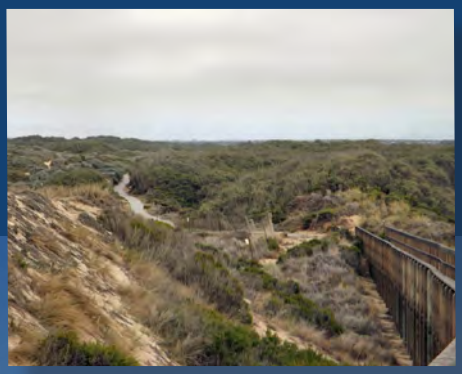










Draft
Habitat Conservation Plan for the Oceano Dunes District

July 2020

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Draft Habitat Conservation Plan
for the California Department of Parks and Recreation
Oceano Dunes District

Prepared for:

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July 2020

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Executive Summary

Overview

Management and operation of Pismo State Beach and Oceano Dunes State Vehicular Recreation Area (SVRA), for which the California Department of Parks and Recreation (CDPR) has responsibility and authority, may negatively affect western snowy plover (*Charadrius nivosus nivosus*), California least tern (*Sternula antillarum browni*), California red-legged frog (*Rana draytonii*), and tidewater goby (*Eucyclogobius newberryi*), as well as six state- and/or federally listed plant species. CDPR is committed to continuing its policy of avoidance and minimization of take[1] of listed species in management of Pismo State Beach and Oceano Dunes SVRA; however, it is anticipated that take of these biological resources will occur. Therefore, CDPR is preparing this Habitat Conservation Plan (HCP) as part of its application for an incidental take permit (ITP) authorized under section 10(a)(1)(B) of the federal Endangered Species Act (FESA).

CDPR's Off-Highway Motor Vehicle Recreation (OHMVR) Division is responsible for management, maintenance, administration, and operation of lands within SVRAs (Pub. Res. Code § 5090.32 b)). The OHMVR Act of 2003 (Public Resources Code § 5090.01 et seq.) provides CDPR's mandate for off-highway vehicle (OHV) recreation. The Oceano Dunes District (District) HCP provides a framework for promoting the protection and recovery of natural resources, including endangered species, while streamlining the permitting process for recreation management, natural resource management, maintenance, and planned development. The HCP will protect, enhance, and restore natural resources in Pismo State Beach and Oceano Dunes SVRA and contribute to the recovery of listed species. Rather than separately permitting and mitigating individual activities, the HCP evaluates natural-resource impacts and mitigation requirements comprehensively in a way that is more efficient and effective for at-risk species and their essential habitats.

The HCP provides the basis for U.S. Fish and Wildlife Service (USFWS) issuance of a 25-year permit authorizing incidental take of listed species under FESA. Separately, CDPR will also be seeking take authorization from the California Department of Fish and Wildlife (CDFW) for species listed under the California Endangered Species Act (CESA) pursuant to California Fish and Game Code Sections 2081 and 2800 et seq., including Section 2835[2]. USFWS will also provide assurances to CDPR that no further commitments of funds, land, or water will be required to address impacts on covered species beyond that described in the HCP.

[1] *Take*, as defined by FESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct." *Harm* is defined as "an act which actually kills or injures wildlife," including "significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering." *Harass* is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." *Take*, as defined under CESA, is any action or attempt to "hunt, pursue, catch, capture, or kill."

[2] Section 2835 of the Fish and Game Code allows CDFW to authorize by permit the taking of any covered species, including those designated as fully protected species, whose conservation and management is provided for in a Natural Community Conservation Plan (NCCP) approved by CDFW.

Geographic Scope

The HCP area is the area in which CDPR is requesting authorization from the USFWS for take incidental to otherwise lawful activities of species covered in this HCP. The 5,005-acre HCP area includes Pismo State Beach and Oceano Dunes SVRA, located in San Luis Obispo County, California. The HCP area is bounded by the City of Pismo Beach to the north, the Guadalupe-Nipomo Dunes National Wildlife Refuge to the south, urban and agricultural land to the east, and the Pacific Ocean to the west. Primary access to the area is via U.S. Highway 101 and State Route 1.

Pismo State Beach and Oceano Dunes SVRA contain approximately 25 percent of the 18-mile linear shoreline of the overall Guadalupe-Nipomo Dunes complex. The Guadalupe-Nipomo Dunes complex extends from Pismo Beach south to Point Sal and roughly from State Route 1 to the Pacific Ocean in San Luis Obispo and Santa Barbara counties. The Guadalupe-Nipomo Dunes complex is a relatively intact coastal dune and dune scrub ecosystem varying in width from 2 to 5 miles.

The HCP area lands are owned by CDPR, except for 584 acres known as the La Grande property, which is owned by San Luis Obispo County; 34 acres owned by Union Oil; and approximately 658 acres owned by Phillips 66. The Phillips 66 land is closed to all public access. All of these lands are managed by the District.

Covered Activities

Covered activities under this HCP include all activities for which CDPR has responsibility within the covered lands that could result in take of covered animal species. These activities include, but are not limited to, public use/recreation management, natural resources management, and park/beach management.

Covered Species

This HCP includes 10 covered species, including 4 federally listed animal and 6 federally listed plant species (Table ES-1). Species were selected for coverage based on their potential to be affected by covered activities, their occurrence in the HCP area, and the species' listing status. This HCP includes avoidance and minimization measures (AMMs) to protect all species selected for coverage under the HCP.

Conservation Program

CDPR will continue to manage the HCP area for covered species largely in the same manner that it has for over a decade. Avoidance and minimization of take of listed species will continue to be the primary objective. The conservation program will recover covered species in the HCP area by protecting and, where appropriate, enhancing their populations. The conservation program includes conservation measures (i.e., actions taken to avoid or minimize take, compensate for loss of habitat, or provide for the conservation of covered species) to achieve the biological goals and objectives set forth in the HCP. The conservation program relies on several types of conservation measures including AMMs, habitat enhancement, habitat restoration, habitat creation, and population enhancement. Recovery and protection of the covered species through the conservation program is accomplished by the following:

- Managing habitat components to benefit covered species
- Minimizing human alteration or disturbance of native habitats
- Reducing conflicts between covered species and park users

- Restoring native habitats
- Monitoring the success of these efforts

Avoidance and Minimization Measures

As required by FESA, the conservation program includes measures to avoid and minimize take of covered animal species. All covered activities must adhere to these measures in order to receive take authorization.

Table ES-1. Species Proposed for Coverage

Species Common Name (*Scientific Name*)	Listing Status	
	State	Federal
Birds		
Western snowy plover (*Charadrius nivosus nivosus*)	CSSC	FT
California least tern (*Sternula antillarum browni*)	SE, SP	FE[1]
Amphibians		
California red-legged frog (*Rana draytonii*)	CSSC	FT
Fish		
Tidewater goby (*Eucyclogobius newberryi*)	CSSC	FE[2]
Plants[3]		
Marsh sandwort (*Arenaria paludicola*)	SE	FE
La Graciosa thistle (*Cirsium scariosum* var. *loncholepis*)	ST	FE
Surf thistle (*Cirsium rhothophilum*)	ST	–
Beach spectaclepod (*Dithyrea maritima*)	ST	–
Nipomo Mesa lupine (*Lupinus nipomensis*)	SE	FE
Gambel's watercress (*Nasturtium* [*Rorippa*] *gambelii*)	ST	FE

Listing Status:
FE Federal listed as endangered
FT Federal listed as threatened
ST State listed as threatened
CSSC California species of special concern
SE State listed as endangered
SP California fully protected

Notes:
[1]The USFWS has recommended, but not formally proposed, downlisting to "threatened."
[2]On March 13, 2014, the USFWS proposed to downlist from federal endangered to threatened (79 FR 14339).
[3]Listed plants are addressed by this HCP, but no take authorization is requested from USFWS.
*Steelhead (*Oncorhynchus mykiss irideus*; South-Central California Coast Ecologically Significant Unit) is not proposed for coverage per 12/23/2008 letter from NOAA Fisheries (NOAA Fisheries 2008) concluding covered activities are not likely to take steelhead with the implementation of AMMs; therefore, an ITP is not required.

Adaptive Management and Monitoring

The conservation program contains detailed guidelines and recommendations for management, enhancement, and restoration techniques in the HCP area. The conservation program also contains a detailed monitoring and adaptive management program. Adaptive management is a process that allows flexible management, such that actions can be adjusted as uncertainties become better understood or

as conditions change—a "learning by doing approach" that reduces the uncertainty inherent in resource management. Adaptive management should identify and address the uncertainty, incorporate a range of previously agreed-upon alternatives for addressing those uncertainties, integrate a monitoring program that detects the necessary information, and incorporate a feedback loop that links implementation and monitoring to a decision-making process that results in appropriate changes in management. Adaptive management will help CDPR achieve the biological goals and objectives of the HCP.

Implementation

CDPR is the Permittee. The HCP will be implemented by the Oceano Dunes District, with the District Superintendent having implementation responsibility and supported by District and other CDPR staff. The District Superintendent can issue orders addressing the covered activities, including:

- Temporary beach or other park area closures needed to protect wildlife resources.
- Strict enforcement of laws and regulations governing the park, including, but not limited to, no entry areas, dogs in prohibited areas, dogs off-leash in leash only areas, horses off trails, and motorized vehicle restrictions.
- Permanent closures of trails or beaches.

The District Superintendent will need assistance from OHMVR Division Headquarters and CDPR management in obtaining the necessary funding and providing overall support for the HCP.

CDPR and the District will be advised by representatives of the USFWS, other regulatory agencies (e.g., California Coastal Commission), and a pool of scientific advisors.

Glossary

The following abbreviations and place name definitions are provided for terms used in this Habitat Conservation Plan.

A. ABBREVIATIONS AND TERMS

AMM	Avoidance and minimization measure
APAP	Aquatic pesticide application plan
ASI	American Safety Institute
ATV	All-terrain vehicle
BMP	Best management practice
°C	Degrees Celsius
CCBER	Cheadle Center for Biodiversity and Ecological Restoration
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFW[3]	California Department of Fish and Wildlife
CDP	Coastal development permit
CDPR	California Department of Parks and Recreation
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CLTE	California least tern
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRHR	California Register of Historical Resources
CRLF	California red-legged frog
CSLRCD	Coastal San Luis Resource Conservation District
DPR	Department of Pesticide Regulation
District	Oceano Dunes District
Dunes Preserve	Pismo Dunes Natural Preserve
eDNA	Environmental DNA
°F	Degrees Fahrenheit
FAA	Federal Aviation Administration

[3] As of January 1, 2013, the California Department of Fish and Game (CDFG) was renamed the California Department of Fish and Wildlife (CDFW). When this document cites reports prepared by the Department prior to 2013, the reference includes the prior department name of CDFG. Both CDFW and CDFG refer to the same agency.

FESA	Federal Endangered Species Act
GIS	Geographic Information System
HCP	Habitat conservation plan
HMS	Habitat monitoring system
IPM	Integrated pest management
ITP	Incidental take permit
LC50	Lethal concentration of a chemical causing 50 percent mortality of test animals
LD50	Lethal dose required to kill 50 percent of a population of test animals
LCSLO	Land Conservancy of San Luis Obispo
MCV2	Manual of California Vegetation
MIG	MIG, Inc.
MOU	Memorandum of Understanding
Mph	Miles per hour
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWS	National Weather Service
OHMVR	Off-highway motor vehicle recreation
OHV	Off-highway vehicle
PCA	Pest control adviser
PCE	Primary constituent element
PM	Particulate matter
Post	Orientation marker posts
PPM	Parts per million
PPT	Parts per thousand
PRBO[4]	PRBO Conservation Science
PWP	Public Works Plan
RUV	Recreational utility vehicle
RV	Recreational vehicle

[4] As of June 5, 2013, PRBO Conservation Science (PRBO) was renamed Point Blue Conservation Science (Point Blue). When this document cites reports prepared prior to June 5, 2013, the reference includes the prior organization name of PRBO. Both PRBO and Point Blue refer to the same organization.

SHPO	State Historic Preservation Officer
SNPL	Western snowy plover
SOA	Stipulated Order of Abatement
SVRA	State vehicular recreation area
TMDL	Total maximum daily loads
UAS	Unmanned Aircraft System; sometimes referred to as “drone”
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VAFB	Vandenberg Air Force Base
VT	Vegetated treatment
WHPP	Wildlife habitat protection program
Wildlife Agencies	U.S. Fish and Wildlife Service and/or California Department of Fish and Wildlife

B. DESCRIPTION OF PLACE NAMES

6 Exclosure[5]	The area (approximately 0.5 mile of shoreline and approximately 60 acres) within the Southern Exclosure from orientation marker post (Post) 6 to Post 7. Vegetation within this exclosure is very sparse with limited area of vegetated hummocks.
7 Exclosure	The area (approximately 0.4 mile of shoreline and approximately 60 acres) within the Southern Exclosure from Post 7 to the north side of the 8 Exclosure. Habitat within this exclosure includes areas of bare sand, limited areas of vegetated hummocks, and limited areas of organic surface debris (e.g., shells, driftwood, dried algal wrack), as well as moderate to heavy vegetation in a small revegetation area.
8 Exclosure	The area (approximately 0.5 mile of shoreline and approximately 85 acres) of the Southern Exclosure from the south side of the 7 Exclosure to the North Oso Flaco fencing south of Post 8. Habitat includes extensive areas of bare sand in the eastern portion, areas of small to moderately tall vegetated foredune hummocks, and limited areas of organic surface debris.

[5] Wire fencing intended to keep predators and humans away from ground nests.

Arroyo Grande Creek	Seasonally flows into the Pacific Ocean approximately 2 miles north of the Southern Exclosure. The associated lagoon is variably located east of the area between Post 1 and Post 2. The upper creek and lagoon are closed to vehicle use year-round to protect sensitive aquatic habitat. Pedestrian and equestrian entry is prohibited during the breeding season for western snowy plover (SNPL) and California least tern (CLTE) but permitted during the non-breeding season. Posts and signs delineate the closed area during the non-breeding season and symbolic rope fencing is added during the breeding season.
Boneyard Exclosure	The area (approximately 95 acres) east of the North Oso Flaco dunes within the Southern Exclosure. Habitat is primarily bare sand and active sand dunes. This exclosure is inland and does not have a shoreline component. A portion of the west side (15.5 acres) has been closed year-round since 2005 due to the presence of a cultural resource in the area, and portions of this area have developed small vegetated hummocks. In addition, straw bales that were placed in 2004 to protect the cultural resource are still present in this area. The east fence is not maintained as a predator fence due to the rapidly shifting open sand dunes in the area. Beginning in 2003, an interior predator fence was placed in the Boneyard Exclosure resulting in an approximately 48-acre western portion that adjoins the 8 Exclosure and North Oso Flaco Exclosure and an approximately 47-acre eastern portion.
Carpenter Creek	Seasonally flows into the Pacific Ocean approximately 4.5 miles north of the Southern Exclosure. Non-California Department of Parks and Recreation (CDPR) vehicles are not allowed in the area as it is approximately 0.4-mile north of the riding area. CDPR vehicles are allowed in this area. The area receives a high level of pedestrian use.
HCP area	The entire area (5,005 acres) for which incidental take coverage is sought, comprising Pismo State Beach, which includes Pismo Dunes Natural Preserve (Dunes Preserve) and Pismo Lake, and Oceano Dunes State Vehicular Recreation Area (SVRA), which includes the Oso Flaco Lake area.
Midramps	Beach access area to Oceano Campground between Grand Avenue and Pier Avenue. Midramps is only open to CDPR vehicles.
North Oso Flaco Exclosure	The area (approximately 0.5 mile and approximately 68 acres, including shoreline) extending south from 8 Exclosure to the pedestrian boardwalk access trail that leads to the Oso Flaco shoreline. Approximately 56 acres of predator fencing is used in this area, and the shoreline portion is symbolically closed to the public.

Oceano Dunes District	Same as the HCP area. The Oceano Dunes District is operated and managed by CDPR, including the Off-Highway Motor Vehicle Recreation (OHMVR) Division of CDPR.
Oceano Dunes SVRA	Oceano Dunes SVRA (3,490 acres), which is operated and managed by CDPR/Oceano Dunes District.
Open riding area	Portion of Oceano Dunes SVRA and Pismo State Beach south of Post 2 (approximately 1,300 acres) open to off-highway motor vehicle recreation and camping.
Pismo Creek Lagoon	Seasonally flows into the Pacific Ocean approximately 4.8 miles north of the Southern Exclosure. Standing water persists all year, with low vegetated hummocks west of the lagoon and tall vegetated dunes and housing to the east. Non-CDPR vehicles are not allowed in the area as it is approximately 0.75 mile north of the riding area. The area receives a high level of pedestrian use. Only a small portion of the lagoon is part of State Park property. CDPR vehicles are allowed in this area.
Pismo Dunes Natural Preserve	Referred to as Dunes Preserve in this HCP. Subunit of Pismo State Beach (694 acres) that is open to pedestrians and equestrians and closed to all vehicular traffic and dogs.
Pismo Lake	A subunit of Pismo State Beach. The Pismo Lake property was acquired in 2007. No management plan or future development design is currently in effect for the area.
Pismo State Beach	A state beach (approximately 1,515 acres) operated and managed by CDPR/Oceano Dunes District.
Riding area	The area within Oceano Dunes SVRA that is open to recreational vehicles and camping. This area changes in size based on seasonal restrictions. Street-legal vehicles are allowed along approximately 5.3 miles of beach, from the Grand Avenue entrance to the southern boundary of the riding area (approximately 0.4 mile south of Post 8). Off-highway motor vehicles and camping are only allowed south of Post 2 in the open riding area.
Sand Highway	Commonly traveled route into the dunes at Oceano Dunes SVRA. The route runs from south of Post 4 to the southern boundary of the open riding area. It is marked with numbered signs for navigation.
Seasonal Exclosure	The contiguous area enclosed by the predator fencing to protect SNPL and CLTE during the breeding season that includes the Southern Exclosure and North Oso Flaco Exclosure. The seasonal exclosure does not include the Oso Flaco shoreline or the eastern Boneyard area.

Southern Exclosure	A single contiguous area, including shoreline, within the southern portion of the open riding area (approximately 300 acres) comprising the 6, 7, 8, and Boneyard exclosures that is fenced and closed to entry during the breeding season to protect nesting SNPL and CLTE. From 2001 to 2004, the amount of seasonally protected nesting habitat in the riding area periodically increased in size. Subsequent to 2004 there has been no increase in size of this protected area.
South Oso Flaco	The area (approximately 1.2 miles of shoreline) that extends from the boardwalk to the southern boundary of Oceano Dunes SVRA. Oso Flaco Lake drains through Oso Flaco Creek, and the mouth of this creek is within the northern portion of South Oso Flaco. Symbolic fencing is used in this area during the breeding season instead of predator fencing to close off the upper beach and dune habitat. The shoreline remains open to the public.
Trails	Oceano Dunes District trails include the Meadow Creek, Grand Dunes, Oceano Lagoon, and Oso Flaco Boardwalk trails. The Grand Dunes Trail is an informal path.
Vegetation islands	Pockets of vegetation, which are fenced off and closed to vehicles, composed largely of central coastal dune scrub, willow thicket, and dune swale found in hollow pockets in active coastal dunes. There are approximately 20 vegetation islands in Oceano Dunes SVRA, including Moy Mel, Pavilion Hill, Worm Valley, BBQ Flats, BBQ Flats South, La Grille Hill, Pawprint, Eucalyptus North, Eucalyptus Tree, Eucalyptus South, Indian Midden South, Boy Scout North, Belly Button, Tabletop, Elvis, Big Mac, Boy Scout Camp, Surprise, 7.5 Reveg, and Pipeline.

Chapter 1. Introduction and Background

1.1 Overview and Background

The California Department of Parks and Recreation (CDPR) has numerous parks within San Luis Obispo County encompassing large sections of the central California coastline, extensive watersheds, and upland terrestrial environments. This Habitat Conservation Plan (HCP) focuses on Pismo State Beach and Oceano Dunes State Vehicular Recreation Area (SVRA), administered by the Oceano Dunes District (District). While together these parks protect tracts of largely open, undeveloped lands, they are set within a geographic context of urban development typical of the California coast.

The mission of CDPR is to provide for the health, inspiration, and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation. Balancing the need to protect California's natural resources, while providing recreational access to the parks, requires the development of sound management strategies that are based on the best available scientific, demographic, and economic information. This is particularly important considering the number of endangered plant and animal species that use these parks as a last safe refuge at the same time that a growing population puts increasing demand on parks.

CDPR's Off-Highway Motor Vehicle Recreation (OHMVR) Division is responsible for management, maintenance, administration, and operation of lands within SVRAs (Pub. Res. Code § 5090.32 b)). The OHMVR Act of 2003 (Public Resources Code § 5090.01 et seq.) provides CDPR's mandate for off-highway vehicle (OHV) recreation. The OHMVR Division is charged with administering the state's OHMVR Program to provide high quality OHV recreation opportunities and to address the effects inherent with those activities. The mission of the OHMVR Division is to provide leadership statewide in the area of OHV recreation; to acquire, develop, and operate state-owned vehicular recreation areas; and to otherwise provide for a statewide system of managed OHV recreational opportunities through funding to other public agencies. The OHMVR Division works to ensure that quality recreational opportunities remain available for future generations by providing for education, conservation, and enforcement efforts that balance OHV recreation impacts with programs that conserve and protect cultural and natural resources (CDPR, OHMVR Division 2009).

The purpose of this HCP is to describe the measures the District will undertake to avoid, minimize, and mitigate specified visitor- and park operations-related impacts to several listed species. Avoidance and minimization of take of listed species will continue to be the primary objective. Consistent with CDPR's and OHMVR Division's missions, this HCP is designed to accommodate recreational use within the covered parks while protecting and benefiting numerous populations of threatened and endangered species occurring within those parks.

1.1.1 Purpose and Goals

This HCP is part of a conservation effort initiated by the OHMVR Division to protect, conserve, and restore the natural resources of Pismo State Beach and Oceano Dunes SVRA while allowing CDPR to continue to operate the park units for public use and enjoyment consistent with unit classifications. The primary goals of the HCP's conservation program are to provide habitat-level protection and management and to minimize human-related impacts to key threatened or endangered wildlife, including the western snowy plover (SNPL; *Charadrius nivosus nivosus*), California least tern (CLTE; *Sternula antillarum browni*), California red-legged frog (CRLF; *Rana draytonii*), tidewater goby (*Eucyclogobius newberryi*), and six state- and/or federally listed plant species. The protection and

management actions implemented for these "covered species" will benefit a host of other plant and animal species that inhabit the same habitats.

This HCP provides mitigation and avoidance and minimization measures (AMMs) that will enhance the long-term probability of survival for the covered species within the HCP area. This will be accomplished by:

- Managing habitat components to benefit the covered species
- Minimizing human alteration or disturbance of native habitats
- Reducing conflicts between covered species and park users
- Restoring native habitats
- Monitoring the success of these efforts

This HCP will provide the basis for issuance of an incidental take permit (ITP) issued by the U.S. Fish and Wildlife Service (USFWS) pursuant to section 10(a)(1)(B) of the federal Endangered Species Act (FESA) of 1973, as amended. The HCP, which is a priority objective of management, establishes allowable levels of incidental take of the covered animal species that may occur as an unintended result of otherwise lawful activities of park visitors and/or park staff and describes measures to minimize and mitigate the incidental take to the maximum extent practicable.

1.2 Permit Holder/Permit Term

CDPR is the Permittee. The HCP will be implemented by the Oceano Dunes District, with the District Superintendent having implementation responsibility and supported by District staff, including Environmental Scientists, Rangers, Environmental Services Interns, and Park Aides. The District Superintendent will need assistance from OHMVR Division Headquarters to obtain adequate annual budgets to implement the conservation program.

The term of the section 10(a)(1)(B) permit shall be 25 years with a report on the program produced annually. The annual report will evaluate the performance and effectiveness of the HCP and will be subject to review by the USFWS (section 5.7). The ITP covers ongoing activities (e.g., recreation, operations, maintenance, natural resources management) and new activities (e.g., SNPL egg and chick capture for captive rearing if they are observed to be threatened by covered activities, listed plant propagation and outplanting, mechanical trash removal, cable fence replacement, Pismo Creek estuary seasonal floating bridge, riding in 40 Acres, new dust control activities, Oso Flaco boardwalk replacement, special projects, exclosure reduction, and use of unmanned aircraft systems [UAS]) in the Oceano Dunes District that are expected to exist in perpetuity. These activities are also expected to potentially affect the covered species in perpetuity, so CDPR requires take authorization for these activities as long as feasible. The 25-year term has been chosen as an appropriate balance between 1) management need and 2) foreseeability of both covered activities and conservation program outcomes. The longstanding management program for SNPL and CLTE, for example, illustrates the effectiveness of the protocols incorporated into this HCP.

1.3 Permit Boundary/Covered Lands

This HCP covers two coastal parks managed by CDPR located in San Luis Obispo County, California (Map 1). The 5,005-acre HCP area comprises Pismo State Beach and Oceano Dunes SVRA. Covered park unit lands comprise state beach, natural preserve, and SVRA (see section 1.5.8). Pismo Dunes Natural Preserve is a subunit within Pismo State Beach. The HCP area is bounded by the City of Pismo Beach to

the north, the Guadalupe-Nipomo Dunes National Wildlife Refuge to the south, urban and agricultural land to the east, and the Pacific Ocean to the west. Primary access to the area is via U.S. Highway 101 and State Route 1 (Map 2).

Pismo State Beach and Oceano Dunes SVRA comprise approximately 25 percent of the 18-mile linear shoreline of the overall Guadalupe-Nipomo Dunes complex. The Guadalupe-Nipomo Dunes complex extends from Pismo Beach south to Point Sal, and roughly from State Route 1 to the Pacific Ocean, in San Luis Obispo and Santa Barbara counties. The Guadalupe-Nipomo Dunes complex is a relatively intact coastal dune and dune scrub ecosystem varying in width from 2 to 5 miles.

The HCP area lands are owned by CDPR, except for 584 acres known as the La Grande property, which is owned by San Luis Obispo County; 34 acres owned by Union Oil; and approximately 658 acres owned by Phillips 66. The land owned by Phillips 66 is closed to all public access. All of these lands are managed by the Oceano Dunes District.

The following discussion gives an overview of each park unit within the HCP area. Details of park operations and resources are provided in subsequent chapters.

1.3.1 Pismo State Beach

Pismo State Beach includes four somewhat distinct areas: the beach area; Pismo Dunes Natural Preserve (Dunes Preserve); Pismo Lake; and a developed portion, including two campgrounds, a golf course with restaurant, ranger station/maintenance yard, and park residence area (Map 3). The entire Pismo State Beach unit is approximately 1,515 acres and is adjacent to the cities of Pismo Beach and Grover Beach and the community of Oceano. The City of Pismo Beach has operated the northern portion of the state beach (i.e., from approximately Addie Street to the northern CDPR boundary) in accordance with an operating agreement in place since 1951. Although the City of Pismo Beach operates this portion of the state beach, when needed, CDPR staff assist with lifeguard operations on the City-operated beach and CDPR Environmental Scientists conduct resource work in this area.

Some areas of Pismo State Beach are closed to vehicles; some areas are open to street-legal vehicles only, while other areas are open to OHVs and street-legal vehicles. The portion of Pismo State Beach north of Grand Avenue is closed to non-CDPR vehicles. The public is allowed to drive motorized vehicles through Pismo State Beach south of Grand Avenue to access Oceano Dunes SVRA. Visitors and CDPR staff can also drive onto the beach via sand ramps at the western terminuses of Grand Avenue and Pier Avenue (Map 2). Motorized vehicles, including OHVs, are allowed on the portion of Pismo State Beach south of orientation marker post (Post) 2 (Map 3). CDPR staff also have access to the beach via an entrance from Oceano Campground, which is north of Pier Avenue (i.e., Midramps; Map 4).

The Dunes Preserve is a 695-acre subunit of Pismo State Beach with undisturbed sand dunes, dune slack, and freshwater wetlands. The Dunes Preserve begins at the south bank of Arroyo Grande Creek. Its southern boundary is shared with Oceano Dunes SVRA. It is bounded on the west by the seaward toe of the foredune at Pismo State Beach. Pedestrian and equestrian use is permitted in the Dunes Preserve, but vehicles and dogs are not allowed.

The 70-acre Pismo Lake area is inland of and disconnected from the rest of Pismo State Beach. Pismo Lake is not officially closed to the general public, but public visitation is not encouraged because designated access points have not been established, and the area is treated as closed in this HCP. No management plan or future development design is currently in effect for the area.

1.3.2 Oceano Dunes State Vehicular Recreation Area

Oceano Dunes SVRA is 3,490 acres and is contiguous with Pismo State Beach. As a result, the vehicle operations at Pismo State Beach and Oceano Dunes SVRA are managed as an SVRA. As noted above, motorized vehicles access Oceano Dunes SVRA via sand ramps in Pismo State Beach at Grand Avenue and Pier Avenue (Map 2). Between the two park units (i.e., Pismo State Beach and Oceano Dunes SVRA), approximately 1,300 acres are set aside for OHV use in what is called the "open riding area." Almost 2,200 acres of Oceano Dunes SVRA outside of the open riding area are maintained in a largely natural state. A portion of Oceano Dunes SVRA, mostly south and southeast of the open riding area, is a pedestrian-only area that can be accessed from Oso Flaco Lake Road off State Route 1, as well as from an entrance from the open riding area at Boneyard (Map 5). This area can also be accessed from the shoreline during the non-breeding season for SNPL and CLTE when shoreline access is not restricted by fencing (i.e., seasonal exclosure) erected by CDPR to protect breeding SNPL and CLTE.

The Phillips 66 leasehold lies between the open riding area and communities east of Oceano Dunes SVRA; it is closed to all visitors. Oceano Dunes District staff manages the leasehold area (e.g., maintains fences and manages resources), as needed. This area can be used for emergency access. Phillips 66 maintains the road through the leasehold property to ensure access for pipeline maintenance.

The state leases some Oceano Dunes SVRA land to local agricultural operators (Map 3) near Oso Flaco Lake. This 211-acre leased portion of Oceano Dunes SVRA is also included in this HCP.

1.4 Species to be Covered by the Permit

Covered species were chosen based on their listing or potential listing status as a federally listed threatened or endangered species and the potential for take within the HCP area. Table 1-1 lists the species addressed by this HCP. Four of these species are listed animals and six are listed plants. Although FESA does not prohibit take of listed plant species, CDPR has included them in this HCP and requests assurances for them under USFWS's "No Surprises" assurances rule, discussed in section 6.5.2.

In addition to the covered species, other special-status species have either been documented within 5 miles of the HCP area and/or are included on the USFWS Resource Report for the HCP area. Appendix A lists these species along with an explanation as to why each species is not included as a covered species. These or other species could be added to the ITP via an amendment to the HCP if they become listed and/or otherwise require incidental take authorization during the duration of the permit.

Table 1-1. Species Proposed for Coverage

Species Common Name (*Scientific Name*)	Listing Status	
	State	Federal
Birds		
Western snowy plover (*Charadrius nivosus nivosus*)	CSSC	FT
California least tern (*Sternula antillarum browni*)	SE, SP	FE[1]
Amphibians		
California red-legged frog (*Rana draytonii*)	CSSC	FT
Fish		
Tidewater goby (*Eucyclogobius newberryi*)	CSSC	FE[2]
Plants[3]		
Marsh sandwort (*Arenaria paludicola*)	SE	FE

Table 1-1. Species Proposed for Coverage

Species Common Name (*Scientific Name*)	Listing Status	
	State	Federal
La Graciosa thistle (*Cirsium scariosum* var. *loncholepi*s)	ST	FE
Surf thistle (*Cirsium rhothophilum*)	ST	–
Beach spectaclepod (*Dithyrea maritima*)	ST	–
Nipomo Mesa lupine (*Lupinus nipomensis*)	SE	FE
Gambel's watercress (*Nasturtium* [*Rorippa*] *gambelii*)	ST	FE

Listing Status:

FE Federally listed as endangered	ST	State listed as threatened
FT Federally listed as threatened	CSSC	California species of special concern
SE State listed as endangered	SP	California fully protected

Notes:

[1]The USFWS has recommended, but not formally proposed, downlisting to "threatened."

[2]On March 13, 2014, the USFWS proposed to downlist from federal endangered to threatened (79 FR 14339).

[3]Listed plants are addressed by this HCP, but no take authorization is requested from USFWS.

*Steelhead (*Oncorhynchus mykiss irideus*; South-Central California Coast Ecologically Significant Unit) is not proposed for coverage per 12/23/2008 letter from NOAA Fisheries (NOAA Fisheries 2008) concluding covered activities are not likely to take steelhead with the implementation of AMMs; therefore, an ITP is not required.

1.5 Regulatory Framework

1.5.1 Federal Endangered Species Act

Section 9 of FESA and federal regulation pursuant to 4(d) of the FESA as applicable to species currently under consideration for coverage under this HCP, prohibit the take of endangered and threatened species, respectively, without exemption. *Take* is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. *Harm* is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. *Harass* is defined by the USFWS as intentional or negligent actions that create the likelihood of injury to listed species by annoying them to such an extent as to significantly disrupt normal behavioral patterns that include, but are not limited to, breeding, feeding, or sheltering. *Incidental take* is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Pursuant to the Principal Deputy Director's Memorandum (USFWS 2018a), harassment is not a form of take permitted under section 10(a)(1)(B) since it is not incidental take and is instead an intentional or negligent act.

Pursuant to FESA section 11(a) and (b), any person who knowingly violates section 9 or any permit, certificate, or regulation related to section 9 may be subject to civil or criminal penalties for each violation and/or imprisonment.

Individuals and state and local agencies proposing an action that is expected to result in the take of federally listed animal species are encouraged to apply for an ITP under FESA section 10(a)(1)(B) to be in compliance with the law. Such permits are issued by the USFWS when take is not the intention of and is incidental to otherwise legal activities. An ITP application must be accompanied by an HCP. The regulatory standard under section 10(a)(1)(B) is that the effects of authorized incidental take must be minimized and mitigated to the maximum extent practicable. Under section 10(a)(1)(B), a proposed

project also must not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and adequate funding for a plan to minimize and mitigate impacts must be ensured.

FESA section 10(a)(1)(A) Recovery Permits are issued to allow for take resulting from activities intended to foster the recovery of listed species. A typical use of a 10(a)(1)(A) Recovery Permit is to allow for scientific research on a listed species in order to better understand the species' long-term survival needs.

Section 3 of FESA provides for the designation of critical habitat for listed species. Section 3 defines critical habitat as: (i) the specific areas within the geographical area occupied by the species at the time it is listed on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon determination that such areas are essential for the conservation of the species. The term "conservation" is defined in section 3 as "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary." Therefore, critical habitat includes biologically suitable areas necessary for recovery of the species. Critical habitat may also include an area that is not currently occupied by the species but that will be needed for its recovery.

Section 7 of FESA requires federal agencies to ensure that their actions, including issuing permits, do not jeopardize the continued existence of listed species or destroy or adversely modify listed species' critical habitat. "Jeopardize the continued existence of…" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 Code of Federal Regulations [CFR] §402.02). "Destruction or adverse modification…" means "a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include … those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (50 CFR §402.02). USFWS issuance of an ITP under FESA section 10(a)(1)(B) is a federal action subject to FESA section 7. As a federal agency issuing a discretionary permit, the USFWS is required to consult with itself (i.e., conduct an internal consultation). Delivery of the HCP and a section 10(a)(1)(B) permit application initiates the section 7 consultation process within the USFWS.

The requirements of section 7 and section 10 substantially overlap. In the section 7 analysis, the Service must evaluate the effects of the action and cumulative effects on the listed species or critical habitat. Cumulative effects are effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area, pursuant to FESA section 7(a)(2). The action area is defined by the area that encompasses all consequences of the action. The action area may or may not be solely contained within the HCP boundary. These additional analyses are included in this HCP to meet the requirements of section 7 and to assist the USFWS with its internal consultation.

1.5.2 The Section 10(a)(1)(B) Process – Habitat Conservation Plan Requirements and Guidelines

The section 10(a)(1)(B) process for obtaining an ITP has three primary phases: 1) the HCP development phase; 2) the formal permit processing phase; and 3) the post-issuance phase.

During the HCP development phase, the project applicant prepares a plan that integrates the proposed project or activity with the protection of listed species. An HCP submitted in support of an ITP application must include the following information:

- Impacts likely to result from the proposed taking of the species for which permit coverage is requested;
- Measures that will be implemented to monitor, minimize, and mitigate impacts; funding that will be made available to undertake such measures; and procedures to deal with unforeseen circumstances;
- Alternative actions considered that will not result in take; and
- Additional measures the USFWS may require as necessary or appropriate for purposes of the plan.

The HCP development phase concludes and the permit processing phase begins when a complete application package is submitted to the appropriate permit-issuing office. A complete application package consists of 1) an HCP, 2) an Implementing Agreement, if applicable, 3) a permit application, and 4) a $100 fee from the applicant. The USFWS must publish a Notice of Availability of the HCP package in the Federal Register to allow for public comment. The USFWS also prepares an Intra-Service section 7 Biological Opinion and prepares a Set of Findings, which evaluates the section 10(a)(1)(B) permit application in the context of permit issuance criteria (see below). An Environmental Action Statement, Environmental Assessment, or Environmental Impact Statement serves as the USFWS's record of compliance with the National Environmental Policy Act (NEPA), which goes out for a 30-day, 60-day, or 90-day public comment period. A section 10(a)(1)(B) ITP is granted once the USFWS determines that all requirements for permit issuance have been met. Statutory criteria for issuance of the permit specify that:

- The taking will be incidental;
- The impacts of incidental take will be minimized and mitigated to the maximum extent practicable;
- Adequate funding for the HCP and procedures to handle unforeseen circumstances will be provided;
- The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild;
- The applicant will provide additional measures that the USFWS requires as being necessary or appropriate; and,
- The USFWS has received assurances, as may be required, that the HCP will be implemented.

During the post-issuance phase, the Permittee and other responsible entities implement the HCP, and the USFWS monitors the Permittee's compliance with the HCP as well as the long-term progress and success of the HCP. The public is notified of permit issuance by means of the Federal Register.

1.5.3 California Endangered Species Act

Section 2080 of the California Fish and Game Code prohibits "take" of any species that the California Department of Fish and Wildlife (CDFW) determines to be an endangered species or a threatened species, except as otherwise provided. *Take* is defined in section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Unlike FESA, the definition of take under CESA does not include harm or harassment. Like FESA, CESA allows for take incidental to otherwise lawful activities.

Section 2081 of the California Fish and Game Code allows CDFW to authorize acts that are otherwise prohibited pursuant to section 2080 of the California Fish and Game Code. Section 2081(a) allows CDFW to authorize the import, export, take, or possession of endangered, threatened, or candidate species through a permit or memorandum of understanding for scientific, educational, or management purposes. Section 2081(b) allows CDFW to authorize take that is incidental to an otherwise lawful activity. Section 2835 of the California Fish and Game Code allows CDFW to authorize by permit the taking of any covered species, including those designated as fully protected species, whose conservation and management is provided for in a Natural Community Conservation Plan (NCCP) approved by CDFW. CDPR is currently in the preliminary stages of preparing an NCCP to comply with CESA. The NCCP will include take coverage for CLTE and the six state-listed plants included in this HCP.

1.5.4 State of California Fully Protected Species

In the 1960s, the State of California first began to designate "fully protected" species prior to the creation of CESA and FESA. Some fully protected species are also listed as threatened or endangered species under the FESA and/or CESA. California Fish and Game Code sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) designate certain species as fully protected species and provide that fully protected species may not be taken or possessed (section 1.5.3), except pursuant to an approved NCCP or a permit from CDFW for "necessary scientific research, including efforts to recover fully protected, threatened, or endangered species." CDFW cannot authorize take or possession of fully protected species for necessary scientific research if that research is conducted in connection with mitigation for a project (Fish and Game Code §§ 3511, 4700, 5050, and 5515).

1.5.5 National Environmental Policy Act and California Environmental Quality Act

The purpose of NEPA is two-fold: to ensure that federal agencies examine environmental impacts of their actions (in this case deciding whether to issue an ITP) and to facilitate public participation. NEPA serves as an analytical tool on direct, indirect, and cumulative impacts of the proposed project alternatives to help the USFWS decide whether to issue an ITP. NEPA analysis must be conducted by the USFWS for each HCP as part of the ITP application process. To fulfill this requirement, an Environmental Assessment has been prepared for this HCP.

OHMVR Division's adoption of this HCP is also a project subject to California Environmental Quality Act (CEQA) compliance. Similar to NEPA, the CEQA analysis considers the potential impacts of adopting the HCP and issuing the permit on the environment. To satisfy this requirement, an Environmental Impact Report has been prepared for this HCP.

1.5.6 National Historic Preservation Act

All federal agencies are required to examine the impacts of their actions (e.g., issuance of a permit) on cultural resources. This may require consultation with the State Historic Preservation Officer (SHPO) and appropriate American Indian tribes. All ITP applicants are requested to submit a Request for Cultural Resources Compliance form to the USFWS. To complete compliance, the applicants may be required to hire contractors to conduct cultural resource surveys and possibly mitigate impacts to those resources.

1.5.7 Superintendent's Orders

The California Public Resources Code requires CDPR to protect units within the state park and SVRA systems from damage (Pub. Res. Code § 5008 (a)). To that end, local districts may establish rules and regulations specific to individual units (Pub. Res. Code § 5003, 14 California Code of Regulations [CCR] § 4326 (a)). Such local rules and regulations are commonly referred to as Superintendent's Orders.

Superintendent's Orders must be posted in a location convenient for public review at district headquarters and at the affected unit (14 CCR § 4301 (i)). Violating CDPR rules and regulations, including a properly posted order, is a misdemeanor (Pub. Res. Code § 5008 (d)). All CDPR rangers are authorized to enforce rules and regulations (Pub. Res. Code § 5008 (b)).

The following orders[6] are currently in effect within the Oceano Dunes District and are relevant to this HCP (Appendix B):

- 554-003-2015 Kiteboarding (kitesurfing) – specifies restrictions on kite flying, including kiteboarding
- 554-004-2015 Refuse Disposal – prohibits importing waste into the Oceano Dunes District, disturbing trash containers, and dumping hazardous materials
- 554-005-2015 Motor Vehicle Operation – specifies restrictions on motor vehicle operation throughout the District, including vehicular crossings of Arroyo Grande Creek
- 554-007-2015 Fees – requires payment of fees for motor vehicle entry
- 554-008-2015 Campfires – governs size, fuel, and burn hours
- 554-009-2015 Seasonal Closure – governs seasonal closures for nesting SNPL and CLTE March 1 through September 30
- 554-018-2015 Campground – specifies campground check-in, check-out, and quiet hours
- 554-21-2015 Closure and Restrictions for Public Access and Entry to Designated Sensitive Resource Areas – prohibits entry into and camping within posted areas
- 554-012-2015 Oso Flaco parking – closes parking lot between sunset and 6 a.m.
- 554-001-15 Motorized and Non-Motorized Vehicles – prohibits camping north of Post 2 and specifies designated camping south of Post 2
- 554-017-2015 Dogs – specifies restrictions on dogs throughout the District

1.5.8 Park Designations

The two park units, and portions thereof, covered by the HCP fall under three different classifications: Natural Preserve (Pub. Res. Code § 5019.17), State Beach (Pub. Res. Code § 5019.56(c)), and SVRA (Pub. Res. Code § 5090.43). The California Public Resources Code describes these classifications and prescribes management and operations guidelines specific to each classification.

1.5.8.1 Natural Preserves

Natural preserves consist of distinct areas of outstanding natural or scientific significance established within the boundaries of State Park System units. The purpose of natural preserves is to preserve features (e.g., rare or endangered plant and animal species and their supporting ecosystems) that are representative examples of plant or animal communities existing in California prior to the impact of

[6] Superintendent's Orders are subject to change (approximately every 3-5 years); therefore, the numbers and titles associated with the Superintendent's Order will likely change during the HCP term. However, the subject matter will continue to be addressed within the new Superintendent's Orders. In addition, Superintendent's Orders can be updated or added due to new or changed circumstances as part of the adaptive management process (section 5.6).

civilization, geological features illustrative of geological processes, significant fossil occurrences or geological features of cultural or economic interest, or topographic features illustrative of representative or unique biogeographical patterns. Habitat manipulation is permitted only in those areas of a natural preserve found by scientific analysis to require manipulation to preserve the species or associations that constitute the basis for establishing the natural preserve (Pub. Res. Code § 5019.71). The public is prohibited from bringing motor vehicles into natural preserves (Pub. Res. Code § 5001.8 (a); CCR § 4351).

1.5.8.2 State Beaches

State beaches are a subset of state recreation units, which consist of areas selected, developed, and operated to provide outdoor recreational opportunities. When planning improvements to be undertaken within state recreation units, compatibility of the design with the surrounding scenic and environmental characteristics must be considered. State beaches consist of areas with frontage on the ocean or bays designed to provide swimming, boating, fishing, and other beach-oriented recreational activities.

1.5.8.3 State Vehicular Recreation Areas

SVRAs consist of areas selected, developed, and operated to provide OHV recreation opportunities. SVRAs must be developed, managed, and operated for the purpose of providing the fullest appropriate public use of the vehicular recreational opportunities present in accordance with the OHMVR Act, while providing for the conservation of cultural resources and the conservation and improvement of natural resource values over time (Pub. Res. Code § 5090.43 (a)). To protect natural and cultural resource values, CDPR may establish sensitive areas within SVRAs. If OHV use results in damage to any natural or cultural resources or damage within sensitive areas, appropriate measures must be taken to protect these lands from any further damage. These measures may include erecting physical barriers and must include restoring natural resources and repairing damage to cultural resources (Pub. Res. Code § 5090.43).

1.5.9 Existing General Plan and Other Plans

General plans, formerly referred to as general development plans, set forth policies governing each park unit. The Pismo State Beach and Pismo [Oceano] Dunes SVRA General Development Plan and Resource Management Plan was approved in April 1975 (CDPR 1975). The following section lists applicable general development plan policies and other resource protection plans relevant to the HCP.

1.5.9.1 Pismo State Beach

The General Development Plan provides the following Declarations of Purpose and Management Policy for the state beach (note that camping on the beach is no longer permitted in the park north of Post 2):

> *Declaration of Purpose*. The purpose of Pismo State Beach is to make available to the people an outstanding coastal area of beach and sand dunes located in and southward from the City of Pismo Beach in San Luis Obispo County. Specific recreational activities to be perpetuated and provided for include the aesthetic enjoyment of dunes and shore; beach vehicular travel, when consistent with the perpetuation of the natural values; camping, both in established inland facilities and on the beach in appropriate zones; fishing and clamming under appropriate applicable regulations; and walking or riding horseback in the sand dune areas.
>
> *Declaration of Management Policy*. Pismo State Beach will be managed by CDPR to perpetuate and enhance the recreational opportunities afforded by this outstanding coastline, together with the scenic and natural features upon which such recreational opportunities depend; to

> regulate the various uses in the interest of the safety and enjoyment of visitors; and to coordinate the various activities and uses in such a way that the resources of the area are protected and perpetuated to ensure their continuous availability to the people. All activities within Pismo State Beach shall be carried out under the guidelines established by the Resource Management Directives of CDPR.

The General Development Plan provides separate Declarations of Purpose and Management Policy for the Dunes Preserve as follows:

> *Declaration of Purpose*. Pismo Dunes Natural Preserve is established to perpetuate in essentially natural condition a substantial tract of sand dunes in an area where they attain outstanding development and where they may easily be visited and enjoyed by interested persons. Full protection is also afforded to all archaeological sites located within the unit and to all natural vegetation and wildlife occurring within it.
>
> *Declaration of Management Policy*. CDPR will manage Pismo Dunes Natural Preserve in accordance with the Public Resources Code and with the CDPR Resource Management Directives. It will be kept free not only of roads, structures, and other facilities, but also of dune stabilization projects of all kinds. Motorized vehicles of any type, except in cases of extreme emergency, are prohibited.

The General Development Plan has been amended twice. In 1982 it was amended to allow for the Grover Beach Lodge at Grand Avenue (CDPR 1982). It was amended again in 1994 (CDPR 1994) to reflect the results of the Pismo [Oceano] Dunes SVRA Access Corridor Project, which concluded that the Grand Avenue and Pier Avenue entrances were the Environmentally Preferred alternative, together with the staging area that remains in use today (CDPR, OHMVR Division 2004).

1.5.9.2 Oceano Dunes SVRA

The General Development Plan provides the following Declarations of Purpose and Management Policy for Oceano Dunes SVRA:

> *Declaration of Purpose*. … [Oceano] Dunes SVRA is established to make available to the people opportunities for recreational use of OHVs in a large area of unstabilized sand dunes exceptionally adapted to this recreational activity; to regulate such uses in the interest of visitor safety and environmental protection; and to provide appropriate related facilities to serve the users of the area. At the same time, the area is established to afford protection to surrounding stabilized sand dunes that embrace some areas of great ecological interest and significance, including freshwater lakes. These areas are important not only in their own right, but also as key elements in the environment within which the vehicular activities will take place and in the quality of the visitor experience arising from those activities. This protection is to be afforded by exclusion of vehicular activities, by establishment of natural preserves in appropriate locations, and by other measures as required.
>
> *Declaration of Management Policy*. CDPR will manage … [Oceano] Dunes SVRA in ways that perpetuate and enhance the uses and values enumerated in the declaration of purpose, that reduce or eliminate conflicts between patterns of use arising from the kinds of resources present in the area, and that forward mutual understanding between the diverse groups of visitors and interested persons who use this area for various recreational and scientific pursuits. Operating and management procedures will provide for the protection and perpetuation of the several islands of vegetation existing within the designated vehicular use areas. All departmental activities at… [Oceano] Dunes SVRA will be carried out within the guidelines established by the Resource Management Directives of CDPR.

Public Resources Code section 5090.35 requires preparation and implementation of a Wildlife Habitat Protection Program (WHPP) for all SVRAs. A WHPP is designed to assist resource managers in maintaining and protecting current wildlife populations and their habitats. The WHPP is a three-tiered process that includes a baseline inventory of plant and animal species, plant communities, and soil types, an annual monitoring program, and management of the park to sustain biodiversity. Special-status species populations are identified and monitored to ensure their protection, as well as to identify factors that may contribute to the overall ecological health of the habitats. In accordance with the Oceano Dunes SVRA WHPP, which is currently being updated, park Environmental Scientists have mapped and designated sensitive habitats throughout the park, including riparian corridors, ponds, known locations of listed plants, and other habitat features. Park Environmental Scientists monitor and manage these areas to reduce recreational impacts, control invasive species, and address other resource needs.

Chapter 2. Project Description/Covered Activities

2.1 Project Description

Together, Pismo State Beach and Oceano Dunes SVRA are visited by almost two million people each year. Visitors come to enjoy wide-ranging pursuits, from OHV (i.e., vehicles that cannot be driven on public streets, such as 4x4, all-terrain vehicle [ATV] quad, motorcycle, and sandrail) recreation and camping to bird watching and horseback riding. To support this high volume and diversity of visitation, the Oceano Dunes District manages an extensive operational program that provides visitor services, including restrooms, camping areas, trails, and interpretive and educational activities; public safety, including law enforcement, first aid, and search and rescue; facilities maintenance and repair; and resource management to protect and enhance native ecosystems and cultural resources. Operations and maintenance activities may be performed by CDPR personnel, contractors, concessionaires, lessees, and/or other non-CDPR entities. All of the components of this operational program are covered activities under this HCP. In addition, certain operational activities that are HCP-required management actions may also result in take and are considered covered activities.

2.2 Activities Covered by Permit

This section describes the covered activities for which the Oceano Dunes District HCP will provide comprehensive compensation and/or AMMs. Most of the covered activities are already currently being implemented in the HCP area with a few exceptions. Those exceptions include: SNPL chick and egg capture for captive rearing if observed to be threatened by covered activities that are not associated with covered species management activities (CA-12b), SNPL adult banding (CA-12b), listed plant management – propagation and outplanting of listed plants (CA-15), general facilities maintenance – mechanical trash removal (CA-21), cable fence replacement (CA-28), Pismo Creek estuary seasonal (floating) bridge installation (CA-41), riding in 40 Acres (CA-42), replacement of the Safety and Education Center (CA-43), Oso Flaco Lake boardwalk replacement (CA-48), special projects (CA-49), reduction of the Boneyard exclosure and 6 exclosure (CA-50), and CDPR UAS use for park activities (CA-52). In addition, although dust control activities (CA-44) are currently implemented in the HCP area, the dust control program is expected to expand over the next 25 years in order for the District to comply with the Stipulated Order of Abatement (SOA) from the San Luis Obispo Air Pollution Control District. Covered activities are briefly summarized in the following list and then described in greater detail in sections 2.2.1 through 2.2.5.

Park Visitor Activities

- CA-1: Motorized recreation
- CA-2: Camping
- CA-3: Pedestrian activities (e.g., picnicking, sunbathing, swimming, hiking)
- CA-4: Bicycling and golfing
- CA-5: Fishing
- CA-6: Dog walking (on leash only)
- CA-7: Equestrian recreation
- CA-8: Boating/surfing

- CA-9: Aerial/wind-driven activities, including kiteboarding
- CA-10: Holidays
- CA-11: Special events

Natural Resources Management

- *Covered Species Management*
  - CA-12a: SNPL/CLTE habitat protections/fencing
  - CA-12b: SNPL/CLTE monitoring and management, including ongoing programs (e.g., habitat enhancement, monitoring, banding, tracking, predator control, salvaging abandoned SNPL eggs and chicks); SNPL chick and egg capture for captive rearing if observed to be threatened by covered activities not related to covered species management; all other activities allowed under USFWS Recovery Permit
  - CA-13: Tidewater goby and salmonid surveys
  - CA-14: CRLF surveys and associated management (e.g., invasive species control)
  - CA-15: Listed plant management – monitoring, propagation, and habitat enhancement
- CA-16: Habitat restoration program, including seed collection, propagation, planting, monitoring, and minor grading to access work areas
- CA-17: Invasive plant and animal control, including prescribed fire, herbicide application, and hand clearing of paths to access work areas
- CA-18: Habitat Monitoring System (HMS) implementation, including small mammal trapping, point counts, shorebird counts, and coverboards
- CA-19: Water quality monitoring projects

Park Maintenance

- CA-20: Campground maintenance, including mowing, hazardous tree program, restroom upkeep, and housekeeping
- CA-21: General facilities maintenance, including mechanical trash removal
- CA-22: Trash control
- CA-23: Wind fencing installation, maintenance, and removal
- CA-24: Sand ramp and other vehicular access maintenance, including roadway resurfacing
- CA-25: Street sweeping
- CA-26: Routine riparian maintenance
  - Spillway maintenance
  - Culvert maintenance
  - Vegetation management along trails and roads
  - Emergent vegetation control

  - Minor flood control maintenance, including maintaining ditch function and vegetation control

- CA-27: Perimeter and vegetation island fence installation, maintenance, and removal
- CA-28: Cable fence maintenance and replacement
- CA-29: Heavy equipment response in all areas of Oceano Dunes District
- CA-30: Minor grading (i.e., less than 50 cubic yards)
- CA-31: Boardwalk and other pedestrian access maintenance

Visitor Services

- CA-32: Ranger, lifeguard, and park aide patrols
- CA-33: Emergency response by CDPR staff, including accidents, injuries, distressed vessels, search and rescue
- CA-34: Access by non-CDPR vehicles
- CA-35: American Safety Institute (ASI) courses, including ATV and recreational utility vehicle (RUV) courses
- CA-36: Beach concessions
- CA-37: Pismo Beach Golf Course operations
- CA-38: Grover Beach Lodge and Conference Center
- CA-39: Natural history and interpretation programs, including stationary programs, roving interpretation, interpretive walks, driving tours

Other HCP Covered Activities

- CA-40: Motorized vehicle crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco creeks
- CA-41: Pismo Creek estuary seasonal (floating) bridge
- CA-42: Riding in 40 Acres
- CA-43: Replacement of the Safety and Education Center
- CA-44: Dust control activities
- CA-45: Cultural resources management
- CA-46: CDPR management of agricultural lands
- CA-47: Maintenance of a bioreactor on agricultural lands
- CA-48: Oso Flaco Lake boardwalk replacement
- CA-49: Special projects
- CA-50: Reduction of the Boneyard and 6 exclosures
- CA-51: Use of pesticides
- CA-52: CDPR UAS use for park activities

2.2.1 Park Visitor Activities

Between 1.6 and 1.9 million people visit the Oceano Dunes District every year engaging in pedestrian, camping, and motorized vehicle activities. All of the following visitor activities are considered covered activities in areas where they are allowed and as performed under the specific regulations that govern the activities. Park visitor activities include, but are not limited to, the following: vehicular traffic on roads and in parking areas, motorized vehicle traffic in designated areas of Pismo State Beach and Oceano Dunes SVRA, camping, pedestrian beach uses, dog walking and horseback riding, kite flying, sail sports, hiking, surfing/boating, and occasional bicycle riding. The acreages open to these uses are shown in Table 2-1 and illustrated in Map 3.

Table 2-1. Oceano Dunes District HCP Area Land Use Acreage

Land Use	Acres
Total HCP area[1]	5,005
Open riding area[2]	1,305
Beach open to street-legal vehicles only	65
Closed to beach driving/OHVs/open camping[3]	3,634
Open to pedestrians[4]	4,065
Open to equestrians[5]	2,802
Closed to all public visitors[6]	940
Campgrounds (Oceano and North Beach)	58
Ranger station and yard	6
Pismo State Beach Golf Course	25
Grand Avenue parking lots and facilities	11
Pismo Lake	70
Phillips 66 leasehold	658
Agricultural lease area	211

Notes:
[1]Comprising Pismo State Beach, including the Dunes Preserve, Pismo Lake, and Oceano Dunes SVRA
[2]Includes approximately 300 acres of riding area seasonally closed March 1–September 30 for SNPL and CLTE nesting
[3]Area closed to camping is 3,637 due to closure of foredune alleys to camping
[4]Entire HCP area except ranger station, Pismo Lake, Phillips 66 leasehold, and agricultural lease area
[5]Includes Pismo State Beach (except Pismo Lake, Golf Course, and Ranger Station) and open riding area within Oceano Dunes SVRA
[6]Phillips 66 leasehold, agricultural lease area, and Pismo Lake (public access not encouraged)
Land uses and acreages overlap.

2.2.1.1 Motorized Recreation (CA-1)

Oceano Dunes SVRA operates consistent with an existing Coastal Development Permit (CDP 4-82-300 and subsequent amendments). Amendment A5 of CDP 4-82-300, which was approved in 2001, established the following daily limits on vehicles within Oceano Dunes SVRA: up to 2,580 street-legal

vehicles, 1,000 street-legal vehicles for camping[7], and 1,720 OHVs. On summer and holiday weekends, street-legal vehicle use approaches these daily limits (Table 2-2). Off-season and weekday use levels are typically less than half of summer weekend levels. The Oceano Dunes District controls and records vehicular attendance via entrance kiosks at Grand and Pier Avenues. In the summer, the kiosks are open from 8 a.m. to 11 p.m. or midnight. During the off-season, the kiosks are open from 9 a.m. to 6 p.m. (or sunset if staff is available). Hours are extended during all holidays, with the Pier Avenue kiosk staying open 24 hours. Once the Grand Avenue kiosk is closed, visitors can only enter the park via Pier Avenue. Entrance is allowed even when both kiosks are unattended.

Table 2-2. 2018 Oceano Dunes District Daily Visitor Use Levels – Day Use

	Day Use Vehicles[1]		Day Use OHVs	All OHVs[2]	Day Use Persons Accompanying Vehicles[3]	Day Use Pedestrians[4]
	Daily Low–High; Avg.[5]	Total[6]	Daily Low–High; Avg.	Total	Total	Total
Permit Limit	2,580	-	1,720	-	-	-
January	82–1,248; 485	17,481	2–142; 43	3,605	36,710	59,190
February	203–2,007; 602	18,259	2–315; 52	5,118	38,344	60,675
March	197–1,386; 535	18,809	0–192; 49	5,289	39,499	41,020
April	230–1,469; 587	20,490	0–156; 50	4,527	43,029	43,317
May	213–2,500; 628	21,271	2–440; 62	5,750	44,669	47,731
June	426–2,203; 913	28,871	20–243; 75	8,113	60,629	71,675
July	543–2,630; 1,330	43,038	25–502; 118	17,362	90,380	104,269
August	415–2,650; 1,013	33,261	11–372; 83	10,083	69,848	81,505
September	224–2,500; 797	24,353	0–541; 78	6,546	51,141	59,189
October	142–1,323; 518	16,780	3–126; 40	3,675	35,238	41,146
November	164–1,459; 620	19,457	0–255; 64	9,032	40,860	72,293
December	156–1,552; 524	16,634	2–206; 43	5,498	34,931	60,344
Total	260,354	278,704	23,284	84,598	585,278	742,354

Notes:

[1] Applies only to street-legal vehicles arriving at Pier Ave. and Grand Ave.

[2] Includes day use OHVs + an estimate of OHVs brought in with camping visitors.

[7] Due to installation of fencing for dust control that closes off over 48 acres of prime camping area (see CA-44), CDPR has administratively reduced camping permits to 500.

[3] Estimated number of people accompanying cars onto Pismo State Beach where street-legal vehicles are allowed. These people may then proceed to the area managed as an SVRA.

[4] Includes Pismo State Beach and Oceano Dunes SVRA pedestrians. Entering at Grand Avenue, Oceano Campground, North Beach Campground, and Dunes Preserve, Pismo State Beach pedestrians total 131,565. Entering at Pier Avenue and at Oso Flaco, Oceano Dunes SVRA pedestrians total 610,789.

[5]Paid at kiosk

[6]Includes paid at kiosk + estimate of day use vehicles entering after kiosk has closed for the day.

Source: (CDPR, OHMVR Division 2018).

Street-legal vehicles can operate on all designated roads within North Beach Campground, Oceano Campground, and in day use parking areas (Map 3; Pismo State Beach, monarch butterfly [*Danaus plexippus plexippus*] grove, Oso Flaco). Motorized vehicles, other than those used by park personnel, are allowed off-road only in designated areas (Map 3). Street-legal vehicles can drive onto the beach at two entrance/exit stations (i.e., the Grand Avenue and Pier Avenue sand ramps; Map 4). Street-legal vehicles can operate from Grand Avenue south throughout the riding area, which begins at Post 2 (i.e., 1 mile south on the beach from Pier Avenue). OHVs can only operate within the open riding area. OHVs must be transported to Post 2 or farther south before off-loading. The designated staging area at Post 2 is primarily used as parking for concessionaires and concessions activities (section 2.2.4.5). Camping is allowed throughout the open riding area since formal campsites are not designated (section 2.2.1.2). Motorhomes, vehicles towing trailers, and other camping vehicles thus move throughout the open riding area to access camping areas.

Motorized vehicle use is allowed in designated areas 24 hours a day. However, motorized vehicle traffic is prohibited year-round within the vegetation islands and the south/southeastern park area (Map 3) and during the SNPL and CLTE breeding season, from March 1 through September 30, within SNPL and CLTE nesting areas (Map 5). Vehicles are not allowed to park within 100 feet of the Southern Exclosure (section 2.2.2.1.1). Except for emergency responders, vehicles must obey a 15-miles-per-hour (mph) speed limit at all times while on the shoreline and in camping and developed areas; no formal speed limit is in place in the dunes when away from occupied campsites. Night driving occurs throughout the beach and dune areas.

A well-traveled route known as the sand highway runs from south of Post 4 into the backdunes all the way to the southern boundary of the open riding area (Map 3). The sand highway is marked with numbered signs for navigation. Within the dune area, OHV riders frequently gather at various locations, including near Independence Hill, Boy Scout Camp, Maidenform Flats, and Competition Hill (Map 3 and Map 6). Typically, these informal gatherings are comprised of 15 to 20 street-legal vehicles and 25 OHVs. A high of 75 to 100 vehicles has been observed informally gathered at Competition Hill.

Organized events with a focus on motorized recreation occur within the portion of the HCP area that is open to vehicles. Events may be formal competitions, organized non-competitive gatherings, or other events requiring the use of vehicles on the beach or dunes. Examples of motorized special events anticipated during the permit term are given in section 2.2.1.12.

2.2.1.2 Camping (CA-2)

Pismo State Beach has two campgrounds, both with designated campsites: North Beach Campground and Oceano Campground (Map 4). North Beach Campground has 103 campsites and Oceano Campground has 82. Together the two campgrounds received almost 150,000 camping visitors in 2017 (Table 2-3). Common day use activities at the North Beach Campground include accessing the beach and walking trails and visiting the monarch butterfly grove. Common day use activities at the Oceano Campground include walking the Lagoon (Guiton) Trail and visiting the native plant garden, Chumash garden, and visitor center, all located near the Lagoon Trail (Map 4).

Table 2-3. 2018 Oceano Dunes District Daily Visitor Use Levels – Camping[1,2]

	Oceano Dunes SVRA Camping Vehicles		Oceano Dunes SVRA Camping Persons	North Beach Campground Camping Occupied Sites		North Beach Camping Persons	Oceano Campground Camping Occupied Sites		Oceano Campground Camping Persons
	Low–High; Avg.	**Total**	**Total**	**Low–High; Avg.**	**Total**	**Total**	**Low–High; Avg.**	**Total**	**Total**
Allowable Limit	1,000[1]			103 campsites[2, 3]			82 campsites[2]		
January	8–512; 109	3,392	9,158	26–73; 54	1,670	7,515	7–27; 19	1,054	2659.5
February	6–1,000; 193	5,400	14,580	24–94; 69	1924	8,658	13–25; 20	1,303	2515.5
March	13–768; 173	5,349	14,442	20–64; 42	836	3,762	14–23; 19	1,948	2614.5
April	15–80; 162	4,866	13,138	24–97; 54	1084	4878	7–22; 17	1,926	2277
May	13–1,000; 215	6,663	17,990	34–95; 72	2235	10,058	7–78; 23	1,659	3150
June	63–1,000; 429	12,588	33,988	84–96; 91	2743	12,344	46–78; 65	2,036	8734.5
July	282–1,000; 743	23,033	62189	87–98; 93	2874	12933	52–79; 67	2,137	9387
August	52–1,000; 460	14,272	38534	74–96; 91	2,824	12708	39–70; 60	1,916	8320.5
September	37–1,000; 292	8,770	23679	53–97; 79	1178	5301	32–75; 60	1,106	8064
October	21–701; 190	5,877	15868	closed	closed	closed	40–70; 61	648	8577
November	7–1,000; 418	12,529	33828	closed	closed	closed	27–73; 56	535	7623
December	8–1,000; 220	6,811	18,390	closed	closed	closed	15–69; 43	522	5976
Total	n/a	109,550	295,784	n/a	17,368	78,157	n/a	14,754	69,899

Notes:

[1] Limited per CDP 4-82-300-A5

[2] Limited per campground capacity

[3] North Beach campground was closed March 21–April 10 and September 16–December 31.

Source: (CDPR, OHMVR Division 2018).

A concessionaire rents camping trailers to individuals camping within the Oceano Dunes District, including Oceano Dunes SVRA and the two campgrounds within Pismo State Beach. In Oceano Dunes SVRA, camping is allowed throughout the open riding area (south of Post 2), including on the beach and in the dunes, and is closely associated with OHV activities. Camping usually extends east to within 100 feet of the primary dunes (typically to the restrooms; Map 3), although during the windy season, campers can be found farther back behind vegetation islands, especially near Pavilion Hill, BBQ Flats, and Eucalyptus Tree (Map 6). Camping and parking are not allowed within 100 feet of the Southern Exclosure (section 2.2.2.1.1). Camping vehicle use at the park frequently reaches daily limits during summer and holiday weekends (Table 2-3). In 2018, there were almost 110,000 camping vehicles with approximately 296,000 people camping in the open riding area at Oceano Dunes SVRA (Table 2-3). Campers register at the Pier Avenue kiosk, plus Oceano Dunes SVRA staff conduct a morning camper tally to further track attendance and ensure all campers are registered. The highest camping use occurs in the summer months and in January and February during holiday periods. Vault toilets and chemical toilets are provided, and water-delivery and holding-tank pump-out services are available on the beach.

Families often establish boundaries for their camping areas, which also serve as a deterrent to other vehicles from entering the area. To do so, Oceano Dunes SVRA campers mark off campsites with yellow construction tape or other barriers, which can encircle multiple camping vehicles and extend well beyond the perimeter of each vehicle. To ensure access is maintained, Oceano Dunes SVRA staff establishes travel corridors closed to camping within the open riding area that allow vehicles to safely move between the shoreline and backdunes.

2.2.1.3 Pedestrian Activities (CA-3)

Pedestrian access is allowed 24 hours a day in most areas of Pismo State Beach and Oceano Dunes SVRA. One exception is the Oso Flaco area, which is only open during daylight hours. A sign is posted in the Oso Flaco Lake parking area, stating that the area is closed to the public after sunset. In 2018, Pismo State Beach had approximately 132,000 pedestrian day use visitors.[8] Pedestrians also enter the park via the campgrounds and Dunes Preserve. Oceano Dunes SVRA had approximately 611,000 pedestrian day use visitors, mostly entering via the Pier Avenue entrance. A small number of pedestrians visit the Oso Flaco area, usually via the parking lot and boardwalk (Map 3), but some walk in from the open riding area. A kiosk operated by staff is open at Oso Flaco from 9 a.m. to 4 or 5 p.m. Cars that park in the Oso Flaco parking lot are included with the day use vehicle totals in Table 2-3. Given the size of the lot, no more than 50 cars can park at any one time, and typical usage is well below that number, with weekends generally being the busiest. CDPR has not developed any trails or other visitor amenities at Pismo Lake. Although the Pismo Lake area is occupied at times by homeless individuals, it does not receive any quantifiable visitation for recreation purposes.

Significant pedestrian use occurs south of Grand Avenue within both Pismo State Beach and Oceano Dunes SVRA. Pedestrians have access to most beach areas and all designated trails. Pedestrians are allowed within vegetation islands year-round but are prohibited within the closed SNPL and CLTE nesting areas (i.e., seasonal exclosures) March 1 through September 30. Campfires and barbeques are allowed in designated campgrounds and on portions of the beach where vehicles are allowed (i.e., south of Grand Avenue). Fire size is limited to 3 feet in diameter by a Superintendent's Order (section 1.5.7).

[8] Pedestrian visitor numbers are determined by random sampling of pedestrians or by random sampling of cars at the free day use areas and observing the number of individuals arriving in those vehicles.

Common pedestrian day use activities within the HCP area include walking along the beach, picnicking, dog-walking (section 2.2.1.6), swimming, building sand castles, exploring the monarch butterfly grove in the butterfly roosting season (November–February), bird watching, hiking in the dunes, and occasionally playing in Pismo Lagoon. The monarch butterfly grove is quite popular, with approximately 75,000 visitors recorded in the area between November 2018 and February 2019.[9] Occupants of houses along Strand Avenue comprise a small number of the day users at Pismo State Beach. Most hiking occurs at Oso Flaco, the Dunes Preserve, and on the Grand Dunes Trail, which is an informal path through the dune area south of Grand Avenue.

Pedestrian access is allowed in the Pismo Creek estuarine lagoon throughout the year, and access is allowed in Arroyo Grande Creek and its lagoon from October to February. Although the public can wade into the water at Arroyo Grande and Pismo creeks, this is an uncommon activity. Pedestrians cross Pismo Creek and Arroyo Grande Creek within the surf zone when the creek is flowing to the ocean (generally during the winter) and across the main stem during periods when the estuaries are impounded. Although no designated crossing exists, pedestrians frequently cross Arroyo Grande Creek to reach the dunes. Guiton Crossing, a private at-grade crossing in Arroyo Grande Creek, traverses Arroyo Grande Creek upstream of Oceano Dunes District property and is also used by pedestrians (Map 3).

Organized events that largely focus on non-motorized recreation occur within the HCP area (although some motorized activity occurs when vendors access the area during these non-motorized events). Such events include, but are not limited to, athletic competitions; large, organized non-competitive gatherings; and weddings. Examples of non-motorized special events anticipated during the permit term are given in section 2.2.1.12. Organized interpretive hikes and coastal cleanups normally do not require a Special Event Permit if there are fewer than 25 people. Junior Rangers and other programs organized and hosted by the Oceano Dunes District do not require Special Event Permits.

2.2.1.4 Bicycling and Golfing (CA-4)

Bicycling occurs primarily in designated campgrounds and on the beach occasionally when the tide is low. Bicycles are not allowed at Oso Flaco Lake or on the boardwalks. Golfing occurs at the Pismo Beach Golf Course as described in section 2.2.4.6.

2.2.1.5 Fishing (CA-5)

Shore fishing is allowed and is a common activity on beaches where pedestrians are allowed. Fishing is prohibited within the Southern Exclosure and North Oso Flaco Exclosure from March 1 through September 30 (i.e., within the CLTE and SNPL breeding season). Fishing is also legal year-round in Oso Flaco Lake; however, the Oceano Dunes District has posted fish consumption advisories because of high levels of pesticides found in fish tissue from the lake. Shore fishing activities typically occur between Pier Avenue and Post 6 and in the Oso Flaco area where the beach is accessed via the boardwalk. Approximately five individuals can be observed fishing at any one time in the Oceano Dunes District, with increased activity on weekdays. In addition, digging for Pismo clams occurs occasionally, with generally no more than one or two individuals clamming along the shoreline in any given week.

[9] Monarch grove visitor numbers are captured by docents using clicker counters to count the number of visitors between 10 a.m. and 4 p.m., weather permitting.

2.2.1.6 Dog Walking (CA-6)

Dogs are allowed on a leash of no longer than 6 feet and under the control of their owner in most locations at Pismo State Beach and Oceano Dunes SVRA. Dogs, other than service dogs, are restricted from the Dunes Preserve and in the south/southeastern portion of Oceano Dunes SVRA, including around Oso Flaco Lake (Map 6). Service dogs are required to accompany their owners and are therefore permitted to enter any area open to visitors where other dogs are restricted. All dogs are prohibited from entry into any area closed to visitors, such as the seasonal SNPL and CLTE exclosures and the Phillips 66 leasehold. All park maps detail leash requirements and all entrance stations have "dogs on leash" signs. Every park employee is aware of and instructed to educate visitors on the leash rule. All park staff that observe a violation of the leash rule may establish contact with the offending party and issue a verbal warning. Rangers may also issue citations.

2.2.1.7 Equestrian Recreation (CA-7)

Equestrians are allowed on and commonly use most of the beaches and trails at Pismo State Beach, including the Dunes Preserve, and at Oceano Dunes SVRA. Equestrians must remain on designated trails where such trails exist. Equestrians are not allowed south of the riding boundary fence (section 2.2.3.9), including around Oso Flaco Lake (Map 6). Most equestrians park in the lot at Grand Avenue and then proceed down the Grand Dunes Trail and exit to the beach at Midramps (Map 4). Other equestrians, particularly those renting horses, travel down the Arroyo Grande Creek Flood Control Channel levee and through the Dunes Preserve, exiting to the beach at Arroyo Grande Creek and traveling up or down the beach from there. Equestrians frequently cross Arroyo Grande Creek at Guiton Crossing, upstream of CDPR property, to reach the dunes. Typically, equestrian use is high when OHV use is low (e.g., during the rainy season). On average, there are 2 to 15 horses every day with most equestrian use occurring on weekends. Equestrian traffic is prohibited from entry into any area closed to visitors, such as the seasonal SNPL and CLTE exclosures.

2.2.1.8 Boating/Surfing (CA-8)

Small craft boating is allowed at both Pismo State Beach and Oceano Dunes SVRA. At Oceano Dunes SVRA, small non-motorized boats are allowed and occasionally seen on Oso Flaco Lake. However, boating can be restricted at the lake if it conflicts with resource protection. Boating is also allowed in Oceano (Meadow Creek) Lagoon. Boats can be launched into the ocean at Pismo State Beach and Oceano Dunes SVRA south of Grand Avenue, but they cannot land on the seasonal exclosure shorelines (Map 6) during the SNPL and CLTE breeding season.

It is legal to launch motorized boats in the HCP area. People typically use trailers to transport their watercraft to the beach. However, from March 1 through September 30, watercraft traveling south of Post 6 must remain in the water and are not allowed onto soft sand along the shoreline to prevent disturbing breeding SNPL and CLTE.

Surfing and stand-up paddleboarding most frequently occur near the Pismo Beach Pier and south of Pier Avenue, although surfers also occur elsewhere, such as near Post 6 (Map 6). Surfers and paddleboarders typically park at Pier Avenue and walk in or park on the beach.

2.2.1.9 Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

CDPR vehicles drive across the portion of Pismo Creek that flows out to the ocean in order to conduct regular ranger and lifeguard patrols along the beach and at North Beach Campground. At times, visitor services and maintenance personnel will also cross the confluence of Pismo/Carpenter Creek to get to the North Beach campground. Although CDPR vehicles could travel on surface streets, this has become

standard practice for expediency, especially during urgent situations (e.g., emergencies), since leaving the beach for surface streets would require the lifeguards/rangers to travel farther and air up their tires, thus increasing response times. CDPR vehicles also cross Oso Flaco Creek closest to the shore when accessing South Oso Flaco. Visitor vehicles are not allowed in this area.

No camping or OHV use is permitted near Arroyo Grande Creek since it is outside of the open riding area, but the creek is crossed by motorized vehicles at its mouth when it is flowing into the ocean. The Oceano Dunes District has established via Superintendent's Order specific guidelines governing closure of the creek to vehicular crossings to protect human life, prevent loss of property, and protect the waterway from pollution potentially caused by prolonged submersion of vehicles (section 1.5.7).

Arroyo Grande Creek can only be crossed using street-legal vehicles. Pursuant to Superintendent's Order 554-005-2015 (section 1.5.7), street-legal vehicles are prohibited from crossing Arroyo Grande Creek in any manner other than by crossing the creek as close to the ocean waterline as possible and parallel to the ocean waterline. Driving upstream or downstream in the creek channel or in any other manner in the creek channel is prohibited. In addition, if the creek crossing has a "closed" sign, crossing the creek is prohibited. The Oceano Dunes District informs visitors of these creek-crossing rules via outreach both in and out of the park, including through active contact with visitors. Because visitors can still access the beach from Grand Avenue and Pier Avenue and drive on the beach when it rains and the creek becomes a challenge to cross, CDPR rangers specifically patrol the crossing area to keep visitors from crossing. The Grand Avenue and Pier Avenue entrances remain open even when the creek crossing is closed because the public is still allowed on the beach north of Arroyo Grande Creek.

2.2.1.10 Aerial/Wind-Driven Activities (CA-9)

While not a common activity, kite flying is permitted at all of the state beaches, except where restricted by Superintendent's Order (section 1.5.7). Within the HCP area, kite flying is prohibited during the SNPL and CLTE breeding season from Pier Avenue south to the southern Oceano Dunes SVRA boundary.

Model rocket launching is an aerial activity that could greatly disturb nesting birds. This activity is not allowed in the HCP area at any time. Fireworks are addressed in section 2.2.1.11.

Kiteboarding has become a popular activity along the coast. Kiteboarding, including kitesurfing, and windsurfing are allowed at most state beaches. Windsurfers and kiteboarders typically set up on the wet to semi-wet beach and surf to just outside the surf zone. Unlike windsurfers, the "sail" on a kiteboard is an aerial kite that could create the same disturbance threat as kite flying. Within the HCP area, dry land launching and landing of kite boards is always permitted between the public restroom north of the Pier Avenue sand ramp and Pismo Creek. Wet launching and landing of kite boards (i.e., launching and landing where the entire kite equipment is in/above the rolling water) is permitted south of Pier Avenue. Open water kite boarding is generally allowed along the entire HCP area. However, from March 1 through September 30 (i.e., during the SNPL and CLTE breeding season) kiteboarding is not allowed within 1,000 feet of the shoreline south of Post 6 (Map 6). At that time, kiteboarders traveling south of Post 6 must remain in the water and are not allowed onto soft sand. If they must come onshore south of Post 6, they must walk north in the water to Post 6. Kiteboarders rarely make it as far south as Oso Flaco. Kiteboarding regulations are in place under Superintendent's Order 554-003-2015 (section 1.5.7). Kiteboarders typically launch between Grand and Pier Avenues, with some sailing south of Pier Avenue as far as Post 5. Typically, 2 to 15 kiteboarders may be present at a time whenever it is windy, with the windy season lasting from the middle of March to the middle of July. Windsurfers are not common in the HCP area, preferring the conditions at Hearst San Simeon State Park.

2.2.1.11 Holidays (CA-10)

The Oceano Dunes District often sees a significant increase in visitation during 3-day holiday weekends, but camping and vehicle levels remain the same due to daily camping and vehicle limits per the CDP (section III.3.d. of CDP 4-82-300-A5) that remain in place at Oceano Dunes SVRA. July 4 is typically one of the busiest holidays of the year. Numerous coastal municipalities sponsor commercial fireworks shows attracting a large influx of visitors to the state, county, and city beaches. The City of Pismo Beach commercial fireworks show that takes place on the Pismo Beach pier attracts a large crowd of spectators on the City's beaches, including Pismo State Beach and Oceano Dunes SVRA. However, other than the City commercial fireworks display, fireworks are prohibited in CDPR units. As a result, fireworks are only legal at the most northern portion of the HCP area, which is over 2 miles away from most nesting SNPL and CLTE. Despite this restriction, illegal fireworks are often observed throughout Oceano Dunes SVRA, including near the seasonal exclosure. Additional CDPR rangers and resource staff are employed during July 4 to handle the large crowds and vehicular traffic. The ranger staff specifically focuses enforcement and education staff near the Southern Exclosure during the July 4 holiday weekend. CDPR continues to implement educational efforts and heightened enforcement to reduce the use of illegal fireworks in that area.

2.2.1.12 Special Events (CA-11)

Each year, Pismo State Beach and Oceano Dunes SVRA host numerous organized events including beach clean-ups, weddings, family reunions, corporate dinners, bonfires, surfing and other sporting contests, media events, video commercials, commercial still photography sessions, and off-road events. Organized special events hosted by outside agencies, businesses, and organizations may require a CDPR Special Event Permit, which must be approved by the District Superintendent. Special Event Permits describe the activity or event that is to occur, the estimated number of participants, the entry fee schedule, the items to be sold, the insurance requirements, and any special conditions placed on the activity or event by the District Superintendent. The permit conditions include AMMs required to protect resources during the event. Specific AMM recommendations are based on past experience and are dependent on the event's location, timing, and its potential to impact covered species. Permit conditions also ensure that events are planned to avoid sensitive resources, including by adjusting the timing and location of the event. For larger events, the Oceano Dunes District resource staff surveys the special event area prior to the event to verify that no CLTE or SNPL are present. An internal protocol for smaller Special Event Permits (e.g., weddings, bonfires, family reunions, corporate dinners near Grand Avenue) requires the resource staff to survey and report any conflicts prior to the event. The Oceano Dunes District also ensures that none of these events result in vehicle limits established by the CDP (section III.3.a. and d. of CDP 4-82-300-A5) being exceeded.

While the specific events that occur during the ITP term will vary, the following examples illustrate the nature of permitted special events potentially occurring in the HCP area. All of these events could occur in any month of the year. These and other similar events are expected to continue during the permit term. The Oceano Dunes District does not issue Special Event Permits for events on the City-operated portion of Pismo State Beach.

- *Poker Runs.* Poker runs are non-timed, non-race, self-guided activities during which participants drive to checkpoints along a course within the open riding area. Such events may include a vending/registration/staging area, typically less than an acre in area, which is also located within the open riding area. These events are typically single-day events.
- *Hucking.* Competitive truck jumping or "hucking" involves an exhibition of trucks jumping off a gradual incline sand dune ramp with a flat landing area. Hucking events have been held at the

Competition Hill portion of the open riding area. Other motorized exhibitions may also be included in hucking events. Such exhibitions are expected to include space for vendors, camping, a stage, and other temporary event facilities closer to the beach. To date, these exhibition areas have been less than 10 acres. From initial set-up to final cleanup, the overall event lasts less than a week; however, the exhibition itself lasts no more than 2 days.

- *Vintage Car Races.* Such events may include car displays, races of pre-World War II-era motorcycles and cars on the hard sand, a beach party, bonfire, and vendors. The race itself comprises two vehicles racing on a short (<1,000 feet) stretch of beach. Cars and motorcycles cross the finish line with an average maximum speed of 35 mph. These events typically take place on weekends.
- *Concerts*. Events may include amplified music, vendors, and camping. Music and other activities may occur around the clock. These events typically take place on weekends.
- *Group Campfires and Receptions.* Group campfires and receptions are frequently set up on the beach near the Grand Avenue entrance.
- *Sports.* Running and/or walking race courses may traverse the beach and dunes. Other non-motorized sporting events include soccer, baseball, and kiteboarding tournaments and exhibitions. These events may include food vendors, music, and other entertainment. These events usually take place in Pismo State Beach and are generally single-day or weekend events.
- *Weddings.* Approximately 25 weddings are held at Pismo State Beach each year. Most weddings occur either in the foredunes and cypress (*Cupressus* sp.) grove near the golf course or near the Grand Avenue entrance within the non-motorized portion of the park. Weddings planned with bonfires or other fire sources are set up within the motorized portion of the park. Weddings usually start at 2 p.m. or later and are allowed to be set up hours before with someone on scene for the duration of the set-up. Wedding ceremonies typically last about an hour; however, if the event includes a reception, then it may last for 5 to 6 hours. Wedding items must be broken down immediately following the conclusion of event activities.
- *Video Production and Still Photography.* Video production and still photography "shoots" require permits and may occur anywhere in the HCP area, with approximately 35 to 40 shoots occurring every year. The shoots may involve minor impacts, such as people standing in the Dunes Preserve shooting still photos, to shoots with greater impacts, such as motor vehicles moving along the shoreline or backdunes. Filmed activities are almost always only those activities already allowed in the area used for the production (i.e., the permits do not generally authorize activities that will otherwise be prohibited).
    - UAS filming will be allowed on a case-by-case basis in the HCP area during the permit term. All UAS operations will be consistent with CDPR policies regarding UAS use. Operators must have received a permit to operate over CDPR lands and must comply with 14 CFR Part 107, which establishes the minimum safety standards for small UAS operations in the United States. As part of the permit to operate, any non-CDPR person conducting UAS filming will be required to follow AMMs to reduce impacts to covered species. For example, during the breeding season, non-CDPR UAS will not be allowed along the shoreline or on the beach south of Post 5. In addition, a USFWS-approved monitor will accompany non-CDPR UAS operators at any time of year if it is determined there is potential to impact covered species.

2.2.2 Natural Resources Management Program

Regular, ongoing natural resource management activities in the HCP area include covered species management, management of vegetation islands, vegetation planting and habitat restoration, biological resource monitoring, invasive plant and animal control, prescribed fire management, and installation of fences and signs to prevent trespass in sensitive areas. These activities are described in more detail in the following sections.

2.2.2.1 Covered Species Management

A detailed discussion of the management areas and management AMMs is provided in Chapter 5. Information provided in the following sections offers an overview of the covered species management program. The management program described in this HCP will be consistent with the current management of SNPL and CLTE in the HCP area. Management of SNPL and CLTE in the HCP area is currently conducted under a USFWS 10(a)(1)(A) permit and/or CDFW Memorandum of Understanding (MOU) that authorize activities, including, but not limited to, monitoring nests and banding chicks Appendix B).

2.2.2.1.1 Installation and Maintenance of Western Snowy Plover and California Least Tern Protection Fences (CA-12a)

Each year, from approximately March 1 through September 30 during the SNPL and CLTE breeding season, CDPR encloses approximately 300 acres of Oceano Dunes SVRA open riding area plus approximately 68 acres in North Oso Flaco within a 6-foot-tall seasonal exclosure (i.e., non-climb fence) to prevent terrestrial predators, vehicles, and humans from entering protected nesting and chick-rearing habitat. [10] The public is prohibited from entering this seasonal exclosure area, and neither camping nor parking is allowed within 100 feet of the fenced area. The seasonal exclosure is made of a lower layer of 2-inch by 4-inch non-climb fence and an upper layer of mesh. The fence is buried in the sand up to 8 inches deep to discourage coyotes (*Canis latrans*) and other potential mammalian predators from digging into the nesting area and depredating a nest. The 6-foot height of the exclosure is intended to deter coyotes from climbing over the fencing. The fence is installed using peeler poles, which are located roughly every 100 to 120 feet with about five metal T-posts between them. Bird barrier spikes (e.g., Nixalite) are installed on peeler poles to discourage avian predators from roosting near the seasonal exclosures.

The exclosure in the open riding area is referred to as the Southern Exclosure and comprises four subareas (Map 5), including the 6 Exclosure (approximately 60 acres), 7 Exclosure (approximately 60 acres), 8 Exclosure (approximately 85 acres), and the Boneyard Exclosure (approximately 94 acres). Due to the rapidly shifting open sand dunes in the eastern Boneyard Exclosure area and in order to exclude coyotes from entering the northern Southern Exclosure area, a 6-foot-tall interior non-climb fence consisting of 2-inch by 4-inch mesh bisects the Boneyard Exclosure from north to south during the breeding season. As a result, the Boneyard Exclosure is divided into two separate areas, including the approximately 48-acre West Boneyard Exclosure (contiguous with 6, 7, and 8 exclosures) and the approximately 47- to 49-acre (depending on dune topography) East Boneyard Exclosure. See section 2.2.5.10 (CA-50) regarding proposed changes to the Boneyard and 6 exclosures.

[10] This section describes the predator fencing specifications currently being used in the HCP area; however, the specifications of the predator fencing used in the HCP area could change based on new information or new protocols issued by USFWS and/or CDFW.

An additional seasonal exclosure is present in the HCP area and is referred to as North Oso Flaco Exclosure. This exclosure is contiguous with the Southern Exclosure and extends south from the 8 Exclosure to the pedestrian boardwalk access trail to the Oso Flaco Creek shoreline (approximately 0.5 mile of shoreline and approximately 68 acres). Similar to the Southern Exclosure, the North Oso Flaco Exclosure is designed to keep potential mammalian predators out and exclude the public. Signs are attached to posts along all exclosure fencelines to educate visitors about the closed area and SNPL and CLTE life history. The North Oso Flaco area is permanently closed to OHV recreation, but the area is open to pedestrian activity during the non-breeding season. This area is contiguous with the Southern Exclosure and is managed consistently with the areas of the Southern Exclosure during the breeding season.

Nests in the Southern Exclosure located close to the east or north fence require temporary additional fencing extending into the open riding area to allow an adequate buffer between recreational activities and the nest. This type of extended fence is called a "bumpout." CLTE nests within 330 feet (100 meters) of the open riding area and SNPL nests within 100 feet (30 meters) of the open riding area receive a bumpout. CDPR staff extend the bumpouts when recreational activities continue to cause disturbance to nesting birds. Although the public is excluded from these bumpouts, monitoring staff may enter the larger CLTE bumpouts when needed to successfully conduct monitoring. Bumpouts are removed once nests in the buffer area are no longer active or after chicks have fledged and/or moved out of the area.

South Oso Flaco and Arroyo Grande Creek are also protected from public disturbance; however, instead of a seasonal exclosure, symbolic fencing and signs are used to keep the public out of nesting habitat. Symbolic fencing consists of rope strung between metal T-posts that are installed at regular intervals. Symbolic fencing does not exclude predators. The portion of the Southern Exclosure and North Oso Flaco shoreline that is not fenced is also protected from the public using symbolic rope and signs at the boundary points. Nests within the symbolic fencing areas may receive some type of individual nest exclosure, as described below.

CDPR staff also selectively installs smaller wire exclosures, including the following:

- *Large single-nest exclosure*: CDPR staff install large circular single-nest exclosures with a height of 5 feet (bottom 8 inches buried) around any CLTE or SNPL nest found in the open riding area. The minimum nest exclosure radius is 330 feet for CLTE nests and 100 feet for SNPL nests. Single-nest exclosures of differing sizes may also be used to protect SNPL nests in areas where vehicles are not permitted (e.g., Oso Flaco, Southern Exclosure shoreline, Arroyo Grande Creek, and areas north of Grand Avenue). Large single-nest exclosures are open at the top. Camping and parking are not allowed within 100 feet of a single-nest exclosure when in the open riding area. Large single-nest exclosures are removed after nests are no longer active or after chicks have fledged and/or moved out of the area.
- *Small single-nest exclosure*: CDPR staff selectively uses a small circular or one of two small square nest exclosures (made of 2-inch by 4-inch wire) around SNPL nests inside or outside of seasonal exclosure fencing for protection from predators, including roosting gull flocks. CDPR staff use different exclosures based on a variety of factors, including, but not limited to, weather, topography, predator threats, and proximity to young broods. In addition, 10-foot by 10-foot exclosures have been used since 2003 and 7-foot-diameter circular exclosures have been used since 2012 to protect SNPL nests outside the seasonal protected area. These exclosures are also built with 5-foot-high sides and the bottom 8 inches are buried. Plastic netting made with 0.5-inch by 0.5-inch mesh is added to the top of these exclosures when avian predation is a concern.

- *Mini exclosure*: Mini exclosures have been used since 2010 to protect SNPL nests. These exclosures are 3-feet by 2-feet by 3-feet with a wire-mesh top. When used outside a seasonal exclosure or a large single-nest exclosure, the bottom of the exclosure is buried in the ground between 4 and 8 inches and the exclosure is staked into the ground.

Installation, maintenance, and removal of the seasonal exclosures involves substantial labor and requires equipment, including vehicles for CDPR staff and materials transport. Installation and removal of the seasonal exclosures takes 4 to 6 weeks. Installation, maintenance, and removal of the smaller exclosures and bumpouts requires less equipment (e.g., vehicles for CDPR staff and materials) and takes less time (the installation can usually be accomplished within 2 hours). Because exclosure fencing is prone to being buried or undermined, depending on wind conditions, it requires constant maintenance to remain an effective predator barrier. During the windy season, maintenance occurs several times a week. Routine maintenance includes burying or exposing buried sections, replacing fencing, adjusting fencing and fence posts, and maintaining signs. At times, maintenance requires heavy equipment—at least once per week during windy periods—to remove accumulated sand or bury large sections that have become exposed.

2.2.2.1.2 Western Snowy Plover and California Least Tern Monitoring and Management (CA-12b)

Prior to each breeding season, the Oceano Dunes District has been preparing a SNPL and CLTE management plan entitled *Nesting Season Management Plan to Avoid Take of the California Least Tern and Western Snowy Plover at Oceano Dunes SVRA*[11] (Appendix E). The management plan has detailed measures to be taken during the SNPL and CLTE breeding season to manage and monitor breeding CLTE and SNPL, including installation and maintenance of the seasonal exclosures described in section 2.2.2.1.1. After the conclusion of each breeding season, the District has been preparing an annual nesting report entitled *Nesting of the California Least Tern and Western Snowy Plover at Oceano Dunes SVRA*[12] (Appendix F). The annual nesting report has described the management and monitoring measures that were implemented during the breeding season, has given detailed breeding results, and has provided recommendations for future management and monitoring. The management and monitoring measures described in the annual nesting reports are the foundation for the AMMs in this HCP and are incorporated into the conservation program to avoid and minimize take (Chapter 5). In addition to the seasonal exclosures described previously, the program includes the following activities, which are detailed below and in Chapter 5:

- Daily monitoring of nesting CLTE and SNPL during the breeding season (March 1 through September 30)
    - Surveying transects within the open riding area and nesting exclosures
    - Protecting chicks/nests observed in the open riding area by closing areas where chicks are located. The chicks are carefully monitored until they move back into protected areas (i.e., seasonal exclosures).
    - Floating eggs to estimate hatch date

[11] The Nesting Season Management Plan will be superseded by this HCP in the future and will, therefore, no longer be required.
[12] In the future, the Annual Nesting Report may be folded into the annual report described in section 6.4.1.

  - Deploying cameras to detect predation events and potential predators and to confirm adult attendance
  - Banding and monitoring chicks to determine fate
  - Salvaging abandoned eggs/chicks and bringing them to an appropriate rehabilitation/captive-rearing facility (SNPL only)
- Monitoring of CLTE night roost and freshwater lake use
- Monitoring and control of potential predators, as appropriate
- Monitoring of SNPL during the non-breeding season (October 1 through February 29)
- Conducting necropsy on CLTE and SNPL carcasses per direction of the Wildlife Agencies
- Enhancing nesting/chick-rearing habitat, including addition of wrack (i.e., seaweed and other organic materials that wash ashore on the beach), woodchips, driftwood, plants, and CLTE chick shelters
- Conducting visitor education and enforcing regulations

Daily Monitoring

Daily monitoring of nesting SNPL and CLTE occurs from March 1 through September 30. At a minimum, three monitors are present during the morning and early afternoon hours. As the season progresses, monitoring increases to include the late afternoon and evening hours. Monitoring involves walking to assess or find new nests, as well as scanning for nests and chicks from parked vehicles outside the seasonal exclosure and from within the exclosure on the shoreline. Monitors check most CLTE and SNPL nests daily. Monitoring always occurs in a manner that minimizes disturbance or adverse effects on adult birds, nests, and chicks.

Monitoring of the open riding area also occurs daily. Monitoring of the open riding area involves driving a vehicle along defined transects to look for SNPL and CLTE nests and/or chicks. Areas along the transects with signs of SNPL and/or CLTE nest activity (e.g., scraping or copulating birds) are checked more thoroughly on foot and with increased frequency using binoculars and/or a spotting scope. When monitors find chicks in the open riding area, the area is closed to vehicles and monitors are present to control traffic and ensure they are kept from disturbing the chicks. Additional monitors are posted in vehicles at various distances from the chicks to track their movement. Chicks are slowly directed back into the protected seasonal exclosure by monitors who slowly and carefully walk toward the chicks and encourage movement in the direction of a protected area. If necessary, additional monitors are also present to watch for potential avian predators, such as gulls, and flush them from the area. Monitors continue to watch chicks once directed back into the seasonal exclosure to confirm they remain in the protected area. Similarly, if an attending adult SNPL is ready to move chicks from an upland nest site to an area closer to the shoreline, monitors will ensure safe passage of chicks.

At times, if SNPL chicks remain in the riding area and are at risk of being struck by a vehicle despite CDPR's best efforts to direct them back to the seasonal exclosure, CDPR will capture SNPL chicks and move them back to the exclosure and attempt to reunite them with attending adults. In the future, if efforts to reunite the SNPL chicks with attending adults fail, CDPR staff may collect them and transfer them to an approved wildlife facility, as described in the subsection entitled Salvage and Rescue below.

New foredune vegetation closure sites (CA-44) will also be monitored on a daily basis. It is assumed that monitors will not be able to drive through these sites but will scan them from vehicles and/or walk

through the areas. Walking the areas would presumably be necessary as vegetation develops, making binocular scanning less effective.

Floating Eggs

Many SNPL and CLTE clutch initiation dates can be estimated from egg-laying dates since this date is often known. However, when SNPL and CLTE nests are found at full clutch and egg-laying dates are not known, eggs will be floated to better estimate initiation and expected hatch dates. Nests will not be disturbed for egg floating during climatic conditions such as high wind and extreme cold or heat or if approaching the nest will disturb nearby broods. Only those individuals approved by USFWS will float SNPL and CLTE eggs.

Banding

CDPR attempts to band all CLTE and SNPL chicks in the HCP area. All banding in the HCP area is conducted by a master bander. CLTE and SNPL chicks in the HCP area are typically banded from 0 to 3 days from the day they hatch. Banding methods are conducted to avoid compromising the safety of chicks, including avoiding disturbing broods/chicks during climatic conditions such as high wind and extreme cold or heat. Chicks are pursued for only a short period of time, typically less than 2 minutes for a single capture attempt and less than 20 minutes in a single day during multiple attempts to capture an individual chick. Chicks are captured by hand, and, when possible, at or close to the nest location. Chicks are released together after banding of all chicks is completed.

CLTE chicks receive a single size 1A blank aluminum band on one leg and a size 1A numbered aluminum federal band on the other leg with color tape covering both bands. The color combinations are applied in such a way to give each individual a unique band combination for the year. SNPL chicks within a brood are given the same color band combination. Chicks are also weighed immediately prior to banding. Band materials and methods used may change over time depending on the accepted USFWS protocols and as determined by the master bander.

Unbanded adult CLTE and SNPL are not currently banded in the HCP area. The occurrence of abandoned SNPL nests can raise concern about possible mortality of adult SNPL. As a result, if elevated adult mortality is observed, banding of SNPL adults could provide beneficial information, such as allowing monitors to verify that mortality was in fact occurring. CDPR may band adult SNPL if it is determined to be necessary.[13] At this time, banding of CLTE adults is not expected to occur as part of this HCP.

Salvage and Rescue

In some circumstances related to covered species management (e.g., abandoned SNPL eggs and/or chicks that are separated from attending adults, chicks deemed to be vulnerable because of unusual circumstances such as an attending adult being predated, etc.), SNPL eggs and/or chicks are collected and will continue to be collected and transferred to an approved facility, such as the Santa Barbara Zoo or Monterey Bay Aquarium (AMM 90). Injured juveniles and adult SNPL are also sometimes brought to an approved facility, such as Pacific Wildlife Care, to be rehabilitated and released back into the wild. This activity is ongoing in the HCP area and is associated with CDPR's covered species natural resources management program.

[13] Any banding of adult SNPL will be subject to approvals by appropriate regulatory agencies.

In the future, under this approved HCP, if SNPL chicks or eggs are determined to be vulnerable to a covered activity that is not related to covered species management activities despite CDPR's efforts[14] to protect eggs and/or direct chicks back to protection of the seasonal exclosure and reunite them with attending adults, CDPR staff may collect SNPL eggs and/or capture chicks and transfer them to an approved wildlife facility. This activity is new and is included as AMM 22 (see Table 5-2).

All chicks in captivity are raised in a manner where they will not imprint on humans. If sufficient bands are available and other logistics are satisfied, all fledglings are color-banded to individual prior to releasing them back into the wild to assist in tracking bird movements, survival, and future reproductive success. In all cases, the need for captive care is determined by a qualified Environmental Scientist, is used selectively, and is dependent on an approved facility having the capacity to accept the eggs and/or chicks. If time permits, CDPR staff will continue to confer with USFWS prior to collecting eggs or chicks for captive rearing. CLTE eggs and/or chicks are not currently collected in the HCP area and captive rearing of CLTE is not currently available.[15]

Monitoring CLTE Night Roost and Freshwater Lake Use

During the breeding season, CLTE may assemble in a night roost. Monitors record the night roost location and total numbers of individuals present as CLTE arrive at dusk. Night-vision equipment is available and used for this task, but it has limited range for viewing from a distance. As a result, there are occasions when CLTE are heard vocalizing and not seen because they arrive after it is too dark to be seen. Therefore, the counts provided are minimum counts due to the limited visibility of night roosts.

Small freshwater lakes are periodically surveyed for CLTE use. During the surveys, the monitors determine if the lakes provide additional appropriately sized fish to feed chicks. Monitors also observe the direction of adult CLTE flight in order to determine the directions of other foraging sources.

Predator Management Program

Predators and predation can be important factors that limit SNPL and CLTE nest success by directly depredating eggs, chicks, juveniles, or adults or indirectly by increasing time spent by adults in vigilance or avoidance behavior and reducing incubating and/or chick-rearing behavior. Substantial evidence exists indicating that human activities affect the type, number, and activity patterns of predators, thereby altering natural predation patterns. As a result, the Oceano Dunes District implements a predator management program to protect nesting SNPL and CLTE.

Predators are monitored from February through September by CDPR and contractors to collect information on predator presence in and around the HCP area. During the breeding season, monitors directly observe mammalian and avian predators and their sign (e.g., tracks, scat, regurgitated pellets, prey remains, depredated nests) each day on foot and from vehicles and then record species, type of sign, behavior (if observed), duration of observation, direction of travel, and any characteristics that may identify an individual predator. Gull monitoring is also conducted during the breeding season. Gulls are counted at the trash dumpster area at least weekly, and the entire shoreline is surveyed for gulls monthly or as Environmental Scientist staff are available.

[14] At times, based on Senior Environmental Scientist professional discretion, CDPR may determine that SNPL eggs and/or chicks should be collected and transferred to an approved wildlife facility without an attempt to protect them on-site because protecting eggs and/or directing chicks back to the exclosure will not eliminate the threat of the covered activity. As a result, captive rearing would be the only option to prevent mortality or injury to the eggs or chicks.

[15] Releasing CLTE from captivity is not usually an option since they migrate together as a family or in groups.

Some standard predator management activities conducted in the HCP area include removing animal carcasses, which attract scavengers in or adjacent to CLTE and/or SNPL nesting and chick-rearing habitat, and hazing predators to flush (i.e., avian predators) them from sensitive areas. Hazing of predators is conducted using techniques including firing a bird whistler and waving arms and making noise while approaching an avian predator on foot or by vehicle. A bird whistler is a handheld launcher that fires a projectile 250 to 300 feet and makes a loud "screech" sound; it emits a bright light and trail of smoke when fired, without harming the bird. The bird whistler can be fired from a vehicle, which can limit disturbance to SNPL and CLTE when it would otherwise be disruptive to approach a predator on foot in breeding habitat.

When additional options for controlling predators are needed, selective live-trapping and relocation of avian predators is conducted by a contractor with the appropriate authorizations to conduct these activities, and selective live-trapping and relocation or lethal removal of mammalian and avian predators is conducted by USDA Wildlife Services or other approved contractors.

Trapping is the most commonly used method for mammalian predator management. Mammalian predators, especially coyotes, may also be lethally removed by calling and shooting them. Calling is most effective at dawn or dusk. Spotlighting is also used to locate and remove mammalian predators. Spotlighting is done while driving a vehicle and shining a high-powered spotlight to look for eyeshine of a predator. Once eyeshine has been located, binoculars are used to make a positive identification, and the predator can then be removed using the above techniques.

Hazing is the most commonly used method for avian predator management. Avian predators that are perched in sensitive areas are almost always flushed or hazed with the bird whistler device before any trapping attempts are made. Only those avian predators that are not deterred from the nesting habitat and are observed targeting or disturbing SNPL and CLTE are candidates for removal. Prior to trapping avian predators for removal and relocation, avian predator justification forms are submitted to CDFW. Any trapping of avian predators is conducted under a USFWS depredation permit. An avian predator capture and relocation form is submitted to CDFW once the avian predator is released.

Non-breeding Season Monitoring of Snowy Plover

During the months of October through February, weekly surveys are conducted for non-breeding SNPL, as weather and/or staff availability permits. However, during the winter of 2016–2017 and winter 2017–2018, monitoring was increased mostly to daily monitoring. During these surveys, monitors drive vehicles and walk, searching for non-breeding SNPL, including any foraging and/or roosting flocks, from north of the Pismo Pier to the southern boundary of the SVRA (section 5.4.1.1.2). As part of this monitoring effort, additional speed limit signs are posted near any foraging and/or roosting flocks of wintering SNPL, and enforcement is increased in these areas, as feasible.

Habitat Enhancement

Following the SNPL and CLTE breeding season (i.e., during October through February), camping, street-legal vehicles, and OHVs are once again allowed in the open riding area portion of the Southern Exclosure. Recreational use in this area results in large areas of flattened terrain and barren sand with very limited scattered debris and vegetation. As a result, each year in February or March prior to nest initiation, Oceano Dunes SVRA staff place material in the 6, 7, and 8 exclosures to enhance SNPL and CLTE habitat and offer more areas of cover for SNPL and CLTE that can provide shelter from wind and blowing sand, reduce exposure to predators, and augment potential nesting substrate. Habitat-enhancement activities consist of adding natural materials, such as driftwood, woodchips, and wrack to the exclosures and shoreline. No habitat enhancement occurs within 100 feet of the exclosure fence

that borders the open riding area in order to discourage CLTE and SNPL from nesting near activities that could disturb breeding birds.

Wrack and Talitrids

Results from studies conducted by Dr. Jenny Dugan and Dr. Mark Page (Marine Science Institute at the University of California Santa Barbara) suggest the 7-month closure of breeding habitat during the breeding season is not a sufficient period of time for invertebrates, which are a food source for SNPL, to effectively recover species diversity and abundance along the Southern Exclosure shoreline following natural winter population declines along with the 5 months of recreational use. As a result, Oceano Dunes SVRA staff install wrack in the Southern Exclosure to increase the food resources available for SNPL chicks and juveniles during the breeding season. Wrack is collected from the open riding area and placed on the shoreline of the Southern Exclosure at the beginning of the breeding season to provide cover for nesting SNPL and CLTE. In addition, the wrack is inoculated with talitrids (commonly called beach hoppers), which are collected from outside the vehicle use area north of Grand Avenue and are a primary food source for SNPL. Collection of wrack and talitrids is done by hand. Wrack is moved from the open riding area to the Southern Exclosure using a truck and trailer.

Woodchips, Branches, and Driftwood

Woodchips are added to the 6, 7, and 8 exclosures in patches of less than 0.25-acre in size in areas of barren sand and over thinning woodchip patches from the previous years. Heavy equipment is used to load woodchips onto trucks for transport to the exclosures. Oceano Dunes SVRA staff also distributes cut branches and driftwood in patches from the mid-portion of the 6 Exclosure and 7 Exclosure to the west fence and upper shoreline west of the exclosure. Staff collect the branches and driftwood from the exclosures at the end of each breeding season and store them for use in the following breeding seasons.

Plants and Seeds

In some years, prior to expected rain, CDPR may broadcast seed and install container plants in the 6 Exclosure and 7 Exclosure in order to provide additional cover for SNPL and CLTE during the breeding season. All seeds and container plants are collected from local foredune species, such as sea rocket (*Cakile maritima*), beach bur (*Ambrosia chamissonis*), and sand verbena (*Abronia maritima*). Seed and container plant collection and dispersal is conducted by hand using hand tools.

CLTE Chick Shelters

CDPR staff sometimes place CLTE chick shelters in the 6 Exclosure and 7 Exclosure in areas of historical CLTE nesting and chick-rearing (e.g., 192 were installed in 2013, 26 were placed on the 6 Exclosure shoreline in 2014). The shelters provide chicks and juveniles with cover from predators and the elements (e.g., sun, wind, wind-blown sand). The chick shelters are simple structures made with two or three pieces of plywood attached together to form either an A-shaped shelter (typically 6 inches high by 12 inches long by 11 inches wide), L-shaped shelter (typically 7 inches high by 19 inches long by 14 inches wide), T-shaped shelter (12 inches by 12 inches flat roof with a center support partially buried in sand), or a double-T-shaped shelter (16 inches by 22 inches flat roof with two supports that are 8 inches deep and 5 inches apart buried in the sand).

Modifications to Habitat Enhancement Approaches

CDPR will continue to adjust approaches to habitat enhancement in response to data collected, input from wildlife agencies and other scientific advisors, and site conditions (see adaptive management described in section 5.6.5). For example, CDPR may consider installing small, 5- to 10-acre year-round

rotating closures, which may improve the quality of nesting habitat for CLTE and SNPL. The area would be protected from recreation activities during the winter, allowing wrack, microtopography, and other surface features to develop. A permanently closed area, however, may become less productive over time as expanding vegetation reduces the open habitat favored by nesting SNPL and CLTE. The perfect combination of open sand, microtopography, and scattered vegetation and debris is not fully known and has not been studied in the HCP area. Observations in the HCP area do indicate that once a foredune system creates significant topographic relief and dense vegetation, it is less productive for nesting SNPL and CLTE. By rotating the location of the year-round exclosure every few years, the closed acreage would be reopened to recreation disturbance. This disturbance would reduce establishing vegetation and topographic relief, which would facilitate long-term maintenance of nesting habitat characteristics.

Investigation of SNPL and CLTE Carcasses

When SNPL and/or CLTE carcasses are discovered in the HCP area, Oceano Dunes SVRA staff collect carcasses in coordination with USFWS and/or CDFW. Carcasses may be stored in a freezer and/or sent to an approved facility for necropsy (see section 5.4.1.8).

2.2.2.1.3 Tidewater Goby and Salmonid Surveys (CA-13)

CDPR biologists routinely monitor covered species populations and habitats, including covered fish species. The fish habitat of the lowest half-mile of Arroyo Grande Creek, including the euryhaline lagoon within Pismo State Beach, is sampled and monitored about four times per year for tidewater goby and salmonids. Qualitative sampling of the fish in this area is conducted to gather information about various species' use of the habitats, to evaluate whether any park activities may be impacting the fishery or aquatic habitat, and to document the impacts of habitat disturbance caused by upstream water management activities. The sampling effort regularly includes seining, dipnetting, and direct observation. Electrofishing in upstream areas is also conducted when streamflows and other conditions (e.g., saltwater levels) are suitable. The Oceano Dunes District may also conduct fish surveys within Pismo Creek and estuary, Carpenter Creek, or Oso Flaco Lake and Creek to check for covered species' presence and to document overall species diversity.

2.2.2.1.4 California Red-legged Frog Surveys and Associated Management (CA-14)

A comprehensive survey to document presence of CRLF in potentially suitable habitat, numbers of individuals, quality of habitat, and habitat disturbances (if any) is conducted as time and staff allow. A full park survey can occur annually if SVRA staff are available and resources allow. Surveys are conducted at all known and potential CRLF habitats (e.g., Pismo Lake, Oso Flaco Lake, Little Oso Flaco Lake, Oso Flaco Creek, Meadow Creek, Oceano Lagoon, Pismo Lagoon, Pismo State Beach Golf Course, Dune Lakes, and Arroyo Grande Creek). Surveys typically begin in January and are completed by the end of September. Multiple survey visits are conducted throughout this survey year. Two day surveys and four night surveys are recommended during the breeding season between October 1 and June 30, and one day and one night survey are recommended during the non-breeding season between July 1 and September 30. At least one survey is conducted prior to August 15. All surveys are visual unless a CRLF is observed. If a CRLF is observed, a 10 (a)(1)(A) permitted (or USFWS-approved) Oceano Dunes SVRA biologist or contractor may conduct dipnet surveys.

During dipnet surveys, the surveyor walks along the entire shore or bank, visually scanning all shoreline or streambank areas and/or uses kayaks to survey appropriate habitat along the shoreline, as necessary when the shoreline is inaccessible. When duckweed or other floating vegetation is present, the surface of the water is scanned. Care is taken not to disturb sediments, vegetation, or any visible larvae. When walking on the bank, care is taken not to crush root balls, overhanging banks, and streamside vegetation that might provide shelter for frogs. When conducting night surveys, flashlights and headlamps requiring

four to six D batteries or one 6-volt battery are used in order not to harm frogs with bright spotlights (USFWS 2000a).

2.2.2.1.5 Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

Vegetation management activities in known and potential covered species' habitat include removing invasive plants such as iceplant (*Carpobrotus edulis*), veldt grass (*Ehrharta calycina*), and European beach grass (*Ammophila arenaria*) via herbicide application and hand weeding and by re-establishing native plants in areas where exotic plants have been removed. Prescribed fire may also be used to remove invasive plants. For example, in December 2009, CDPR Environmental Scientists implemented an approximately 160-acre prescribed burn in the foredunes south of Oso Flaco Lake prior to applying herbicide on European beach grass to improve habitat for beach spectaclepod (*Dithyrea maritima*) and surf thistle (*Cirsium rhothophilium*) (CDPR 2012a).

As part of the listed plant, propagation, and habitat enhancement program, CDPR will actively participate in the recovery of listed plant species. As a result, restoration of native habitats may include propagation and planting of listed species for recovery purposes only. Propagation will involve seed or plant material collection, greenhouse cultivation, record keeping, and ultimately experimental transplanting of listed plant individuals. A Restoration and Monitoring Plan for experimental planting of listed plant species will be developed in coordination with the Wildlife Agencies and in accordance with federal and state regulations protecting listed plant species.

Regular monitoring of listed plant populations in the HCP area will also occur. Monitoring listed plant populations requires entering occupied habitat and measuring critical information about listed plant populations and their associated plant communities. Other management activities may include trimming vegetation away from listed plant populations to promote recovery, as well as other actions deemed necessary to protect and enhance existing listed plant populations. Vegetation management frequently requires vehicle access off of designated roads, including access into remote areas through potentially sensitive areas.

2.2.2.2 Habitat Restoration Program (CA-16)

Since 1989, Oceano Dunes District has annually implemented stabilization projects to control the sand movement within vegetated areas of the dunes and restoration projects to maintain the integrity of native dune and riparian habitats located within or adjacent to the open riding area of Oceano Dunes SVRA and Pismo State Beach. Oceano Dunes District maintains a primitive greenhouse and nursery operation. Native seed and plant propagation materials for plants used in the restoration projects are harvested within the boundaries of the park.

The Oceano Dunes District has fenced off approximately 240 acres of largely native dune vegetation within Oceano Dunes SVRA (Map 6). This acreage consists of the vegetation islands and other vegetated areas. There are approximately 30 such areas, with the majority being within the open riding area of Oceano Dunes SVRA. Over the years, restoration projects have varied from stabilizing large bare sand sheets or sand encroachment along the edges of a vegetated island to restoring areas with potential soil or habitat loss due to construction, access roads, high winds, high tides, weed encroachment, and other factors. Table 2-4 summarizes the restoration efforts in the HCP area from 2011 through spring 2018.

The vegetation islands range in size from less than an acre to over 40 acres and are only open to pedestrians and dogs on leash. In addition, Oceano Dunes District resource staff and affiliated biologists enter the areas for monitoring and management purposes. Exterior fencing must also be maintained as the shifting dune sand often undermines or overtops the fencing. Restoration activities conducted in the

vegetation islands include minor grading to access work areas, seed collection, propagation, planting, and monitoring.

Oceano Dunes District has established a protocol for the materials used and how they are applied at the targeted sites. Prior to the spread of seed or installation of plants, park crews along with California Conservation Corps or CalFire crews, spread or hand punch Certified Weed-Free wheat straw over the project. Planting is dependent on seasonal rains and is site specific. Species used include silver lupine (*Lupinus chamissonis*), yarrow (*Achillea millefolium*), Blochmans groundsel (*Senecio blochmaniae*), mock heather (*Ericameria ericoides*), crisp monardella (*Monardella undulata* ssp. *crispa*), arroyo willow (*Salix lasiolepis*), and others. Machine or hand broadcasting of Re-Green (sterile wheat seed), 14*14*14 granular fertilizer, and native seed follows planting. In 2014 or 2015, biodegradable erosion control blankets were installed on the steep and wind-swept slopes found at Indian Midden with the intention of reducing the amount of sand loss from wind off the slope and encouraging seed recruitment and germination on the slope.

Table 2-4. Recent Restoration Efforts within the Oceano Dunes District

Year	Acreage	Number of Plants	Seed (lbs.)	Fertilizer (lbs.)	Re-Green	Number of Straw Bales	Blankets
2011/12	9.08	16,263	75	1,400	1,200	1,792	–
2012/13	13.94	20,912	199	745	1,397	2,048	–
2013/14	23.1	12,268	203	728	728	1,573	–
2014/15	16.15	15,375	172	500	1,000	1,800	20
2015/16	14.09	23,022	160	550	550	2,236	10
2016/17	17.16	23,640	115	200	250	2,048	–
2017/18	8.84	5,108	209	1,530	1,014	884	–
2018/19	49.18	125,701	494	2,775	–	5,315	–

The District performs these activities to enhance the habitat characteristics of existing vegetation islands present within Oceano Dunes SVRA, as well as to protect sensitive habitat areas (such as Oso Flaco Lake) and critical park infrastructure (such as access roads) from encroaching sand dunes. Most of the installed vegetation has been planted on sandy areas adjacent to existing vegetation islands or other vegetated areas in the southern half of Oceano Dunes SVRA. Vegetation planting associated with the habitat restoration program is anticipated to continue at a similar rate over the permit term as shown in Table 2-4.

Limited planting of foredune plants and seeds is conducted in the footprint of the seasonal exclosure to enhance SNPL and CLTE nesting habitat. Although planting generally occurs in February if there is sufficient rain, in some years when rains are not sufficient, it must be done in March after the seasonal exclosure fences have been erected.

2.2.2.3 Invasive Plant and Animal Control (CA-17)

In addition to the vegetation control measures conducted as part of the Routine Riparian Maintenance Program (section 2.2.3.7) and vegetation management specifically targeting covered species (section 2.2.2.1.5), Environmental Scientists manage the plant and animal communities within the park to control invasive species and to generally improve ecosystem health. An invasive plant or animal is a species that has or is likely to spread into native systems and cause economic or environmental harm by developing self-sustaining populations and becoming dominant or disruptive to those systems. Invasive animal species such as crayfish (*Procambarus clarkii*), warm-water fish, American bullfrogs (*Lithobates catesbeiana)*, and feral pigs (*Sus scrofa*) may be removed by trapping or other means (section 2.2.2.1.2). Manual removal, herbicide application, and prescribed fire may all be used to control invasive plants, such as perennial veldt grass. These activities may require hand clearing of paths to access work areas.

Prescribed fire is used where it is the appropriate management tool to control invasive species, such as European beach grass. Fire can be used alone or serve as an effective tool to reduce the amount of aboveground biomass prior to herbicide application. Implementing a broadcast burn can greatly reduce the amount of work and resources required to manually remove vegetation and the amount of herbicide required for control.

2.2.2.4 Habitat Monitoring System Implementation (CA-18)

The OHMVR Division is required to establish both soil loss standards and a WHPP for each SVRA. The Oceano Dunes SVRA WHPP, which is currently being updated, formed the basis for the current HMS. The HMS has been developed to standardize a broad range of scientifically accepted techniques and practices appropriate for monitoring the health of the unique habitats found within the HCP area. Ecological monitoring and data collection involve a set of systematic surveys repeated over time in an effort to detect changes or trends in biotic or abiotic components of an ecosystem. Monitoring provides an early warning of potential problems, which can then be corrected before conditions are seriously degraded. The purpose of an ecological monitoring program is not necessarily to be exhaustive by recording every plant or animal species, but to obtain information on representative organisms as indicators of ecological health and possible significant ecological changes (Elzinga et al. 2001).

In order to keep pace with the current state of best practices, resource specialists must regularly review and update protocols, thereby improving the effectiveness and efficiency of the monitoring program. The Oceano Dunes HMS program incorporates “control” monitoring sites (i.e., undisturbed sites of similar vegetation/wildlife habitat, where OHV recreation is not allowed) and compares conditions in these control sites to treatment sites (i.e., sites where OHV riding occurs). This program includes the establishment of permanent control monitoring plots at the Dunes Preserve, the Oso Flaco Lake area, Phillips 66 Refinery property, and the protected foredune region north of the mouth of Oso Flaco Creek. The monitoring program includes continued annual and seasonal monitoring at known locations for listed plant species, tidewater goby, and for CRLF where permanent control monitoring plots have been established. The CLTE and SNPL monitoring program is also part of the HMS. An additional element of the Oceano Dunes SVRA HMS incorporates analyzing and assessing the effects of management practices, especially vegetation planting. HMS surveys include small mammal trapping, point counts, invasive plants, shorebird counts, and using coverboard traps.

2.2.2.5 Water Quality Monitoring Projects (CA-19)

The Oceano Dunes District is implementing a surface water protection program as well as an illicit discharge detection program with a water quality monitoring component. Water quality sampling includes using handheld sensors or filling containers for analysis by a lab. Most monitoring is completed from the shoreline of the water body being tested. Other water quality monitoring projects could

include grab samples, flow measurements, and installation of continuous meters in water bodies throughout the HCP area. Section 2.2.5.7 discusses the installation of a bioreactor downstream of the leased agriculture lands, which works to improve water quality in the Oso Flaco Lake system. Other water quality improvement projects resulting from water quality monitoring are not known at this time and would be subject to a separate regulatory evaluation.

2.2.3 Park Maintenance

Park maintenance activities include maintaining campgrounds, ramps, roads, and trails; collecting garbage; erecting and maintaining fences; and riparian vegetation maintenance. Each activity is described in more detail in the following sections.

2.2.3.1 Campground Maintenance (CA-20)

Campground maintenance activities include mowing, implementing a hazardous tree program, restroom upkeep, and housekeeping. The hazardous tree program entails routine tree inspections. Limbs and whole trees are removed, as needed, to eliminate hazards.

2.2.3.2 General Facilities Maintenance (CA-21)

Ten locations with vault toilets exist within the open riding area. The footprint of each vault toilet is approximately 8 by 8 feet. Road base is added around vault toilets during installation within a roughly 5-foot perimeter to provide access and prevent undermining by the strong winds. The road base is generally buried by sand quickly after toilet installation and is no longer visible. Chemical toilets, approximately 4 by 4 feet, are also located within the open riding area where needed and are typically placed on pallets.

Other routine and minor maintenance activities include building maintenance; minor vegetation clearing around buildings; replacing fencing, signposts, and information kiosks; and maintaining structures such as sheds. These ongoing maintenance activities are completed on an as-needed basis. The frequency of this work depends on visitor usage and/or any weather-related damage.

CDPR will be using a tractor-towed rake or similar device during daylight hours only, to collect nails, broken glass, and other debris from open sand areas that may pose a hazard to visitors or wildlife. This mechanical trash removal may be implemented year-round from the Grand Avenue entrance area south to Post 6 and will only occur above the active wrack line. Mechanical trash removal will not occur within vegetated areas or within 500 feet of any known SNPL or CLTE nesting area, and it will be set back from lagoons and creeks. Equipment operating speed will be 5 to 10 mph. Collected debris will be deposited in the dumpsters. It is expected that work will be conducted in the morning to avoid peak visitation. A maximum of approximately 24 acres could be treated on any 1 day. Given time constraints, speed limits, and other factors, fewer acres may be treated. Some areas could be treated several times in a month during a busy season, whereas others may be treated only once or twice a year, if at all. Although trash removal would focus on a narrow (200- to 300-foot-wide), approximately 140-acre band running from Grand Avenue to Post 6, other areas may be treated pending resource staff review and within the above setback parameters.

2.2.3.3 Trash Control (CA-22)

Maintenance crews pull 20-cubic-yard roll-off dumpsters onto the dunes just south of Post 2 for trash control. Normally two to four dumpsters are deployed, but more are used as required to contain trash, depending on events and holidays. The dumpsters occupy up to 0.25 acre of sand. The dumpsters stay for a week, at which time they are hauled away by trucks to be emptied and then brought back and replaced in the sand, depending on the expected number of visitors. Given high winds in the HCP area,

trash can blow out of the dumpsters. Uncovered trash dumpsters also attract a large number of gulls that land and forage in the dumpsters (CDPR 2017a). CDPR is evaluating several options to reduce the movement of trash from the dumpsters and prevent foraging, including, but not limited to, installing covers on the dumpsters and building a structure that encloses the dumpsters.

Smaller trash bins are transported in a pick-up truck and placed in the non-motorized portion of Pismo State Beach. Garbage pickup is occasionally required along various creeks or other areas where trash collects. This effort is completed on foot with handheld trash bags.

2.2.3.4 Wind Fencing Installation, Maintenance, and Removal (CA-23)

The Oceano Dunes District installs approximately 1,700 linear feet of wind fencing directly upwind of Grand Avenue, Pier Avenue, and Strand Way annually from March to July (Map 4). The plastic fencing material is stretched across fence poles in approximately 80-foot sections. This wind fencing is installed to control natural sand drift from the beach onto public roads, parking areas, and other structures such as residences that front the southern portion of Pismo Beach. Maintaining the wind fencing requires ongoing grading to remove sand, depending on the wind strength and direction. The Oceano Dunes District may use heavy equipment to move and distribute sand that has accumulated in wind fencing projects throughout the park. The sand is typically distributed in front of the wind fencing and above the mean high tide line.

2.2.3.5 Sand Ramp and Other Vehicular Access Maintenance (CA-24)

At Pismo State Beach, vehicles access the beach via the sand ramps at Grand Avenue and Pier Avenue. The sand ramps are maintained as needed, sometimes as often as daily, to ensure safe vehicular access. Excess sand is scraped off the ramp and deposited above the mean high tide line, and road base is added to the face of the sand ramps for traction. CDPR vehicles also access the beach via the Midramps entrance from Oceano Campground north of Pier Avenue. The Midramps access is also maintained by grading and removing less than 50 cubic yards of sand. Road base is added as needed. In addition, CDPR staff create alleyways (approximately 80 to 100 feet wide) during holidays to ensure ingress and egress for CDPR vehicles.

Roadway and parking lot resurfacing occurs as needed within the HCP area. In addition to adding road base to the sand ramps, it is installed in and around the maintenance yard. Parking areas within the HCP area, including the dirt lot at Grand Avenue, the monarch butterfly preserve lot, the maintenance yard, the ranger station, and the Oso Flaco Lake parking lot, are also graded and resurfaced with road base, as needed. Some trails, such as the Grand Dunes Trail, also require grading or resurfacing. At Oso Flaco Lake, vegetation removal is required and an ongoing activity along the access road. Road base is also added to the northern end of the Oso Flaco Lake access road approximately 4 feet from the road's edge to ensure continued accessibility.

2.2.3.6 Street Sweeping (CA-25)

The Oceano Dunes District operates a street sweeping program to remove sand that accumulates on Grand Avenue in the City of Grover Beach and on Pier Avenue in the community of Oceano. District staff operate a small, CDPR-owned, street sweeper from the Grand Avenue and Pier Avenue entrance stations to the sand ramps leading to the beach (a distance of approximately 100 feet) two to three times per week. The Oceano Dunes District also conducts or contracts street sweepers outside of the HCP area.

2.2.3.7 Routine Riparian Maintenance (CA-26)

The Oceano Dunes District implements the following riparian maintenance activities on an as-needed basis (Map 7; CDPR, OHMVR Division 2012):

- *Pismo Lake Spillway Maintenance*. Routine maintenance is occasionally needed to remove vegetation, sediment, and other debris blocking the concrete rip-rap spillway located within Pismo Lake to prevent flooding the lake. Ongoing maintenance within the spillway is limited to manually removing cattail root balls, dead and downed wood material, and other debris or sedimentation in the spillway. Crews enter the spillway using either hand or hand-power tools to trim obstructing branches that measure less than 4 inches in diameter from trees and shrubs along the spillway. A chainsaw may be needed if a fallen tree or a large limb is blocking the spillway.
- *Culvert Maintenance*. Culverts are cleaned of debris, vegetation, and sediment on an as-needed basis. Cleanout includes the following sites within the HCP area: 2 culverts at Oso Flaco Lake, 2 culverts at the Meadow Creek access road, and 11 culverts at Meadow and Carpenter Creeks in the North Beach Campground. Culverts are cleaned manually or, for larger jobs, by using a back-hoe. All back-hoe work occurs from the road, trail, or upper bank outside the wetted stream channel; therefore, only the back-hoe bucket enters the water body to lift and remove obstructing objects. The back-hoe accesses all project sites from existing roads or trails.
- *Riparian Tree and Shrub Maintenance*. This activity involves removing dead and downed trees, trimming obstructing or damaged limbs less than 4 inches in diameter, and trimming tree canopies. This work happens at the Oso Flaco Lake area; Oceano (Meadow Creek) Lagoon; and within Meadow Creek at the North Beach Trail, Maintenance Yard, and Ranger Station. Shrubs are cut up to 4 feet from the edge of the road, path, or trail. Crews use hand and power tools. Some mechanized equipment, such as mowers may be used, but only in areas where an existing roadway provides access to maintenance areas.
- *Emergent Species Control*. Growth of emergent plants within Meadow Creek and Carpenter Creek in Pismo State Beach is managed to prevent the vegetation from choking up the creek and to allow water to move through the creeks unhindered. Work is conducted using handheld tools and occurs in the stream channel only during low or no-flow conditions.
- *Invasive Plant Control*. This activity involves removal or management of invasive plants, including Cape ivy (*Delairea odorata*), Boston/English ivy (*Hedera helix*), Pampas grass (*Cortaderia selloana*), and Italian thistle (*Carduus pycnocephalus*) from within the riparian plant community. The work occurs at Grand Avenue, the Oso Flaco Lake area, Oceano (Meadow Creek) Lagoon, and Meadow Creek. OHMVR Division hires a qualified and licensed pesticide contractor experienced in working within a riparian plant community for the manual and chemical treatment of these invasive plant species. Chemical treatment involves a contractor applying an herbicide from a backpack sprayer at each location where removal of these species has been identified as necessary. OHMVR Division staff also perform manual treatment (e.g., pulling by hand, weed trimming) of these plant species. The acreage of both manual removal and herbicide application varies from year to year.

Spillway maintenance, culvert maintenance, and emergent species control activities are conducted on an as-needed basis, affecting a maximum of approximately 0.3 acre of wetlands annually (Map 7).

Approximately 2 miles of creek corridor are subject to riparian tree and shrub maintenance and spot treatment to control invasive plant species. This work occurs seasonally as needed.

All work within the stream channels occurs during the driest part of the year, usually between July 1 and December 1. Tree trimming activities occur between October 1 and March 1, outside of the migratory breeding season, as feasible. Some tree trimming could occur within the breeding season, however, in areas where surveys by qualified biologists have determined no breeding activity is occurring. The U.S. Army Corps of Engineers has reviewed these activities and determined that they do not involve a discharge of dredged or fill material or affect areas subject to the ebb and flow of the tide. As a result, these routine riparian maintenance activities are not regulated under section 404 of the Clean Water Act or section 10 of the Rivers and Harbors Act; therefore, section 7 of the Endangered Species Act was not conducted for these activities.

2.2.3.8 Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)

In addition to the fencing described previously, such as nesting exclosures and wind fencing (sections 2.2.2.1.1 and 2.2.3.4), Oceano Dunes District staff maintains miles of additional fencing and other barriers. Such fencing includes perimeter fencing around the parks and campgrounds, as well as fencing around the vegetation islands. The fencing consists of field fencing, peeler poles, and T-posts. All fencing must be maintained, including by removing sand to ensure the fences are not buried and by replacing the fences as needed. Due to sand movement, fencing may not always be replaced in the exact same location but is aligned to maintain consistent boundaries.

2.2.3.9 Cable Fence Maintenance and Replacement (CA-28)

A cable boundary fence in Oceano Dunes SVRA, which is located on the shoreline along the southern boundary of the open riding area at Post 8, prevents vehicular and equestrian intrusion into the sensitive habitats in the vicinity of Oso Flaco Lake. The fenceline extends into the wave zone to provide a year-round barrier, regardless of beach width or tide levels. The southern boundary of the cable fence is mandated by the Coastal Commission Local Coastal Program (4-82-39, Condition 3.E (b)). The fence consists of a cable connecting 17 steel posts that are spaced 20 feet apart for a total length of 340 feet. The fence also contains an 18-foot steel gate.

The cable boundary fence requires year-round routine maintenance to remove sand that builds up along the fenceline. During the winter the beach profile, and thus the fence, does not extend as far to the west. In the summer, the beach profile builds up; thus, the fence must be extended west to maintain the integrity of the closed area. In late September, just before the exclosure fencing is removed, grading must occur around the cable fence to ensure it is functioning properly as a barrier.

Due to harsh coastal conditions, the gate and fence may need to be replaced as frequently as every 5 to 10 years; it was last replaced in 2010. Removal of the existing 20-foot-long posts requires excavation of sand to a depth of 15 feet using an excavator and use of a pile driver to install the new posts. Construction may last approximately 3 weeks and is implemented outside of the SNPL and CLTE breeding season.

2.2.3.10 Heavy Equipment Response (CA-29)

Heavy equipment (e.g., loader, tractor) is utilized throughout the HCP area for everything from removing stranded vehicles or boats to burying deceased marine life.

2.2.3.11 Minor Grading (CA-30)

As discussed above, minor grading may occur throughout the HCP area (e.g., sand removal from fences, sand ramps (section 2.2.3.5), and the cable fence (section 2.2.3.9). In addition, other maintenance or resource needs (e.g., to access buried fencing or create a pad for chemical toilets) may require minor

grading of no more than 50 cubic yards on average. Other than grading the cable fence (section 2.2.3.9) at the end of the SNPL and CLTE breeding season, grading occurs in upland, non-wetland habitat.

2.2.3.12 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Boardwalks in Pismo State Beach and Oso Flaco Lake require maintenance such as grading and repair of degraded sections. This work may be conducted on sections of boardwalk traversing upland or aquatic habitat, including both open water and wetland. Vegetation intruding onto footpaths may need to be trimmed at least once a year, which is usually completed using hand tools. Maintaining pedestrian access, including work conducted for Americans with Disabilities Act purposes, requires trail treadwork as well as culvert and footbridge maintenance and installation. Replacement of degraded sections of boardwalks at Pismo State Beach and in upland habitat in the Oso Flaco area may also be required, including the western portion of the Oso Flaco boardwalk that sits directly on the sand. Replacement of sections of the Oso Flaco Lake boardwalk over aquatic habitat is described in CA-48 (section 2.2.5.8).

2.2.4 Visitor Services

General park operations include patrolling beaches and trails; conducting public safety, law enforcement, medical aid, and emergency response activities; and providing other visitor services. These services may be conducted by CDPR personnel, contractors, other agencies, for-profit and not-for-profit entities, concessionaires, or lessees. These activities are described in more detail in the following sections.

2.2.4.1 Ranger, Lifeguard, and Park Aide Patrols (CA-32)

Both Pismo State Beach and Oceano Dunes SVRA are subject to regular ranger and park aide patrols throughout the HCP areas that are open to the public to ensure that visitors are obeying regulations. Patrols are largely conducted via vehicles, such as pick-up trucks, ATVs, and ROVs.

Lifeguards perform their services at their assigned lifeguard towers and on roaming patrols that extend from Pismo State Beach to the southern open riding area boundary. Lifeguard towers are installed seasonally around spring break. The towers are built onto a trailer with wheels that is towed onto the beach and erected with the wheels buried. Tower sites are subject to change but are currently near Grand and Pier avenues and the North Beach Campground.

CDPR rangers, lifeguards, and park aides all must drive across Arroyo Grande Creek and Pismo Creek, when necessary, and are subject to the same crossing restrictions as non-CDPR personnel (section 2.2.1.9 and Appendix A).

2.2.4.2 Emergency Response (CA-33)

CDPR staff responds to medical and law enforcement emergencies, which can occur anywhere within the HCP area and are essential for maintaining human safety. Emergencies exist any time human health or safety is at risk and may require high-speed travel by medical and law enforcement vehicles (e.g., pick-up truck, sport utility vehicle, four-wheel drive ambulance), including in areas without frequent vehicular traffic. Past emergencies have included water rescues, boat strandings, public safety issues, and requests for assistance from adjacent property owners or managers. These and other emergency situations are expected to continue during the permit term. Additionally, although infrequent, CDPR personnel may need to respond to emergencies, such as trespassing, stranded boats, and stranded swimmers, within SNPL and CLTE seasonal exclosures during the breeding season.

2.2.4.3 Access by Non-CDPR Vehicles (CA-34)

Concessionaires and private companies that provide visitor-related services and require vehicle access are described in sections 2.2.1.1 and 2.2.4.5. On occasion, non-CDPR vehicles require access to the HCP area for various reasons, including enforcing federal, state, county, and municipal laws; conducting search and rescue for lost watercraft in the ocean; conducting marine mammal rescue to remove dead or injured marine mammals; CDFW wardens enforcing California Fish and Game Code regulations for fishing and other resources activities; towing/removing stuck or broken down vehicles at Oceano Dunes SVRA; repairing utility facilities that are on park property; and flying/landing medevac helicopters. These activities may take place throughout the HCP area but primarily occur along the beach and adjacent shoreline. Non-CDPR vehicles generally access areas open to public vehicles, but exceptions include removing vehicles stuck in a closed portion of shoreline, boat salvage, and water rescue. If possible, CDPR will have a permitted resource monitor to escort non-CDPR vehicles into otherwise closed areas.

2.2.4.4 ASI Courses (ATV and RUV) (CA-35)

ATV Safety Institute (ASI) certified instructors conduct occasional OHV safety training. The training typically consists of a 4-hour day with no more than 20 participants. The approximately half-acre training area near the Worm Valley vegetation island is fenced (Map 3).

2.2.4.5 Beach Concessions (CA-36)

In support of the motorized vehicle recreation occurring at the Oceano Dunes District, various concessionaires have been contracted to conduct business on the beach. The OHV rental and tour services stage is located just south of Post 2. The following types of concessionaire-operated services currently occur throughout the open riding area. These and similar services are expected to continue during the permit term.

- Mobile recreational vehicle (RV) wastewater pumping and freshwater renewal, which also provides camping-related items
- Professional Humvee tours of the dunes
- Five OHV rental services
- A towing service
- Camper rentals

2.2.4.6 Pismo Beach Golf Course Operations (CA-37)

The Pismo Beach Golf Course and restaurant are located within Pismo State Beach (Map 4) and are operated by a concessionaire. The golf course has nine par-3 holes, and golf carts are available to rent. Covered activities in the golf course include regular watering and mowing of lawns, clearing of vegetation around artificial water features, and application of fertilizers and/or herbicides.

2.2.4.7 Grover Beach Lodge and Conference Center (CA-38)

The Grover Beach Lodge and Conference Center has been approved for development on the west end of Grand Avenue within Pismo State Beach (Map 8). The project is a joint effort involving the City of Grover Beach, CDPR, and a private developer. The project comprises 13 acres within the HCP area, including approximately 8 acres for the 150-room lodge and conference center and almost 5 acres of proposed improvements to Pismo State Beach. Construction of the lodge would require relocating existing day use parking, an equestrian staging area, and an RV dump station. The day use parking and equestrian staging area would be accommodated in a mixed-use parking lot in the southeast corner of the Grover Beach

Lodge and Conference Center project site. The RV dump station would be relocated to Le Sage Drive, which is outside the HCP area. The final design of the project is still in progress and may not include the conference center.

2.2.4.8 Natural History and Interpretation Programs (CA-39)

Guided hikes are held in the Oso Flaco Lake area, some of which are led by local non-profits. Most guided hikes are on existing trails. During the school year, the Oceano Dunes District may conduct school field trips at Oso Flaco Lake and at other locations in the HCP area, including the butterfly grove and visitor center. These school field trips typically are attended by 10 to 60 people. In addition, the Dunes Center, a local non-profit, conducts two to three guided field trips per month at Oso Flaco Lake. Typically, the Dune Center field trips accommodate 5 to 30 people. The Oceano Dunes District staff conducts stationary and "roving" interpretation in the Oso Flaco Lake area more frequently, especially in the summer. Roving interpretation may include setting up a table with items of interest, such as animal specimens, and inviting the public to learn about the displays. Interpretive walks are also provided in the HCP area. Oceano Dunes District staff also have two interpretive trailers that can be towed onto the beach or elsewhere and are utilized for programs or more impromptu outreach.

2.2.5 Other HCP Covered Activities

2.2.5.1 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

Pismo Village RV Resort is a private campground that abuts the Pismo State Beach boundary and Pismo Creek estuary (Map 3). Visitors camping in the resort access the Pismo State Beach by following a volunteer path that has formed on CDPR property along the southeast bank of Pismo Creek. The Oceano Dunes District has proposed installing a seasonal, floating pedestrian bridge across Pismo Creek estuary to provide pedestrian access from the Pismo Coast RV Resort to Pismo State Beach (Map 8). Should the Oceano Dunes District obtain the permits and materials necessary to install the bridge, it will be included as a covered activity under this HCP.

The floating bridge will be an 8-foot wide, pontoon-style bridge with interlocking modules, handrails, and abutments. The abutments will be supported using two helical anchors at each abutment. The bridge will be installed in the spring after flows no longer threaten to undermine the abutments or wash out the bridge. Once installed, the bridge will be removed during any event that could threaten to undermine the abutments or wash out the bridge. The determination to remove the bridge in the fall, prior to the rainy season/winter, will be based on current field conditions and anticipated rainfall or wave duration, frequency, and intensity. Installing the bridge should reduce the pedestrian impact on Pismo Creek by reducing erosion and providing an alternative to walking through the mouth of the creek for pedestrians wishing to walk up the coast.

The bridge, abutments, and anchors will be installed and removed each year by a licensed contractor employing hand crews and/or a small excavator. Installation and removal will last 2 to 3 days at each instance (4 to 6 days per year). The bridge will be stored offsite when not in use and will be transported to and from the beach by truck.

2.2.5.2 Riding in 40 Acres (CA-42)

Starting in the 1980s, CDPR planted native vegetation (non-listed species) in a dune area that was deemed vulnerable to movement into Oso Flaco Lake. The area that was vegetated is called the "40 Acres" site and is currently closed to motorized recreation (Map 8). In order to retain the potential for motorized vehicle recreation opportunity in this area, the project was broken into phases. The first phase, vegetating the sand sheets to control sand movement, was completed. The next phase, installing a trail system through the area, would restore motorized vehicle recreation opportunity in the area

while reducing the potential for sand movement into Oso Flaco Lake. The trail has not been built and is currently only in a conceptual stage, but it may be developed during the permit term. Trail construction would require clearing vegetation and maintaining the cleared alignment. For purposes of HCP analysis and ITP coverage, it is assumed the project would comprise less than 2 miles of trail with a trail width of 20 to 30 feet. The trail may be a "dead end" with a turnaround area, a loop, or a through passageway between the Boneyard and Maidenform Flats areas. The trail may include basic amenities such as a picnic table or interpretive features. Segments of the trail that include a turnaround or amenities would be wider than the rest of the alignment. For example, a turnaround could be approximately 30 feet in diameter to safely accommodate vehicles. CDPR would monitor the trail to check for vehicles leaving the trail and trespassing onto vegetation. In addition to frequent patrols, signage and fencing would be used as needed to prevent trespass. Additionally, the trail entrance(s) would be gated so that the trail could be closed if needed, although it is assumed that the trail would typically be open year-round on a 24-hour basis.

2.2.5.3 Replacement of the Safety and Education Center (CA-43)

An informational kiosk area referred to as the Safety and Education Center exists on the dunes just south of Pavilion Hill (Map 3). This facility needs routine maintenance (e.g., signs cleaned and painted). In addition, signs and associated structures need to be removed and replaced every 5 to 10 years.

2.2.5.4 Dust Control Activities (CA-44)

The District implements a program to control and minimize indirect emissions of dust and particulate matter (PM) that are generated at Oceano Dunes SVRA during periods of strong, persistent winds and subsequently blown downwind of the SVRA and onto the Nipomo Mesa. To address windblown dust, CDPR has already implemented a series of dust control and monitoring measures in the HCP area, which include:

- *Native vegetation planting*. Between 2014 and 2018, CDPR planted almost 50 acres of vegetation for dust control purposes. Approximately 36 additional acres were planted in winter 2018/2019. This area was part of a straw bale array installed earlier in 2018 (see next bullet point). The vegetation planting is in addition to vegetation planted for habitat restoration purposes described in section 2.2.2.2.
- *Wind fencing and straw bale array deployment*. In 2018, CDPR installed three wind fencing arrays totaling approximately 49 acres and two straw bale arrays totaling approximately 36 acres. The wind fencing arrays comprise 4-foot-high wind fencing rows, oriented perpendicular to the prevailing wind direction and spaced approximately 28 feet apart, depending on topography. The three arrays are located adjacent to existing vegetation islands inside the open riding area. Wind fencing installed for dust control purposes is in addition to the linear wind fencing installed to control drifting sand as described in section 2.2.3.4. The straw bale arrays comprise rows of standard straw bales oriented perpendicular to the prevailing wind direction, spaced approximately every 16 feet. Once deployed, straw bales eventually become partially buried and deteriorate and can be incorporated into future vegetation plantings. The two straw bale arrays were planted in winter 2018/2019.
- *Dust and meteorological monitoring*. The OHMVR Division has operated and maintained a meteorological tower, referred to as the "S1" tower, in the open riding area since 2010. The S1 tower is an approximately 33-foot-tall lattice tower with air temperature and relative humidity instruments, a wind vane, a propeller anemometer, and sand-transport measurement devices. A perimeter fence surrounds the approximately 0.1-acre meteorological tower site. The OHMVR Division installed an air quality monitoring station, the Oso Flaco station, in the southeast corner

of Oceano Dunes SVRA in 2015.[16] The approximately 0.4-acre site includes air quality and meteorological monitoring equipment mounted on and around a 33-foot-tall tower, plus solar panels with associated solar charging and battery-backup systems. To reduce avian predators using these towers as roosting sites, CDPR installs Nixalite (bird spikes) to reduce perching potential and the potential for a bird to interfere with instrumentation.

- *Fencing an approximately 48-acre area for future foredune vegetation planting*. The fencing for the 48-acre foredune has been installed north of Post 6, roughly aligning with extant foredunes south of Post 8 (Map 8). Fencing comprises multi-strand fence with variable size openings. Wooden peeler poles are spaced approximately every 100 feet along the fencing, with T-posts spaced every 10 to 15 feet.

The above dust control and monitoring measures are currently in place and are expected to continue during the permit term, subject to modification consistent with legal obligations described here. In May 2018, CDPR entered into an SOA (amended November 2019) with the San Luis Obispo Air Pollution Control District. Under the SOA, which expires December 1, 2023, CDPR agreed to implement numerous dust control measures, including: 1) permanently closing off sections of open riding area to motorized recreation and camping; 2) installing track-out devices at the Grand Avenue and Pier Avenue entrances to prevent track-out of sand onto paved, public roadways; and 3) preparing a Particulate Matter Reduction Plan (PMRP). The SOA was amended on November 18, 2019. As noted above, CDPR already closed off and planted approximately 40 acres of open riding area in winter 2018/2019. CDPR released a draft PMRP in June 2019, which specifies actions that will be undertaken through December 2023 (CDPR 2019). The PMRP is supplemented by annual work plans, which include a description of dust control activities to be undertaken or completed in the coming term year. Measures proposed in the PMRP's implementation plan, as modified by the initial work plan and November 2019 SOA amendment, are included as covered activities in this HCP. These measures include the following:

- *Developing an approximately 48-acre vegetated foredune just above the tidal zone and adding approximately 4 acres of additional foredune vegetation*. The fencing for the 48-acre foredune has been installed north of Post 6, roughly aligning with extant foredunes south of Post 8 (Map 8). However, the 48-acre foredune area has not been fully planted at this time, and the exact location of the additional 4 acres of foredune vegetation has not been selected. The 48-acre foredune was subject to varying test planting treatments in February 2020. As a result, almost 44 acres within the foredune has been either planted or seeded with varying levels of resulting coverage density; the remaining 4-acre area was left untreated as a control. The 48-acre foredune area is currently fenced and closed to motorized recreation and camping, but the fencing allows for vehicle travel pathways through the foredune area between the shoreline and the open riding area to the east, although these "alleys" are closed to camping to maintain vehicle circulation. The foredune boundaries also exclude vault toilets to ensure access to those facilities remains. The 4 acres of additional foredune vegetation will also be fenced and closed to motorized recreation and camping. The foredune areas will remain open to pedestrians until the foredune vegetation is planted. The OHMVR Division will eventually install additional vegetation within the fenced areas, possibly per existing practice, which is random spacing of appropriate native vegetation and localized use of straw mulch. Other treatment methods are currently under consideration, but all of the treatments involve the use of weed-free straw, native plants, and/or native seed. The hummocky foredune landform is expected to grow and develop as

[16] The air quality monitoring station was removed and replaced again in 2017.

progressively more sand becomes trapped within the vegetation. Depending on the outcome of the February 2020 test plantings, it is possible CDPR could implement other surface treatments, such as spreading straw, prior to installing vegetation. Fencing for the 4 acres of additional foredune will also comprise multi-strand fence with variable size openings as described above. Plants are usually installed during the winter rainy season to ensure adequate natural irrigation. Once the vegetation is established, pedestrians will be allowed within the areas, although such uses would not be encouraged. Visual monitoring of the sites (for vegetation cover) and additional air quality monitoring, both upwind and downwind, may be implemented. In addition, if a SNPL or CLTE nest is established within the foredune area, bumpouts and single-nest exclosures will be implemented as necessary (section 5.3) to ensure that nesting SNPL and CLTE are not disturbed by foredune activities. As part of developing the foredune, CDPR has administratively reduced camping numbers and may also utilize operational changes to increase camping density where feasible.

- *Converting the approximately 49-acre wind fencing areas noted above into natural vegetation cover similar to surrounding areas outside the open riding area*. Planting efforts will likely include both installing container-grown plants and spreading native seed, consistent with methodology as described in section 2.2.2.2. Spacing is approximately 4 feet in each direction between plants. The sites will be monitored to ensure plant survivorship meets ecological and emission control goals, with supplemental planting implemented as needed. Plantings will be timed to take advantage of the rainy season; supplemental irrigation such as watering via trucks will not be used.
- *Converting additional backdune areas (up to 319 acres total) to native vegetation cover*. The location of this additional backdune planting is not yet determined but is expected to be in areas of high emissivity and may be entirely within the open riding area. Planting methodology will be as described above for conversion of wind fencing areas.
- *Deploying seasonal temporary wind fencing (up to 40 acres annually)*. The location of this wind fencing is not yet determined but is expected to be in the backdunes in areas of high emissivity and may be entirely within the open riding area. Wind fencing is expected to be of similar design and density as described above for wind fencing installed in 2018. Seasonal wind fencing is usually installed in the spring and removed at the end of summer, and it will likely be installed after the Southern Exclosure has been erected.
- *Installing track-out control devices*. Preliminarily, the OHMVR Division is proposing to install V-shaped, grooved concrete panels, up to 45-feet wide, west of the entrance kiosks at Grand Avenue and Pier Avenue. The concrete panels would be between 50 to 125 feet in length and would be located in the Grand Avenue and Pier Avenue roadways, potentially extending down the entrances' sand ramps.
- *Installing additional monitoring equipment (up to 3 acres total)*. The OHMVR Division anticipates installing additional monitoring stations for measuring meteorological variables (wind speed, wind direction, temperature, relative humidity, barometric pressure, and precipitation) and PM_{10} concentrations. Air quality monitors would be set up upwind and downwind of control sites. The area that each monitoring site occupies will vary according to the type of equipment installed, mounting structure used, and power required to operate the equipment, but could range between approximately 0.1 to 0.3 acre per site. In general, sites with equipment mounted on 6-foot-tall tripods or poles require less area than sites that have a 33-foot-tall lattice tower or that require a solar panel array. These sites will be installed on a temporary basis ranging between 6 months to 2 years in duration, depending on the purpose and need for the

monitoring site, the dust and PM levels measured at the site, etc. Once installed, monitoring equipment will require regular (daily or weekly) maintenance. Maintenance activities typically require one technician in a pick-up truck or ROV to conduct instrument maintenance and diagnose issues with the solar charging system.

Although not specifically listed in the PMRP, CDPR may also consider using a non-toxic, environmentally friendly soil stabilizer to control and minimize dust on a seasonal basis. The implementation plan proposed through 2023 likely does not constitute the final action plan for dust control at Oceano Dunes SVRA. The SOA includes an annual reporting, review, and approval process that will shape future dust control projects. If additional dust control projects or modifications to existing or proposed efforts described in this HCP are brought forward for implementation, they will be assessed for incorporation into the HCP.

2.2.5.5 Cultural Resources Management (CA-45)

Cultural resource management actions in the HCP area include, but are not limited to, the following: archeological testing and/or data recovery mitigation, archaeological survey and inventory, archaeological site monitoring, evaluation of cultural resources according to the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) criteria, erosion control and stabilization of archaeological sites, control of invasive plant species, revegetation of archaeological sites, cultural landscape inventory, historic landscape maintenance, and formulating and implementing protection, preservation, and interpretive standards for eligible resources. OHMVR Division archaeologists work with staff environmental specialists to ensure that cultural resource projects avoid or minimize impacts to sensitive natural resources. Environmental monitors often accompany archaeologists in the field when cultural resources protection work will be occurring within or adjacent to sensitive habitat.

2.2.5.6 CDPR Management of Agricultural Lands (CA-46)

The Oceano Dunes District leases two parcels comprising 211 acres of land east of Oso Flaco Lake to an agricultural operator (Map 3). These lands have been actively farmed for more than 30 years. Agricultural operations, including tilling, planting, harvesting, and pesticide use, are not covered activities. However, two ditches that flow from the agricultural lands drain into Oso Flaco Lake (Map 7). Ditch maintenance consisting of sediment or vegetation removal is a covered activity that may be required sometime in the next 25 years.

2.2.5.7 Maintenance of a Bioreactor on Agricultural Lands (CA-47)

A bioreactor was installed on the southern agricultural parcel to improve water quality of runoff from the agricultural lands upstream of the Oso Flaco area (Map 7). Denitrifying bioreactors are a technology currently undergoing research and development to reduce nitrate and pesticide concentrations in runoff water. Nitrate is removed from the water and converted to nitrogen gas by denitrifying bacteria living in the anoxic woodchip bioreactor that use the wood as a carbon source. The Coastal San Luis Resource Conservation District (CSLRCD) has constructed a woodchip bioreactor lined with 10 millimeter (mm) heavy-duty agricultural liner and fed by water from Little Oso Flaco Lake. Source water is pumped to the bioreactor from several hundred yards away through a polyvinyl chloride (PVC) pipe and is distributed over about half the length of the bioreactor through a gated irrigation pipe. After filling, the bioreactor gravity-drains over a period of several hours back into Little Oso Flaco Lake, then refills again.

Bioreactor construction was completed October 30, 2014 and was monitored for the water volume treated, nitrate concentration reduction, and nitrate load reduction. A total of 360,000 gallons of irrigated runoff water were treated and the average concentration of nitrate was reduced by 12 parts per million (ppm) (with an average inflow of 20 ppm and average outflow of 8 ppm), and 36 pounds of

nitrate as nitrogen was removed (Wagner 2015). Preliminary data shows that the bioreactor is efficient for nitrate removal. However, pesticide-removal efficiency has not been monitored and evaluated. The Surface Water Protection Program described in section 2.2.2.5 includes water quality monitoring for pesticides.

Bioreactors require little to no maintenance. The covered activity includes maintenance of the bioreactor itself, maintenance of the pump, and maintenance of the water inlet and outlet.

2.2.5.8 Oso Flaco Lake Boardwalk Replacement (CA-48)

The boardwalk that extends over Oso Flaco Lake will likely need to be replaced at least once during the permit term. This segment of the boardwalk spans approximately 940 linear feet of aquatic habitat (wetlands and open water), comprising approximately 6,757 square feet. Compared to replacement of upland boardwalk segments in Oso Flaco (CA-31 section 2.2.3.12), replacing all or significant sections of the boardwalk spanning aquatic habitat would involve more complex logistics. For example, wooden and/or plastic pilings supporting the structure would need to be removed, with replacement piers potentially installed via a pile driver. Equipment and materials may traverse wetlands or need to be ferried to the worksite via a boat or floating platform. Additionally, the replacement boardwalk would need to comply with current code and, thus, may need to be modified in size, location, or other design considerations that could affect its footprint within aquatic habitat. Construction details are not available at this time but would be developed as part of the budgetary and planning process. It is assumed the boardwalk would be designed to avoid the loss of CRLF aquatic habitat, as feasible, and any change in the boardwalk layout would affect no more than 1.5 acres of aquatic habitat. Measures will be developed to address possible impacts to covered species, jurisdictional waters, water quality, migratory birds, and other resources in the area.

2.2.5.9 Special Projects (CA-49)

Special projects considered under CA-49 are activities that are not yet proposed, and are thus not described under other covered activities, but that may occur over the permit duration. Special projects are those activities that are not considered routine but are required to meet facility and/or operational needs (e.g., installing vault toilets, rerouting trails, etc.) and that could have an impact on a covered species or its habitat. Only special projects that incorporate take avoidance and minimization measures are covered under the HCP. Such projects fall into two categories:

- Replacement/expansion of existing facilities in the existing facility footprint
- New facilities that are consistent with existing facilities, not to exceed 35 acres over the permit term

Special projects covered by this HCP could occur near but not within vegetation islands and do not include those that may occur in aquatic habitat. Special projects in aquatic habitat would be subject to a separate regulatory evaluation. Special projects that could impact covered species (e.g., projects within primary SNPL and CLTE habitat) will be submitted to the USFWS for review and approval prior to construction. A more detailed explanation of the approval process for special projects is provided in Chapter 6.

2.2.5.10 Reduction of the Boneyard and 6 Exclosures (CA-50)

The OHMVR Division plans to open additional area for recreation during the SNPL and CLTE breeding season. To provide additional opportunity for year-round recreation, the OHMVR Division proposes to no longer fence off the East Boneyard Exclosure (approximately 47 to 49 acres depending on dune topography) starting with the first breeding season under the HCP. The eastern fenceline of East

Boneyard is not maintained as a predator fence due to the rapidly shifting open sand dunes in the area that make it difficult to maintain. Although the Boneyard Exclosure once played a more significant role in CLTE and SNPL nesting, it no longer receives the number of nests it did prior to 2005. In fact, CLTE have not nested in the East Boneyard Exclosure at all since 2005, and only seven SNPL nests have been established in the East Boneyard Exclosure during this time. The Boneyard Exclosure area is located in an extremely active part of the dunes; thus, there is no set location for the current interior boneyard fence. It is installed annually in a location that best allows necessary maintenance. CDPR may need to adjust the location of the fence each year. The area opened up for East Boneyard may fluctuate up to 4 acres based on field conditions.

Currently, visitation by park users in South Oso Flaco is infrequent during the breeding season because there is no public access via the open riding area. When East Boneyard is no longer closed off during the breeding season, the Oso Flaco fence at the south end of East Boneyard would be moved, as necessary, to ensure that recreational access to South Oso Flaco from the former East Boneyard Exclosure would be limited. In addition, because SNPL and/or CLTE may still use West Boneyard to nest and could be disrupted by vehicles that travel in the former East Boneyard area, fencing would be erected in the East Boneyard area, as needed, to ensure that appropriate buffers from any nests are maintained.

The Southern Exclosure was initially extended north to Post 6 in July 2003 as a result of a consent decree that CDPR entered into with a local Sierra Club chapter in 2005.[17] Specific to the HCP process, the consent decree stipulated that CDPR "shall support a northern [seasonal exclosure] boundary of Distance Marker Number 7, notwithstanding the terms of this consent decree." This stipulation memorialized CDPR's commitment to providing recreational opportunities in the area if compatible with natural and cultural resources conservation, specifically the conservation of SNPL and CLTE. Thus, if specific criteria are met, CDPR may approve the incremental reduction of the 6 Exclosure, and the approximately 60-acre exclosure may ultimately no longer be fenced.

If CDPR determines that reductions are supported by the appropriate considerations, the 6 Exclosure may be reduced in approximately 328-foot (100-meter) increments from north to south, or CDPR may implement alternative incremental reductions—such as by adjusting the eastern fence—to better suit SNPL and CLTE management. CDPR will work with the USFWS and the appropriate stakeholders to develop a 6 Exclosure reduction that achieves additional riding area while protecting nesting shorebirds (see section 5.2.3 for a more detailed explanation of the criteria for reducing the exclosed area). If the criteria are not met for either species, the 6 Exclosure will be restored to its original extent in the following breeding season in coordination with the USFWS. Any decisions to restore the 6 Exclosure fence to ensure the criteria are met will be based on the best available science and could include additional management actions (e.g., predator management) in addition to restoring the fence size.

2.2.5.11 Use of Pesticides (CA-51)

CDPR has determined the need to use vector control and terrestrial and aquatic herbicides (together "pesticides") to control invasive species and encourage re-establishment of native dune and wetland vegetation. Oceano Dunes District staff use pesticides in the HCP area to manage habitat (section 2.2.2.2), control invasive plants (section 2.2.2.3), maintain facilities (section 2.2.3.2), and for other ecosystem management purposes (sections 2.2.3.7 and 2.2.4.6). The Oceano Dunes District has used pesticides for over 15 years and has devoted approximately $100,000 each year to controlling invasive

[17] Although the consent decree was not finalized until 2005, it included implementation of exclosure boundary adjustments in 2003. The initial extension, in 2003, was narrower than the current configuration, which began in 2004.

species in the HCP area. Independent contractors are hired to apply herbicides for invasive species control, and the local vector management district is contracted to apply insecticides for mosquito control. Most herbicides are applied via backpack and vehicle-mounted sprayers; however, additional methods may be used as they are approved. Insecticides used for mosquito control are applied using helicopters. In addition, CDPR started using a helicopter equipped with a spray boom for the application of herbicides to control veldt grass in spring of 2019 in Phillips 66 Leasehold and Coreopsis Hill. Aerial application allows a large area to be sprayed in a short amount of time (e.g., 90 acres in about 2.5 hours for veldt grass control), allowing for efficient coverage. Aerial spraying for veldt grass can be conducted during the SNPL and CLTE nesting season but is conducted well away from nesting areas. In addition, aerial spraying activities include a 200-foot minimum buffer from riparian and wetland areas.

All pesticides are stored, applied, and disposed of in accordance with label instructions and in compliance with state and local laws.

The Oceano Dunes District is currently developing an Aquatic Pesticide Application Plan (APAP) for the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for the Residual Aquatic Pesticide Discharges to Waters of the U.S. from Algae and Aquatic Weed Control Applications. CDPR intends to control infestations of invasive plant species, including, but not limited to, Russian wheat grass (*Elytrigia juncea* ssp. *boreali-atlantica*), European beachgrass, and giant reed (*Arundo donax*), present along riparian corridors, lagoons, and wetlands in the HCP area.

Targeted treatment of invasive species by CDPR staff and contractors is determined by the implementation of an Integrated Pest Management (IPM) program. One of the primary operational goals of the IPM program is to establish a general and reasonable set of control measures that not only aid in managing invasive species populations, but also address public health and safety, economic, beneficial use, legal, and aesthetic requirements. Setting an action threshold is a critical step in guiding pest control management decisions and determining the scope of IPM program implementation. An action threshold level is the point at which action should be taken to control invasive species before a water body or native plant community is significantly impacted; however, established action threshold levels may change based on public expectations. A central feature of IPM is to determine when control action is necessary, determine the best preventive measures, and limit the unnecessary use of pesticides. Other adverse impacts to native plant ecosystem functions that could trigger an action include overcrowding and out-competing native species; topographical alterations with foredune build-up that impede the flow of fog drip to backdune areas; or reducing recreational access. If invasive species conditions exceed a threshold, a control method is often implemented. Control methods can include mechanical (i.e., by hand, weed whips, mowing, or excavators), cultural (i.e., modifying the timing of pesticide and non-pesticide controls to reduce the amount of pesticides used), biological, and/or chemical control, consistent with CDPR's IPM techniques.

The selection of and decision to use a pesticide is based on the recommendation of a California Department of Pesticide Regulation (DPR) licensed Pest Control Adviser (PCA). The PCA considers a variety of control options that may include mechanical removal and/or cultural methods, which are the most efficacious and protective of the environment. Evaluating alternative control techniques is part of CDPR's IPM approach; therefore, an alternative treatment may be selected as part of a test program. Alternative control techniques include mechanical removal and/or native species establishment. In general, alternative control techniques may be more expensive, labor intensive, and not as effective as chemical control. In addition, alternative control techniques could cause temporary water quality degradation and/or the further spread of weeds.

Chemical control may be employed as a control method and is considered a critical part of the IPM program. For some weed varieties, herbicide application may be the most effective method of control

(i.e., longest-lasting or least labor-intensive); for highly aggressive invasive species, this may be the only control method available. Herbicide application may also be implemented as a preventive measure prior to threshold exceedance. For example, weeds may reasonably be predicted to cause future problems based on predicted growth rate and density, historical trends, weather patterns, water flow, and habitat management experience. Managing invasive plant populations before they reach reproductive maturity is an important step in a comprehensive and effective weed control program. Early treatment of weed incursions reduces the total amount of herbicide needed because there is less plant mass to target. Furthermore, treating weeds within the ideal time frame of their growth cycles ensures that the selected control measures will be most effective. When using herbicides, the product label provides information for how and where the herbicide may be used. This includes methods of applying herbicides, the type of plant that it will effectively treat, and the timing of herbicide applications.

Pesticides currently used in the HCP area include the following:[18]

- Glyphosate (Roundup)
- Imazapyr
- Fluazifop p butyl (Fusilade)
- Triclopyr (Garlon)
- Aminocyclopyrachlor (Perspective)
- Chlorsulfuron (Perspective)
- Aminopyralid (Milestone)
- Clethodim (Vaquero)
- Sethoxydim (Poast)
- VectoBac G
- Crosshair
- Surfactants

Three main herbicides are used throughout the HCP area as part of IPM program implementation, including glyphosate (Roundup), imazapyr, and fluazifop-P-butyl (Fusilade). Triclopyr (Garlon), aminocyclopyrachlor + chlorsulfuron (Perspective), and aminopyralid (Milestone) are used infrequently in the HCP area. Specifically, Aminocyclopyrachlor + chlorsulfuron is used on iceplant populations that are resistant to glyphosate, aminopyralid is used on Cape ivy, and Triclopyr is mixed with glyphosate to treat populations of Cape ivy. Round Up Custom® is a glyphosate formulation that is approved for use in aquatic systems and will be part of CDPR's management of invasive weeds below the high-water mark when the APAP is approved. Clethodim and/or sethoxydim are used in aerial application to control veldt grass. Herbicides may be combined as needed. In addition to the herbicides, surfactants and crosshair are usually added to herbicide spray solutions for efficacy. CDPR also uses the insecticide VectoBac G for mosquito control.

[18] Additional pesticides may be used in the HCP area as new products become available, especially if research indicates they can be more effective at controlling invasive species on site. All new pesticides and application methods will be used in accordance with label instructions and in compliance with state and local laws.

A detailed description of these pesticides and their toxicity is included in Appendix G. Appendix G also includes a map showing the products that were used most frequently in the HCP area for invasive plant control in the last several years (2011 through 2018) and where they were used. The map reflects typical use of pesticides/herbicides in the HCP area. Every 2 years CDPR creates new contracts for invasive species removal to continue the control of past sites and include new sites to spray. AMMs to minimize the impacts of pesticides on covered species are included in Chapter 5.

2.2.5.12 CDPR UAS Use for Park Activities (CA-52)

CDPR may use UAS in the HCP area to reduce the time and cost associated with data collection, especially in more remote areas. All UAS operations will be consistent with CDPR policies regarding UAS use. While the immediate use for UAS has been to assess habitat for habitat enhancement activities (section 2.2.2.1.2), CDPR may use UAS for other activities as staff experience and accessibility increases (CDPR 2018a). Activities for which UAS may be used include, but are not limited to, SNPL and CLTE monitoring (section 2.2.2.1.2), especially in areas that are difficult to access; predator management, including tracking (section 2.2.2.1.2); assessment of seasonal exclosure fencing (section 2.2.2.1.1); assessment of wind fencing (section 2.2.3.4); assessment of air quality projects (section 2.2.5.4); watershed assessments, including water flow, temperature, and turbidity (section 2.2.2.5); Habitat Monitoring System program, including documenting vegetation, invasive species, and other natural resources (section 2.2.2.4); and restoration planning, including documenting changes in vegetation (section 2.2.2.2).

2.2.6 Activities Not Covered by Permit

- Unlawful actions of visitors not following park regulations (e.g., dogs off leash or entering prohibited areas)[19]
- Impacts to covered species in the HCP area from off-site activities outside the control of CDPR (e.g., agricultural runoff)
- Agricultural operations on CDPR-owned lands, including non-CDPR application of pesticides (e.g., herbicides, insecticides, and rodenticides) for agricultural uses
- Actions of non-CDPR personnel (e.g., Phillips 66, utility companies, local agencies, other state agencies, federal agencies) in the HCP area but outside the control of CDPR personnel (e.g., no prior notification, no ability of CDPR to advise as to closures or other avoidance/minimization measures)
- Any major development projects (e.g., new campgrounds, roads, or new building construction) not described in this HCP

2.2.7 Public Works Plan

Concurrent with the HCP process, CDPR is undertaking development of a public works plan (PWP), which is a long-range land use and development plan pursuant to the California Coastal Act and California Public Resources Code. The PWP would cover operations and development within the Oceano Dunes

[19] Unlawful activities will occur in the HCP area and are discussed in the HCP. The AMMs in section 5.3 include measures CDPR implements to minimize these unlawful activities.

District, replacing CDP 4-82-300. CDPR is currently evaluating including the following projects in the PWP:

- Converting all or a portion of the 120-acre agricultural lease area near Oso Flaco to a campground and/or day use area
- Developing public motorized and/or non-motorized access into the southern area of the SVRA via the new campground and/or day use site
- Facility improvements at the parks' corporation yard
- Oceano Campground infrastructure improvements
- North Beach Campground facility improvements
- Changes at the Grand Avenue and Pier Avenue entrance areas, including lifeguard tower and kiosk improvements and assessing changes to use of those entrances
- Adding visitor-serving amenities at the butterfly grove
- Developing an accessible public access boardwalk along foredunes between Grand and Pier avenues
- Operational changes that could alter the areas that are open to OHV recreation within the covered areas.
- Riding in 40 Acres

Because the PWP process is still in the planning stage, the PWP projects are subject to revision. As individual PWP projects are brought forward for implementation, they will be assessed for incorporation into the HCP via amendment. Some of the smaller PWP projects could possibly be incorporated into the HCP as special projects (CA-49; section 2.2.5.9) and not require an amendment. Riding in 40 Acres is already included as a covered activity (CA-42; section 2.2.5.2).

Chapter 3. Environmental Setting/Biological Resources

This chapter focuses on the natural history of each of the covered species, including status, distribution, and habitat characteristics, along with literature sources. Specific information is provided regarding the occurrence of the species within the HCP area, along with the regulatory setting and listing status for each species. Chapter 3 also describes the overall setting of the HCP area and summarizes the data and data sources used for the analysis of the covered species, including data on vegetation communities, species occurrences, water features and drainages, topography, soils, and imagery.

3.1 Environmental Setting

3.1.1 Climate

The HCP area has a Mediterranean climate characterized by year-round mild temperatures of little diurnal fluctuation, moist winters, and warm dry summers. A band of low clouds often occurs along the immediate coast during the summer months. This cloudy zone moves inland during the night and early morning hours and recedes offshore during the day. As a result of the influence of the Pacific Ocean, temperatures along the coast remain moderate year-round. Average maximum temperatures in the summer are typically in the 60s and 70s; average minimum temperatures in winter are typically in the 40s and 50s. Local precipitation data can be retrieved from a weather station installed in Nipomo by the California Irrigation Management Information System (CIMIS). The 2013–2015 data reflect the recent drought suffered by all of California. Annual precipitation in 2013 was 7.1 inches, 14.1 inches in 2014 (CIMIS 2014), 8.3 inches in 2015 (CIMIS 2015), 14.3 inches in 2016 (CIMIS 2016), 15.5 inches in 2017 (CIMIS 2017), and 11.6 inches in 2018 (CIMIS 2018).

Along the coast of California, wind predominately blows from the west and northwest. These prevailing wind patterns are most pronounced during the spring (March to June). During this period, hourly average wind speeds often exceed 20 mph or more in the HCP area from approximately mid-morning to late afternoon, with little to no variation in the prevailing wind direction. The winds become light and variable at night and in the early morning hours.

3.1.2 Topography/Geology

The HCP area is located within the Coast Range geomorphic province of California, at the intersection of the Pacific and North American tectonic plates. The province is typified by northwest-trending mountain ranges and valleys, almost parallel to the San Andreas Fault, which is located about 40 miles east of the HCP area. Most of San Luis Obispo County sits atop a 180-million-year-old mix of consolidated igneous, metamorphic, and sedimentary rock.

The HCP area is located at a low elevation, ranging from about 0 to 192 feet above mean sea level (USGS National Elevation Dataset, 1/3 arcsecond DEM, accessed on June 4, 2013). The shoreline is composed of flat, broad beaches, and it undulates through the dunes that are located to the east. Lake, creek, and wetland areas within or adjacent to the dunes are generally flat.

The HCP area is dominated by sand dunes; thus, beach sand is the dominant soil in the HCP area, much of which is barren of vegetation. Soil permeability is high and rapid, and wind- and wave-action erosion is high. The dune sands originate from rivers and streams and are deposited by ocean currents onto the beach, where they are shaped by prevailing ocean winds. Dune crests run north to south. On the western, windward side, dune slopes are gentle. On the eastern, leeward side of the dunes, slopes are steep. Wave action, wind, and water erosion cause dunes to move slowly over time.

3.1.3 Hydrology/Streams, Rivers, Drainages

Two major watersheds comprise the HCP area, including the Arroyo Grande Creek watershed in the northern portion of the HCP area and the Oso Flaco Creek watershed in the southern portion of the HCP area.

The Arroyo Grande Creek watershed covers approximately 150 square miles in the southern portion of San Luis Obispo County. The water quality and quantity of Arroyo Grande Creek and estuary are influenced by water uses upstream. Lopez Dam impounds about 67 square miles of the watershed and is a primary water supply for some local municipalities and agricultural interests. Small domestic and agricultural water uses downstream of Lopez Dam also reduce the amount of surface water available for the lower reaches of Arroyo Grande Creek. In dry or drought years, groundwater pumping and surface diversions may cause portions of lower Arroyo Grande Creek to completely dry up, resulting in dry creek beds and a much smaller lagoon (Rischbieter 2008, 2009a, 2013). During summer months or during extremely dry winters when stormwater runoff and baseflow are the lowest, the creek becomes impounded and forms a lagoon instead of flowing into the ocean. Below Lopez Dam, Arroyo Grande Creek is listed on the Clean Water Act section 303(d) Impaired Waters List for *E. coli* and fecal coliform from urban runoff, grazing, and agricultural activities (State Water Resources Control Board 2010).

Within the HCP area, the Arroyo Grande Creek watershed historically also included the lower portion of Pismo Creek, located to the north of Arroyo Grande Creek. Prior to 1911 when an extreme flood event occurred, Pismo Creek's lower drainage included Pismo Lake and what today is called Meadow Creek. Lower Pismo Creek joined with Arroyo Grande Creek in its lowest reaches and flowed into the ocean. Grading in the 1950s rerouted Pismo Creek to its current configuration. The Pismo Creek channel/lagoon system trends southerly with a break in the barrier beach generally occurring one to several hundred yards south of Addie Street. The lagoon forms seasonally at the mouth of Pismo Creek, varying annually in size depending on rainfall and on sand drift and accumulation.

Pismo Lake lies 0.5 mile east of the Pacific Ocean and is part of the Meadow Creek/Arroyo Grande Creek watershed, with the upper reaches of Meadow Creek feeding into Pismo Lake at Fourth Street in the City of Pismo Beach. Pismo Lake then flows into the lower reaches of Meadow Creek at the Union Pacific Railroad crossing and State Route 1. The construction of the Union Pacific Railroad was likely one of the first major alterations to the hydrology of this watershed. Meadow Creek is a remnant marsh drainage system that drains Pismo Lake, flows south in the HCP area to the North Beach Campground through the Pismo Beach Golf Course, and empties into the Oceano (Meadow Creek) Lagoon. Meadow Creek then enters Arroyo Grande Creek just upstream of its confluence with the ocean. Flood control flapgates were installed at the point where Meadow Creek meets the Arroyo Grande Creek Flood Control Channel levee to prevent storm surge backwater from infiltrating the lowland marsh area and damaging nearby homes. Carpenter Creek is a small outfall off of Meadow Creek that can occasionally connect to the Pismo Creek Lagoon south of the North Beach Campground (Map 7).

The Oso Flaco Creek watershed contains approximately 7,400 acres, nearly all of which consist of prime agricultural land. Oso Flaco Creek flows into Oso Flaco Lake and ultimately to the Pacific Ocean. At approximately 39 acres, Oso Flaco Lake is the largest of the freshwater lakes associated with the Guadalupe-Nipomo Dunes complex and the only such lake within the HCP area. Water quality in the Oso Flaco watershed has been found by the Regional Water Quality Control Board to be impaired by several pollutants, including pesticides, nitrate, and excessive sediment (CSLRCD 2013). A fish consumption advisory is posted at Oso Flaco Lake due to high levels of mercury, pesticides, and PCBs (Office of Environmental Health Hazard Assessment 2013).

3.1.4 Land Use and Acquisition Background

Land uses adjacent to the HCP area include extensive urban development (e.g., numerous tourist-related businesses on the north and northeast boundaries of the HCP area). Agricultural fields are contiguous with the Dunes Preserve and southeast boundary of Oceano Dunes SVRA. The Phillips 66 oil refinery is located immediately east of the Phillips 66 leasehold. The Dune Lakes Limited property, a large, privately held and mostly undeveloped area of land with numerous, small freshwater lakes, adjoins the northwest border of Oceano Dunes SVRA, and the Guadalupe-Nipomo Dunes Wildlife Refuge adjoins the southern boundary (Map 1). Existing land uses within the HCP area are described in depth in section 1.5.9 and Chapter 2 and are shown in Map 3. The history of CDPR land acquisition in the HCP area and the evolution of land uses is provided in section 4.9.1.

3.1.5 HCP Area Habitats

The HCP area consists of open sand, foredunes and backdunes, dune scrub, vegetation islands interspersed within the dunes, dune lakes, freshwater streams, coastal lagoons, wetlands, riparian habitats, and woodlands, along with agricultural and developed areas. In 2013, CDPR and MIG|TRA Environmental Sciences (now MIG) mapped vegetation (MIG 2015) within the HCP area boundaries following the Manual of California Vegetation (Sawyer et al. 2009) classification system. The vegetation types within the HCP area are discussed below in section 3.1.5.1.

The sandy beaches in the HCP area are a harsh environment where most plants are unable to survive. Located behind them are the dunes, which may be divided into two zones—foredunes and backdunes—characterized by their location and dominant vegetation. Foredunes, which begin at the high tide line and include vast natural areas of open sand sheet, are characterized as low wind-deposited dunes that are sparsely vegetated with the hardiest of dune stabilizing plants. When vegetation can gain a foothold, only low-growing plants with deep root systems can survive, such as sand verbena and beach bur. The strong winds, storm waves, salt spray, lack of freshwater, nutrient-poor substrate (i.e., sand), and alternating periods of sand burial and erosion make this area uninhabitable for other types of plants. The backdunes, located behind the foredunes, are more stabilized and vegetated than the foredunes due to less wind and other erosive forces. The backdunes are dominated by dune scrub species like mock heather, silver dune lupine, seacliff buckwheat (*Eriogonum parviflorum*), and dune ragwort (*Senecio blochmaniae*).

Wetland and riparian habitats can be found surrounding Oso Flaco Lake, Little Oso Flaco Lake, and Pismo Lake and are also scattered throughout the South Oso Flaco area and the Phillips 66 leasehold area and along streams. The wetlands include the areas that hold and maintain water, such as salt marshes, fresh- and brackish-water marshes, swamps, mudflats, and the dune slack lakes. Dune slack lakes are flats eroded by wind down to the water table to form wetland “slacks” (i.e., seasonally flooded marshes and flats near sea level). Plants that live within these coastal wetland environments are adapted to dynamic environmental conditions, including high salinity concentrations and extreme temperatures (McLeod 2001).

Woodland habitats are limited in size and largely composed of non-native species, including eucalyptus (*Eucalyptus* sp.) and Monterey pine (*Pinus radiata*). A few native coast live oaks (*Quercus agrifolia*) are present, scattered as single trees in the backdunes. The pines are similarly scattered, but the eucalyptus form groves at some sites, including the monarch butterfly grove near State Route 1.

Weeds threatening native plant life have been introduced into the dune environment both purposefully and accidentally. Various native plants are choked out by invasive species like European beach grass, perennial veldt grass, and iceplant. These species were all planted to stabilize the dunes many years prior to CDPR acquisition (California Geological Survey 2007) and are still sometimes planted by

neighboring landowners. The foredune system of the Dunes Preserve is stabilized with these species, which form dense mats, and is thus unusually tall in comparison to other foredunes in Oceano Dunes SVRA that are stabilized with native vegetation. The Oceano Dunes District actively controls European beach grass, perennial veldt grass, jubata grass, iceplant, Cape ivy, and Russian wheat grass.

3.1.5.1 Vegetation of the HCP Area

A detailed discussion of the vegetation and other land coverage found in the HCP area can be found in Appendix H. CDPR and MIG staff conducted vegetation mapping in the fall of 2012. Vegetation types are summarized below and listed in Table 3-1 along with acreages.[20] In the HCP area, vegetation types are defined by their dominant or co-dominant species, following the classification system in the Manual of California Vegetation, Second Edition (MCV2; [Sawyer et al. 2009]). These vegetation types are known as vegetation alliances. Some parts of the HCP area have dominant plants with no corresponding alliance in the MCV2; in those cases, CDPR staff and their consultants created alliances to accommodate this information (Appendix H). These vegetation alliances indirectly align with habitats found in the HCP area.

Table 3-1. Vegetation Types and Other Land Coverage, Including Acreages within the HCP Area

Vegetation Type	Acres	Percentage of Total HCP Area
Sand	2,499	49.93
Silver dune lupine-mock heather scrub	1,079	21.56
Arroyo willow thicket	370	7.39
European beach grass sward (invasive)	192	3.84
Dune mat	140	2.80
Native wetland alliances	136	2.72
Agriculture	134	2.68
Other non-native alliances	120	2.40
Other native upland alliances	89	1.78
Perennial veldt grass stand (invasive)	88	1.76
Disturbed/developed	86	1.71
Open water	72	1.43
Total	5,005	100.00

Within the HCP area, there are almost 2,500 acres of open sand, 1,814 acres of native vegetation, and 534 acres of non-native vegetation and agricultural production. The dominant vegetation in the HCP area is the native upland silver dune lupine-mock heather scrub alliance covering 1,079 acres of the backdune (Map 9). Arroyo willow thickets are the second most prevalent alliance, covering 370 acres of the backdune. Although, arroyo willow is considered a wetland alliance, standing water or other wetland

[20] Land coverage mapping and acreages are listed as found during the 2012 survey. Some changes to vegetation coverage may have since occurred, e.g., vegetation planting for restoration or dust control.

species are not associated with every arroyo willow stand. European beach grass swards are the third most prevalent alliance, covering over 192 acres of upland foredune habitat. European beach grass is a non-native, invasive species. Dune mat is a native herbaceous alliance that occurs in 140 acres of foredune upland habitat. Non-native perennial veldt grass stands cover about 88 acres of the backdunes in the HCP area. The remaining 40 alliances range in size from less than 1 acre to 45 acres and mostly occur in the more heavily vegetated backdunes.

3.1.6 Common Wildlife in the HCP Area

Numerous species of saltwater and freshwater fish, reptiles and amphibians, birds, mammals, and invertebrates also depend on the dune ecosystem in the HCP area. CDPR surveys of Pismo State Beach and Oceano Dunes SVRA have detected at least 19 species of fish (D. Rischbieter, pers. comm. 2017b), 28 species of reptiles and amphibians, 19 species of mammals, and numerous bird species (CDPR 2017b). Over 200 species of birds live in or migrate through the Guadalupe-Nipomo Dunes Complex (Sierra Club Santa Lucia Chapter 2013). Common wildlife observed in the HCP area are discussed below.

The beach receives nutrients from the ocean that feed its burrowing invertebrate populations. Willets (*Catoptrophorus semipalmatus*), marbled godwits (*Limosa fedoa*), and sanderlings (*Calidris alba*) search for food in the sand. Several species of gulls (*Laridae* sp.) frequent the beach to scavenge, as do some terrestrial birds such as the Brewer's blackbird (*Euphagus cyanocephalus*) and white-crowned sparrow (*Zonotrichia leucophrys*). Behind the beach, wind-created sand dunes and their vegetation offer some protection for wildlife. Red-winged blackbirds (*Agelaius phoeniceus*), song sparrows (*Melospiza melodia*), and western meadowlarks (*Sturnella neglecta*) take advantage of the seeds provided by the dune vegetation. Deer mice (*Peromyscus maniculatus*) and black-tailed jackrabbits (*Lepus californicus*) forage in the dune scrub and may become food for predators such as great horned owl (*Bubo virginianus*), coyote (*Canis latrans*), and bobcat (*Lynx rufus*). Migrating waterfowl stop over at the wetlands in the HCP area.

The riparian habitats, with their constantly available water and dense, diverse vegetation of trees, shrubs, and herbs, provide abundant food and cover to many wildlife species. The moist riparian area produces abundant insect life, food for many insectivorous amphibians, birds, and mammals such as the Pacific treefrog (*Pseudacris* [=*Hyla*] *regilla*), western skink (*Eumeces skiltonianus*), Wilson's warbler (*Wilsonia pusilla*), black phoebe (*Sayornis nigricans*), Pacific-slope flycatcher (*Empidonax difficilis*), northern rough-winged swallow (*Stelgidopteryx serripennis*), and ornate shrew (*Sorex ornatus*). Omnivorous inhabitants include the big-eared woodrat (*Neotoma macrotis*), opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*). Predators include the garter snake (*Thamnophis* sp.), black-crowned night heron (*Nycticorax nycticorax*), red-shouldered hawk (*Buteo lineatus*), and gray fox (*Urocyon cinereoargenteus*).

Freshwater creeks provide habitat for aquatic macroinvertebrates which, along with vegetative detritus in the form of leaf litter and woody debris, form the base of the stream food chain. Freshwater streams or creeks support resident rainbow trout (*Oncorhynchus mykiss*) and steelhead (i.e., seagoing [anadromous] rainbow trout) as well as other native fishes such as threespine stickleback (*Gasterosteus aculeatus*) and prickly sculpin (*Cottus asper*). Slow-moving sections of streams provide important habitat for native amphibians and reptiles such as CRLF and western pond turtles (*Emys marmorata*). Ephemeral and intermittent tributary streams may provide important habitat for western toad (*Bufo boreas*) and other amphibian species. A high variety of insects, birds, amphibians, reptiles, and mammals utilize the riparian vegetation associated with freshwater streams.

3.2 Identifying Suitable Covered Species' Habitat in the HCP Area

This HCP includes maps of suitable habitat for the covered species to inform the development of the effects analysis (Chapter 4) and the conservation program (Chapter 5). Habitat for each species was determined on the basis of whether or not an area (e.g., sand dunes, lake, creek, etc.) or vegetation alliance (for listed plants) could potentially be occupied based on the species' habitat requirements. The habitat requirements described below are from various sources, including the scientific literature, recovery plans, critical habitat designations, USFWS 5-year reviews, locations of occurrences in the HCP area, and the best professional judgment of CDPR staff with experience working with the covered species in the HCP area. Detailed descriptions of suitable habitat are provided in sections 3.3 and 3.4.

Suitable habitat for covered wildlife species in the HCP area was mapped using Geographic Information System (GIS) and is based on the habitat requirements described in sections 3.3 and 3.4. Suitable habitat for listed plant species was mapped by identifying the vegetation alliances described in section 3.1.5.1 that could be associated with each plant species. Alliances were mapped as suitable habitat for each listed plant species if that plant species was found to occur in that alliance in the HCP area. Alliances were also mapped as suitable habitat if the California Natural Diversity Database (CNDDB) occurrence records from outside the HCP area identified additional vegetation alliances, as indicated by commonly associated species. Refinements between each listed plant species and vegetation alliances were also identified based on the scientific literature, recovery plans, critical habitat designation, USFWS 5-year reviews, and the best professional judgment of CDPR staff with experience working with the covered species in the HCP area.

Beach spectaclepod and surf thistle habitat occur in open and sparsely vegetated sand dunes. Vegetation alliances were not mapped in these areas because they do not support enough vegetation to identify an alliance. Therefore, for beach spectaclepod and surf thistle, habitat in open and sparsely vegetated areas was mapped using physical criteria, such as distance from the mean high tide line.

The covered species' habitat maps likely overestimate suitable habitat, as some modeled habitat may not contain the microhabitat features required by that species. Furthermore, areas mapped as suitable habitat may have some physical and biological features that meet a species' habitat requirements, but past and ongoing activities (e.g., recreation) have disturbed the habitat to the extent that it is not likely to be occupied by the species. As such, it is expected that all mapped habitat will not be occupied or saturated by the covered species.

3.3 Covered Wildlife

The following description of the covered species considers all of the known data on biology, regional distribution, habitat associations, and occurrence of the species within the HCP area as of winter 2015–2016. All relevant tables regarding covered species are included at the end of each section describing the species.

3.3.1 Western Snowy Plover (*Charadrius nivosus nivosus*)

3.3.1.1 Taxonomy, Regional Distribution, and Abundance

The SNPL and the Cuban snowy plover (*C. n. tenuirostris*) are the two distinct subspecies of snowy plover that inhabit portions of North America (American Ornithologist's Union 1957). The taxonomy and nomenclature of the SNPL went through revisions in 2010 (USFWS 2012a). The change split the Kentish plover from the snowy plover, adopting the Kentish plover for Palaearctic populations (zoogeographical region consisting of Europe, Africa north of the Sahara, and most of Asia north of the Himalayas), and changed the scientific name of the snowy plover in Central and North America to *Charadrius nivosus*

(Cassin 1858) with three subspecies: western snowy plover (*C. nivosus*; previously *C. alexandrinus nivosus*), with a range that includes all of the continental United States and portions of Mexico; Cuban snowy plover (*C. nivosus tenuirostris;* previously *C. alexandrinus nivosus*), with a range that includes Cuba, Puerto Rico, the Caribbean and the Yucatan Peninsula; and, Peruvian snowy plover (*C. nivosus occidentalis;* previously *C. alexandrinus occidentalis*), with a range that includes South America (USFWS 2012a).

The SNPL in the HCP is the Pacific Coast population. The Pacific Coast population is defined as the individuals that occupy breeding sites along the Pacific Ocean on the North American mainland coast, peninsula offshore islands, interior bays, estuaries, and rivers (USFWS 2007a). This population was listed as threatened under FESA in 1993.

Annual window surveys give an estimate of the size of the adult breeding population of SNPL at known breeding locations along the U.S. Pacific Coast. Window surveys are a one-time pass made by a surveyor or team of surveyors through SNPL nesting habitat between the last week of May and first week of June. The surveyor counts all adult SNPL and identifies the sex of adults when possible (USFWS 2007a). The surveys were initiated by PRBO Conservation Science (PRBO) in 1977 and have subsequently been conducted in 1978–1980, 1989, 1991, 1995, 2000, and annually since 2002. Window surveys have been coordinated by USFWS since 2005. Because SNPL move throughout the season, this one-time "snapshot" approach may be the best way to estimate the total number of breeding birds on the U.S. Pacific Coast. Breeding population estimates by state, county, and USFWS Recovery Plan recovery unit are provided in Table 3-4.

3.3.1.2 Habitat Associations

SNPL breed and forage on sandy beaches. Nests are typically found on flat, open areas of the back beach or backdunes where vegetation is sparse or non-existent (Stenzel et al. 1981). Low or sparse vegetation allows the birds to visually detect approaching predators or other potential threats at a distance. Areas that have been overgrown by introduced European beach grass are not suitable as nesting habitat. After the chicks hatch, they tend to move into areas where there is at least some vegetation or beach debris, which provides cover from the heat of the sun, inclement weather, and predators. In general, SNPL nests are most often located within 328 feet (100 meters) of water, or at least within sight of it (Stenzel et al. 1981, USFWS 2007a). While this may be true for most of the beaches along the San Luis Obispo County coast, which tends to be fairly narrow, it is not the case at Pismo State Beach and Oceano Dunes SVRA. In those locations, SNPL nests may be located several hundred feet from the nearest water source, and they are often tucked into areas sheltered from wind behind foredunes where views of the ocean are blocked.

Along the Pacific Ocean coastline, SNPL forage in a wide variety of habitat types, from the dry sandy regions of the backdunes to wet sands, beach-cast kelp, and wrack lines along the lower beaches. They may use freshwater edges such as the mouths of creeks as they cross beaches and the edges of lagoons. Their diet can vary considerably but it primarily consists of small marine and terrestrial invertebrates. They also pick insects off of vegetation, probe sand, and occasionally take small fish (USFWS 2007a).

SNPL forage both day and night, and microhabitats used for foraging may vary between day and night and by time of year. With their large eyes and keen vision, SNPL are especially well-equipped for nocturnal foraging. During a series of nighttime surveys conducted at Oceano Dunes SVRA, researchers observed nocturnal SNPL foraging behavior (Burton and Kutilek 1997). Burton and Kutilek (1997) found that far fewer birds foraged along the shoreline at night during the breeding season than during the non-breeding season. Birds that were observed foraging at night during the breeding season tended to remain near their nesting areas, while nocturnal foraging birds were widely distributed along the entire beach during the non-breeding season. In a subsequent nocturnal study of plovers and other shorebirds

conducted at Oceano Dunes SVRA, SNPL were encountered on the shoreline as frequently at night as in the day (Mad River Biologists 2005).

Throughout the non-breeding season, SNPL along the coast tend to aggregate in loose flocks along the beach, often around the mouths of freshwater creeks and rivers and along the swash line or upper beach. These flocks may consist of resident adults, juveniles born in the area, overwintering birds that breed elsewhere along the Pacific Coast and interior sites (Warriner et al. 1986), and transitory adults and juvenile birds on migration.

3.3.1.3 Breeding

SNPL that nest on central California beaches typically begin to form breeding pairs by mid-March. Eggs are laid in a small scrape formed as a shallow depression in sand or gravel that may be partially decorated with shell fragments or other small debris. SNPL typically lay a clutch of three eggs and can range from two to four eggs. Eggs are incubated for 26 to 32 days. Newly hatched chicks remain in or nearby their nests for a period of several hours, protected from predators by their cryptic coloration, which is a near perfect match to most sandy substrates. Soon after hatching, the precocial chicks are able to move about and are capable of foraging on their own. Fledging typically occurs between 29 and 33 days after hatching. In most cases the female attends the chicks for up to 6 days, after which she abandons the brood, leaving their care to the male (Warriner et al. 1986). Females may then breed with a different male and produce a second brood within a single nesting season. After remaining with the chicks for 29 to 47 days, males may also nest a second time with a different female.

3.3.1.4 Population Status in the HCP Area

3.3.1.4.1 Breeding

Intensive monitoring of the breeding SNPL population in the HCP area provides valuable data for estimating the breeding population size in the HCP area. The number of breeding individuals (Figure 3-1) is estimated from observations of nests, rather than from counts of banded adults, because not all adult SNPL are banded and readily counted.

Although the number of breeding SNPL in the HCP area has been estimated using range-wide window surveys (Table 3-3), this method (Appendix I) does not provide the best estimate for SNPL breeding pairs in the HCP area. Range-wide surveys may underestimate the number of birds at a particular site since some adults are very secretive and avoid detection, or the timing of the window survey may not coincide with the peak number of nesters at a particular site. Therefore, SNPL breeding pair estimates in this document were obtained using data from the Oceano Dunes District SNPL conservation program. Methods for obtaining breeding pair estimates are described in the SNPL annual monitoring reports for Oceano Dunes SVRA (George 2002, 2003, CDPR 2004, 2005, 2006, 2007, 2008a, 2009, 2010, 2011, 2012b, 2014a, 2015a, 2016, 2017a, 2018b, USFWS 2006a, 2007b, 2008a, 2009a, 2010a, 2011a, 2012b, 2013a, 2014a, 2015a, 2016a, 2017a, 2018b). Table 3-4 compares the estimated breeding season population sizes of SNPL in the HCP area based on annual window surveys and breeding pair estimates.

3.3.1.4.2 Wintering

Annual SNPL window surveys have been conducted along the Pacific Coast during January since the winter of 2003–2004, using methods similar to those used in the breeding season. Within the HCP area, winter window surveys are conducted at Pismo State Beach and Oceano Dunes SVRA, including a separate survey of the Oso Flaco area. Oceano Dunes SVRA is an important overwintering site for SNPL in San Luis Obispo county: the numbers of SNPL observed at Oceano Dunes SVRA during winter surveys have been the highest of all sites surveyed in San Luis Obispo County since the winter of 2004–2005 (Table 3-5).

Since 2009, Oceano Dunes District resource staff have conducted more intensive surveys for SNPL at approximately weekly intervals during the months of October through February. The shoreline is divided into the following five sections listed from north to south:

1. Approximately 0.5 miles north of Pismo Pier to Grand Avenue (pedestrian use only; no non-CDPR vehicle use allowed)
2. Grand Avenue south to Post 2 (street-legal vehicles and day use only; no camping)
3. Post 2 south to Post 6 (street-legal vehicles, OHVs, and camping allowed year around)
4. Post 6 south to the southern shoreline open riding area boundary (shore and portion of upper beach closed to public use during March 1 through September 30 and open to all activities during the rest of the year)
5. Oso Flaco (southern shoreline open riding area boundary to Oceano Dunes SVRA's southern boundary with pedestrian use only and a portion of shore and upper beach closed to pedestrian use March 1 through September 30).

Monthly averages are taken from one to five weekly surveys for each section of beach during the months from October through February (Table 3-6). The majority of SNPL observed during the surveys were located between Grand Avenue and Post 2, where OHV use is prohibited but street-legal vehicles are allowed. Within this area, foraging birds and roosting flocks were most frequently encountered on the relatively narrow beach between Grand and Pier Avenues.

Banded SNPL are regularly observed on the weekly winter surveys. The majority of the banded birds observed were banded at Oceano Dunes SVRA. In 2018, for example, 113 banded SNPL were recorded during winter surveys from October 1, 2017 to February 28, 2018. Of these banded individuals, 83 were banded at Oceano Dunes SVRA, 20 from Vandenberg Air Force Base (VAFB) in Santa Barbara County, 8 from Monterey Bay area in Monterey County, 1 from Coos Bay in Oregon, and 1 was missing two bands and was from an unknown location (CDPR 2018b).

3.3.1.5 Western Snowy Plover Nesting within the HCP Area

A considerable amount of information on SNPL reproduction in the HCP area is available as a result of long-term monitoring by Oceano Dunes District resource staff, researchers from several academic institutions, and other state and federal Resource Agencies. The current protocol (CDPR 2017a) for the ongoing nest monitoring program began in 2001 and has since been implemented annually. As a result, nesting data were gathered under different protocol during the years 1998–2000 and after 2001. In addition, the open riding area has been monitored on a daily basis since 2000; however, the seasonal exclosure and Oso Flaco area did not receive such intensive monitoring until more recently (i.e., the level of monitoring at Oso Flaco and the non-vehicular areas has been monitored with increasing frequency since 2005). As a result, nesting data were gathered under different monitoring levels during the years 2001–2004 and after 2005. Therefore, caution should be exercised when comparing data that use different protocols or different levels of monitoring intensity. Figure 3-1 summarizes the nesting data discussed in the following sections.

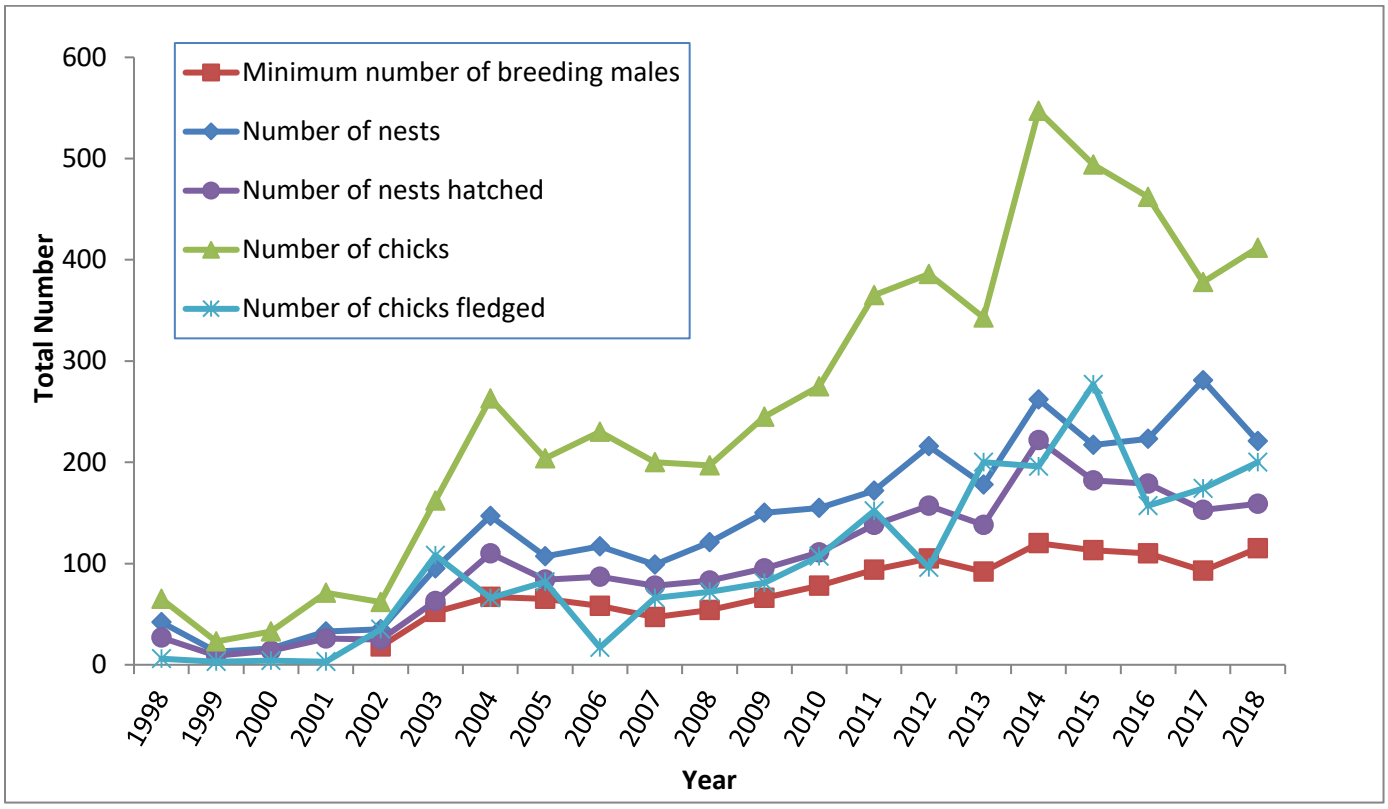


Figure 3-1. Number of SNPL nests, nests hatched, chicks, chicks fledged, and minimum number of breeding males.[21]

3.3.1.5.1 Western Snowy Plover Hatching and Fledging Success in the HCP Area

An upward trend in the average number of nests observed since 1998 (Table 3-7) indicates that management actions aimed at protecting nesting SNPL in the HCP area have been successful. A more thorough discussion of the number of nests, hatching success, and fledging success from 1998 to 2018 follows.

Number of Nests

From 1998 to 2002, the numbers of SNPL nests established ranged from a low of 13 in 1999 to a high of 42 in 1998 (Table 3-7). In 2003, the number of SNPL nests increased from previous years, reaching a high of 95 nests. Since 2003, the number of nests has generally continued to increase, with a high of 281 in 2017 (Table 3-7). In 2003, the number of SNPL nests increased from previous years, reaching a high of 95 nests. Since 2003, the number of nests has generally continued to increase, with a high of 281 in 2017 (Table 3-7).

Hatching Success

The primary causes of nest failure (i.e., failure of eggs to hatch) in the HCP area have been depredation by predators, weather-related failure such as being buried by wind-blown sand and tides, non-viable

[21] Prior to 2001, monitoring in Oso Flaco and Pismo Dunes Natural Preserve was intermittent and fledging data were not obtained (CDPR 2015a).

eggs, and abandonment due to the death of parents or other unknown causes (George 2002, 2003, CDPR 2004, 2005, 2006, 2007, 2008a, 2009, 2010, 2011, 2012b, 2013, 2014a, 2015a, 2016, 2017a, 2018c). Intensive efforts to protect nests from predators and human disturbance have been made in the HCP area to improve hatching rates. From 2002–2018, at least 61 percent of the SNPL nests established within the HCP area (with known fate and location) hatched (Table 3-7). The lowest hatching rate in the HCP area occurred in 2009 and 2017 when only approximately 61 percent of nests hatched. The greatest hatching rate in the HCP area between 2002 and 2018 occurred in 2014, 2015, and 2016 when approximately 86 percent of nests hatched each year (Table 3-7).

Fledging Success

CDPR has implemented intensive efforts to protect nests from predators and human disturbance and to improve fledging rates in the HCP area. Although nest hatch rates are an important indicator of successful management actions, fledging success is a better index of reproductive success, as fledging success incorporates survivorship through the incubation and brooding stages. Furthermore, mortality during the brooding period can be high when chicks are highly vulnerable to predation, limiting recruitment into the adult breeding population. Accurate estimates of fledging rates require that the majority of chicks are banded so they can be identified and their fates determined. A SNPL banding program designed to facilitate quantification of fledging success at Oceano Dunes SVRA was implemented in 1998. However, birds hatched in the beginning of the 1998 and 1999 breeding seasons were not banded, so fledging rates for these years could not be accurately assessed. Since 2001, SNPL chicks have been banded throughout the breeding season, and therefore, estimates of fledging rates starting in 2001 are the most accurate to date. Since 2001, the annual fledging rate has ranged between approximately 4 and 68 percent (Table 3-7).

The primary cause of mortality for chicks and juveniles in the HCP area is predation. Henkel (2001) reported finding the bands of at least seven SNPL chicks (hatched in the open riding area) in loggerhead shrike regurgitation pellets—a finding that clearly implicated shrike predation as an important cause of mortality for SNPL chicks. CDPR initiated a predator management program in the 2002 breeding season, which has continued in subsequent seasons. Shrikes are just one of many predators of SNPL adults, juveniles, and chicks in the HCP area. In addition to shrikes, other documented predators of SNPL observed in the HCP area include, but are not limited to, gulls, coyotes, merlins, skunks, northern harriers, peregrine falcons, great horned owls, and ravens.

Most SNPL plover broods are initially led from the nest by the parent(s) to the nearest shore to forage. From 2009–2017, the majority of broods (65 to 82 percent) were not known to move beyond the individual beach section (6, 7, and 8 exclosures and North and South Oso Flaco) nearest to where they hatched. Close proximity of quality shoreline habitat for raising chicks can decrease the likelihood that young chicks will be exposed to sources of mortality (e.g., inclement weather, predators) and increase fledging success (Page and Stenzel 1981, Colwell et al. 2007). For example, of the 107 fledglings produced in 2010, 83 were from broods that remained in the same general area where hatched. In 2017, 93 of 124[22] fledglings were from broods remaining in the same general shoreline area adjacent to where they hatched.

The SNPL Recovery Plan suggests a target of 1.0 chick fledged per breeding male for population stability and 1.2 chicks fledged per breeding male for population growth (USFWS 2007a). For the 17-year period

[22] Fifty fledglings are excluded from this number because they are from unbanded broods, and the broods were not assigned a specific nest number.

from 2002–2018, the average annual number of juveniles fledged per breeding male was 1.5, and the number of chicks fledged per breeding male exceeded 1.2 in 14 of the 16 years (Table 3-8, Figure 3-3). As a result, it appears that management actions directed toward enhancing SNPL reproduction in the HCP area were successful at keeping the fledging rates above the SNPL Recovery Plan target level of 1.0 chick fledged per breeding pair. Although the management actions appear to be successful, it might be unrealistic to expect an increase in hatching rate and fledging rate since other factors, such as environmental conditions (e.g., inclement weather, differences in habitat characteristics) (Colwell et al. 2005, 2007, 2010), management strategy (e.g., the size of the seasonal exclosure), and physiology (e.g., inability to thermoregulate) (Colwell et al. 2007), might be setting the upper limits of these demographic measures.

3.3.1.6 Regulatory Status, Critical Habitat, and Recovery Plan

In addition to being listed as threatened under FESA, the SNPL is also a CDFW species of special concern. The USFWS has designated critical habitat and finalized a recovery plan for the species.

3.3.1.6.1 Critical Habitat

The USFWS finalized the current critical habitat designation for the Pacific Coast SNPL population in 2012 (USFWS 2012a). The designation includes 24,527 acres in 60 units in Washington, Oregon, and California. The Pismo Beach/Nipomo Dunes unit (Unit CA 31) contains critical habitat within the HCP area.

Pismo Beach/Nipomo Dunes (Unit CA 31) includes 1,652 acres, of which 780 acres (47 percent of Unit CA 31; 3 percent of all designated SNPL critical habitat) occurs within the HCP area in Pismo State Beach and Oceano Dunes SVRA. The HCP area critical habitat extends along the coast from just north of Arroyo Grande Creek south through the southern end of Oceano Dunes SVRA (Map 10). The entire Unit CA 31, including locations outside the HCP area, extends about 12 miles along the coast from the north side of Arroyo Grande Creek at the south end of Strand Way to about 0.4 mile north of Mussel Point (USFWS 2012a) and includes portions of the Guadalupe-Nipomo Dunes National Wildlife Refuge, which is owned and managed by USFWS; the Guadalupe oil field (Guadalupe Restoration Project), which is owned and managed by Chevron Corporation; Rancho Guadalupe County Park, which is owned and managed by the County of Santa Barbara; and private property, including Corralitos Ranch just north of VAFB.

3.3.1.6.2 Recovery Plan

The USFWS finalized the Recovery Plan for SNPL in 2007 (USFWS 2007a). The Recovery Plan divided the Pacific Coast population of the SNPL into six recovery units. Recovery Unit 5 includes the coastal beaches of San Luis Obispo, Santa Barbara, and Ventura counties and encompasses the entire HCP area (Map 10). The Recovery Plan identifies specific areas within each unit that are important for the recovery of SNPL. The USFWS identified 100 specific areas in Recovery Unit 5; the beaches of Oceano Dunes SVRA are within specific area Unit CA-83, which encompasses the Pismo Beach/Nipomo Dunes area.

The Recovery Plan developed population targets for Recovery Units to assess the recovery status of SNPL. The sizes of the minimum subpopulations the Recovery Team projected for each recovery unit is based on historical population sizes, current population sizes, and potential for supporting breeding and wintering SNPL. The Recovery Plan recommends maintaining an average population of 3,000 adults, distributed among the six recovery units for a period of at least 10 years. Based on these criteria, delisting of the overall population requires, in part, that 1,200 adults are consistently breeding within Recovery Unit 5. Additional criteria for delisting include minimum numbers of chicks fledged per male over a 5-year period and the development and implementation of plans and cooperative agreements among various agencies, landowners, and conservation organizations, which will ensure the long-term survival of the subpopulations.

In addition to setting numeric subpopulation targets as recovery criteria for the Recovery Units, the Recovery Plan also provides guidance on management potential for specific breeding locations. The Management Potential Breeding Numbers presented in the Recovery Plan represent population targets that the USFWS estimated can be achieved under intensive management. The technical subteam of the SNPL Recovery Team[23] developed Management Potential Breeding Numbers for the Recovery Plan, estimating the population levels attainable under intensive management as based on survey data at breeding locations and expert opinion regarding the feasibility of management options and the extent and quality of habitat. The Management Potential Breeding Numbers for the Pismo Beach/Nipomo Dunes area (Unit CA-83) is 350 breeding SNPL (USFWS 2007a).

The Recovery Team identified the role and level of participation of various federal, state, municipal, and private lands and the role of state and local governments in their overall strategy for recovery of the SNPL. In particular, lands managed by CDPR were identified as critical to the long-term survival of the SNPL, in part because park lands can be intensively managed and monitored consistent with park management plans and classifications.

3.3.1.7 HCP Area Conservation Program

CDPR currently manages the SNPL conservation program presented in this HCP to optimize breeding success and reduce potential impacts to SNPL in the HCP area. The conservation program includes such actions as seasonally closing areas to visitors and installing fence and signage around these areas to delineate them; augmenting existing habitat with branches, woodchips, and wrack; and implementing a predator management program. Over the years, CDPR has worked with CDFW and USFWS to modify the conservation program and respond to potential impacts to SNPL. For example, daily monitoring in the open riding area began in 2001, the predator management program began in 2002, a limited number of SNPL eggs or chicks were brought into captivity starting in 2003, and weekly monitoring of SNPL during the non-breeding season began in 2009. In 2000, prior to daily monitoring, predator management, and other activities associated with the conservation program, only 16 nests were located in the HCP area, and only 4 chicks fledged (i.e., 15 percent of the hatched chicks). Starting in 2002, 1 year after daily monitoring began in the open riding area and more regular monitoring began in other portions of the HCP area, 35 nests were located in the HCP area and 35 chicks fledged (i.e., 57 percent of the hatched chicks). Starting in 2003, 1 year after predator management began, 95 nests were located in the HCP area and 108 chicks fledged (68 percent of the hatched chicks). Since 2004, the number of nests has varied between 99 and 273, and the number of chicks fledged has varied between 17[24] and 277 (Table 3-7). Overall, breeding success for SNPL in the HCP area has increased, and this is likely to be predominantly from CDPR's efforts toward the conservation program.

3.3.1.8 Suitable Habitat in the HCP Area

SNPL nests in the HCP area are typically found in the seasonal exclosures during the breeding season. Specifically, SNPL nests have been found in North Oso Flaco, South Oso Flaco, 6 Exclosure, 7 Exclosure, 8 Exclosure, and Boneyard Exclosure. In addition, some nests have been found outside the seasonal exclosure within the open riding area, including near Arroyo Grande Creek, and near Oso Flaco Lake. Although nests have not previously been found throughout the HCP area, the HCP area does contain additional suitable habitat for SNPL. This section describes habitat available for SNPL in the HCP area.

[23] Recovery teams serve as independent advisors to the USFWS during preparation of a Recovery Plan.

[24] In 2006, only 17 of 230 chicks (i.e., 7.4 percent) were known to have fledged. Excluding 2006, the number of chicks fledged from 2004–2018 varied from 66 to 277.

SNPL habitat in the HCP area was mapped based on the habitat requirements identified in the scientific literature (Stenzel et al. 1981, Wilson-Jacobs and Meslow 1984, Warriner et al. 1986, Page et al. 2009, MacDonald et al. 2010), breeding locations identified in the *Recovery Plan for the Pacific Coast Population of the Western SNPL* (USFWS 2007a), location of critical habitat (USFWS 2012a), and the best professional judgment of CDPR staff with experience working with SNPL in the HCP area (Map 10). Portions of the HCP area identified as potential habitat for SNPL support suitable habitat characteristics for SNPL (e.g., foraging habitat along sandy shoreline, nesting habitat in open areas of the back-beach and backdunes where vegetation is sparse or non-existent).

The habitat maps include potentially suitable habitat inside and outside the seasonal exclosure. Past and ongoing park visitor activities at Oceano Dunes District have greatly affected the distribution and use of habitat at Oceano Dunes District, as SNPL nests almost entirely within the seasonal exclosure and rarely nest in habitat subject to intensive park visitor activities (e.g., motorized vehicle recreation). Despite the present distribution of nesting SNPL at Oceano Dunes District, the area outside the seasonal exclosure is identified as potentially suitable habitat because this area supports key habitat elements necessary for breeding, foraging, and roosting SNPL.

Not all potential SNPL habitat will support the same numbers and densities of SNPL. Therefore, for the purposes of this HCP, SNPL habitat was identified as primary, secondary, and tertiary. The identification of habitat as primary, secondary, and tertiary reflects the expected level of use of these habitats by SNPL. For example, primary habitat would support a higher density of nesting SNPL than secondary habitat, which would support a higher density of nesting SNPL than tertiary habitat.

Primary habitat provides all of the necessary physical and biological features to support behavioral activities such as breeding (e.g., nesting, rearing), foraging, and roosting. SNPL forage extensively along shorelines and in the wrack above the high tide line. In dune-backed coastal habitat, SNPL usually nest in sparsely vegetated areas close to water, often within 328 feet (100 meters) (Page and Stenzel 1981). Therefore, primary habitat in the HCP area includes shoreline, beach, and sparsely vegetated foredune habitats that are generally within 492 to 1,640 feet of the shore, extending from Arroyo Grande Creek south to the Oceano Dunes SVRA southern boundary (Map 10). In general, the eastern limit of primary habitat approximates the crest of the first foredune with the majority of the habitat facing north and west.

Secondary habitat provides some or all of the physical and biological features to support behavioral activities such as breeding, foraging, and roosting. Within secondary habitat, some of the physical and biological features that support breeding, foraging, or roosting may be absent, degraded by historical land use, or support physical habitat features that provide lower-quality habitat than those identified in primary habitat. Pismo Beach from Arroyo Grande Creek to Addie street was mapped as secondary habitat, as the habitat in this area has been rendered less suitable for nesting due to historic human activity (Page and Stenzel 1981) and extensive adjacent urban development (Map 10) (Page and Stenzel 1981). Adjacent urban development may indirectly affect SNPL attempting to nest at Pismo Beach by facilitating high levels of human activity at the beach and increasing predator presence.

Potential nesting habitat inland (i.e., east) from primary habitat (from 984 to 1,969 feet from the mean high tide line) was also identified as secondary habitat. SNPL may occasionally attempt to nest in this area, but to a much lesser extent than nesting habitat closer to the mean high tide line. In the area open to riding and in the Oso Flaco area, secondary habitat was mapped on the south- and east-facing slopes on the leeward side of the largest foredune. This aspect provides some protection from high winds; therefore, this area may be suitable SNPL nesting habitat.

Tertiary habitat provides very little of the physical and biological features to support behavioral activities such as breeding, foraging, and roosting. These features (or the location of these features) are assumed

to provide marginal or low-quality habitat because they are generally located far from the shore, contain only low-quality habitat features (e.g., vegetated dunes), or have been highly degraded by historical land uses (e.g., recreation on beaches, indirectly degraded by adjacent urban development). SNPL are anticipated to rarely nest in tertiary habitat or otherwise use this habitat for foraging and roosting. The portion of Pismo Beach located north of Addie Street, including the Pismo Pier (Map 10), was identified as tertiary habitat, since the habitat in this area has rendered unsuitable by historic human activity and adjacent urban development. In addition, tertiary habitat was defined as all other potentially suitable habitats in the HCP area not mapped as primary or secondary.

Lakes, wetlands, and riparian areas were excluded from these habitat classifications since they were not considered suitable SNPL habitat unless they were part of the dynamic dune system. Developed campgrounds, as well as the golf course, ranger station, parking lots, monarch grove, and agricultural areas were also excluded from the habitat classifications since they were not considered suitable SNPL habitat.

In total, 4,513 acres were mapped as suitable SNPL habitat in the HCP area: 727 acres of primary habitat, 276 acres of secondary habitat, and 3,510 acres of tertiary habitat. In addition, 492 acres within the HCP area were not mapped as suitable SNPL habitat. For the period from 2005–2015, virtually all the SNPL nests with known locations occurred in primary habitat (99 percent) (Table 3-2). This is expected as most of the SNPL nesting in the HCP area nest within the seasonal exclosure, which is placed mostly within primary habitat.

Table 3-2. SNPL Nests with Known Locations in Primary, Secondary, and Tertiary Habitat in the HCP Area (Map 11)

Year	Primary Habitat	Secondary Habitat	Tertiary Habitat
2005	98	4	0
2006	117	2	1
2007	91	0	0
2008	118	1	0
2009	148	1	0
2010	150	3	0
2011	162	3	0
2012	210	1	0
2013	169	1	0
2014	245	1	0
2015	200	1	0
2016	208	3	0
2017	272	6	1
2018	210	2	0
Total	2,398	29	2

Table 3-3. Range-wide SNPL Survey Breeding Survey Results, 2002–2018

Region	*Total Adults*																
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Washington Total*	n/a	n/a	n/a	37	67	50	42	42	38	34	28	46	41	64	102	77	81
Oregon Total	71	63	82	100	91	125	105	140	158	168	206	222	228	276	375	265	321
Total Unit 1	**n/a**	**n/a**	**n/a**	**137**	**158**	**175**	**147**	**182**	**196**	**202**	**234**	**268**	**269**	**340**	**477**	**342**	**402**
Del Norte County	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Humboldt County	49	38	37	32	42	23	18	15	20	27	20	21	27	32	44	53	48
Mendocino County	0	1	3	9	3	3	0	0	1	1	1	2	0	6	2	3	4
Total Unit 2	**49**	**39**	**40**	**41**	**45**	**26**	**18**	**15**	**28**	**28**	**21**	**23**	**27**	**38**	**46**	**56**	**52**
San Francisco Bay	78	72	113	124	102	207	133	147	275	249	147	202	178	195	202	246	235
Total Unit 3	**78**	**72**	**113**	**124**	**102**	**207**	**133**	**147**	**275**	**249**	**147**	**202**	**178**	**195**	**202**	**246**	**235**
Sonoma County	0	0	0	5	0	0	1	8	0	0	0	0	0	1	0	0	0
Marin County	25	17	26	22	16	20	25	21	23	13	12	16	37	41	45	45	65
San Francisco County	n/a	n/a	n/a	1	0	0	0	0	0	0	1	0	0	0	0	0	0
San Mateo County	3	4	17	2	7	3	1	0	0	5	4	0	0	1	8	8	5
Santa Cruz County	35	37	54	68	86	75	36	30	34	28	59	66	63	66	69	62	66
Monterey County	249	250	284	239	248	172	194	220	241	265	249	179	274	239	244	254	225
Total Unit 4	**312**	**308**	**381**	**337**	**357**	**270**	**257**	**279**	**298**	**311**	**324**	**261**	**374**	**348**	**366**	**369**	**361**

Table 3-3. Range-wide SNPL Survey Breeding Survey Results, 2002–2018

Region	*Total Adults*																
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
San Luis Obispo County	232	258	408	413	330	206	262	270	240	312	317	279	373	403	393	374	383
Santa Barbara County	288	333	483	384	366	286	291	241	243	320	249	260	274	419	271	313	328
Ventura County	233	170	198	172	221	184	164	196	203	164	205	215	175	141	256	169	163
Total Unit 5	**753**	**761**	**1089**	**969**	**917**	**676**	**717**	**707**	**686**	**796**	**771**	**751**	**822**	**963**	**820**	**856**	**874**
Los Angeles County	0	0	0	0	0	0	2	1	1	3	0	4	0	2	5	4	8
Orange County	38	31	31	66	62	36	50	48	62	51	60	55	66	67	88	110	137
San Diego County	157	233	250	143	236	147	217	208	248	277	298	267	280	307	280	350	306
Total Unit 6	**195**	**264**	**281**	**209**	**298**	**183**	**269**	**257**	**311**	**331**	**358**	**326**	**346**	**376**	**373**	**464**	**451**
California Total	**1,387**	**1,444**	**1,904**	**1,680**	**1,719**	**1,362**	**1,394**	**1,405**	**1,598**	**1,715**	**1,621**	**1,563**	**1,747**	**1,920**	**1,807**	**1,991**	**1,973**
Pacific Coast Total	**n/a**	**n/a**	**n/a**	**1,817**	**1,877**	**1,537**	**1,541**	**1,587**	**1,794**	**1,917**	**1,855**	**1,834**	**2,016**	**2,260**	**2,284**	**2,333**	**2,375**

* In 2006, surveyors in Washington State began following more intensive survey methods, and consequently, more effort was devoted to locating birds than in previous years. As a result, survey results prior to 2006 are not necessarily comparable with those from 2006 through 2016 (Pearson et al. 2008).

Sources: USFWS 2006a, 2007b, 2008a, 2009a, 2010a, 2011a, 2012b, 2013a, 2014a, 2015a, 2016a, 2017a, 2018a.

Table 3-4. Estimated Breeding Season Population Sizes of SNPL in the HCP Area Based on Annual Window Surveys and Intensive Monitoring of Breeding Individuals

Method of Counting	Year																
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Window survey	–	–	–	92	87	60	102	98	74	112	145	94	180	180	160	174	154
Calculated minimum number of breeding adults	32	84	121	116	107	79	95	114	137	160	190	163	226	205	209	183	201
Ratio: window survey/calculate minimum numbers	–	–	–	0.79	0.81	0.76	1.07	0.86	0.54	0.70	0.76	0.58	0.80	0.88	0.77	0.95	0.77

Sources: George 2002, 2003, CDPR 2004, 2005, 2006, 2007, 2008a, 2009, 2010, 2011, 2012b, 2014a, 2015a, 2016, 2017a, 2018b, USFWS 2006a, 2007b, 2008a, 2009a, 2010a, 2011a, 2012b, 2013a, 2014a, 2015a, 2016a, 2017a, 2018b.

Table 3-5. Number of SNPL Observed During Winter Season Window Surveys in San Luis Obispo County

Site*	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
San Carpoforo Creek	26	46	52	11	0	53	0	0	16	1	26	0	0	14	0	36
Point Sierra Nevada	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arroyo de La Cruz	-	-	-	-	-	-	-	-	2	0	0	0	0	0	0	0
Sydney's Lagoon	–	–	0	8	0	0	0	0	0	0	0	0	0	0	0	0
Arroyo Laguna Creek	0	–	0	0	0	44	0	31	27	0	0	0	0	6	0	0
Little Pico Creek	-	-	-	-	-	-	-	-	28	0	0	0	0	0	0	0
San Simeon State Beach	143	54	38	0	43	0	0	0	46	33	93	144	193	0	54	88
Santa Rosa State Beach	-	-	-	-	-	-	-	18	0	0	0	0	0	0	4	0
Estero Bluffs State Beach	32	45	84	106	10	63	112	52	28	33	0	35	0	0	16	0
Toro Creek	0	121	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Morro Strand State Beach	249	44	8	10	1	0	105	24	1	81	141	106	5	55	56	2
Morro Rock City Beach	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Morro Bay Sandspit: City Sector	–	0	63	0	3	26	7	0	0	28	0	37	0	1	2	4

Table 3-5. Number of SNPL Observed During Winter Season Window Surveys in San Luis Obispo County

Site*	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
Morro Bay Sandspit: State Sector	103	3	41	30	55	19	40	0	0	50	76	130	123	201	23	3
Pismo State Beach**	–	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**34**	**0**	**0**	**0**	**7**	**0**	**0**	**0**
Oceano Dunes SVRA	**154**	**141**	**91**	**114**	**62**	**89**	**117**	**138**	**118**	**113**	**227**	**219**	**232**	**138**	**112**	**90**
Oso Flaco	**32**	**18**	**8**	**18**	**0**	**3**	**35**	**18**	**32**	**22**	**34**	**19**	**7**	**0**	**22**	**26**
Guadalupe-Nipomo Dunes NWR	29	9	5	22	0	22	1	38	44	39	11	19	1	6	17	8
Guadalupe Restoration Project (Chevron)	72	57	59	26	37	42	12	16	26	25	2	33	7	17	15	38
Total	840	538	449	346	211	361	429	338	402	425	610	742	575	438	321	295

*Sites within the HCP area are highlighted in **bold**.

**Pismo State Beach is defined in the surveys as Pismo SB north of Grand Avenue only. North of Pismo Pier to Grand Avenue and Oso Flaco were included in the winter surveys beginning in 2010.

Sources: USFWS 2005a, 2007c, 2008b, 2009b, 2010b, 2011b, 2013b, 2014b, 2015b, 2016b, 2018a, 2019.

Table 3-6. Average Number of Wintering* SNPL Observed Between October and February in the HCP Area**

Shoreline Section	2009–10	2010–11	2011–12	2012–13	2014–15	2015–16	2016–17	2017–18
Pismo Pier to Grand Avenue	–	–	5–57	77–237	0	0–47	0–9	0–1
Grand Avenue to Post 2	90–116	44–125	50–129	15–90	83–169	39–103	0–56	4–49
Post 2 to Post 6	0–3	0–21	3–26	3–72	15–67	8–50	17–117	5–75
Post 6 to Open Riding Area Southern Boundary (Shoreline)	11–45	9–58	11–47	3–94	2–144	11–86	8–89	18–58
Oso Flaco	–	15–47	28–39	18–35	0–27	5–63	0–52	23–28

*Pacific Coast SNPL joined by interior breeding birds.

**Numbers in this table represent the range of averages for each month of the monitoring year.

Sources: CDPR 2010, 2011, 2012, 2013, 2015, 2016, 2017, 2018.

Table 3-7. Nesting Success of SNPL in the HCP Area, 2001–2018

Year	Area	No. Nests[1]	No. Nests with Known Fate and Location	No. Nests Hatching	Percent Nests Hatching[2]	No. Chicks[3]	No. Banded or Known Fate Chicks[3]	No. Chicks Fledged[3]	Percent Known Fledged
2001	Arroyo Grande Creek	3	3	3	100	9	9	0	0
	Riding Area	26	25	22	88	65–68	54	1	2
	Oso Flaco	4	2	2	100	6	6	1	17
	Total	**33**	**30**	**27**	**87**	**71–74**	**71**	**3**	**4**

Table 3-7. Nesting Success of SNPL in the HCP Area, 2001–2018

Year	Area	No. Nests[1]	No. Nests with Known Fate and Location	No. Nests Hatching	Percent Nests Hatching[2]	No. Chicks[3]	No. Banded or Known Fate Chicks[3]	No. Chicks Fledged[3]	Percent Known Fledged
2002	Riding Area	33	33	25	76	62	62	35	56
	Oso Flaco	2	2	0	0	0	-	-	-
	Total	**35**	**35**	**25**	**71**	**62**	**62**	**35**	**57**
2003	Dunes Preserve	1	1	1	100	3	3	0	0
	Riding Area	77	76	55	72	139	138	97	70
	Oso Flaco	13	13	5	38	11	11	7	64
	Pipeline Revegetation	3	3	2	67	4	4	2	50
	Unknown location	1	-	1	-	2	2	2	100
	Total	**95**	**93**	**63**	**68**	**162**	**159**	**108**	**68**
2004	Riding Area	114	112	87	78	208	205	59	29
	Oso Flaco	27	27	17	63	40	39	7	18
	Pipeline Revegetation	1	1	1	100	3	3	0	0
	Unknown location	5	-	5	-	12	12	0	0
	Total	**147**	**140**	**110**	**75**	**263**	**263**	**66**	**25**
2005	Riding Area	81	81	62	77	148	148	59	40
	Oso Flaco	22	22	18	82	49	49	23	47
	Unknown location	4	-	4	-	7	7	0	0
	Total	**107**	**103**	**84**	**78**	**204**	**204**	**82**	**40**
2006	Riding Area	88	85	65	76	173	173	8	5
	Oso Flaco	29	29	22	76	57	57	9	16
	Total	**117**	**114**	**87**	**76**	**230**	**230**	**17**	**7**

Table 3-7. Nesting Success of SNPL in the HCP Area, 2001–2018

Year	Area	No. Nests[1]	No. Nests with Known Fate and Location	No. Nests Hatching	Percent Nests Hatching[2]	No. Chicks[3]	No. Banded or Known Fate Chicks[3]	No. Chicks Fledged[3]	Percent Known Fledged
2007	Riding Area	76	76	61	80	159	157	58	37
	Oso Flaco	15	15	9	60	20	20	4	20
	Unknown location	8	-	8	-	21	21	4	19
	Total	**99**	**91**	**78**	**77**	**200**	**198**	**66**	**33**
2008	Riding Area	100	100	73	73	172	172	64	37
	Oso Flaco	19	19	8	42	19	19	5	26
	Unknown location	2	-	2	-	6	6	3	50
	Total	**121**	**119**	**83**	**68**	**197**	**197**	**72**	**37**
2009	Pismo Lagoon	1	1	0	0	0	-	-	-
	Riding Area	125	124	86	69	221	221	79	36
	Oso Flaco	23	22	8	36	22	22	2	9
	Unknown location	1	-	1	-	2	2	0	0
	Total	**150**	**147**	**95**	**64**	**245**	**245**	**81**	**33**
2010	Carpenter Creek	1	1	0	0	0	0	0	-
	Arroyo Grande Creek	3	3	0	0	0	0	0	-
	Riding Area	127	124	96	77	236	236	88	37
	Oso Flaco	22	22	13	59	33	33	15	46
	Unknown location	2	-	2	-	6	6	4	67
	Total	**155**	**150**	**111**	**73**	**275**	**275**	**107**	**39**

Table 3-7. Nesting Success of SNPL in the HCP Area, 2001–2018

Year	Area	No. Nests[1]	No. Nests with Known Fate and Location	No. Nests Hatching	Percent Nests Hatching[2]	No. Chicks[3]	No. Banded or Known Fate Chicks[3]	No. Chicks Fledged[3]	Percent Known Fledged
2011	Riding Area	142	137	115	84	305	305	130	43
	Oso Flaco	23	23	16	70	40	40	18	45
	Unknown location	7	-	7	-	20	20	4	20
	Total	**172**	**160**	**138**	**82**	**365**	**365**	**152**	**42**
2012	Riding Area	197	189	143	76	353	353	85	24
	Oso Flaco	14	14	9	64	21	21	4	19
	Unknown location	5	-	5	-	12	12	2	17
	Unassigned broods	7	-	7	-	19	19	5	26
	Total	**216**	**203**	**157**	**75**	**386**	**386**	**96**	**25**
2013	Riding Area	147	144	115	80	288	288	147	51
	Oso Flaco	23	23	15	65	39	39	25	64
	Unknown location	8	-	8	-	16	16	15	94
	Total	**178**	**167**	**138**	**78**	**343**	**343**	**200**	**58**
2014	Open Riding Area	1	1	0	0	0	0	0	0
	Southern Exclosure	201	194	173	89	428	428	142	33
	Oso Flaco	44	44	33	75	86	86	35	31
	Total	**246**	**239**	**206**	**86**	**514**	**514**	**177**	**36**
2015	Arroyo Grande Creek	1	-	1	-	2	2	0	0
	Southern Exclosure	182	175	153	87	401	401	215	54
	Oso Flaco	20	20	14	70	39	39	24	62
	Total	**203**	**195**	**168**	**86**	**494**	**494**	**277**	**56**

Table 3-7. Nesting Success of SNPL in the HCP Area, 2001–2018

Year	Area	No. Nests[1]	No. Nests with Known Fate and Location	No. Nests Hatching	Percent Nests Hatching[2]	No. Chicks[3]	No. Banded or Known Fate Chicks[3]	No. Chicks Fledged[3]	Percent Known Fledged
2016	Southern Exclosure	169	156	136	87	326	326	94	29
	Oso Flaco	40	37	29	78	82	82	36	43
	Total	**209**	**193**	**165**	**86**	**462**	**462**	**157**	**34**
2017	Arroyo Grande Creek	1	1	0	0	0	0	0	0
	Southern Exclosure	195	165	107	65	252	252	105	42
	Oso Flaco	77	72	38	53	96	96	55	57
	Total	**273**	**238**	**145**	**61**	**348**	**348**	**160**	**46**
2018	Oso Flaco	61	61	33	54	84	84	43	51
	Southern Exclosure	145	139	111	80	274	274	131	48
	Total	**206**	**200**	**144**	**72**	**358**	**358**	**174**	**49**

Notes:

[1]Does not include nests that were identified only by detection of the brood (unknown nest location).

[2]For calculating the percent of nests hatching, nests with unknown fate or detected only by the presence of brood are excluded. Beginning in 2006, an additional 0.4 mile of shoreline at the southern end of park has been monitored by Oceano Dunes SVRA (a survey conducted by the Guadalupe-Nipomo Dunes National Wildlife Refuge in 2005 determined this area was part of Oceano Dunes SVRA and not the refuge, as was previously thought). Between 1998 and 2003, the amount of riding area seasonally closed increased; the size has been relatively stable since 2004. Nests from unknown locations were detected as broods inside the seasonally protected habitat in Southern Exclosure or Oso Flaco. Prior to 2001, monitoring in Oso Flaco and Pismo Dunes Natural Preserve was intermittent and fledgling information was not obtained. For corrections made to data presented in previous reports, see Appendix H in the 2009 report (CDPR 2009). In 2012, insufficient information existed to assign seven broods to specific known nests. Unassigned broods are not included in nest, egg, hatching, or chick totals and percentages. Fledglings from unassigned broods are included in totals and percentages, as they likely represent known existing nests.

[3]Does not include chicks for which there was insufficient information to assign broods to a specific nest

Sources: CDPR 1999a, 1999b, 2001a, 2004, 2005, 2006, 2007, 2008a, 2009, 2010, 2011, 2012b, 2013, 2014a, 2015a, 2016, 2017a, 2018b, George 2002, 2003.

Table 3-8. Number of SNPL Chicks Fledged Per Breeding Male in the HCP Area, 2002–2018

Year	Min. No. Breeding Adults	Min. No. Breeding Males	No. Fledglings	No. Fledglings Per Breeding Male
2002	32	18	35	1.94
2003	84	52	107	2.06
2004	121	67	66	0.99
2005	116	65	82	1.26
2006	107	58	17	0.29
2007	79	47	66	1.40
2008	95	54	72	1.33
2009	114	66	81	1.23
2010	137	78	107	1.37
2011	160	94	152	1.62
2012	190	105	96	0.91
2013	163	92	187	2.03
2014	226	120	196	1.63
2015	205	113	277	2.45
2016	209	110	157	1.43
2017	183	93	174	1.87
2018	201	115	200	1.74
Average for 17-year period (2002–18)	142	79	122	1.50
Average for 5-year period (2014–18)	205	110	201	1.82
Average for 3-year period (2016–18)	198	106	177	1.68

Note: The minimum number of breeding females is estimated from the maximum number of nests active on the same day, plus any additional nests hatching 1 day before or initiated 1 day after this date. From 2002 to 2008, the minimum number of breeding males was estimated from the highest same-day count of active nests and broods (males typically raise the chicks; males with broods 3 weeks of age or older are not included as they could be associated with a new nest). Beginning in 2009, all color-banded adults confirmed to be breeding were identified, and any individuals of this group that could not be accounted for on the same-day high count, including nests or broods with unknown adults, were added to the same-day high count for the appropriate sex. Source: (CDPR 2018b).



Figure 3-2. Three-year running average population size of breeding SNPL at Oceano Dunes SVRA, management target, and threshold that triggers additional conservation actions.

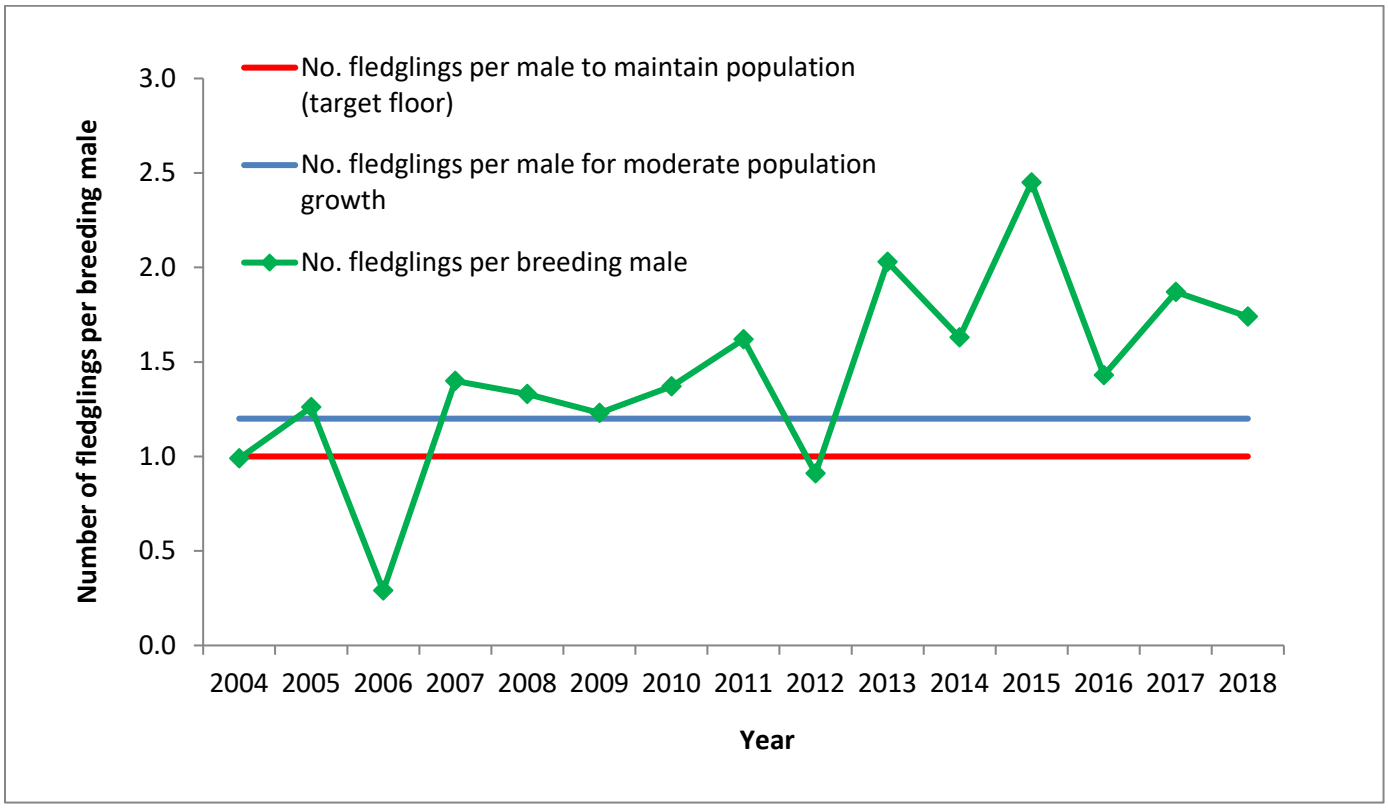


Figure 3-3. Number of SNPL fledglings per breeding male at Oceano Dunes District, 2002–2018.

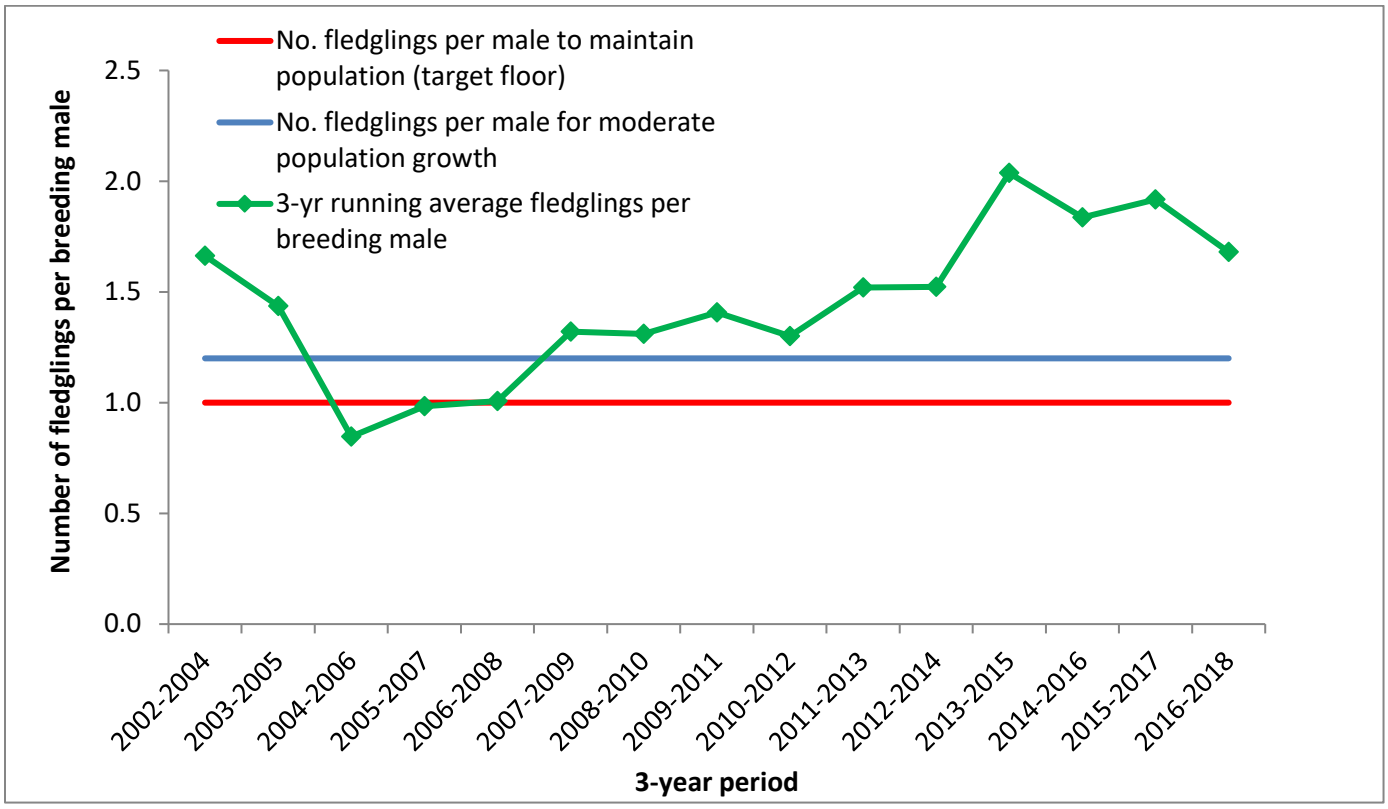


Figure 3-4. Three-year running average number of fledglings per breeding male SNPL at Oceano Dunes SVRA.[25]

3.3.2 California Least Tern (*Sternula antillarum browni*)

3.3.2.1 Regional Distribution and Abundance

The smallest of the North American terns, the CLTE is a colonial nesting seabird that nests along the Pacific Coast from Baja California to San Francisco Bay, California (Grinnell 1928, Small 1994, Thompson et al. 1997, USFWS 2006b). Nesting also occurs sporadically at inland sites in the San Francisco Bay Delta and Central Valley (USFWS 2009c). Loss of habitat to development and recreation along with disturbance of nesting and feeding grounds has resulted in substantial declines in this subspecies following World War II (Atwood and Minsky 1983, Thompson et al. 1997). Historically, CLTE nested on beaches, often near estuaries. Currently, nest sites are restricted to a few defined locations, some of which are artificial and most of which persist because of management (USFWS 2009c). From 1973 to 1975, the California breeding population was estimated at around 600 pairs (Bender 1973, 1974, Massey 1975); by 2011 the estimated number of breeding pairs in California was 4,826–6,108 (Marschalek 2012). The CLTE has been designated as endangered under both CESA and FESA since 1976, and it is also a fully protected species under the California Fish and Game Code. The USFWS 5-year review, completed in September 2006, concluded with a recommendation that the species should be downlisted to threatened (USFWS 2006b); however, it is still listed as endangered.

[25] 1.0 fledglings produced per male is necessary to prevent population decline, and 1.2 fledglings produced per male will result in population growth.

3.3.2.2 Habitat Associations

CLTE often nest in habitats similar to those of SNPL, and there is often an overlap with the two species breeding on the same beach (USFWS 2007a). CLTE nesting colonies along the California coast are typically located on broad dune-backed sandy beaches or small sandspits where vegetation is either sparse or altogether absent (Map 12). CLTE forage primarily in near shore ocean waters and in shallow estuaries and lagoons (Massey 1988). At colonies where feeding activities have been studied, CLTE forage mostly within 2 miles of the breeding area and primarily in near shore ocean waters less than 60 feet deep (Atwood and Minsky 1983). CLTE feed on fish caught by diving into the surface waters of freshwater lakes, lagoons, and oceans.

Because of the documented movement of individual birds, the limits of colonies are difficult to define. Therefore, the USFWS views the CLTE population in terms of geographic "clusters" of sites rather than colonies (Massey and Fancher 1989, Fancher 1992). "Clusters" include several discrete nesting areas that are situated close to each other and where observations of banded birds suggest that movement among these areas are frequent (Atwood and Massey 1988). The distance between neighboring "clusters" ranges from 30 to 180 miles (USFWS 2006b). Within the central California coast, the CLTE is thought to be part of a geographic cluster that includes Oceano Dunes SVRA, Rancho Guadalupe County Park, Coal Oil Point Reserve, and VAFB. CLTE observed at Oceano Dunes SVRA, at the Santa Maria River mouth (i.e., Rancho Guadalupe County Park), and at VAFB in Santa Barbara County, California typically nest among the large open expanses of the beach and dunes that are completely or nearly completely devoid of vegetation. Nests may be found from within several feet of the shore to more than a mile inland. Nests are normally located in open areas where aerial and terrestrial predators can be detected at a distance. When threatened, adult CLTE will leave the nest and aggressively harass an intruder by mobbing, defecating, and vocalizing.

CLTE in and around the HCP area are most commonly observed foraging over the ocean, though they are regularly observed foraging at Oso Flaco Lake, and in the past were observed foraging at Pismo Lake, and Dune Lakes (approximately 1.0 to 1.5 miles inland from the site of the colony), and at Cypress Ridge Lake (approximately 3.2 miles from the site of the CLTE colony), as well as at the small lagoon that forms at the mouth of Pismo Creek.

During the breeding season, adult CLTE not engaged in incubation or chick care may assemble in a communal night roost and are often joined by fledglings later in the breeding season. Reduced exposure to disturbance from predators is likely an important factor in the selection of a night roost location. Since at least 2004, adult and fledgling daytime roosting and loafing behavior at Oceano Dunes SVRA has occurred primarily in the protected Southern Exclosure, including the tidal shoreline. There can be a high degree of site fidelity, both within a breeding season and between years, with birds continuing to roost in the same location. In 2015, the night roost was initially located in the same area of northern 6 Exclosure used since 2004 (when the 6 Exclosure first became available as protected habitat for a complete season). In early July, the roost location appeared to have moved to an area in mid-7 Exclosure and was sometimes not visible or not located during surveys after this time. Counts at the night roost are minimums, as some or all birds often arrive after it is too dark to count individuals and distinguish plumages and age class. In 2017, the highest count was 57 birds at the night roost on June 23 (CDPR 2017a). This compares to an average night roost count of 60 (range 35 to 95) from 2007 through 2016 (CDPR 2007, 2008a, 2009, 2010, 2011, 2012b, 2013, 2014a, 2016, 2017a).

3.3.2.3 Breeding

In mid to late April, CLTE return to nesting grounds along the coast of California and Baja, Mexico. The breeding season lasts about 5 months, after which the birds migrate to wintering sites on the coasts of Central and South America (Thompson et al. 1997).

CLTE usually choose a nesting location in an open expanse of sand, dirt, or dried mud, close to a lagoon or estuary with a dependable food supply (Massey 1974, USFWS 1985). CLTE normally scrape a small depression about 3.9 inches in diameter in sand or gravel where two or three eggs are incubated for 20–22 days (Anderson 1970, Massey 1974, Thompson et al. 1997). The semi-precocial chicks, which are capable of leaving the nest and hiding within a few days of hatching, are fed entirely on small fish brought by the parents. Fledging occurs 21–23 days after hatching, at which time the young birds may be led to a freshwater lake or slough, where the parents continue to provide food while the young birds learn to forage on their own (Thompson et al. 1997).

3.3.2.4 Population Status in the HCP Area

CLTE first arrive in the HCP area from early April to mid-May and fully depart by late August to early September. As with SNPL, intensive monitoring of the breeding CLTE population in the HCP area provides valuable data for estimating the breeding population size and reproductive success. For CLTE, the single-day high count of concurrent nests and broods is used to determine the minimum number of breeding pairs. CLTE chicks in the Oceano Dunes District were first banded in 2003, though determining fledging rate was difficult because the bands did not enable monitors to distinguish birds between broods. Starting in 2005, chicks were banded so each brood could be identified, and in 2006 each individual chick received a unique band combination. As a result, there has been a substantial increase in the opportunity to identify the number of active broods on a given date since 2005.

The number of CLTE nests that have been found within the HCP area has varied considerably from year to year and closely mirrors the number of breeding pairs (Table 3-10 and Figure 3-5). During the 16-year period from 2002 through 2017, an average of 48 nests per year were found. In 2018, 35 nesting attempts were documented (Table 3-10).

From 1991 to the present (2018), the majority of CLTE have nested within the southern portion of the open riding area within the Southern Exclosure. Use of the 6 and 7 exclosures for nesting by CLTE has increased since the Southern Exclosure was expanded north to Post 6 in 2004. Since 2010, the majority of the CLTE nests have been within the 6 and 7 exclosures, with 70 percent of the nests being located in the 6 Exclosure in 2015, 53 percent of nests located in the 6 Exclosure in 2016, 50 percent of total nests located in the 6 Exclosure in 2017, and 57 percent of the total nests located in the 6 Exclosure in 2018. Conversely, since 2005 the percent of total nests at Oceano Dunes SVRA occurring in 8 Exclosure and Boneyard Exclosure has decreased from 69 percent in 2005 to 0 percent in 2010, 2011, 2012, 2014, 2017, and 2018. A single CLTE nest was located in the 8 Exclosure in both 2013 and 2015 (Table 3-10). In addition, three nests were located in the 8 Exclosure in 2016 (Table 3-10).

From 2005 through 2017, the average hatching rate for CLTE in the HCP area was 83 percent. In 2018, the hatching rate was 80 percent. The primary causes of nest failure in the HCP area (documented since 2002) were loss due to abandonment (67 percent of 139 failed nests were abandoned from 2002 to 2018) and, to a lesser extent, predation (14 percent of 139 failed nests were depredated from 2002 to 2018). Abandonment may occur because eggs are buried by wind-blown sand, are not viable, or are disturbed by humans and/or predators. Intensive efforts to protect nests from predators and human disturbance have been employed in the HCP area to improve the hatching success for CLTE.

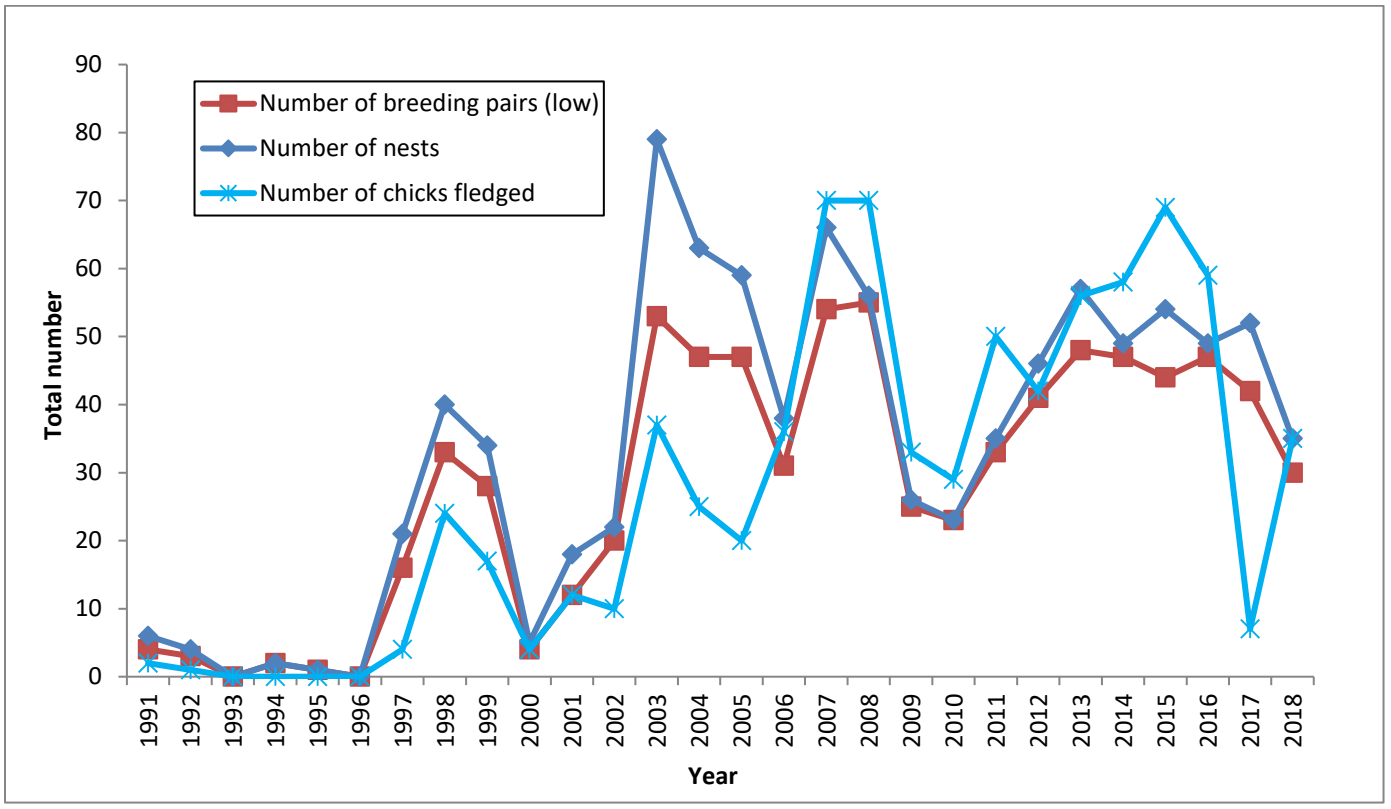


Figure 3-5. Number of CLTE breeding pairs, nests, and fledglings at Oceano Dunes District, 1991–2018.[26]

Protection from predators and human disturbance appears to have improved fledging rates. Fledging rates in the HCP area have been relatively high since 2006, exceeding 65 percent annually from 2006 through 2016; however, in 2017 the fledging rate was exceptionally low at 17.9 percent (Table 3-10). In 2018, the fledging rate increased again to 83 percent. From 2006 through 2016 and in 2018, the number of juveniles fledged per pair exceeded 1.0 each year; however, in 2017 the number of juveniles fledged per pair was well below 1.0 (Table 3-10).

From 2005 through 2016 the statewide average fledge rate of CLTE chicks per breeding pair was 0.27-0.39 compared to the average fledge rate of 1.12-1.19 per pair in the HCP area over the same time period (Table 3-11). Overall, the number of chicks fledged closely reflects the number of breeding pairs in the HCP area (Figure 3-5), which suggests that the best way to maximize total reproductive output is to manage habitat to support a large breeding population and to protect nests and chicks to maximize the fledging rate.

3.3.2.5 Importance of the Oceano Dunes District Least Tern Breeding Colony

The CLTE breeding colony in the HCP area, primarily the SVRA, has benefited from the increased level of protection and management actions provided since 2002. The colony is important in meeting statewide recovery goals as loss of breeding habitat has resulted in a fragmented population distribution and a limited number of remaining breeding populations (USFWS 1985, 2006b). On a regional level, very few active breeding sites exist along the central coast of California, and none remain between Oceano Dunes

[26] Source: (CDPR 2017a)

SVRA and San Francisco Bay. Within San Luis Obispo and Santa Barbara counties there are four CLTE colony sites, all with management providing protective measures. Oceano Dunes SVRA is the only site in San Luis Obispo County. Rancho Guadalupe Dunes County Park, VAFB, and Coal Oil Point Reserve are in Santa Barbara County and approximately 7, 22, and 85 miles south of the Oceano Dunes SVRA colony, respectively. The CLTE at Oceano Dunes SVRA represent a significant component of this regional population. From 2004 to 2018, numbers of breeding CLTE at Oceano Dunes SVRA varied from 23 to 60 pairs compared with the total from other aforementioned sites, which ranged from 7 to 71 pairs (Table 3-12). Oceano Dunes SVRA also has become an important source of productivity for this regional population. During the period 2004–2018, Oceano Dunes SVRA produced a minimum of 659 juvenile CLTE while Rancho Guadalupe Dunes County Park, VAFB, and Coal Oil Point Reserve combined produced 262 juveniles (Table 3-12).

3.3.2.6 Regulatory Status and Recovery Plan

In addition to being listed as endangered under both FESA and CESA, the CLTE is also a California fully protected species. The USFWS has not designated critical habitat for the species, but the USFWS did finalize the revised Recovery Plan for the CLTE in 1985 (USFWS 1985). The Recovery Plan identified the following delisting criteria for CLTE:

- Maintain at least 1,200 breeding pairs distributed in at least 20 of 23 coastal management areas
- Each of the 20 “secure” coastal management areas must have at least 20 breeding pairs
- Each of the 20 “secure” coastal management areas must have a 5-year mean reproductive rate of at least 1.0 young fledged per breeding pair
- San Francisco Bay, Mission Bay, and San Diego Bay must be included within the 20 secure management areas with 4, 6, and 6 secure colonies respectively

The most recently completed USFWS 5-year review, however, recommended revising the current Recovery Plan because “current estimates of population and productivity necessary for downlisting and delisting may not be practicable or applicable, per advances in tern ecology, habitat management, and population viability analysis” (USFWS 2006b). For example, the 1985 recovery criteria do not explicitly address specific threats to CLTE. Also, the 5-Year Review noted data on reproduction and population size suggested that a rate less than 1.0 young fledged per breeding pair appeared to have been adequate for population growth. In addition to revisiting and revising the current CLTE recovery plan, the 5-year review also recommended the following:

- Continued management of existing nest sites
- Monitoring of nesting sites
- Creation of new nest sites and site expansion at existing sites

The resource protection strategies employed by CDPR that will be continued under this HCP will ensure continued management and monitoring of CLTE at Oceano Dunes SVRA. The ongoing CLTE management program at Oceano Dunes SVRA has been successful as measured by the delisting criteria listed above: from 2005 to 2018 the average annual number of breeding pairs was 41 to 44, and from 2005 to 2018, the average number of juveniles fledged per pair was 1.13 to 1.06. USFWS initiated a new 5-year review in 2010 (USFWS 2010c), but that process has not been completed.

3.3.2.7 HCP Area Conservation Program

CDPR currently manages the CLTE conservation program presented in this HCP to optimize breeding success and reduce potential impacts to CLTE in the HCP area. The conservation program includes such actions as seasonally closing areas to visitors and installing fence and signage around these areas to delineate them; augmenting existing habitat with branches, woodchips, and wrack; and implementing a predator management program. Over the years, CDPR has worked with CDFW and USFWS to modify the conservation program and respond to potential impacts to CLTE. For example, daily monitoring in the open riding area began in 2001, the predator management program began in 2002, night roost monitoring began in 2009 and night-vision equipment was used to monitor the nigh roost starting in 2009, and the minimum distance between CLTE nests and open riding area was increased in 2016. In 2000, prior to daily monitoring and other activities associated with the conservation program, only five nests were located in the HCP area, and only four chicks fledged. Starting in 2002, 1 year after daily monitoring began in the open riding area and more regular monitoring began in other portions of the HCP area, 22 nests were located in the HCP area and 10 chicks fledged. Starting in 2003, 1 year after predator management began, 79 nests were located in the HCP area, and 37 chicks fledged. Since 2004, the number of nests has varied between 23 and 66, and the number of chicks fledged has varied between 7 and 70 (Table 3-10). Overall, breeding success for CLTE in the HCP area has increased, and this is likely due in large part to CDPR's efforts towards the conservation program.

3.3.2.8 Suitable Habitat in the HCP Area

CLTE nests in the HCP area are typically found in the seasonal exclosures during the breeding season (Map 13). Specifically, CLTE nests have been found in the 6 Exclosure, 7 Exclosure, and 8 Exclosure. CLTE nests have also been found in the Boneyard Exclosure. In addition, the CLTE night roost has been located in both the 6 Exclosure and 7 Exclosure in the past. The HCP area, however, contains additional suitable habitat for CLTE. This section describes habitat available for CLTE in the HCP area.

CLTE terrestrial habitat was mapped using the same criteria as SNPL (section 3.3.1.7), as CLTE generally have similar habitat requirements for nesting and roosting in dune-backed coastal habitats in the region (Map 12). However, habitat used by SNPL for foraging is not used for foraging by CLTE. CLTE forage for fish by diving into the surface waters of freshwater lakes and rivers and oceans. Therefore, all suitable aquatic habitats (e.g., ocean and lakes) were mapped as foraging habitat.

In total, 4,593 acres were mapped as suitable CLTE terrestrial habitat in the HCP area: 727 acres of primary habitat, 276 acres of secondary habitat, and 3,510 acres of tertiary habitat. An additional 80 acres of aquatic habitat were mapped as suitable foraging habitat. For the period from 2005 to 2018, virtually all of the observed CLTE nests occurred in primary habitat (greater than 99 percent) (Table 3-9). This is expected as most of the CLTE nesting in the HCP area nest within the Southern Exclosure, which is placed mostly within primary habitat.

Table 3-9. Number of CLTE Nests with Known Locations in Primary, Secondary, and Tertiary Habitat in the HCP Area (Map 13)

Year	Nests in Primary Habitat	Nests in Secondary Habitat	Nests in Tertiary Habitat
2005	58	0	0
2006	38	0	0
2007	63	2	0
2008	55	0	0
2009	26	0	0
2010	23	0	0
2011	35	0	0
2012	46	0	0
2013	56	0	0
2014	49	0	0
2015	54	0	0
2016	48	0	0
2017	52	0	0
2018	36	0	0
Total	639	2	0

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2018

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair
2001	8 Exclosure	–	14	28	11 (79)	18	–	–	–
	Boneyard Exclosure	–	4	7	2 (50)	3	–	–	–
	Total	**12–15**	**18 (18)**	**35**	**13[2] (72)**	**22[3]**	**12[4] (55)**	**0.67[4]**	**0.80–1.00**
2002	7/8 exclosures	–	17 (14)[5]	34	11	19	–	–	–
	Oso Flaco Exclosures	–	5	10	4	8	–	–	–
	Total	**20–21**	**22 (19)**	**44**	**15[6] (79)**	**27**	**10 (37)**	**0.53**	**0.48–0.50**
2003	7 Exclosure	–	26	44	19 (73)	29	–	–	–
	8 Exclosure	–	47	80	36 (77)	63	–	–	–
	Boneyard Exclosure	–	6	11	5 (83)	9	–	–	–
	Total	**53–66**	**79 (77)**	**135**	**60[7] (78)**	**101**	**37 (37)**	**0.48[8]**	**0.56–0.70**
2004	7 Exclosure	–	14	26	10 (71)	16	–	–	–
	8 Exclosure	–	40	64	25 (63)	40	–	–	–
	Boneyard Exclosure	–	7	12	7 (100)	10	–	–	–
	Southern Exclosure Total	–	61	102	42 (69)	66	–	–	–
	Uncertain location	–	1	1	1 (100)	1	–	–	–
	Open riding area	–	1[9]	2	1 (100)	2	–	–	–
	Total	**47–55**	**63 (60)**	**105**	**44 (73)**	**69**	**25 (36)**	**0.42**	**0.45–0.53**

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2018									
Year	**Location**	**Estimated No. Breeding Pairs**	**Total No. Nests (known fate)**	**No. Eggs Laid**	**No. Nests Hatching (percent known fate hatching)**	**No. Chicks**	**No. Chicks Fledging (percent chicks fledging)[1]**	**Juveniles Fledged Per Nest**	**Juveniles Fledged Per Pair**
2005	6 Exclosure	–	4	7	4 (100)	7	5 (71)	1.25	–
	7 Exclosure	–	13	25	10 (77)	18	7 (39)	0.54	–
	8 Exclosure	–	31	53	17 (55)	28	6 (21)	0.19	–
	Boneyard Exclosure	–	10	16	7 (70)	11	0 (0)	0.00	–
	Southern Exclosure Total	–	58	101	38 (66)	64	18 (28)	0.31	–
	Open riding area	–	1[10]	2	1 (100)	2	2 (100)	2.00	–
	Total	**47–53**	**59 (59)**	**103**	**39 (66)**	**66**	**20 (30)**	**0.34**	**0.38–0.43**
2006	6 Exclosure	–	20	31	14 (70)	21	16 (76)	0.80	–
	7 Exclosure	–	6	9	5 (83)	8	8 (100)	1.33	–
	8 Exclosure	–	12	20	9 (75)	16	12 (75)	1.00	–
	Total	**31–35**	**38 (38)**	**60**	**28 (74)**	**45**	**36 (80)**	**0.95**	**1.03–1.16**
2007	6 Exclosure	–	25	46	20 (80)	33	29 (88)	1.16	–
	7 Exclosure	–	28[11]	48	22 (79)	40	28 (70)	1.00	–
	8 Exclosure	–	9	18	5 (56)	10	4 (40)	0.44	–
	Boneyard Exclosure	–	4	8	4 (100)	7	7 (100)	1.75	–
	Unknown nest identity	–	–	–	–	–	2 (–)	–	–
	Total	**54–60**	**66 (66)**	**120**	**51 (77)**	**90**	**70 (78)**	**1.06**	**1.17–1.30**
2008	6 Exclosure	–	32	67	28 (88)	57	38 (67)	1.19	–
	7 Exclosure	–	13[12]	26	12 (92)	23	16 (70)	1.23	–
	8 Exclosure	–	10	20	9 (90)	17	11 (65)	1.10	–
	Boneyard Exclosure	–	1	2	1 (100)	2	2 (100)	2.00	–

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2018									
Year	**Location**	**Estimated No. Breeding Pairs**	**Total No. Nests (known fate)**	**No. Eggs Laid**	**No. Nests Hatching (percent known fate hatching)**	**No. Chicks**	**No. Chicks Fledging (percent chicks fledging)[1]**	**Juveniles Fledged Per Nest**	**Juveniles Fledged Per Pair**
	Unknown nest identity	–	–	–	–	–	3 (–)	–	–
	Total	**55–56**	**56 (56)**	**115**	**50 (89)**	**99**	**70 (71)**	**1.25**	**1.25–1.27**
2009	6 Exclosure	–	20	Min. 40	17 (85)	32	23–27 (72–84)	1.15–1.35	–
	7 Exclosure	–	3	6	3 (100)	6	5 (83)	1.67	–
	8 Exclosure	–	2	3	2 (100)	3	0 (0)	–	–
	Boneyard Exclosure	–	1	2	1 (100)	2	1 (50)	1.00	–
	Total	**25–26**	**26 (26)**	**Min. 51**	**23 (88)**	**43[13]**	**29–33 (67–77)[14]**	**1.16–1.32[14]**	**1.27–1.32**
2010	6 Exclosure	–	20	39	18 (90)	32	26 (81)	1.30	–
	7 Exclosure	–	3	6	2 (67)	3	3 (100)	1.00	–
	8 Exclosure	–	0	0	0 (–)	0	0 (-)	–	–
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (-)	–	–
	Total	**23**	**23 (23)**	**45**	**20 (87)**	**35**	**29 (83)[15]**	**1.26**	**1.26**
2011	6 Exclosure	–	26	47	22 (85)	38	37 (97)	1.42	–
	7 Exclosure	–	9	18	9 (100)	17	13 (77)	1.44	–
	8 Exclosure	–	0	0	0 (–)	0	0 (–)	–	–
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	–	–
	Total	**33–34**	**35 (35)**	**65**	**31 (89)**	**55**	**50 (91)**	**1.43**	**1.47–1.52**
2012	6 Exclosure	–	36	62	26 (87)	41	33 (81)	1.10	–
	7 Exclosure	–	10	19	6 (67)	10	8 (80)	0.89	–
	8 Exclosure	–	0	0	0 (–)	0	0 (-)	–	–

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2018									
Year	**Location**	**Estimated No. Breeding Pairs**	**Total No. Nests (known fate)**	**No. Eggs Laid**	**No. Nests Hatching (percent known fate hatching)**	**No. Chicks**	**No. Chicks Fledging (percent chicks fledging)[1]**	**Juveniles Fledged Per Nest**	**Juveniles Fledged Per Pair**
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	–	–
	Total	**41–44**	**46 (40)**	**82**	**33 (83)**	**52**	**42 (81)**	**1.05**	**0.95–1.02**
2013	6 Exclosure	–	39	74	36 (97)	65	45[16] (69.2)	–	–
	7 Exclosure	–	17	32	8 (57)	17	7 (41.2)	–	–
	8 Exclosure	–	1	3	1 (100)	3	0 (–)	–	–
	Boneyard Exclosure	–	0	0	0 (–)	0	0 (–)	0	0
	Total	**48–53**	**57 (52)**	**109**	**45 (87)**	**85**	**56 (66)**	**1.08**	**1.06–1.17**
2014	6 Exclosure	–	37 (36)	71	33 (92)	60	–	–	–
	7 Exclosure	–	12 (10)	24	9 (90)	16	–	–	–
	8 Exclosure	–	–	–	–	–	–	–	–
	Boneyard Exclosure	–	–	–	–	–	–	–	–
	Total	**47–48**	**49 (46)**	**95**	**42 (91)**	**76**	**58 (76)**	**1.26**	**1.21–1.23**
2015	6 Exclosure	–	38 (38)	71	35 (92)	61	–	–	–
	7 Exclosure	–	15 (15)	25	12 (80)	21	–	–	–
	8 Exclosure	–	1 (1)	2	1 (100)	2	–	–	–
	Boneyard Exclosure	–	–	–	–	–	–	–	–
	Total	**44–49**	**54 (54)**	**98**	**48 (89)**	**84**	**69 (82)**	**1.28**	**1.41–1.57**
2016	6 Exclosure	–	26 (25)	52	25 (100)	43	–	–	–
	7 Exclosure	–	20 (19)	38	18 (95)	29	–	–	–
	8 Exclosure	–	3 (3)	6	3 (100)	6	–	–	–
	Boneyard Exclosure	–	0 (0)	0	0 (0)	0	–	–	–
	Total	**47–48**	**49 (47)**	**96**	**46 (98)**	**78**	**59 (76)**	**1.26**	**1.23–1.26**

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2018

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair
2017	6 Exclosure	–	26 (19)	40	11 (58)	18	–	–	–
	7 Exclosure	–	26 (15)	42	11 (73)	21	–	–	–
	8 Exclosure	–	–	–	–	–	–	–	–
	Boneyard Exclosure	–	–	–	–	–	–	–	–
	Total	**42–47**	**52 (34)**	**82**	**22 (65)**	**39**	**7 (18)**	**0.13**	**0.15–0.17**
2018	6 Exclosure	–	20 (20)	–	14 (70)	31	–	–	–
	7 Exclosure	–	15 (15)	–	14 (93)	20	–	–	–
	8 Exclosure	–	–	–	–	–	–	–	–
	Boneyard Exclosure	–	–	–	–	–	–	–	–
	Total	**30–33**	**35 (35)**	**52**	**28 (80)**	**42**	**35 (83)**	**1.00**	**1.06–1.17**

– = Data not available

Notes:

[1]The method for estimating the number of fledglings has varied among years: single-day high count for 2001; 3-week-interval day count conducted from 2002 to 2004 (chicks banded to site in 2003 and 2004); chicks were color-banded to brood in 2005 and to individual since 2006, resulting in more accurate documentation of fledge rate than previous methods. Estimates of fledging rates prior to 2005 are less accurate and may represent substantial under-counts or over-counts; therefore, comparisons of annual fledging rates before 2005 may be unreliable.

[2] It was not determined whether four nests hatched or failed.

[3] The number of chicks from one known-hatch nest was not determined.

[4] Chicks were not banded; therefore, accurate estimates of fledging rates are not available.

[5] The location was not identified for the three nests whose fate (hatched or failed) was not determined. For accounting purposes, the three nests were categorized as having occurred in 7 and 8 exclosures.

[6] It was not determined if three nests hatched or failed.

[7] It was not determined if two nests hatched or failed.

[8] Chicks were banded, but not to brood; therefore, fledge rates are estimates.

[9] Nest located just outside the Southern Exclosure northeast of Post 8.

[10] Nest located on the beach near Arroyo Grande Creek in an area open to pedestrians, equestrians, and street-legal vehicles.

[11] One nest known only from detection of small chicks being brooded in 7 Exclosure, the nest was assumed to have been in 7 Exclosure for purpose of calculation.

[12] One nest known only from detection of very small chicks being brooded (and banded) in 7 Exclosure, nest was assumed to have been in 7 Exclosure.

Table 3-10. CLTE Nesting Success by Location in the HCP Area, 2001–2018

Year	Location	Estimated No. Breeding Pairs	Total No. Nests (known fate)	No. Eggs Laid	No. Nests Hatching (percent known fate hatching)	No. Chicks	No. Chicks Fledging (percent chicks fledging)[1]	Juveniles Fledged Per Nest	Juveniles Fledged Per Pair

[13] Six chicks were unbanded and four of these were identified as fledging and are included.

[14] The number of chicks fledged and juveniles fledged per nest are reported as a range, with 29 banded chicks confirmed fledging and an additional four unbanded chicks likely fledging.

[15] One chick was unbanded and identified as fledging and is included.

[16] Four unbanded fledglings were seen in 6 Exclosure on 28 July. These four unbanded fledglings were not assigned to specific nests and are not included in this table.

Sources: CDPR 2001a, 2004, 2005, 2006, 2007, 2008a, 2009, 2010, 2011, 2012b, 2013, 2014a, 2015a, 2016, 2017a, 2018b, Henkel 2001, George 2002, 2003

Table 3-11. Number of CLTE Chicks Fledged Per Pair in the HCP Area and Statewide, 2006–2018

Year	HCP Area	Statewide*
2006	1.16	0.35–0.52
2007	1.30	0.33–0.39
2008	1.27	0.29–0.37
2009	1.32	0.24–0.30
2010	1.26	0.29–0.35
2011	1.52	0.17–0.25
2012	1.02	0.09–0.15
2013	1.17	0.25–0.38
2014	1.23	0.37–0.68
2015	1.57	0.29–0.45
2016	1.26	0.35–0.50
2017	0.17	n/a
2018	1.06–1.17	–

*The statewide number is presented with a minimum and maximum range of CLTE chicks fledged per pair.

Sources: Marschalek 2007, 2008, 2009, 2010, 2011, 2012, Frost 2013, 2014, 2016, 2016, 2017.

Table 3-12. Number of Reported Breeding CLTE Pairs and Juveniles Produced at Oceano Dunes SVRA and the Combined Sites of Rancho Guadalupe Dunes County Park (RGDCP), Vandenberg Air Force Base (VAFB), and Coal Oil Point Reserve (COPR), 2004–2018

	Oceano Dunes SVRA			RGDCP, VAFB, and COPR combined	
Year	**Number of Breeding Pairs**	**Number of Juveniles**		**Number of Breeding Pairs**	**Number of Juveniles**
2004	47–55	25		15	0
2005	47–53	20		48	1
2006	31–35	36		7	7
2007	54–60	70		23	17
2008	55–56	70		19	19
2009	25–26	33		32–33	40
2010	23	29		34	31
2011	33–34	50		33	4
2012	41–44	42		18	10
2013	48–53	56		15	19
2014	47–48	58		17	20
2015	44–49	69		22	29
2016	47–48	59		25	18
2017	42–47	7		27	8
2018	30–33	35		70–71	39
Total Juveniles Produced		659			262

Note: Almost all CLTE chicks are banded at Oceano Dunes SVRA, and observation of color-bands is the primary means to document juvenile production. Banding does not occur at the other sites, and other methods are used to estimate the number of juveniles produced.

Source: (CDPR 2018b).

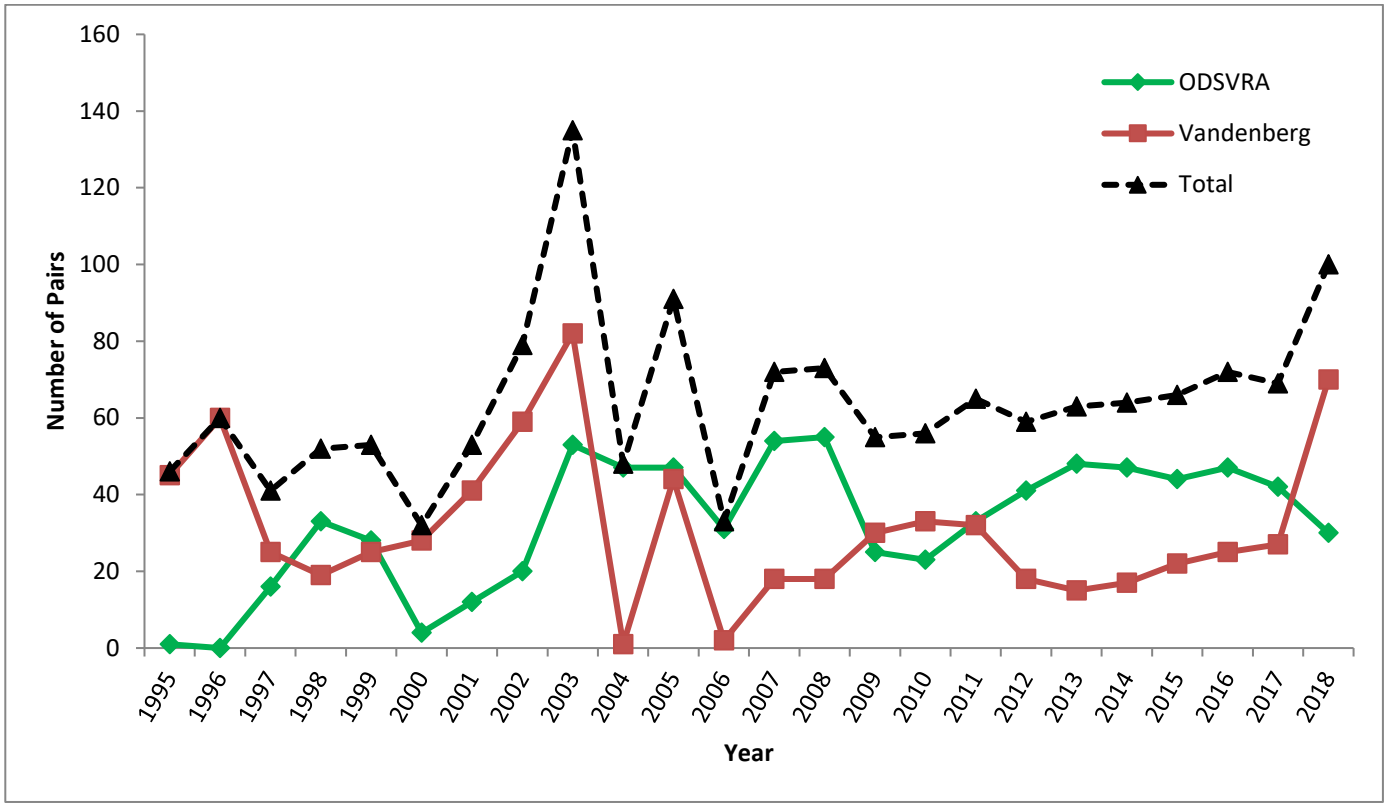


Figure 3-6. Estimated number of breeding pairs of CLTE at Oceano Dunes SVRA and Vandenberg Air Force Base, 1995–2018.

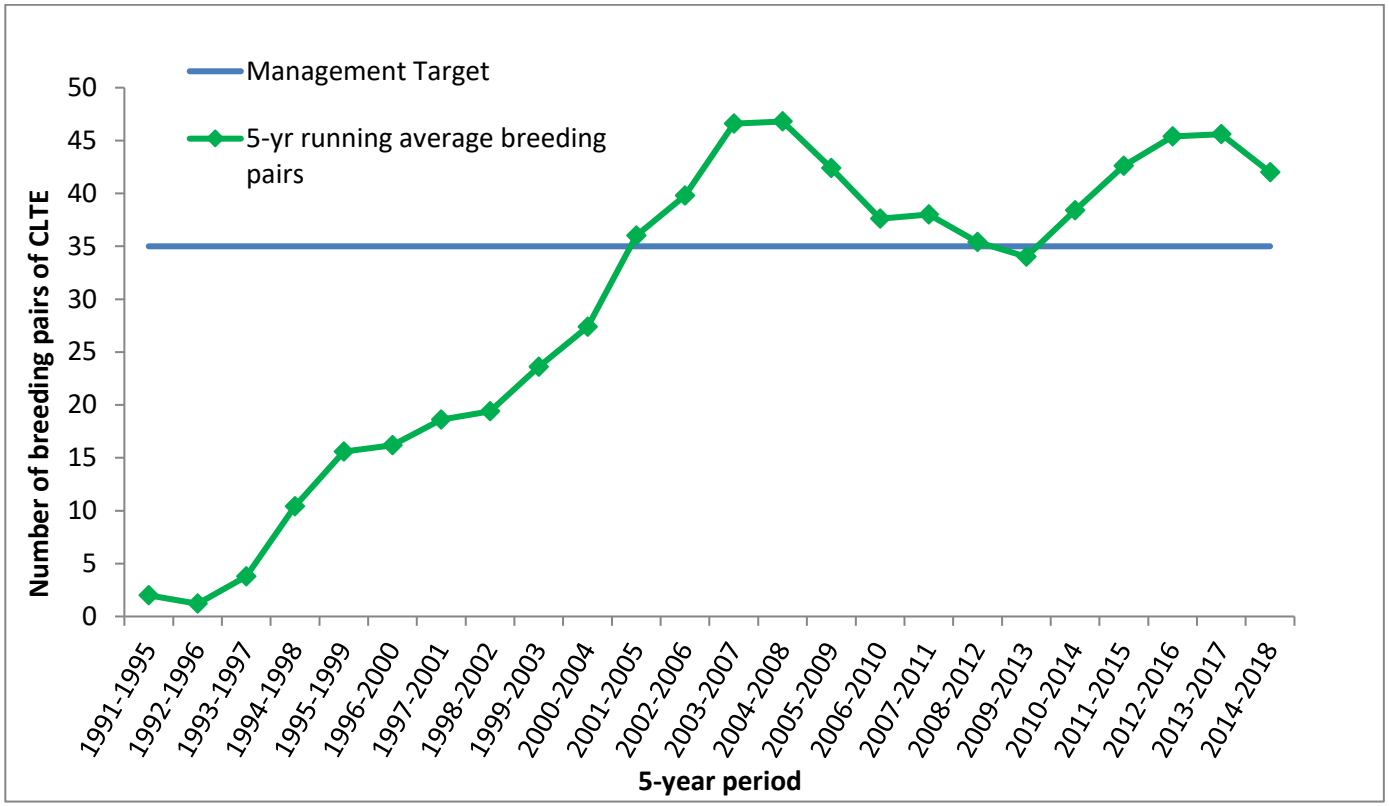


Figure 3-7. Five-year running average of breeding pairs of CLTE at Oceano Dunes SVRA.

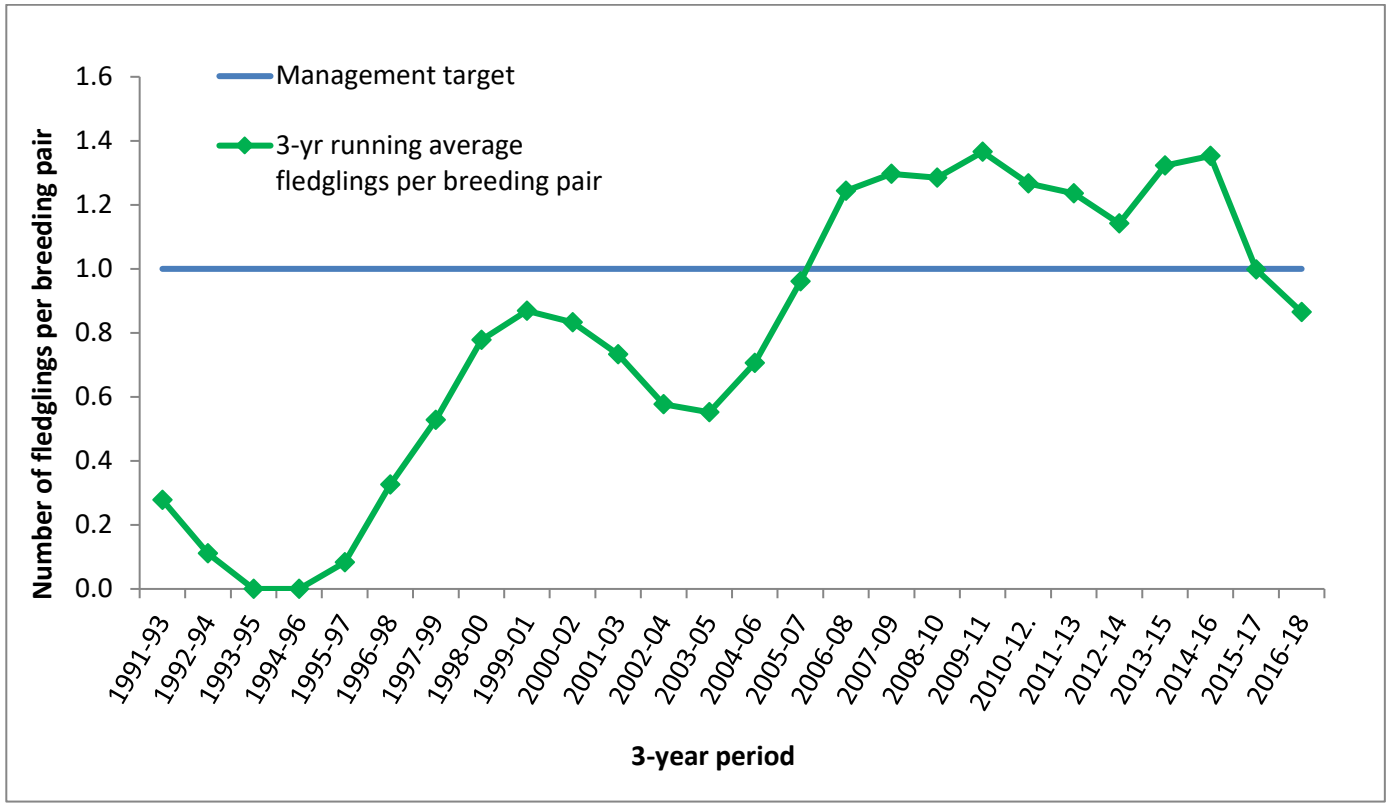


Figure 3-8. Three-year running average of fledglings per breeding pair of CLTE at Oceano Dunes SVRA. A 3-year average that falls below the management target will trigger additional management and/or consultation.

3.3.3 California Red-Legged Frog (*Rana draytonii*)

3.3.3.1 Regional Distribution and Abundance

The CRLF is the largest native frog in California (3.3 to 5.4 inches) and has been found at elevations from sea level to about 5,000 feet, with most observations occurring below 3,500 feet (USFWS 2002). The species is declining throughout its range (USFWS 2002). Historically, CRLF were common in coastal habitats from Point Reyes National Seashore, Marin County, California and inland from the vicinity of Redding, Shasta County, California, southward to northwestern Baja California, Mexico (Hayes and Jennings 1988). The current restricted distribution of CRLF represents only a small percentage of its former distribution in the region. Historic records indicate that CRLF were present in most of the streams and ponds in the region.

CRLF has been extirpated or nearly extirpated from over 70 percent of its former range (Hayes and Jennings 1988, USFWS 1996). Historically, CRLF were found in 46 counties in California, but the species is now extirpated from 24 of these (USFWS 2002). Remaining populations occur in isolated localities in the Sierra Nevada, northern coast, and northern Transverse Ranges, and they are believed to be nearly extirpated from the southern Transverse and Peninsular ranges (USFWS 2002). This species is still common in the San Francisco Bay area and along the central coast (CNDDB 2016). Monterey, San Luis Obispo, and Santa Barbara counties support the largest extent of occupied habitat (USFWS 2002). The most secure aggregations of CRLF are found in aquatic sites that support substantial riparian and aquatic vegetation and lack invasive predators such as American bullfrogs.

The principal causes of decline and continued threats to CRLF include loss and degradation of habitat due to agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, invasive plants, impoundments, water diversions, degraded water quality, use of pesticides, and introduced predators. The reason for decline and the degree of threats vary by geographic location. An important factor influencing the suitability of aquatic breeding sites is the general lack of introduced aquatic predators such as bullfrogs, mosquitofish (*Gambusia affinis*), bass (*Micropterus* spp.), sunfish (*Lepomis* spp.), and crayfish (USFWS 2002). While CRLF are occasionally known to persist in the presence of either bullfrogs or mosquitofish (and other invasive species), the combined effects of invasive frogs and fish often lead to extirpation of CRLF (USFWS 2002). Native predators such as raccoons, great blue herons (*Ardea herodias*), and garter snakes also eat CRLF.

Within the HCP area, principal threats include loss and modification of habitat, water diversions, including groundwater pumping, predatory and competitive introduced species, and degraded water quality.

3.3.3.2 Habitat Associations

Researchers studying wildlife in the Guadalupe-Nipomo Dunes region have found CRLF in wetland, riparian, and dune swale habitats (Map 14; Blecha et al 2007). Habitats of CRLF are characterized by dense, shrubby riparian vegetation associated with deep (2 feet), still or slow-moving water (Jennings and Hayes 1994). The shrubby vegetation preferred by CRLF is arroyo willow, cattails, and bulrushes (*Scirpus* sp.), found in wetland and riparian habitats. Riparian habitat includes vegetation that grows along banks and in the floodplains of streams and adjacent to ponds and that is dependent on the bordering water source for survival. Most important to CRLF is a breeding pond or slow-flowing stream reach or deep pool within a stream with vegetation or other material to which egg masses may be attached. These areas must hold water long enough for tadpoles to complete their metamorphosis into juvenile frogs that can survive outside of water (Jennings and Hayes 1994). CRLF eggs are usually attached to emergent vegetation in lagoons, streams, and a variety of natural and human-made ponds.

Water with a salinity of less than 4.5 parts per thousand is necessary to ensure the survival of embryonic stages. Juvenile CRLF seem to favor open, shallow aquatic habitats with dense, submergent vegetation.

CRLF are nocturnal, although sub-adults are sometimes active during the day (Jennings and Hayes 1994). CRLF have a varied diet that includes both invertebrates and vertebrates (USFWS 2002). The moisture and camouflage provided by riparian vegetation provides foraging and resting habitat. During dry periods, CRLF are seldom found far from water. However, during wet weather, individuals may make overland excursions through upland habitats over distances up to 2 miles in order to find new breeding locations or food. These dispersal movements are generally straight-line, point-to-point migrations rather than following specific habitat corridors. Dispersal distances are believed to depend on the availability of suitable habitat and prevailing environmental conditions. CRLF disperse through uplands such as grasslands and typically find cover amongst boulders or rocks and organic debris such as downed trees or logs, industrial debris, and agricultural features such as drains, watering troughs, spring boxes, and abandoned sheds (USFWS 2001a). CRLF also use small mammal burrows and moist leaf litter for cover (Jennings and Hayes 1994, USFWS 1996). Incised stream channels with portions narrower and deeper than 18 inches may also provide habitat (USFWS 1996). Use of this habitat type by CRLF is most likely dependent on year-to-year variations in climate and habitat suitability and varying requisites per life stage (USFWS 2001a).

3.3.3.3 Breeding and Migration

CRLF breed from November through April, with the earlier breeding records occurring in southern localities. Females deposit egg masses on emergent vegetation so that the masses float on the surface of the water. Eggs hatch in 6 to 14 days, while tadpoles take 3.5 months or longer to metamorphose (Jennings et al. 1992). Males attain sexual maturity by 2 years and females by 3 years of age (Jennings and Hayes 1994). CRLF may live 8 to 10 years. CRLF occupies aquatic and terrestrial habitats during different stages of its life and during different seasons of the year. While tadpoles stay in the breeding area until metamorphosis in late summer/fall, sub-adult and adult CRLF may disperse locally shortly after metamorphosis, July to September, and away from their natal habitats during warm rain events; however, CRLF tadpoles have been observed to overwinter in their natal habitat in some areas (Fellers et al. 2001). Most adult CRLF remain near or within aquatic breeding habitat. Adults that disperse typically disperse during the wet season after rain events (November through April), with most of the overland movements occurring at night; however, CRLF may move from breeding sites at any time of the year depending on habitat availability and the environmental conditions of the aquatic habitat (USFWS 2010d). CRLF have been documented to travel as far as 2.2 miles from non-breeding to breeding habitats (Bulger et al. 2003). These long-distance movements are migrations rather than simply moving between habitats (USFWS 2010d).

Most individuals make short-range forays into upland habitats for periods of days to weeks in response to precipitation but return to their aquatic habitat at the end of the upland interval. These are called non-migrating frogs. These individuals show a clear response to rainfall during the summer and early winter months (Bulger et al. 2003). In Bulger et al. (2003), frogs were virtually always less than 16 feet from their pond or stream of residence during dry intervals of the summer, but moved outward into upland habitats to distances of up to 427 feet in response to summer rains. Median distance from water increased to a constant 49 to 82 feet with the onset of winter rains. Ninety percent of non-migrating frogs during the summer and early winter months were always within 197 feet of water. Frogs made little use of rainfall and upland habitat during mid- to late-winter, and this appeared to be due to breeding chronology. From February through May, 90 percent of non-migrating frogs were always within 20 feet of water. Non-migrating frogs spent the most time on land during the early winter, then

summer, and very little time was spent on land in mid- to late-winter. CRLF have brief bouts of movement followed by longer intervals of inactivity during their migration (Bulger et al. 2003).

Some individual CRLF make overland movements between two aquatic sites, typically before or after breeding. These are called migrating frogs. Migrating frogs most frequently migrated between breeding ponds from October 31 to November 25, usually in association with rainfall or along a waterway with running water along its length. Post-breeding migration typically occurs between January and May in association with a 1-day rainfall. Migrating frogs moved between sites that were separated by map distances of 656 to 9,186 feet. Migrations tended to be an approximately straight line between the source and target site. Frogs moved through coniferous forest, grass/scrub rangeland, and agricultural land (Bulger et al. 2003).

Where obvious, direct corridors exist between two occupied aquatic sites, it undoubtedly will receive regular use by migrating frogs. However, there is no evidence from this study that natural corridors are either essential to migrating frogs or that they will be used preferentially over alternative upland routes (Bulger et al. 2003).

Frogs make small-scale movements (less than 98 feet) without leaving the breeding sites (i.e., local dispersal) throughout the year. Movements of greater than 98 feet generally coincide with winter rains, although some frogs did not move until their seasonal habitat was on the verge of drying. In general, frogs departed from breeding ponds with the onset of heavy winter rains. Frogs departed from breeding ponds at varying times throughout the rainy season, with some frogs remaining in permanent ponds all year (Fellers and Kleeman 2007).

3.3.3.4 Occurrence within HCP Area

Modified protocol-level surveys were conducted during the spring and summer of 2017, 2018, and 2019. Results from these surveys are presented in Table 3-13.

Table 3-13. CRLF Protocol-Level Surveys, 2017–2019

Location	No. Adults Observed – Date	No. Juveniles Observed – Date	No. Tadpoles Observed – Date	No. Egg Masses Observed – Date
Arroyo Grande Creek[1]	6 – August 1, 2019	0	1 – June 12, 2017	1 – March 19, 2019
Arroyo Grande Estuary[1]	2 – May 1, 2019 6 – August 1, 2019	3 – August 10, 2017 6 – May 30, 2019 (1 with 50% certainty) 12 – August 1, 2019	2 – May 1, 2019 1 – May 30, 2019	0
Carpenter Creek[2]	0	0	1 – July 9, 2019 (Presumed sighting[3])	0
Little Hawaii	0	0	0	0
Little Oso Flaco Lake	1 – August 14, 2017[4] 1 – May 15, 2018 1 – July 17, 2018 1 – April 9, 2019 2 – May 3, 2019	5 – July 31, 2019	0	0

Table 3-13. CRLF Protocol-Level Surveys, 2017–2019

Location	No. Adults Observed – Date	No. Juveniles Observed – Date	No. Tadpoles Observed – Date	No. Egg Masses Observed – Date
Meadow Creek[2]	0	0	0	0
Oso Flaco Creek[2]	0	0	0	0
Oso Flaco Lake	1 – April 3, 2019 (Calling)	2 – July 29, 2019	0	0
Oceano Lagoon	0	0	0	0
Pismo Beach Golf Course[2]	0	0	0	0
Pismo Lagoon[2]	0	0	0	0
Pismo Lake[2]	0	0	0	0

Notes:

[1]Location not surveyed in 2018.

[2]Location not surveyed in 2019.

[3]Observed incidental to fisheries surveys.

[4]Two additional CRLF were heard; however, they were never observed, and a positive identification of either individual was not obtained.

Source: (Cleveland 2018a, 2018b, 2018c, 2018d, S. Little, pers. comm. 2019a, 2019b)

CRLF individuals were observed in Arroyo Grande Creek and Estuary, Little Oso Flaco Lake, and Oso Flaco Lake (Cleveland 2018a, 2018b, 2018c, 2018d, S. Little, pers. comm. 2019a, 2019b). In addition, a CRLF tadpole and egg mass were observed in Arroyo Grande Creek, CRLF tadpoles were sighted in Arroyo Grande Estuary, and a tadpole observed[27] in Carpenter Creek is presumed to have been a CRLF. Suitable breeding habitat for CRLF encompasses 178 acres within the HCP area, while upland habitat encompasses 4,827 acres. Pismo Lake contains suitable habitat, but there are no modern records of presence, presumably because of warm-water-introduced fish and bullfrogs (Rischbieter 2011, CNDDB 2017). The reaches of Meadow Creek from the Oceano (Meadow Creek) Lagoon north to State Route 1 are confined to a set channel, in places by levees, for flood-control purposes. In addition, much of the runoff from developed portions of the City of Grover Beach is directed to this reach of the creek. Due to the flood control and drainage practices, the water quality in this area appears to be heavily degraded, and pools are choked with vegetation. The poor water quality and steep banks in this area provide little suitable habitat for aquatic species such as CRLF in the northern portion of Meadow Creek. Some aquatic species do persist; however, a large population of bullfrog occurs in the creek (Althouse and Meade, Inc. 2005). Farther downstream in Oceano (Meadow Creek) Lagoon, one CRLF was observed near Lakeside Avenue in 2012 by San Luis Obispo County workers removing bulrush (K. Drexhage, pers. comm. 2016). Two CRLF were also observed in Meadow Creek in 2012 near the confluence with Arroyo Grande Creek (Terra Verde Environmental Consulting 2012).

CRLF have been observed during fisheries surveys within Arroyo Grande Creek and during monitoring for a nearby flood control maintenance project (Cleveland 2009, Rischbieter 2009a, 2010, 2013, CNDDB

[27] Based on its characteristics, a tadpole observed incidental to fisheries surveys is presumed to have been a CRLF (S. Little, pers. comm. 2019b).

2016). In addition, CRLF were regularly found in Arroyo Grande Creek from 1996 through 2009 from 0.3 mile upstream from the mouth (the CDPR boundary) to the railroad (Cleveland 2009, CNDDB 2016). More recently, CRLF were observed along the northern bank of Arroyo Grande Creek within the HCP area (Terra Verde Environmental Consulting 2012). The habitat within this area typically consists of pools with tall willows and emergent vegetation. CRLF population observations within Arroyo Grande Creek and Estuary between 2010 and 2019 are presented in Table 3-14. Years where CRLF were not observed are attributed to significant drought (C. Cleveland, pers. comm. 2017).

Table 3-14. CRLF Observations within Arroyo Grande Creek and Estuary, 2010–2019

Year	No. Adults	No. Juveniles	No. Tadpoles	No. Egg Masses
2010	0	2	0	0
2011	0	0	2	0
2012	0	0	0	0
2013	0	3	0	0
2014	0	0	0	0
2015	0	0	0	0
2016	0	0	0	0
2017	0	3	1	0
2018	0	0	0	0
2019	14[1]	18[1]	3[1]	1

[1]Table shows total number of observations in a given year, which may include multiple surveys. The same individual may have been observed and counted during more than one survey.

Sources: (Cleveland 2018c, 2018a, 2018b, 2018d, C. Cleveland, pers. comm. 2019)

CRLF habitat is distributed throughout the Oso Flaco Lake system. The freshwater lakes in the Oso Flaco Lake area occupy a surface area of 82 acres and are classified as palustrine emergent wetlands. CNDDB reports CRLF within Oso Flaco Creek upstream of the HCP area boundary (outside of CDPR ownership) on three separate survey dates beginning in 2002 (CNDDB 2016). The channel in this area has ponds lined with cattails and bulrush and a willow riparian area. CNDDB reports CRLF occurring at Little Oso Flaco Lake in 1998, and surveyors observed one adult in Little Oso Flaco Lake in 2017, two adults in 2018 (Cleveland 2018c), and up to 3 adults and 5 juveniles in 2019 (S. Little, pers. comm. 2019a). Surveyors heard 1 adult calling and observed 2 juveniles in Oso Flaco Lake in 2019. Habitat in this area consists of dune swales dominated by rush (*Juncus* sp.), cattails, and poison oak (*Toxicodendron diversilobum*). Dune scrub comprises the adjacent uplands. CRLF have also been observed in Jack Lake and in the Phillips 66 leasehold approximately 0.7 miles northeast of Little Oso Flaco Lake in 2006.

Numerous water bodies, wetland habitats, and permanent and intermittent creeks that occur within and immediately adjacent to the HCP area could also support small populations of CRLF depending on rainfall, irrigation practices, and presence of non-native predators such as sunfish. These include Pismo Creek, Meadow Creek, Carpenter Creek, Oceano (Meadow Creek) Lagoon, and numerous unnamed water bodies such as the dune slack lakes. In general, while these wetlands generally provide low-quality habitat, with bullfrogs and mosquito fish present, the seasonal drying of these wetlands may help to benefit CRLF by periodically killing off their more water-dependent predators. CRLF is also known from CNDDB and other records to occur outside of the HCP area. For example, in 2000, CRLF were found in a marshy area south of Oso Flaco Lake and in an area referred to as “Finger Lake,” which feeds into Little

Oso Flaco Lake (CDPR 2001b). CRLF are also known to occur at the Guadalupe-Nipomo Dunes National Wildlife Refuge, immediately south of the HCP area (USFWS 2013c).

Habitat conditions for CRLF within the HCP area vary in water quality and the presence of invasive predators. For example, largemouth bass (*Micropterus salmoides*), crayfish, and a snapping turtle (*Chelydra serpentina*) have been found in Oso Flaco Lake (CDPR 2001b, 2017b). Poor water quality in Oso Flaco Lake, which receives agricultural discharge, may negatively affect resident CRLF.

3.3.3.5 Regulatory Status and Recovery Plan

The USFWS listed the CRLF as a threatened species in 1996 (USFWS 1996). The species is also a CDFW species of special concern. Critical habitat for CRLF has been designated and redesignated several times by the USFWS (USFWS 2001a, 2006c). The current rule for final critical habitat was finalized in 2010 (USFWS 2010d). There is no designated critical habitat within the HCP area.

The USFWS issued the final Recovery Plan for the CRLF in 2002 (USFWS 2002). San Luis Obispo County is within Recovery Unit 5 of the CRLF Recovery Plan (USFWS 2002). The USFWS Recovery Plan for the CRLF (USFWS 2002) identifies five criteria for recovery and seven general actions. The overall recovery strategy involves:

- Protecting existing populations by reducing threats
- Restoring and creating habitat that will be protected and managed in perpetuity
- Surveying and monitoring populations and conducting research on the biology and threats of subspecies
- Re-establishing subspecies populations within its historic range
- Determining, protecting, and managing additional habitat needed for population connectivity, recolonization, and dispersal

The Recovery Plan recommends management and protection plans for each watershed and Core Recovery Area to address the recovery strategies as applicable. Management and protection plans are to include proposals to incrementally protect (via conservation easements, fee title, acquisitions or other mechanisms) important breeding and dispersal habitats. Arroyo Grande Creek is identified as a Core Recovery Area and is within the HCP area. In addition, Oso Flaco Creek and Oso Flaco Lake are included in Core Recovery Area 24 and are within the HCP area. Specific conservation needs identified in the Recovery Plan for the Arroyo Grande Core Recovery Area 23 and Santa Maria-Santa Ynez Core Recovery Area 24 are:

- Arroyo Grande Creek: Restore habitat, protect habitat connectivity (Recovery Task 1.23).
- Santa Maria-Santa Ynez River: Protect existing populations; reduce contamination of habitat; control non-native predators; implement management guidelines for recreation; cease stocking dune ponds with non-native, warm water fish; manage flows to decrease impacts of water diversions; implement guidelines for channel maintenance activities (Recovery Task 1.24).

Task 1.23 of the Recovery Plan also recommends that CDPR and USFWS develop and implement a management and protection plan for Core Recovery Area 23 (USFWS 2002). Management target numbers are not part of the CRLF Recovery Plan.

3.3.3.6 Suitable Habitat in the HCP Area

CRLF habitat was mapped in the HCP area to identify potentially suitable aquatic habitat and upland habitat (Map 14). Aquatic habitat was identified based on the habitat associations described in section 3.3.3.2 and the aquatic areas known and suspected to be occupied by CRLF. CRLF is known to occur in Arroyo Grande Creek and estuary, Oceano (Meadow Creek) Lagoon, Oso Flaco Creek, Little Oso Flaco Lake, Jack Lake, and Oso Flaco Lake (Cleveland 2009, Terra Verde Environmental Consulting 2012, CNDDB 2017, S. Little, pers. comm. 2019a, 2019b). Mapped aquatic habitat includes these areas as well as all adjacent riparian areas, which could serve as dispersal habitat. Pismo Lake would provide potentially suitable aquatic habitat; however, it is not known to be occupied due to an abundance of bullfrogs. Because it lacks adequate vegetative cover, Pismo Creek does not provide aquatic or riparian habitat for CRLF within the HCP area. A presumed CRLF tadpole was observed in Carpenter Creek in 2019, but no CRLF of any life stage were observed during subsequent surveys. The creek was inundated with non-native fish (S. Little, pers. comm., 2019b). Carpenter Creek may be suitable CRLF habitat in some years if water conditions are suitable and non-native predators are limited.

Potentially suitable upland habitat primarily includes areas that may be used for dispersal and, to a lesser extent, aestivation and foraging. Potentially suitable upland habitat was considered all habitat within a 1-mile buffer around aquatic habitat. In the USFWS review of dispersal distances in the final rule for critical habitat (USFWS 2010d), the USFWS concluded that 1 mile is reflective of the average dispersal distance for CRLF. Upland habitat was limited at the coastline to the mean high water as calculated by National Ocean and Atmospheric Administration and delineated in the National Hydrography Dataset (United States Geological Survey 2013), as CRLF are sensitive to high salinity (USFWS 2002). Developed areas, such as the ranger station and yard, are not included in upland habitat given the hardscape and dense development in these areas. Upland habitat outside the HCP area is also not included in Map 14, given the level of urban development.

A total of 5,005 acres were mapped as suitable CRLF habitat in the HCP area: 178 acres of aquatic habitat and 4,827 acres of upland habitat.

3.3.4 Tidewater goby (Eucyclogobius newberryi)

3.3.4.1 Biology and Distribution

Endemic to coastal, brackish-water habitats of California, tidewater goby is a small, elongate fish rarely exceeding 2 inches, with two dorsal fins, large pectoral fins, and eyes oriented high on the head. Male tidewater gobies are nearly transparent, with a mottled brownish upper surface, and they tend to remain near their burrows. Female tidewater gobies develop darker colors, often black, on the body and dorsal and anal fins, with pectoral and pelvic fins, head, and tail remaining grey or brown (USFWS 2005b).

Tidewater gobies generally only live for about 1 year, with few individuals living longer (Swift et al. 1989, Moyle et al. 1995). Reproduction occurs year-round, although distinct peaks in spawning occur, often in early spring and late summer (USFWS 2005b). Fluctuations in reproduction are likely due to the death of breeding adults in early summer and colder temperatures or hydrological disruptions in winter (Swift et al. 1989). Male tidewater gobies begin digging breeding burrows in relatively unconsolidated, clean, coarse sand, in April or May after lagoons are closed off from the ocean (Swift et al. 1989). Female tidewater gobies aggressively spar with each other for access to males with burrows for laying their eggs. Female tidewater gobies can lay 300 to 500 eggs per clutch, depending on the size of the individual female (Swift et al. 1989). Male tidewater gobies remain in the burrow to guard the eggs, which are attached to sand grains in the burrow ceiling and walls. The male tidewater goby cares for the embryos for approximately 9 to 11 days until they hatch, rarely if ever emerging from the burrow to feed.

Historically ranging from Tillas Slough (mouth of the Smith River, Del Norte County) near the Oregon border to Agua Hedionda Lagoon (northern San Diego County), tidewater gobies are still found today entirely within that original known range. Tidewater gobies are absent from areas where the coastline is steep and streams do not form lagoons or estuaries. The tidewater goby lacks an explicit marine dispersal phase and spends its entire life within discrete coastal wetlands, naturally separated by the presence of sandbars that restrict access to the Pacific Ocean (McCraney et al. 2010). These sandbars generally breach 1–2 times per year during periods of high surf and freshwater input, resulting in rapid draining of the estuary (Krauss et al. 2002). Thus, successful migration between lagoon habitats requires coordination of breaching events, typically between geographically proximate habitats, and dispersal is passive (Lafferty et al. 1999, Dawson et al. 2001, McCraney et al. 2010). Migration between lagoons is thought to be rare (McCraney et al. 2010).

Tidewater goby populations (i.e., localities) are believed to occur as metapopulations[28] (Lafferty et al. 1999, USFWS 2005b). Tidewater goby populations are frequently isolated from other local populations by extensive areas of unsuitable habitat, and tidewater gobies occupy coastal lagoons and estuaries that in most cases are separated from each other by the open ocean. Very few tidewater gobies have ever been captured in the marine environment (Swift et al. 1989), which suggests this species rarely occurs in the open ocean. Lafferty et al. (1999) suggest that some tidewater goby populations persist on a consistent basis (potential sources of individuals for recolonization), while other tidewater goby populations appear to experience intermittent extirpations. Flood flow and desiccation extirpate tidewater goby habitats, imparting an extirpation/recolonization metapopulation dynamic (Lafferty et al. 1999), and extirpation appears to be accentuated by anthropogenic habitat modification and introduction of invasive species (Swift et al. 1989). Some localities where tidewater gobies have been extirpated have apparently been recolonized when extant populations were present within a relatively short distance of the extirpated population (USFWS 2007d).

Tidewater goby is known to have historically inhabited at least 135 localities (USFWS 2005b). Presently 23 of the 134 (17 percent) documented localities are considered extirpated and 55 to 70 (41 to 52 percent) of the localities are naturally so small or have been degraded so much over time that long-term persistence is uncertain. Principal threats to the tidewater goby include loss and modification of habitat, water diversions (including groundwater pumping), predatory and competitive introduced fish species, habitat channelization, and degraded water quality (USFWS 2005b).

Data on tidewater goby population dynamics are limited. Estimates of population size are generally lacking due to the constant variability in local abundance. Seasonal changes in distribution and abundance further hamper efforts to estimate population size for this short-lived species. Tidewater goby populations can also vary with between-year changes in environmental conditions such as drought (USFWS 2007d).

3.3.4.2 Habitat Associations

Tidewater gobies are adapted to coastal lagoons, marshes, the uppermost brackish zone of larger estuaries, and lower-stream reaches where the water is fairly still but not stagnant. Tidewater gobies rarely inhabit marine or freshwater habitats. They avoid open areas where there is strong wave action

[28] A *metapopulation* is a group of partially isolated populations belonging to the same species that are connected by pathways of immigration and emigration. Exchange of individuals occurs between such populations, enabling recolonization of sites from which the species has recently become extirpated (locally extinct).

or strong currents, though they enter marine environments when flushed out of brackish habitats by high flows (or normal breaching of lagoon sandbars, if present) following storm events. Tidewater gobies prefer a sandy substrate for breeding, but they can be found on rock, mud, and silt substrates as well.

Tidewater goby is almost unique among fishes of the Pacific Coast of the U.S. in its restriction to low-salinity water. The species is typically found in water less than 3.3 feet deep and salinities of less than 12 parts per thousand (ppt), though they have been documented in waters with salinity levels from 0 to 42 ppt, water depths from 10 to 79 inches, and waters with temperature levels from 46 to 77 degrees Fahrenheit (°F; 8 to 25 degrees Celsius [°C]) (USFWS 2005b). The tidewater goby is benthic in nature, with a diet consisting mostly of small crustaceans and aquatic insects (Swift et al. 1989).

3.3.4.3 Occurrence within HCP Area

Within the HCP area, tidewater goby is known to occur in Pismo and Arroyo Grande Creeks (Map 15). Both creeks arise from the mountains of San Luis Obispo County and flow westward to the Pacific Ocean. The mouths of both creeks end at coastal lagoons/estuaries typical of small coastal watersheds that form sandbars in low-flow summer and fall periods. A lagoon is typically present year-round at Pismo and Arroyo Grande creeks; however, during some periods of drought, the lagoon has been known to dry up completely. The lagoon's size and configuration vary due to runoff and waves. In most winters, sufficient runoff is present after large rain events to breach the sandbar formed at the crest of the beach and create a continuous flow into the ocean. The creeks then form lagoons in the summer and fall when runoff is very low or absent. Tidewater goby habitat encompasses 45 acres within the HCP area.

Tidewater gobies have also been observed in Carpenter Creek, which can connect to the Pismo Creek Lagoon, and in the Oceano (Meadow Creek) Lagoon, which drains into the Arroyo Grande Creek Lagoon (Rischbieter 2014). The small Carpenter Creek population is an extension of the population in Pismo Creek. Tidewater gobies have been observed in Carpenter Creek as recently as 2018 (D. Rischbieter, pers. comm. 2018). Tidewater goby is also known to occur in San Luis Obispo Creek and Santa Maria Creek near the HCP area (each about 9 miles to the north and south, respectively; [USFWS 2005b, 2007d]).

Two tidewater gobies have also been documented in lower Oso Flaco Creek (D. Rischbieter, pers. comm. 2017a); this is significant in part because the Oso Flaco watershed includes designated critical habitat for tidewater goby (USFWS 2008c)**.**

3.3.4.3.1 Pismo Creek

The Pismo Creek channel/lagoon system trends southerly but does not typically drift as far south as Meadow Creek. The lagoon varies in size and length yearly, with the break in the barrier beach generally occurring one to several hundred yards south of Addie Street. At high tide, saltwater flows into Pismo Creek for nearly 0.5 mile upstream to a grade-control structure that begins at the Highway 101 overpass.

In the Pismo Creek estuarine lagoon, the available tidewater goby habitat encompasses approximately 24 acres. Tidewater gobies were present in Pismo Creek during surveys in September 2007 (D. Rischbieter, pers. comm. 2007); February 2008 (C. Swift, pers. comm. 2008); March, July, and October 2011 (D. Rischbieter, pers. comm. 2011a, 2011b, 2011c); April 2012 (D. Rischbieter, pers. comm. 2012); and throughout 2017 and 2018 (D. Rischbieter, pers. comm. 2018).

3.3.4.3.2 Arroyo Grande Creek

In 1961, Arroyo Grande Creek was channelized from Los Berros Creek downstream to the Pacific Ocean with the use of levees to control flooding (Waterways Consulting, Inc. 2010). The Arroyo Grande Creek estuary typically consists of three distinct aquatic habitats: an upstream riverine environment

characterized by a series of short low-gradient riffles and shallow (less than 3 feet) pools, runs, and glides that flow westward; a several-acre L-shaped lagoon behind the beach and along the end of a levee; and, when the lagoon is draining to the ocean, a few hundred feet of transitory low-complexity, relatively shallow channel that connects the lagoon to the surf line, characterized by sand banks and substrate. The northeast/upstream end of the lagoon and both sides of the upstream reach are confined by levees. Patches of submerged and emergent aquatic vegetation and varying substrates of mud, silt, and gravel characterize the lagoon. The upper lotic (i.e., area of flowing water) reach is usually characterized by dense riparian vegetation on and overhanging the banks, predominantly small-gravel and sand substrate, and a sparse distribution of large woody debris.

Tidewater goby were first observed in Arroyo Grande Creek in February 2005 (Rischbieter 2006) and have been observed in Arroyo Grande Creek irregularly since then (Table 3-15). In-depth fishery sampling in 2004 was relatively extensive; thus, the species is presumed to have been absent in 2004, and its occurrence in 2005 is assumed to be the result of a recent colonization. There is no known record of their collection here at any previous time during the last century.

The lower 1 mile of Arroyo Grande Creek and the Arroyo Grande Creek Lagoon are located within Pismo State Beach. As discussed previously (section 3.1.3), the lower portion of Arroyo Grande Creek and the lagoon are heavily impacted by water uses upstream (including unregulated groundwater pumping), which in dry years result in dry creek beds and a greatly reduced lagoon (Rischbieter 2010). Periodic sampling for tidewater goby suggests their presence in the Arroyo Grande Creek Lagoon can be variable and tenuous depending on conditions in the lagoon (Rischbieter 2009a, 2009b). Although found to be common in February 2008 (C. Swift, pers. comm. 2008), no tidewater gobies were collected in surveys in September and December 2008 or in four sampling efforts in 2009 (Rischbieter 2009a, 2009b). Droughts in 2008 and 2009 likely resulted in near-complete fish-kills, and tidewater goby was thought to be extirpated from the lagoon at that time (Rischbieter 2009a, 2009b). Specifically, the complete desiccation of the lagoon and nearby upstream area due to groundwater overdraft during a very dry summer was likely responsible for the apparent extirpation in 2008 and 2009 (Rischbieter 2009a, 2009b). Tidewater gobies recolonized the Arroyo Grande Creek Lagoon in 2010, and a small amount of freshwater inflow occurring as late as August 2010 likely allowed fish species to persist through the summer (Rischbieter 2010). Since then, tidewater goby had a resurgence, numbering in the 1,000s in 2013 and 2014 despite the drought conditions (Table 3-15; [Rischbieter 2013]). Tidewater goby was not found during surveys conducted in December 2015 or February 2016, but otherwise dozens to thousands were observed throughout the lagoon later in 2016 and during all 2017 and 2018 surveys (Table 3-15, Rischbieter 2017, (Rischbieter 2018).

Tidewater goby was also found in July 2014 in Meadow Creek upstream of the flood control flapgates separating Arroyo Grande Creek and the Meadow Creek watershed (Rischbieter 2014). However, stream conditions in 2015 were persistently the driest observed at Arroyo Grande Creek since CDPR began tidewater goby monitoring in 2003 (i.e., there was no lotic stream habitat present on any survey date) and surface inflow to the large, persistent lagoon pool was absent essentially all year. Lagoon water quantity and quality progressively declined over the 2015 survey period, but never reached the near-complete desiccation observed in 2008 and 2009. Immediately preceding the last survey in December 2015, a surge of seawater (i.e., high tides and surf over about 2 days) apparently caused a large-scale displacement of the previously-established and drought-enduring fishery. This 2-day event seemed to impact the lagoon ecosystem even more significantly than had the severe 2014–2015 drought conditions, so much so that the entirety of the Arroyo Grande Creek Lagoon fish community suffered a severe decline (Rischbieter 2016).

The available tidewater goby habitat in Arroyo Grande Creek encompasses approximately 19 acres and is entirely within or adjacent to the HCP area. At least 18 other species of fish have been documented

using this habitat (Rischbieter 2009a, 2011), including introduced warm water sport fish such as largemouth bass and various other sunfish. The Arroyo Grande Creek Lagoon is separated from the Meadow Creek drainage to the north by a levee and flood control gates (Rischbieter 2010, Waterways Consulting, Inc. 2010). When stream levels rise, the floodgates are opened and these invasive species make their way into the Arroyo Grande Creek Lagoon (D. Rischbieter, pers. comm. 2011c). Existing fisheries' survey permitting authority does not specifically authorize removal of invasive predatory species upon collection. Surface water diversions and especially groundwater pumping have been blamed for the occasional dewatering of habitat in the lower reaches of this stream. Unregulated groundwater pumping perennially creates a significant cone of depression adjacent to Arroyo Grande Creek immediately upstream from the park boundary (Fugro Consultants 2014, 2015, GSI Water Solutions, Inc. 2018), and it is believed that the surface waters of lower Arroyo Grande Creek are occasionally 100 percent consumed by this persistent, well-induced feature.

3.3.4.3.3 Oso Flaco Creek

The USFWS has identified approximately 0.7 acre of available, potential (unoccupied) tidewater goby critical habitat in what the USFWS calls the "Oso Flaco Lagoon" (USFWS 2005b). A true lagoon appears to form here rarely, but it is hydrologically associated with Oso Flaco Lake and Creek when present. Historically, tidewater goby has not been known to occur in the lake or creek until the first such collection in March 2017, when two adult tidewater gobies were collected within a short reach extending from the surf zone to where Oso Flaco Creek exits the dunes (D. Rischbieter, pers. comm. 2017a). A positive collection could not be subsequently repeated, despite several subsequent attempts (D. Rischbieter, pers. comm. 2018). In the absence of a true and persistent lagoon, CDPR does not consider the creek habitat to be suitable for goby in most years. The Oso Flaco Lake fishery is dominated by warm water sport fish, such as largemouth bass and sunfish, and the creek is narrow and confined (D. Rischbieter, pers. comm. 2011c). The creek only rarely impounds to form a true lagoon, and as a result, there is a large freshwater influence with no saltwater prism. Consequently, this area appears to be poor long-term habitat for tidewater goby.

3.3.4.4 Tidewater Goby Regulatory Status, Recovery Plan, and Critical Habitat

The State of California listed the tidewater goby as a species of special concern in 1980. The USFWS listed the tidewater goby as an endangered species in 1994 (USFWS 1994). The USFWS 12-month finding, completed in March 2014, concluded with a proposed rule that the species be downlisted to threatened (USFWS 2014c); however, it is still listed as endangered, and the USFWS has not finalized the downlisting. The USFWS published the final designated critical habitat in 2008 (USFWS 2008c); the USFWS revised the critical habitat in 2013 (USFWS 2013d).

The USFWS designated 18 acres of Pismo Creek and Pismo Creek Lagoon as critical habitat in 2008 (Unit SLO-11; Map 15), noting the habitat is threatened by coastal development, channelization, and non-point and point source pollution (USFWS 2008c, 2013d). The 2013 revised critical habitat designation increased the critical habitat at Pismo Creek by 2 acres, bringing the total to 20 acres in this area. The USFWS also added a new critical habitat unit at Oso Flaco Lake (Unit SLO-12). The unit encompasses approximately 171 acres and consists of 140 acres of CDPR lands and 30 acres of private lands. The USFWS defined this critical habitat unit as an area that is "outside the geographical area occupied by the species at the time of listing, is not known to be currently occupied, and [that] there are no historical tidewater goby records for this location" (USFWS 2013d). However, the USFWS found this unit is essential for the conservation of the species because "it provides habitat to nearby occupied units and is identified in the Recovery Plan as a potential introduction site, and could provide habitat for maintaining the tidewater goby metapopulation in the region" (USFWS 2013d). It is suspected that this unit has the potential to provide habitat for tidewater goby that disperse from Arroyo Grande Creek and the Santa

Maria River and allow for connectivity between populations; however, water quality impairments may prevent tidewater goby from establishment at this area.

The USFWS issued the final Recovery Plan for the tidewater goby in 2005 (USFWS 2005b). The HCP area occurs within Sub-Unit CO1 of the Conception Recovery Unit. The Conception Recovery Unit begins south of the promontory of Point Buchon (a headland just south of Montana de Oro State Park), extends all the way around Point Conception, and is bounded to the south and east of the Santa Barbara coast, ending at the southern Ventura County line. Sub-Unit CO1 extends between Point San Luis and Point Sal and consists of a largely sandy shoreline. Four localities in this sub-unit currently have tidewater gobies: San Luis Obispo Creek, Pismo Creek, Arroyo Grande Creek, and the Santa Maria River (USFWS 2005b, C. Swift, pers. comm. 2008). Only Pismo Creek and Arroyo Grande Creek are located in the HCP area. Based on the apparent genotypic distinction of populations in this region, effort to reestablish tidewater gobies in other coastal habitat, such as near Oso Flaco Lake, is recommended (USFWS 2005b). As noted above (section 3.3.4.3.2), however, this area would most likely be poor long-term habitat for the tidewater goby.

The overall recovery strategy contained in the USFWS Recovery Plan for the Tidewater Goby (USFWS 2005b) involves the following:

- Monitor, protect, and enhance current habitat conditions for extant populations
- Conduct research to acquire additional information needed for management
- Restore degraded habitats to suitable conditions and reintroduce or introduce tidewater gobies to those habitats
- Develop and implement an information and education program

3.3.4.5 Suitable Habitat in the HCP Area

Suitable tidewater goby habitat was mapped based on the areas in the HCP area known to be occupied by tidewater goby (Map 15). Tidewater goby are known to occur in Pismo Creek estuary, Arroyo Grande Creek estuary, and occasionally in Carpenter Creek and the Oceano (Meadow Creek) Lagoon. Tidewater gobies generally select habitat in the upper estuary, usually within the fresh-saltwater interface. Tidewater gobies are typically found upstream a short distance into freshwater and downstream into water of up to about 80 percent sea water or 28 ppt (Worcester 1992, Worcester and Lea 1996). Map 15 shows tidewater goby occupied habitat at the Pismo Creek and Arroyo Grande Creek estuaries. The occupied habitat was mapped using aerial imagery (National Agricultural Imagery Program 2014) and the location of tidewater goby habitat identified from tidewater goby field surveys that have been conducted since 2003 (Rischbieter 2018). Potential occupied habitat was not mapped at Oso Flaco Lake and Oso Flaco Creek, as a true lagoon/estuary has too rarely been observed in this area, and there is a large freshwater influence with no salt-water prism (section 3.3.4.3.2). A total of 45 acres was mapped as suitable tidewater goby habitat in the HCP area.

Table 3-15. Results from Surveys for Tidewater Goby at Arroyo Grande Creek, 2005–2018

Survey Date (Year-Month)	No. of Tidewater Goby Observed	Survey Date (Year-Month)	No. of Tidewater Goby Observed
2005-March	Abundant; this is the first observation of tidewater goby at Arroyo Grande Creek	2012-July	1,000s
2005-June	Not sampled	2012-September	100,000s

Table 3-15. Results from Surveys for Tidewater Goby at Arroyo Grande Creek, 2005–2018			
Survey Date (Year-Month)	**No. of Tidewater Goby Observed**	**Survey Date (Year-Month)**	**No. of Tidewater Goby Observed**
2005-August	Few*	2013-April	1,000s
2005-December	0	2013-May	Dozens
2006-February	0	2013-July	Dozens
2006-June	1	2013-September	Few to dozens
2006-September	1	2014-April	Dozens
2006-December	0	2014-May	100s
2007-April	Few	2014-July	100s
2007-June	Abundant**	2014-September	100s
2007-September	Abundant	2014-December	Dozens
2007-December	Abundant	2015-February	1,000s
2008-March	Few	2015-April	1,000s
2008-June	Few; survey was concurrent with an extensive fish-kill	2015-June	1,000s
2008-September	0	2015-August	1,000s
2008-December	0	2015-October	1,000s
2009-April	0	2015-December	0
2009-June	0	2016-February	0
2009-August	0	2016-April	Dozens
2009-October	0	2016-July	Dozens
2010-April	2	2016-October	1
2010-June	9	2016-December	Dozens
2010-August	4	2017-March	Dozens
2010-October	3	2017-June	100s
2011-March	0	2017-July	10,000s
2011-June	0	2017-October	1,000s
2011-July	0	2018-February	100s
2011-October	6	2018-April	100s
2012-April	Few	2018-July	1,000s
2012-June	10s	2018-October	1,000s

Notes:

*"few" = never more than single digits in any seine haul, and some seine hauls without any of that species

**"abundant" = essentially unavoidable (present in all or most seine hauls), collected in numbers that make it the most or one of the most common/abundant species present at the time (usually many-tens or dozens at a time)

Sources: (Rischbieter 2006, 2007, 2008, 2009b, 2009a, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018)

3.4 Listed Plant Species

This HCP includes six plant species that are listed under CESA and/or FESA (Table 1-1) and are present within the HCP area. Of the six listed plant species, four are listed as federal endangered as well as state-

listed (state endangered or threatened), and two are only state threatened. Although FESA does not prohibit take of listed plant species, the Oceano Dunes District has included them in this HCP and requests assurances for them under USFWS's "No Surprises" assurances rule, discussed in section 6.5.2.

Habitat for each listed plant species was mapped (Map 16) by identifying the vegetation alliances described in section 3.1.5.1 that could be associated with each plant species. Alliances were mapped as suitable habitat for each listed plant species if the particular plant species was found to occur in that alliance in the HCP area. Alliances were also mapped as suitable habitat if the CNDDB occurrence records from outside the HCP area identified additional vegetation alliances, as indicated by commonly associated species. Refinements between each listed plant species and vegetation alliances were also identified based on the scientific literature, recovery plans, critical habitat designation, USFWS 5-year reviews, and the best professional judgment of CDPR staff with experience working with the covered species in the HCP area.

Listed plant species occurrence data were reviewed and used to prepare the following sections. Two primary sources of spatial (GIS-based) data were used: (1) plant species occurrence data collected during various surveys in portions of the HCP area (CDPR 2014b, MIG 2015) and (2) CNDDB occurrence data (CNDDB 2017). Listed plant occurrence data collected during various surveys in portions of the HCP area were either recorded on field maps to be digitized or recorded using a Global Positioning System (GPS) unit.

The following sections use different terms to describe groupings of the same species of plants to be consistent with the terms used by CNDDB and USFWS (e.g., in the USFWS 5-year reviews for La Graciosa thistle (USFWS 2011c), Nipomo Mesa lupine (USFWS 2009d), marsh sandwort (USFWS 2008d), and Gambel's watercress (USFWS 2011c), and to identify smaller groupings of plants in and adjacent to the HCP area during survey efforts by the Oceano Dunes District and other entities (e.g., the Land Conservancy of San Luis Obispo [LCSLO]).

- The term "occurrence" is used to be consistent with the definition used by CNDDB and as used in the 5-year reviews, which is an individual or group of individuals within 0.25 mile and not separated by significant habitat discontinuities (CNDDB 2017).
- The term "population" refers to a group of interbreeding individuals. A single population may include one or more occurrences.

3.4.1 Marsh Sandwort (*Arenaria paludicola*)

Marsh sandwort is a perennial herb in the pink family (Caryophyllaceae). It has rooting, trailing stems and small white, inconspicuous flowers that bloom from May through August. It can also reproduce asexually by producing adventitious roots on the trailing stems that come in contact with suitable conditions.

3.4.1.1 Regulatory Status, Recovery Plan, and Threats to the Species

Marsh sandwort was listed as a state endangered species in 1990 and as an endangered species by the USFWS in 1993 (USFWS 1993). Marsh sandwort is one of two species addressed in the 1998 Recovery Plan for Marsh Sandwort (*Arenaria paludicola*) and Gambel's Watercress (*Nasturtium* [*Rorippa*] *gambelii*) (USFWS 1998). Recovery objectives for these species include the following:

- Protect, maintain, and enhance habitats
- Monitor and document species populations and habitat characteristics
- Conduct research on the ecology and biology of the species

- Expand existing populations
- Establish new populations
- Evaluate progress and update management and recovery guidelines

The USFWS conducted a 5-year status review of marsh sandwort to determine whether the federal listing status should be considered for change in 2008 (USFWS 2008d). As a result of this 5-year review, no change in status was recommended. Likewise, no change to its CESA listing status is proposed, and no critical habitat has been designated for this species.

The primary threats to the continued existence of marsh sandwort include: (1) habitat modification by converting marsh habitat to mesic upland habitats that support grass and shrub-dominated plant communities; (2) increased sedimentation caused by urbanization; (3) alteration of the hydrological regime; (4) herbivory by mammals; (5) water quality issues (e.g., excessive nitrogen); (6) climate change; and (7) sea-level rise (USFWS 2016c).

3.4.1.2 Regional Distribution and Abundance

Historically, this species occurred in swamps, marshes, and other wet areas in widely disjunct localities in California and Washington between sea level and 1,000 feet. In California, historical populations are known from five areas: San Francisco Bay (Crissy Field, San Francisco County), Santa Cruz (Scotts Valley, Santa Cruz County), Guadalupe-Nipomo Dunes (Black Lake, Black Lake Canyon, Jack Lake, Oso Flaco Lake, Twin Lake, and Pismo Beach, San Luis Obispo County), Los Angeles (Los Angeles basin, Los Angeles County), and along the Santa Ana River (vicinity of San Bernardino, San Bernardino County) (USFWS 2016c). Marsh sandwort typically occurred on saturated, acidic bog soils that were predominantly sandy with a high organic content (USFWS 1998). Currently, its primary habitat consists of boggy areas in freshwater marshes and swamps below 560 feet in elevation (USFWS 2008d). Marsh sandwort is found with dense mats of rushes, cattails, bur-reed (*Sparganium* spp.), and bulrush (USFWS 2008d).

When it was federally listed in 1993, marsh sandwort was only known from one extant population near the San Luis Obispo County coast at Black Lake Canyon on the Nipomo Mesa (Table 3-16). Naturally occurring plants were last seen at Black Lake Canyon in 1994 after a steady decline since 1985 (USFWS 1998). The species had since been reintroduced to Black Lake Canyon on three different occasions, but all attempts were unsuccessful, with the last observation in 1999. Marsh sandwort is now considered to be extirpated from Black Lake Canyon (USFWS 2008d). Marsh sandwort has also been reintroduced to the Sweet Springs Audubon Nature Preserve in Los Osos in San Luis Obispo County in 2003 (USFWS 2008d, CNDDB 2017). Approximately 200 marsh sandwort propagules were outplanted at six unnamed ponds and marshes on the Guadalupe-Nipomo National Wildlife Refuge in October 2008 (USFWS 2016c). While most survived the move, grazing mammals consumed nearly all the plants within 2 years (USFWS 2016c). In August 2013, an additional 90 marsh sandwort propagules were outplanted at the Guadalupe-Nipomo National Wildlife Refuge (USFWS 2016c). Exclusion fencing minimized the threat to the plants from herbivory by mammals, and at least 50 percent survived through at least October 2013. Their current status on the Guadalupe-Nipomo National Wildlife Refuge is unknown (USFWS 2016c).

Additional reintroduction efforts of marsh sandwort have occurred at Wilder Ranch/Baldwin Creek in Santa Cruz County, California and the Rodeo Creek and Miwok watersheds in the Golden Gate National Recreation Area in San Francisco County, California (National Park Service 2016, USFWS 2016c). The marsh sandwort plants at the Golden Gate National Recreation Area appear to be stable at all locations (National Park Service 2016). As of 2016, the two sites in Golden Gate National Recreation Area supported outplanted marsh sandwort individuals (National Park Service 2016). While marsh sandwort

plants are still extant at Baldwin Creek sites, it is too early to determine if these plants will establish and will be successful in the long term (USFWS 2016c).

After marsh sandwort was federally listed, a natural population was rediscovered in the HCP area at Oso Flaco Lake in 1998 (Map 17) (Chestnut 1998, USFWS 1998, 2008d). Chestnut (1998) reported marsh sandwort from two locations, separated by approximately 330 feet, in a marshy area near the northeast corner of Oso Flaco Lake. The larger of the two locations contained at least 65 plants, and the smaller location was comprised of at least 20 plants. The plants were growing in an area dominated by broad-fruited bur-reed (*Sparganium eurycarpum*) and appeared to be especially associated with Cusick's sedge (*Carex cusickii*)—a large, tussock-forming species of localized occurrence in this area. This site now comprises the only known extant, wild population. This population has been in decline since 1998, however, with only 25 clumps reported in 2005 (CNDDB 2017). A decline in habitat quantity and quality was recorded at this site in late 2006 (CNDDB 2016). The vegetation at this location was observed to be thicker, denser, and more overgrown, consistent with biostimulation. Development and agricultural operations upstream from the lake have indirectly caused a decline in the quality of the marsh and swamp habitat through increases in nutrients (USFWS 2008d). A survey by CDPR contractors for marsh sandwort was attempted in 2013. Surveyors could not confirm presence of the plant due to problems with accessibility but did determine that habitat, including the sedge (*Carex*) mat microhabitat used by this species, is still present in locations where marsh sandwort was observed in the past (Appendix H). The area was surveyed in June and September 2018 (J. Chestnut, pers. comm. 2019). Surveyors found marsh sandwort growing in a narrow band just outside the overhead willow canopy and shoreward from the tule marsh that dominates that portion of the lake. They noted that in this narrow band, Cusick's sedge formed floating clumps that provided a substrate for the marsh sandwort to grow over. Although specific numbers of individuals or population acreage was not determined, it appeared the tule coverage had expanded compared to previous visits, and the habitat band for the sandwort was in turn shrinking (J. Chestnut, pers. comm. 2019).

The CNDDB reports only the populations at Oso Flaco Lake and Morro Coast Audubon Society Sweet Springs in Los Osos to be extant. Outplanted individuals (described above) have not been reported to CNDDB and are not included in Table 3-16 below. All other previously reported populations (i.e., 13 since 1899) are considered extirpated or presumed extirpated (CNDDB 2017).

3.4.1.3 Suitable Habitat in the HCP Area

Suitable habitat for marsh sandwort was modeled for the HCP area using known habitat requirements for the species: all perennial wetlands, including freshwater marshes (fens), slow moving creeks in open places in peat; and possibly in brackish waters (USFWS 1998). For this HCP, CDPR mapped a total of 11 acres as suitable marsh sandwort habitat in the HCP area.

Table 3-16. Marsh Sandwort Occurrences In* and Near the HCP Area (Map 17)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
MASA1*	3	1993	0	CNDDB: Possibly extirpated	CNDDB (last updated in CNDDB: 2007-05-15): Site known from a 1950 collection. No plants found in 1987 and 1993.

Table 3-16. Marsh Sandwort Occurrences In* and Near the HCP Area (Map 17)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
MASA2*	9	2018	Present, but number of plants unknown	CNDDB: Presumed extant	CNDDB (last updated in CNDDB: 2016-4-15): 86 plants observed in 1998. Approximately 25 clumps seen in 2005; unknown number observed in 2006. This is the last remaining naturally occurring population. CDPR: CDPR survey attempt in 2013, but site was inaccessible. Suitable habitat appeared present. Unknown number of plants present in 2018 (J. Chestnut, pers. comm. 2018); observed narrow band shoreward from tule marsh. Assessed habitat band appears to be shrinking, likely due to tule expansion.
MASA3*	7	1998	0	CNDDB: Possibly extirpated	CNDDB: Jack Lake. Very few plants found in 1964. Area visited in 1987 and 1998 but no plants found. Lake overgrown so primary habitat no longer exists. CNDDB considers this occurrence to be "possibly extirpated."
MASA4*	4	1999	0	CNDDB: Possibly extirpated	CNDDB: 9 plants transplanted to Land Conservancy easement of Black Lake; none surviving in 1999. CNDDB considers this occurrence to be "possibly extirpated."

*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.

3.4.2 La Graciosa Thistle (*Cirsium scariosum* var. *loncholepis*)

La Graciosa thistle is a bushy biennial or short-lived, perennial herb with large, smooth to slightly hairy leaves and clustered heads of white flowers. Flowering May–August, it is a spreading, mound-like or erect plant in the sunflower family (Asteraceae) that is well armored with spines on the leaves and flower heads. This species thrives on sandy soils and is pollinated by hummingbirds and insects (USFWS 2000b, 2009e). The variety and abundance of pollinators indicate that this species is a generalist (i.e., utilizes a wide variety of pollinators).

3.4.2.1 Regulatory Status and Threats to the Species

La Graciosa thistle was listed as a state threatened species in 1990 and a federal endangered species in 2000 (USFWS 2000b). Several taxonomic revisions were made for this species since that date and *C. loncholepis* is currently recognized by the scientific name *Cirsium scariosum* var. *loncholepis*.

The USFWS determined that existing La Graciosa thistle populations were threatened by direct and indirect effects from energy-related operations (e.g., maintenance activities, hazardous waste cleanup), development that results in additional habitat modification (e.g., agricultural and urban development), facility accidents by oil companies or VAFB, groundwater extraction and other hydrologic alterations,

direct and indirect effects from OHV activity, small population size, habitat fragmentation, loss through the invasion of aggressive invasive weeds, and climate change (USFWS 2000b, 2009e, 2011d).

A recovery plan for La Graciosa thistle has not yet been developed, but a draft recovery outline has been initiated (USFWS 2008e). The following recovery objectives are provided in the draft outline:

- Expand the current range to its historical range
- Increase the number of populations to maintain viable metapopulations
- Reduce threats from habitat alteration, competition with invasive species, and other threats to the point that populations are self-sustaining
- Maintain habitat of sufficient quality and configuration to support all life history stages, including germination, growth, reproduction, and seed dispersal

Critical habitat for La Graciosa thistle was designated in 2009 (USFWS 2009e). The USFWS-designated critical habitat in the HCP area includes the vegetation islands and adjacent open dunes in order to account for movement of vegetation islands over time at an estimation of approximately 1.6 feet per year (USFWS 2009e). However, the USFWS mapping only accounted for movement over 20 years.

3.4.2.2 Regional Distribution and Abundance

This species is known from coastal San Luis Obispo and Santa Barbara counties from Pismo Beach south to Los Alamos in Santa Barbara County. In general, La Graciosa thistle is associated with backdune and coastal wetlands on the margins of dune swales, dune lakes, marshes, estuaries, coastal meadows, seeps, springs, intermittent streams, creeks, and rivers (USFWS 2009e). The distribution of individual plants within populations is often an elongated pattern that is consistent with seed dispersal caused by the prevailing coastal winds (USFWS 2001b). It is often found in a mat of low-growing herbaceous plants, including rushes, sedge, salt grass (*Distichlis spicata*), Bermuda grass (*Cynodon dactylon*), clover (*Trifolium wormskioldii*), yerba mansa (*Anemopsis californica*), silverweed (*Potentilla anserina*), and birdfoot trefoil (*Lotus corniculatus*; (USFWS 2001b).

The Santa Maria River mouth area supports the largest concentration of this species, which is most frequently found in grassy patches on the upper margins of marshes associated with the Santa Maria River estuary. Floods in 1998 greatly reduced the number of La Graciosa thistle plants in that area (USFWS 2000b). Since federal listing, populations of this species have severely declined. The CNDDB currently reports 8 occurrences to be presumed extant; however, at the time of listing, the USFWS believed there were 11 extant occurrences distributed among 7 populations (USFWS 2000b). At that time, the extant occurrences ranged from the northern Callender Dune Lakes in the Callender Dunes to the seeps at Cañada de las Flores. At the time of the most recent USFWS 5-year review (USFWS 2011c), however, La Graciosa thistle was considered to have eight extant occurrences distributed among four populations, including southern Callender Dunes Lake, Oso Flaco, southern Guadalupe Dunes, and the Santa Maria River (Table 3-17). Two of these occurrences (i.e., Oso Flaco and southern Guadalupe Dunes) are within the HCP area and presumed extant (Map 18). Surveys in 2013, 2015, and 2017 confirmed the presence of La Graciosa thistle in the South Oso Flaco area at Surprise Lake; however, the Jack Lake occurrence appears to be extirpated (MIG 2015, M. Skinner, pers. comm. 2017).

Table 3-17. La Graciosa Thistle Occurrences In* and Near the HCP Area (Map 18)					
ODD HCP ID	**CNDDB Occurrence No.**	**Last Survey**	**No. Observed on Last Survey**	**Current Status (from CNDDB and/or USFWS)**	**Survey Source: Notes from Survey**
LGTH1	11	1988	20	CNDDB: Presumed extant	CDPR: <10 plants observed in 1981; 10-50 plants observed in 1984; 20 seen in 1988. CNDDB: ~245 plants in 2017. NW end of Small Twin Lake: 41 in 2018.
LGTH2	10	1986	0	CNDDB: Possibly extirpated	CNDDB: <10 plants seen in 1981; 100+ plants seen in 1983, none found in 1986. Populations fluctuate greatly from year to year. No plants observed in 2017.
LGTH3*	8	2015	0	CNDDB: Possibly extirpated	CDPR: Occurrence is small: only 1 flower plants, 3 seedlings, and 44 vegetative plants seen in 1990; one severely damaged plant was found 100 m east of the main population. Only 2 plants observed in 1998 and none in 2015. CNDDB: None seen in 1998, 2015, 2017.
LGTH4*	20	2017	0	CNDDB: Possibly extirpated	CDPR: 11 plants observed in 1990. No plants seen in 1998 or 2015. CNDDB: General SE polygon: Unknown number of plants at Lettuce Lake, mentioned in a 1980 McCoy report; no plants seen in 1998 or 2017. NW polygon: 12 plants observed in 1990; no plants seen in 1998, 2015, or 2017.
LGTH5*	13	2015	0	CNDDB: Possibly extirpated	CDPR: 34 plants found in two colonies in 1990. None seen in 1998 or 2015.
LGTH6*	30	2015	0	CNDDB: Possibly extirpated	CNDDB: Only source of information for this site is 1975 collection by Keefe. No plants seen in 2015 or 2017.
LGTH7*	12	2018	0	CNDDB: Presumed extant	CDPR: Surprise Lake. Fewer than 50 plants found in 1981; none found in 1986; 50 in 1987; 27 in 1990, 54 in 1997; 7 on N side in 1998 (none on E side). 10 in 2008; 37 in 2013, 1 in 2015, 8 in 2017. CNDDB: 37 in 2016, 65 in 2017, 0 in 2018.
LGTH8	31	2017	≥5	CNDDB: Presumed extant	CNDDB: 87 plants in 1997; 50 plants in 2007; seen in 2008; 300 in 2010; 172 in 2013, 10 in 2014. At least 5 plants (with seed heads) in 2017; fenced area no longer contained plants.

Table 3-17. La Graciosa Thistle Occurrences In* and Near the HCP Area (Map 18)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
LGTH9	32	2017	0	CNDDB: Possibly extirpated	CNDDB: 420 plants in 2005; 280 in 2006; 119 in 2007; 94 in 2008; 23 in 2009; 34 in 2010; 35 in 2011; 18 in 2012; 12 in 2013; 1 in 2014. Fence installed to protect plants from cattle. However, feral pigs have been invading the Guadalupe Dunes and are causing damage to many areas. No plants in 2015, 2016, or 2017
LGTH10	18	2017	913	CNDDB: Presumed extant	CNDDB: 137 plants in 1990; 31 in 1995 in 3 subpops. Unknown no. in 2000-2002; 2240 in 2006; 1558 in 2007; 1005 in 2008; 280 in 2009; 240 in 2010; 247 in 2011; 649 in 2012; 2812 in 2013; 23,500 in 2014; 5374 in 2015; 803 in 2016; 913 in 2017.
LGTH11	6	2017	unknown	CNDDB: Presumed extant	CNDDB: Gen. pop numbers for portions of site: 1000-10,000 plants in 1983; ~6000 in 1986; 54,000 established in 1990; 1746 in 2006; 1339 in 2007; 8362 in 2008; 9751 in 2009; 4464 in 2010; 3861 in 2014; 2833 in 2015; 1510 in 2016; seen in 2017.
LGTH12	19	2017	**0**	CNDDB: Presumed extant	CNDDB: 100 plants estimated in 1991; no plants seen in 2017.
LGTH13	28	1983	**0**	CNDDB: Possibly extirpated	CNDDB: Only source of information for this site is 1983 collection by Bevier. Plants uncommon. None seen in 2005, 2013 or 2017.

*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.

3.4.2.3 Suitable Habitat in the HCP Area

La Graciosa thistle habitat was modeled by CDPR in the HCP area using known habitat requirements for the species. This species has historically been treated as a lowland, coastal wetland species; therefore, dune wetlands and moist areas were identified as suitable habitat as shown in Map 16. For this HCP, CDPR mapped a total of 549 acres as suitable La Graciosa thistle habitat in the HCP area.

3.4.3 Surf Thistle (*Cirsium rhothophilum*)

Part of the sunflower family (Asteraceae), this species is a low-growing, short-lived perennial, usually living 2 **to** 3 years. Flowering occurs between April and June. It is characterized by large rosettes of spiny, white-woolly, deeply lobed and undulating leaves with white flowers in dense heads. The deep roots

and white-woolly herbage are adaptations to the physical stresses of the dune habitat, such as high light intensity, sand movement and abrasion, and limited water (CDFG 2005). Surf thistle occurs only in the narrow strip of coastal habitat between stabilized dunes and windblown beach between 9 and 200 feet elevation (CDFG 2005).

3.4.3.1 Regulatory Status and Threats to the Species

Surf thistle was listed as a state threatened species in 1990. This species is not a federally listed species. In general, motor vehicles, foot traffic, and invasive plants threaten this species (CNPS 2012).

3.4.3.2 Regional Distribution and Abundance

This species is endemic to the dunes of the central California coast, from the Nipomo Dunes of southern San Luis Obispo County to Point Conception in Santa Barbara County, including populations within Pismo State Beach and Oceano Dunes SVRA (Map 19). It grows in coastal foredunes on the slopes of transverse ridges in areas of active sand accumulation. At the southern extreme of its range, it is found in sand at the bases or tops of cliffs (CDFG 2005).

Statewide, the CNDDB has 21 recorded occurrences of surf thistle, with 1 considered extirpated, 1 considered possibly extirpated, and 19 presumed extant. Most observations have been documented on the VAFB. Within the HCP area, surf thistle was observed near Oso Flaco Creek and in the foredunes of the South Oso Flaco area (Appendix H) during vegetation mapping surveys conducted in 2012, as well as during rare plant surveys conducted annually since 2013 (Table 3-18). Although surf thistle was previously documented in the north Oso Flaco area, it has not been observed in this area since 2003 (CDPR 2008b).

Table 3-18. Surf Thistle Occurrences In* and Near the HCP Area (Map 19)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
SUTH1*	N/A	2013	0	N/A	CDPR: Extant Locally (L. Gardner, pers. comm. 2003); occurrence has not been observed since 2003. ST1 not present in this location 2013. North of known populations. No plants present at GPS point during 2013 survey. Unsuitable habitat.
SUTH2*	13	2014	0	CNDDB: Possibly extirpated	CDPR: Notes from CNDDB (last updated in CNDDB: 2015-06-11): 9 plants seen in 1986, 4 in 1990. None found in 1995 or 1998. Most of the population believed to be extirpated by an experimental revegetation project.

Table 3-18. Surf Thistle Occurrences In* and Near the HCP Area (Map 19)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
SUTH3*	14 (4 parts)	2019	2045	CNDDB: Presumed extant	4 polygons. CDPR: Northern polygon: 694 in 2013; 215 in 2014; 322 in 2015. Notes from CNDDB (last updated in CNDDB: 2015-06-11): 100+ plants observed in 1983. A few plants observed scattered through small transverse dunes in 1986. 85 plants in 1998. 296 in 2004. 2 middle polygons: 280 plants in 1998, 169 in 2008, 542 in 2012, approximately 1,623 in 2014, >1,600 in 2015, 1,298 in 2016, 1,483 in 2017, 1,263 in 2018, 1,449 in 2019. CNDDB: Southern polygon shows a reduction in size since 1986.
SUTH4	12 (2 parts)	1998	Unknown	CNDDB: Presumed extant	CNDDB (last updated in CNDDB: 2015-06-11): Reduction in size since 1986. 554 plants in 1990. Managed by the Nature Conservancy. Unknown number observed in 1998.
SUTH5	10 (3 parts)	1994	12	CNDDB: Presumed extant	CNDDB (last updated in CNDDB: 2015-06-11): 2 southern polygons: 1 plant observed in 1981 and 1986. 3 colonies mapped in 1981. Northern polygon: 11 plants observed in 1994.

*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.

3.4.3.3 Suitable Habitat in the HCP Area

CDPR modeled surf thistle habitat in the HCP area using known habitat requirements for the species. Modeled habitat includes sand dunes, mainly between the first set of dunes (unstabilized foredunes) and the stabilized dune areas (backdunes) (Map 16). For this HCP, CDPR mapped a total of 870 acres as suitable surf thistle habitat in the HCP area.

3.4.4 Beach Spectaclepod (*Dithyrea maritima*)

This species is a low growing, whitish-flowered perennial herb in the mustard family (Brassicaceae). The leaves are densely covered with grey hairs and are somewhat fleshy. The exposed stems are prostrate and less than 0.2 meter long, with the lower stems often under the sand (Al-Shehbaz 2017). The flowers are white to purple and can be seen from March to August (Al-Shehbaz 2017).

3.4.4.1 Regulatory Status and Threats to the Species

Beach spectaclepod was listed as a state threatened species in 1990. This species is not a federally listed species. Threats to the species include trampling by elephant seals (island occurrences) and humans, soil and water contamination, and invasive plants (CDFG 2005).

3.4.4.2 Regional Distribution and Abundance

Beach spectaclepod is found in small transverse foredunes within approximately 160–1,000 feet from the surf (CDFG 2005). Beach spectaclepod is usually found in areas of fragile dunes where the sand is relatively unstable. Historically occurring as far south as Los Angeles County and possibly Baja California Norte, Mexico, this species currently occurs in the dunes of San Luis Obispo and Santa Barbara counties and on San Nicholas and San Miguel Islands (CDFG 2005). At Oceano Dunes SVRA, beach spectaclepod is protected and monitored closely within the symbolic fence area in the foredune located just north and south of Oso Flaco Lake (Table 3-19 and Map 20; (CDPR 2015c, 2017b).

The CNDDB has recorded 28 occurrences of beach spectaclepod, with 3 considered extirpated and 25 presumed extant. At Oceano Dunes SVRA, beach spectaclepod was observed in the North Oso Flaco area during vegetation mapping surveys conducted in 2012 (Table 3-19) and in the North and South Oso Flaco areas during rare plant surveys conducted since 2013 (Table 3-19).

Table 3-19. Beach Spectaclepod Occurrences In* and Near the HCP Area (Map 20)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
BESP1*	12	2019	370	CNDDB: Presumed extant	Northern polygon: CDPR: Extant Locally, (L. Gardner, pers. comm. 2003); occurrence has not been observed since 2003. Middle 2 polygons: 2013, 237 plants; 2014, 53 plants; 2016, 337 plants; 2017, 252 plants; 2018, 276 plants; 2019, 370 plants. Eastern polygon: CNDDB (last updated in CNDDB: 2015-05-20): 54 plants in 1990; site is an experimental revegetation site.
BESP2*	25	2019	1,079	CNDDB: Presumed extant	CDPR: Burn transects: Northern polygon: 28 plants in 2008; approximately 101 in 2013; 20 in 2014; 6 in 2015. Middle polygon: 16 in 2004; 0 in 2008; approximately 115 in 2013; 0 in 2014; 368 in 2015. Southern 4 polygons: 16 in 2004; 269 in 2008; 327 in 2013; 289 in 2014; 342 in 2015, 713 in 2016, 538 in 2017, 529 in 2018, 1,079 in 2019. CNDDB (last updated in CNDDB: 2019-03-26): Mapped by CNDDB as 7 polygons according to 2015-2019 digital data. Collections from dunes south of Oso Flaco Lake are also attributed to this site.

Table 3-19. Beach Spectaclepod Occurrences In* and Near the HCP Area (Map 20)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
BESP3	24	1981	N/A	CNDDB: Presumed extant	CNDDB (last updated in CNDDB: 1999-01-19): Only source of information for this site is 1981 report and map by J. Vanderwier; unknown number of plants seen.
BESP4	10	1998	1,000	CNDDB: Presumed extant	CNDDB (last updated in CNDDB: 2019-03-26): 6 colonies (unknown number of plants) seen in 1981. Fewer than 10 plants seen in 1984–1986. 404 plants seen in 1990. Approximately 1,000 ramets seen in 1998. 1987 Smith collection also attributed here. 7627 plants in 2006; 8481 in 2007; 11,459 in 2008; 10,806 in 2009; 12,790 in 2010; 9930 in 2011; 12,171 in 2012; 13,579 in 2013; 19,312 in 2014; 22,697 in 2015; 7960 in 2016. Occurrence includes restoration sites with outplantings. Includes former EO #s 19 & 22.

*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.

3.4.4.3 Suitable Habitat in the HCP Area

Beach spectaclepod habitat was modeled in the HCP area using known habitat requirements for the species. Modeled habitat includes sand dunes, mainly between the first set of dunes (unstabilized foredunes) and the stabilized dune areas (backdunes) (Map 16). For this HCP, CDPR mapped a total of 870 acres as suitable beach spectaclepod habitat in the HCP area.

3.4.5 Nipomo Mesa Lupine (*Lupinus nipomensis*)

This species is a low-growing, blue-flowered, annual herb in the pea family (Fabaceae). Nipomo Mesa lupine requires fine-grained sandy soils of open sites or sparsely vegetated, stabilized dune communities close to the coast. Flowers are presumably capable of self-pollination but may require insect visitation to maximize seed production. Seed germination and maximum plant size are apparently enhanced by activities of pocket gophers (Walters and Walters 1988), as cited in (USFWS 2009d), which also present a threat of herbivory (USFWS 2000b, 2009d).

3.4.5.1 Regulatory Status and Threats to the Species

Nipomo Mesa lupine was listed as a state endangered species in 1987 and as a federal endangered species in 2000 (USFWS 2000b). There is no recovery plan or designated critical habitat for this species.

Because Nipomo Mesa lupine exists in a single, small population (section 3.4.5.2) it is vulnerable to extinction from random events (USFWS 2009d). For example, the small population may be vulnerable to catastrophic environmental events such as drought and wildfire and demographic factors such as

inbreeding. In addition, coastal development and possible expansion of oil refinery activities (USFWS 2009d) potentially threaten the existing populations of Nipomo Mesa lupine. Expansion of invasive plants, such as perennial veldt grass and iceplant, within the backdune scrub community also threatens this species (USFWS 2000b, 2009d).

3.4.5.2 Regional Distribution and Abundance

Nipomo Mesa lupine is restricted to dry sandy flats of stabilized coastal dunes that lie west of Nipomo Mesa in San Luis Obispo County (USFWS 2009d). Associated species include perennial species as California croton (*Croton californicus*), mock heather, dune eriogonum (*Eriogonum parvifolium*), dune ragwort, and perennial veldt grass (a non-native, invasive species).

At the time of the USFWS 5-year review (USFWS 2009d), only one Nipomo Mesa lupine population, composed of numerous colonies, was known to be extant (Map 21). Individuals in this population are scattered across a 2-mile stretch of backdune habitat west of State Route 1 and between Black Lake Canyon and Oso Flaco Lake in San Luis Obispo County. USFWS considered all occurrences or colonies in the site to comprise a single population; it is also now recorded as one occurrence in CNDDB (Table 3-20). USFWS estimates the total area of suitable habitat for Nipomo Mesa lupine in San Luis Obispo County to be approximately 1,000 acres, but the footprint of the extant occurrences covers approximately 100 acres (USFWS 2009d). Currently, the species is restricted to nine geographically isolated populations that have a fluctuating total population ranging from 100 to 1,800 individuals in any given year. Much of the habitat for the species is privately owned, mostly by Philips 66, with smaller portions owned by other private landowners. A portion of the habitat also occurs within a California Department of Transportation right-of-way (USFWS 2009d) and in the HCP area within the Phillips 66 leasehold (Map 21).[29] Though potentially suitable habitat extends onto CDPR-owned portions of Oceano Dunes SVRA, no known occurrences exist on CDPR-owned property.

Table 3-20. Nipomo Mesa Lupine Occurrences In* and Near the HCP Area (Map 21)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
NMLU1*	1	2017	60+	CNDDB: Presumed extant	CNDDB: Population represented by 37 polygons. Entire site details not specified. Population numbers for portions of site: 86 plants in 1980, 272 in 1981, 204 in 1982, 3232 in 1988, 241 in 1998, 3336 in 2004, 2919 in 2005, 780 in 2006 & 2007, 139 in 2008, 531 in 2009, 1195 in 2010, 986 in 2011, 295 in 2012, 1677 in 2013, 252 in 2014, 60+ in 2017.

[29] Road maintenance or other actions conducted by Phillips 66 within the leasehold are not covered activities under this HCP.

Table 3-20. Nipomo Mesa Lupine Occurrences In* and Near the HCP Area (Map 21)					
ODD HCP ID	**CNDDB Occurrence No.**	**Last Survey**	**No. Observed on Last Survey**	**Current Status (from CNDDB and/or USFWS)**	**Survey Source: Notes from Survey**
NMLU2	10	2016	278	CNDDB: Presumed extant	CNDDB: 278 individuals observed in two polygons, reintroduced occurrence. Seeds collected from natural populations on Nipomo Mesa in 2005. Outplanting experiments first took place in 2014-2015 but were disappointing; however, in 2016, 278 individuals germinated with 24 successfully reproducing.
NMLU3	3	1988	0	CNDDB: Extirpated	CNDDB: Extirpated.
Northeast	N/A	2017	369	N/A	LCSLO: 256 individuals in 2012; 1415 in 2013; 164 in 2014; 342 in 2015; 96 in 2016; 369 in 2017.
Southeast	N/A	2017	453	N/A	LCSLO: 453 individuals in 2017.
West*	N/A	2017	89	N/A	LCSLO: 39 individuals in 2012; 263 in 2013; 88 in 2014; 292 in 2015; 85 in 2016; 89 in 2017.
*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.					

The Cheadle Center for Biodiversity and Ecological Restoration (CCBER) has been working on outplanting experiments for Nipomo Mesa lupine in the Black Lake Ecological Area (protected and managed by the LCSLO). In late 2012, CCBER partnered with USFWS to study and develop a habitat suitability model for future Nipomo Mesa lupine outplantings. They also began seed bulking in their greenhouse. The LCSLO's Black Lake Ecological Area was selected for outplantings both because of the historical presence of Nipomo Mesa lupine in this location (the species was first described at Black Lake) and the low abundance of perennial veldt grass after more than a decade of control efforts. After a disappointing germination in 2015, CCBER reported higher numbers in 2016 and 2017.

Long-term census data are not reliable enough to assess population trends. However, reliable data from 2006 through 2017 indicate the total numbers of Nipomo Mesa lupine is very low and fluctuates annually (LCSLO 2018) . The LCSLO has been monitoring the Nipomo Mesa lupine population annually since 2007. In 2017, a total of 911 *L. nipomensis* individuals were recorded. Of the plants located, 465 of the 911 individuals achieved seed set, resulting in a 51 percent effective population for the 2016–2017 season. This is down from 2013, where 1,677 individuals were recorded with 759 of the 1,677 setting seed, resulting in a 45 percent effective population (LCSLO 2018).

In 1999, CDFW met with CDPR and the LCSLO to outline a program of dunegrass and perennial veldt grass removal on private land within the Guadalupe Dunes. Since 2000, the LCSLO has removed perennial veldt grass from Nipomo Mesa lupine habitat. While this work has slowed the conversion of this habitat to a monoculture of perennial veldt grass, this management likely will have to continue in

perpetuity to maintain open patches required by Nipomo Mesa lupine (USFWS 2009d). Beginning with the 2015–2016 season, OHMVR Division took over management activities in the HCP area within the Phillips 66 leasehold area (LCSLO 2017).

3.4.5.3 Suitable Habitat in the HCP Area

Nipomo Mesa lupine habitat was modeled in the HCP area using known habitat requirements for the species, including stabilized dunes (sandy soil). For this HCP, CDPR mapped a total of 117 acres as suitable Nipomo Mesa lupine habitat in the HCP area.

3.4.6 Gambel's Watercress (*Nasturtium gambelii*)

Gambel's watercress is a rhizomatous, perennial herb in the mustard family (Brassicaceae) that can grow up to 6 feet tall. This species characteristically roots from the stem, which bears scattered compound leaves and dense clusters of white flowers. Gambel's watercress is found in freshwater or brackish marsh habitats at the margins of lakes and along slow-flowing streams. It grows in or just above the water level and requires a permanent source of water. In San Luis Obispo and Santa Barbara counties, Gambel's watercress has been reported to grow in perennially swampy and other mesic areas with bulrush (*Scirpus* spp.), broad fruit bur-reed, cutleaf water-parsnip (*Berula erecta*), straggly gooseberry (*Ribes divaricatum* var. *pubiflorum*), western poison oak, willow (*Salix* spp.), and other riparian vegetation (USFWS 2016c). Gambel's watercress generally blooms from April to July.

3.4.6.1 Regulatory Status, Recovery Plan, and Threats to the Species

Gambel's watercress was listed as a state threatened species in 1990 and as endangered by the USFWS in 1993 (USFWS 1993). Gambel's watercress is one of two species addressed in the 1998 Recovery Plan for Marsh Sandwort (*Arenaria paludicola*) and Gambel's Watercress (*Nasturtium* [*Rorippa*] *gambelii*) (USFWS 1998). Recovery objectives for these species include the following:

- Protect, maintain, and enhance habitats
- Monitor and document species populations and habitat characteristics
- Conduct research on the ecology and biology of the species
- Expand existing populations
- Establish new populations
- Evaluate progress and update management and recovery guidelines

The following conditions are serious threats to any remaining Gambel's watercress populations: (1) hybridization and subsequent genetic introgression with the closely related *N. officinale*; (2) habitat loss and degradation; (3) adverse effects from eutrophication (artificial or natural addition of substances such as nitrates and phosphates to an aquatic system); (4) sedimentation; (5) encroachment of non-native eucalyptus trees; and (6) drilling of water wells in the immediate watershed (USFWS 2009f, 2011c, CNDDB 2017). In 2013, the Regional Water Quality Control Board amended the Central Coastal Basin plan by adopting total maximum daily loads (TMDLs) for nutrients and orthophosphates in the Lower Santa Maria River watershed, including Oso Flaco Lake and tributaries; the State Water Resources Control Board adopted the amendment in 2014 (State Water Resources Control Board 2014). Achieving the TMDLs should help alleviate adverse effects on native species from nitrogen and other biostimulatory chemicals that are found in the watershed (Regional Water Quality Control Board 2013).

3.4.6.2 Regional Distribution and Abundance

Historically, Gambel's watercress occurred in interior wetland areas of Orange, San Bernardino, and Los Angeles counties, as well as coastal wetland areas of San Luis Obispo and Santa Barbara counties. A population from Mexico is thought to be extirpated (CDPR, OHMVR Division 2009).

At the time of listing, there were three known extant occurrences of Gambel's watercress: Black Lake Canyon, and, within the HCP area, Oso Flaco Lake and Little Oso Flaco Lake. (Table 3-21; Map 22; (USFWS 1993). The Black Lake Canyon and Little Oso Flaco Lake occurrences are now considered to be "possibly extirpated" (USFWS 2009f, 2011c, CNDDB 2017), with some observers indicating individuals appeared to show introgression with *N. officinale* (white or common watercress (CNDDB 2017). The Gambel's watercress occurrence at Oso Flaco Lake was observed in fall 2013 (J. Chestnut, pers. comm. 2013), and the Oso Flaco area was surveyed again in 2018. Within the Oso Flaco Lake area, surveyors found a very healthy population of Gambel's watercress on the farm drain on the agricultural property. The number of individuals or distribution acreage was not determined. The populations of Gambel's watercress previously observed along the Oso Flaco Lake Causeway were gone (J. Chestnut, pers. comm. 2019).

Table 3-21. Gambel's Watercress Occurrences In* and Near the HCP Area (Map 22)

ODD HCP ID	CNDDB Occurrence No.	Last Survey	No. Observed on Last Survey	Current Status (from CNDDB and/or USFWS)	Survey Source: Notes from Survey
GAWC1*	1	2018	Unknown	CNDDB: Presumed extant	CNDDB (last updated in CNDDB 2017-12-20): Several colonies reported and mapped since 1984. W of road, N. shore: 100 in 1984; 300 in 1989; 0 in 1992 & 1998. W of road, S shore: 10 in 1998; 68 in 1998. E of road, NE shore: <5 in 1988; 0 in 1989; >150 in 1998. E of road, S Shore: >400 in 1998. Seen in 1999, 2001, 2005, 2010, & 2014. CDPR: Hundreds seen in 1980s and 1990s. In 2013, Gambel's watercress covered an area measuring 15m x 20m. Very healthy population observed in 2018 (J. Chestnut, pers. comm., 2019).
GAWC2*	9	2005	0	CNDDB: Possibly extirpated	CNDDB (last updated in CNDDB 2010-04-19): East colony: approximately 300 in 1989 forming pure stand in ditch; approximately 500 in 1993 and 1994; 0 in 1998. West colony: <10 in 1985, 0 in 1989 and 2005. Not surveyed in 2013.
GAWC3	10	2005	0	CNDDB: Possibly extirpated	CNDDB (last updated in CNDDB 2017-12-20): approximately 100 plants seen in 1988; approximately 1,000 in 1992; 50 flowering plants in 1993. Not seen in 2005.

Table 3-21. Gambel's Watercress Occurrences In* and Near the HCP Area (Map 22)					
GAWC4	11	2005	0	CNDDB: Possibly extirpated	CNDDB (last updated in CNDDB 2010-04-19): approximately 500 plants in 1994. No plants seen in 1998, 1999, or 2005.
GAWC5	2	1981	0	CNDDB: Extirpated	CNDDB: General site based on a 1947 Hoover collection from "Near small twin lake" and 1981 Wise collection from "Celery Lake." Extirpated by development or alteration of habitat.
*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.					

The occurrence in Black Lake Canyon in San Luis Obispo County has not been seen since 1994 (CNDDB 2017), and the occurrence north of Black Lake Canyon is also considered extirpated. Pure Gambel's watercress is known from two wild populations that were discovered in 1998 and 2016 (C. Rutherford, pers. comm. 2016) on VAFB in Santa Barbara County and from one population that was introduced in 2008 within the Guadalupe-Nipomo Dunes National Wildlife Refuge, where a combination of 600 marsh sandwort and Gambel's watercress plants were planted at eight sites. However, the plants have not fully established at the Refuge, and the USFWS does not consider it to be a viable population (USFWS 2011c). An unknown watercress species (*Nasturtium* sp.) was observed in the HCP area near Oso Flaco Creek during vegetation mapping surveys conducted in 2012 (Appendix H). This HCP treats watercress found at within the HCP area Gambel's watercress barring contrary identification by a qualified biologist.

3.4.6.3 Suitable Habitat in the HCP Area

Suitable habitat for Gambel's watercress was modeled for the HCP area using known habitat requirements for the species. Known habitat is defined as all perennial wetlands, including freshwater marshes (fens), slow moving creeks in open places in peat, possibly in brackish waters (USFWS 1998). For this HCP, CDPR mapped a total of 11 acres as suitable Gambel's watercress habitat in the HCP area.

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Chapter 4. Potential Biological Effects/Take Assessment

4.1 Overview

Chapter 4 describes the potential direct and indirect effects of the covered activities on each the covered species and their habitats. Chapter 4 then describes the potential for incidental take of covered animal species during implementation of covered activities. Effects on critical habitat, anticipated impacts of the take on each species as a whole, and cumulative impacts are also discussed. CDPR is committed to its policy of avoidance and minimization of take of listed species. Thus, Oceano Dunes District implements an ongoing comprehensive natural resources management program, including management of the covered species. This management program forms the basis for this HCP's conservation program and AMMs (Chapter 5). The ongoing natural resources management program, including covered species management, is an activity covered by this HCP. The take assessment for all covered animal species includes implementation of the conservation and AMMs described in detail in Chapter 5. Together, the chapters in this HCP provide a complete analysis of covered animal species' incidental take in the HCP area.

The effects analyses in this chapter discuss all aspects of covered activities that could possibly affect the covered species. However, not every effect on a covered species rises to the level of take. FESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S. Code §1533(19)). "Harm" is further defined as "an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." "Harass" is further defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering" (50 CFR §17.3). Pursuant to the Principal Deputy Director's Memorandum (USFWS 2018a), harassment is not a form of take permitted under section 10(a)(1)(B) since it is not incidental take and is instead an intentional or negligent act.

The California Fish and Game Code prohibits take or possession at any time of fully protected species designated under sections 3511, 4700, 5050, and 5515, with few exceptions (section 1.5.4). The CLTE is a California fully protected species. California Fish and Game Code section 2835 authorizes CDFW to permit the take of any covered species, including species designated as fully protected species, whose conservation and management are provided for in an approved NCCP. CDPR is currently in the preliminary stages of preparing an NCCP to cover CLTE and the six state-listed plants also included in this HCP. The NCCP program takes a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity. An NCCP identifies and provides for the regional or area-wide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity—in this case, motorized and non-motorized recreation.

Each species' effects analysis is followed by the take assessment for that species. While take of listed plants is not prohibited under FESA, CDPR has included them in this HCP and requests assurances for them under USFWS's "No Surprise" assurances rule, discussed in section 6.5.2. Take levels are expressed in this HCP in the following ways: (1) in terms of the specific number of animals if those numbers can be estimated and (2) in terms of habitat acres to be affected generally or because of a specific activity, in cases where the specific number of individuals is unknown or indeterminable. Take estimates are based on the best available estimate of take that may occur and, in many cases, take estimates are largely based on the size of the population in the HCP area and/or past observations of take. In cases where take is difficult to estimate due to the variable size of the population in the HCP area, difficulty in

estimating the population size, difficulty in finding a dead or injured individual due to such things as small body size, and/or difficulty in determining the extent of the disturbance impact, take is also quantified as the number of acres of habitat that are affected by the covered activities, if appropriate.

The analysis of the impacts of the take includes a summary of the status and distribution of the species within its range, a summary of the loss and conservation of the species expected to occur with implementation of the HCP, and a conclusion regarding the overall impacts of the take associated with the HCP on the species as a whole.

This HCP supports a request to incorporate two categories of take permitting. The first category is take that arises incidental to otherwise lawful activities (e.g., recreation, visitor services, and park operations), which is permitted via a FESA section 10(a)(1)(B) ITP. The second category is take that arises during measures taken to enhance the propagation or survival of a listed species (e.g., monitoring or habitat restoration), which is permitted via a FESA section 10(a)(1)(A) Recovery Permit.

4.2 Methods Used to Analyze Effects on Covered Species

This chapter provides both a qualitative and quantitative analysis of the effects on covered species resulting from implementing covered activities. Covered activities may directly or indirectly affect covered species. Direct effects on covered species occur at the time and location the covered activity is undertaken. Examples of direct effects would include crushing a SNPL egg or removing CRLF habitat when clearing vegetation from waterways. Direct effects can be either permanent or temporary. Indirect effects are defined by USFWS as “those that are caused by the proposed action and are later in time, but are still reasonably certain to occur” (50 CFR §402.02). Examples of indirect effects would include constructing a new trail that facilitates predator access into SNPL and/or CLTE nesting habitat causing increased predation or predators following human tracks into the SNPL and/or CLTE nesting habitat and preying on eggs at the nest.

The land area and covered species affected by many of the covered activities overlap, and the nature of the effects among activities can also be similar. To provide a comprehensive assessment, however, the potential effects of each covered activity are discussed separately.

The following summarizes the general methods used to evaluate effects on covered species. Details on methods used for specific species are described below in the respective section for each species.

Quantitative methods with respect to modeled suitable habitat for covered species include the following:

- Define and map modeled suitable habitat for each of the covered species.
- Intersect modeled suitable habitat with covered activities having permanent impacts to quantify acreage of affected modeled suitable habitat within these areas.

Quantitative methods with respect to covered species occurrences include the following:

- Document known occurrences of the particular covered species within the HCP area.
- Intersect the known occurrences with covered activities with permanent impacts.
- Estimate potential additional occurrences, as appropriate, within modeled suitable habitat based on results of previous surveys and on available life history information in the species accounts for the particular species (e.g., territory size, home range, and typical population densities and spatial distribution patterns).

- Estimate potential impacts to individuals of each species, to the extent feasible, and modeled suitable habitat.
- Estimate the reduction of impacts to covered species individuals as a result of applying avoidance and minimization measures, as appropriate.

Qualitative methods with respect to modeled suitable habitat and species occurrences include assessing potential effects due to non-permanent covered activities based on descriptions of covered activities in Chapter 2 and known and likely threats to each species as identified in the species accounts in Chapter 3.

4.3 Western Snowy Plover

Effects on SNPL and potential SNPL habitat in the HCP area are described in the following sections. 4.3.2.2 in section 4.3.2 summarizes the potential effects and potential take of SNPL from covered activities. AMMs that address the effects are provided in section 5.3.1.1. Activities occurring in tertiary habitat for SNPL (Map 23) are not anticipated to affect the species unless specifically discussed in the following sections.

4.3.1 Direct and Indirect Effects of Covered Activities on Western Snowy Plover

Even though avoidance and minimization of take will continue to be the primary objective of the program, effects of covered activities on SNPL may occur during both the breeding and non-breeding seasons. The OHMVR Division dedicates a significant portion of its staff and other resources to implementing the SNPL and CLTE management program during the breeding season.[30] Thus, many of the effects that could occur during the breeding season are minimized.

Covered activities occur within all 4,513 acres of SNPL habitat, including critical habitat. This includes 727 acres of primary habitat, 276 acres of secondary habitat, and 3,510 acres of tertiary habitat (section 3.3.1.7). Map 23 shows the location of covered activities in relation to SNPL habitat. Effects on critical habitat are discussed in more detail in section 4.9.1. As described in section 3.3.1.7, SNPL nests are typically found within the seasonal exclosure. However, some nests are found outside the seasonal exclosure, and suitable breeding habitat for SNPL is present outside of the exclosure. As a result, this HCP describes potentially suitable SNPL habitat by using the categories primary, secondary, and tertiary. A summary of each habitat category follows:

- Primary habitat includes areas that support breeding, foraging, and roosting. Primary habitat in the HCP area includes the shoreline, beach, and sparsely vegetated foredune habitat that is generally within 492 to 1,640 feet of the shore extending from Arroyo Grande Creek south to the Oceano Dunes southern boundary (Map 10). Primary habitat also includes most of the seasonal exclosure. Between 2005 and 2018, 2,398 of 2,429 SNPL nests were discovered in primary habitat (Map 11).
- Secondary habitat supports breeding, foraging, and roosting, but the habitat has been degraded by historic land use or the physical habitat features are lower quality than primary habitat for breeding, foraging, and roosting. Secondary habitat in the HCP area includes Pismo Beach from

[30] Management is also implemented outside of the breeding season for wintering SNPL; however, fewer staff and resources are available during the non-breeding season and fewer AMMs are implemented (e.g., monitoring is not conducted as frequently and seasonal exclosures are not in place).

Arroyo Grande Creek to Addie Street, as well as habitat inland (i.e., east) from primary habitat, ranging from 984 to 1,969 feet of the mean high tide line and the south- and east-facing slopes of the leeward side of the foredune in the open riding area and Oso Flaco area (Map 10). SNPL occasionally attempt to nest in secondary habitat, but to a much lesser extent than in primary habitat. Between 2005 and 2018, 29 of 2,429 SNPL nests were discovered in secondary habitat (Map 11).

- Tertiary habitat provides very little of the physical and biological features needed to support breeding, foraging, and roosting, and SNPL rarely use this habitat. Tertiary habitat in the HCP area includes Pismo Beach north of Addie Street, including the Pismo Pier, as well as all other potentially suitable habitat in the HCP area not identified as primary and secondary habitat (Map 10). Between 2005 and 2018, only 2 of 2,429 SNPL nests were observed in tertiary habitat (Map 11).

Covered activities have different intensities of effects depending on the type of habitat (i.e., primary, secondary, and tertiary) affected and the type of activity (e.g., motorized, non-motorized, management-related) occurring in the habitat. For example, effects on SNPL in tertiary habitat are relatively low (if any) because SNPL rarely nest in tertiary habitat or otherwise use this habitat for foraging and roosting (section 3.3.1.7).

Motorized and non-motorized recreation are the predominant covered activities affecting SNPL and their habitat, with motorized recreation having the greatest effects on SNPL in the HCP area (section 4.3.1.1.1). Motorized recreation occurs in 1,370 acres of SNPL habitat (i.e., approximately 412 acres in primary, 181 acres in secondary, and 777 acres in tertiary habitat). Non-motorized recreation also has an effect on SNPL, especially within suitable habitat that is not open to motorized recreation. Non-motorized recreation occurs within almost 2,500 acres of SNPL habitat where motorized recreation is not permitted (i.e., approximately 315 acres within primary, 95 acres within secondary, and 2,075 acres within tertiary habitat). Non-motorized recreation also occurs within the entire area open to motorized recreation. The effects of non-motorized recreation on SNPL depend on the intensity of use (e.g., numbers of park visitors to a given area), type of activity (e.g., dog walking, horseback riding, picnicking), and the type of habitat (i.e., primary, secondary, tertiary) affected.

The following sections describe the mechanisms by which covered activities could affect SNPL. Effects will be avoided and minimized, to the extent feasible, through existing and new AMMs. Therefore, not all effects are expected to rise to the level of take, as defined by FESA. AMMs proposed to reduce the effects are briefly mentioned here and are described in greater detail in Table 5-2. Despite the implementation of AMMs, some take of SNPL adults, juveniles, chicks, and eggs will still occur due to covered activities. Expected take levels are described in greater detail in Table 4-1.

4.3.1.1 Park Visitor Activities

4.3.1.1.1 Motorized Recreation (CA-1)

Vehicle Strike – Breeding Season. Vehicles driving within tertiary habitat do not currently impact breeding, foraging, and roosting SNPL and are not expected to impact breeding, foraging, or roosting SNPL in the future. Therefore, activities in these areas will not affect SNPL.

A large portion of the SNPL breeding population in the HCP area nests within the seasonal exclosure, which consists of a contiguous area, including the shoreline, within the southern portion of the open riding area and Oso Flaco area that is fenced and closed to the public during the breeding season (March 1–September 30). SNPL adults, eggs, and chicks within these exclosures are protected from motorized recreation activities. Therefore, SNPL within these areas will not be directly impacted by motorized recreation.

SNPL will sometimes nest outside the protection of the seasonal exclosure in areas open to vehicles. SNPL have been known to nest outside the seasonal exclosure in the open riding area and near Arroyo Grande Creek in areas open to street-legal vehicles. The cryptic nature of SNPL nests and chicks makes it conceivable that a vehicle could crush an active SNPL nest or a chick that is outside the fenced area and not yet identified by monitors. Vehicle traffic has been known to result in the destruction of shorebird eggs, chicks, and adults (Warriner et al. 1986, Melvin et al. 1994). Any incubating or brooding adults at the nest will also be vulnerable to vehicle strike; however, adults typically respond to disturbance by flushing from the nest and/or brood (Flemming et al. 1988) rather than sitting on the nest where they would be more vulnerable to vehicle strike. SNPL may also avoid nesting in areas open to vehicles due at least in part to frequent disturbance when nesting, which may make them less vulnerable to impacts associated with motorized vehicles. As noted above, most SNPL in the HCP area nest within the seasonal exclosure, thus protecting eggs and chicks from vehicle strike.

CDPR also implements an ongoing SNPL and CLTE management program in the HCP area to further protect SNPL nests from vehicle strike. As part of this program, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the seasonal exclosure. Any nests found outside the exclosure will be quickly protected by a single-nest exclosure, as appropriate, thus reducing the likelihood of a vehicle striking a SNPL or crushing a nest. Monitors will also continue to track SNPL chicks that are hatched within the riding area (i.e., within single-nest exclosures) to determine travel routes and patterns associated with foraging and exploration and either erect symbolic fencing to provide safe passage of the chicks to a non-vehicle use area or divert vehicle traffic, as appropriate.

Based on the results presented in the SNPL and CLTE Annual Breeding Season Reports (Appendix F), since these AMMs began to be implemented as part of the SNPL and CLTE management program, the AMMs have been successful at protecting SNPL nests (e.g., few chicks and eggs have been found crushed/killed by a vehicle), increasing reproductive success, and reducing direct impacts to nesting SNPL (e.g., few adults have been found injured or killed by vehicles in the breeding season) outside the seasonal exclosure from motorized recreation. As a result, direct impacts to nesting SNPL outside the seasonal exclosure due to motorized recreation will continue to be minimal. Although unlikely, some SNPL eggs, chicks, and adults could still be struck by vehicles if they go undetected.

In the breeding season, SNPL forage, traverse, and roost in the open riding area and along the shoreline south of Grand Avenue, which is not fenced and is open to street-legal vehicles. Vehicles driving through these areas could strike individual adults, juveniles, or chicks that are walking, roosting, and/or foraging outside the Southern Exclosure. This may be especially true for chicks, since they have been observed responding to approaching vehicles with apparent indifference and only jumping from the path of a vehicle's front tire when the vehicle was 3.28 feet away (Flemming et al. 1988). In addition, SNPL are likely more vulnerable to vehicle strike by speeding vehicles since there is less time for the bird to move out of harm's way, and the driver may not see a bird. Mad River Biologists (2005) found that shorebirds using Oceano Dunes SVRA, especially SNPL and sanderlings, were highly tolerant of vehicle disturbance when vehicles were traveling at the legal shoreline speed limit of 15 mph or less and were passing very nearby, but were not on a collision course with them. The birds often did not react even at close distances (e.g., approximately 10 feet). In contrast, shorebirds, including SNPL, always reacted to a vehicle that was on a collision course with them. Shorebirds at Oceano Dunes SVRA may be acclimated to vehicle activity and thus less subject to disturbance. This acclimatization, however, may leave them more vulnerable to strike should a driver engage in sudden, unexpected changes in direction (Mad River Biologists 2005). Adults and chicks may also roost and move about in tire tracks. If chicks are unable to climb out of tire tracks, they become more vulnerable to vehicular traffic impacts since most people use the same tracks when returning (Melvin et al. 1994).

In order to reduce the risk of vehicles striking a foraging or roosting SNPL in areas open to vehicles, CDPR will continue to implement the SNPL and CLTE management program. As part of this management program, speed limits are enforced (i.e., speed limits are posted and rangers issue citations) in the HCP area. CDPR will also continue to conduct daily monitoring for SNPL during the breeding season to enable better identification of potential threats. In addition, if broods are observed to be in harm's way, vehicle traffic flow is diverted or regulated to allow the safe movement of the brood. Although these measures will reduce impacts to SNPL eggs and chicks in the riding area, some eggs and chicks may need to be captured and brought to a captive rearing facility to prevent mortality and injury (AMM 22). Few adults and chicks have been documented as injured or killed in the HCP area during the breeding season due to vehicle strike. As a result, the AMMs will continue to minimize the risk of a vehicle striking a foraging or roosting SNPL in the breeding season. Although unlikely, some vehicle strike could still occur.

Vehicle Strike at Night – Breeding and Non-breeding Season. Vehicles can drive in the street-legal access corridor and open riding area 24 hours a day, and some biologists have raised concern that nighttime vehicle traffic may be especially hazardous for SNPL since SNPL roost and forage near the shoreline at night (Pienkowski 1983, Staine and Burger 1994, Mad River Biologists 2005). Drivers of ATVs at night have run over SNPL at VAFB, and a CDPR ranger patrol vehicle crushed SNPL chicks at Oceano Dunes SVRA during a night patrol (USFWS 2007a). However, during the breeding season in the HCP area the seasonal exclosure protects most foraging chicks and adults from vehicle strike. In addition, Mad River Biologists (2005) found that SNPL reacted more quickly, and at a greater distance, to an approaching vehicle at night than during the day. They were also more likely to respond by flying rather than running when disturbed at night (Mad River Biologists 2005). Consequently, in assessing the risk of collision between birds and vehicles at night, the higher degree of reaction (i.e., more likely to react, more likely to fly than run, and reacting to vehicles at greater distance) likely decreases the risk of collision with vehicles at night. Although unlikely, it is still possible that a SNPL roosting or foraging at night could be struck by a vehicle, especially during the non-breeding season.

Vehicle Strike – Non-breeding Season. SNPL are present and vulnerable to vehicle strike or disturbance during the non-breeding season. As noted in section 3.3.1.4.2, foraging and roosting, wintering SNPL are frequently concentrated on the relatively narrow beach between Grand Avenue and Pier Avenue and north of Post 2, where OHV use is prohibited but street-legal vehicles are allowed. Within this area, foraging birds and roosting flocks are most often encountered on the relatively narrow beach between Grand and Pier avenues and north of Post 2. As a result, SNPL are likely most vulnerable to vehicle strike from street-legal vehicles between Grand and Pier avenues and north of Post 2 during the non-breeding season.

To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes weekly monitoring for wintering SNPL in the HCP area to locate foraging and/or roosting birds, enforcement of the posted speed limits, placing additional speed limit signs near foraging and/or roosting flocks, and implementing public education methods (e.g., handing out brochures, posting signs). Implementation of the SNPL and CLTE management program reduces the impacts to wintering SNPL from motorized recreation; however, some vehicle strike of wintering SNPL has still been documented, including in recent years. As a result, in 2017, CDPR Environmental Scientists evaluated beach conditions that could lead to conflicts between wintering SNPL and vehicle traffic. They determined that wintering SNPL may be most at risk to vehicle strike during storm events and high tides/large surf (CDPR 2017c). Neuman et al. (2005) also found that at high tide, the mean numbers of shorebirds overall (and SNPL specifically) per mile in the open riding area were negatively related to

disturbance levels.[31] As a result, if determined to be necessary by a CDPR Senior Environmental Scientist to reduce the risk of vehicle strike and disturbance during the non-breeding season, CDPR staff will close the beach to motor vehicle recreation activities temporarily until such conditions (i.e., storm events, high tides, large surf) no longer exist. In addition, if determined to be necessary by the District Superintendent, CDPR staff will temporarily close the Grand Avenue park entrance to vehicle traffic during certain high tides and storm events in order to eliminate conflict between foraging/roosting wintering SNPL and vehicles. During the closures, beach conditions will be regularly monitored and vehicle recreation will only be allowed again after CDPR staff have determined that no harm would occur to roosting SNPL. With the implementation of these measures, impacts to wintering SNPL from vehicle traffic are anticipated to be reduced. However, some wintering SNPL could still be struck by vehicles.

Nesting or Brooding Disturbance. SNPL nesting near the fenceline or outside the Southern Exclosure can be disturbed by nearby motorized recreation. Chronic disturbance of breeding adults from motorized activities can directly or indirectly affect chicks or eggs. Chicks or nests can be abandoned, left unattended for prolonged periods of time, or exposed to predation. In addition, chicks can be orphaned or inadequately nourished, and eggs could be buried by sand or not properly incubated (Warriner et al. 1986). Disturbance by vehicles has been shown to increase both egg and chick mortality in SNPL (Warriner et al. 1986, Flemming et al. 1988, Staine and Burger 1994). Chicks repeatedly disturbed by vehicles may die of exhaustion (Powell 1996) or be separated from adults (Warriner et al. 1986). These effects are exacerbated if human disturbance coincides with periods of high wind or extreme temperature. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Specifically, CDPR will continue to conduct daily monitoring to enable better identification of potential threats. If broods are observed to be in harm's way, vehicle traffic flow will be diverted or regulated to allow the safe movement of the brood. In addition, a nest avoidance buffer a minimum of 100 feet will be used to protect SNPL nests in the open riding area. The buffer will be increased, as necessary, until monitors observe that SNPL adults are no longer disturbed. As a result, disturbance to nesting or brooding SNPL associated with motorized recreation will continue to be minimized.

Foraging and/or Roosting Disturbance – Non-breeding Season. Where it is allowed, motorized recreation can disturb roosting or foraging adult SNPL during the non-breeding season, especially in areas where SNPL are known to roost (e.g., between Post 1 and Post 2 or near Midramps). Disturbance from vehicles can cause SNPL to continually flush or move from the area, which can result in increased vigilance or stress and/or decreased foraging/resting. However, adult SNPL often move from the area to other available foraging/roosting habitat; therefore, although this impact can occur it is considered to be minimal.

Increased Predators. Recreationists increase the presence of trash, most of which is disposed of properly in dumpsters. However, any trash that is accessible to predatory species may artificially increase the number of individual predators in areas being used by SNPL and thus increase predation on SNPL. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes requiring all visitors to deposit their trash in dumpsters/receptacles and providing trash bags to all campers and CDPR staff. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing SNPL adults, chicks,

[31] This pattern was not apparent at low tide (Neuman et al. 2005).

or eggs. As a result, this effect is reduced. However, generalist predators that forage on refuse continue to be present in the HCP area and are often suspected of preying on SNPL eggs, chicks, adults, and juveniles.

Reduced Habitat. Motorized vehicle recreation may reduce available habitat for SNPL and other shorebirds by limiting use in the open riding area compared to non-motorized areas, especially in certain conditions such as during high tides. (Neuman et al. 2005) conducted studies comparing shorebird abundance, behavior, and disturbance in the open riding area with that along the shoreline to the south, which is open only to non-motorized recreation. Disturbance levels were found to be greater in the open riding area and mean daily densities of all shorebird species combined (and of SNPL alone) were greater in non-vehicular areas. Therefore, it appears, at least to some degree, SNPL (and other shorebirds) avoid areas open to recreation. To reduce impacts related to reduced habitat, CDPR will continue to implement the SNPL and CLTE management program. As part of this program, CDPR installs a seasonal exclosure (i.e., predator fence and/or symbolic fence) that limits vehicle and human trespass and ensures suitable nesting and brood-rearing habitat is maintained within the HCP area. Since implementation of the SNPL and CLTE management program, including the installation of the seasonal exclosure, SNPL and CLTE reproductive success has improved in the HCP area, and most SNPL have nested within the protected areas. This trend is expected to continue in the future. As a result, this impact is considered minimal.

Motorized recreation in the non-breeding season can alter dune vegetation and topography necessary for breeding. Specifically, motorized recreation can reduce vegetation, organic surface materials (e.g., driftwood and wrack), and microtopography (e.g., hummocks) required for SNPL breeding, foraging, and/or roosting (MacIvor et al. 1990, Powell 1996). Altering these habitat features can increase SNPL exposure to predators or inclement weather and reduce prey availability for foraging SNPL during the breeding season. Although some wrack naturally develops within the Southern Exclosure during the breeding season, it is not quickly colonized by invertebrates and thus does not provide the diversity or abundance of this important SNPL food source (CDPR 2009) found in areas not subject to motorized recreations. The ongoing SNPL/CLTE management program mitigates these effects by placing natural materials such as driftwood and wrack in the seasonal exclosure and inoculating wrack with talitrids (commonly called beach hoppers) to ensure prey species and cover from predators are available in the protected areas. The program also includes seeding and planting foredune species, if necessary, to ensure areas outside the seasonal exclosure continue to provide cover from predators and inclement weather. As a result, effects on SNPL of altering habitat from motorized recreation during the non-breeding season is considered to be minimal.

4.3.1.1.2 Camping (CA-2)

The designated campgrounds (i.e., North Beach Campground and Oceano Campground) in the HCP area are not located within suitable SNPL breeding, foraging, or roosting habitat. Therefore, activities in designated campground areas do not affect SNPL.

Vehicle Strike. Camping vehicles driving through tertiary habitat do not affect SNPL. Camping vehicles driving within primary and/or secondary SNPL breeding, foraging, and/or roosting habitat can cause the same type of effects on SNPL in the same overall area as those described for motorized recreation (section 4.3.1.1.1). Therefore, the discussion of motorized recreation effects applies to camping vehicles as well.

Nesting or Brooding Disturbance. Camping activities outside the designated campgrounds within tertiary habitat in the open riding area south of Post 2 do not affect SNPL.

Beach fires and other prolonged activities associated with camping outside the designated campgrounds within primary and/or secondary habitat for SNPL in the open riding area south of Post 2 can disturb any nearby nesting and/or foraging SNPL, causing the nests and/or chicks to be left unattended for long periods and exposed to predators and extreme temperatures. However, camping outside the designated campground areas within primary and secondary habitat typically occurs in areas where SNPL do not nest (e.g., outside the seasonal exclosure). To further minimize impacts of camping activities outside designated campground areas, CDPR will continue to implement the SNPL and CLTE management program. Specifically, a buffer zone a minimum of 100 feet will continue to be established around all individual nest exclosures and the Southern Exclosure to ensure that camping activities do not encroach on or disturb nesting SNPL. The buffer will continue to be increased (e.g., by adding a bumpout), as necessary, until monitors observe that SNPL adults are no longer disturbed. In addition, CDPR staff will continue to hand out educational materials on SNPL to visitors in the HCP area to prevent visitors from disturbing SNPL nests and chicks.

If driftwood or other naturally occurring materials such as wrack or rocks are collected for campfires, chicks and adults can be disrupted from foraging. However, during the breeding season many SNPL, including chicks, forage along the shoreline of the Southern Exclosure, which is closed to the public. In addition, any visitors observed disturbing foraging or roosting SNPL are asked to move from the area; therefore, any effects are typically short in duration and minimal in impact in areas where SNPL do forage that are open to pedestrians/campers.

Increased Predators. Campers typically generate more trash than day users, which can artificially increase the number of predators in areas being used by SNPL and thus increase predation on SNPL. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes providing all campers with plastic garbage bags to encourage trash removal from the camp area. CDPR staff will continue to pick up trash in the HCP area on a regular basis. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing SNPL adults, chicks, or eggs. As a result, this effect will continue to be minimized. However, generalist predators that forage on refuse continue to be present in the HCP area and are often suspected of preying on SNPL eggs, chicks, adults, and juveniles.

Reduced Habitat. Collecting driftwood or other naturally occurring materials can reduce the quality of cover used by chicks and adults as shelter from inclement weather or predators. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes placing woodchips, large woody material, beach wrack, and native plants in the seasonal exclosures to serve as natural shelter. The placement of woodchips, large woody material, beach wrack, and native plants in the seasonal exclosure has previously been successful in providing natural shelter for SNPL in the exclosure. As a result, this effect will continue to be minimal.

4.3.1.1.3 Pedestrian Activities (CA-3)

Nesting or Brooding Impacts. Most of the breeding SNPL population within the HCP area nests within the seasonal exclosure, which is surrounded with predator and/or symbolic fence. SNPL adults, eggs, and chicks within the exclosure are protected from pedestrian activities because pedestrians are not permitted in these areas; therefore, direct impacts (e.g., eggs being crushed) from pedestrian activities to SNPL adults, eggs, and chicks within the seasonal exclosure are not likely.

Breeding SNPL near the fenceline or outside the seasonal exclosure can be disturbed by pedestrian activities. In addition, unlike motorized vehicles, pedestrians can access the shoreline south of the Oso Flaco Lake boardwalk. Although most of the breeding SNPL population in the HCP area nests within the seasonal exclosure, some SNPL will nest outside of the fenced area (Map 11). The cryptic nature of SNPL nests and chicks makes it conceivable that a pedestrian could crush an active SNPL nest or a chick that is

outside the fenced area and not yet identified by monitors, although there are no records of this occurring in the HCP area. Chronic disturbance of breeding adults from pedestrian activities near the seasonal exclosure can also indirectly affect chicks or eggs. People can disturb nesting birds if they approach too closely or quickly (Lafferty 2001a). Shorebird adults and chicks can be more sensitive to disturbance (e.g., flush greater distances and more quickly) by pedestrians than vehicles (Flemming et al. 1988, Cohen et al. 2014). Muir and Colwell (2010) found that SNPL flush from the nest when observers approached at a mean distance of 262 feet (80 meters); however, this distance is likely variable depending on location and type of disturbance. Frequent flushing of adults can keep attending adults off the nest or away from chicks. Nests can fail, or chicks can die from exposure to excessive hot or cold temperatures. Chicks or nests can be abandoned, left unattended for prolonged periods of time, or exposed to predation. In addition, chicks can be orphaned or inadequately nourished, and eggs can be buried by sand or not properly incubated.

Studies in California have shown that more SNPL chicks are lost on weekends and holidays than on weekdays. This suggests that increased recreational activity is linked to increased chick loss (Ruhlen et al. 2003). To reduce impacts from pedestrians on nesting or brooding SNPL, CDPR will continue to implement the SNPL and CLTE management program. Monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the seasonal exclosures. Monitoring will continue to be increased during periods of high visitation, including on weekends and holidays, to reduce the risks associated with increased recreation. Any nests that are found outside a seasonal exclosure will be protected by a single-nest exclosure, if appropriate. At Oso Flaco, in cases where a single-nest exclosure is not appropriate (e.g., an avian predator has keyed in on the exclosure), the symbolic fencing will be moved to include the nest to deter pedestrians from entering the nest area. Finally, a buffer zone a minimum of 100 feet will be established within the open riding area around all individual nest exclosures and the Southern Exclosure to ensure that pedestrian activities do not encroach on SNPL nests. The buffer will be increased (e.g., by adding a bumpout), as necessary, until monitors observe that SNPL adults are no longer disturbed. As a result, the effects of pedestrian activity on nesting SNPL will continue to be minimal.

Stationary activities, such as picnicking and sunbathing, can displace SNPL for long periods. This effect has been most acute along the shoreline south of the Oso Flaco boardwalk, where monitors have observed visitor presence keeping SNPL off nests. In addition, frequent or prolonged pedestrian activities can keep SNPL from using otherwise suitable habitat. Webber et al. (2013) found that high human disturbance was negatively associated with initial SNPL occupancy and colonization of suitable habitat in Florida. Wilson and Colwell (2010) found that family groups of SNPL tended to avoid areas of high human activity and preferentially settled in protected areas. They also found that chicks that hatched outside the protected area traveled greater distances than those that hatched within these areas, likely due to higher human disturbance. Chicks that travel greater distances are likely more vulnerable to predation and inclement weather, especially during the first few days of life. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, a buffer zone of a minimum of 100 feet will be established around all individual nest exclosures and in the Southern Exclosure to ensure stationary pedestrian activities do not encroach on SNPL nests. The buffer will continue to be increased (e.g., by adding a bumpout), as necessary, until monitors observe that SNPL adults are no longer disturbed. In addition, if monitors observe visitor activity too close to a nest in the Oso Flaco area, they will ask visitors to relocate farther away from nests, and the symbolic fencing will continue to be adjusted as needed. As a result, the effects on nesting SNPL will continue to be minimal.

If a SNPL chick should enter an area open to pedestrians, a well-meaning visitor may attempt to “rescue” the chick by picking it up and moving it to another location or bringing it to park staff. This has

been documented in the HCP area, including in 2014 when a 1- to 2-day-old SNPL chick was picked up by a park visitor and given to park staff. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes handing out educational materials on SNPL to visitors in the HCP area to prevent visitors from disturbing SNPL nests and chicks. Based on the results presented in SNPL and CLTE Annual Breeding Season Reports (Appendix F) since the SNPL and CLTE management program was initiated, the program has been successful at preventing this situation, and a visitor picking up a chick is a very rare event.

Foraging and/or Roosting Disturbance. Pedestrians moving through habitat occupied by SNPL can disturb foraging or roosting SNPL, including during the non-breeding season. In Southern California, where levels of human disturbance are high, management of disturbance from humans led to an increase in SNPL abundance during the non-breeding season and the re-establishment of breeding SNPL after a 30-year absence (Lafferty et al. 2006). Human traffic may disturb SNPL foraging (Burger 1994) since SNPL frequently feed on terrestrial insects that typically are found in the wrack line where people prefer to walk. Foraging SNPL adults and chicks interrupted by humans were observed to stop foraging and move away from the wrack until the disturbance passed (Webber et al. 2013).

In a study on piping plovers, chicks were found to forage less and were brooded less when humans were within 525 feet (Flemming et al. 1988). If SNPL spend too much time avoiding disturbance because of frequent or prolonged pedestrian use, they may not be able to dedicate the amount of time necessary to hunt invertebrates and could become emaciated (Webber et al. 2013). Further, suspended feeding and expenditure of energy during repeated flushing can affect reproduction and survival of adults and chicks (Lafferty 2001a). Overall, the types of effects of pedestrian disturbance on SNPL will be similar to disturbance from vehicles (section 4.3.1.1.1), including indirect effects on chicks and eggs. However, the intensity and extent of pedestrian disturbance to SNPL is likely less than the disturbance caused by vehicles within the HCP area. Neuman et al. 2005 found mean daily densities of all shorebird species combined (and of SNPL alone) were greater in non-vehicular areas, although other environmental factors may have played a role. To ensure this impact is reduced, CDPR will continue to implement the SNPL and CLTE management program. Monitoring will continue to occur on a daily basis during the breeding season and a weekly basis during the non-breeding season. In addition, monitoring will continue to be increased during periods of high visitation, including on weekends and holidays, to reduce the risks associated with increased recreation. CDPR staff will also continue to hand out educational materials on SNPL to visitors in the HCP area to prevent visitors from disturbing foraging and/or roosting SNPL. As a result, the effects on foraging and roosting SNPL will continue to be minimal.

Increased Predators. As with all visitors, pedestrians increase the presence of trash, which can artificially increase the number of predators in areas being used by SNPL and thus increase predation on SNPL. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes requiring visitors to deposit all trash in dumpsters/receptacles and providing trash bags to all campers and CDPR staff. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing SNPL adults, chicks, or eggs. As a result, this effect will continue to be minimized. However, generalist predators that forage on refuse continue to be present in the HCP area and are often suspected of preying on SNPL eggs, chicks, adults, and juveniles.

4.3.1.1.4 Bicycling and Golfing (CA-4)

Golfing activities do not affect SNPL since the golf course is not located within or near SNPL breeding, foraging, or roosting habitat.

Few (if any) studies have been conducted that document the effects of bicycles on shorebird species. McLeod et al. (2013) observed waterbirds to have shorter flight initiation distances to cars compared with bicycles, though the number of observations were too few to draw any conclusions. Bicycle riding likely results in a different response than to motor vehicles because bicyclists are more visible to shorebirds. Bicycles also typically travel at slower speeds than motor vehicles and, thus, could disturb birds for longer periods of time. McLeod et al. (2013)also found that pedestrians (singly or in a group) often evoked longer flight initiation distances in 39 species of waterbirds than bicycle riders. Therefore, the discussion above regarding pedestrian effects (section 4.3.1.1.3) on SNPL is likely relevant to bicycle riding, but the effects may be less intense. In addition, bike riding within habitat occupied by SNPL in the HCP area is infrequent. With implementation of the ongoing SNPL and CLTE management program AMMs discussed for pedestrian activities above (section 4.4.1.1.3), effects from bicycle riding on SNPL have been minimal and will continue to be minimal.

4.3.1.1.5 Fishing (CA-5)

Nesting, Brooding, and Foraging Impacts. The effects on SNPL from fishing is similar to the discussion above regarding pedestrian effects (section 4.3.1.1.3); however, the effects are limited to the ocean shoreline where SNPL are more likely to be foraging rather than nesting. Most SNPL nest within the seasonal exclosure where the shoreline is closed to all public access and where fishing is not allowed; therefore, fishing does not affect nesting SNPL in that area. However, fishing could occur near SNPL nesting and chick-rearing areas in South Oso Flaco. People fishing generally occupy habitat longer than pedestrians who are just passing through. As a result, foraging SNPL may avoid areas near fishing activities and are ultimately at less risk of disturbance. If fishing activities such as surf fishing in Oso Flaco do remain near SNPL nests or foraging birds for extended periods of time, however, they can disrupt incubation, brooding, and foraging for long periods, thereby increasing the exposure of chicks and eggs to extreme temperatures or predation. CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Monitors will thus continue to conduct regular searches for nests in potential nesting habitat to ensure that any nests outside the exclosure are quickly protected with a single-nest exclosure, as appropriate. In cases where a single-nest exclosure is not appropriate (e.g., an avian predator has keyed in on the exclosure), the symbolic fencing will be moved to include the nest to deter pedestrians from entering the nest area. If fishing activity is observed disturbing SNPL, visitors will be asked to relocate farther away from nests and fencing will be adjusted, as needed. As a result, direct impacts to SNPL nests from fishing activities will continue to be minimal.

Increased Predators and Entanglement. Discarded fishing line or hooks can entangle or pierce SNPL adults, juveniles, and chicks. In addition to trash, discarded fishing bait may further attract predators to SNPL habitat and thus increase predation on SNPL. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes encouraging and educating anglers about properly disposing of fishing lines, hooks, and bait in trash receptacles. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches. As a result, this effect will continue to be minimal.

4.3.1.1.6 Dog Walking (CA-6)

Nesting and Brooding Impacts. Most of the breeding SNPL population within the HCP area nests within the seasonal exclosure. Dogs are not allowed in the seasonal exclosure. Therefore, SNPL adults, eggs, and chicks within these areas are protected from direct impacts (e.g., eggs being crushed) from dogs. In addition, dogs (other than service dogs) are not allowed in the Oso Flaco area. As a result, impacts to SNPL from dogs in this area are minimized.

Service dogs can enter any area where visitors are allowed, including in the Oso Flaco area. In addition, although most SNPL nest within the seasonal exclosure, SNPL occasionally nest outside the exclosure

(e.g., Arroyo Grande Creek, open riding area), and such nests can be destroyed by dogs. SNPL breeding near the fenceline or outside the exclosures can also be disturbed by dog walking activities. The presence of dogs has the potential to affect the behavior, distribution, survivorship, and fecundity of SNPL.

SNPL may be displaced from incubation more frequently and for longer duration when dogs are present (USFWS 2007a). Studies on shorebirds (and SNPL) have shown that leading a dog when approaching a nest causes a greater disruption to incubation than humans alone (Lord et al. 2001). This could leave the nest exposed for longer periods of time, making the nest vulnerable to predation and inclement weather. A study in Santa Barbara County found that dogs (in addition to horses, humans, crows, and other birds) strongly disturb SNPL (Lafferty 2001b) and, in another study, the difference in SNPL response between leashed and unleashed dogs was insignificant (Lafferty 2001a). Brooding and incubating SNPL respond to dogs with avoidance or active distraction displays, thus exposing chicks or eggs to inadvertent trampling or predation, and these disturbances can lead to the eventual separation of chicks from adults. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Monitors will continue to search daily for SNPL nests outside exclosures, protecting them with individual nest exclosures, as appropriate. In cases where a single-nest exclosure is not appropriate (e.g., an avian predator has keyed in on the exclosure), the symbolic fencing will be moved to include the nest to deter pedestrians from entering the nest area. Finally, a buffer zone of a minimum of 100 feet will continue to be established within the open riding area around all individual nest exclosures to ensure dogs do not encroach within 100 feet of SNPL nests. The buffer will be increased, as necessary, until monitors observe that SNPL adults are no longer disturbed. In addition, dogs are required to be kept on a leash no longer than 6 feet and under the control of their owner at all times. CDPR staff also strictly enforce the dog leash regulation in any area where dog activity could impact nesting SNPL. As a result, the effects of dogs on nesting SNPL are considered minimal.

Unleashed dogs can chase SNPL chicks and adults, cause chicks to become separated from adults, and trample nests. Unrestrained dogs can traverse a much larger area and thereby disrupt a greater number of birds and/or trample more nests. Several instances of nests lost to dogs have been reported along Monterey Bay (USFWS 2007a). Adverse effects on SNPL from unleashed dogs are considered minimal within the HCP area because dogs are not allowed within the Southern Exclosure or Oso Flaco area where the majority of SNPL nest and forage. In addition, dogs are only allowed within the HCP area on leashes no longer than 6 feet and they must be under the control of their owner at all times; CDPR staff strictly enforce the dog leash regulation in any area where dog activity could impact nesting or brooding SNPL. However, occasionally, a dog has been observed off leash along the exclosure shoreline in the HCP area where it may impact SNPL adults, chicks, or eggs.

Foraging and/or Roosting Disturbance – Non-breeding Season. A study in Santa Barbara County found wintering SNPL were more likely to fly from dogs than from humans (Lafferty 2001b). Repeated disturbance to wintering SNPL can reduce the amount of foraging and roosting time and increase the amount of energy spent and stress. This can alter the birds' ability to survive the winter and breed the following summer. To reduce this impact, CDPR will continue to require dogs to be kept on a leash no longer than 6 feet and under the control of their owner at all times within the HCP area, and CDPR staff will strictly enforce this regulation in areas where wintering SNPL have been observed roosting and/or foraging.

4.3.1.1.7 Equestrian Recreation (CA-7)

Nesting and Brooding Impacts. Most of the breeding SNPL population within the HCP area nests within the seasonal exclosure. Horses are not allowed in the Southern Exclosure or within the Oso Flaco area.

Therefore, SNPL adults, eggs, and chicks within these areas are protected from direct impacts (e.g., eggs being crushed) from horses.

Most equestrian activity occurs in the northern portion of the HCP area and other areas where SNPL are unlikely to nest. If equestrian activity occurred in areas where SNPL nest or if a SNPL nested outside the seasonal exclosure in an area where equestrian activity is allowed, it would generally have the same types of effects on nesting SNPL as pedestrians (section 4.3.1.1.3). Monitors have documented at least four SNPL clutches on Morro Spit, California, that were destroyed by horses trampling the nests (Persons and Ellison 2001 as cited in ICF International 2010). To reduce the impacts from equestrian activity, CDPR will continue to implement the SNPL and CLTE management program, which includes installing additional fencing (i.e., bumpouts) on the Southern Exclosure, if necessary, to ensure that equestrian activities do not disturb nesting SNPL. Monitors will also continue to search daily for SNPL nests outside the Southern Exclosure and protect them with an individual exclosure, as necessary and appropriate. In addition, a buffer zone a minimum of 100 feet will be established around all individual nest exclosures in the open riding area to ensure that recreation activities do not disturb nesting SNPL. As a result, the effects on nesting SNPL from equestrian recreation are considered to be minimal.

Foraging and/or Roosting Disturbance. Equestrian activity can disturb foraging SNPL during the breeding and non-breeding seasons in a similar manner as described for pedestrian activities (section 4.3.1.1.3). Equestrian activity during the breeding season typically occurs outside areas where SNPL are known to forage; however, during the non-breeding season, SNPL forage in areas where there is equestrian activity (i.e., Post 2 to Grand Avenue). When equestrian activity occurs in SNPL foraging habitat (e.g., near Post 2 during the non-breeding season), disturbance of foraging SNPL is likely limited due to the short duration of disturbance caused by equestrian recreation. A study in Santa Barbara County found that horses (in addition to dogs, humans, crows and other birds) disturb SNPL (Lafferty 2001b). However, adult SNPL typically move from the area to other available foraging habitat. CDPR will also continue to implement the SNPL and CLTE management program, which includes handing out educational materials on SNPL to visitors, including horseback riders, in the HCP area to prevent visitors from disturbing SNPL. Equestrian activities will continue to have minimal impacts on foraging SNPL.

Reduced Habitat Quality. At some SNPL nesting sites, equestrian activity can degrade the quality of habitat because horses leave depressions in an otherwise naturally flat, wave-washed shoreline, which can disrupt or impede the movement of chicks and adults (Neuman 2001), as cited in ICF International 2010). If chicks are unable to climb out of the depressions, they become more vulnerable to recreation activities, energetically stressed, and/or emaciated. However, this impact likely doesn't occur in the HCP area because equestrian activity generally occurs in the northern portion of the HCP area outside of areas where SNPL chicks typically occur, equestrians are not allowed south of the riding boundary fence (e.g., Oso Flaco) where SNPL chicks do occur, and equestrians are required to stay on designated trails where such trails exist.

4.3.1.1.8 Boating/Surfing (CA-8)

Nesting and Brooding Impacts. Boaters and surfers do not affect breeding SNPL because the seasonal exclosure shoreline is closed to boat landings, surfers, and paddleboarders during the breeding season.

Foraging and/or Roosting Disturbance. Surfing, small boat, and paddleboard launchings along the beach likely have similar effects on year-round roosting and foraging SNPL as pedestrians (section 4.3.1.1.3). Surfing, small boat, and paddleboard launching activities can displace wintering SNPL and/or breeding SNPL adults and/or broods from foraging along the shoreline outside the seasonal exclosure. However, disturbance from kayakers, paddleboarders, and surfers is likely more limited than other pedestrian activities because these uses tend to be concentrated outside areas where SNPL typically occur, although surfers sometimes surf near Post 6, where SNPL can roost or forage.

Increased Predators. Surfing, small boats, and paddleboard launchings can also disturb gull flocks foraging on the shoreline and displace gulls into areas where SNPL nests or broods are located, thus increasing the risk of predation. However, in accordance with the Superintendent's Order (section 1.5.7), all surfing, boating, and paddleboarding activities are not allowed along the seasonal exclosure shoreline or within 1,000 feet of the shoreline. CDPR will also continue to implement the SNPL and CLTE management program, which includes implementing a predator management program in the HCP area. As part of the ongoing predator management program, CDPR monitors and controls avian predators when necessary (section 2.2.2.1.2). As a result, this effect is considered to be minimal.

4.3.1.1.9 Aerial/Wind-Driven Activities (CA-9)

Nesting and Brooding Impacts. Biologists believe shorebirds may perceive kites as potential avian predators; therefore, kite flying and/or kiteboarding may be extremely disruptive to nesting SNPL. The District Superintendent's Orders (section 1.5.7) prohibit kite flying and kiteboarding from Pier Avenue south to the southern Oceano Dunes SVRA boundary during the SNPL breeding season. As a result, disturbance due to kite flying and/or kiteboarding do not affect nesting SNPL.

SNPL chicks have been shown to lie motionless in response to avian predators (Colwell et al. 2007). If chicks respond to kites in the same way as potential avian predators and lie motionless when a kite is near, then chicks may be more vulnerable to vehicle strike and predation during this time. However, kite flying and kiteboarding are not allowed in areas where chicks are expected to forage (i.e., between Pier Avenue and the southern Oceano Dunes SVRA boundary) or within 1,000 feet of the shoreline during the breeding season (section 1.5.7). CDPR will also continue to implement the SNPL and CLTE management program, including having monitors conducting daily searches for and monitoring of SNPL broods in suitable habitat outside the exclosure area. As a result, impacts from kite flying and kite boarding are considered minimal.

Foraging and/or Roosting Disturbance – Non-breeding Season. Where it is allowed, kite flying and/or kiteboarding can disturb roosting or foraging adult SNPL during the non-breeding season, especially in areas where SNPL are known to roost (e.g., between Post 1 and Post 2 or near Midramps). Disturbance from kites can cause SNPL to continually flush or move from the area, which can result in increased vigilance or stress and/or decreased foraging. However, adult SNPL typically move from the area to other available foraging habitat; therefore, this impact is considered to be minimal. In addition, even in the non-breeding season, kiteboarders rarely make it as far south as Oso Flaco. Therefore, any roosting or wintering SNPL south of Oso Flaco are not likely disturbed.

4.3.1.1.10 Holidays (CA-10)

Vehicle Impacts. Oceano Dunes SVRA closes the park to additional vehicles once the limits prescribed by the Oceano Dunes CDP (CDP 4-82-300-A5, section 2.2.1.1) are reached on any holiday. As a result, the effects of motor vehicles on holidays do not change from those discussed in section 4.3.1.1.1.

Nesting, Brooding, and Foraging Impacts. Studies in California have shown that more SNPL chicks are lost on weekends and holidays than on weekdays. This suggests that increased recreational activity is linked to increased chick loss (Ruhlen et al. 2003). Pedestrians are not subject to limits in the HCP area, and some holidays (e.g., the July 4 holiday) attract large pedestrian crowds to area beaches. Effects from increased crowds are similar to those described for pedestrian activities (section 4.3.1.1.3), but the amount and type of disturbance can be more frequent and/or longer in duration. High levels of pedestrian traffic can cause repeated flushing of adults. Frequent flushing of adults can keep adults from brooding chicks, thus increasing thermoregulatory costs and potentially reducing rates of development and/or increasing their vulnerability to predators and inclement weather. Additionally, suspended feeding and expenditure of energy during repeated flushing can affect reproduction and survival of

adults and chicks (Lafferty 2001a). To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitoring within the HCP area will be increased during periods of high visitation, including on weekends and holidays, to reduce the risks associated with increased recreation. In addition, CDPR staff will continue to hand out educational materials on SNPL to visitors in the HCP area to prevent visitors from disturbing SNPL nests and chicks. As a result, any increased impacts from holidays are considered to be minimal.

Fireworks are prohibited in the HCP area; however, once a year the City of Pismo Beach has a fireworks display on July 4 on the Pismo Beach pier. Therefore, during the July 4 holiday, many spectators congregate in the northern portion of the HCP area, which is over 2 miles from the northern edge of the Southern Exclosure. As a result, crowds associated with the City of Pismo Beach fireworks display are located in areas where they likely don't affect breeding SNPL. However, SNPL are largely precluded from foraging and roosting in areas that are heavily congested during the fireworks displays (e.g., the area north of Grand Avenue). In addition, although fireworks are illegal in the HCP area, some illegal fireworks have been regularly observed during the July 4 week in or near SNPL breeding habitat, and have been observed disturbing nesting, roosting, and/or foraging SNPL. Disturbance from fireworks causes SNPL to flush or move from the area, which results in increased vigilance or stress, decreased foraging, and/or decreased brooding. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. To minimize potential illegal fireworks use and any effects from increased crowds due to legal fireworks, CDPR will continue to employ additional ranger staff at Oceano Dunes SVRA to enforce regulations during the July 4 holiday. In addition, CDPR will continue to increase staff near the Southern Exclosure to reduce illegal firework use in this area. Therefore, effects from fireworks or other actions that can disturb breeding SNPL during the July 4 holiday are reduced.

4.3.1.1.11 Special Events (CA-11)

As with holidays, the vehicle limits prescribed by Oceano Dunes CDP (CDP 4-82-300-A5, section 2.2.1.1) are not exceeded during special events, and Special Event Permits do not authorize activities in areas that will otherwise be closed to visitors. Thus, the potential for a given special event to affect SNPL depends on the nature of the event being approved and is generally similar to non-special event activities. For example, the effects of a special event involving OHVs is the same as the effects of typical motorized recreation (section 4.3.1.1.1), and a wedding or family reunion near Grand Avenue has effects similar to pedestrian activities (section 4.3.1.1.3).

Special events are potentially different from typical non-special event activities in a few ways. First, many events tend to focus participants in the event area, which can mean that spectators or vendors are more concentrated in a given area than they might otherwise be during an ordinary day. Effects on SNPL from concentrating spectators and vendors in an area is similar to the effects described for motorized recreation (section 4.3.1.1.1) and/or pedestrian recreation (section 4.3.1.1.3); however, the effects can be more frequent during the event and/or longer in duration due to the increased number of visitors. Second, special events change use patterns and increase visitation on days that might normally not be at capacity; however, the effects from this difference are likely not any different than those described above, depending on the activities associated with the event. Special events are evaluated for potential effects on covered species to determine whether AMMs are necessary to include in the permit conditions. Review is based on past experience and is dependent on the event location, timing, and potential to impact covered species like SNPL. For example, larger special event conditions may include AMMs such as assigning resource monitors or additional enforcement staff or adjusting scheduling, location, or paths of travel, as necessary, for each event. With the implementation of AMMs during special events, impacts from special events are considered to be minimal.

UAS may be used in the future for video production within the HCP area. UAS will not be allowed south of Post 5 during the breeding season. Therefore, UAS are not expected to affect nesting SNPL. UAS could disturb SNPL foraging and/or roosting north of Post 5. However, Vas et al. (2015) assessed reactions by a variety of waterbirds to approaches by drones and found that the birds remained unaffected in most cases, suggesting the potential to use drones without significant disturbance. In addition, to ensure disturbance to foraging and/or roosting SNPL from UAS operations is minimized, all UAS operators will be required to obtain a permit to operate over CDPR lands. As part of the permit to operate, any UAS operator will be required to follow AMMs to reduce impacts to SNPL. For example, during the breeding season, UAS will not be allowed along the shoreline south of Post 5. In addition, a USFWS-approved monitor will accompany UAS operators at any time of the year if it is determined there is potential to impact covered species. As a result, impacts of UAS operations to foraging and/or roosting SNPL are expected to be minimal.

4.3.1.2 Natural Resources Management Program

4.3.1.2.1 Covered Species Management

Installation and Maintenance of Western Snowy Plover and California Least Tern Protection Fences (CA-12a)

Seasonal Exclosure Fencing Exclosure and symbolic fencing are installed and maintained in the HCP area each breeding season as part of the ongoing SNPL and CLTE management program. Exclosure and symbolic fencing is installed by March 1, which is before SNPL typically form breeding pairs, and it is removed starting October 1, which is after the date when all nests and broods have a known fate and the breeding season has ended. As a result, initial installation and removal of the exclosure perimeter fencing does not affect nesting SNPL.

Vehicle Strike. Exclosure fences and symbolic fencing must be maintained throughout the breeding season to ensure integrity against terrestrial predators and human disturbance. Bumpouts are also installed to further protect nests from human disturbance, when needed. Fence maintenance is conducted by hand or by heavy equipment and may have different intensity of impacts depending on the method. Maintenance of the fence and bumpout installation can occur multiple times in a week and may involve extended or repeated visits to the nesting sites. Maintenance vehicles may need to drive within the closed portion of the shoreline (but not within the exclosure itself) and can potentially crush chicks. However, to minimize the risk of maintenance vehicles striking an SNPL, CDPR staff are trained to operate a vehicle on the shoreline when SNPL broods are present, including by scanning ahead of the vehicle for SNPL, driving where chicks are less likely to occur, avoiding wrack, keeping speeds at or below 5 mph, and in some cases avoiding driving the shoreline during high tides. As a result, effects are considered minimal.

Nesting and Brooding Disturbance. Both heavy equipment and hand maintenance of the fence and bumpout installation can disturb nesting SNPL by temporarily flushing brooding adults away from nests or chicks or by flushing chicks. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated and chicks can be depredated, inadequately fed, or flushed into the open riding area. Maintenance using heavy equipment is typically shorter in duration than maintenance by hand and thus likely results in less impact to nesting SNPL than hand maintenance. In addition, effects from exclosure and symbolic fence maintenance have been minimal in the past due to the implementation of established protocols in the SNPL and CLTE management program. Specifically, fence maintenance and bumpout installation are timed to avoid extremely windy periods or other inclement weather. In addition, monitors conduct a survey prior to conducting fence maintenance activities. If a nesting SNPL could be impacted by activities, monitors postpone maintenance, if

appropriate, or remain on site during fence maintenance/installation to minimize disruption to SNPL. Furthermore, if chicks are flushed out of the exclosure during fence maintenance and/or bumpout installation, monitors attempt to follow and protect the chicks until they move back inside the exclosure. Overall, fenced protected areas have been shown to increase SNPL and other shorebird reproductive success in other locations (Isaksson et al. 2007, Hardy and Colwell 2008, Wilson and Colwell 2010, Pearson et al. 2014). In the HCP area, reproductive success has increased since the implementation of the SNPL and CLTE management program, including the use of the seasonal exclosure and symbolic fencing; therefore, the seasonal exclosure and symbolic fencing areas have provided a considerable benefit to SNPL.

Impacts from Fencing. Fences placed in otherwise open habitat can be hazardous to flying birds. Shorebirds have been observed being killed upon striking cable (symbolic) fences at other sites (Page et al. 2002). Although infrequent, monitors at Oceano Dunes SVRA have observed SNPL striking the seasonal exclosure fence while flying (CDPR 2014a). In 2015, CDPR placed brightly colored strips of fencing along sections of the Southern Exclosure to increase the visibility of the exclosure fence. The strip of fencing was attempted as an experiment in 2015 and was placed on the western and northern Southern Exclosure fence in 2016 with favorable results. CDPR will continue to implement this program by lining the top of the Southern Exclosure fence with a strip of thicker plastic fencing (orange silt construction fencing cut into approximately 1-foot sections) in March of each year, covering most of the western and northern Southern Exclosure fenced areas. If staff resources are available, some of the eastern fenceline and bumpout fencing will also be lined with this strip fencing. Therefore, it is anticipated the visible fencing will continue to reduce the likelihood of a SNPL striking a fence in areas where it is installed. SNPL are known to nest in the Oso Flaco area and can still strike symbolic fencing in this area. However, this event has rarely been documented since the implementation of the SNPL and CLTE management program. As a result, this event will continue to be rare. Overall, the seasonal exclosure fence is an important protective measure that has increased SNPL reproductive success in the HCP area. Therefore, the seasonal exclosure fence will continue to be used despite the potential for birds to strike the fence.

Single-Nest and Other Small Exclosures

Nesting and Brooding Disturbance. Single-nest exclosures are installed and maintained in the HCP area as part of the ongoing SNPL and CLTE management program. Installation of SNPL single-nest exclosures can be highly disruptive to SNPL as adults are often displaced from incubation for the duration of the exclosure construction. Melvin et al. (1992) found that plovers returned to the exclosure and completed the clutch when exclosures were placed around incomplete clutches of at least three eggs, indicating that individuals are less likely to abandon a nest when the clutch is close to completion. Therefore, as part of the protocol associated with the ongoing SNPL and CLTE management program in the HCP area, monitors typically attempt to minimize the risk of abandonment when erecting exclosures around SNPL nests in non-motorized areas by waiting until at least two eggs are present in the nest. However, because there is greater risk to the nest from motorized activity in the open riding area than from the installation of the exclosure, single-nest exclosures are installed as soon as feasible once a nest is discovered outside the seasonal exclosure. Additional AMMs that are implemented as part of the ongoing SNPL and CLTE management program that will continue to be implemented include having only experienced, qualified biologists install the exclosure, timing the installation of the exclosure to avoid extremely windy periods, installing the exclosures within timelines established within existing federal permits, and monitoring the nest after exclosure installation to ensure the adult returns to the nest. Overall, single-nest exclosures have been beneficial to nesting SNPL and protect nests from the impacts of recreation and predation.

Impacts from Fencing. While mesh tops that are installed on the tops of the small single-nest exclosure protect SNPL nests from predators, the mesh top itself poses a collision or entanglement risk to adult SNPL. One adult SNPL in the HCP area died in 2004 after becoming entangled in a mesh exclosure top. That net top was a large mesh (4-inch by 4-inch) that is no longer used in the HCP area. A smaller mesh of 0.5-inch by 0.5-inch has been used since 2005, but even this smaller mesh top still poses a risk of entanglement for adult SNPL. Although SNPL entanglement within these mesh tops has not been observed in the HCP area, monitors in the HCP area carefully approach nests in exclosures with mesh tops to avoid startling the SNPL on the nest and minimize the risk of entanglement. In addition, this risk is likely minimal since SNPL usually leave the exclosures by walking or running rather than flying (Melvin et al. 1992).

Increased Predators. Single-nest exclosures can also pose a risk to incubating adult SNPL because they may increase the likelihood that predators will recognize the exclosure and prey on the attending adults. Murphy et al. (2003) showed that nest exclosures had a negative effect on the survival of adult piping plovers (*Charadrius melodus*). Isaksson et al. (2007) found that nest exclosures increased predation on incubating adult redshanks (*Tringa totanus*). Similarly, Watts et al. (2012) observed an increase in adult SNPL mortality in 2006 in Humboldt County that was caused by the presence of nest exclosures; however, it is unknown whether this was an isolated occurrence. During monitoring efforts associated with the SNPL and CLTE management program, CDPR monitors have observed or suspected predation of SNPL at small single-nest and mini exclosures within the HCP area. To reduce this impact within the HCP area, CDPR staff implements established protocols to minimize the likelihood that a predator can key in on small single-nest or mini exclosures and depredate SNPL adults or nests. Specifically, small single-nest and mini exclosures are closely monitored to evaluate their effectiveness and ensure substantial adult mortality due to predation at the exclosure does not occur. If predation is suspected, monitors remove the small single-nest or mini exclosures in the area and attempt to trap/remove the predator. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing SNPL at a large single-nest exclosure. Based on SNPL and CLTE Annual Breeding Season Reports (Appendix F) since the implementation of these established protocols, the protocols have been successful at reducing predation at small nest exclosures; however, some predation still occurs and will continue to occur at these exclosures.

Western Snowy Plover and California Least Tern Monitoring and Management (CA-12b)

Monitoring

Vehicle Strike. Although most SNPL nest within the seasonal exclosure in the HCP area, some SNPL have been observed nesting outside the seasonal exclosure (e.g., near Arroyo Grande Creek). While driving to access the seasonal exclosure, monitors or their vehicles can crush a chick or nest outside the seasonal exclosure if an SNPL nest has not yet discovered. In addition, a monitor vehicle could crush a chick that is foraging or being brooded on the shoreline if the monitor does not see them. To reduce this risk, monitors in the HCP area follow established protocols to minimize adverse effects on nesting SNPL, including, but not limited to, keeping speeds below 5 mph along the shoreline, scanning ahead of the vehicle for SNPL, and avoiding driving in the wrack. Monitoring is also conducted by experienced monitors who are authorized by the USFWS to conduct the monitoring and/or who work under the specific requirements of the 10(a)(1)(A) Recovery Permit so it is less likely that there will be impacts to nests or chicks. Monitors will continue to follow established protocols when conducting monitoring activities. Therefore, this impact is not likely to occur.

Nesting and Brooding Impacts. Monitoring of SNPL has been conducted in the HCP area since 1992, although the methods have been modified over the years to ensure the monitoring is effective.

Monitoring activities involve extended or repeated visits to SNPL nesting sites, which can disrupt nesting birds by keeping them off their nests, separating broods, scaring chicks into the open riding area, and exposing birds to inclement weather and predators. In addition, the practice of floating SNPL eggs to estimate hatch date could damage the eggs themselves and disturb attending adults at the nest. MacIvor et al. (1990) found that regular monitoring of piping plover nests and trapping at the nest did not lead to increased nest predation. Similarly, Galbraith (1987) found that clutch survival of lapwings (*Vanellus vanellus*) was not affected by marking and visiting nests or by handling eggs. Within the HCP area, CDPR staff implement established protocols during monitoring to minimize adverse effects of monitors on nesting SNPL. In addition, monitors must have a 10(a)(1)(A) Recovery Permit (or be approved by the USFWS). Based on SNPL and CLTE Annual Breeding Season Reports (Appendix F) in the HCP area since the implementation of the SNPL and CLTE management program, the protocols have been successful at increasing SNPL reproductive success. Therefore, monitoring of nests, when carried out by experienced and permitted biologists as is done in the HCP area, benefits SNPL by increasing the number of SNPL eggs and chicks found and by providing information that is critical to the conservation and protection of the species.

Monitoring activities in the HCP area can flush chicks into the territory of a neighboring nest or brood. Monitors in the HCP area have observed adult SNPL acting aggressively toward chicks that approach their nests or chicks. In a few instances, injury or death of the chick has resulted (CDPR 2015a). To reduce this risk, CDPR follows established protocols as part of the SNPL and CLTE management program when entering the exclosures. Specifically, monitors that enter the exclosure are aware of the location of nests, brood, and adults to minimize situations where a brood may move into the territory of another nest. However, adult aggression may still occur, including if the population in the HCP area continues to increase.

Within the HCP area, cameras are sometimes installed at SNPL nests to document nest predators. Cameras have been effective for identifying nest predators in other locations in California (Demers and Robinson-Nilsen 2012). While they collect useful data on nesting SNPL, cameras that are used to monitor nests need to be maintained, which can cause additional disturbance when the monitors approach the cameras to maintain them. In addition, the cameras may be spotted by potential SNPL predators and alert these predators to the location of nearby nests. However, in other studies that used cameras to monitor nests, the presence of cameras did not appear to influence nesting success or attract predators to the nest (Brown et al. 1998, Demers and Robinson-Nilsen 2012). Cameras have not been observed influencing nest success in the HCP area to date. To ensure effects from cameras are minimized, CDPR will also continue to implement the SNPL and CLTE management program, which includes AMMs to be implemented while using still or video cameras, such as training monitors on how to install cameras, not installing cameras when the wind speed is above 15 mph or strong enough to move sand or if it is raining, waiting to deploy cameras if a predator sighting recently occurred, and not installing cameras on nests that are readily visible to the public. As a result, the effects of using cameras near SNPL nests are considered to be minimal.

Collecting SNPL chicks and eggs requires handling chicks and/or eggs to relocate them to an authorized wildlife facility. This activity can also result in increased stress and vigilance of chicks while monitors attempt to capture the chicks. In addition, captive rearing is not always successful, and eggs or chicks may not survive in the captive facility. Despite this potential outcome, captive rearing has been documented as successful in a few studies (Powell and Cuthbert 1993, Powell et al. 1997, Neuman et al. 2013) and, even in studies where survival of captive-reared young is low, proponents of the technique point out that even small numbers that survive and breed indicate some success toward conservation of the species since otherwise the eggs or chicks would not have survived (Roche et al. 2008, Neuman et al. 2013). In the past, approximately 112 eggs and 52 chicks within the HCP area have been salvaged when

they were found abandoned or injured. A portion of these individuals have survived to fledging age in a captive rearing facility. These fledglings have been released back into the wild and many were documented as integrating into the wild SNPL population and breeding, although not necessarily within the HCP area. As a result, salvaging SNPL eggs and chicks will continue to be beneficial to the individuals removed, which—if they go on to breed—would benefit SNPL overall.

Banding

Chick Impacts. Leg bands are commonly used to mark shorebird chicks. SNPL chicks in the HCP area have been banded as young as the day of hatch since 2000. Banding SNPL chicks results in capture of the chicks and could lead to injury or death; however, studies of piping plovers in the Great Lakes indicate that banding has no detrimental effect on the survival of the chicks to fledging (Roche et al. 2010). To minimize the risk of injury or mortality during banding activities, CDPR implements established protocols associated with the SNPL and CLTE management program. Specifically, CDPR uses a master bander to band all SNPL chicks in the HCP area. In addition, monitors capture birds and remove the leg bands if a bird shows signs of leg injury due to bands. No injuries or mortalities have been reported during banding activities in the HCP area to date. As a result, injuries or mortality associated with banding activities in the future are not expected.

Some SNPL have been observed in the HCP area with leg injuries from unknown causes. Although the causes of the leg injury have not been determined, these injuries could be from leg bands. As part of the ongoing SNPL and CLTE management program in the HCP area, to minimize the risk of additional injury and mortality associated with leg bands, monitors capture birds that show signs of leg injury due to bands and remove the bands. For example, in 2017 a banded adult was observed with a slight limp, and when captured, the right leg bands were not moving freely. The bird was taken to a wildlife center, the leg bands were removed, and the leg was treated. A few weeks later the bird's leg had improved and the bird was released back in the HCP area. Leg injuries that can be attributed to leg bands have been infrequent in the past and are expected to continue to be infrequent.

Adult Impacts. Currently, adult SNPL are not banded in the HCP area; however, the Oceano Dunes District may request permission from the USFWS to band adults at a later date. Banding adults could pose risk of injury or mortality to adults. In addition, banding could substantially disturb nesting SNPL and ultimately cause them to abandon their eggs or chicks. To reduce these impacts, CDPR will implement established protocols during banding in accordance with the SNPL and CLTE management program. Specifically, a master bander will be used to band any SNPL in the HCP area. In addition, monitors and master banders will be required to have a 10(a)(1)(A) Recovery Permit and/or be approved by the USFWS and follow careful protocols designed to minimize any adverse effects on SNPL during these activities. Furthermore, monitors that enter the exclosure will be aware of the location of nests, brood, and adults in order to minimize situations where an adult might abandon eggs or chicks. As a result, the effects from banding adults are expected to be minimal.

Predator Control

Nesting and Brooding Impacts. A predator management program has been implemented as part of the ongoing SNPL and CLTE management program in the HCP area since 2002. Control of both avian and mammalian predators has been shown to increase chick survival in other shorebirds and SNPL (Neuman et al. 2004, Catlin et al. 2011). However, control of both avian and mammalian predators (e.g., hazing, live trapping, or lethal removal) can result in negative effects on SNPL. Predator removal may require a predator specialist to enter the seasonal exclosure and/or remain in an area for a prolonged period of time to set and monitor predator traps. These effects are similar to the effects of monitoring activities and can result in disrupting nesting birds by keeping them off their nest, separating broods, scaring

chicks into the open riding area, and exposing birds to inclement weather and predators. In order to reduce effects on SNPL, CDPR implements established protocols as part of the SNPL and CLTE management program. Specifically, predator specialists that enter the seasonal exclosure are either accompanied by a qualified CDPR staff member or have been approved by the USFWS to enter the nesting area. Predator specialists are also provided with information on SNPL in the HCP area and are made aware of the location of nests, brood, and adults in order to minimize situations where a brood or incubating adult could be disturbed. Monitors also observe the open riding area during any predator removal activities that could result in chicks leaving the exclosure and moving into the open riding area to ensure no broods flush into the area during activities. If broods move into the open riding area, monitors control traffic and ensure that chicks move safely back into the seasonal exclosure. Overall, the predator management program appears to have had beneficial effects and has likely increased the overall population (i.e., number of breeding adults) and reproductive success (i.e., number of fledglings per nesting pair) for SNPL in the HCP area. As a result, predator management will continue to benefit SNPL in the HCP area.

Habitat Enhancement

Nesting and Brooding Disturbance. Habitat enhancement has been implemented each year in the HCP area as part of the ongoing SNPL and CLTE management program. Transporting and installing the materials used for habitat enhancement measures (e.g., enhancing wrack, adding woodchips) is implemented prior to the start of the breeding season and at the end of the breeding season. To the extent feasible, this work is conducted immediately before the seasonal exclosure is removed when all nests have been confirmed to have fledged to avoid impacting nesting SNPL. Therefore, with the exception of the following habitat enhancement activities, these activities do not affect breeding SNPL.

A limited number of habitat enhancement activities occur on the shoreline (e.g., collecting and depositing wrack and beach hoppers/talitrids) near the seasonal exclosure during the breeding season. The effects are similar to those from monitoring activities and can result in disrupting nesting SNPL by keeping them off their nests, separating broods, and/or exposing birds to inclement weather and predators. In addition, foraging SNPL adults that are interrupted by humans have been observed to stop foraging and move away from the wrack until the disturbance has passed (Webber et al. 2013). To reduce impacts to SNPL, CDPR staff implements established protocols during habitat enhancement activities to minimize adverse effects of monitors on nesting SNPL. Specifically, monitors are aware of the location of nests, brood, and adults in order to minimize situations where a brood or incubating adult could be disturbed. In addition, only monitors approved by the USFWS or with a 10(a)(1)(A) Recovery Permit are permitted to collect materials along the shoreline near the seasonal exclosures. Overall, habitat enhancement has had a positive effect on SNPL by providing cover and other habitat improvements within breeding habitat. Therefore, habitat enhancement will continue to have an overall positive effect on SNPL.

Foraging and/or Roosting Disturbance – Non-Breeding Season. Habitat enhancement has limited effects on wintering SNPL, if any, because these activities are limited in the winter and typically only occur after storm events when lots of wrack is present on the beach. In addition, wintering SNPL typically move from the area to other available foraging habitat.

Tidewater Goby and Salmonid Surveys (CA-13)

Nesting, Brooding, and Foraging Disturbance. Tidewater goby and salmonid surveys can occur within Pismo Creek and estuary; however, SNPL have only been observed nesting near Pismo Creek estuary one time (in 2009). Therefore, impacts to SNPL during the breeding season at Pismo Creek estuary are unlikely.

Tidewater goby and salmonid surveys in lower Arroyo Grande Creek, including the euryhaline lagoon at Pismo State Beach, can occur up to four times during the SNPL breeding season. SNPL have been observed nesting adjacent to Arroyo Grande Creek in the past, but this is an infrequent occurrence. If SNPL are nesting immediately adjacent to the creek or lagoon, then fisheries monitoring/surveys can result in disturbance, vehicular collision, or crushing of nests or chicks, such as described above for SNPL monitoring (section 4.3.1.2.1). In addition, fish surveys can disturb foraging or roosting SNPL near Arroyo Grande Creek and the lagoon during the nesting season. Given that only four such surveys are conducted each year, the surveys are short in duration, survey staff includes personnel experienced with conducting fisheries surveys within SNPL habitat, and SNPL infrequently attempt to nest in the Arroyo Grande Creek area or near the lagoon, the likelihood of these surveys resulting in effects on nesting, foraging, or roosting SNPL is low. CDPR will also continue to implement the SNPL and CLTE management program in the HCP area to reduce impacts to SNPL. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the seasonal exclosures, including the Arroyo Grande Creek area. In addition, fisheries surveys are not conducted within 300 feet of an active SNPL nest. As a result, effects on SNPL from fisheries surveys during the breeding season are considered to be minimal.

SNPL rarely occur at Oso Flaco Lake; therefore, any tidewater goby surveys conducted at Oso Flaco Lake do not impact SNPL. Although infrequent, a lagoon-like reach will sometimes form where Oso Flaco Creek flows out into the Pacific Ocean. When this happens, surveys for tidewater goby may occur within the Oso Flaco Lake/Creek area and thus within an area where SNPL can occur. Effects on SNPL from these surveys are similar to those discussed above for Arroyo Grande Creek and lagoon. Monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the seasonal exclosure, and fisheries surveys are not conducted within 300 feet of an active SNPL nest. In addition, fisheries survey staff includes personnel experienced with conducting fisheries surveys within SNPL habitat. As a result, effects on SNPL from fisheries surveys during the breeding season are considered to be minimal.

Foraging and/or Roosting Disturbance – Non-Breeding Season. Non-breeding season SNPL flocks form near the Arroyo Grande Creek river mouth and pooling water. If present during tidewater goby surveys, they would likely be flushed. However, any impacts are temporary and relatively short in duration and SNPL flocks typically relocate to another location or adapt to the minor disturbance. In addition, tidewater goby surveys are conducted by personnel experienced with conducting surveys within SNPL habitat. As a result, effects on SNPL flocks from fisheries surveys during the non-breeding season are considered to be minimal.

California Red-legged Frog Surveys and Associated Management (CA-14)

Nesting, Brooding, and Foraging Disturbance. CRLF survey locations at Oso Flaco Lake and Meadow Creek and lagoon are located outside suitable SNPL nesting, foraging, and roosting habitat and thus do not affect SNPL.

CRLF surveys in lower Arroyo Grande Creek, including the lagoon at Pismo State Beach, can occur year-round, including during the SNPL breeding season. SNPL have been observed nesting adjacent to Arroyo Grande Creek in the past, but this is an infrequent occurrence. If SNPL are nesting immediately adjacent to the creek or lagoon, then CRLF surveys can result in disturbance, vehicular collision, or crushing of nests or chicks, such as described above for SNPL monitoring. In addition, CRLF surveys can disturb foraging or roosting SNPL near Arroyo Grande Creek and the lagoon during the breeding season. Given that the surveys are short in duration and that SNPL infrequently attempt to nest in the Arroyo Grande Creek area or near the lagoon, the likelihood of these surveys resulting in effects on nesting SNPL is low. CDPR will also continue to implement the SNPL and CLTE management program in the HCP area to

ensure that these impacts are reduced. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the seasonal exclosures, including the Arroyo Grande Creek area. In addition, CRLF surveys are not conducted within 300 feet of an active SNPL nest. Furthermore, CRLF survey staff includes personnel experienced with conducting surveys within SNPL habitat. As a result, effects on SNPL from CRLF surveys during the breeding season are considered to be minimal.

Foraging and/or Roosting Disturbance – Non-Breeding Season. Non-breeding season SNPL flocks form near the Arroyo Grande Creek river mouth and pooling water. If present during CRLF surveys, it is likely they would be flushed. However, any impacts are temporary and relatively short in duration and SNPL flocks typically relocate to another location or adapt to the minor disturbance. In addition, CRLF surveys are conducted by personnel experienced with conducting surveys within SNPL habitat. As a result, effects on SNPL flocks from CRLF surveys during the non-breeding season are considered to be minimal.

Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

Nesting, Brooding, and Foraging Disturbance. Monitoring for most listed plant species is conducted outside of the SNPL breeding season and/or habitat. Therefore, within the exception of the following listed plant monitoring activities, these activities have no effect on breeding SNPL.

Surf thistle and beach spectaclepod are known to occur within North and South Oso Flaco, where SNPL are known to nest, including within the seasonal exclosure (Map 19 and Map 20). Because of the timing of their blooming and growth periods, both plant species can only be accurately identified by doing surveys during the SNPL breeding season. These surveys can temporarily disturb nesting and/or foraging SNPL within North and South Oso Flaco in a similar manner as described for monitoring activities (section 4.3.1.2.1). However, since conducting surveys for these plant species requires entry into the seasonal exclosure, the Oceano Dunes District has established detailed survey protocols in the Nesting Season Management Plan[32] (Appendix E), which is part of the ongoing SNPL and CLTE management program, to minimize effects on nesting and foraging SNPL. No destruction of eggs or mortality of chicks and/or adults have been observed during past surveys for surf thistle and beach spectaclepod in the HCP area. In addition, surveys for surf thistle and beach spectaclepod within or directly adjacent to the seasonal exclosure are conducted with a 10(a)(1)(A) SNPL and CLTE permitted (or a USFWS-approved) biologist, which has been successful at reducing disturbance to nesting and/or foraging SNPL. As a result, surveys conducted during the breeding season for surf thistle and beach spectaclepod are considered to have minimal effects on nesting and/or foraging SNPL. Seed collection for propagation would not be done within areas occupied by breeding SNPL, and any planting would be done outside the breeding season.

Foraging and/or Roosting Disturbance—Non-Breeding Season. Listed plant monitoring can result in disturbance to foraging and roosting SNPL during the non-breeding season. In addition, plant monitoring surveys can keep foraging and/or roosting SNPL from the area for the period of time the surveys are conducted. However, the plant monitoring surveys are short in duration (i.e., no longer than 15 minutes at each site), and CDPR will continue to implement the SNPL and CLTE management program. As a result, any disturbance from listed plant monitoring on foraging and roosting SNPL during the non-breeding season is considered to be minimal.

[32] The Nesting Season Management Plan will be superseded by this HCP in the future and will, therefore, no longer be required.

4.3.1.2.2 Habitat Restoration Program (CA-16)

Nesting and Brooding Disturbance. Any planting of foredune plants and seeds within the seasonal exclosure occurs by March, which is before SNPL begin to nest. Other habitat restoration and related activities, including fence maintenance, occur prior to SNPL breeding season to the extent feasible. If activities occur in the breeding season, they are planned to avoid areas where SNPL nest.

Foraging and/or Roosting Disturbance—Non-breeding Season. Habitat restoration activities can disturb foraging and/or roosting SNPL during the non-breeding season. Specifically, surveys can disturb SNPL adults and deter them from foraging and/or roosting in the area. However, restoration activities are typically short in duration and infrequent. As a result, any disturbance from restoration activities on foraging and/or roosting SNPL during the non-breeding season is considered to be minimal.

Reduced Habitat. If vegetation for restoration purposes is planted in and grows too densely within the footprint of the seasonal exclosure or other primary and/or secondary suitable SNPL nesting habitat, it can reduce SNPL breeding habitat in these areas.[33] To reduce this impact, vegetation associated with the habitat restoration program is not planted beyond existing vegetated islands. Therefore, such impacts to SNPL breeding habitat are unlikely.

Increased Predators. Vegetation that is planted in the vicinity of known SNPL breeding, roosting, and/or foraging habitat can impact breeding SNPL by providing habitat for predators to hide and stalk nesting, foraging, and/or roosting SNPL. To reduce this impact, CDPR implements a predator management program that has been successful at controlling predators in the HCP area and protecting breeding SNPL. The predator management program has likely increased reproductive success and benefited SNPL and is expected to alleviate any impacts associated with any additional vegetation being planted near SNPL habitat. As a result, these effects are minimal.

4.3.1.2.3 Invasive Plant and Animal Control (CA-17)

Nesting and Brooding Disturbance. Actions taken to control invasive plants during the SNPL breeding season do not occur near the seasonal exclosures. In addition, any control of invasive plants within areas where SNPL may nest are avoided during the breeding season. Therefore, effects on nesting SNPL do not occur.

Foraging and/or Roosting Disturbance. Invasive plant or animal control can occur in areas that may disturb roosting or foraging SNPL during the breeding season, such as near the Pismo Creek or Arroyo Grande Creek lagoons. Invasive plant and animal control can disturb SNPL adults and chicks and deter them from foraging and/or roosting in the area. To reduce impacts from invasive plant or animal control, CDPR will continue to implement the SNPL and CLTE management program. Therefore, any invasive plant and animal control that needs to be conducted during the breeding season in or near SNPL foraging or roosting habitat will continue to be conducted when SNPL are not observed to be present. As a result, effects on foraging and/or roosting SNPL during the breeding season from invasive plant and animal control is considered to be minimal. In addition, invasive plants have been shown to prevent SNPL from nesting in otherwise suitable areas (Wiedemann 1984, Muir and Colwell 2010); therefore, removal of invasive plants ultimately improves native habitats and increases available SNPL breeding habitat in the HCP area.

[33] Installing plants at the start of the SNPL breeding season specifically to enhance breeding habitat is a separate action from habitat restoration [section 4.3.1.2.2]

Effects on wintering SNPL are considered to be minimal since invasive plant removal is not typically conducted in areas where wintering SNPL occur, and any activities that are conducted near wintering SNPL are short in duration.

4.3.1.2.4 Habitat Monitoring System Implementation (CA-18)

The effects of the CLTE and SNPL, CRLF, tidewater goby, and listed plant monitoring programs, which are part of the HMS, are described in the previous section (i.e., section 4.3.1.2.1).

Nesting and Brooding Disturbance. The effects of other components of the HMS (e.g., vegetation monitoring, terrestrial bird monitoring, reptile and amphibian monitoring, small mammal monitoring, and large mammal monitoring) are limited because most HMS monitoring that needs to be conducted in SNPL breeding habitat is implemented outside of the breeding season. HMS activities that need to occur within the breeding season are described below.

Small mammal trapping surveys occur during the breeding season within SNPL secondary and tertiary habitat. Between 2005 and 2018, only 29 SNPL nests were discovered in secondary habitat (Map 11). Therefore, it is unlikely that any nests will be located near small mammal trapping. In addition, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting daily searches for nests in potential nesting habitat that is outside the seasonal exclosures. Any nests that are found outside a seasonal exclosure will be protected by a single-nest exclosure, if appropriate. Therefore, effects from small mammal trapping are considered to be minimal.

During the breeding season, monitors conduct three surveys for shorebirds along the shoreline of the HCP area, including within the exclosure shoreline. These surveys can disturb nesting or brooding SNPL. As a result, the HMS monitoring surveys within or near the seasonal exclosure are conducted by monitors with a 10(a)(1)(A) Recovery Permit (or approved by the USFWS). Therefore, disturbance caused by these surveys results in the same effects as those described for SNPL monitoring (section 4.3.1.2.4) and is considered to be minimal.

Foraging and/or Roosting Disturbance. Non-breeding season HMS surveys can disturb foraging or roosting wintering SNPL. Since monitors are experienced biologists and conduct surveys in a manner that minimizes disturbance on SNPL, any disturbance associated with HMS monitoring is considered to be minimal.

4.3.1.2.5 Water Quality Monitoring Projects (CA-19)

Nesting, Brooding, and Foraging Disturbance. Installation of water quality monitoring equipment occurs outside the SNPL breeding season; therefore, installation activities do not affect breeding SNPL.

Water quality monitoring equipment is currently installed at Oso Flaco Lake, which does not impact nesting, foraging, or roosting SNPL. Water quality monitoring equipment may be installed in other aquatic habitat in the HCP area in the future. Maintenance and/or installation of water quality monitoring equipment at Oso Flaco Creek, Pismo Creek, Arroyo Grande Creek, and associated estuaries will be timed to avoid disturbance to nesting SNPL to the extent feasible. However, some maintenance of water quality equipment may need to occur during the breeding season. Minor disturbance of nesting (e.g., near Arroyo Grande Creek), roosting, or foraging SNPL could occur near the estuaries. These effects are expected to be negligible given the short duration and minimal equipment required to conduct the maintenance and/or installation activities. In addition, CDPR will continue to implement the SNPL and CLTE management program, which includes having a permitted monitor (or monitor approved by the USFWS) accompany water quality monitoring/maintenance staff to areas where SNPL could be present. As a result, effects on nesting, foraging, and roosting SNPL will be minimal.

Foraging and/or Roosting Disturbance – Non-Breeding Season. Disturbance of roosting or foraging SNPL could occur during water quality monitoring and installation of water quality equipment in the non-breeding season; however, these effects will be minimal due to the short duration of these activities.

4.3.1.3 Park Maintenance

4.3.1.3.1 Campground Maintenance (CA-20)

Campground maintenance activities do not affect SNPL since the designated campgrounds are not located within SNPL breeding or foraging habitat.

4.3.1.3.2 General Facilities Maintenance (CA-21)

Existing general maintenance activities do not occur within the seasonal exclosure;[34] therefore, direct effects on SNPL nests within the exclosure do not occur. Existing general maintenance activities that can affect SNPL include litter pick-up, facility repairs, and restroom and signpost maintenance when these activities are located near SNPL primary and/or secondary nesting or foraging habitat.

Mechanical trash removal will only occur above the wrack line and will be set back from foredunes; therefore, mechanical trash removal is not expected to affect foraging SNPL along the shoreline. Mechanical trash removal will not occur within areas encompassed by the seasonal exclosures; therefore, direct effects on SNPL nests within the exclosure will not occur.

Vehicle Strike – Breeding Season. Although infrequent, SNPL have been known to nest outside the seasonal exclosure in areas where general maintenance activities occur, such as in the open riding area and near Arroyo Grande Creek (Map 11). General maintenance vehicles driving through habitat occupied by SNPL can strike individual chicks and/or adults that are outside a protected exclosure. A general maintenance vehicle can also crush eggs or chicks in an active SNPL nest that is outside a seasonal exclosure and not yet identified by monitors. To reduce the potential for vehicle strike, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, with monitors conducting daily searches for nests in potential nesting habitat that is outside these exclosures. Any nests found outside an exclosure will be quickly protected by a single-nest exclosure (section 5.3.1), as appropriate. In addition, all general maintenance staff will continue to receive training that includes life history information, measures, and rules that should be implemented to protect SNPL. All general maintenance staff will also continue to observe the park regulations and rules. In addition, all CDPR staff are trained on how to operate a vehicle when SNPL broods are present, including by scanning ahead of the vehicle for SNPL, driving where chicks are less likely to occur, avoiding wrack, and keeping speeds along the shoreline at or below 5 mph. A permitted monitor also escorts general maintenance vehicles along the exclosure shoreline, as necessary. As a result, these impacts are considered to be minimal.

Mechanical trash removal will not be conducted in the seasonal exclosure area during the breeding season; therefore, SNPL habitat in the seasonal exclosure would not be impacted. CDPR Environmental Scientist staff will also inspect and approve trash removal areas prior to each deployment, remaining on site or immediately available for monitoring, with mechanical trash removal ceasing if any SNPL are present. As a result, vehicle strike from mechanical trash removal is not expected.

Vehicle Strike and Disturbance – Non-Breeding Season. Many general maintenance activities occur within areas where SNPL do not typically forage and/or roost and thus do not affect foraging and/or

[34] Effects associated with maintenance of the seasonal exclosure are discussed in section 4.3.1.2.1.

roosting SNPL. Foraging and/or roosting SNPL can be disturbed by maintenance activities and/or struck by a maintenance vehicle traveling through or working within occupied foraging or roosting habitat during the non-breeding season. To reduce the potential for vehicle strike, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting a training for all general maintenance staff on SNPL and observing the park regulations and rules to protect SNPL. General maintenance workers traveling along the shoreline are also trained how to drive within areas where SNPL could forage or roost and are instructed to keep speeds at or below 5 mph, drive lower on the shore below areas where SNPL are more likely to forage or roost (e.g., the wrack line), and scan ahead of the vehicle for SNPL. As a result, the impacts are considered to be minimal.

SNPL are known to winter in areas where mechanical trash removal may occur. If SNPL are foraging or roosting in areas where mechanical trash removal occurs, they could be temporarily disturbed by the activities and/or precluded from foraging and roosting in these areas. However, CDPR will implement AMMs, including conducting mechanical trash removal above the highest high tide and avoiding all wrack and lagoons, having a CDPR Environmental Scientist staff inspect and approve trash removal areas prior to each deployment, and remaining on site or immediately available for monitoring, with mechanical trash removal ceasing if any SNPL are present. As a result, vehicle strike and disturbance during the non-breeding season are not expected.

Nesting and Brooding Disturbance. If general maintenance activities are conducted adjacent to the seasonal exclosure, they can disturb nesting SNPL by temporarily flushing brooding adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated, and chicks can be depredated, inadequately fed, or flushed into the open riding area. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, surveys will continue to be conducted in areas where SNPL occur prior to performing maintenance activities to ascertain the presence of SNPL. If SNPL are observed, maintenance activities will be delayed until an experienced monitor determines that SNPL will not be impacted. In addition, monitors will continue to escort maintenance workers along the shoreline south of Post 6 to ensure disturbance to nesting SNPL is minimized. As a result, effects from general maintenance activities near the seasonal exclosures will be minimal.

Restroom facilities need to be maintained regularly during the breeding season. Most restroom facilities are located in secondary and/or tertiary habitat and have minimal to no impacts on nesting SNPL. In addition, those restrooms that are in primary habitat are located in areas that SNPL do not typically nest (i.e., outside the seasonal exclosure). Furthermore, the Oceano Dunes District implements established protocol if SNPL establish a nest within 150 feet of these structures to ensure that restroom maintenance and public access at the restrooms do not disturb breeding SNPL. Specifically, permanent restroom buildings are closed to public use and exclosure fencing is erected around the restroom to isolate it and prevent public use. In addition, chemical toilets are relocated a minimum of 330 feet from any nest site. Therefore, the effect on SNPL from maintaining restroom structures is minimal.

If mechanical trash removal activities are conducted adjacent to the northern limit of the seasonal exclosure, they could disturb nesting SNPL by temporarily flushing brooding adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult, but the 500-foot buffer should be adequate to avoid disturbing breeding SNPL.

Reduced Habitat. The placement of restroom facilities within SNPL breeding habitat reduces the amount of habitat available to SNPL for breeding by precluding them from nesting within the footprint of the structures. However, restroom facilities are small (i.e., no larger than 8 feet by 8 feet), and they

are placed in areas where SNPL do not typically nest (i.e., outside the seasonal exclosure). Therefore, this effect is considered to be minimal.

Mechanical trash removal would not be conducted within 500 feet of the seasonal exclosure area during the breeding or non-breeding season; therefore, SNPL habitat in the seasonal exclosure would not be impacted and would remain undisturbed year-round. In addition, mechanical trash removal would not be conducted at or below the active wrack line; therefore, SNPL foraging habitat along the shoreline would not be impacted.

Mechanical trash removal could affect favorable SNPL nesting habitat (i.e., primary and secondary habitat) outside of the seasonal exclosure by altering dune composition and topography. Specifically, mechanical trash removal could reduce micro-topography and/or organic surface materials (e.g., driftwood and campfire charcoal) that are scattered throughout the HCP area above the active wrack line. However, most mechanical trash removal will be conducted to remove litter in areas where recreation activities have been concentrated and the substrate is already highly disturbed. These areas are unlikely to support the appropriate SNPL nesting habitat due to the high level of recreation; therefore, SNPL are not expected to nest in the areas where mechanical trash removal will typically occur. As a result, this effect will be minimal.

Although mechanical trash removal will occur above the active wrack line, mechanical trash removal during the summer could remove scattered debris (e.g., driftwood and kelp) from the previous winter wrack line still present in the beach area above the active wrack line, which is likely important habitat for wrack-associated beach invertebrates. If mechanical trash removal occurs frequently, this material may not have time to naturally develop again, and species richness, abundance, and biomass of wrack-associated invertebrates that are important SNPL prey resources could decline. As a result, wintering SNPL could be impacted by a reduced prey source. CDPR will implement AMM 109, which includes implementing a study to determine the impact of mechanical trash removal on wrack-associated invertebrates. If a significant decline in invertebrates is observed, CDPR will implement additional measures to reduce the impact, such as conducting habitat enhancement in mechanical trash removal areas, reducing the frequency of mechanical trash removal, and/or reducing the mechanical trash removal locations. As a result, mechanical trash removal will have a minimal impact on wintering SNPL foraging opportunities and the quality of their habitat.

4.3.1.1.3.3 Trash Control (CA-22)

Installation and maintenance of small trash bins in the non-motorized portion of Pismo State Beach does not affect SNPL since the trash bins are installed near the parking areas and access points, outside of suitable nesting and foraging habitat for SNPL.

Nesting and Brooding Impacts. Because most of the large trash dumpsters are located in the dunes approximately 2 miles from the 6 Exclosure, vehicle strike and disturbance of nesting SNPL is unlikely when visitors or maintenance staff access these dumpsters. However, some large trash dumpsters near Post 2 are located within SNPL primary habitat. Although SNPL do not typically nest in this area, if a nest were established near the dumpsters, activity could crush a nest that has not been discovered by monitors or it might disturb nearby nesting and/or roosting SNPL by temporarily flushing brooding adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs could be buried by sand, depredated, or inadequately incubated, and chicks could be depredated, inadequately fed, or flushed into the open riding area. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, which requires that the location of the trash dumpster near Post 2 be changed, as necessary, to avoid disturbance to any nearby active SNPL nests. Monitors will also continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. Any

nests found outside an exclosure will be quickly protected by a single-nest exclosure (section 5.3.1), as appropriate, and a 100-foot buffer will be established around the nest. As a result, this effect will continue to be minimal.

Foraging and Roosting Disturbance. Trash bins are transported to and from Post 2 and the Pier Avenue entrance year-round. Transporting trash bins can affect roosting or foraging SNPL in a similar manner to the effects described for general maintenance activities (section 4.3.1.3.1) since wintering flocks of SNPL have been observed between Post 1 and Post 2. However, these effects will continue to be minimal with the implementation of the AMMs associated with the ongoing SNPL and CLTE management program as described for general maintenance activities (section 4.3.1.3.1).

Although infrequent, some garbage pick-up, including volunteer beach cleanup and cleanup of the beach after a storm, is required in the HCP area. These activities are conducted outside of the SNPL breeding season to the extent feasible. If activities occur during the breeding season (e.g., after a storm event), they are planned to avoid active SNPL nesting areas. When cleanups do occur, whether during the breeding or non-breeding season, they are typically completed on foot with handheld trash bags and can cause similar disturbance of roosting and/or foraging SNPL as general maintenance activities (section 4.3.1.3.1). To reduce any impacts from volunteer cleanup, CDPR implements the ongoing SNPL and CLTE management program, which includes ensuring all staff that conduct beach cleanups will continue to be given a training on SNPL life history and conservation measures in the HCP area. In addition, if volunteer beach cleanup occurs during the breeding season in areas where SNPL could be impacted, a permitted (or USFWS-approved) monitor is present during the activities to ensure that no impacts occur. Effects from beach cleanup are considered to be minimal with the implementation of the SNPL and CLTE management program AMMs.

Increased Predators. Trash dumpsters attract a large number of gulls that land and forage in the dumpsters if they are left uncovered (CDPR 2014a). As a result, the continued use of the uncovered trash bins within or near SNPL breeding habitat can artificially increase the number of predatory species, including gulls, and thus increase depredation of SNPL. Increasing the number of trash bins on holidays and during special events to accommodate the increased number of visitors can also artificially increase the number of predators at these times and increase depredation of SNPL. To minimize these impacts, CDPR is evaluating several options to limit the movement of trash from the dumpsters and reduce predator presence at the dumpster sites. CDPR will also continue to implement the predator management program to ensure depredation of SNPL is minimized. The predator management program has likely contributed to the overall population (i.e., number of breeding adults) and reproductive success (i.e., number of fledglings per nesting pair) increase for SNPL in the HCP area. Curtailing predator presence near the dumpsters and limiting the movement of trash from the dumpsters will reduce the risk of predation on SNPL.

4.3.1.3.4 Wind Fencing Installation, Maintenance, and Removal (CA-23)

Nesting and Brooding Impacts. Most SNPL nest inside the seasonal exclosure and well outside of the areas where wind fencing is installed (Map 4). As a result, the nests within the seasonal exclosure are not directly impacted by wind fence installation, maintenance, and/or removal.

SNPL will also sometimes nest outside the protection of the seasonal exclosure. SNPL have been known to nest outside the seasonal exclosure along the shoreline adjacent to the seasonal exclosure and near Arroyo Grande Creek. Wind fencing is located upwind of Grand Avenue, Pier Avenue, and Strand Way, which is not in areas where SNPL typically nest. Although SNPL do not typically nest in the wind fencing areas, the wind fencing is located in secondary habitat for SNPL. Therefore, installation, maintenance, and/or removal of wind fencing in these areas can result in destruction or disturbance of a SNPL nest or brood that is outside the seasonal exclosure and has not yet been discovered by monitors. To reduce

this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside of these exclosures. Any nests found outside a seasonal exclosure will be quickly protected by a single-nest exclosure (section 5.3.1), as appropriate. As a result, direct impacts to SNPL nests or chicks outside the seasonal exclosure are considered to be minimal.

Vehicle Strike – Non-breeding Season. Vehicles could strike foraging or roosting SNPL during travel to install or maintain wind fencing. However, this is unlikely to occur because as part of the ongoing SNPL and CLTE management program, all staff that conduct the activities in the HCP area receive a training on SNPL and are expected to adhere to all measures implemented to protect SNPL, including a 5-mph speed limit along the shoreline.

Foraging and/or Roosting Disturbance – Non-breeding Season. Wind fencing installation, maintenance, and removal can temporarily disturb foraging or roosting SNPL during the non-breeding season; however, these activities typically require a truck to pass by non-breeding flocks of SNPL for only a brief time (i.e., no more than a few minutes). As a result, these activities have minimal effects of foraging or roosting non-breeding SNPL.

4.3.1.3.5 Sand Ramp and Other Vehicular Access Maintenance (CA-24)

Vehicular access maintenance activities (e.g., maintenance of parking areas, the Grand Dunes Trail, and access corridors at Oso Flaco Lake), other than sand ramp maintenance, are outside of suitable SNPL nesting, roosting, and/or foraging habitat. Therefore, these maintenance activities do not affect SNPL. The expected effects of sand ramp maintenance are described below.

Nesting and Brooding Impacts. Prior to 2014, monitoring for nesting SNPL was conducted prior to any sand ramp maintenance, which occurs in secondary SNPL habitat. During this time, no nests or SNPL individuals were observed (CDPR 2014a). In addition, given the high number of visitors in this area, it is unlikely that SNPL will attempt to nest near the sand ramps. Therefore, breeding SNPL are not likely to be affected by sand ramp maintenance. Although monitoring for nesting SNPL is not currently conducted immediately prior to sand ramp maintenance, to ensure that breeding SNPL are not affected, CDPR will continue to implement the ongoing SNPL and CLTE management program, which includes conducting surveys of the sand ramps once per day as part of the daily transects and postponing sand ramp maintenance activities if any nests are found. No impacts to nesting SNPL have been observed during sand ramp maintenance activities to date. Therefore, effects on nesting SNPL from sand ramp maintenance activities will continue to be minimal.

Foraging and Roosting Impacts. During less busy periods in the HCP area, SNPL may roost or forage near the sand ramps. Therefore, roosting or foraging SNPL can be disturbed by sand ramp maintenance year-round. However, sand ramp maintenance activities are typically accomplished within a few hours. In addition, CDPR will continue to conduct the ongoing SNPL and management program. Therefore, to ensure that roosting or foraging SNPL are not affected, weekly surveys of the sand ramp areas will continue to be conducted as part of the routine non-breeding season monitoring for flocks of roosting birds. In addition, activities will be postponed if SNPL are observed to be present. Therefore, these activities are considered to have minimal impacts on foraging or roosting SNPL.

4.3.1.3.6 Street Sweeping (CA-25)

Street sweeping activities do not affect SNPL since the Grand Avenue and Pier Avenue entrance stations are not located within or near SNPL breeding, foraging, or roosting habitat.

4.3.1.3.7 Routine Riparian Maintenance (CA-26)

SNPL nesting, foraging, and roosting habitat does not occur at riparian maintenance work sites; therefore, riparian maintenance at these locations does not affect this species.

4.3.1.3.8 Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)

Nesting and Brooding Impacts. A large portion of the SNPL breeding population in the HCP area nests within the seasonal exclosure, which consists of a contiguous area that includes the shoreline within the southern portion of the open riding area and Oso Flaco area that is fenced (i.e., predator fence and symbolic fence) during the breeding season (March 1 through September 30). Vegetation island fence and perimeter fence (Map 5) installation, maintenance, and removal does not occur within the seasonal exclosure. As a result, the nests within the seasonal exclosure are not directly impacted by perimeter fence installation, maintenance, and/or removal.

Perimeter fencing delineates the riding area from other areas within the HCP area. Most perimeter fencing occurs within tertiary habitat and does not affect nesting SNPL, although some limited perimeter fencing does occur within primary and secondary habitat.

Vegetation island fencing is placed around vegetation islands and occurs within primary, secondary, and tertiary habitat. SNPL are not affected by vegetation island fencing in tertiary habitat.

A limited amount of perimeter and vegetation island fencing occurs directly adjacent to the seasonal exclosure (e.g., Pipeline vegetation island). Perimeter and vegetation island fence maintenance adjacent to the seasonal exclosure can disturb nesting SNPL within the exclosure (Map 5). To reduce this impact, CDPR will continue to delay fence maintenance activities adjacent to the exclosure until late September, when all SNPL nests are confirmed to be fledged and broods are not observed to be in the area. As a result, perimeter and vegetation island fence maintenance occurring adjacent to the exclosure does not affect nesting SNPL.

SNPL also sometimes nest outside the protection of the seasonal exclosure. SNPL typically avoid nesting in areas that are heavily vegetated (e.g., vegetation islands), although they will nest nearby them; therefore, SNPL can infrequently nest near a vegetation island in primary and secondary habitat outside the seasonal exclosure. In addition, although unlikely, SNPL can nest near perimeter fence located within primary or secondary habitat. Installation, maintenance, and/or removal of perimeter or vegetation island fencing in primary and/or secondary habitat can result in destruction or disturbance of an SNPL nest located outside the seasonal exclosure that has not yet been discovered by monitors. To reduce the potential impact to nests outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. Any nests found outside a seasonal exclosure will be quickly protected by a single-nest exclosure (section 5.3.1), as appropriate. In addition, any perimeter or vegetation island fence work will be delayed if SNPL are observed in the area. As a result, impacts to SNPL nests or chicks outside the seasonal exclosure are considered to be minimal.

Foraging and/or Roosting Disturbance. Perimeter and vegetation island fence installation, maintenance, and removal activities can affect SNPL when these activities are located near SNPL foraging and/or roosting habitat. Foraging and roosting SNPL can be disturbed during installation, maintenance, or removal activities because roosting and/or foraging activities are interrupted. However, maintenance activities are infrequent and short duration in areas where SNPL forage and/or roost, and birds typically move to suitable nearby foraging and roosting areas. Therefore, the effect on SNPL from these activities is considered to be minimal.

4.3.1.3.9 Cable Fence Maintenance and Replacement (CA-28)

Nesting and Brooding Impacts. Cable fence replacement is conducted outside the SNPL breeding season. Therefore, replacing the cable fence does not affect breeding SNPL.

To the extent feasible, any maintenance of the cable fence is avoided during the breeding season, but some cable fence maintenance may need to occur when SNPL are still nesting. Cable fence maintenance does not occur within the seasonal exclosure where SNPL typically nest. However, some cable fence maintenance may occur along the shoreline near Post 8 adjacent to the seasonal exclosure (Map 5). Any cable fence maintenance conducted during the breeding season is typically conducted after most nests have fledged and chicks are no longer in the area. Although unlikely, any nests remaining in the area could be disturbed or destroyed. However, to reduce impacts to any remaining SNPL nests, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct a survey immediately prior to maintenance activities to ensure that no active nests or broods are located in the area. If an active nest or brood is found, activities will be delayed until a monitor determines that SNPL will not be impacted. Therefore, these effects are considered to be minimal.

Foraging and/or Roosting Impacts – Breeding Season. Although cable fence maintenance is typically conducted outside the SNPL breeding season or late in September so that all nesting activities have ceased, some maintenance of cable fence near the seasonal exclosure may occur when broods are still present and could be foraging within or near the maintenance areas. Fence maintenance during the breeding season can be disruptive to foraging and/or roosting SNPL. The noise associated with excavating sand can displace foraging and/or roosting SNPL adults and chicks, as well as cause increased vigilance and exposure to inclement weather and predators. In addition, maintenance vehicles can strike a roosting or foraging SNPL when driving along the shoreline near the seasonal exclosure. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, any fence maintenance that is needed in or near SNPL foraging or roosting habitat will be conducted when SNPL are not observed to be present. In addition, monitors will continue to escort the maintenance workers and equipment in and out of the areas near the seasonal exclosure and require that all maintenance vehicles adhere to a 5-mph speed limit along the shoreline in order to ensure SNPL foraging and/or roosting nearby are not disturbed or struck by vehicles. Maintenance workers are also trained how to drive within areas where SNPL could forage or roost and instructed to drive lower on the shore below areas where SNPL are more likely to forage or roost (e.g., the wrack line). As a result, these effects are considered to be minimal.

Foraging and/or Roosting Disturbance – Non-breeding Season. Maintenance and/or fence replacement during the non-breeding season can be disruptive to wintering SNPL by interrupting foraging and/or roosting behavior. In addition, the noise associated with removing posts, excavating sand, and pile driving can displace foraging and/or roosting wintering SNPL and cause increased vigilance. Although maintenance activities occur as needed, these activities are relatively short in duration (i.e., a couple of hours). Cable fence replacement occurs infrequently (i.e., every 10 to 15 years), and both maintenance and replacement activities are subject to pre-construction SNPL monitoring to minimize impacts. Finally, to further reduce the impacts associated with cable fence maintenance, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Any cable fence maintenance or replacement work that must occur in or near SNPL foraging or roosting habitat will be conducted when SNPL are not observed to be present within 150 feet of the work area; therefore, these activities will continue to have a minimal effect on wintering SNPL.

Habitat Impacts. Cable fence maintenance can modify SNPL foraging habitat and deter SNPL from foraging in the area if sand is pushed out of the cable fence area into foraging habitat. This has been

observed in the HCP in the past. However, additional foraging habitat is present along the HCP area shoreline, including within the protected exclosure area. As a result, this impact is considered to be minimal.

4.3.1.3.10 Heavy Equipment Response (CA-29)

Vehicle Strike. Heavy equipment generally results in the same type of effects on SNPL as general facilities maintenance (section 4.3.1.3.1). It is sometimes necessary to use heavy equipment in SNPL primary and/or secondary habitat, including for fence maintenance and deposition for habitat enhancement, as well as for unplanned reasons, such as burying of marine mammals or moving an abandoned boat. Although SNPL often nest within the seasonal exclosure, SNPL can also nest outside the protection of the seasonal exclosure. Heavy equipment can crush eggs or chicks in an active SNPL nest that is outside a seasonal exclosure and not yet identified by monitors. To reduce impacts to any SNPL nests outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. In addition, any nests found outside of a seasonal exclosure will be quickly protected by a single-nest exclosure (section 5.3.1), as appropriate, thus reducing the likelihood of vehicle strike. In addition, all heavy equipment operators will continue to receive training that includes life history information, measures, and rules that should be implemented to protect SNPL. If heavy equipment response is needed on the shoreline south of Post 6 during the breeding season when SNPL and/or CLTE are actively nesting, the equipment will continue to be escorted by permitted and trained monitors to ensure disturbance to roosting and nesting SNPL is minimized. Accordingly, direct impacts to nesting SNPL located outside the seasonal exclosure resulting from heavy equipment use are considered to be minimal.

Nesting and Brooding Disturbance. Heavy equipment activities that are conducted adjacent to the seasonal exclosure can disturb nesting SNPL by temporarily flushing brooding adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated, and chicks can be depredated, inadequately fed, or flushed into the open riding area. To reduce disturbance to nesting SNPL associated with heavy equipment activities, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, surveys will continue to be conducted in primary and/or secondary habitat prior to maintenance activities to ascertain that no active nests or broods are in the area that would be disturbed by heavy equipment activities. If SNPL are observed, activities will be delayed until an experienced monitor determines that SNPL will not be impacted. As a result, effects from activities near the seasonal exclosures are considered to be minimal.

Foraging and/or Roosting Impacts. Heavy equipment activities often occur within areas where SNPL do not typically forage and/or roost and thus, do not affect foraging and/or roosting SNPL. Foraging and/or roosting SNPL can be disturbed by heavy equipment activities and/or struck by heavy equipment traveling through or working within occupied foraging or roosting habitat during both the breeding and non-breeding seasons. To minimize impacts to foraging and/or roosting SNPL from heavy equipment activities, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting a training on SNPL for all heavy equipment operators and observing the park regulations and rules intended to protect SNPL (e.g., 15-mph speed limit on the portion of the beach open to the public). Heavy equipment operators traveling along the shoreline are also trained how to drive within areas where SNPL could forage or roost and are instructed to scan ahead of the vehicle for SNPL, keep speeds at or below 5 mph, and drive lower on the shore below areas where SNPL are more likely to forage or roost (e.g., the wrack line). As a result, and effects from heavy equipment activities on foraging and roosting SNPL are considered to be minimal.

Heavy equipment can result in more intense disturbance to foraging and/or roosting SNPL adults and chicks if the equipment remains in an area for a prolonged period of time (e.g., when burying deceased marine life). During this time, SNPL adults and chicks can become energetically stressed by prolonged disturbance. Prolonged disturbance from heavy equipment can also reduce SNPL foraging times, and both chicks and adults can become malnourished. In addition, SNPL chicks can become separated from adults, which can leave them exposed to predators and/or inclement weather. To minimize these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, surveys for SNPL will continue to be conducted prior to using heavy equipment in any areas where SNPL are likely to forage or roost (e.g., primary habitat). If any SNPL are observed within 150 feet of a work area, heavy equipment activities will be delayed until the SNPL have left the area. Because heavy equipment activities are only conducted when SNPL are not observed to be present, these activities have had minimal to no effect on foraging and roosting SNPL in the past. As a result, effects on foraging and roosting SNPL will continue to be minimal.

4.3.1.3.11 Minor Grading (CA-30)

The specific location and timing of minor grading activities changes from year to year. The effects of grading to maintain seasonal exclosure fencing are included in section 4.3.1.2.1, the effects of grading to maintain the perimeter and vegetation island fence are included in section 4.3.1.3.8, and the effects of grading to maintain the cable boundary fence are included in section 4.3.1.3.9.

Nesting, Brooding, and Foraging/Roosting Impacts – Breeding Season. Other minor grading is either not conducted during the SNPL breeding season or is accomplished in a manner and/or location that does not affect the species; therefore, SNPL breeding is not affected by these activities.

Foraging/Roosting Impacts – Non-Breeding Season. Minor grading during the non-breeding season can be temporarily disruptive to wintering SNPL by interrupting foraging and/or roosting behavior. In addition, the noise associated with grading activities can temporarily displace foraging and/or roosting SNPL, as well as cause increased vigilance and exposure to inclement weather and predators. However, minor grading is typically short in duration. In addition, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, surveys for SNPL will continue to be conducted prior to initiating grading activities in any areas where SNPL are known to forage and/or roost during the non-breeding season. If any SNPL are observed within 150 feet of a work area, grading will be delayed until the SNPL have left the area. Because minor grading is only conducted when SNPL are not observed to be present, these activities have had minimal to no effect on foraging and roosting SNPL during the non-breeding season in the past. As a result, effects on foraging and roosting SNPL in the non-breeding season will continue to be minimal.

4.3.1.3.12 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Nesting, Brooding, and Foraging/Roosting Impacts – Breeding Season. Vegetation intruding onto footpaths typically needs to be trimmed at least once a year; this is usually completed using hand tools. The boardwalk within Pismo State Beach is located in tertiary SNPL habitat. Most of the Oso Flaco Lake boardwalk is also located within tertiary SNPL habitat, although a very limited portion of the boardwalk does extend into primary habitat. This western portion of the boardwalk, including a spur trail to a lookout, runs between the North and South Oso Flaco exclosures, but the boardwalk itself ends where the path to the shoreline transitions to a sand trail. Given the distance to the shoreline, SNPL have not nested in primary habitat directly adjacent to the boardwalk in the past; therefore, work on the boardwalk is unlikely to affect nesting SNPL. In addition, boardwalk maintenance within tertiary habitat does not affect SNPL. Work on the boardwalks and other pedestrian access areas within primary habitat is conducted outside the SNPL breeding season, if possible, to avoid impacts to foraging and/or roosting SNPL. If activities are conducted during the breeding season, the associated noise and activity can

displace foraging and/or roosting SNPL, as well as cause increased vigilance. However, activities associated with maintenance of access areas are short in duration. In addition, CDPR will continue to implement the SNPL and CLTE management program. Therefore, surveys for SNPL will be conducted prior to conducting any maintenance activities in areas where SNPL could be disturbed (i.e., within or adjacent to primary habitat). If SNPL are observed within 150 feet of a work area, maintenance will continue to be delayed until they have left the area. As a result, these effects are considered to be minimal.

Foraging/Roosting Impacts – Non-Breeding Season. Boardwalk maintenance at Pismo State Beach and some maintenance in the Oso Flaco area during the non-breeding season can be temporarily disruptive to wintering SNPL by interrupting foraging and/or roosting behavior. However, most of the boardwalk locations are outside areas where SNPL typically forage or roost during the non-breeding season. In addition, maintenance of the boardwalks and footpaths is typically conducted using hand tools, which is a less intrusive method for removing vegetation around sensitive wildlife, and work is relatively short in duration. As a result, effects on non-breeding SNPL from boardwalk maintenance are considered to be minimal.

Heavy equipment is sometimes required to remove accumulated sand along the boardwalk, such as in the Oso Flaco area. Effects from using heavy equipment to conduct this work are similar to minor grading (section 4.3.1.3.11) and are thus considered to be minimal.

4.3.1.4 Visitor Services

4.3.1.4.1 Ranger, Lifeguard, and Park Aide Patrols (CA-32)

The potential threats posed by routine, non-emergency ranger and park staff patrols are similar to those described for general facilities maintenance (section 4.3.1.3.2) in that patrol vehicles drive along the beaches and dunes within posted speed limits (with the exception of emergency response [section 4.3.1.4.2]).

Vehicle Strike. Ranger and patrol vehicles are not expected to enter the seasonal exclosure during normal, non-emergency response without having a permitted monitor escort them into the area; therefore, impacts to SNPL nesting within the seasonal exclosure are considered to be minimal.

Lifeguard towers are not placed within habitat used by SNPL for nesting; therefore, no effects on nesting SNPL occur from lifeguard tower activity.

SNPL do nest outside the seasonal exclosure (e.g., near Arroyo Grande Creek, in the open riding area, and adjacent to the seasonal exclosure). Ranger and patrol vehicles can enter some of these areas. Ranger and patrol vehicles driving through habitat occupied by SNPL can strike individual chicks or nests that are outside the protection of a seasonal exclosure and not yet identified by monitors. To reduce impacts to any SNPL nests outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, which includes monitors conducting daily searches for nests in potential nesting habitat that is outside these exclosures. Any nests found outside a seasonal exclosure will be quickly protected by a single-nest exclosure (section 5.3.1), as appropriate, thus reducing the likelihood of a vehicle striking an SNPL or crushing a nest. As a result, impacts to SNPL nests outside the seasonal exclosure due to ranger and patrol vehicles will continue to be minimal.

Nesting and Brooding Disturbance. As with general maintenance activities, disturbance to nesting SNPL from park staff patrols is usually limited due to the infrequency and short duration of the activities in any one location, as well as the distance between most patrol activities and the seasonal exclosure. The occasional stuck vehicle or traffic stop near a SNPL nest within the Southern Exclosure may cause disturbance to SNPL since the activity takes longer time to complete. During this time, SNPL adults and

chicks can become energetically stressed by prolonged disturbance. In addition, SNPL chicks can become separated from adults, which can leave them exposed to predators and/or inclement weather. To reduce disturbance to nesting SNPL, CDPR will continue to implement the SNPL and CLTE management program, which requires a minimum 100-foot buffer to protect SNPL nests within the HCP area, including installing bumpouts for nests within the Southern Exclosure adjacent to riding or camping areas. The bumpouts are monitored regularly, and if an incubating bird is disturbed by vehicle or non-vehicle activity, the buffer area is increased in size as needed. As a result, these impacts are considered to be minimal.

Foraging and/or Roosting Impacts. Non-emergency ranger and patrol vehicles and/or staff generally access areas open to public vehicles along the beach and adjacent shoreline. Disturbance of foraging and roosting SNPL can occur when these activities are located near occupied SNPL foraging and/or roosting habitat. In addition, vehicle strikes of foraging or roosting adults, juveniles, and/or chicks can occur if vehicles travel directly through habitat where SNPL are located during the breeding and/or non-breeding season. However, as with general maintenance activities, disturbance of SNPL from park staff patrols is usually limited due to the infrequency and short duration of the activities in any one location and the buffer between most patrol activities and the seasonal exclosure. In addition, all vehicles travel at a speed no greater than 5 mph along the shoreline to reduce the risk of a vehicle striking a foraging, roosting bird. Any non-emergency vehicles traveling along the shoreline are also trained how to drive within areas where SNPL could forage or roost and instructed to drive lower on the shore below areas where SNPL are more likely to forage or roost (e.g., the wrack line). Ranger vehicles have struck foraging or roosting adult SNPL during the breeding season in the HCP area in the past, including in 1998 and 2002. However, due to increased education and enforcement of regulations, including the 5-mph speed limit associated with the SNPL and CLTE management program as currently implemented in the HCP area, these impacts have been reduced. CDPR has not documented a ranger or patrol vehicle striking a foraging or roosting adult since 2002. These impacts are expected to continue to be minimal.

4.3.1.4.2 Emergency Response (CA-33)

Emergency medical and law enforcement responses by CDPR staff, which are important for maintaining human safety, can occur anywhere within the HCP area and are difficult to predict. Occasional but necessary high-speed travel by medical and law enforcement vehicles responding to an emergency sometimes occurs in areas without frequent vehicular traffic.

Nesting and Brooding Impacts. Emergency situations are infrequent in areas where SNPL typically nest, forage, or roost during the breeding season. However, emergency vehicles must respond to human safety issues and may need to enter areas occupied by breeding SNPL.

If an emergency occurs within a seasonal exclosure, it can be highly disruptive to SNPL as adults may flush from the nest and leave the eggs unattended for the duration of the disturbance. SNPL nests or chicks can be abandoned if the adult is injured, killed, or disturbed so that it does not return to the eggs or chick. In addition, SNPL chicks that are out in the open can be separated from adults during the disturbance, which can leave them vulnerable to predation and/or inclement weather. Disturbance can also separate broods, cause chicks to run away from the disturbance into the open riding area, and expose chicks to inclement weather. Although emergency response may occur within the seasonal exclosure, such events are rare and do not occur in most years. Monitors also inform emergency responders of the locations of sensitive areas and escort emergency response personnel into and out of the seasonal exclosure to minimize the potential for vehicle strike, when feasible, as part of the SNPL and CLTE management program. Monitors also attempt to survey the area once the emergency situation has been resolved and all emergency personnel are clear in order to evaluate and address any impacts that occurred. Emergency vehicles have not been documented significantly impacting SNPL

within the seasonal exclosure to date. As a result, effects on SNPL inside the seasonal exclosure are expected to continue to be minimal.

Although infrequent, SNPL sometimes nest outside the protection of the seasonal exclosure (e.g., near Arroyo Grande Creek, adjacent to the seasonal exclosure, in the open riding area). Emergency vehicles can crush eggs or chicks in an active SNPL nest that is outside a seasonal exclosure and not yet identified by monitors. To reduce impacts to any SNPL nests outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. Any nests found outside a seasonal exclosure will be quickly protected by a single-nest exclosure (section 5.3.1), as appropriate, reducing the likelihood of a vehicle striking an SNPL or crushing a nest. In addition, CDPR emergency responders are informed of the areas that are considered sensitive (e.g., seasonal exclosures, shoreline foraging/brooding areas), to the extent feasible, and signs are posted to mark sensitive areas. Permitted monitors also escort emergency vehicles into areas that are sensitive if the situation allows for this opportunity. As a result, direct impacts to nesting SNPL outside the seasonal exclosure due to emergency response will continue to be minimal.

Foraging and/or Roosting Impacts. SNPL foraging or roosting along the shoreline and not protected by an exclosure can be struck by a speeding emergency vehicle, which can occur during the breeding or non-breeding season. If emergency vehicles must travel through areas where SNPL could forage or roost (e.g., along the shoreline), CDPR emergency responders are trained to scan ahead of the vehicle for SNPL and travel low on the shoreline to avoid most roosting birds, if time and the emergency situation allow. An emergency vehicle has not been observed striking a foraging or roosting SNPL in the HCP area to date; however, this event may be difficult to observe. Therefore, although unlikely, it is possible that a roosting or foraging SNPL may be struck by an emergency vehicle.

Emergency response can also disturb and/or deter foraging SNPL when they drive past, and they can become malnourished if the disturbance is prolonged. However, emergency responders typically drive through an area quickly. In addition, adequate alternative foraging habitat for SNPL is present in the HCP area, including during the non-breeding season. As a result, SNPL are not typically kept from foraging due to emergency response activities.

4.3.1.4.3 Access by Non-CDPR Vehicles (CA-34)

In the past, vehicles driven by non-CDPR personnel, including law enforcement agencies, salvage personnel, and marine mammal rescue, may have caused unpredictable disturbances, often involving multiple vehicles and unrestricted access to the shoreline. However, the Oceano Dunes District has enacted policies requiring non-park personnel to notify park staff when access to park lands is necessary. Non-park personnel that are granted vehicular access are informed of any restricted areas or other special conditions before entering the HCP area. Except in cases of extreme emergencies, this practice has eliminated resource damage and reduced mortality, injury, and disturbance to SNPL.

Nesting and Brooding Impacts. Effects from emergencies associated with non-CDPR vehicles are similar to those effects described in section 4.3.1.4.2, but CDPR is not always able to train non-CDPR responders. Therefore, given the travel speeds sometimes necessary for emergency response, some vehicle strikes may not be avoided if the emergency requires a non-CDPR vehicle to travel through areas where SNPL are present.

Medevac helicopters are also sometimes used in the HCP area during emergencies. Medevac helicopters flying low over or landing within occupied SNPL habitat can cause significant disturbance to nesting and/or brooding SNPL. The noise from the helicopter can be highly disruptive to SNPL and the helicopter itself could be seen as a threat. Adults may flush from the nest and leave the eggs unattended, and wind

generated by the rotors may move enough sand to bury any nest in the area. SNPL nests or chicks can be abandoned if the adult is disturbed so that it does not return to the nest or chicks. Chicks can be separated from adults, leaving them vulnerable to predation and/or inclement weather; they may become separated from their brood, or they could run away from the disturbance and move into the open riding area where they become vulnerable to vehicle strike. In addition, helicopters can lead to increased vigilance in adults which can lead to them being energetically stressed or to reduced foraging. However, helicopter activity in the HCP area is a sporadic event, especially in areas where SNPL typically nest; therefore, this impact rarely (if ever) occurs. The following paragraphs detail effects from non-emergency non-CDPR vehicle activities.

Non-emergency non-CDPR vehicles do not enter the seasonal exclosure; therefore, impacts to SNPL nesting within the seasonal exclosure do not occur. In addition, non-emergency non-CDPR vehicles do not enter the Oso Flaco area where vehicles are prohibited; therefore, impacts to SNPL nesting outside the seasonal exclosure within the Oso Flaco area do not occur.

Although infrequent, SNPL do nest outside the seasonal exclosure (e.g., near Arroyo Grande Creek and in the open riding area). Non-emergency non-CDPR vehicles can enter some of these areas. These vehicles driving through habitat occupied by SNPL can strike individual chicks or nests that are outside the protection of a seasonal exclosure and not yet identified by monitors. To reduce the potential impact to an SNPL nest outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. Any nests found outside a seasonal exclosure will be quickly protected by a single-nest exclosure (section 5.3.1), as appropriate, thus reducing the likelihood of a vehicle striking a SNPL or crushing a nest. Monitors will also continue to track SNPL chicks that are hatched within the riding area (i.e., within single-nest exclosures) to determine travel routes and patterns associated with foraging and exploration and either erect symbolic fencing to provide safe passage of the chicks to a non-vehicle use area or divert vehicle traffic, as appropriate. As a result, direct impacts to nesting SNPL outside the seasonal exclosure due to non-emergency non-CDPR vehicles will continue to be minimal.

Foraging and/or Roosting Impacts. Non-emergency non-CDPR vehicles and/or staff generally access areas open to public vehicles along the beach and adjacent shoreline. Disturbance of foraging and roosting SNPL during the breeding season is infrequent since SNPL do not typically forage or roost in these areas during the breeding season. However, disturbance of foraging and roosting SNPL may occur more frequently during the non-breeding season when these activities are located in or near areas where SNPL typically forage or roost. In addition, vehicle strikes of foraging or roosting adults, juveniles, and/or chicks may occur if vehicles travel directly through occupied foraging and/or roosting habitat for SNPL. To reduce the potential for vehicle strike, all vehicles travel at a speed no greater than 15 mph to reduce the risk of a vehicle striking a foraging or roosting bird. In addition, as part of the ongoing SNPL and CLTE management program, CDPR provides an education program to drivers of non-emergency non-CDPR vehicles. When possible, CDPR also has a permitted monitor escort non-emergency vehicles into otherwise closed areas to minimize disturbance to SNPL in these areas. As a result, impacts from non-emergency non-CDPR vehicles are considered to be minimal.

4.3.1.4.4 ASI Courses (ATV and RUV) (CA-35)

ASI courses occur near Worm Valley vegetation island, where SNPL are not known to nest. In addition, the ASI training area is fenced. As a result, impacts to SNPL are not known to occur from this activity.

4.3.1.4.5 Beach Concessions (CA-36)

Concession services operate throughout the open riding area. The effects of concession services, such as towing and wastewater pumping, are similar to the effects of general facilities maintenance discussed in section 4.3.1.3.1. The effects of camper rentals are similar to the effects of other campers as discussed in section 4.3.1.1.2.

Nesting and Brooding Impacts. The effects of the OHV rentals are addressed in section 4.3.1.1.1. SNPL do not typically nest between Post 2 and 2.5 where OHV rentals are located; therefore, impacts to nesting SNPL are not known to occur. However, SNPL can nest outside the seasonal exclosure and could nest within suitable habitat between Posts 2 and 2.5, as well in locations where vehicles travel to reach the OHV rental location. Therefore, visitors to the OHV rental location could crush eggs, chicks, or adults or disturb SNPL chicks or adults in an active SNPL nest that is outside a seasonal exclosure and not yet identified by monitors. To reduce the potential to impact a SNPL nest outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. Any nests found outside a seasonal exclosure will be quickly protected by a single-nest exclosure (section 5.3.1), as appropriate, thus reducing the likelihood of a vehicle destroying or disturbing a nest. In addition, if a nest is found near the OHV rental location, a 100-foot buffer will be implemented to ensure that visitors do not disturb the nesting bird. The buffer will continue to be increased, as necessary, until monitors observe that SNPL chicks and adults are no longer disturbed. As a result, impacts to nesting SNPL outside the seasonal exclosure will continue to be minimal.

Foraging and/or Roosting Impacts – Non-Breeding Season. SNPL often roost and forage along the shoreline south of Grand Avenue, which is open to street-legal vehicles. Vehicles driving to or from concession services can strike individual SNPL. In addition, vehicles driving to and from the concession services can disturb individual SNPL in this area by flushing them from their location and causing them to become energetically stressed. To reduce the potential to disturb or strike a foraging or roosting SNPL, as part of the ongoing SNPL and CLTE management program in the HCP area, all concession service staff receive a focused training on SNPL life history and regulations, and concession service vehicles are required to maintain the speed limit and not stop while driving through areas where SNPL occur. As a result, impacts from concessions are considered to be minimal.

4.3.1.4.6 Pismo Beach Golf Course Operations (CA-37)

Pismo Beach golf course operations do not affect SNPL since the golf course is not located within or near SNPL breeding or foraging habitat.

4.3.1.4.7 Grover Beach Lodge and Conference Center (CA-38)

Impacts to SNPL were analyzed as part of the Grover Beach Lodge EIR (SWCA Environmental Consultants 2012). Central dune scrub habitat in the Grover Beach Lodge project area was determined to have potential to support wintering SNPL, and impacts could occur during construction (Map 4). Pre-construction surveys were required to be conducted between October and February, and activities were not permitted within 500 feet of any wintering SNPL observed during the surveys. As a result, impacts to SNPL from this activity will be minimal.

4.3.1.4.8 Natural History and Interpretation Programs (CA-39)

Suitable breeding and foraging habitat for SNPL is not present at Oso Flaco Lake; therefore, natural history and interpretation programs at Oso Flaco Lake do not affect SNPL.

Trailers may be towed by CDPR staff to the beach to provide additional, impromptu, interpretive programs. These trailers are placed outside of actively used SNPL nesting, roosting, and foraging habitat. Therefore, effects on SNPL from use of the trailers do not occur.

4.3.1.5 Other HCP Covered Activities

4.3.1.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

Nesting and Brooding Impacts. Only one SNPL nest has been observed near the Pismo Creek estuary since the implementation of SNPL monitoring in 1992 (in 2009); therefore, impacts to nesting SNPL from CDPR vehicles crossing near Pismo/Carpenter Creek are not known to occur and are not expected to occur in the future.

CDPR vehicles cross Oso Flaco Creek along the shoreline and do not enter the seasonal exclosure; therefore, SNPL nests in the Oso Flaco area are not expected to be impacted.

Although infrequent, SNPL are known to nest near Arroyo Grande Creek, which is outside the protection of the seasonal exclosure. SNPL adults and chicks also forage and roost along the shoreline outside the protection of the seasonal exclosure near Arroyo Grande Creek and Oso Flaco Creek. Effects from CDPR vehicles crossing Arroyo Grande Creek and Oso Flaco Creek are similar to those described for general maintenance vehicles driving along the shoreline or near the seasonal exclosure (section 4.3.1.3.1) and are considered to be minimal.

Vehicle Strike – Non-breeding Season. Non-breeding SNPL can occur in the vicinity of Arroyo Grande, Pismo, and/or Oso Flaco creeks. Effects from CDPR vehicles crossing these creeks are similar to the effects described for general maintenance vehicles (section 4.3.1.3.1) and are considered to be minimal.

4.3.1.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

Nesting and Brooding Impacts. Since the implementation of SNPL monitoring in 1992, only one SNPL nest has been detected near the Pismo Creek estuary (in 2009); therefore, bridge installation is not expected to affect nesting SNPL. Although SNPL rarely nest in this area (Map 11), bridge installation and removal will need to follow AMMs, including pre-installation surveys and 100-foot minimum buffers from active nests to ensure effects on nesting SNPL are minimal.

Foraging and/or Roosting Disturbance – Non-breeding Season. Non-breeding SNPL could occur in the vicinity of the bridge project area and could be disturbed by bridge installation, use, and removal if foraging and/or roosting behavior is interrupted. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which requires surveys to be conducted prior to project activities to ensure that SNPL are not present in the area. If SNPL are observed within 150 feet of the project area, the program requires that activities be delayed until the birds have left the area. In addition, CDPR has established an AMM specific to the future bridge location that requires that the bridge be closed to public use until the birds have left the area if visitor activities are observed to be disturbing foraging or roosting SNPL at the bridge location. Therefore, effects from the installation and use of the floating bridge are anticipated to be minimal.

4.3.1.5.3 Riding in 40 Acres (CA-42)

Riding in 40 Acres will be located outside the seasonal exclosure and within tertiary SNPL habitat. Vehicles riding in 40 Acres are not expected to affect SNPL nests, since SNPL are not expected to nest in tertiary habitat and thus would not be affected. Similarly, SNPL typically forage and/or roost along the shoreline and not within the 40 Acre area; therefore, effects on foraging and roosting SNPL are not expected.

4.3.1.5.4 Replacement of the Safety and Education Center (CA-43)

Nesting and Brooding Impacts. Most SNPL nest inside the seasonal exclosure, which is south of the safety and education center. As a result, the nests within the seasonal exclosure are not anticipated to be impacted by replacement of the safety and education center.

SNPL will also sometimes nest outside the protection of the seasonal exclosure. The safety and education center is located north of Post 5 near the Pipeline vegetation island (Map 3), which is not in an area where SNPL typically nest. Although SNPL do not typically nest in this area, the safety and education center is located in primary habitat for SNPL, and they could nest in this location in the future. Therefore, replacement of this facility could result in destruction or disturbance of a SNPL nest or brood that is outside the seasonal exclosure and has not yet been discovered by monitors. To reduce the potential to impact a SNPL nest outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. Any nests found outside a seasonal exclosure will be quickly protected by a single-nest exclosure, as appropriate, and a 100-foot buffer will be implemented around the nest (section 5.3.1). The buffer will be increased (e.g., by adding a bumpout), as necessary, until monitors observe that SNPL chicks and adults are no longer disturbed. Therefore, impacts to SNPL nests or chicks outside the seasonal exclosure from replacement of the safety and education center will be minimal.

Foraging and/or Roosting Impacts. Foraging and/or roosting SNPL could be disturbed by the safety and education center replacement activities and/or struck by a vehicle working within occupied foraging or roosting habitat during both the breeding and non-breeding season. To minimize the potential for these impacts to occur, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting a training for all CDPR staff on SNPL and observing the park regulations and rules to protect SNPL. In addition, surveys for SNPL will be conducted prior to conducting work and activities will be delayed until SNPL are no longer present. Workers traveling along the shoreline and within primary SNPL habitat are also trained how to drive within areas where SNPL could forage or roost and instructed to keep speeds at or below 5 mph, drive lower on the shore below areas where SNPL are more likely to forage or roost (e.g., the wrack line), and scan ahead of the vehicle for SNPL. As a result, effects from safety and education center replacement activities on foraging and roosting SNPL will be minimal.

4.3.1.5.5 Dust Control Activities (CA-44)

Numerous dust control measures are already in place in the HCP area (section 2.2.5.4) and are expected to continue during the permit term. In addition to these measures, CDPR has agreed to implement additional dust control measures, including 1) permanently closing off sections of open riding area to motorized recreation and camping; 2) installing track-out devices at the Grand Avenue and Pier Avenue entrances to prevent track-out of sand onto paved, public roadways; and 3) preparing a PMRP. Most new dust control activities will occur within the backdune area, which is considered tertiary habitat for SNPL. Dust control activities in tertiary habitat will not impact SNPL. A description of the impacts associated with dust control activities in primary and secondary SNPL habitat follows.

Nesting, Brooding, and/or Foraging/Roosting Impacts—Breeding Season. Activities associated with dust control (e.g., vegetation planting, placement, and maintenance of artificial dust control measures, and maintenance of a temporary monitoring site) will not occur within the seasonal exclosure where SNPL typically nest (Map 23).

A 48-acre area has been fenced for a new foredune and is located outside the seasonal exclosure area but within SNPL primary habitat. The 48-acre area, which is closed to motorized recreation and camping, was planted with experimental planting treatments in February 2020 and is expected to develop

foredune characteristics. CDPR anticipates planting the area with additional vegetation subject to the outcome of the experimental planting, reviews, and approvals. In addition, approximately 4 additional acres of foredune area are proposed to be fenced and vegetated as part of the dust control activities. It is assumed that the 4 acres of new foredune vegetation will also be in SNPL primary habitat. Any associated air quality monitoring equipment could also be in primary habitat but would be outside of the seasonal exclosure. Given the need to plant vegetation during the rainy season, additional plants are expected to be installed prior to March 1 and the start of the SNPL breeding season or after the season concludes in September, which will not impact nesting SNPL. Monitors will conduct daily searches for nests in these newly closed foredune areas, and should any planting need to occur within the SNPL breeding season (after February 28/29), such searches would occur before any equipment or personnel moved into the foredune area for planting. Any nests that are found will be protected by a single-nest exclosure, if appropriate, and a buffer zone a minimum of 100 feet will be implemented around the nest. As a result, impacts from planting after February 28/29 will be minimal.

Once planted, both areas will be initially closed to pedestrians but open to CDPR staff needing to maintain the vegetated areas. The areas will be opened to pedestrians once CDPR has determined that the vegetation is adequately established. By creating closed areas free from the ongoing disturbance that occurs north of Post 6, the new 48-acre foredune and additional 4-acre foredune vegetation area could attract nesting SNPL. The 48-acre foredune site in particular creates a large closed area that at least initially – prior to vegetation establishment – may be conducive to nesting, as has been observed during the 2020 nesting season. SNPL may also continue to nest in more open areas within and adjacent to the foredune once the foredune vegetation is established. If a SNPL nest is established outside the seasonal exclosure in the newly closed foredune areas, the cryptic nature of SNPL nests and chicks makes it possible for a nest/chick to be crushed/killed or injured if a nest has not yet been identified by monitors. In addition, vehicle and/or pedestrian activities occurring adjacent to these areas, and pedestrian or maintenance activities within the vegetated areas, could result in disturbance of nesting SNPL, and SNPL could be deterred from incubating eggs or brooding chicks. However, CDPR will implement the SNPL and CLTE management program within these areas. Monitors will conduct daily searches for nests in these foredune areas. Any nests that are found will be protected by a single-nest exclosure, if appropriate, and a buffer zone a minimum of 100 feet will be established around all nests in areas open to recreation to ensure that recreation activities do not encroach on SNPL nests. As a result, this impact will be minimal.

Chicks that leave nests within these foredune areas are vulnerable to injury or mortality as they move from the nest area to the shoreline where they may encounter vehicles. However, CDPR will implement SNPL AMMs, as appropriate, including SNPL AMMs 1 through 30 to reduce the risk of crushing/killing or injuring a nest/chick. These AMMs include monitors observing known nests prior to hatching, posting signs or symbolic fencing to provide safe passage, and capturing chicks for captive rearing. As a result, these impacts will be minimal.

SNPL nesting near the fenceline of the 6 Exclosure may be disturbed by vehicles travelling between the 6 Exclosure and southern edge of the new foredune. Chronic disturbance of breeding adults from recreation activities can directly or indirectly affect chicks or eggs. Chicks or nests can be abandoned, left unattended for prolonged periods of time, or exposed to predation. In addition, chicks can be orphaned or inadequately nourished, and eggs could be buried by sand or not properly incubated (Warriner et al. 1986). To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Specifically, CDPR will continue to conduct daily monitoring to enable better identification of potential threats. In addition, a nest avoidance buffer of a minimum of 100 feet will be used to protect SNPL nests near the fenceline of the 6 Exclosure. The buffer will be

increased, as necessary, until monitors observe that SNPL adults are no longer disturbed. As a result, disturbance to nesting or brooding SNPL associated with recreation will be minimized.

The multi-strand metal fencing used for these foredune areas is similar to fences placed at other vegetation islands. Fences placed in otherwise open habitat can be hazardous to flying birds. Only SNPL nesting within these areas will be at risk of striking the foredune fencing. SNPL may nest in these foredune areas and could fly into the multi-strand fence when leaving a nest for another location. However, SNPL have not been documented striking other vegetation island fencing and, although they have been documented striking the symbolic fence at Oso Flaco, this event has been rare and happened only a few times from 2002 to 2018. In addition, CDPR will implement SNPL AMMs (Table 5-2), as necessary, to minimize the risk of fence strike. As a result, SNPL are very unlikely to strike the fencing, and this impact is expected to be minimal.

SNPL chicks and adults/juveniles have been observed leaving the protection of the seasonal exclosure and entering the open riding area where they are at risk of being struck by a vehicle. Establishing a foredune in an area open to motorized recreation will exacerbate this issue since it will limit the open sand areas for motorized recreation to occur, especially along the shoreline where SNPL chicks are brooded and/or adults and chicks are foraging. Vehicle alleys in the foredune areas may allow vehicles to travel through without impacting SNPL; however, SNPL may also utilize the pathways for travel to the shoreline. As a result, more SNPL will be vulnerable to vehicle strike due to the presence of vehicles on the shoreline. Chicks will be most vulnerable since they will be unable to fly out of harm's way. This could be exacerbated in conjunction with the exclosure reduction (section 2.2.5.10), which is predicted to result in some adult aggression/density issues and push additional chicks and adults out of the protection of the exclosure into the open riding area. In addition, nests established in the foredune areas addition will be at risk if they hatch and chicks leave the foredune and travel along motorized recreation trails in order to reach the shoreline to forage. To minimize the risk of vehicle strike along the shoreline, CDPR will implement AMMs associated with motorized and/or pedestrian recreation (section 4.6.1.1.1 and 4.6.1.1.2), including new AMM 22, which establishes a maximum number of eggs and chicks that can be captured (e.g., up to 12 eggs/4 nests and 12 chicks/4 broods) to protect them from covered activities not related to covered species management. The measure also establishes a threshold (i.e., 8 eggs and 8 chicks) at which point CDPR would contact the USFWS and discuss whether AMMs (e.g., expanding the exclosure along the shoreline to provide additional protected foraging habitat, increasing monitoring along the shoreline, increasing signage in the breeding area) are appropriate to reduce impacts of additional take that could occur from covered activities not related to covered species management activities. With these measures, mortality impacts will be minimized. Some capture of SNPL chicks will likely occur.

Foraging/Roosting Impacts—Non-Breeding Season. Foredune fencing and vegetation installation could disturb foraging and/or roosting wintering SNPL by displacing them from suitable foraging and/or roosting habitat during the disturbance and or deterring them from foraging and/or roosting during the disturbance. CDPR will conduct pre-construction surveys for SNPL prior to starting work and delay activity until SNPL are no longer present (SNPL AMM 103). As a result, potential impacts to SNPL from these activities will be minimal.

SNPL are present and vulnerable to vehicle strike or disturbance during the non-breeding season. As noted in section 3.3.1.4.2, foraging and roosting wintering SNPL are frequently concentrated on the relatively narrow beach between Grand Avenue and Pier Avenue and north of Post 2, where OHV use is prohibited but street-legal vehicles are allowed. SNPL may roost or forage along the shoreline where the new foredune is located. Fencing off the new foredune, and potentially the additional 4-acre area, removes some shoreline area that can be utilized for both driving and foraging. As a result, SNPL could be more vulnerable to vehicle strike due to the reduced area along the shoreline. To reduce this impact,

CDPR will implement the SNPL and CLTE management program in these areas, which includes weekly monitoring for wintering SNPL in the HCP area to locate foraging and/or roosting birds, enforcement of the posted speed limits, placing additional speed limit signs near foraging and/or roosting flocks, and implementing public education methods (e.g., handing out brochures, posting signs). Implementation of the SNPL and CLTE management program will reduce the impacts to wintering SNPL from motorized recreation.

Reduced Habitat. Foredune vegetation installed within SNPL primary habitat will reduce available suitable SNPL breeding and/or wintering habitat by decreasing the amount of open, wide beaches. Any additional vegetation associated with dust control activities within SNPL secondary habitat will further reduce the quality of such habitat and ultimately potentially convert it into tertiary habitat (e.g., vegetated dune; see section 3.3.1.8). Previous studies have found that SNPL select habitats that are open (or wide) and have less vegetative cover in order to facilitate early detection of predators and reduce predation risk (Muir and Colwell 2010, Brindock and Colwell 2011, Patrick and Colwell 2014). Reducing SNPL habitat by planting vegetation in suitable primary and secondary habitat for this species could lead to less open (or wide), sparsely vegetated beaches and could potentially increase predation on adults, chicks, and/or eggs if SNPL are not able to detect predators moving towards the nest location. However, all vegetation installation has been designed to avoid the active nest area, and randomly spacing the native foredune vegetation will avoid creating areas of heavy vegetation. CDPR will also implement all AMMs (Table 5-2), as appropriate, to reduce impacts from dust control activities. In addition, CDPR implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing SNPL adults, chicks, or eggs. With these measures, impacts are expected to be reduced.

Increased Predators. Vegetation planted for dust control, especially vegetation planted within primary or secondary habitat, may impact breeding SNPL by providing habitat for mammalian predators to hide and stalk nesting, foraging, and/or roosting SNPL. CDPR will implement all AMMs (Table 5-2), as appropriate, to reduce impacts from dust control activities. These measures will include erecting single-nest or mini exclosures as needed around any SNPL nests that occur within the new foredune vegetation areas. Furthermore, CDPR's predator management program has been successful at controlling predators in the HCP area and protecting breeding SNPL. The predator management program has likely increased reproductive success for SNPL and is expected to alleviate any impacts associated with additional vegetation being planted near SNPL habitat. CDPR reviews the predator management plan each year, in coordination with USFWS, and updates it to identify additional appropriate measures to address increased or new predators, if necessary. As a result, these effects are anticipated to be minimal.

4.3.1.5.6 Cultural Resources Management (CA-45)

Cultural resource management activities are generally conducted outside areas where SNPL are typically observed or outside the SNPL breeding season and do not affect SNPL. In the unlikely event that cultural resource management activities must occur in the future during the breeding season in areas where SNPL typically nest, these activities could disturb and/or displace SNPL from roosting or nesting. In addition, cultural resource management activities could disturb and/or displace SNPL from roosting or foraging during the non-breeding season. To reduce any impacts from cultural resource management activities, CDPR will continue to implement the SNPL and CLTE management program. Therefore, surveys will continue to be conducted in areas where SNPL could occur to ensure SNPL nests, adults, and chicks are not present within and near the cultural resource management area, and activities will be delayed until an experienced monitor determines that no impacts will occur if a SNPL is observed during the surveys. Furthermore, to limit the potential for disturbance to nesting SNPL, environmental monitors will continue accompanying archaeologists in the field when cultural resources protection

work must occur within or adjacent to areas where SNPL are known to nest. Therefore, the effects from cultural resource management are considered minimal and will continue to be minimal in the future.

4.3.1.5.7 CDPR Management of Agricultural Lands (CA-46)

Management activities conducted on agricultural lands do not affect SNPL since agricultural lands are not SNPL breeding or foraging habitat.

4.3.1.5.8 Maintenance of a Bioreactor on Agricultural Lands (CA-47)

Maintenance of a bioreactor on agricultural lands does not affect SNPL since the agricultural lands are not SNPL breeding or foraging habitat.

4.3.1.5.9 Oso Flaco Lake Boardwalk Replacement (CA-48)

Suitable nesting, foraging, and/or roosting habitat for SNPL is not present at Oso Flaco Lake; therefore, Oso Flaco boardwalk replacement is not expected to affect this species.

4.3.1.5.10 Special Projects (CA-49)

Nesting and Brooding Impacts. Special projects include activities required to meet a facility's need, such as installing vault toilets (section 2.2.5.10). Though the actual location of special projects is not yet known, this HCP anticipates that special projects could directly affect up to 35 acres of 4,511 acres of available SNPL habitat over the permit term, although only approximately 1,000 acres are within primary and/or secondary habitat (i.e., 727 acres in primary habitat and 276 acres in secondary habitat) where SNPL may nest. Special projects within tertiary habitat are not expected to affect SNPL since SNPL rarely occur within tertiary habitat. Special projects in primary and secondary habitat will be conducted outside the SNPL breeding season, to the extent feasible. If special projects in primary and secondary habitat are conducted in the breeding season, they will not be conducted within the seasonal exclosure where the majority of SNPL nest; therefore, SNPL nesting within the seasonal exclosure will not be affected by special projects.

Although most SNPL nest within the seasonal exclosure, SNPL also occasionally nest outside the protection of the seasonal exclosure, including adjacent to the seasonal exclosure in the open riding area and near Arroyo Grande Creek. Construction activities and vehicles associated with special project construction could crush eggs, chicks, or adults or disturb SNPL chicks or adults in an active SNPL nest that is outside a seasonal exclosure and not yet identified by monitors. To reduce impacts to SNPL nests that could occur outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. In addition, any nests found outside a seasonal exclosure are quickly protected by a single-nest exclosure (section 5.3.1), as appropriate, thus reducing the likelihood of construction activities destroying or disturbing a nest. Furthermore, special project plans, including AMMs (e.g., conducting surveys prior to special project activities and delaying construction until SNPL are no longer in the area), will be submitted to the USFWS for review and approval prior to constructing a special project that could impact SNPL. As a result, special projects are not expected to affect nesting SNPL.

Foraging and/or Roosting Impacts. Foraging and/or roosting SNPL may be disturbed during special project activities because roosting and/or foraging activities could be interrupted. However, 3,488 acres of the 4,512 acres where special projects could occur are located in tertiary habitat where SNPL are not expected to forage and/or roost. Special project activities in primary and secondary habitat are expected to be infrequent and of short duration. In addition, special project plans, including AMMs (e.g., conducting surveys prior to special project activities and delaying construction until SNPL are no longer in the area), will be submitted to the USFWS for review and approval prior to constructing a special

project in areas that could impact SNPL (e.g., primary and secondary habitat). As a result, special projects are not expected to affect foraging and/or roosting SNPL.

Reduced Habitat. Placing special projects within SNPL primary and secondary breeding habitat reduces the amount of habitat available to SNPL for breeding by precluding them from nesting within the footprint of the structures. However, many special projects will not be placed within primary and/or secondary habitat. In addition, special projects are small (i.e., not to exceed 35 acres over the permit term), and they are placed in areas where SNPL do not typically nest (e.g., outside the seasonal exclosure). In addition, special project plans within areas that could impact SNPL will be submitted to the USFWS for review and approval prior to construction. Therefore, this effect will be minimal.

4.3.1.5.11 Reduction of the Boneyard and 6 Exclosures (CA-50)

Reduction of the Boneyard and 6 exclosures is not expected to result in additional impacts to adult and/or juvenile SNPL beyond those described above for motorized recreation (section 4.3.1.1.1) and pedestrian activities (section 4.3.1.1.3) since SNPL AMMs would be implemented, as appropriate, including installing single-nest exclosures or bumpouts around any SNPL nest within the open riding area, and any SNPL adults and/or juveniles found outside an exclosure would typically be expected to fly out of harm's way.

Eliminating the East Boneyard Exclosure (approximately 49 acres) and incremental elimination of 6 Exclosure (60 acres)[35] could result in the loss of up to 109 acres of protected SNPL breeding habitat. This reduction represents approximately one-third of the 368 acres of SNPL breeding habitat currently protected by the seasonal exclosure (300 acres in the Southern Exclosure and 68 acres in Oso Flaco Exclosure).

Although the East Boneyard Exclosure is considered suitable habitat for SNPL, it has supported only seven SNPL nests (a single nest in a few different breeding seasons) since 2005, indicating that this area may not provide ideal nesting habitat for SNPL. Any nest that was established in this area once the exclosure fencing is removed would be protected by a single-nest exclosure, and a 100-foot buffer would be implemented. SNPL are known to nest within the West Boneyard Exclosure, and the East Boneyard Exclosure has provided a buffer from any recreational disturbance in the open riding area. Removal of the East Boneyard Exclosure would thus result in motorized recreation activities adjacent to the West Boneyard Exclosure where SNPL could nest. However, if any SNPL within the West Boneyard Exclosure are observed to be disturbed by increased recreation and/or new travel patterns within the former adjacent East Boneyard Exclosure, a bumpout will be installed to ensure that disturbance in this area is minimized. As a result, impacts to SNPL from removal of the East Boneyard Exclosure will be minimal.

The Boneyard gate is currently inaccessible during the SNPL breeding season since it is enclosed within the East Boneyard Exclosure. If the East Boneyard Exclosure is removed, then recreationists could once again access the Boneyard gate during the breeding season. SNPL frequently nest in the Oso Flaco area, and any SNPL that nest within South Oso Flaco could be disturbed by recreationists that enter South Oso Flaco through the Boneyard gate. However, the Oso Flaco fence at the south end of East Boneyard

[35] CDPR may reduce the exclosure via other configurations, such as east to west. However, the north-to-south configuration is anticipated to be the most impactful scenario to SNPL due to the simultaneous loss of nesting and foraging habitat. Therefore, for purposes of analysis this section focuses on the worst-case scenario (i.e., a north-to-south, 328-foot or approximately 7.5-acre reduction).

would be moved, as necessary, to ensure that recreational access to South Oso Flaco from the former East Boneyard area would continue to be limited. As a result, this impact will be minimal.

The 6 Exclosure has had greater nesting success and is one of the higher producing exclosure areas. From 2005 to 2018, between 25 and 73 SNPL nests (i.e., 25 to 45 percent of the total SNPL nests in the HCP area) have been established in the 6 Exclosure annually. Therefore, reduction of the 6 Exclosure could expose nesting, foraging, and/or roosting SNPL to recreation and other activities. Individuals not protected by the exclosure fence could be killed, injured, or disturbed if activities occur close by. Based on historical data in the HCP area from 2005 to 2018, the most nests established in the first 328 feet[36] of the 6 Exclosure in a year has been six nests. As a result, although unlikely,[37] it is possible that up to six nests could be exposed to recreation and other activities during the first incremental decrease of the 6 Exclosure if SNPL do not move south into the remaining protected area. Ultimately, although unlikely, if the entire 6 Exclosure is removed, between 25 and 73 nests could be exposed to recreation. In addition, as the SNPL population increases, it is possible that more SNPL breeding activity would occur in the open riding area.

From 2005 to 2018, the average density of SNPL nests within the 6 Exclosure ranged from 0.5 to 1.9 nests/acre. Although adult territorial aggression towards SNPL chicks mostly occurs along the shoreline, the behavior has been observed within the seasonal exclosure when chicks from one brood move into the territory of another brood. Adult aggression toward chicks can injure or kill the chicks or expose them to inclement weather, starvation, and/or predation. Currently, territorial aggression in the seasonal exclosure is only occasionally observed. However, reduction of the 6 Exclosure could exacerbate the territorial aggression within the seasonal exclosure by reducing the amount of habitat available for nesting so that nests must be established in closer proximity, and chicks will be more likely to enter the territory of another brood. In addition, as the SNPL population increases, it is possible that more SNPL breeding activity may move into the open riding area. The maximum number of SNPL nests during one breeding season within 1 acre in the 6 Exclosure from 2005 to 2018 has not exceeded seven nests, and some portion of these nests was established during the same time period. Therefore, this suggests that the maximum density for SNPL nests within an acre is seven nests. If the 6 Exclosure is reduced by 328 feet in a breeding season, SNPL that previously nested in that portion of the seasonal exclosure are expected to move into the remaining protected area (Lafferty et al. 2006), which would contract the SNPL nest distribution and increase the density of nests in the remaining exclosure area. Ideally, habitat would be available for SNPL to continue to nest at a favorable density; however, it is estimated that in a worst-case scenario, nest density within a breeding season could exceed the maximum density in some areas of the exclosure by at least one nest in the first 328-foot exclosure reduction. This trend would continue if the exclosure continued to be reduced by 328 feet or approximately 7.5 acres each breeding season.

Adult territorial aggression towards SNPL chicks has been observed along the shoreline when foraging chicks move into the territory of another brood. Adult aggression toward chicks on the shoreline can injure or kill chicks and/or separate them from the attending adult. In addition, adult aggression can result in chicks along the exclosure shoreline leaving the protection of the seasonal exclosure and entering the open riding area where they are at risk of being struck by a vehicle. Reduction of the 6

[36] CDPR may reduce the exclosure via other configurations, such as east to west, but for purposes of analysis this section focuses on a north-to-south, 328-foot (approximately 7.5 acre) reduction.

[37] Most SNPL are expected to move south into the protection of the exclosure to avoid disturbance from recreation activity. This has been observed at Coal Oil Point Reserve (Lafferty, Goodman and Sandoval 2006) where SNPL increased in abundance and contracted their distribution to within the protected area to avoid recreation disturbance.

Exclosure (especially if the exclosure is reduced from north to south) would exacerbate this territorial aggression issue by reducing the amount of protected shoreline habitat available for foraging so that broods would either forage in closer proximity to another brood or leave the protection of the exclosure to avoid entering the territory of another brood. Historical nest data indicates that between 25 and 73 nests have been established annually in the 6 Exclosure between 2005 and 2018; therefore, if the entire 6 Exclosure is removed, although unlikely, it could result in 75 to 219 chicks moving into the open riding area to forage where they are at risk of being struck by a vehicle.

To ensure that SNPL nesting levels in the HCP area continue to contribute to the overall success of the population, the HCP ensures that the 6 Exclosure will not be reduced unless specific criteria are met, including obtaining a breeding population size greater than 155 SNPL for 3 consecutive years and a fledge rate of 1.0 fledgling per pair over the same period (section 5.2.3). In addition, any nests found outside a seasonal exclosure will be protected by a single-nest exclosure, thus reducing the likelihood of direct impacts to nesting SNPL. Monitors would also track SNPL chicks that are hatched within the riding area to determine travel routes and patterns associated with foraging and exploration and protect them with symbolic fencing to keep vehicles away, and bumpouts would be installed as necessary to reduce disturbance to SNPL nesting near the areas open to motorized recreation.

Although these measures will reduce impacts to SNPL eggs and chicks in the riding area, some eggs and chicks may still need to be captured and brought to a captive rearing facility to prevent mortality and injury. The number of eggs or chicks that may need to be captured for captive rearing is difficult to predict at this time. Therefore, new SNPL AMM 22 establishes a maximum number of eggs or chicks that can be captured (e.g., up to 12 eggs/4 nests and/or 12 chicks/4 broods) to protect them from covered activities not related to covered species management. AMM 22 also establishes a threshold (i.e., 8 eggs or 8 chicks) at which point CDPR would contact the USFWS and discuss whether AMMs (e.g., expanding the exclosure along the shoreline to provide additional protected foraging habitat, increasing monitoring along the shoreline, increasing signage in the breeding area) are appropriate to reduce impacts of additional take that could occur from covered activities not related to covered species management activities. With these measures the reduction of East Boneyard and 6 Exclosures are expected to be minimized. In addition, the criteria will ensure that a viable population of SNPL continues to breed within the HCP area.

4.3.1.5.12 Use of Pesticides (CA-51)

While the risk characterization for each pesticide focuses on the potential for direct toxic effects, potential for indirect effects exists in virtually all groups of non-target organisms. Terrestrial applications of any effective herbicide are likely to alter vegetation within the treatment area. This alteration could have indirect effects on terrestrial or aquatic animals, including changes in food availability and habitat quality. These indirect effects may be beneficial to some species and detrimental to other species. Moreover, the magnitude of indirect effects is likely to vary over time. While these concerns are acknowledged, they are not specific to herbicide applications in general. Any effective method for vegetation management, including mechanical methods that do not involve herbicide, could be associated with indirect effects on both animals and non-target vegetation.

Indirect exposure of pesticides on birds, fish, or amphibians can occur when they eat contaminated prey or vegetation. Direct exposure can occur when birds, fish, or s contact pesticide residues with their skin or eyes or when they inhale vapors or particulates. Expected effects from each pesticide are described in more detail below.

Nesting or Brooding Impacts. Insecticides are not applied during the SNPL breeding season. Therefore, insecticides do not affect breeding SNPL.

Herbicides are used during the SNPL breeding season; however, they are not used in areas known to be occupied by SNPL. SNPL can be impacted by drift from herbicides sprayed outside of but nearby known breeding areas. In addition, SNPL outside of known breeding areas that have not yet been discovered by monitors can be impacted by herbicides as described below for foraging and/or roosting impacts during the non-breeding season. AMMs listed in section 5.3.1.1 will reduce or eliminate these impacts.

Aerial spraying of herbicides has the potential to flush SNPL. However, aerial spraying is conducted in the backdunes, which is outside areas where SNPL nest, forage, or roost. As a result, SNPL are not impacted by aerial spraying activities.

Foraging and/or Roosting Impacts – Non-breeding Season. A general description of the location where each pesticide is used in the HCP area in relation to SNPL habitat and the anticipated effects of each pesticide on SNPL follows.

Glyphosate is sometimes used in suitable SNPL habitat (i.e., foredunes) to control European beach grass and Russian wheat grass. Numerous scientific and regulatory reviews have examined the potential direct effects of glyphosate on a wide variety of wildlife species including birds. Such reviews consistently conclude that the use of glyphosate products in accordance with product labels does not pose a significant risk of either direct acute or chronic toxicity to terrestrial wildlife species (EPA 1993, Giesy et al. 2000, Tatum 2004, SERA 2011a, Pest Management Regulatory Agency 2015). The detailed risk assessment conducted by Syracuse Environmental Research Associates (SERA) (2011a) calculated the risk of glyphosate to small mammals and birds based on the relationship between estimated exposure (e.g., via direct overspray or through consumption of contaminated vegetation, water, insects, or fish) following application of glyphosate-based herbicides and considered both acute and chronic (i.e., longer-term exposures). In summary, the author stated that congruent with the Environmental Protection Agency (EPA) (1993) assessment, “none of the hazard quotients for acute or chronic scenarios reach a level of concern even at the upper ranges of exposure.”

Fluazifop-p-butyl is typically used in the backdunes to control perennial veldt grass, which is outside areas where SNPL typically nest, forage, and/or roost. In addition, fluazifop-p-butyl is considered practically non-toxic (Class 0) to avian species (White 2007).

Imazapyr is sometimes used in suitable SNPL habitat (i.e., foredunes) to control European beach grass and Russian wheat grass. The available avian studies on imazapyr, all of which were conducted up to limit doses, do not report any signs of toxicity (SERA 2011b).

Triclopyr is typically used to control Cape ivy, which mostly occurs in riparian areas outside areas where SNPL typically nest, forage, and/or roost. In addition, triclopyr acid is considered practically non-toxic (Class 0) to slightly toxic (Class 1) to birds (White 2007).

Aminocyclopyracholor is typically used to control iceplant, which sometimes occurs in suitable SNPL habitat (i.e., foredunes). The EPA/Office of Pesticide Programs (2010) classifies aminocyclopyrachlor as practically non-toxic (Class 0) or only slightly toxic (Class 1) to mammals, birds, fish, and aquatic invertebrates (SERA 2012).

Chlorsulfuron is typically used to control iceplant, which sometimes occurs in suitable SNPL habitat (i.e., foredunes). The EPA pesticide registration process requires toxicological data be supplied to evaluate avian tolerance to chlorsulfuron. Data from the available literature indicate that chlorsulfuron has low toxicity to birds. Acute dietary exposure did not result in toxic effects at 5,000 parts per million (ppm), (equivalent to 500 milligrams (mg)/kg bodyweight-day (BW-day) in mallards [*Anas platyrhynchos*]) and at 5,620 ppm (equivalent to 3,394 mg/kg BW-day in bobwhite quail [*Colinus virginianus*]) using technical grade chlorsulfuron (ENSR International 2005). CDPR’s current application rates and use patterns for chlorsulfuron pose a negligible risk to wildlife.

Aminopyralid is typically used to control Cape ivy, which mostly occurs in riparian areas outside areas where SNPL typically nest, forage, and/or roost. In addition, in Dow AgroSciences laboratory testing, aminopyralid has been shown to be "practically non-toxic" (Class 0) to birds, fish, honeybees, earthworms, and aquatic invertebrates (EPA 2005, DOW Chemical Company AgroSciences 2008).

Sethoxydim is slightly toxic to birds (SERA 2001); however, it is used in the backdunes to control perennial veldt grass, which is outside areas where SNPL typically nest, forage, and/or roost.

Clethodim is used in the backdunes to control perennial veldt grass, which is outside areas where SNPL typically nest, forage, and/or roost. In addition, clethodim is practically non-toxic to birds and is unlikely to pose a hazard to avian species (SERA 2014).

Vector control is not directly applied in suitable SNPL habitat. In addition, VectoBac G is toxic only to the larvae of certain diptera; it does not harm other aquatic, marine, or terrestrial fauna (Swedish Chemicals Agency 2015).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA®. Competitor® is a surfactant labeled for aquatic use, with either imazapyr or glyphosate. Little information is available regarding the potential effects of Competitor® on SNPL; however, the product safety data sheet states that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016a). Renegade EA® is a surfactant labeled for aquatic use that is made of methylated seed oil, UAN solution, and nonionic surfactant. Little information is available regarding the potential effects of Renegade EA® on SNPL; however, the product safety data sheet also states that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016b).

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Based on years of survey data for covered species and implementation of specific AMMs for pesticide use (Chapter 5), pesticide use within the HCP area results in overall beneficial effects to covered species by removing invasive species in the area. Also, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide exposure and associated risks to SNPL decrease with increasing distance from the treated field or site of application. CDPR takes extra precautions applying pesticides near sensitive habitats that support SNPL. However, contamination may result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. AMMs listed in section 5.3.1.1 will reduce or eliminate these impacts.

4.3.1.5.13 CDPR UAS Use for Park Activities (CA-52)

Nesting and Brooding Disturbance. CDPR will avoid flying UAS in areas where breeding SNPL will be affected, if possible. However, CDPR may use UAS in or near SNPL nesting or brood rearing habitat during the breeding season for some activities (e.g., predator management, habitat enhancement, SNPL monitoring). In 2018, prior to the SNPL breeding season, CDPR staff assessed the ability of a UAS to capture the amount of wrack present on the shoreline within SNPL breeding habitat. The UAS was tested over a period of a week and found to be highly effective at assessing nesting habitat enhancements distributed by staff. During the UAS flight, CDPR observed a small flock of SNPL and other shorebirds nearby. The flock of SNPL and other shorebirds did not flush or crouch in response to the UAS. Vas et al. (2015) also assessed reactions by a variety of waterbirds to approaches by UAS and found that the birds remained unaffected in most cases, suggesting the potential to use UAS without significant disturbance. In addition, AMMs (section 5.3.1.1) will be implemented to ensure disturbance from UAS is minimized, including, but not limited to, initiating flights at least 330 feet from the closest known nest location, following existing monitoring guidelines that have been established by USFWS,

having a trained biologist scan the area for roosting and nesting SNPL before every flight, having a trained biologist monitor the flight if SNPL are observed, ensuring UAS flight patterns are not erratic so they are not interpreted as an avian predator, and flying UAS at least 100 feet above ground at all times and moving UAS to higher altitude or aborting the mission if UAS are observed disturbing nests or broods. As a result, UAS are expected to have minimal impacts on nesting and/or brooding SNPL during the breeding season, although some disturbance may occur depending on the protocol necessary for the specific data gathering. Overall, UAS will likely collect valuable information on SNPL habitat, predators, and breeding that will inform future management decisions within the HCP area.

Foraging and/or Roosting Disturbance – Breeding and Non-breeding Season. UAS may be used during the non-breeding season throughout the HCP area and during the breeding season outside occupied SNPL breeding habitat and could disturb roosting and/or foraging SNPL. However, Vas et al. (2015) assessed reactions by a variety of waterbirds to approaches by UAS and found that the birds remained unaffected in most cases, suggesting the potential to use UAS without significant disturbance. In addition, AMMs (section 5.3.1.1) will be implemented to ensure disturbance from UAS is minimized, including, but not limited to, ensuring UAS flight patterns are not erratic so they are not interpreted as an avian predator, scanning the area for roosting or foraging SNPL prior to every flight, flying UAS at least 100 feet above ground, and ensuring all flights are approved by the Environmental Resources Project Manager. As a result, UAS are expected to have minimal impacts on foraging and/or roosting SNPL during the non-breeding season and/or outside occupied SNPL breeding habitat during the breeding season.

4.3.2 Anticipated Take of Western Snowy Plover

This section quantifies the potential for incidental take of SNPL due to the effects described in the preceding section. Given that both covered activities and the conservation program described in this HCP are largely ongoing, take estimates are based primarily on past take data, with the exception of the take associated with future exclosure reduction (CA-50) and newly implemented dust control activities (CA-44). The take numbers presented in this HCP are based on worst-case past observations of mortality and injury that have rarely been observed during the timeframe from 2002 to 2018 and do not happen every year. Oceano Dunes District will continue to manage for breeding SNPL targets. The estimates recognize that not every egg or individual SNPL may be detected. These data have resulted from long-term, intensive monitoring within the HCP area. A similar level of future take is expected to occur if CDPR maintains a similar set of conditions for the SNPL population within the HCP area in the future. One new form of take (i.e., egg and chick capture for captive rearing if determined to be threatened by covered activities) that does not currently occur within the HCP area has been added to this HCP. The take numbers thus include 12 eggs (i.e., 4 nests) and 12 chicks (i.e., 4 broods) that could be captured for captive rearing or crushed/killed due to existing and new covered activities.

The following sections estimate incidental take of SNPL based on the effects analyses (section 4.3.1). The effects analyses provide a complete discussion of all aspects of covered activities that could possibly impact the covered species. However, not every effect on a covered species rises to the level of take.

This HCP quantifies lethal take, capture, and harm of SNPL within the HCP area in terms of:

- Take of individual SNPL adults, juveniles, chicks, and eggs caused by park operations, recreation, and other activities not related to covered species management
- Take of SNPL caused by covered species management-related activities

The estimated annual take of SNPL is summarized in Table 4-1 and discussed in detail below. A large amount of lethal take and harm to nesting SNPL due to park operation, recreation, and natural

resources management-related activities not related to covered species management is avoided during the breeding season due to the implementation of AMMs. However, some lethal take or harm may still occur despite the implementation of AMMs. Additional lethal take or harm of SNPL due to park operation, recreation, and natural resources management-related activities (non-covered species management) can occur during the non-breeding season.

4.3.2.1 Take of SNPL Adults, Juveniles, Chicks, and Eggs from Park Operations, Recreation, and Other Activities Not Related to Covered Species Management

This section provides an estimate of SNPL take that could occur during covered activities not related to covered species management. Take estimates are generally based on worst-case past observations of SNPL in the HCP area. All take estimates also account for the conservation program measures and AMMs since the conservation program is part of an ongoing practice in the HCP area. Table 4-1 summarizes the estimates for take of SNPL adults, juveniles, chicks, and eggs.

4.3.2.1.1 Take of Adults and Juveniles

Take of adult and juvenile SNPL may occur during both the breeding and non-breeding seasons. However, CDPR dedicates a significant portion of its staff and other resources to implementing the SNPL and CLTE management program during the breeding season.[38] As a result, take that could otherwise occur during the breeding season is minimized. In addition, adults are generally able to avoid take in the form of mortality or injury from recreational activities because they are stronger fliers than juveniles (Lauten et al. 2006).

Take of adult and juvenile SNPL is most likely to occur from motorized vehicle recreation (section 4.3.1.1.1) and park operations (sections 4.3.1.3 through 4.3.1.5), although some take may occur due to non-motorized vehicle recreation (sections 4.3.1.1.2 through 4.3.1.1.9). Many SNPL nest within the Southern Exclosure and are thus protected from vehicles and disturbance from motorized and non-motorized activities. Many SNPL also nest within the Oso Flaco area, where vehicles are prohibited and either predator or symbolic fencing is erected to protect breeding birds and minimize impacts from other activities. However, some SNPL will occasionally nest outside the seasonal exclosure in areas open to vehicles and other activities. Park staff monitor the habitat outside the exclosure daily, looking for SNPL and signs that they may be nesting outside the seasonal exclosure. Nests found outside the seasonal exclosure are protected within a single-nest exclosure (section 5.3.1.1), as appropriate. However, although the majority of the nests outside the seasonal exclosure are likely found, due to their cryptic nature, some nests could go undetected, and adults sitting on the nest or protecting the nest could be killed or injured from collisions with motorized vehicles. SNPL may also forage and roost outside the seasonal exclosure along the shoreline that is open to vehicles or within the open riding area, where they are at risk of being struck or disturbed by a vehicle.

SNPL individuals during the non-breeding season are not protected by a seasonal exclosure and may be found foraging and/or roosting in areas open to vehicles. As a result, SNPL adults and juveniles during the non-breeding season may be killed or injured from collisions with motorized vehicles.

Estimates of adult and juvenile SNPL lethal take and/or harm are largely based on the following past observations of injured and dead SNPL. The annual mean minimum number of breeding adults in the

[38] Management is also implemented outside the breeding season for wintering SNPL; however, fewer staff and resources are deployed during the non-breeding season (e.g., monitoring is not conducted as frequently and seasonal exclosures are not in place).

HCP area from 2002 to 2018 was 142 breeding adults (Table 3-8). From 2001 to winter of 2018, 52 dead or injured adult and/or juvenile SNPL were recovered in the areas open to recreation (motorized and/or non-motorized), and some were determined to have been killed or injured by trauma. As a result, these deaths could be attributed to motorized and non-motorized activities, including recreation activities, park operations, or other activities not related to covered species management. Of the dead or injured SNPL found between 2001 and winter 2018, a total of 26[39] were found during the breeding season and 27 dead or injured adult and/or juvenile SNPL were recovered during the non-breeding season.

In six of the years from 2001 to winter 2018 (i.e., 2002, 2010, 2011, 2013, 2016, and 2017), two juvenile and/or adult SNPL were killed each year during the breeding season. In winter 2018, three adults were killed during the breeding season; however, one was killed on March 1 and the other two were killed at the end of September, when SNPL when breeding is likely not occurring. In addition, in four of the years from 2001 to winter 2018 (i.e., 2004, 2008, 2013, and 2015), two juvenile and/or adult SNPL were killed each year during the non-breeding season. The highest number of juveniles and/or adult SNPL killed or injured was in 2017, when seven juveniles and/or adults were killed, and two juveniles were injured. Of these, five juveniles and/or adults were killed in the non-breeding season, and four juveniles and/or adults were killed or injured in the breeding season.[40] Furthermore, in 2016 and 2018, eight juveniles and/or adult SNPL were killed in a year. Based on these past levels of take, this HCP anticipates a maximum of 12[41] juveniles and/or adults in a year could be injured or killed in the HCP area. In addition, because 12 juveniles and/or adults being injured or killed per year is based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes only 1 or 2 years will result in the maximum take levels and other years will have lower take levels. As a result, this HCP estimates that no more than 45 juveniles and/or adults will be injured or killed in the HCP area over a 5-year period.

4.3.2.1.2 Take of Chicks and Eggs

Take of eggs and chicks during recreation activities, park operations, and/or other activities that are not related to covered species management may occur by collision with motorized vehicles and by non-motorized activities (e.g., pedestrians stepping on eggs or picking up chicks). Take may also occur if eggs are abandoned because an adult is killed or injured in a collision with a motorized vehicle. Furthermore, take of chicks or eggs could occur if a nest is located outside a seasonal exclosure, where chicks and eggs are at risk of being killed, injured, or crushed by motorized and non-motorized activities, or during brood movement from an upland nesting site to an area closer to the shoreline. Typically, the eggs can be protected by a single-nest exclosure, or the chicks can be protected and directed out of harm's way. However, chicks and eggs could be injured, killed, or crushed if monitors do not find them soon enough. CDPR monitors may, in the future, capture chicks for captive rearing in the HCP area when they are at risk of being killed or injured by covered activities not related to covered species management activities (AMM 22), including new proposed activities. In this HCP, this situation could occur for 12 eggs (i.e., 4

[39] Eleven of these birds were found at the very end of the season in September, after most breeding has concluded and SNPL were found in non-breeding flocks. As a result, they may actually have been wintering birds. In addition, one individual was found at the very beginning of the breeding season on March 1, before breeding had started.

[40] During the winter of 2016–2017 and winter 2017–2018, monitoring was increased to mostly daily monitoring. As a result, more birds may have been found due to more frequent monitoring.

[41] Although the majority of dead or injured adults/juveniles are likely found, not all dead or injured adults/juveniles are assumed to be detected due to SNPL that are scavenged or buried prior to discovery and SNPL cryptic size and coloration. Therefore, this take estimate considers a worst-case scenario where additional dead or injured adults/juveniles may not have been discovered in some years in both the breeding and non-breeding seasons.

nests of 3 eggs) and/or 12 chicks (i.e., 4 broods of 3 chicks) each year during the breeding season (see new AMM 22 in Table 5-2)[42]. Additional take of eggs or chicks could occur if pedestrians step on eggs or chicks that are not protected within the seasonal exclosure or within a single-nest exclosure. However, such incidents have not been documented in the HCP area; therefore, this risk of take is anticipated to be low. Park visitors may also pick up chicks (i.e., "capture chicks"). Although this event is rare, park visitors have picked up chicks and given them to park staff in the HCP area, including in 1994, 1998, and 2014.

Recreation, park operations, and other activities not related to covered species management could also disturb attending adults or broods to the extent that chicks are separated from the attending adult and either abandoned, exposed to predators/inclement weather, or malnourished. This is especially true if adults and chicks leave the safety of the seasonal exclosure and enter an area open to vehicles where chicks could be separated from adults or struck by a vehicle and are at risk of lethal take. In the HCP area, chicks in the seasonal exclosures are carefully monitored, and most instances when they enter the open riding area are documented. Therefore, estimating when chicks are at risk of lethal take is possible based on past observations of these occurrences. Mortality or injury of a chick that enters an area open to vehicles is likely a rare event, however, due to the implementation of AMMs, such as stopping traffic in the area and directing chicks back to the safety of the exclosure.

Chicks are infrequently found dead in the HCP area as a result of motorized or non-motorized activities. However, between 1997 and 2001,[43] four dead chicks were found in the HCP area as a result of park operations, including recreation activities. These occurrences include one chick that was hit by a ranger vehicle in 1997, two chicks that were thought to be killed by a pedestrian in 1998, and one chick that may have been separated from the attending adult and died on the July 4 holiday in 2001. Chick mortality from public recreational activity has not been documented in the HCP area since 2001; however, due to the cryptic nature of the chicks, it is possible that some small number of mortalities have gone undetected.

In addition to mortality, based on previous data collected in the HCP area, chicks have been observed in the open riding area where they are at risk of vehicle strike or being separated from an attending adult. The greatest number of chicks (i.e., 19 chicks) documented leaving the protection of the exclosures and entering the open riding area where they were at risk of lethal take was in 2016, although chicks are known to have entered the open riding area in other years as well. Although these chicks are monitored and successfully directed back to the exclosure, they are at risk of being injured or killed for the period of time they are in the open riding area. In addition, although chicks in the HCP area are monitored closely, some portion of these chicks may enter the open riding undetected. For the purpose of this HCP, it is assumed that two broods (or six chicks) could enter the open riding area and be injured or killed prior to CDPR implementing AMMs. Chicks have also been observed without an attending adult after a prolonged disturbance, leaving them exposed to predation and inclement weather. The highest number of chicks that have been observed unattended by an adult after a prolonged disturbance was in 2016 when six chicks were found abandoned. As part of this HCP, CDPR may also capture chicks that could otherwise be injured or killed from covered activities without CDPR intervention (AMM 22). This HCP anticipates that each year CDPR may need to capture 12 chicks (i.e., four broods of three chicks) that could be injured or killed from covered activities and place them in a captive rearing facility. As a result,

[42] These eggs and chicks would likely not survive if they were not captured for captive rearing.

[43] Monitoring of SNPL was not conducted regularly in the HCP area until 2001. Therefore, data prior to 2001 only include mortalities that were incidentally observed in the HCP area.

this HCP anticipates that take could occur in the form of injury, capture, and/or mortality for a maximum of 28[44] chicks in a year during the breeding season. In addition, because 28 chicks being injured, captured, or killed per year is based on a worst-case scenario and is likely a high estimate of take in most years, this HCP includes a 5-year estimate that assumes only 1 year will result in the maximum take levels and other years will have lower take levels. Therefore, this HCP estimates that no more than 88 chicks over a 5-year period will be subject to take in the form of mortality, injury, capture, or harm during the breeding season.

The potential for incidental take of eggs (i.e., the potential for eggs to be crushed or abandoned) due to park operations, recreation activities, and other activities that are not related to covered species management, was estimated based on the number of nests initiated outside of fenced areas that were at risk of destruction by motorized and/or non-motorized activities (had they not been protected with fencing soon after their discovery) and by the number of nests that were abandoned in areas where adults could have been killed or subject to frequent disturbance by park operations, including recreation activities. The highest level of potential incidental take that occurred under the current conservation program was in 2014 when three nests with three eggs were potentially abandoned due to their close proximity to motorized and/or non-motorized activities, and one nest with three eggs was established in the open riding area.

As part of this HCP, CDPR includes the option to remove eggs that are deemed vulnerable to covered activities, taking them to an available captive rearing facility, to ensure they are not harmed. In these cases, it is anticipated that the eggs could otherwise be harmed without CDPR intervention. This HCP anticipates that CDPR may have to remove 12 eggs (i.e., 4 nests with 3 eggs) that could be harmed by covered activities each breeding season and place them in a captive rearing facility. As a result, it is assumed that the potential for incidental take is a maximum of 27[45] SNPL eggs in some years. In addition, because 27 eggs being crushed or abandoned per year is based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes only 1 or 2 years will result in the maximum take levels, and other years will have lower take levels. In a few other years between 2001 and 2018 between one and six eggs have been abandoned due their close proximity to motorized and/or non-motorized activity or have been found outside the seasonal exclosure resulting in an average of one egg over this period. Therefore, the potential for incidental take due to park operations, recreation, and other non SNPL management-related activities is assumed to be no more than 79 eggs over a 5-year period.

4.3.2.2 Take of SNPL Due to SNPL Management-Related Activities

The HCP's conservation program integrates ongoing management intended to protect and recover SNPL (Chapter 5). Currently, all SNPL management activities are conducted under a USFWS 10(a)(1)(A) permit and CDFW MOU (Appendix C).[46] This management program has been successful at protecting and enhancing SNPL populations, and enhancing reproductive success to levels that allow for population

[44] It is assumed that a portion of dead or injured chicks are not detected due to chicks that are scavenged or buried prior to discovery and SNPL cryptic size and coloration. Therefore, this take estimate considers a worst-case scenario where additional dead or injured chicks may not have been discovered in some years.

[45] Although the majority of crushed or abandoned nests are likely found, it is assumed that not all are detected due to eggs that are scavenged or buried prior to discovery and the cryptic size and coloration of the eggs. Therefore, this take estimate considers a worst-case scenario where additional crushed or abandoned nests may not have been discovered in some years.

[46] This HCP will include the activities to conduct the management activities in the future. Therefore, separate federal permits may not be necessary.

growth (sections 3.3.1.5.1 and 3.3.2.6). Despite careful implementation of AMMs, however, take of SNPL may occur incidental to management-related activities.

Management-related take could occur if SNPL individuals or eggs are injured, killed, captured, or otherwise harmed by management actions designed to protect and recover the species. The majority of management activities that could result in take of SNPL occur during the breeding season, since management efforts are focused on this portion of SNPL life history. Management activities that could result in take are described in section 4.3.1.2, and include, but are not limited to such actions as banding, which requires capturing SNPL chicks (and potentially adults in the future); the use of a single-nest or smaller exclosure, which could result in predators keying in on the exclosures and killing or injuring SNPL; monitors entering the seasonal exclosure or other active nest areas, which could cause the direct loss of eggs or chicks if either is stepped on or disturb attending adults or broods to the extent that chicks are separated from the attending adult and either abandoned, exposed to predators/inclement weather, or malnourished and/or eggs are left vulnerable to inclement weather/predators; handling eggs to float them, which could result in an egg cracking; and use of seasonal exclosure and/or symbolic fencing to protect nesting SNPL from people and/or predators, which could result in an individual colliding with the fence. Management-related actions may take all life stages of SNPL. As a result, this HCP estimates levels of lethal take and/or harm for SNPL eggs, chicks, and adults/juveniles within their breeding habitat as a result of management-related activities. All take estimates also account for the conservation program measures and AMMs since the conservation program is part of an ongoing practice in the HCP area. The following estimates of take are largely based on worst-case past incidences of management-related take in the HCP area. Table 4-1 summarizes the estimates for take of SNPL adults, juveniles, chicks, and eggs.

4.3.2.2.1 Take of Adults and Juveniles

To date, adults/juveniles in the HCP area have not been banded. However, banding of adults/juveniles could occur in the future. The number of adults/juveniles that could be captured during banding over the permit term is unknown at this time, but for reference, the annual mean minimum number of breeding adults in the HCP area from 2002 to 2018 was 142 breeding adults (Table 3-8). Of those individuals, a portion are already banded;[47] therefore, not all adults in the HCP area will need to be captured for banding. As a result, it is estimated that no more than 35 adults would be banded in the HCP area each year.

Adult and/or juvenile SNPL in the HCP area are at times found with a severe injury or illness. As part of the ongoing management program, these individuals are sometimes captured and/or brought to an approved wildlife facility for rehabilitation.[48] This has occurred in ten years from 2005 to 2018. The highest number of adults/juveniles that were captured and/or brought to an approved wildlife facility occurred in 2017 when five adults and/or juveniles were captured due to illness or injury (i.e., three adults/juveniles with leg injuries, one juvenile with a wing injury, and one sick juvenile). All but one of these individuals[49] were removed from the HCP area and brought to an approved wildlife facility. Therefore, this HCP estimates that up to five adults/juveniles in a year may need to be captured and transported to an approved wildlife facility for rehabilitation.

[47] Banded birds included previously banded chicks that have returned and/or SNPL that have immigrated from other locations.
[48] Currently, CDPR conducts salvage and rescue activities in coordination with the USFWS when these activities are required.
[49] One juvenile was found with a large feather attached to the left leg and restricting movement. The bird was captured, and the feather was removed. The bird was released immediately after removing the feather.

Lethal take or harm of adults/juveniles could occur during covered species management-related activities if an individual is 1) killed or injured by a predator in a small single-nest exclosure or mini-exclosure (adult only); 2) killed or injured by collision with the top or sides of an exclosure (adult or juvenile); 3) killed or injured by collision with fencing when flying (adult or juvenile); or 4) killed or injured during banding activities. Injuries could occur during banding activities; however, because a master bander will conduct the banding, an injury due to banding is expected to be an infrequent event. Therefore, it is estimated that no more than two adults/juveniles could be injured during banding activities each year.

Although exclosures help to protect nests from being depredated, the use of small single-nest or mini exclosures may make the nest location more visible and may result in predators spotting nests more easily. In addition, adults and juveniles can become tangled or entrapped in the mesh top of the exclosures and/or run into the symbolic fencing or seasonal exclosure fencing while flying. Between 2002 and 2018, there were 12 instances of adults/juveniles being killed and/or injured due to the possibility of colliding with a fence during the breeding season in the HCP area. Starting in 2015, CDPR began lining the top of the Southern Exclosure fencing with a strip of thicker plastic fencing (orange silt construction fencing) along most of the western and northern fenced areas to make the fencing more visible to CLTE nesting within this portion of the seasonal exclosure; the top lining is presumed to increase visibility to SNPL as well. The highest number of SNPL juveniles and/or adults found injured or dead with wing injuries that were attributed to collision with an exclosure fence was in 2016, when four juveniles and/or adults were found. In addition, between 2002 and 2018, five instances of adults dying at small single-nest or mini exclosures were documented, possibly due to predation. Therefore, based on these past levels of take and the possibility of injury during banding, this HCP anticipates lethal take, capture, and/or harm of a maximum of nine juveniles and/or adults in a year, including those captured for captive rearing. In addition, because nine juveniles and/or adults being injured or killed per year is based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes only 1 or 2 years will result in the maximum take levels and other years will have lower take levels. Therefore, this HCP assumes no more than 17 juveniles and/or adults will be injured, captured, or killed over a 5-year period due to management-related activities, including capture for captive rearing.

4.3.2.2.2 Take of Chicks

As part of the management in the HCP area, CDPR staff and monitors must enter the seasonal exclosure to band SNPL and conduct other management-related activities. CDPR staff attempt to band all hatched chicks within the HCP area each breeding season. Although chicks must be captured for banding, no chicks have been reported as injured or killed during banding activities. The number of chicks that will be captured during banding over the permit term is unknown at this time, but for reference, CDPR has banded between 156 and 423 SNPL chicks each year from 2003 to 2018. As a result, this HCP estimates that up to 500 SNPL chicks could be banded in a year.

CDPR staff salvages and rescues chicks in the HCP area each year and brings them to an approved wildlife facility to be reared in captivity when they are found injured, ill, or abandoned (see AMM 90).[50] At times, CDPR also warms injured or sick chicks in a brooder on-site if the chick is expected to recover quickly and can be reunited with an attending adult. The most chicks that have been captured in a year and brought to captive rearing and/or brooded overnight was in 2017 when eight chicks were captured

[50] Currently, CDPR conducts salvage and rescue activities in coordination with the USFWS when these activities are required.

for this purpose. As a result, this HCP estimates that up to eight chicks could be captured in a year and brought to an approved wildlife facility and/or brooded on-site. These ongoing salvage and rescue actions, and the associated take, are part of the HCP area's existing level of take and separate from AMM 22. When continuing to implement salvage and rescue of eggs and chicks (AMM 90), CDPR staff are not subject to the take limits included with AMM 22.

Chicks have not been documented as being injured or killed during management-related activities. However, entering the seasonal exclosure on foot to monitor nests or for banding activities could disturb adults and their broods, which could cause chicks to be separated from attending adults. In addition, although unlikely, monitors in vehicles can disturb chicks, which could cause chicks to become separated from adults and/or strike chicks along the shoreline. Chicks that are separated from attending adults are more vulnerable to starvation, depredation, and inclement weather. Chicks have been documented being separated from adults during management activities in the HCP area in the past. In the HCP area chicks will often return to the attending adult, or some of these chicks have been rescued and either reunited with the attending adult or brought to a captive rearing facility. However, if the chicks are not located soon after the disturbance, they could possibly be injured or killed.

Chicks can also be killed or injured by a predator in a small single-nest exclosure or mini exclosure if the exclosure makes the nest more visible to the predator. Chicks are thought to have been killed by a predator in association with a small single-nest/mini exclosure[51] in the HCP area in 2005, when three chicks were killed at North Oso Flaco, and in 2016 when three chicks associated with a mini-exclosure were killed by a loggerhead shrike in South Oso Flaco.

Although chicks have not been documented as injured or killed during management-related activities in the seasonal exclosure, it is possible a brood of three chicks could be separated from adults or orphaned during management-related activities and perish due to starvation or exposure to predators and/or inclement weather. It is also possible, that a brood of three chicks could be injured or killed in association with a small single-nest/mini exclosure if the exclosure makes the nest/chicks more visible to a predator. As a result, it is possible that management-related lethal take or harm of a maximum of 11 chicks in a year, including those captured for captive rearing, or up to 26 chicks over a 5-year period, could occur in the HCP area.

4.3.2.2.3 Take of Eggs

As part of the management program, SNPL eggs that have been abandoned are sometimes moved to another nest with non-viable eggs or brought to an approved wildlife facility to be captive reared (AMM 90).[52] These eggs have typically been abandoned due to adult mortality (e.g., predation), being buried in sand during high winds, being overwashed by high tide, or other unknown reasons. The highest number of abandoned nests that were transferred to another nest and/or brought to an approved wildlife facility was in 2014 when 9 nests or 26 eggs were removed from the HCP area and brought to an approved facility for captive rearing. As a result, this HCP estimates that up to 26 eggs in a year could be removed from a nest and transferred to another nest or brought to an approved wildlife facility for captive rearing.

Loss of eggs can occur at a small single-nest or mini exclosure if those exclosures make it easier for predators to spot nests. Eggs can also be cracked or broken during handling to float them as part of the

[51] The predation event was not observed, and it cannot be confirmed that the predator keyed in on the exclosure.
[52] Currently, CDPR conducts salvage and rescue activities in coordination with the USFWS when these activities are required.

management program, although this has only been documented as occurring once, in 2017, when one egg was damaged while handling it for floating purposes. In addition, death, injury, and/or prolonged/frequent disturbance of nesting adults caused by management actions can lead to nest abandonment and, therefore, results in loss of eggs. Mortality/injury of adults may occur during management-related activities if an adult is 1) killed or injured by a predator keying in on a small single-nest exclosure or mini exclosure; 2) killed or injured by collision with the top or sides of an exclosure; or 3) killed or injured by collision with fencing when flying. Prolonged or frequent disturbance of adults can occur during management-related activities when monitors enter an active nest area and/or install a single-nest exclosure.

Determining the number of nests that fail due to adult mortality and/or abandonment is difficult. Each year, there are a number of nests where monitors suspect failure due to adult mortality and/or abandonment; however, the cause of mortality and/or abandonment is often not determined. In most years between 2001 and 2018, anywhere from 3 to 15 eggs were lost each year, and it was thought that these losses could be due to predation or an adult abandoning a nest at a small single-nest exclosure or mini exclosure, including during installation. The highest number of eggs thought to be lost in a small single-nest/mini exclosure occurred in 2008, when 18 eggs were depredated and/or abandoned at a single-nest exclosure. At least three of these occurrences were within the same area in South Oso Flaco. As a result, it is assumed that a maximum of 41 eggs could be taken in a year, including those captured for captive rearing. In addition, because 41 eggs being crushed, abandoned, or captured each year is based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes one year will result in the maximum take levels and other years will have lower take levels. Therefore, up to 80 eggs[53] could be lost over a 5-year period due to natural resources management-related activities. This estimate is also intended to account for incidental take that may not have been detected due to the cryptic nature of the eggs.

Table 4-1. Summary of Estimated SNPL Take

Nature of Take[1]	Annual Take[2] of Individuals	5-year Running Take[2] of Individuals
Park operations, recreation activities, and other non-covered species-management activities[3]	12 adults and/or juveniles; 28 chicks;[3,4] 27 eggs[3]	45 adults and/or juveniles; 88 chicks; 79 eggs
Covered species management-related activities[5]	9 adults and/or juveniles; 11 chicks; 41 eggs	17 adults and/or juveniles; 26 chicks; 80 eggs
Banding activities (capture only)	Up to 35 adults/juveniles each year Up to 500 chicks[6]	N/A

Notes:

[1]Take estimates include mortality and/or injury/harm unless otherwise noted.

[53] This estimate assumes that 3 nests (or 9 eggs) are taken in most years (i.e., 4 of the years), but up to 18 eggs could be taken in 1 year. This also accounts for 26 eggs captured each year for captive rearing and for eggs that may not be detected due to the cryptic nature of the eggs.

[2]Take numbers presented in this HCP are based on worst-case past observations of mortality and injury that have rarely been observed during the timeframe from 2002 to 2018 and do not happen every year. The numbers do recognize that not every egg or individual SNPL may be detected. The 5-year running average is intended to account for years in which a higher amount of take may occur and will not trigger an amendment to the HCP.

[3]Take estimate includes salvage and rescue of SNPL eggs and chicks if they are observed to be threatened by park operations, recreation activity, and other non-covered species management activities. In this case, 12 eggs and 12 chicks each year may be captured for captive rearing if they are determined to be threatened by covered activities not related to covered species management, including new proposed activities. These are included in the total lethal take number since the eggs and chicks would likely not survive if they were not captured for captive rearing and since eggs and chicks taken for captive rearing may, ultimately, not be reintroduced back into the population.

[4]Take estimate is based on chicks that have been observed in the open riding area and subject to potential harm by motorized and non-motorized recreation and at risk of vehicle strike. With the implementation of AMMs, such as escorting chicks back to the seasonal exclosure, the risk of lethal take and/or harm is low.

[5]Take estimate includes salvage and rescue of SNPL adults/juveniles, eggs, and chicks if they are observed to be injured, abandoned, or sick as part of the ongoing natural resources management program. Although this form of take is considered capture only, the SNPL captured are generally removed from the population in the HCP area.

[6]CDPR staff attempt to band all SNPL chicks in the HCP area. From 2003 to 2018, between 156 and 423 chicks were banded each breeding season. This estimate is intended to include any increase in future reproductive success in the HCP area.

4.3.3 Anticipated Impacts of the SNPL Taking

This section describes the overall impacts of the anticipated take of SNPL within the HCP area and discusses the overall impacts from covered activities on the entire Pacific Coast SNPL population. The assessment of impacts takes into account the implementation of conservation and AMMs, where appropriate, which are described in greater detail in Chapter 5.

As stated previously, SNPL in the HCP area are anticipated to be predominantly affected by motorized activities, and SNPL are expected to be largely precluded from successfully breeding in the HCP area where motorized activities occur (Map 23), although much of the open riding area is within tertiary habitat where SNPL rarely if ever nest. Motorized activities affect SNPL by disturbing nesting, roosting, and foraging birds (section 4.3.1.1.1). Within primary, and to some extent secondary, habitat where motorized activities occur in the HCP area, SNPL are expected to have reduced nesting attempts. Motorized activities also reduce prey availability (i.e., reducing habitat quality by altering or reducing wrack, which provides essential habitat for talitrids); reduce habitat quality (e.g., removing/destroying objects such as kelp and driftwood associated with nesting); reduce microtopographic complexity, which provides cover from predators and inclement weather; and prevent establishment of foredune vegetation, which provide microhabitat features that can support nesting and roosting.

Non-motorized activities could also affect SNPL, including in areas where motorized recreation does not occur (e.g., Oso Flaco). SNPL will likely be precluded from successfully breeding in the HCP area where non-motorized activities occur (Map 23), depending on the type and intensity of non-motorized use. Intensive use of beaches by people outside of the HCP area, especially those in Los Angeles and Orange Counties, have rendered beaches with historical evidence of SNPL nesting unsuitable for nesting SNPL (Page and Stenzel 1981). The effects of non-motorized recreation can be greater during the breeding season when park visitation rates are high. The effects from non-motorized activities include disturbing nesting, roosting, and foraging birds (sections 4.3.1.1.2 through 4.3.1.1.9), making it less likely that SNPL will nest in areas where non-motorized activities are present. In addition, park visitors in the HCP area have been observed picking up SNPL chicks (i.e., capturing chicks) and separating them from their attending adult.

Special projects include activities required to meet a facility need, such as installing vault toilets (section 4.3.1.5.7). Special projects could directly affect up to 35 acres within the HCP area over the permit term. Although special projects will not be implemented within the area protected by the seasonal exclosure,

these projects could occur within SNPL breeding habitat and preclude SNPL from nesting if they are located within these areas.

The conservation program activities proposed for coverage under this HCP have been occurring in the HCP area for various periods of time prior to HCP preparation. For example, the current configuration of the seasonal exclosure has been used in the HCP area since 2004. In addition, some recreation activities (e.g., motorized and pedestrian activities) have been occurring in the HCP for over a century (section 4.9.1). This historic, intensive use of the beaches and dunes in the HCP area likely resulted in low numbers of SNPL nesting in the HCP area long before the implementation of this HCP (Page and Stenzel 1981). Data obtained from the early estimates in the HCP area indicate that there were likely low numbers of SNPL in the HCP area in the decades prior to acquisition of the initial Oceano Dunes SVRA lands in 1974. Page and Stenzel (1981) found three pairs of adult SNPL (i.e., six total adults) in the northern section of the Nipomo Dunes (extending from north of the Santa Maria River mouth to Pismo Beach) during surveys in 1978. No SNPL were found at Pismo Beach during this survey. Page and Stenzel concluded that SNPL habitat at Pismo Beach was unsuitable due to historic human activity or development. The only previously reported records of SNPL in the section of the coast from Pismo Beach south through the Nipomo Dunes area were two SNPL nests at Pismo Beach in 1965 (Page and Stenzel 1981). As a result, the implementation of the conservation program at Oceano Dunes SVRA has likely increased SNPL numbers in the HCP area prior to the implementation of this HCP.

Since implementation, the conservation program has also successfully protected SNPL habitat in the HCP area and offset the effects of the covered activities to date. The conservation program is part of an ongoing program that has been particularly successful at protecting the breeding population of SNPL. This is demonstrated by looking at whether the HCP conservation program goals and objectives have been achieved, including SNPL Objective 1.1 to increase the size of the SNPL population breeding in the HCP area to meet or exceed 155 breeding SNPL, averaged over a moving 3-year window and SNPL Objective 1.2 to maintain a 3-year moving average of at least 1.0 fledgling per male (section 5.2.1). Objective 1.1 has been met in the HCP area since 2012 when the 3-year breeding population size was 162. In addition, over the 5-year period from 2014 to 2018, the SNPL breeding population in the HCP area has averaged 205 breeding adult SNPL per year (range of 183–226), thus exceeding SNPL Objective 1.1 and the management potential recommended by the Recovery Plan for the HCP area portion of the Pismo Beach/Nipomo Dunes (Unit CA-83) management area (section 5.2.1). Objective 1.2 has been met in the HCP area since 2008, when the 3-year SNPL reproduction rate was 1.01 fledgling per male. In addition, during the 5-year time period from 2014 through 2018, the ongoing conservation program has achieved a SNPL reproduction rate of 1.82 fledged per breeding male, which also exceeds SNPL Objective 1.2 and the Recovery Plan goal of 1.0 fledged young per breeding male for population stability and greater than or equal to 1.2 young per breeding male for population growth (USFWS 2007a). As a result, the continued implementation of the conservation program through this HCP is anticipated to provide a net benefit to SNPL and fully offset any impacts from covered activities by achieving the conservation program and Recovery Plan goals to meet or exceed 155 breeding SNPL averaged over a moving 3-year window and to maintain a 3-year moving average of at least 1.0 fledgling per male SNPL. By continuing to meet or exceed these goals, the HCP area is anticipated to continue to contribute to overall population growth for the Pacific Coast population of SNPL.

4.4 California Least Tern

Effects on CLTE and potential CLTE habitat in the HCP area are described in the following sections. Table 4-2 in section 4.4.2 summarizes the potential effects and potential take of CLTE from covered activities. AMMs that address the effects are provided in section 5.3.1.2. Activities occurring in tertiary habitat for

CLTE (Map 11) are not anticipated to affect the species unless specifically discussed in the following sections.

4.4.1 Direct and Indirect Effects of Covered Activities on California Least Tern

Avoidance and minimization of take of listed species will continue to be the primary goal of CDPR. Still, effects of covered activities on CLTE are possible and are discussed below. The OHMVR Division dedicates a significant portion of its staff and other resources to implementing the SNPL and CLTE management program during the breeding season. This program has been modified over the years based on CDFW and USFWS comments to avoid impacts to CLTE from covered activities, including activities implemented to foster the recovery of the species associated with the SNPL and CLTE management program. As a result, the effects on CLTE from covered activities that could occur during the breeding season are reduced substantially.

Although CLTE and SNPL share similar breeding habitat, effects are not expected to be the same due to life history and behavior differences. Some key differences include, but are not limited to, the following:

- CLTE do not occur in the HCP area outside of the breeding season.
- CLTE forage over water and not on land.
- CLTE do not forage at night.
- CLTE are not known to nest in North or South Oso Flaco shorelines and rarely nest outside the protection of the seasonal exclosure.
- CLTE gather after dusk and form a night roost.
- Chicks at later developmental stages are not constantly attended/brooded by adults.
- Sustained incubation begins after the first egg is laid.

Covered activities occur within all 4,593 acres of CLTE suitable habitat. This includes 727 acres of primary habitat, 276 acres of secondary habitat, 3,510 acres of tertiary habitat, and 80 acres of aquatic habitat (section 3.3.2.7). See Map 24 for the location of covered activities in relation to CLTE. As described in section 3.3.2.7, CLTE nests are typically found within the 6, 7, and 8 Exclosures. CLTE nests have also been found previously in the Boneyard Exclosure. The CLTE night roost has been located in both the 6 Exclosure and 7 Exclosure. CLTE nests are rarely found outside the Southern Exclosure. However, some nests have infrequently been found outside the Southern Exclosure (e.g., a nest near Arroyo Grande Creek in 2005), and suitable breeding habitat for CLTE is present outside the exclosure. As a result, given similarities in terrestrial habitat preferences, this HCP describes potentially suitable CLTE habitat by using the categories primary, secondary, and tertiary habitat that were defined in section 4.3.1 for SNPL. A summary of the number of CLTE nests in each habitat category follows:

- Between 2005 and 2018, 639 CLTE nests were discovered in primary habitat (Map 11).
- Between 2005 and 2017, 2 CLTE nests were discovered in secondary habitat (Map 11).
- Between 2005 and 2017, no CLTE nests were observed in tertiary habitat (Map 11).

Covered activities have different intensities of effects depending on the type of habitat (i.e., primary, secondary, and tertiary) affected and the type of activity (e.g., motorized, non-motorized, management-related) occurring in the habitat. For example, effects on CLTE in tertiary habitat are not likely because this habitat is generally low quality and CLTE do not use this habitat for nesting, foraging, and/or roosting (section 3.3.2.7). In addition, effects on CLTE within primary or secondary habitat in areas

where motorized recreation is not permitted are lower than in areas where motorized recreation is allowed because interaction/collision with recreational vehicles does not occur.

Motorized and non-motorized recreation are the predominant covered activities that can affect CLTE, as well as their habitat. Motorized recreation has the greatest potential for effects on CLTE (section 4.4.1.1.1). Motorized recreation occurs in 1,370 acres of CLTE habitat (i.e., approximately 412 acres within primary, 181 acres in secondary, and 777 acres within tertiary habitat). Non-motorized recreation can also affect CLTE, especially in areas where motorized recreation is not permitted. Non-motorized recreation occurs within almost 2,500 acres of CLTE habitat where motorized recreation is not permitted (i.e., approximately 315 acres within primary, 95 acres within secondary, and 2,075 acres within tertiary habitat). Non-motorized recreation also occurs within the entire area open to motorized recreation. The effects of non-motorized recreation on CLTE depend on the intensity and type of use (e.g., numbers of park visitors to a given area), type of activity (e.g., dog walking, horseback riding, picnicking), and the type of habitat (i.e., primary, secondary, tertiary) affected.

The following sections describe the mechanisms by which covered activities could affect CLTE. Effects will be avoided and minimized, to the extent feasible, through implementation of AMMs. Therefore, not all effects are expected to rise to the level of take, as defined by FESA.[54] AMMs proposed to reduce the effects are briefly mentioned here and are described in greater detail in Table 5-3. Despite the implementation of AMMs, some take of CLTE adults, juveniles, chicks, and eggs will still occur due to covered activities. Expected take levels are described in greater detail in section 4.4.2 and Table 4-2.

4.4.1.1 Park Visitor Activities

4.4.1.1.1 Motorized Recreation (CA-1)

CLTE are not present during the non-breeding season (October 1 through February 28), and therefore, are not affected by activities during that time. In addition, vehicles driving within tertiary habitat are not expected to encounter breeding, foraging, or roosting CLTE. Therefore, activities in tertiary habitat do not affect CLTE since CLTE are not found in these locations.

Vehicle Strike. Within the HCP area, almost all CLTE nest within the Southern Exclosure (Map 13), a portion of the open riding area that is fenced within predator fencing and closed to entry during the breeding season (March 1 through September 30). CLTE adult, eggs, and chicks within the exclosure are protected from motorized recreation activities because motorized activities are not permitted in these areas; therefore, direct impacts (e.g., eggs being crushed, chicks and/or adults being struck) from motorized recreation to CLTE adults, nests, and eggs within the fenced areas are avoided.

Within the HCP area, CLTE nests have rarely been found outside the fenced areas. For example, the last nest found outside the fenced area in a region open to recreation was in 2005 near the mouth of Arroyo Grande Creek. Although CLTE almost exclusively nest within the Southern Exclosure, CLTE could nest outside the exclosure in areas open to vehicular recreation in the future. If a CLTE establishes a nest outside the seasonal exclosure in an area open to vehicles, the cryptic nature of CLTE nests and chicks makes it conceivable that a vehicle could crush eggs or chicks in an active CLTE nest that has not yet been identified by monitors. In addition, any incubating adult at the nest could be vulnerable to vehicle strike, although adults typically respond to disturbance by flying from the nest rather than sitting on the nest where they would be more vulnerable to vehicle strike.

[54] An NCCP will be prepared separately to provide CDFW coverage for incidental take of CLTE.

To reduce the possibility of a vehicle striking an individual or crushing a CLTE nest outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the seasonal exclosure. In addition to searching for tracks, scrapes, or paired CLTE, monitors also note CLTE behavior that may be consistent with tending a nest or chick, such as CLTE dropping down to the ground outside an exclosure. Any nests found outside the seasonal exclosure will be quickly protected by a single-nest exclosure, thus reducing the likelihood of vehicle strike. Furthermore, if a CLTE chick is observed traveling outside a single-nest exclosure, the exclosure will be increased in size up to 600 feet in radius and silt fencing will be used around the exclosure fence to ensure that vehicles do not crush eggs or strike chicks.

Based on the results presented in the SNPL and CLTE Annual Breeding Season Reports (Appendix F), since these AMMs began to be implemented as part of the SNPL and CLTE management program, the AMMs have been successful at protecting CLTE nests from motorized recreation (e.g., few adults, juveniles, chicks, and eggs have been found killed or injured/crushed by a vehicles) and increasing reproductive success. As a result, direct impacts to nesting CLTE outside the seasonal exclosure due to motorized recreation will continue to be minimized. Although unlikely, some CLTE eggs, chicks, and adults/juveniles could still be struck by vehicles if they go undetected.

Unlike SNPL, CLTE forage by flying over water and thus are not found foraging in areas where motorized recreation occurs. As a result, CLTE are not affected by motorized recreation when foraging.

CLTE traverse and can roost in the open riding area, which is not fenced and is open to vehicles. In addition, adults have been observed feeding fledglings in the open riding area. Vehicles driving through these areas could strike individual adults, juveniles, or chicks that are walking or roosting in this area. Chicks and juveniles are most vulnerable to vehicle strike since chicks cannot fly out of harm's way and juveniles are inexperienced flyers and may not fly out of harm's way fast enough. In addition, vehicle disturbance can separate chicks from an attending adult and chicks can be left vulnerable to predation.

CDPR will continue to implement the SNPL and CLTE management program, which reduces the risk of vehicles striking a roosting CLTE in areas open to vehicles. Daily monitoring of CLTE adults, juveniles, and chicks will continue to be conducted during the breeding season. If chicks are observed to be in harm's way (e.g., in the open riding area), vehicle traffic flow will be diverted or regulated to allow the safe movement of the chicks out of the area. Finally, if CLTE chicks are observed traveling outside of a single-nest exclosure into the open riding area, CDPR will increase the exclosure in size up to 600 feet in radius and silt fencing will be used to reduce CLTE travel outside the exclosed area, as necessary. Few adults, juveniles, and chicks have been documented as injured or killed in the HCP area due to vehicle strike. As a result, AMMs will continue to minimize the risk of a vehicle striking a CLTE in the open riding area. Although unlikely, some vehicle strike could still occur.

In recent years, CLTE have selected an area within the 6 Exclosure for a night roost. Should CLTE change the location of their night roost to an area outside of a seasonal closure that is accessible to vehicles, then vehicles can strike or disrupt night-roosting CLTE. To reduce the risk of vehicle strike, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Environmental Scientists will continue to closely monitor the CLTE night roost and will be able to identify most changes in roosting behavior. Over the past 10 years, the night roost has been located within the seasonal exclosure. If the location of the night roost changes, CDPR has a protocol in place to protect the CLTE in the night roost from disturbance by motorized activities, including, but not limited to, closing off the area with fencing as soon as possible and implementing an appropriate no-disturbance buffer of 330 feet around the night roost. Thus, impacts to CLTE in the night roost resulting from vehicle activity will continue to be minimal.

Nesting Disturbance. Nesting CLTE near the fenceline or outside the Southern Exclosure can be disturbed by nearby motorized recreation. Mortality, injury, and chronic disturbance of breeding adults from motorized activities can also indirectly affect chicks or eggs. Chicks or eggs can be abandoned, left unattended for prolonged periods of time, or exposed to predation. In addition, eggs can be buried by sand or not properly incubated. These effects are exacerbated if human disturbance coincides with periods of high wind or extreme temperature. Breeding colonial waterbirds, such as CLTE, are particularly susceptible to human disturbance from motorized and non-motorized recreation activities (Erwin 1989, Rodgers and Smith 1995). Human disturbance can increase both egg and chick mortality.

In previous studies, colonies of nesting colonial CLTE were observed to determine distances at which birds flushed in response to human disturbance. Erwin (1989) recommended a buffer distance of 328 feet (100 meters) for least terns in Virginia. Rodgers and Smith (1995) recommended a buffer distance of 505 feet (154 meters) in Florida. In a letter sent to CDPR on March 2, 2016, CDFW recommended a minimum 330-foot (approximately 100 meter) buffer to avoid take of CLTE (CDFW 2016a). As a result, a buffer of 330 feet is currently being used to protect CLTE nests in the HCP area. Based on observations from daily monitoring in the HCP area associated with the ongoing SNPL and CLTE management program, the 330-foot buffer has minimized disturbance to nesting CLTE from motorized recreation. As a result, disturbance to nesting CLTE associated with motorized recreation will continue to be minimal.

Increased Predators. Recreationists increase the presence of trash, most of which is disposed of properly in dumpsters. However, any trash that is accessible to predatory species may artificially increase the number of individual predators in CLTE habitat and thus increase predation on CLTE. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes requiring visitors to deposit all trash in dumpsters/receptacles and providing trash bags to all campers and CDPR staff. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing CLTE adults, chicks, or eggs. As a result, this effect is reduced. However, generalist predators that forage on refuse continue to be present in the HCP area and are often suspected of preying on CLTE eggs, chicks, adults, and juveniles.

Reduced Habitat. Motorized recreation in the non-breeding season can alter dune vegetation and topography necessary for breeding. Specifically, motorized recreation can reduce vegetation, organic surface materials (e.g., driftwood and wrack), and microtopography (e.g., hummocks) required for CLTE breeding and/or roosting. Altering these habitat features can increase CLTE exposure to predators or inclement weather during the breeding season. The ongoing SNPL and CLTE management program mitigates for these non-breeding season effects by placing natural materials such as driftwood and wrack in the seasonal exclosure to ensure cover from predators is available in the protected areas; seeding and planting foredune species, if needed, to ensure areas outside the seasonal exclosures continue to provide cover from predators and inclement weather; and installing CLTE chick shelters (as available and needed) to provide cover from predators and inclement weather. Therefore, the effects on CLTE from non-breeding season habitat alteration will be minimal.

4.4.1.1.2 Camping (CA-2)

The designated campgrounds (i.e., North Beach Campground and Oceano Campground) in the HCP area are not located within suitable CLTE breeding, foraging, or roosting habitat. Therefore, activities in these areas do not affect CLTE.

Vehicle Strike. Camping vehicles driving through tertiary habitat do not affect CLTE since CLTE are not known to utilize tertiary habitat for nesting and/or roosting. Camping vehicles driving within primary and/or secondary CLTE breeding and/or roosting habitat can cause similar effects on CLTE in the same

overall area as those described for motorized recreation (section 4.4.1.1.1). As a result, the discussion of motorized recreation effects applies to camping vehicles as well.

Nesting Disturbance. Camping activities outside the designated campgrounds within tertiary habitat in the open riding area south of Post 2 do not affect CLTE since CLTE are not known to nest, forage, or roost in these areas.

Beach fires and other prolonged activities associated with camping outside the designated campgrounds within primary and/or secondary habitat in the open riding area south of Post 2 can disturb any nearby nesting CLTE, causing the eggs and/or chicks to be left unattended for long periods and potentially exposing them to predators and/or extreme temperatures. However, camping outside the designated campground areas within primary and secondary habitat occurs in areas where CLTE do not typically nest (i.e., outside the seasonal exclosure). To further minimize impacts of camping activities outside the designated campgrounds, CDPR will continue to implement the SNPL and CLTE management program. Specifically, CDPR will continue to establish and maintain a 330-foot avoidance buffer around CLTE nests within the HCP area. In addition, CDPR staff will continue to hand out educational materials on CLTE to visitors in the HCP area to prevent visitors from disturbing CLTE nests and chicks.

Increased Predators. Campers typically generate more trash than day users, which can artificially increase the number of predators in areas being used by CLTE and thus increase predation on CLTE. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes providing all campers with plastic garbage bags to ensure trash is removed from the camp area. CDPR staff will also continue to pick up trash in the HCP area on a regular basis. In addition, CDPR implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing CLTE adults, chicks, or eggs. As a result, this effect is reduced. However, generalist predators that forage on refuse continue to be present in the HCP area and are often suspected of preying on CLTE eggs, chicks, adults, and juveniles.

Reduced Habitat. Collecting driftwood or other naturally occurring materials can reduce the quality of cover used by chicks and adults as shelter from inclement weather or predators. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes placing woodchips, large woody material, beach wrack, and native plants (as necessary) in the seasonal exclosures to serve as natural shelter. The placement of woodchips, large woody material, beach wrack, and native plants in the seasonal exclosure has been successful at providing natural shelter for CLTE in the exclosure in the past. As a result, this effect is considered to be minimal.

4.4.1.1.3 Pedestrian Activities (CA-3)

Nesting Impacts. CLTE are not present during the non-breeding season (October 1 through February 28) and therefore, are not affected by activities during that time. The majority of CLTE nest within the Southern Exclosure (Map 11), a portion of the open riding area that is fenced with predator fencing and closed to entry during the breeding season (March 1 through September 30). CLTE adults, eggs, and chicks within the exclosure are protected from pedestrian activities because pedestrians are not permitted in these areas; therefore, direct impacts (e.g., eggs being crushed) from pedestrian activities to CLTE adults, eggs, and chicks within the exclosure are avoided.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE can nest outside the exclosure in areas open to pedestrians. Within the HCP area, CLTE nests have rarely been found outside the fenced areas. However, if a CLTE establishes a nest outside the seasonal exclosure in an area open to pedestrians, the cryptic nature of CLTE nests and chicks makes it conceivable that a pedestrian could crush eggs or chicks in an active CLTE nest that has not yet identified by monitors. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore,

monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the seasonal exclosure. Monitoring will also continue to be increased during periods of high visitation, including on weekends and holidays, to reduce the risks associated with increased recreation. In addition, any nests found outside the seasonal exclosure are quickly protected by a single-nest exclosure. As a result, the effects of pedestrian activity on nesting CLTE are considered to be minimal.

CLTE nesting near the fenceline or outside the seasonal exclosure can be disturbed by nearby pedestrian activities. Chronic disturbance of breeding adults resulting from pedestrian activities near the seasonal exclosure can also indirectly affect chicks or eggs. Chicks or eggs can be abandoned, left unattended for prolonged periods of time, and/or exposed to predation. In addition, eggs can be buried by sand or not properly incubated. These effects are exacerbated if human disturbance coincides with periods of high wind or extreme temperature. Breeding colonial waterbirds, such as CLTE, are particularly susceptible to human disturbance from motorized and non-motorized recreation activities (Erwin 1989, Rodgers and Smith 1995). Human disturbance can increase both egg and chick mortality. To reduce human disturbance to nesting CLTE, CDPR implements a minimum 330-foot buffer to protect CLTE nests in the HCP area (CDFW 2016b). Based on observations from daily monitoring in the HCP area associated with the ongoing SNPL and CLTE management program, the 330-foot buffer has minimized disturbance to nesting CLTE from recreation. As a result, disturbance to nesting CLTE associated with pedestrians will continue to be minimal.

Stationary activities, such as picnicking and sunbathing, can displace CLTE for long periods. When adults defend a nest against an intruder, eggs and/or chicks are left unattended and exposed to inclement weather, heat stress, and/or predation. In addition, foraging birds can spend their time avoiding disturbance and become energetically stressed. Within the HCP area, the ongoing SNPL and CLTE management program includes implementing the 330-foot avoidance buffer to ensure stationary pedestrian activities do not encroach on CLTE nests. In addition, if CLTE are observed being disturbed during roosting or foraging, monitors ask visitors to relocate farther away from the birds, as needed. As a result, the effects of human disturbance from stationary activities on nesting and/or foraging CLTE is considered to be minimal.

If a CLTE chick enter an area open to pedestrians, a well-meaning visitor may attempt to “rescue” the chick by picking it up and moving it to another location or bringing it to park staff. This has been documented in the HCP area in 2010 when a park visitor picked up an injured fledgling CLTE in the open riding area and gave it to park staff. To reduce the potential for this situation to occur, CDPR will continue to implement the SNPL and CLTE management program, which includes handing out educational materials on CLTE to visitors in the HCP area to prevent visitors from disturbing CLTE nests and chicks. Captive care/rehabilitation is not currently an option for CLTE. Therefore, CDPR would continue to determine the best approach to address this situation in consultation with the Wildlife Agencies, including the option to reunite/place the chick in another nest in the exclosure, if appropriate. Based on the results presented in SNPL and CLTE Annual Breeding Season Reports (Appendix F) since the SNPL and CLTE management program was initiated, the program has been successful at preventing this situation, and a visitor picking up a chick is a very rare event.

Foraging and/or Roosting Disturbance. Pedestrians moving through aquatic habitat areas occupied by foraging CLTE (e.g., Oso Flaco Lake) can disturb CLTE foraging and/or roosting in these areas. In addition, the footbridge hand railing at Oso Flaco Lake is used by CLTE for perching after chicks have fledged and adult birds are teaching fledglings to fish in the lake. Pedestrians at the lake can disturb CLTE adults and fledglings and deter them from foraging in the area. Fledglings learning to fish can become energetically stressed if they are unable to forage normally. To ensure CLTE are not disturbed during foraging activities, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, CDPR staff will continue to provide visitors with information on CLTE presence and activity at

Oso Flaco Lake, as well as guidelines to avoid disturbing CLTE in the area. In addition, CDPR monitors will continue to retain the option to close the boardwalk access to Oso Flaco Lake or temporarily prohibit certain types of public use on the boardwalk if, in the opinion of monitors, visitor activity is disrupting CLTE foraging behavior. As a result, effects on foraging CLTE are considered minimal.

Increased Predators. As with all visitors, pedestrians increase the presence of trash, which can artificially increase the number of predators in CLTE habitat and thus increase predation on CLTE. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes requiring visitors to deposit all trash in dumpsters/receptacles and providing trash bags to all campers and CDPR staff. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches. CDPR also implements a predator management program to control avian and/or mammalian predators that are observed targeting or disturbing CLTE adults, chicks, or eggs. As a result, the effects are reduced. However, generalist predators that forage on refuse continue to be present in the HCP area and are often suspected of preying on SNPL eggs, chicks, adults, and juveniles.

4.4.1.1.4 Bicycling and Golfing (CA-4)

Golfing activities do not affect CLTE since the golf course is not located within or near CLTE breeding, foraging, or roosting habitat.

Few (if any) studies have been conducted that document the effects of bicycles on shorebird species. McLeod et al. (2013) observed waterbirds to have shorter flight initiation distances to cars compared with bicycles, though the number of observations were too few to draw any conclusions. Bicycle riding likely results in a different response than to motor vehicles because bicyclists are more visible to shorebirds. Bicycles also typically travel at slower speeds than motor vehicles and thus can disturb birds for longer periods of time. McLeod et al. (2013) also found that pedestrians (singly or in a group) often evoked longer flight initiation distances in 39 species of waterbirds than bicycle riders. Therefore, the discussion above regarding pedestrian effects (section 4.4.1.1.3) on CLTE is likely relevant to bicycle riding, but the effects from bicycle riding may be less intense. In addition, bicycles are not allowed in the Oso Flaco Lake area and bike riding within habitat occupied by CLTE is infrequent. With the implementation of the ongoing SNPL and CLTE management program AMMs discussed for pedestrian activities above (section 4.4.1.1.3), effects from bicycle riding on CLTE have been minimal and will continue to be minimal.

4.4.1.1.5 Fishing (CA-5)

Nesting Impacts. The effects of fishing on CLTE are similar to the discussion above regarding pedestrian effects (section 4.3.1.1.3); however, the effects are limited to the ocean shoreline and lakes (e.g., Oso Flaco Lake) where CLTE are more likely to be foraging and/or roosting.

Almost all CLTE nest within the Southern Exclosure where fishing is not allowed; therefore, effects on nesting CLTE from fishing are rare (if any) since the shoreline is also closed to the public, including for fishing, in the Southern Exclosure area south through North Oso Flaco. Visitors can fish along the shoreline in South Oso Flaco, but since CLTE have not been observed nesting in the South Oso Flaco area from 2005 to 2018, fishing in that area does not currently affect CLTE. If CLTE were to nest in South Oso Flaco, they could be affected if fishing activities remained near CLTE nests for extended periods of time. Fishing can disrupt incubation, thereby increasing the exposure of chicks and/or eggs to extreme temperatures or predation. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat to ensure that any nests outside the exclosure are quickly protected with a single-nest exclosure and that a 330-foot buffer is implemented around the nest. If fishing activity is observed disturbing CLTE, visitors will be asked to relocate farther away from nests,

and fencing will be adjusted, as needed. As a result, direct impacts to CLTE nests outside the seasonal exclosure resulting from fishing activities is considered to be minimal.

Foraging Impacts. People fishing generally occupy habitat longer than pedestrians who are just passing through. As a result, foraging and/or roosting CLTE may avoid areas near fishing activities and are less at risk of disturbance. If fishing activities do remain near foraging and/or roosting CLTE for extended periods of time, they can disrupt foraging for long periods of time, thereby disrupting normal foraging behavior and potentially causing adults and/or chicks to become energetically stressed. To reduce impacts to foraging CLTE, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, if fishing activity is observed disturbing CLTE, visitors will be asked to relocate, as needed. Monitors will also continue to retain the option to close access to Oso Flaco Lake, as needed, to ensure foraging and/or roosting birds are not disturbed. As a result, effects of fishing activities on CLTE foraging and/or roosting birds is considered to be minimal.

Increased Predators and Entanglement. Discarded fishing line or hooks can entangle or pierce CLTE adults, juveniles, and chicks, including at Oso Flaco Lake. In addition to trash, discarded fishing bait may further attract predators to areas where CLTE are known to forage, roost, and/or nest and thus increase predation on CLTE. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program, which includes encouraging and educating anglers about proper disposal of fishing lines, hooks, and bait in trash receptacles. In addition, CDPR staff will continue to manually remove litter and garbage from the beaches. As a result, this effect will continue to be minimal.

4.4.1.1.6 Dog Walking (CA-6)

Nesting Impacts. CLTE are not present during the non-breeding season (October 1 through February 28) and therefore, are not affected by activities during that time. Almost all CLTE nest within the Southern Exclosure, which is enclosed by predator fence. Dogs are not allowed in the seasonal exclosure. Therefore, CLTE adults/juveniles, eggs, and chicks within the exclosure are protected from direct impacts (e.g., eggs being crushed) from dogs.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE could nest outside the protection of the exclosure in areas open to recreation, including dog walking. CLTE nests have rarely been found outside the exclosures in the past. For example, the last nest outside the exclosure in an area open to recreation was found in 2005 near the mouth of Arroyo Grande Creek. However, if a CLTE establishes a nest outside the seasonal exclosure in an area open to recreation, the cryptic nature of CLTE nests and chicks makes it conceivable that a nest that has not yet identified by monitors could be impacted.

The presence of dogs has the potential to affect the behavior, distribution, survivorship, and fecundity of CLTE. CLTE likely have a similar reaction to dogs near their nests as SNPL. Incubating CLTE are likely to respond to dogs by leaving the nest to defend it from approaching dogs, thus exposing eggs to inclement weather or predation or leaving chicks unattended. Unleashed dogs can chase CLTE chicks and adults, causing chicks to become separated from adults, and/or trample nests, with unrestrained dogs able to traverse a much larger area and disrupt a greater number of birds. For example, dogs have been observed destroying nests at Santa Clara River, Ormond Beach, and Tijuana River in California (Caffrey 1998); however, there are no records of this occurring in the HCP area. Furthermore, such impacts are unlikely within the HCP area because dogs are only allowed when they are on leashes no longer than 6 feet and under the control of the owner at all times.

CDPR will also continue to implement the SNPL and CLTE management program. Therefore, monitors will continue to search daily for CLTE nests outside the seasonal exclosure and protect them with an individual nest exclosure. A buffer zone of a minimum of 330 feet will be established around all

individual nest exclosures to ensure that recreation activities do not disturb nesting CLTE. In addition, additional fencing (i.e., bumpout) will be installed in the Southern Exclosure if necessary, to ensure that activities such as dog walking do not disturb nesting CLTE. As a result, the effects of dogs on nesting CLTE is considered to be minimal.

Foraging and/or Roosting Disturbance. Foraging CLTE are not impacted by dogs because CLTE forage over water. Impacts from dogs on roosting CLTE are minimal because dogs are not allowed in the Southern Exclosure, where CLTE form their night roost and where many CLTE roost during the day. In addition, only service dogs that are on a leash and under the control of their owner are allowed in the south/southeastern portion of Oceano Dunes SVRA, including around Oso Flaco Lake. CDPR staff strictly also enforces the dog leash regulation in any other area where dog activity can impact roosting CLTE.

4.4.1.1.7 Equestrian Recreation (CA-7)

Nesting Impacts. Almost all of the breeding CLTE population within the HCP area nests within the Southern Exclosure, where horses are not allowed. Therefore, CLTE adults/juveniles, eggs, and chicks within these areas are protected from direct impacts (e.g., eggs being crushed) from horses.

Most equestrian activity occurs in the northern portion of the HCP area and other areas where CLTE are not known to nest. In addition, the Southern Exclosure shoreline is closed to equestrian activity during the breeding season. Although not expected, if CLTE nest outside the seasonal exclosure, where equestrian activity can occur, equestrian activity would generally have the same types of effects on CLTE as pedestrians (section 4.4.1.1.3).

CLTE nests were documented as being destroyed by horse trampling at Tijuana River in California (Caffrey 1998). To reduce any potential impacts from equestrian activity, CDPR will continue to implement the SNPL and CLTE management program. Therefore, additional fencing (i.e., bumpout) will be installed in the Southern Exclosure, if necessary, to ensure activities on the eastern side of the fenceline do not disturb nesting CLTE. Monitors will also continue to search daily for CLTE nests outside the seasonal exclosure and protect them with an individual exclosure. A buffer zone a minimum of 330 feet will continue to be established around all individual nest exclosures to ensure that recreation activities do not disturb nesting CLTE. As a result, the effects of equestrian activity on nesting CLTE will continue to be minimal.

4.4.1.1.8 Boating/Surfing (CA-8)

Nesting Impacts. Boaters and surfers do not affect nesting CLTE because the seasonal exclosure shoreline is closed to boat landings and surfers during the breeding season.

Foraging and/or Roosting Disturbance. Surfing, small boat, and paddleboard launchings along the beach may have similar effects on roosting and/or foraging CLTE as pedestrians (section 4.4.1.1.3). However, interior least tern have been observed to exhibit greater average flush distances in reaction to a walking approach than an approaching motor boat (Rodgers and Smith 1995); therefore, effects from these activities are likely less intense than those for pedestrian activities.

Boaters on Oso Flaco Lake can disrupt foraging and/or roosting CLTE. However, boating on Oso Flaco Lake is uncommon. In addition, as part of the ongoing SNPL and CLTE management program, CDPR can restrict access to Oso Flaco Lake if monitors observe conflicts with foraging and/or roosting CLTE. As a result, the effects of boating at Oso Flaco Lake on CLTE are considered to be minimal.

Increased Predators. Surfing, small boats, and paddleboard launchings can disturb gull flocks foraging on the shoreline and displace gulls into areas where CLTE nests, chicks, or adults are located, thus increasing the risk of predation. However, in accordance with the Superintendent's Order (section 1.5.7) all surfing, boating, and paddleboarding activities are not allowed along the seasonal exclosure shoreline

or within 1,000 feet of the shoreline. CDPR will also continue to implement the SNPL and CLTE management program, which includes implementing a predator management program in the HCP area. As part of the ongoing predator management program, CDPR monitors and controls avian predators when necessary (section 2.2.2.1.2). As a result, this effect is considered to be minimal.

4.4.1.1.9 Aerial/Wind-Driven Activities (CA-9)

Nesting Impacts. Biologists believe shorebirds may perceive kites as potential avian predators; therefore, kite flying and kite boarding can be extremely disruptive to breeding CLTE. Kite flying is prohibited from Pier Avenue south to the southern Oceano Dunes SVRA boundary or within 1,000 feet of the shoreline during the CLTE breeding season (section 1.5.7). In addition, kite boarding is prohibited south of Post 6 from March 1 through September 30. The kite flying and kite boarding prohibition is also strictly enforced in areas where these activities can impact CLTE. As a result, disturbance to CLTE due to kite flying and/or kite boarding is avoided.

4.4.1.1.10 Holidays (CA-10)

Vehicle Impacts. Oceano Dunes SVRA closes the park to additional vehicles once the limits prescribed by Oceano Dunes CDP (CDP 4-82-300-A5, section 2.2.1.1) on any holiday are reached. As a result, the effects of motor vehicles during holidays do not change from those discussed in section 4.4.1.1.1.

Nesting and Foraging Impacts. Pedestrians are not subject to limits in the HCP area, and some holidays (e.g., the July 4 holiday) attract large pedestrian crowds to area beaches. Effects from increased crowds are similar to those described for pedestrian activities (section 4.4.1.1.3), but the amount and type of disturbance can be more frequent and/or longer in duration. High levels of pedestrian traffic can cause repeated flushing of adults. Frequent flushing of adults can keep adults from incubating a nest and/or feeding chicks, potentially reducing rates of development. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitoring within the HCP area will continue to be increased during periods of high visitation, including on weekends and holidays, to reduce the risks associated with increased recreation. In addition, CDPR staff will continue to hand out educational materials on CLTE to visitors in the HCP area to prevent visitors from disturbing CLTE nests and chicks. As a result, any increased impacts from holidays are considered to be minimal.

Fireworks are prohibited in the HCP area; however, once a year the City of Pismo Beach has a fireworks display on July 4 on the Pismo Beach pier. Therefore, during the July 4 holiday, many spectators congregate in the northern portion of the HCP area, which is over 2 miles from the northern edge of the Southern Exclosure where CLTE typically nest, roost, and/or forage during the breeding season. As a result, crowds associated with the City of Pismo Beach fireworks display are located in areas where they likely do not affect CLTE. Although fireworks are illegal in the HCP area, illegal fireworks have been regularly observed during the July 4 week in or near CLTE breeding habitat and they have been observed disturbing nesting, roosting, and/or foraging CLTE adults and chicks. Disturbance from fireworks causes CLTE to flush or move from the area, which results in increased vigilance or stress, decreased foraging, and/or decreased incubating (Patton 2009). To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. To minimize potential illegal fireworks use and any effects from increased crowds due to legal fireworks, CDPR staff will continue to employ additional ranger staff at Oceano Dunes SVRA to enforce regulations during these times. In addition, CDPR will continue to increase staff near the Southern Exclosure to reduce illegal firework use in this area. Therefore, effects from fireworks or other actions that can disturb breeding CLTE during the July 4 holiday are reduced.

4.4.1.1.11 Special Events (CA-11)

As with holidays, the vehicle limits prescribed by Oceano Dunes CDP (CDP 4-82-300-A5, section 2.2.1.1) are not exceeded during special events, and Special Event Permits do not authorize activities in areas that are otherwise closed to visitors. Thus, the potential for a given special event to affect CLTE depends on the nature of the event being approved and is generally similar to non-special event activities. For example, the effects of a special event involving OHVs is the same as the effects of typical motorized recreation (section 4.4.1.1.1), and a wedding or family reunion near Grand Avenue has effects similar to pedestrian activities (section 4.4.1.1.3).

Special events are potentially different from typical non-special event activities in a few ways. First, many events tend to focus participants in the event area, which can mean that spectators or vendors are more concentrated in a given area than they might otherwise be during an ordinary day. Effects on CLTE from concentrating spectators and vendors in an area is similar to the effects described for motorized recreation (section 4.4.1.1.1) and/or pedestrian recreation (section 4.4.1.1.3); however, the effects can be more frequent and/or longer in duration due to the increased number of visitors. Second, special events change use patterns and increase visitation on days that might not otherwise be at capacity; however, the actual effects from these variations are likely no different than those described above, depending on the activities associated with the event.

Special events are evaluated for potential effects on covered species to determine whether AMMs are necessary to include in the permit conditions. Review is based on past experience and is dependent on the event location, timing, and potential to impact covered species like CLTE. For example, larger special event conditions may include AMMs, such as assigning resource monitors or additional enforcement staff or adjusting scheduling, location, or paths of travel, as necessary, for each event. With the implementation of AMMs during special events, impacts from special events are considered to be minimal.

UAS may be used in the future for video production within the HCP area. UAS will not be allowed south of Post 5 during the breeding season. Therefore, UAS are not expected to effect nesting CLTE. Drones could disturb foraging and/or roosting CLTE during the breeding season if foraging or roosting occurs north of Post 5. However, Vas et al. (2015) assessed reactions by a variety of waterbirds to approaches by drones and found that the birds remained unaffected in most cases, suggesting the potential to use drones without significant disturbance.

All UAS operations will be consistent with CDPR policies regarding UAS use. Operators must receive a permit to operate over State Park lands and must comply with 14 CFR Part 107, which establishes the minimum safety standards for small UAS operations in the United States. As part of their permit to operate, any non-CDPR person conducting UAS filming will be required to follow AMMs to reduce impacts to covered species. For example, during the breeding season, non-CDPR UAS will not be allowed along the shoreline south of Post 5 and will be limited whenever necessary to avoid impacting CLTE. In addition, a USFWS-approved monitor will accompany non-CDPR UAS operators at any time of year potential impacts to covered species are anticipated. As a result, impacts of UAS to foraging and/or roosting CLTE are expected to be minimal.

4.4.1.2 Natural Resources Management Program

4.4.1.2.1 Covered Species Management

Installation and Maintenance of Western Snowy Plover and California Least Tern Protection Fences (CA-12a)

Seasonal Exclosure Fencing

Exclosure and symbolic fencing are installed and maintained in the HCP area each breeding season as part of the ongoing SNPL and CLTE management program. Exclosure and symbolic fencing is installed by March 1, before CLTE have arrived, and it is removed starting October 1, which is after the date when all nests and broods have a known fate and the breeding season has ended. As a result, initial installation and removal of the exclosure perimeter fencing do not affect CLTE.

Exclosure fences and symbolic fencing must be maintained throughout the breeding season to ensure integrity against predators and human disturbance. Symbolic fence maintenance does not affect nesting CLTE since CLTE have not been observed nesting in the South Oso Flaco area where symbolic fencing is used from 2005 to 2018.

Vehicle Strike. The Southern Exclosure fences, where most CLTE are known to nest, must be maintained throughout the breeding season to ensure integrity against terrestrial predators and human disturbance. Bumpouts are also installed to further protect nests from human disturbance, when needed. Fence maintenance can be conducted by hand or by heavy equipment and may have different levels of impact depending on the method used. Maintenance of the fence and bumpout installation can occur multiple times in a week and may involve extended or repeated visits to the nesting sites. Maintenance vehicles may need to drive within the closed portion of the shoreline (but not within the fenced seasonal exclosure itself). Although CLTE do not forage or typically nest along the shoreline west of the exclosure fence, a nest could be established outside the fence and chicks could be present and thus could potentially be crushed by a maintenance vehicle driving along the shoreline. However, to minimize the risk of maintenance vehicles striking a CLTE chick, CDPR staff driving on the seasonal exclosure shoreline are escorted by monitors permitted by USFWS. In addition, CDPR staff are trained to operate a vehicle on the shoreline when CLTE are present, including by scanning ahead of the vehicle for CLTE chicks and keeping speeds at or below 5 mph. As a result, effects are considered to be minimal.

Nesting Disturbance. Both heavy equipment and hand maintenance of the fence and bumpout installation can disturb nesting CLTE by temporarily flushing adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated and chicks could be depredated, inadequately fed, or flushed into the open riding area. Maintenance using heavy equipment is typically shorter in duration than maintenance by hand and likely results in fewer impacts to nesting CLTE than hand maintenance. In addition, effects from exclosure maintenance have been minimal in the past due to the implementation of established protocols in the SNPL and CLTE management program. Specifically, fence maintenance and bumpout installation are timed to avoid windy periods or other inclement weather. In addition, monitors survey the area prior to conducting fence maintenance activities. If a nesting CLTE is in a location where it can be impacted by activities, monitors postpone maintenance, if necessary, and remain on site during fence maintenance/installation to minimize disruption to CLTE. Furthermore, if chicks are flushed out of the exclosure during fence maintenance and/or bumpout installation, monitors attempt to follow and protect the chicks until they move back inside the exclosure. Overall, fenced protected areas have been shown to increase CLTE and other shorebirds' reproductive success in other locations (Isaksson et al. 2007, Hardy and Colwell 2008, Wilson

and Colwell 2010, Pearson et al. 2014). In the HCP area, reproductive success has increased since the implementation of the SNPL and CLTE management program, including the use of the seasonal exclosure; therefore, the seasonal exclosure areas have provided a considerable benefit to CLTE.

Impacts from Fencing. Fences placed in otherwise open habitat can be hazardous to flying birds. Shorebirds have been killed upon striking cable (symbolic) fences at other sites where such fencing has been installed (Page et al. 2002). Although there are no direct observations of CLTE striking the seasonal exclosure fencing or South Oso Flaco symbolic fence, dead or injured adult/juvenile CLTE have been found within the Southern Exclosure or nearby shoreline; therefore, these birds might have been injured or killed due to striking the fence (CDPR 2014a).

In 2015, CDPR placed brightly colored strips of fencing along sections of the Southern Exclosure to increase the visibility of the exclosure fence for flying CLTE. Use of the strip of fencing was attempted as an experiment in 2015, where it was placed on the western and northern Southern Exclosure fence in 2016, with favorable results. CDPR will continue to implement this program by lining the top of the Southern Exclosure fence with a strip of thicker plastic fencing (orange silt construction fencing cut into approximately 1-foot sections) in March of each year covering most of the western and northern Southern Exclosure fenced areas. If staff resources are available, some of the eastern fenceline and bumpout fencing will also be lined with this strip fencing. Therefore, the visible fencing is anticipated to reduce the likelihood of a CLTE striking a fence in areas where it is installed. As a result, this event will continue to be rare. Overall, the seasonal exclosure fence is an important protective measure that has increased CLTE reproductive success in the HCP area. Therefore, the seasonal exclosure fence will continue to be used despite the potential for birds to strike the fence.

Single-Nest Exclosures

Nesting Disturbance. Single-nest exclosures are installed and maintained in the HCP area as part of the ongoing SNPL and CLTE management program. Only large single-nest exclosures are erected around CLTE nests (section 2.2.2.1.1). Installation of CLTE single-nest exclosures can be highly disruptive to CLTE as adults are often displaced from incubation for the duration of the exclosure construction. Burton (1996) found that when exclosures were built around CLTE nests where adults were incubating full clutches, the adults rarely left the vicinity during exclosure installation and they returned to the nest before fence construction was completed. In the HCP area, CLTE begin incubating after the first egg is laid. Also, given the greater risk to the nest from recreationists in the open riding area, it is not possible to wait for a complete clutch, and therefore single-nest exclosures are installed as soon as feasible once a nest is discovered outside the seasonal exclosure. Additional AMMs that are implemented as part of the ongoing SNPL and CLTE management program that will continue to be implemented include having only experienced, qualified biologists install the exclosure; timing the installation of the exclosure to avoid extremely windy periods; minimizing time spent installing the exclosures as much as possible; and monitoring the nest after exclosure installation to ensure that the adult returns. Overall, single-nest exclosures are beneficial and appear to protect nests from the impacts of recreation and/or predation.

Increased Predators. Single-nest exclosures can also pose a risk to incubating adult CLTE because they may increase the likelihood that predators key in on the exclosure and prey on the attending adults. Although this has been observed to occur on SNPL nests with small single-nest exclosures or mini exclosures in the HCP area, these types of exclosures are not used for CLTE. Predators could still key in on large single-nest exclosures. To minimize this impact, CDPR implements a predator management program that will control avian and/or mammalian predators if they are observed targeting or disturbing CLTE at a large single-nest exclosure. Therefore, this effect is considered to be minimal.

Western Snowy Plover and California Least Tern Monitoring and Management (CA-12b)

Monitoring

Vehicle Strike. Although almost all CLTE nest in the HCP area between 2005 and 2018 have been found within the Southern Exclosure, some CLTE may nest outside the seasonal exclosure. While driving to access the seasonal exclosure, monitors or their vehicles can crush a chick or nest that lies outside the seasonal exclosure if a CLTE nest has been established there but not yet discovered. To reduce this risk, monitors in the HCP area follow established protocols to minimize adverse effects on nesting CLTE, including, but not limited to, keeping speeds below 5 mph along the shoreline and scanning ahead of the vehicle for CLTE. Monitoring is conducted by experienced monitors who are authorized by the USFWS to conduct the monitoring and/or who work under the specific requirements of the 10(a)(1)(A) Recovery Permit so it is less likely that there will be impacts to nests or chicks. Monitors will continue to follow established protocols when conducting monitoring activities. Therefore, impact from vehicle strike is not likely to occur.

Nesting Impacts. Monitoring of CLTE has been conducted in the HCP area since 1991, although the methods have been modified over the years to ensure the monitoring is effective. Monitoring activities involve extended or repeated visits to CLTE nesting sites, which can disrupt nesting birds by keeping them off their nest, separating chicks from adults, displacing chicks into the open riding area, and exposing eggs to inclement weather and predators. Investigator disturbance has been shown to lower reproductive success of colonial nesting birds (Burger 1981, Carney and Sydeman 1999). Two additional studies reported that the negative influences of investigators on ring-billed gulls (*Larus delawarensis*), a colonial nesting bird, were nearly eliminated when careful measures were taken (Fetterolf 1981, Brown and Morris 1994, 1995). Within the HCP area, CDPR staff implements established protocols during monitoring to minimize adverse effects of monitors on nesting CLTE. In addition, monitors must either have a 10(a)(1)(A) Recovery Permit or be approved by the USFWS. Overall, monitoring of nests, when carried out by experienced and permitted biologists, as is done in the HCP area, benefits CLTE by tracking nest fate and identifying threats to breeding birds, providing information that is critical to the conservation and protection of the species.

Within the HCP area, cameras are sometimes installed at CLTE nests to document nest predators. While they collect useful data on nesting, cameras that are used to monitor nests need to be maintained, which can cause additional disturbance when the monitors approach the cameras to maintain them. In addition, the cameras may be spotted by potential CLTE predators and alert these predators to the location of nearby nests. However, in other studies that used cameras to monitor shorebird nests, the presence of cameras did not appear to influence nesting success or attract predators to the nest (Brown et al. 1998, Demers and Robinson-Nilsen 2012). Cameras have not been observed influencing nest success in the HCP area to date. To ensure effects from cameras are minimized, CDPR will also continue to implement the SNPL and CLTE management program, which includes AMMs that should be implemented while using still or video cameras, such as training monitors on how to install cameras, not installing cameras when the wind speed is above 15 mph or strong enough to move sand or if it's raining, waiting to deploy cameras if a predator sighting recently occurred, and not installing cameras on nests that are readily visible to the public. As a result, the effects of using cameras near CLTE nests are considered to be minimal.

Banding

Adult Impacts. Adult CLTE in the HCP area are not currently captured to be banded and this will not occur in the future.

Chick Impacts. Leg bands are used to mark CLTE chicks within the HCP area. Banding CLTE chicks results in capture of the chicks and can lead to injury or death; however, this has not been documented in the HCP area to date. To minimize the risk of injury or mortality during banding activities, CDPR implements established protocols associated with the SNPL and CLTE management program. Specifically, CDPR uses a master bander to band all CLTE chicks in the HCP area. As a result, injuries or mortality associated with banding are expected to be rare (if any) in the future.

Banding activities typically require a master bander to enter the seasonal exclosure and/or remain in an area for a prolonged period of time to band the chicks. Effects of banding activities are expected to be similar to the effects of monitoring activities (section 4.3.1.2.1) and could result in disrupting nesting birds by keeping them off their nest, separating chicks from adults, displacing or moving chicks into the open riding area, and exposing birds to predators. In order to reduce effects on CLTE, CDPR implements established protocols as part of the SNPL and CLTE management program. Specifically, only a master bander with a 10(a)(1)(A) Recovery Permit or approved by the USFWS conduct banding activities. Banders are also provided with information on CLTE in the HCP area and are made aware of the location of nests, chicks, and adults in order to minimize situations where a chick or incubating adult are disturbed. Monitors also observe the open riding area during any activities that can result in chicks leaving the exclosure and moving into the open riding area to ensure no chicks flush into the area during activities. If chicks move into the open riding area, monitors control traffic and ensure the chicks move safely back into the seasonal exclosure. As a result, disturbance of CLTE related to banding activities are considered to be minimal.

Predator Control

Nesting Impacts. Avian and mammalian predation has been recognized as a severely limiting factor to the CLTE's recovery (Massey 1988, USFWS 1988). A predator management program has been implemented in the HCP area since 2002 as part of the ongoing SNPL and CLTE management program. Control of both avian and mammalian predators (including removal) has been shown to increase chick survival in shorebirds (Neuman et al. 2004, Catlin et al. 2011). However, control of both avian and mammalian predators (e.g., hazing, live trapping, or lethal removal) can result in negative effects on CLTE. Predator removal may require a predator specialist to enter the seasonal exclosure and/or remain in an area for a prolonged period of time to set and monitor predator traps.

Effects of predator management activities are similar to the effects of monitoring activities (section 4.3.1.2.1) and can result in disrupting nesting birds by keeping them off their nests, separating chicks from adults, displacing or moving chicks into the open riding area, and exposing birds to predators. In order to reduce effects on CLTE, CDPR implements established protocols as part of the SNPL and CLTE management program. Specifically, predator specialists that enter the seasonal exclosure are either accompanied by a qualified CDPR staff member or are approved by the USFWS to enter the nesting area. Predator specialists are also provided with information on CLTE in the HCP area and are made aware of the location of nests, chicks, and adults in order to minimize situations where a chick or incubating adult could be disturbed. Monitors also observe the open riding area during any activities that can result in chicks leaving the exclosure and moving into the open riding area to ensure no chicks flush into the area during activities. If chicks move into the open riding area, monitors control traffic and ensure the chicks move safely back into the seasonal exclosure. In addition, studies of CLTE colonies in California indicate predator management has been successful at increasing CLTE reproductive success (Butchko 1990, Butchko and Small 1992). Therefore, predator management will continue to benefit breeding CLTE in the HCP area.

Habitat Enhancement

Nesting Disturbance. Habitat enhancement has been implemented each year in the HCP area as part of the ongoing SNPL and CLTE management program. Chick shelters have not been used recently but are sometimes provided within the seasonal exclosure. Chick shelters have been successful at preventing avian predation in Nantucket Island, Massachusetts (Jenks-Jay 1982). Any chick shelters used are typically placed prior to CLTE arriving in the HCP area and are only placed if CLTE have not begun nesting to avoid disturbing nesting birds. As a result, chick shelters do not negatively affect CLTE and provide a considerable benefit to CLTE chicks.

Transporting and installing the materials used for habitat enhancement measures (e.g., enhancing wrack, adding woodchips) occurs in the seasonal exclosure prior to the start of the breeding season before CLTE arrive and/or at the end of the breeding season when CLTE are no longer nesting. Therefore, with the exception of the following, habitat enhancement activities do not affect CLTE.

A limited amount of habitat enhancement activities occurs on the shoreline (e.g., collecting and depositing wrack and beach hoppers/talitrids) near the seasonal exclosure during the breeding season. The effects are similar to the effects of monitoring activities (section 4.3.1.2.1) and can result in disrupting nesting birds by keeping them off their nest, separating chicks from adults, and/or exposing birds to predators. To reduce impacts to CLTE, CDPR staff implements established protocols during habitat enhancement activities to minimize adverse effects of monitors on nesting CLTE. Specifically, monitors are aware of the location of CLTE nests, chicks, and adults in order to minimize situations where chicks or incubating adults are disturbed. In addition, only monitors approved by the USFWS or with a 10(a)(1)(A) Recovery Permit are permitted to collect materials along the shoreline near the seasonal exclosure. Overall, habitat enhancement has had a positive effect on CLTE by providing cover and other habitat improvements within breeding habitat. Therefore, habitat enhancement will continue to have an overall positive effect on CLTE.

Tidewater Goby and Salmonid Surveys (CA-13)

Nesting Disturbance. One CLTE nest was observed in the HCP area near Arroyo Grande Creek where tidewater goby surveys occur; however, this last occurred in 2005. As a result, tidewater goby and salmonid surveys do not occur in locations where CLTE typically known to nest and impacts to nesting CLTE are unlikely to occur.

Foraging and/or Roosting Disturbance. Tidewater goby and salmonid surveys occur during the CLTE breeding season at Oso Flaco Creek, including the lagoon-like reach (if present); Oso Flaco Lake; Arroyo Grande Creek and lagoon; or Pismo Creek and lagoon where CLTE are known to forage. If CLTE are foraging in these areas during surveys, then surveys can result in disturbance to foraging and/or roosting CLTE. Specifically, surveys can disturb CLTE adults and fledglings and deter them from foraging in the area. Fledglings learning to fish can become energetically stressed if they are unable to forage normally. Given that the surveys are short in duration and infrequent (i.e., conducted about four times in a year), the likelihood of these surveys affecting CLTE is low. In addition, CDPR will continue to implement the SNPL and CLTE management program within the HCP area. Daily monitoring during the breeding season will continue to include areas where fisheries survey will occur, and fisheries surveys will continue to be adjusted if daily surveys determine CLTE will be affected. Fisheries survey staff include personnel experienced with conducting fisheries surveys within CLTE habitat and may include permitted CLTE monitors, if deemed necessary. Surveys will be delayed if CLTE are observed foraging and/or roosting in the area and may be impacted by survey activities. These surveys have thus had minimal to no effect on CLTE in the past, and effects on CLTE will continue to be minimal.

California Red-legged Frog Surveys and Associated Management (CA-14)

Nesting Disturbance. One CLTE nest has been observed in the HCP area near Arroyo Grande Creek where CRLF surveys occur; however, this last occurred in 2005. As a result, CRLF surveys do not occur in locations where CLTE typically known to nest and impacts to nesting CLTE are unlikely to occur.

Foraging and/or Roosting Disturbance. CRLF surveys conducted within Oso Flaco Lake or the lagoons in the HCP area can temporarily disturb foraging and/or roosting CLTE. Specifically, CRLF surveys can disturb CLTE adults and fledglings and deter them from foraging and/or roosting in the area. Fledglings learning to fish can become energetically stressed if they are unable to forage normally. CDPR will continue to implement the SNPL and CLTE management program within the HCP area to ensure these impacts are reduced. Specifically, surveys are not conducted if CLTE are observed foraging and roosting in the area and could be impacted by survey activities. In addition, CRLF surveys are typically short in duration and infrequent. As a result, any disturbance to foraging and/or roosting CLTE from CRLF surveys are considered to be minimal.

Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

Nesting Impacts. Monitoring for most listed plant species is conducted outside of the CLTE breeding season and/or habitat. Therefore, with the exception of the following listed plant monitoring activities, which occur in the breeding season, these activities have no effect on CLTE.

Surf thistle and beach spectaclepod are known to occur in North and South Oso Flaco within potential CLTE breeding habitat, including within the seasonal exclosure (Map 19 and Map 20). Because of the timing of their blooming and growth periods, both plant species can only be accurately identified by doing surveys during the CLTE breeding season. To date, CLTE have not been observed nesting in North or South Oso Flaco; therefore, impacts to nesting CLTE have not occurred during these surveys and are not expected. Seed collection for propagation would not be completed within areas occupied by breeding CLTE, and any planting would be done outside the breeding season.

Since potentially suitable breeding habitat (i.e., primary habitat) for CLTE is present in North and South Oso Flaco, although unlikely, it is possible that CLTE could nest within this area in the future. Because the blooming and growth periods for surf thistle and beach spectaclepod occur during the CLTE breeding season, these surveys could temporarily disturb any future CLTE nesting within North and South Oso Flaco in a similar manner as described for monitoring activities (section 4.3.1.2.1). However, since conducting surveys for these plant species requires entry into the seasonal exclosure, the Oceano Dunes District has established detailed survey protocols in the Nesting Season Management Plan[55] (Appendix E), which is part of the ongoing SNPL and CLTE management program, to minimize effects on nesting CLTE. As a result, surveys conducted for surf thistle and beach spectaclepod during the breeding season are not expected to affect any CLTE that may nest in North or South Oso Falco in the future.

4.4.1.2.2 Habitat Restoration Program (CA-16)

Nesting Impacts. Any planting of foredune plants and seeds within or around the seasonal exclosure occurs prior to March, which is before CLTE arrive in the HCP area. Other habitat restoration and related activities, including fence maintenance, occur prior to CLTE breeding season to the extent feasible. If activities occur in the breeding season, they are planned to avoid areas where CLTE are known to nest. As a result, no impacts to nesting CLTE occur.

[55] The Nesting Season Management Plan will be superseded by this HCP in the future and will, therefore, no longer be required.

Reduced Habitat. If vegetation for restoration purposes is planted in and grows too densely within the footprint of the seasonal exclosure or other primary and/or secondary suitable CLTE nesting habitat, it can reduce CLTE breeding habitat in these areas.[56] To reduce this impact, vegetation associated with the habitat restoration program is not planted beyond existing vegetated islands. Therefore, such impacts to CLTE breeding habitat are unlikely.

Increased Predators. Vegetation that is planted in the vicinity of known CLTE nesting and/or roosting habitat can impact CLTE by providing habitat for predators to hide and stalk nesting and/or roosting CLTE. To reduce this impact, CDPR implements a predator management program that has been successful at controlling predators in the HCP area and protecting breeding CLTE. The predator management program has likely increased reproductive success for CLTE and is expected to alleviate impacts associated with any additional vegetation being planted near CLTE habitat. As a result, these effects are minimal.

4.4.1.2.3 Invasive Plant and Animal Control (CA-17)

Nesting Impacts. Actions taken to control invasive plants do not occur near the seasonal exclosures. In addition, any control of invasive plants within areas where CLTE may nest outside the exclosure are avoided during the breeding season. Therefore, effects on nesting CLTE do not occur.

Foraging and/or Roosting Disturbance. Invasive plant or animal control may occur in areas that can disturb roosting or foraging CLTE, especially near water bodies in the HCP area (e.g., Pismo Creek lagoon, Arroyo Grande Creek lagoon). Invasive plant and animal control can disturb CLTE adults and fledglings and deter them from foraging and/or roosting in the area. Fledglings learning to fish can become energetically stressed if they are unable to forage normally. To reduce impacts from invasive plant or animal control, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, Environmental Scientists conducting the work will continue to be aware of CLTE activity and will adjust timing and location of the control actions to avoid any disturbance to foraging CLTE. As a result, effects on foraging and/or roosting CLTE is considered to be minimal. In addition, invasive plants have been shown to prevent CLTE from nesting in otherwise suitable areas (Wiedemann 1984, Muir and Colwell 2010); therefore, removal of invasive plants ultimately improves native habitats and potentially increases available CLTE habitat in the HCP area.

4.4.1.2.4 Habitat Monitoring System Implementation (CA-18)

The effects of the CLTE and SNPL, CRLF, tidewater goby, and plant monitoring programs, which are part of the HMS, are described in the previous section (i.e., section 4.3.1.2.1).

Nesting Impacts. The effects of other components of the HMS (e.g., vegetation monitoring, terrestrial bird monitoring, reptile and amphibian monitoring, small mammal monitoring, and large mammal monitoring) are limited because most HMS monitoring that needs to be conducted in CLTE breeding habitat is implemented outside the breeding season or in areas where CLTE are not likely to nest. HMS activities that need to occur within the breeding season are described below.

Small mammal trapping surveys occur during the breeding season within CLTE secondary habitat. Between 2005 and 2018, only two CLTE nests were discovered in secondary habitat. Therefore, it is unlikely that any nests will occur near small mammal trapping in the future. In addition, CDPR will continue to implement the SNPL and CLTE management program, which includes conducting daily

[56] Installing plants at the start of the CLTE breeding season specifically to enhance breeding habitat is a separate action from habitat restoration (section 4.3.1.2.2).

searches for nests in potential nesting habitat that is outside the seasonal exclosures. Any nests that are found outside a seasonal exclosure will be protected by a single-nest exclosure, if appropriate. Finally, a buffer zone of a minimum of 330 feet will be established around all individual nest exclosures. Therefore, effects from small mammal trapping will continue to be minimal.

During the breeding season, monitors conduct three surveys for shorebirds along the shoreline of the HCP area, including within the exclosure shoreline. These surveys can disturb nesting or brooding CLTE. As a result, the HMS monitoring surveys within or near the seasonal exclosure are conducted by monitors with a 10(a)(1)(A) Recovery Permit (or approved by USFWS). Therefore, disturbance caused by these surveys results in the same effects as those described for CLTE monitoring (section 4.3.1.2.1) and are considered to be minimal.

4.4.1.2.5 Water Quality Monitoring Projects (CA-19)

Nesting, Foraging, and/or Roosting Disturbance. Installation of water quality monitoring equipment occurs outside the CLTE breeding season; therefore, any future installation activities will not affect CLTE.

Water quality monitoring equipment is currently installed at Oso Flaco Lake. Water quality monitoring equipment may be installed in other aquatic habitat in the HCP area in the future. Maintenance and/or installation of water quality monitoring equipment at Oso Flaco Creek, Pismo Creek, Arroyo Grande Creek, and associated estuaries will be timed to avoid the CLTE breeding season, to the extent feasible. However, some maintenance of water quality equipment may need to occur during the breeding season. Water quality maintenance does not occur in areas where CLTE typically nest; therefore, these activities are not expected to affect nesting CLTE. Depending on the areas being accessed for water quality monitoring during the breeding season, minor disturbance of foraging and/or roosting CLTE could occur. Specifically, maintenance of equipment could disturb CLTE adults and fledglings and deter them from foraging and/or roosting in the area. Fledglings learning to fish could become energetically stressed if they are unable to forage normally. However, these effects are expected to be minimal given the short duration and minimal equipment requirements required to maintain the monitoring device. In addition, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, which includes delaying work if a CLTE is observed foraging and/or roosting in the area and could be disturbed by activities. As a result, effects on nesting, foraging, and roosting CLTE will be minimal.

4.4.1.3 Park Maintenance

4.4.1.3.1 Campground Maintenance (CA-20)

Campground maintenance activities do not affect CLTE since the designated campgrounds are not considered CLTE breeding or foraging habitat.

4.4.1.3.2 General Facilities Maintenance (CA-21)

Existing general maintenance activities do not occur within the Southern Exclosure;[57] therefore, direct effects on CLTE nests within the exclosure do not occur. General maintenance activities that can affect CLTE include litter pick-up, facility repairs, and restroom and signpost maintenance when these activities are located near CLTE primary and/or secondary nesting and/or foraging habitat.

[57] Effects associated with maintenance of the seasonal exclosure are discussed in section 4.3.1.2.1.

Mechanical trash removal will not occur within areas encompassed by the seasonal exclosures; therefore, direct effects on CLTE nests within the exclosure will not occur. Mechanical trash removal will also be set back from all creeks and lagoons; therefore, impacts to foraging CLTE are not expected.

Vehicle Strike. Although CLTE almost exclusively nest within the Southern Exclosure, CLTE can nest in primary and/or secondary habitat outside the seasonal exclosure. In the HCP area in the past, this has been an infrequent occurrence. A general maintenance vehicle can crush eggs or chicks in an active CLTE nest that is outside the seasonal exclosure and not yet identified by monitors. To reduce the potential for vehicle strike, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. In addition, any nests found outside a seasonal exclosure will be quickly protected by a large single-nest exclosure (section 5.3.1). Furthermore, if a CLTE chick is observed traveling outside a single-nest exclosure, monitors will increase the exclosure in size up to 600 feet in radius and silt fencing will be used around the exclosure fence to ensure that vehicles do not crush eggs or strike chicks. As a result, these impacts will continue to be minimal.

Maintenance vehicles can also strike a roosting adult or chick outside, but adjacent to the exclosure. To reduce the risk of a maintenance vehicle striking a CLTE adult or chick, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to escort maintenance workers south of Post 6 to reduce the risk of a vehicle striking a roosting adult or chick. As a result, this impact is considered to be minimal.

Nesting Disturbance. If maintenance activities, including mechanical trash removal, are conducted adjacent to the northern limit of the seasonal exclosure along the shoreline or within the open riding area, they can disturb nesting and/or roosting CLTE by temporarily flushing adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated and chicks can be depredated, inadequately fed, or flushed into the open riding area. To reduce these impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, surveys will continue to be conducted in areas where CLTE occur prior to maintenance activities to ascertain the presence of CLTE. If CLTE are observed, maintenance activities will be delayed until an experienced monitor determines that CLTE will not be impacted. In addition, monitors will continue to escort maintenance workers south of Post 6 along the shoreline to ensure disturbance to roosting and nesting CLTE is minimized. Further, mechanical trash removal will not be conducted within 500 feet of any known nesting area. As a result, effects from activities near the seasonal exclosures are considered to be minimal.

Restroom facilities need to be maintained regularly within the breeding season. No restrooms are located within or near the seasonal exclosure where almost all CLTE nest and the night roost is typically located. Some restrooms are located within CLTE primary and/or secondary, and tertiary breeding habitat. CLTE have never been found nesting in tertiary habitat; therefore, impacts to CLTE in tertiary habitat are not known to occur. CLTE have rarely been found nesting within secondary habitat (e.g., two nests were found in secondary habitat between 2005 and 2018), and almost all of the CLTE nests in primary habitat are located within the Southern Exclosure (Map 11); therefore, restroom facilities are unlikely to impact CLTE nests. However, impacts to CLTE nests within primary and secondary habitat outside the seasonal exclosure could occur in the rare case when a CLTE nests outside the seasonal exclosure in the future. In order to minimize these impacts, the District implements established protocol if CLTE establish a nest within 330 feet of these structures to ensure that restroom maintenance and public access at the restrooms do not disturb breeding CLTE. Specifically, permanent restroom buildings are closed to public use and the large single-nest exclosure fencing is erected around the restroom to

isolate it and prevent public use. In addition, chemical toilets are relocated to a minimum of 330 feet from any nest site. Therefore, the effect on CLTE from maintaining restroom structures is minimal.

Foraging and/or Roosting Disturbance. Foraging and/or roosting CLTE can be disturbed by maintenance activities within foraging or roosting habitat, such as Oso Flaco Lake. Specifically, general maintenance activities can disturb CLTE adults and fledglings and deter them from foraging and/or roosting in the area. Fledglings learning to fish can become energetically stressed if they are unable to forage normally. Maintenance activities have minimal effects on foraging and/or roosting CLTE because maintenance activities are generally accomplished quickly. In addition, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to be aware of CLTE activity and will adjust the timing and/or location of general maintenance activities to avoid foraging and/or roosting CLTE. As a result, effects from activities near foraging and/or roosting CLTE are considered to be minimal.

Reduced Habitat. The placement of restroom facilities within CLTE breeding habitat reduces the amount of habitat available to CLTE for breeding by precluding them from nesting within the footprint of the structures. However, restroom facilities are small (i.e., no larger than 8 feet by 8 feet) and they are placed in areas where CLTE do not typically nest (i.e., outside the seasonal exclosure). Therefore, this effect is minimal.

Mechanical trash removal will not be conducted in or immediately adjacent to the seasonal exclosure area during the breeding or non-breeding season; therefore, CLTE habitat in the seasonal exclosure will not be affected. In addition, mechanical trash removal will be set back from any lakes or other water bodies; therefore, CLTE foraging habitat will not be impacted. Mechanical trash removal could affect favorable CLTE nesting habitat (i.e., primary and secondary habitat) by altering dune composition and topography. Specifically, mechanical trash removal could reduce organic surface materials (e.g., driftwood) and microtopography. Most mechanical trash removal will be conducted to remove litter in areas where recreation activities have been concentrated. These areas are unlikely to support the appropriate nesting habitat for CLTE due to the high level of recreation; therefore, CLTE are not expected to nest in the areas where mechanical trash removal will typically occur. As a result, this effect will be minimal.

4.4.1.3.3 Trash Control (CA-22)

Installation and maintenance of small trash bins in the non-motorized portion of Pismo State Beach does not affect CLTE since the trash bins are installed near the parking areas and access points, which are outside of suitable nesting and foraging habitat for CLTE.

Nesting Impacts. Because most of the large trash dumpsters are located in the dunes, approximately 2 miles from the 6 Exclosure, vehicle strike and disturbance of nesting CLTE is unlikely when visitors or maintenance staff access the dumpsters. However, some large trash dumpsters near Post 2 are located within an area mapped as primary CLTE breeding habitat. Although CLTE have not nested in this area in the past, if a nest were established near the dumpsters, activity could crush a nest that has not been discovered by monitors or disturb nearby nesting and/or roosting CLTE by temporarily flushing adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult.

Once the adults leave the nests or chicks, eggs could be buried by sand, depredated, or inadequately incubated and chicks could be depredated, inadequately fed, or flushed into the open riding area. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area, which requires that the location of the trash dumpster near Post 2 be changed, as necessary, to avoid disturbance to any nearby active CLTE nests. Monitors will also continue to conduct daily

searches for nests in potential nesting habitat that is outside exclosures. Any nests found outside an exclosure will be quickly protected by a large, single-nest exclosure (section 5.3.1). As a result, this effect is considered to be minimal.

Foraging and Roosting Disturbance. Although infrequent, some garbage pick-up, including volunteer beach cleanup and cleanup on the beach after a storm, is required in the HCP area. These activities are conducted outside of the CLTE breeding season to the extent feasible. If activities occur during the breeding season (e.g., after a storm event) they are planned to avoid active CLTE nesting areas. Where cleanups do occur during the breeding season, they are typically completed on foot with handheld trash bags and can cause similar disturbance of foraging and/or roosting CLTE as general maintenance activities (section 4.4.1.3.2). To reduce any impacts from volunteer cleanup, CDPR implements the ongoing SNPL and CLTE management program, which includes ensuring all staff and volunteers that conduct beach cleanups will continue to be given a training on CLTE life history and conservation measures in the HCP area. In addition, if volunteer beach cleanup occurs during the breeding season it is typically scheduled to occur during times when most CLTE have left the HCP area. If volunteer cleanup occurs in areas where foraging and/or roosting CLTE could be impacted, a permitted (or USFWS approved) monitor is present during the activities to ensure no impacts occur. Effects from beach cleanup are minimal with the implementation of the SNPL and CLTE management program AMMs.

Increased Predators. Trash dumpsters attract a large number of gulls that land and forage in the dumpsters if they are left uncovered (CDPR 2014a). As a result, the continued use of the uncovered trash bins within or near CLTE areas where CLTE nest, forage, and/or roost can artificially increase the number of predatory species, including gulls, and thus increase depredation of CLTE. To date, CLTE have not nested, roosted, or foraged in the area where the trash dumpsters are located. Increasing the number of trash bins on holidays and during special events to accommodate the increased number of visitors can also artificially increase the number of predators at these times and increase depredation of CLTE. To reduce any potential impacts from the trash dumpsters, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. CDPR is evaluating several options to reduce the movement of trash from the dumpsters and reduce predator presence at the dump sites. CDPR will also continue to implement the predator management program to ensure depredation of CLTE is minimized. The predator management program has likely contributed to the overall population (i.e., number of breeding adults) and reproductive success (i.e., number of fledglings per nesting pair) increase for CLTE in the HCP area. Reducing predator presence near the dumpsters and reducing the movement of trash from the dumpsters will reduce the risk of predation on CLTE.

4.4.1.3.4 Wind Fencing Installation, Maintenance, and Removal (CA-23)

Nesting Impacts. The last CLTE nest found outside the fenced Southern Exclosure area in an area open to recreation was in 2005 at the mouth of Arroyo Grande Creek. Therefore, wind fencing installation, maintenance, and/or removal has not affected and is not expected to affect CLTE in the future since it is located upwind of Grand Avenue, Pier Avenue, and Strand Way, which is not near the Southern Exclosure.

Although CLTE do not typically nest in the wind fencing areas upwind of Strand Way, Pier Avenue, and Grand Avenue, the wind fencing is located in an area mapped as primary habitat for CLTE. Therefore, installation, maintenance, and/or removal of wind fencing in these areas could result in destruction or disturbance of a CLTE nest in the rare event that a CLTE establishes a nest that is outside the exclosure and has not yet been discovered by monitors. To reduce this impact, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. In addition, any nests found outside a seasonal exclosure will be quickly protected by a single-nest exclosure. As a result,

effects on CLTE from wind fencing installation, maintenance, and/or removal are considered to be minimal.

Foraging and/or Roosting Impacts. Foraging and/or roosting CLTE are not known to be disturbed by wind fence installation, maintenance, and/or removal activities because these fences are not located near aquatic foraging habitat.

4.4.1.3.5 Sand Ramp and Other Vehicular Access Maintenance (CA-24)

Nesting and Foraging Impacts. CLTE are not known or expected to nest near the sand ramps. To ensure that breeding CLTE are not affected, CDPR will continue to conduct surveys of the sand ramps once per day as part of the daily transects associated with the SNPL and CLTE management program. In addition, sand ramp maintenance activities will be postponed if any nests are found. Therefore, impacts to breeding CLTE from sand ramp maintenance are avoided.

Other vehicular access maintenance activities (e.g., maintenance of parking areas, the Grand Dunes Trail, and access corridors at Oso Flaco Lake) are outside of CLTE breeding and foraging habitat, and maintenance do not affect the species.

4.4.1.3.6 Street Sweeping (CA-25)

Street sweeping activities do not affect CLTE since the Grand and Pier Avenue entrance stations are not located within or near CLTE habitat.

4.4.1.3.7 Routine Riparian Maintenance (CA-26)

Nesting Impacts. Routine riparian maintenance activities are not conducted in suitable CLTE nesting habitat; therefore, these activities do not affect nesting CLTE.

Foraging and/or Roosting Impacts. The Pismo Lake spillway and the two culverts at Oso Flaco Lake are maintained as needed. CLTE are known to forage and/or roost adjacent to riparian maintenance areas in open water habitats including Pismo Lake and Oso Flaco Lake. Maintenance typically entails CDPR staff manually or, if needed, mechanically removing vegetation, debris, and sediment build-up above the natural channel bed. Noise from equipment during culvert maintenance can temporarily disturb foraging CLTE and interfere with foraging activity if conducted during the CLTE breeding season. Routine riparian maintenance work in or adjacent to CLTE foraging habitat is implemented outside of the breeding season, when feasible. If maintenance activities must be conducted during the breeding season, disturbance to foraging CLTE is minimized by having a monitor present to observe CLTE behavior. If the monitor determines that CLTE foraging nearby are disturbed, the monitor stops work until it is determined that no impacts will occur. As a result, the effects of these activities on CLTE are minimal.

All tree trimming and invasive plant removal activities at Oso Flaco Lake occur between August 15 and March 1, which is largely outside the CLTE breeding season. If CLTE are present in Oso Flaco Lake, tree trimming and invasive plant removal can disturb foraging CLTE and interfere with foraging activities. To reduce this impact, a monitor is present to observe CLTE behavior during these activities. If the monitor determines that CLTE foraging nearby are disturbed, the monitor stops work until it is determined that no impacts will occur. As a result, tree trimming and invasive removal have only minimal effects, if any, on foraging CLTE.

4.4.1.3.8 Perimeter and Vegetation Island Fence Installation, Maintenance, and Removal (CA-27)

Nesting Impacts. Almost all of the CLTE breeding population in the HCP area nest within the Southern Exclosure. Perimeter fence and vegetation island fence installation, maintenance, and removal does not

occur within the Southern Exclosure. As a result, the nests within the Southern Exclosure are not directly impacted by perimeter fence installation, maintenance, and/or removal.

Perimeter fencing delineates the riding area from other areas within the HCP area. Most perimeter fencing occurs within tertiary habitat and does not affect CLTE, although some limited perimeter fencing does occur within primary and secondary habitat. Vegetation island fencing is placed around vegetation islands and occurs within primary, secondary, and tertiary habitat. CLTE are not affected by vegetation island fencing in tertiary habitat.

A limited amount of perimeter and vegetation island fencing occurs directly adjacent to the Southern Exclosure (e.g., Pipeline vegetation island). Perimeter and vegetation island fence maintenance adjacent to the exclosure can disturb nesting CLTE within the exclosure (Map 5). To reduce this impact, CDPR will continue to delay fence maintenance activities adjacent to the exclosure until late September, when all CLTE nests are confirmed to be fledged. As a result, perimeter and vegetation island fence maintenance adjacent to the exclosure does not affect nesting CLTE.

Although CLTE do not typically nest outside the Southern Exclosure, some of the perimeter and vegetation island fencing is located in primary and/or secondary breeding habitat for CLTE. Therefore, installation, maintenance, and/or removal of the fencing in these areas could result in destruction or disturbance of a CLTE nest in the rare event that a CLTE establishes a nest outside the seasonal exclosure and it has not yet been discovered by monitors. To reduce the potential for nests outside the seasonal exclosure to be impacted, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. Any nests found outside a seasonal exclosure will be quickly protected by a single-nest exclosure. In addition, any perimeter or vegetation island fence work will be delayed if CLTE are observed in the area. Therefore, the effect on CLTE from these activities is considered to be minimal.

Foraging and/or Roosting Impacts. Foraging and/or roosting CLTE are not disturbed by perimeter and vegetation island installation, maintenance, and/or removal activities because these fences are not located near aquatic foraging habitat.

4.4.1.3.9 Cable Fence Maintenance and Replacement (CA-28)

Nesting Impacts. Cable fence replacement is conducted outside the CLTE breeding season. Therefore, the replacement of the cable fence does not affect CLTE.

To the extent feasible, any maintenance on the cable fence is conducted outside the CLTE breeding season or late in September so that all nesting activities have ceased and CLTE are no longer in the HCP area. Cable fence maintenance does not occur within the seasonal exclosure where CLTE typically nest. However, some cable fence maintenance may need to occur along the shoreline near Post 8 (Map 5) adjacent to the seasonal exclosure fence when CLTE are still nesting and can result in disturbance of a CLTE nest within the fenced area. Cable fence maintenance in this area can also result in destruction or disturbance of a CLTE nest in the event that a CLTE establishes a nest outside the fence and it has not yet been discovered by monitors. To reduce any impacts to nesting CLTE, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct a survey immediately prior to maintenance activities to ensure that no active nests or chicks are in the area that could be disturbed by activities. If an active nest or chick is found, activities will continue to be delayed until a monitor determines that CLTE will not be impacted. As a result, these effects are considered to be minimal.

Foraging and/or Roosting Impacts. Fence maintenance during the breeding season can be disruptive to CLTE foraging offshore near Post 8. The noise associated with excavating sand can displace foraging CLTE

adults and chicks, as well as cause increased vigilance and exposure to inclement weather and predators. To reduce these impacts, as part of the ongoing SNPL and CLTE management program, surveys for CLTE will continue to be conducted prior to conducting any fence maintenance activities. If CLTE are observed foraging in the area, maintenance will continue to be delayed until the birds have left the area. As a result, effects on foraging CLTE is considered to be minimal.

4.4.1.3.10 Heavy Equipment Response (CA-29)

Vehicle Strike. Heavy equipment generally results in the same type of effects on CLTE as general facilities maintenance (section 4.4.1.3.2) and maintenance of the SNPL and CLTE protection fence (section 4.3.1.2.1). It may be necessary to use heavy equipment in CLTE primary and/or secondary breeding habitat, including for fence maintenance and wrack collection and deposition for habitat enhancement, as well as for unplanned reasons, such as burying of marine mammals and moving an abandoned boat.

Almost all of the CLTE breeding population in the HCP area nests within the Southern Exclosure. Heavy equipment response does not occur within the Southern Exclosure. As a result, most CLTE nests are not directly affected by heavy equipment operations since they are protected by the Southern Exclosure.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE can infrequently nest outside the protection of the exclosure. Heavy equipment can crush eggs or chicks in an active CLTE nest that is outside a seasonal exclosure and not yet identified by monitors. To reduce impacts to any CLTE nests outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. In addition, any nests found outside a seasonal exclosure will be quickly protected by a single-nest exclosure (section 5.3.1), thus reducing the likelihood of vehicle strike. Furthermore, if a CLTE chick is observed traveling outside a single-nest exclosure, a monitor will increase the exclosure in size up to 600 feet in radius and silt fencing will be used around the exclosure fence to ensure that vehicles do not crush eggs or strike chicks. All heavy equipment operators will also continue to receive training that includes life history information, measures, and rules that should be implemented to protect CLTE. In addition, if heavy equipment response is needed on the shoreline south of Post 6, monitors will continue to escort heavy equipment along the shoreline, if feasible, to ensure disturbance to roosting and nesting CLTE is minimized. As a result, direct impacts to nesting CLTE outside the seasonal exclosure from heavy equipment will continue to be minimal.

Nesting Disturbance. If heavy equipment activities are conducted adjacent to the seasonal exclosure, they can disturb nesting CLTE by temporarily flushing adults away from nests or chicks or by flushing chicks from the nest and separating them from the attending adult. Once the adults leave the nests or chicks, eggs can be buried by sand, depredated, or inadequately incubated and chicks can be depredated, inadequately fed, or flushed into the open riding area. To reduce disturbance to nesting CLTE associated with heavy equipment activities, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, heavy equipment activities will be delayed when CLTE are observed to be present. As a result, effects from activities near the seasonal exclosures are considered to be minimal.

Foraging and/or Roosting Disturbance. Heavy equipment can disturb and/or displace foraging and/or roosting CLTE adults and chicks if the equipment needs to stay in an area near aquatic foraging habitat for a prolonged period of time (e.g., when burying deceased marine life). During this time, CLTE adults and chicks can become energetically stressed by prolonged disturbance. Prolonged disturbance from heavy equipment can also reduce CLTE foraging times, and both chicks and adults can become malnourished. In addition, chicks can become separated from adults, which can leave them exposed to predators. To minimize impacts to foraging and/or roosting CLTE from heavy equipment activities, CDPR

will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, a survey will continue to be conducted for CLTE prior to using heavy equipment in areas that could affect roosting or foraging CLTE. If CLTE are observed, heavy equipment activities will be delayed until the bird(s) has left the area. As a result, effects on foraging CLTE from using heavy equipment are considered to be minimal.

4.4.1.3.11 Minor Grading (CA-30)

The specific location and timing of minor grading changes from year to year. The effects of grading to maintain seasonal exclosure fencing are included in section 4.3.1.2.1, the effects of grading to maintain the perimeter and vegetation island fence are included in section 4.4.1.3.8, and the effects of grading to maintain the cable boundary fence are included in section 4.4.1.3.9.

Other minor grading either is not conducted during the CLTE breeding season or is conducted in a manner and/or location that does not affect the species; therefore, CLTE are not affected by these activities.

4.4.1.3.12 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Work on boardwalks in Pismo State Beach and Oso Flaco Lake can be conducted in or adjacent to wetland and other aquatic habitat, which is considered suitable CLTE foraging habitat. Work on the boardwalks and other pedestrian access areas is conducted outside the CLTE breeding season, if possible. If activities are conducted in the breeding season, effects are similar to those discussed for general maintenance activities on foraging CLTE (section 4.4.1.3.2) and are minimal.

4.4.1.4 Visitor Services

4.4.1.4.1 Ranger, Lifeguard, and Park Aide Patrols (CA-32)

The potential threats posed by routine, non-emergency ranger and park staff patrols are similar to those described for general facilities maintenance (section 4.4.1.3.2) in that patrol vehicles drive along the beaches and dunes within posted speed limits (with the exception of emergency response [section 4.4.1.4.2]).

Vehicle Strike. Ranger and patrol vehicles do not enter the seasonal exclosure during routine, non-emergency situations, without an escort by a permitted monitor or without training by a permitted monitor; therefore, impacts to nesting CLTE are considered to be minimal.

Lifeguard towers are not placed within habitat used by CLTE for nesting; therefore, no impacts to nesting CLTE occur from lifeguard tower activities.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE have infrequently nested outside the protection of the exclosure. For example, in 2005, a CLTE nest was found near the Arroyo Grande Creek mouth. Non-emergency ranger and patrol vehicles can crush eggs or chicks in an active CLTE nest that is outside a seasonal exclosure and not yet identified by monitors. To reduce impacts to any CLTE nests outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. Any nests found outside a seasonal exclosure will be protected by a single-nest exclosure (section 5.3.1), thus reducing the likelihood of a routine, non-emergency ranger and/or park staff patrol destroying or disturbing a nest. As a result, direct impacts to nesting CLTE outside the seasonal exclosure will continue to be minimal.

Nesting Disturbance. As with general maintenance activities, disturbance to nesting CLTE from park staff patrols is usually limited due to the infrequency and short duration of the activities in any one location, as well as the distance between most patrol activities and the seasonal exclosure. The occasional stuck

vehicle or traffic stop near a CLTE nest within the Southern Exclosure can cause disturbance to CLTE since the activity takes longer time to complete. During this time, CLTE adults and chicks can become energetically stressed by prolonged disturbance. In addition, CLTE chicks can become separated from adults, which can leave them exposed to predators and/or inclement weather. To reduce disturbance to nesting CLTE, CDPR will continue to implement the SNPL and CLTE management program, which requires that a buffer of a minimum of 330 feet be used to protect CLTE nests within the HCP area, including installing bumpouts for nests within the Southern Exclosure adjacent to riding or camping areas. The bumpouts are monitored regularly, and if an incubating bird is disturbed by vehicle or non-vehicle activity, the buffer area is increased in size as needed. As a result, these impacts are considered to be minimal.

Foraging and/or Roosting Impacts. Vehicles do not disturb or strike foraging CLTE since CLTE forage over water.

Non-emergency ranger and patrol vehicles generally access areas open to public vehicles along the beach and adjacent shoreline. Disturbance of roosting CLTE can occur when these activities are located near occupied CLTE roosting habitat. In addition, vehicle strikes of roosting CLTE adults, juveniles, or chicks can occur if vehicles travel directly through habitat where CLTE are located during the breeding season. However, as with general maintenance activities, disturbance of CLTE from park staff patrols is usually limited due to the infrequency and short duration of the activities in any one location and the buffer between most patrol activities and the seasonal exclosure. In addition, during normal ranger and lifeguard patrols, vehicles travel at a speed no greater than 5 mph along the shoreline to reduce the risk of a vehicle striking a roosting bird. Furthermore, as part of the ongoing SNPL and CLTE management program, all ranger and park staff receive a training on CLTE in the HCP area. As a result, these effects are considered minimal.

4.4.1.4.2 Emergency Response (CA-33)

Emergency medical and law enforcement responses by CDPR staff, which are important for maintaining human safety, can occur anywhere within the HCP area and are difficult to predict. Occasional, but necessary, high-speed travel by medical and law enforcement vehicles responding to an emergency sometimes occurs in areas without frequent vehicular traffic.

Emergency situations are infrequent in areas where CLTE typically nest, forage, or roost during the breeding season. However, emergency vehicles must respond to human safety issues and may need to enter areas occupied by breeding CLTE. Therefore, impacts to nesting, foraging, and roosting CLTE are discussed further below.

Nesting Impacts. If an emergency occurs within the seasonal exclosure, it can be highly disruptive to CLTE as adults may flush from the nest and leave the eggs unattended for the duration of the disturbance. CLTE nests or chicks can be abandoned if the adult is injured, killed, or severely disturbed to the point it does not return to the eggs or chick. Chicks can also react to the disturbance by running away, and they may move into the open riding area or become separated from adults. Although emergency response can occur within the seasonal exclosure, such events are rare and do not occur in most years. Furthermore, as part of the ongoing SNPL and CLTE management program in the HCP area, monitors inform emergency responders of the locations of sensitive areas and escort emergency response personnel into and out of the seasonal exclosure to minimize the potential for vehicle strike when feasible. Monitors also attempt to survey the area once the emergency situation has been resolved and cleared of emergency personnel in order to document and address, to the extent feasible, any impacts (e.g., missing or broken fencing) that occurred. Emergency vehicles have not been documented impacting CLTE within the seasonal exclosure to date. As a result, effects on CLTE inside the seasonal exclosure are expected to continue to be minimal.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE can nest outside the exclosure (e.g., near Arroyo Grande Creek and in the open riding area). Emergency vehicles can crush eggs or chicks in an active CLTE nest that is outside a seasonal exclosure and not yet identified by monitors. To reduce impacts to any CLTE nests outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. In the unlikely event that a CLTE nest is found established outside the seasonal exclosure, it will be protected by a single-nest exclosure (section 5.3.1), thus reducing the likelihood of vehicle strike. In addition, emergency responders are informed of the locations of areas that are sensitive (e.g., seasonal exclosures, shoreline foraging/brooding areas), to the extent feasible, and signs will continue to be posted to mark these areas. Permitted monitors will also continue to escort emergency vehicles into areas that are sensitive if the situation allows for this opportunity. As a result, direct impacts to nesting CLTE outside the seasonal exclosure due to emergency response will continue to be minimal.

Foraging and/or Roosting Impacts. CLTE forage over water and are thus not at risk of being struck by a speeding emergency vehicle while foraging. In addition, most CLTE roost within an exclosure (e.g., 6 Exclosure and 7 Exclosure) where they are generally not at risk of being struck by a speeding emergency vehicle. However, CLTE that do roost along the shoreline or adjacent to the lagoons and are not protected by an exclosure can be struck by a speeding emergency vehicle. As part of the ongoing SNPL and CLTE management program, monitors attempt to minimize mortality and/or injury during an emergency response by escorting emergency vehicles into areas where CLTE roost, if the emergency situation allows. In addition, high speed travel by emergency vehicles within CLTE breeding habitat is rare. An emergency vehicle has not been observed striking a roosting CLTE in the HCP area to date; however, this event may be difficult to observe. Therefore, although unlikely, it is possible that a roosting CLTE could be struck by an emergency vehicle.

Emergency response activities can also disturb and/or deter foraging CLTE, although since CLTE forage over water, it is unlikely any land-based emergency response will disturb foraging CLTE to any significant degree. Some aquatic emergency response is required in the HCP area. However, these activities are typically localized, and adequate alternative foraging habitat is present in and adjacent to the HCP area. As a result, this impact is considered to be minimal.

4.4.1.4.3 Access by Non-CDPR Vehicles (CA-34)

In the past, vehicles driven by non-CDPR personnel including law enforcement agencies, salvage personnel, and marine mammal rescue, may have caused unpredictable disturbances, often involving multiple vehicles and unrestricted access to the shoreline. However, the District has enacted policies requiring non-park personnel to notify park staff when access to park lands is necessary. Non-park personnel that are granted vehicular access are informed of any restricted areas or other special conditions before entering the HCP area. Except in cases of extreme emergencies, this practice has eliminated resource damage and greatly reduced mortality, injury, and disturbance to CLTE.

Nesting Impacts. Effects from emergencies associated with non-CDPR vehicles are similar to those effects described in section 4.4.1.4.2, but CDPR is not always able to train non-CDPR responders. Therefore, some vehicle strike may not be avoided if the emergency requires a non-CDPR vehicle to travel through areas where CLTE are present.

Medevac helicopters are also sometimes used in the HCP area during emergencies. Medevac helicopters flying low over or landing within occupied CLTE habitat can cause significant disturbance to nesting, roosting, and/or foraging CLTE. The noise from the helicopter may be highly disruptive to CLTE and the helicopter itself may be seen as a threat. Adults may flush from the nest and leave the eggs unattended and CLTE nests or chicks may be abandoned if the adult is disturbed enough it does not return to the

nest or chicks. Chicks may be separated from adults and they may move into the open riding area where they become vulnerable to vehicle strike. In addition, helicopters may lead to increased vigilance in adults which may lead to them being energetically stressed or to reduced foraging. However, helicopter activity is an infrequent event in the HCP area, especially in areas where CLTE typically nest, forage, and/or roost; therefore, this impact is rarely (if ever) expected to occur. The following paragraphs detail effects from non-emergency activities.

Non-emergency non-CDPR vehicles do not enter the seasonal exclosure; therefore, impacts to CLTE nesting within the seasonal exclosure do not occur.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE can nest outside the exclosure (e.g., near Arroyo Grande Creek and in the open riding area). Non-emergency non-CDPR vehicles may enter some of these areas. These vehicles driving through habitat occupied by CLTE can strike individual chicks or nests that are outside the protection of an exclosure and not yet identified by monitors. To reduce the potential to impact a CLTE nest outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures.

In the unlikely event a CLTE nest is found outside an exclosure, it will be protected by a large single-nest exclosure (section 5.3.1), thus reducing the likelihood of a vehicle striking an incubating CLTE or crushing a nest and to ensure that non-emergency allied agencies working in the HCP area do not disturb the nesting bird. Furthermore, if a CLTE chick is observed traveling outside a single-nest exclosure, monitors will increase the exclosure in size up to 660 feet in radius, and silt fencing will be used around the exclosure fence to ensure that allied agencies activities do not result in the loss of chicks. As a result, direct impacts to nesting CLTE outside the seasonal exclosure due to non-emergency non-CDPR vehicles will continue to be minimal.

Foraging and/or Roosting Impacts. Non-CDPR vehicles do not disturb or strike foraging CLTE since CLTE forage over water.

Non-emergency non-CDPR vehicles generally access areas open to public vehicles along the beach and adjacent shoreline. Disturbance of roosting CLTE may occur when these activities are located near occupied CLTE roosting habitat. In addition, vehicle strikes of roosting CLTE adults, juveniles, or chicks can occur if vehicles travel directly through areas where CLTE are roosting. To reduce the potential for a vehicle striking a roosting CLTE during a non-emergency response, all vehicles must travel at a speed no greater than 15 mph. In addition, as part of the ongoing SNPL and CLTE management program, when possible, CDPR has a permitted monitor escort non-emergency non-CDPR vehicles into otherwise closed areas to minimize disturbance to CLTE in these areas. As a result, impacts to roosting CLTE from non-emergency non-CDPR vehicles are considered to be minimal.

4.4.1.4.4 Beach Concessions (CA-36)

Most concession services operate throughout the open riding area. The effects of concession services such as towing and wastewater pumping are similar to the effects of general facilities maintenance discussed in section 4.4.1.3.2. The effects of camper rentals are similar to the effects of other campers as discussed in section 4.4.1.1.2.

Nesting Impacts. The effects specific to OHV rentals are addressed in section 4.4.1.1.1. Although CLTE almost exclusively nest within the Southern Exclosure, CLTE have infrequently nested outside the protection of the exclosure and could continue to do so in the future. Although CLTE have never nested near the OHV rental location between Post 2 and 2.5 in the past, it is located in an area mapped as primary habitat and CLTE could potentially nest at this location. Visitors to the OHV rental location could

crush eggs, chicks, or adults or disturb CLTE chicks or adults in an active CLTE nest that is outside a seasonal exclosure and not yet identified by monitors. To reduce the potential to impact a CLTE nest outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. In addition, any nests found outside a seasonal exclosure will be quickly protected by a large single-nest exclosure (section 5.3.1), thus reducing the likelihood of a vehicle destroying or disturbing a nest and to ensure that visitors do not disturb the nesting bird. As a result, direct impacts to nesting CLTE in the OHV rental area are unlikely.

Foraging and/or Roosting Impacts. CLTE may roost along the shoreline south of Grand Avenue, an area open to street-legal vehicles. Vehicles driving to or from concession services may strike individual CLTE or flush them from their location and cause them to become energetically stressed. To reduce the potential to disturb or strike a foraging or roosting CLTE, as part of the ongoing SNPL and CLTE management program in the HCP area, all concession service staff receive a focused training on CLTE life history and regulations, and all concession service vehicles are required to abide by the speed limit. As a result, impacts from concessions is considered to be minimal.

4.4.1.4.5 Pismo Beach Golf Course Operations (CA-37)

In over 20 years of observation, CLTE have not been recorded using the water features of the golf course to forage. Pismo Beach golf course operations do not affect CLTE since the golf course is not located within or near CLTE breeding or foraging habitat.

4.4.1.4.6 Grover Beach Lodge and Conference Center (CA-38)

Grover Beach lodge and conference center will not affect CLTE since the lodge and the conference center are not located within or near CLTE breeding or foraging habitat.

4.4.1.4.7 Natural History and Interpretation Programs (CA-39)

Nesting Impacts. Trailers may be towed by CDPR staff to the beach to provide additional, impromptu, interpretive programs. These trailers are placed outside of actively used CLTE nesting, roosting, and foraging habitat. Therefore, effects on CLTE from use of the trailers do not occur.

Foraging and/or Roosting Impacts. Natural history and interpretive programs occur at Oso Flaco Lake where CLTE forage. The footbridge hand railing at Oso Flaco Lake is also used by CLTE for perching after chicks have fledged and when adult birds are teaching fledglings to fish in the lake. As a result, foraging and roosting CLTE can be temporarily disturbed by noise and activities associated with interpretive walks and field trips at Oso Flaco Lake. To minimize possible disturbance to foraging and/or roosting CLTE at Oso Flaco Lake, CDPR will continue to either hold programs when CLTE are not present or observe CLTE behavior and modify the program to avoid disturbance. Therefore, effects on CLTE from interpretive programs are considered to be minimal.

4.4.1.5 Other HCP Covered Activities

4.4.1.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

Nesting Impacts. CLTE are not known to nest near Pismo/Carpenter Creek. In addition, CLTE have not nested near Arroyo Grande Creek since 2005. Therefore, impacts to nesting CLTE in these areas are unlikely.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE may nest outside the protection of the exclosure near Oso Flaco Creek. Due to the cryptic nature of chicks and eggs, vehicles might crush eggs, chicks, or adults or disturb CLTE chicks or adults in an active CLTE nest that is outside a

seasonal exclosure and not yet identified by monitors. However, any crossing of Oso Flaco Creek is close to the shore where CLTE do not nest. As a result, impacts to CLTE nesting outside the seasonal exclosure are unlikely.

Foraging and/or Roosting Impacts. Effects on foraging CLTE during motorized vehicle crossings of Pismo/Carpenter Creek, Oso Flaco Creek, or Arroyo Grande Creek are minimal since CLTE forage over water and do not typically forage within the portion of the creek that vehicles will cross. In addition, any vehicle crossing is typically short in duration only lasting a few minutes.

Vehicles crossing creeks drive along the shoreline where CLTE may roost, although most roosting along Arroyo Grande Creek and Pismo Creek occurs at the end of the breeding season after most chicks have fledged. Disturbance of roosting CLTE can occur when these activities are located near occupied CLTE roosting habitat. In addition, vehicles crossing creeks can strike a roosting adult or juvenile, although any roosting bird is able to fly out of harm's way. As with general maintenance activities, impacts to CLTE from CDPR vehicles is minimal due to the implementation of AMMs and the short duration of the creek crossing. Impacts to CLTE from visitors is also somewhat limited due to the short duration of the vehicle crossing the creek and moving to another part of the HCP area. In addition, all vehicles travel at a speed no greater than 15 mph along the shoreline to reduce the risk of a vehicle striking a roosting bird. As a result, vehicle strike is unlikely, although it may still occur if a roosting bird is not seen and doesn't fly out of harm's way.

4.4.1.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

Nesting Impacts. CLTE are not known to nest near Pismo Creek. Therefore, impacts to nesting CLTE at Pismo Creek from the installation of Pismo Creek Estuary seasonal bridge are not expected.

Foraging and/or Roosting Impacts. CLTE could use the Pismo Creek bridge handrails, once installed, for roosting, including after chicks have fledged and adults are teaching fledglings to fish; therefore, installation, use, and removal of the bridge could disturb roosting CLTE. To reduce impacts to foraging and/or roosting CLTE, CDPR will continue to implement the SNPL and CLTE management program. Therefore, surveys will be conducted prior to bridge installation and removal to ensure that CLTE are not present in the area. If CLTE are observed, bridge installation or removal will be delayed until the birds have left the area. In addition, CDPR has established an AMM specific to the future bridge location that requires the bridge to be closed to public use until the birds have left the area if visitor activities are observed to be disturbing foraging or roosting CLTE at the bridge location. Therefore, effects from the installation and use of the floating bridge are anticipated to be minimal.

4.4.1.5.3 Riding in 40 Acres (CA-42)

Riding in 40 Acres will be located outside the seasonal exclosure and within tertiary CLTE breeding and roosting habitat. No foraging habitat is present. Therefore, impacts to nesting, roosting, and foraging CLTE are not expected. CLTE have been observed flying through the 40 Acres area to reach suitable lake foraging habitat nearby. At times, CLTE have been observed flying as low as 15 feet. At this height, although unlikely, they could be struck by a vehicle traveling through the 40 Acres area. Although the potential for vehicle strike is low, it does exist.

4.4.1.5.4 Replacement of the Safety and Education Center (CA-43)

Nesting Impacts. Almost all CLTE nest inside the Southern Exclosure, which is south of the safety and education center. As a result, the nests within the Southern Exclosure are not anticipated to be impacted by the replacement of the safety and education center.

Although CLTE almost exclusively nest within the Southern Exclosure, CLTE have infrequently nested outside the protection of the exclosure. The safety and education center is located north of Post 5 near

the Pipeline vegetation island, which is within primary habitat for CLTE. Therefore, replacement of this facility could result in destruction or disturbance of a CLTE nest or chicks outside the seasonal exclosure and not yet discovered by monitors. To reduce the potential to impact a CLTE nest outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside these exclosures. Any nests found outside a seasonal exclosure will be quickly protected by a large single-nest exclosure (section 5.3.1). As a result, impacts to CLTE nests or chicks outside the seasonal exclosure from replacement of the safety and education center will be minimal.

Foraging and/or Roosting Impacts. Effects on foraging and roosting CLTE are not expected during the replacement of the safety and education center since CLTE do not forage on land and they are not known to roost in this area.

4.4.1.5.5 Dust Control Activities (CA-44)

Numerous dust control measures are already in place in the HCP area (section 2.2.5.4) and are expected to continue during the permit term. In addition to these measures, CDPR has agreed to implement additional dust control measures, including 1) permanently closing off sections of open riding area to motorized recreation and camping; 2) installing track-out devices at the Grand Avenue and Pier Avenue entrances to prevent track-out of sand onto paved, public roadways; and 3) preparing a PMRP. Most new dust control activities will occur within the backdune area, which is considered tertiary habitat for CLTE. Dust control activities in tertiary habitat will not impact CLTE. A description of the impacts to associated with dust control activities in primary and secondary CLTE habitat follows.

Nesting, Foraging, and/or Roosting Impacts. Activities associated with dust control (e.g., vegetation planting, placement, and maintenance of artificial dust control measures, and maintenance of a temporary monitoring site) will not occur within the Southern Exclosure where CLTE almost exclusively nest. Additionally, additional foredune vegetation is expected to be installed during the rainy season, which concludes prior to CLTE arriving onsite for breeding. Activities will also not be conducted within aquatic habitat. As a result, impacts to nesting, roosting, and foraging CLTE from dust control installation are not expected.

The 48-acre fenced area for a foredune, in which CDPR installed experimental planting treatments in February 2020, is located outside the seasonal exclosure area but within CLTE primary habitat. In addition, approximately 4 additional acres of foredune area are proposed to be vegetated as part of the dust control activities. It is assumed that the 4 acres of new foredune vegetation will also be in CLTE primary habitat. Any associated air quality monitoring equipment could also be in primary habitat but would be outside of the seasonal exclosure.

In recent years, CLTE have selected an area within the 6 Exclosure for a night roost. The fencing around the foredune area creates a large closed area that at least initially—prior to extensive vegetation establishment—may be suitable for a CLTE night roost. Should CLTE change the location of their night roost to the foredune area, pedestrian and vehicle activities adjacent to the foredune could disrupt night-roosting CLTE. To reduce the risk of disturbance impacts, CDPR will continue to implement the SNPL and CLTE management program in the HCP area. Environmental Scientists will continue to closely monitor the CLTE night roost and will be able to identify most changes in roosting behavior. Over the past 10 years, the night roost has been located within the seasonal exclosure. If the location of the night roost changes, CDPR has a protocol in place to protect the CLTE in the night roost from disturbance by recreation activities, including, but not limited to, implementing an appropriate no-disturbance buffer of 330 feet around the night roost. Thus, impacts to CLTE in the night roost will be minimized.

Once planted, both areas will be initially closed to pedestrians but open to CDPR staff needing to maintain the vegetated areas. The areas will be opened to pedestrians once CDPR has determined that the vegetation is adequately established. CLTE almost exclusively nest in the Southern Exclosure. As a result, CLTE are not expected to nest within the new foredune areas. However, the new foredune site in particular creates a large closed area that at least initially—prior to vegetation establishment—may be conducive to nesting. If a CLTE nest is established outside the seasonal exclosure in the new foredune area, the cryptic nature of CLTE nests and chicks makes it possible for a nest/chick to be crushed/killed or injured if a nest has not yet been identified by monitors. In addition, vehicle and/or pedestrian activities in the foredune vicinity, and maintenance and pedestrian activities within the foredune itself, could result in disturbance of nesting CLTE, and CLTE could be deterred from incubating eggs or brooding chicks. However, CDPR will implement CLTE AMMs, as appropriate, including CLTE AMMs 1 through 23 to reduce the risk of crushing/killing or injuring a nest/chick. These AMMs include conducting daily searches for nests in the foredune areas, protecting any nests found with a single-nest exclosure, and ensuring a minimum 330-foot nest avoidance buffer around any CLTE nests. As a result, this impact will be minimal.

The foredune area may increase recreation and motorized activity directly adjacent to the 6 Exclosure as vehicles travel within the gap between the 6 Exclosure and southern edge of the foredune. Recreation and motorized activity adjacent to the 6 Exclosure could result in disturbance to nesting CLTE if they nested near the fenceline of the 6 Exclosure. However, for at least the last 8 years, CLTE have not been observed nesting near the fenceline of the 6 Exclosure (Map 13). In addition, CDPR will continue to implement the CLTE and SNPL management program, which includes ensuring that a minimum 330-foot no-disturbance buffer is implemented around any CLTE nest and increasing this buffer, as necessary, to ensure nesting CLTE are not disturbed by recreation activities. As a result, this impact will be minimized.

The multi-strand metal fencing used for these foredune areas is similar to fences placed at other vegetation islands. Fences placed in otherwise open habitat can be hazardous to flying birds. Although there are no direct observations of CLTE striking the seasonal exclosure fencing or South Oso Flaco symbolic fence, dead or injured adult/juvenile CLTE have been found within the Southern Exclosure or nearby shoreline. These birds might have been injured or killed due to striking the fence (CDPR 2014a). Based on previous nesting patterns from 2002 to 2018, CLTE are not expected to nest or form a night roost within the newly vegetated foredune areas since they are almost exclusively found nesting and roosting within the Southern Exclosure. As a result, CLTE are unlikely to be impacted by fencing placed around these vegetated areas. However, if CLTE did nest or form a night roost within these areas, it could collide with the multi-strand metal fence when flying from or to the area from another location. In 2015, CDPR placed brightly colored strips of fencing along sections of the Southern Exclosure to increase the visibility of the exclosure fence. The strip of fencing was attempted as an experiment in 2015 and was placed on the western and northern Southern Exclosure fence in 2016 with favorable results (CLTE AMM 75). As a result, if CLTE are observed by a CDPR Environmental Scientist to be at risk of fence collision and it is determined necessary to protect CLTE from the risk of fence collision, CDPR will implement this program by lining the top of the fence with a strip of thicker plastic fencing (orange silt construction fencing cut into approximately 1-foot sections) in March of each year. It is anticipated the visible fencing will reduce or eliminate the likelihood of a CLTE striking a fence in areas where it is installed.

Reduced Habitat. Foredune vegetation associated with dust control activities will be established in CLTE primary habitat. Ultimately, approximately 52 acres of primary habitat will be planted with foredune vegetation, which could make it less suitable for CLTE nesting. Additional vegetation may also be planted within and/or adjacent to CLTE secondary habitat. However, CLTE currently nest almost exclusively within the Southern Exclosure and have avoided nesting in habitat north of Post 6 due to the heavy

recreation use occurring in this area. In addition, randomly spacing the native foredune vegetation will avoid creating areas of heavy vegetation; therefore, the area would still retain some suitable CLTE nesting habitat characteristics. CDPR will also implement all AMMs (Table 5-3), as appropriate, to reduce impacts associated with dust control. With these measures, impacts are expected to be reduced.

Increased Predators. Vegetation planted for dust control, especially vegetation planted within primary or secondary habitat, may impact breeding CLTE by providing habitat for mammalian predators to hide and stalk nesting and/or roosting CLTE. At this time, these indirect impacts from dust control activities are not known. CDPR will implement all CLTE AMMs (Table 5-3), as appropriate, to reduce impacts from dust control activities. These measures will include erecting single-nest exclosures as needed around any CLTE nests that occur within the foredune or Pavilion Hill. In addition, CDPR's predator management program has been successful at controlling predators that are observed targeting or disturbing CLTE adults, chicks, or eggs. The predator management program has likely increased reproductive success for CLTE and is expected to alleviate any impacts associated with additional vegetation being planted near CLTE habitat. CDPR reviews the predator management plan each year, in coordination with USFWS, and updates it to identify additional appropriate measures to address increased or new predators, if necessary. As a result, these effects are anticipated to be minimal.

4.4.1.5.6 Cultural Resources Management (CA-45)

Cultural resource management activities are generally conducted outside areas where CLTE are typically observed or outside the CLTE breeding season and do not affect CLTE. In the unlikely event that cultural resource management activities must occur in CLTE areas where CLTE typically nest, forage, and/or roost in the future during the breeding season, these activities could disturb and/or displace CLTE from roosting or nesting. To reduce any impacts from cultural resource management activities, CDPR will continue to implement the SNPL and CLTE management program. Therefore, surveys will continue to be conducted in areas where CLTE could occur to ensure CLTE nests, adults, and chicks are not present within and near the cultural resource management area, and activities will be delayed until an experienced monitor determines that no impacts will occur if a CLTE is observed during the surveys. Furthermore, environmental monitors will continue accompanying archaeologists in the field when cultural resources protection work will be occurring within or adjacent to the seasonal exclosure where CLTE are known to nest and roost to limit the potential for disturbance to nesting or roosting CLTE. Therefore, the effects from cultural resources management are considered to be minimal and will continue to be minimal in the future.

4.4.1.5.7 CDPR Management of Agricultural Lands (CA-46)

Management on agricultural lands does not affect CLTE since agricultural lands are not CLTE breeding or foraging habitat.

4.4.1.5.8 Maintenance of a Bioreactor on Agricultural Lands (CA-47)

Maintenance of a bioreactor on agricultural lands does not affect CLTE since the agricultural lands are not CLTE breeding or foraging habitat.

4.4.1.5.9 Oso Flaco Lake Boardwalk Replacement (CA-48)

Nesting Impacts. Oso Flaco Lake is not CLTE nesting habitat; therefore, CLTE nests will not be affected.

Foraging and/or Roosting Impacts. CLTE could use the Oso Flaco Lake boardwalk handrails for roosting, including after chicks have fledged and adults are teaching fledglings to fish. Oso Flaco Lake is also used by CLTE to forage for fish. Therefore, Oso Flaco Lake boardwalk replacement could disturb foraging and/or roosting CLTE if work is conducted when CLTE are likely to be present in the HCP area (generally April 15 to September 15). To reduce impacts to foraging and/or roosting CLTE at Oso Flaco Lake,

surveys will be conducted prior to any boardwalk construction to assess whether CLTE are present in the area, and if so, whether CLTE may be disturbed. If so, the biologist will delay construction activities within 250 feet of the CLTE until it leaves of its own accord. Additionally, the Oso Flaco Lake boardwalk is a long structure that will be replaced in sections, leaving many sections of the boardwalk and surrounding lake undisturbed at any given time. Given the surveys for CLTE, establishment of a buffer if needed, and the remaining undisturbed aquatic habitat, effects of replacing the boardwalk on CLTE are expected to be minimal. CDPR will also develop additional AMMs prior to the activity, if deemed necessary, as part of the adaptive management process (section 5.6).

4.4.1.5.10 Special Projects (CA-49)

Nesting Impacts. Special projects include activities required to meet a facility's need, such as installing vault toilets (section 2.2.5.10). Though the actual location of the special projects is not yet known, this HCP anticipates that special projects could directly affect up to 35 acres of 4,511 acres of available CLTE habitat over the permit term, although only 1,003 acres are within primary and/or secondary habitat (i.e., 727 acres in primary habitat and 276 acres in secondary habitat where CLTE may potentially nest). Special projects within tertiary habitat are not expected to affect CLTE since CLTE rarely, if ever, occur within tertiary habitat. Specials projects in primary and secondary habitat will be conducted outside of the CLTE breeding season to the extent feasible. If special projects in primary and secondary habitat are conducted during the breeding season, they will not be conducted within the seasonal exclosure; therefore, nesting CLTE are not expected to be affected by special projects since CLTE almost exclusively nest within the seasonal exclosure.

Should a CLTE pair nest outside the seasonal exclosure, construction activities and vehicles associated with special project construction could crush eggs, chicks, or adults or disturb CLTE chicks or adults in an active CLTE nest that is outside a seasonal exclosure and not yet identified by monitors. To reduce impacts to SNPL nests that could occur outside the seasonal exclosure, CDPR will continue to implement the SNPL and CLTE management program. Therefore, monitors will continue to conduct daily searches for nests in potential nesting habitat that is outside the seasonal exclosure, and any nests found outside a seasonal exclosure will be located and quickly protected by a large single-nest exclosure, thus reducing the likelihood of construction activities destructing or disturbing a nest. Furthermore, special project plans, including AMMs (e.g., conducting surveys prior to special project activities and delaying construction until CLTE are no longer in the area), will be submitted to the USFWS for review and approval prior to constructing a special project that could impact CLTE. As a result, this effect is expected to be minimal.

Foraging and/or Roosting Impacts. Foraging CLTE are not expected to be affected by special projects, since special projects will not occur within aquatic habitat.[58] Roosting CLTE may be disturbed during special project activities because roosting activities could be interrupted. However, 3,488 acres of the 4,512 acres where special projects could occur are located in tertiary habitat, where CLTE are not expected to roost. Special project activities are expected to be infrequent and short duration in CLTE primary and secondary habitat and will not occur in areas where CLTE typically roost (i.e., the seasonal exclosure). In addition, special project plans, including AMMs (e.g., conducting surveys prior to special project activities and delaying construction until CLTE are no longer in the area), will be submitted to the USFWS for review and approval prior to constructing a special project in areas that could impact CLTE. As a result, this effect is expected to be minimal.

[58] Effects of boardwalk replacement at Oso Flaco Lake are described in section 4.4.1.5.9.

Reduced Habitat. The placement of special projects within CLTE primary and secondary breeding habitat reduces the amount of habitat available to CLTE for breeding by precluding them from nesting within the footprint of the structures. However, special projects will rarely be placed within primary and/or secondary habitat. In addition, special projects are small (i.e., not to exceed 35 acres over the permit term), and they are placed in areas where CLTE do not typically nest (i.e., outside the seasonal exclosure). In addition, special project plans within areas that could impact CLTE will be submitted to the USFWS for review and approval prior to construction. Therefore, this effect is anticipated to be minimal.

4.4.1.5.11 Reduction of the Boneyard and 6 Exclosures (CA-50)

Reduction of the Boneyard and 6 exclosures is not expected to result in additional impacts to adult and/or juvenile CLTE beyond those described above for motorized recreation (section 4.4.1.1.1) and pedestrian activities (section 4.4.1.1.3) since CLTE almost exclusively nest within the protection of exclosure fences. In addition, CLTE AMMs would be implemented, as appropriate, including installing single-nest exclosures or bumpouts around any CLTE nest within the open riding area and any CLTE adults and/or juveniles found outside an exclosure would typically be expected to fly out of harm's way.

Elimination of East Boneyard (49 acres) and incremental elimination of 6 Exclosure (60 acres) could result in the permanent loss of up to 109 acres of protected breeding habitat. This reduction represents approximately one-third of the 368 acres of CLTE breeding habitat currently protected by the seasonal exclosure (300 acres in the Southern Exclosure and 68 acres in Oso Flaco Exclosure).

It is expected that the removal of the East Boneyard Exclosure from the Southern Exclosure could be accomplished with no direct impact on nesting CLTE at East Boneyard because CLTE have not nested there since 2005. CLTE are also not known to form their night roost in the East Boneyard Exclosure; therefore, it is expected the East Boneyard Exclosure can be removed with no direct impact on roosting CLTE.

CLTE are known to nest within the West Boneyard Exclosure, and previously the East Boneyard Exclosure provided a buffer from any recreational disturbance in the open riding area. Removal of the East Boneyard Exclosure will thus result in motorized recreation activities adjacent to the West Boneyard Exclosure where CLTE could nest. However, if any CLTE within the West Boneyard Exclosure are observed to be disturbed by increased recreation and/or new travel patterns within the former adjacent East Boneyard Exclosure, a bumpout will be installed as described in the CLTE AMMs to ensure that disturbance in this area is minimized. As a result, this impact is expected to be minimal.

The 6 Exclosure has had greater nesting success and is one of the higher producing exclosure areas. From 2005 to 2018, between 4 and 39 CLTE nests (i.e., 35 to 80 percent of the total CLTE nests) have been established in the 6 Exclosure annually. Therefore, removal of some of the 6 Exclosure could expose nesting and/or roosting CLTE to recreation and other activities. Individuals not protected by the exclosure fence could be killed, injured, or disturbed if activities occur close by. However, from 2005 to 2018, only one CLTE nest has occurred within the upper 328 feet[59] of the 6 Exclosure. As a result, the 6 Exclosure reduction could expose one nest during the first incremental decrease of the exclosure, although this is unlikely since CLTE are expected to avoid areas that are regularly disturbed and continue to move south in the protected seasonal exclosure area. If the entire 6 Exclosure is removed, between 4

[59] CDPR may reduce the exclosure via other configurations, such as east-to-west. Both scenarios are expected to result in similar impacts since CLTE almost exclusively nest within the Southern Exclosure and do not use the shoreline to forage. For consistency with the SNPL analysis, this section focuses on a north-to-south, 328-foot or approximately 7.5-acre reduction.

and 39 nests could be exposed to recreation, assuming they do not relocate. In addition, if the CLTE population increases, then more CLTE breeding activity might occur in the open riding area.

During the breeding season, adult CLTE not engaged in incubation or chick care often assemble in a communal night roost and are joined by fledglings later in the breeding season. From 2007 to 2018, the high count of CLTE in the night roost has ranged from 35 to 95. The CLTE night roost has been located in the northern portion of the 6 Exclosure since 2004, except in 2015 when CLTE also used the 7 Exclosure. Therefore, reduction of the 6 Exclosure will reduce the habitat available for the CLTE night roost. Although unlikely,[60] if CLTE do form the night roost in the former 6 Exclosure area that is open to vehicles and recreation, between 35 and 95 individuals could be susceptible to vehicle strike and/or disturbance from recreation. Disturbance could deter CLTE from resting and could result in increased vigilance and stress.

From 2005 to 2018, the average density of CLTE nests within the 6 Exclosure has ranged from 0.01 to 0.9 nest/acre. CLTE chicks and adults have been observed leaving the exclosure and entering the open riding area in some years. Reduction of the 6 Exclosure could exacerbate this this issue by reducing the amount of habitat available for nesting and rearing chicks so that nests must be established in closer proximity and adults are pushed into the open riding area more frequently. If the 6 Exclosure is reduced incrementally by 328 feet in a breeding season, CLTE that would otherwise establish nests in the former closure area may instead move south into the remaining protected area, which would increase the density of nests in the 6 Exclosure. Ideally, adequate habitat would be available for CLTE to continue to nest without adverse interactions; however, in a worst-case scenario, nest density could increase to a point where CLTE nests and chicks could be pushed into the open riding area.

To ensure that CLTE continue to nest and roost within the HCP area at levels that contribute to the overall population of CLTE, the 6 Exclosure will not be reduced unless specific criteria are met (section 5.2.3) and maintained, including obtaining a CLTE breeding population with a 5-year average of 35 nesting pairs and a fledge rate of 1.0 fledglings per pair over the same period. In addition, the exclosure will be reduced in increments (e.g., 328-foot sections per year), allowing for close monitoring of and response to any nests initiated outside the exclosure. Any such nests would be protected by a large single-nest exclosure, thus reducing the likelihood of impacting nesting CLTE. If a CLTE chick is observed traveling outside a single-nest exclosure, the fencing would be increased by a maximum radius of 600 feet, with silt fencing used around the exclosure fence to ensure that vehicles do not crush eggs or strike chicks. Furthermore, monitors will track changes in the night roosting behavior of CLTE and ensure the night roosts are protected within an exclosure. If a night roost is found outside the fenced area, CDPR will close off the night roost area with fencing as soon as possible and implement a 330-foot no-disturbance buffer around the night roost. With these measures in place, the effects of reducing the Boneyard and 6 Exclosures on CLTE are expected to be reduced by minimizing mortality and disturbance-related impacts and ensuring that a viable population of CLTE continues to breed within the HCP area.

4.4.1.5.12 Use of Pesticides (CA-51)

While the risk characterization for each pesticide focuses on the potential for direct toxic effects, potential for indirect effects exists in virtually all groups of non-target organisms. Terrestrial applications of any effective herbicide are likely to alter vegetation within the treatment area. This alteration could

[60] CLTE are expected to move south and form a night roost in the protected area that is free of disturbance. In addition, the night roost is regularly monitored, so impacts related to a change in night roost location are expected to be observed quickly.

have indirect effects on terrestrial or aquatic animals, including changes in food availability and habitat quality. These indirect effects may be beneficial to some species and detrimental to other species. Moreover, the magnitude of indirect effects is likely to vary over time. While these concerns are acknowledged, they are not specific to herbicide applications in general. Any effective method for vegetation management, including mechanical methods that do not involve herbicide, could be associated with indirect effects on both animals and non-target vegetation.

Indirect exposure to birds, fish, or amphibians can occur when they eat contaminated prey or vegetation. Direct exposure can occur when birds, fish, or amphibians contact pesticide residues with their skin or eyes or when they inhale vapors or particulates. Expected effects from each pesticide are described in more detail below.

Nesting Impacts. Insecticides are not applied during the CLTE breeding season. Therefore, insecticides will not affect CLTE.

Herbicides are used during the CLTE breeding season; however, they are not used in areas known to be occupied by CLTE. CLTE could be impacted by drift from herbicides sprayed outside, but nearby known breeding areas. In addition, CLTE outside known breeding areas that have not yet been discovered by monitors can be impacted by herbicides as described below for foraging and/or roosting impacts. AMMs listed in section 5.3.1.1 reduce or eliminate these impacts.

Aerial spraying of herbicides has the potential to flush CLTE. However, aerial spraying is conducted in the backdunes, which is outside areas where CLTE nest or roost. In addition, aerial spraying includes a 200-foot buffer from aquatic resources where CLTE forage. As a result, CLTE are not impacted by aerial spraying activities.

Foraging and/or Roosting Impacts. A general description of the location where each herbicide is used in the HCP area in relation to CLTE habitat and the anticipated effects of each herbicide on CLTE follows.

Glyphosate is sometimes used in suitable CLTE habitat (i.e., foredunes and near Oso Flaco Lake) to control European beach grass and Russian wheat grass. Numerous scientific and regulatory reviews have examined the potential direct effects of glyphosate on a wide variety of wildlife species, including birds. Such reviews consistently conclude that the use of glyphosate products in accordance with product labels does not pose a significant risk of either direct acute or chronic toxicity to terrestrial wildlife species (EPA 1993, Giesy et al. 2000, Tatum 2004, SERA 2011a, Pest Management Regulatory Agency 2015). The detailed risk assessment conducted by SERA (2011a) calculated the risk to small mammals and birds based on the relationship between estimated exposure (e.g., via direct overspray or through consumption of contaminated vegetation, water, insects, or fish) following application of glyphosate-based herbicides at a rate equivalent to 2.24 kg acid equivalent/ha, as compared to no observable effect levels in laboratory animals, considering both acute and chronic (longer term exposures). In summary, the author stated that, congruent with the EPA (1993) assessment, “none of the hazard quotients for acute or chronic scenarios reach a level of concern even at the upper ranges of exposure.”

Fluazifop-p-butyl is typically used in the backdunes to control perennial veldt grass. Veldt grass grows in upland habitat; therefore, fluazifop-p-butyl is not typically used in or near CLTE foraging or roosting habitat. In addition, Fluazifop-p-butyl is found to be practically non-toxic (Class 0) to avian species (White 2007).

Imazapyr is sometimes used in suitable CLTE habitat (i.e., foredunes) to control European beach grass and Russian wheat grass. The available avian studies on imazapyr, all of which were conducted up to limit doses, do not report any signs of toxicity (SERA 2011b).

Triclopyr is typically used to control Cape ivy, which occurs in riparian habitat and may occur near CLTE foraging habitat. Triclopyr acid is found to be practically non-toxic (Class 0) to slightly toxic (Class 1) to birds (EPA 1998).

Aminocyclopyracholor is typically used to control iceplant, which sometimes occurs in suitable CLTE habitat (i.e., foredunes). The EPA/Office of Pesticide Programs (2010) classifies aminocyclopyrachlor as practically non-toxic (Class 0) or only slightly toxic (Class 1) to mammals, birds, fish, and aquatic invertebrates (SERA 2012).

Chlorsulfuron is typically used to control iceplant, which sometimes occurs in suitable CLTE habitat (i.e., foredunes). CDPR's current application rates and use patterns for chlorsulfuron pose a negligible risk to wildlife. The EPA pesticide registration process requires toxicological data be supplied to evaluate avian tolerance to chlorsulfuron. Data from the available literature indicate that chlorsulfuron has low toxicity to birds. Acute dietary exposure did not result in toxic effects at 5,000 ppm (equivalent to 500 mg/kg BW-day in mallards) and at 5,620 ppm (equivalent to 3,394 mg/kg BW-day in bobwhite quail) using technical grade chlorsulfuron (ENSR International 2005).

Aminopyralid is typically used to control Cape ivy, which occurs in riparian habitat and may occur near CLTE foraging habitat. In Dow AgroSciences laboratory testing, aminopyralid has been shown to be "practically non-toxic" (Class 0) to birds, fish, honeybees, earthworms, and aquatic invertebrates (EPA 2005, DOW Chemical Company AgroSciences 2008).

Sethoxydim is slightly toxic to birds (SERA 2001); however, it is used in the backdunes to control perennial veldt grass, which is outside areas where CLTE typically nest, forage, and/or roost.

Clethodim is used in the backdunes to control perennial veldt grass, which is outside areas where CLTE typically nest, forage, and/or roost. In addition, clethodim is practically non-toxic to birds and is unlikely to pose a hazard to avian species (SERA 2014).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA ®. Competitor® is a surfactant labeled for aquatic use, with either imazapyr or glyphosate. Little information is available regarding the potential effects of Competitor® on CLTE; however, the product safety data sheet states that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016a). Renegade EA ® is a surfactant labeled for aquatic use that is made of methylated seed oil, UAN solution, and nonionic surfactant. Little information is available regarding the potential effects of Renegade EA® on CLTE; however, the product safety data sheet also states that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016b).

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Based on years of survey data for covered species and implementation of specific AMMs for pesticide use (Chapter 5), pesticide use within the HCP area results in overall benefits to CLTE by preventing invasive plants from taking over CLTE habitat or providing hiding places for predators. Also, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide exposure and associated risks to SNPL decrease with increasing distance away from the treated field or site of application. CDPR takes extra precautions applying pesticides near sensitive habitats that support CLTE. However, contamination may result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. AMMs listed in Chapter 5 reduce or eliminate these impacts.

4.4.1.5.13 CDPR UAS Use for Park Activities (CA-52)

CDPR will avoid flying UAS in areas where breeding CLTE will be affected, if possible. However, CDPR may use drones in or near CLTE nesting or chick-rearing habitat during the breeding season for some activities (e.g., predator management, habitat enhancement, CLTE monitoring). In 2018, prior to the CLTE breeding season, CDPR staff assessed the ability of a UAS to capture the amount of wrack present on the shoreline within SNPL breeding habitat. The UAS was tested over a period of a week and found to be highly effective at assessing habitat distributed by staff. During the UAS flight, CDPR observed a small flock of SNPL and other shorebirds nearby, and the flock did not flush or crouch in response to the UAS. Vas et al. (2015) also assessed reactions by a variety of waterbirds to approaches by UAS and found that the birds remained unaffected in most cases, suggesting the potential to use UAS without significant disturbance. In addition, AMMs (section 5.3.1.2) will be implemented to ensure disturbance from UAS is minimized, including, but not limited to, initiating flights at least 330 feet from the closest known nest location, following existing monitoring guidelines that have been established by USFWS, having a trained biologist scan the area for roosting and nesting CLTE before every flight, having a trained biologist monitor the flight if CLTE are observed, ensuring UAS flight patterns are not erratic so they are not interpreted as an avian predator, and flying UAS at least 100 feet above ground at all times and moving UAS to higher altitude or aborting the mission if UAS are observed disturbing nests or broods. As a result, UASs are expected to have minimal impacts on nesting, foraging, and/or roosting CLTE during the breeding season, although some disturbance may occur depending on the protocol necessary for the specific data gathering. Overall, UAS will likely collect valuable information on CLTE habitat, predators, and breeding that will inform future management decisions within the HCP area.

4.4.2 Anticipated Take of California Least Tern

This section quantifies the potential for incidental take CLTE due to the effects described in the preceding section. Given that both covered activities and the conservation program described in this HCP are largely ongoing, take estimates are based primarily on past take data. However, the take numbers presented in this HCP are based on worst-case past observations of mortality and injury that have rarely been observed during the timeframe from 2002 to 2018 and do not happen every year. Oceano Dunes District will continue to manage for breeding CLTE targets. The estimates recognize that not every egg or individual CLTE may be detected. These data have resulted from long-term, intensive monitoring within the HCP area. It is estimated that a similar level of future take will occur if CDPR maintains a similar set of conditions for the CLTE population within the HCP area in the future.

The following sections estimate incidental take of CLTE based on the effects analyses (section 4.4.1). The effects analyses provide a complete discussion of all aspects of covered activities that could possibly impact the covered species. However, not every effect on a covered species rises to the level of take.

The CLTE is a California fully protected species. As such, CDFW may only permit take of CLTE (as defined by CESA[61]) necessary for scientific research or pursuant to an approved NCCP.[62] CDPR is seeking take authorization from CDFW separately.

[61] Take, as defined under CESA, is any action or attempt to "hunt, pursue, catch, capture, or kill."

[62] Section 2835 of the Fish and Game Code allows CDFW to authorize by permit the taking of any covered species, including those designated as fully protected species, whose conservation and management is provided for in a NCCP approved by CDFW.

This HCP quantifies lethal take, capture, and harm of CLTE within the HCP area in terms of:

- Take of individual CLTE adults, juveniles, chicks, and eggs caused by park operations, recreation, and other activities not related to covered species management
- Take of CLTE caused by covered species management-related activities

CDPR dedicates a significant portion of its staff and other resources to implementing the SNPL and CLTE management program during the breeding season. This program has been modified over the years based on CDFW and USFWS guidance to avoid impacts to CLTE from park operations and recreation activities. As a result, the effects of many of the covered activities on CLTE are not anticipated to rise to the level of take, as defined by FESA. In fact, mortality and/or injury of CLTE in the HCP area due to park operation, recreation, and other activities not related to covered-species management has been infrequent, [63] and no mortalities or injuries of CLTE have been documented in the HCP area as potentially being caused by park operations, recreation, or other activities not related to covered species management since 2003.[64] However, some lethal take or harm of CLTE could still occur despite the infrequency of take to date and the implementation of AMMs. The estimated annual take of CLTE is summarized in Table 4-2 and discussed in detail below.

4.4.2.1 Take of CLTE Adults, Juveniles, Chicks, and Eggs from Park Operations, Recreation, and Other Activities Not Related to Covered Species Management

This section provides an estimate of CLTE take that could occur during covered activities not related to covered species management. Take estimates are generally based on worst-case past observations of CLTE in the HCP area. All take estimates also account for the conservation program measures and AMMs since the conservation program is part of an ongoing practice in the HCP area. Table 4-2 summarizes the estimates for take of CLTE adults, juveniles, chicks, and eggs.

4.4.2.1.1 Take of Adults and Juveniles

CDPR dedicates a significant portion of its staff and other resources to implementing the SNPL and CLTE management program during the breeding season. As a result, take that could otherwise occur during the breeding season is minimized.

Take of adult and juvenile CLTE is most likely to occur from motorized vehicle recreation (section 4.4.1.1.1) and park operations (sections 4.4.1.3 through 4.4.1.5), although some take may occur due to non-motorized vehicle recreation (4.4.1.1.2 through 4.4.1.1.9). Most CLTE nest within the Southern Exclosure and are thus protected from vehicles and disturbance from motorized and non-motorized activities. However, some CLTE could occasionally nest outside the Southern Exclosure in areas open to vehicles and other activities. Park staff monitor the habitat outside the exclosure daily, looking for CLTE and signs that they may be nesting outside the exclosure. Nests found outside the exclosure are protected within large, single-nest exclosures. Although the majority of the nests outside the seasonal exclosure are likely found, due to the cryptic nature of the nests, some nests could go undetected and

[63] Monitoring of CLTE was not conducted regularly in the HCP area until 2001. Therefore, data prior to 2001 only include mortalities or injuries that were incidentally observed in the HCP area. Mortalities and injuries associated with natural resource management are included under management-related take (section 4.4.2.2).

[64] A juvenile CLTE was found with a wing injury in the open riding area in 2014; however, the cause of the wing injury is unknown. Other CLTE individuals with wing injuries have been observed in the HCP area in the past. Although the events causing wing injuries were not observed, they were attributed to potential collision with exclosure fencing. Wing injuries associated with potential collision with exclosure fencing is included under management-related take (section 4.4.2.2).

adults sitting on the nest or protecting the nest could be killed or injured from collisions with motorized vehicles.

Additional take of adults and/or juveniles could occur if park visitors pick up (i.e., "capture") an injured bird. Although this event is rare, a park visitor picked up an injured juvenile in the HCP area and gave it to park staff in 2010.

Fledglings are also sometimes observed in the open riding area. These fledglings are typically monitored and directed back to the exclosure. However, because they are new to flying, they may not move as quickly from an approaching vehicle and thus could be at risk of lethal take during the time they are in the open riding area. in addition, some portion of the juveniles that enter the open riding area may go undetected and could be injured or killed.

Estimates of adult and juvenile CLTE lethal take and/or harm are largely based on the following past observations of injured and dead CLTE. The annual mean minimum number of breeding adults at Oceano Dunes SVRA from 2002 to 2018 was 40 breeding pairs (Table 3-11). From 2001 to 2018, six[65] dead or injured adult and/or juvenile CLTE that could have been killed or injured by trauma were recovered in the areas open to non-motorized and/or motorized recreation. As a result, these deaths could be attributed to motorized and non-motorized activities, including recreation activities and/or park operations. The highest documented mortality of juvenile and/or adult CLTE was in 2003, when two juveniles and/or adults were found dead.

In addition, as stated previously, fledglings are sometimes observed in the open riding area. These fledglings are typically monitored and directed back to the exclosure and no harm occurs. However, because they are new to flying, they may not move as quickly from an approaching vehicle and thus could be at risk of lethal take during the time they are in the open riding area. Although these instances are not always documented, up to 12 juveniles in a year have been observed in the open riding area and directed back to the safety of an exclosure. AMMs are effective at protecting juveniles in the open riding area, however, some portion of these individuals may go undetected. For the purpose of this HCP, it is assumed that two juveniles could enter the open riding area and be injured or killed prior to CDPR implementing AMMs. Additional injured or dead CLTE adults and/or juveniles are found in the HCP area in some years, and the cause for the injury and/or mortality cannot be determined. Some of these injuries and/or mortalities could be the result of non-covered species management-related activities, including park operations and recreation. Therefore, based on these past levels of take, this HCP anticipates that a maximum of six juveniles and/or adults could be injured or killed in the HCP area in a year. In addition, because six juveniles and/or adults being injured or killed per year is based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes only 1 year within a 5-year period will result in the maximum take levels and other years will have lower take levels. As a result, this HCP estimates that no more than 10 juveniles and/or adults will be injured or killed in the HCP area over a 5-year period. Due to size and cryptic coloration, it is assumed the detection rate of dead or injured birds is low, and some birds that are injured or killed are not observed. Therefore, this take estimate considers a worst-case scenario where additional dead birds may not be discovered.

[65] A juvenile was found with a wing injury in the open riding area in 2014 and is included in this number; however, the cause of the wing injury is unknown. Other CLTE individuals with wing injuries have been observed in the HCP area in the past. Although the events causing wing injuries were not observed, they were attributed to potential collision with exclosure fencing. Wing injuries associated with potential collision with exclosure fencing are included under management-related take (section 4.4.2.2).

4.4.2.1.2 Take of Chicks and Eggs

Take of eggs and chicks during recreation, park operations, and other activities that are not related to covered species management may occur by collision with motorized vehicles and by non-motorized activities. Specifically, take may occur if eggs or chicks are abandoned because an adult is killed or injured, such as in a collision with a motorized vehicle. Additional take of eggs or chicks could occur if pedestrians step on eggs or chicks that are not protected within the seasonal exclosure or within a single-nest exclosure. However, such incidents have not been documented in the HCP area; therefore, this risk of take is anticipated to be low. Park visitors may also pick up chicks (i.e., "capture chicks"). To date, a park visitor has not been documented picking up a CLTE chick; however, it has been documented for SNPL and could occur for CLTE.

Recreation, park operations, and other activities not related to covered species management could also disturb attending adults or broods to the extent that adults abandon a nest or chicks are separated from the attending adult and either abandoned or malnourished. This is especially true if adults and chicks leave the safety of the seasonal exclosure and enter an area open to vehicles where they could be separated from adults or struck by a vehicle and are at risk of lethal take. In the HCP area, chicks in the seasonal exclosures are carefully monitored, and most instances when they enter the open riding area are documented. Therefore, it is possible to estimate when chicks are at risk of lethal take based on past observations of these occurrences. However, the likelihood of chicks entering an area open to vehicles has been reduced due to implementation of a minimum 330-foot buffer around CLTE nests, and mortality or injury of a chick that does enter an area open to vehicles is likely a rare event due to the implementation of AMMs, such as stopping traffic in the area and directing chicks back to the safety of the exclosure.

Two CLTE chicks found dead in the HCP area in 1998 and 1999 were considered likely to have been run over by an OHV. These two chick mortalities are the only such occurrences recorded prior to 2001,[66] and other instances have not been documented in the HCP area since that time. Due to the cryptic nature of the chicks, however, it is possible that some small number of mortalities has gone undetected. In addition, based on data collected in the HCP area in the past, chicks have been observed in the open riding area where they are at risk of vehicle strike or being separated from an attending adult. The greatest number of chicks (eight chicks) documented leaving the protection of the exclosures and entering the open riding area where they were at risk of lethal take was in 2008, although chicks are known to have entered the open riding area in other years as well. Although chicks observed in the open riding area are monitored and successfully directed back to the exclosure, they are at risk of being injured or killed for the period of time that they are in the open riding area. In addition, despite intensive monitoring, some chicks may enter the open riding undetected. For the purpose of this HCP, it is assumed that four chicks could enter the open riding area and be injured or killed prior to CDPR implementing AMMs. Additionally, although difficult to document, it is possible that abandonment due to an adult mortality could have occurred that was not observed or attributed to recreation, park operations, or other non-covered species management activities. In this HCP, it is assumed this could occur for up to two chicks a year. This HCP thus anticipates that a maximum of eight chicks[67] could be injured or killed in a year. In addition, because eight chicks being injured or killed in a year is based on a

[66] Monitoring of CLTE was not conducted regularly in the HCP area until 2001. Therefore, data prior to 2001 only includes mortalities that were incidentally observed in the HCP area.

[67] It is assumed that a portion of dead or injured chicks are not detected due to chicks that are scavenged or buried prior to discovery and CLTE cryptic size and coloration. Therefore, this take estimate considers a worst-case scenario where additional dead or injured chicks may not have been discovered in some years.

worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes that only 1 or 2 years within a 5-year period will have the maximum take levels, and other years will have lower take levels. As a result, this HCP estimates that no more than 24 chicks will be injured or killed in the HCP area over a 5-year period due to recreation, park operations, and other non-covered species management activities. Due to size and cryptic coloration, it is assumed the detection rate of dead or injured birds is low. Therefore, this take estimate considers a worst-case scenario where a relatively high amount of incidental take may occur, or some number of dead birds may not be discovered.

The potential for incidental take of eggs (i.e., the potential for eggs to be crushed or abandoned) due to recreation, park operations, and other non-covered species management activities was estimated from the number of nests that were thought to have been abandoned due to an adult being disturbed by recreation activities before a bumpout was installed to reduce disturbance. Between 2001 and 2018, six nests (with up to two eggs each) were thought to have been abandoned due to recreation activities based on direct observation of an adult being disturbed by vehicular or other activity prior to abandonment and/or the proximity of the nest to the open riding area. These nests include one in 2009 (two eggs), three in 2011 (four eggs), and one in 2014 (two eggs). Additionally, although difficult to document, it is possible that abandonment due to an adult mortality could have occurred that was not observed or attributed to recreation, park operations, or other non-covered species management activities. In this HCP, it is assumed this could occur for up to one nest (or two eggs) a year. Therefore, this HCP anticipates there is potential for incidental take of up to a maximum of eight eggs in a year. In addition, because the estimate of eight eggs is likely based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes only 1 or 2 years within a 5-year period will result in the maximum take levels and other years will have lower take levels. As a result, this HCP estimates that take of no more than 22 eggs will occur over a 5-year period. Due to the cryptic nature of the eggs, it is possible that additional abandonment or harm has occurred that was not observed. Therefore, this estimate is also intended to account for incidental take that may not have been detected due to their cryptic nature.

4.4.2.2 Take of CLTE Due to CLTE Management-Related Activities

The HCP's conservation program integrates ongoing management intended to protect and recover CLTE (Chapter 5). Currently, all CLTE management activities are conducted under a USFWS 10(a)(1)(A) permit and CDFW MOU (Appendix C).[68] Overall, the management program has been successful at protecting and enhancing CLTE populations and enhancing reproductive success to levels that allow for population growth (sections 3.3.1.5.1 and 3.3.2.6).

CDPR is requesting authorization of take associated with surveying for CLTE by entering colonies, locating and monitoring (i.e., observing and approaching nests for purposes of banding or seeing and counting contents), and constructing and maintaining protective fences around nest areas.

Management-related take could occur if CLTE individuals or eggs are injured, killed, or otherwise harmed by management actions designed to protect and recover CLTE. Management activities are not anticipated to result in injury or mortality of CLTE within aquatic foraging habitat. Management activities that could result in take of CLTE include, but are not limited to, such actions as banding, which could result in injury of CLTE chicks; an adult or juvenile striking an exclosure fence; monitors entering the

[68] This HCP will include the activities to conduct the management activities in the future. Therefore, separate federal permits may not be necessary.

seasonal exclosure or other active nest areas, which could cause the direct loss of eggs or chicks if they are stepped on or disturb attending adults or broods to the extent that chicks are separated from the attending adult and either abandoned, malnourished, or vulnerable to predators, nearby territorial aggressive adults, and/or vehicle strike and/or eggs are left vulnerable to inclement weather/predators; and the use of a single-nest exclosure that could result in predators keying in on the exclosures and killing or injuring CLTE. Management-related actions may take all life stages of CLTE. This HCP estimates levels of lethal take and/or harm for CLTE eggs, chicks, and adults/juveniles within their breeding habitat as a result of management-related activities. All take estimates also account for the conservation program measures and AMMs since the conservation program is part of an ongoing practice in the HCP area. The following estimates of take are generally based on worst-case-scenario past incidences of management-related take in the HCP area. Table 4-2 summarizes the estimates for take of CLTE adults, juveniles, chicks, and eggs.

4.4.2.2.1 Take of Adults and Juveniles

No adults or juveniles have been directly observed being injured or killed from covered species management-related activities. Overall, exclosure fencing has been demonstrated to protect CLTE adults/juveniles from predation and human disturbance in the HCP area. Some CLTE may be killed or injured if they collide with the exclosure fence when they are flushed from the exclosure. In 2014, two recorded incidents of CLTE injury (both juveniles) and four dead CLTE (three juveniles and one adult) were documented within the 6 Exclosure or nearby shoreline. It is not known how these injuries or mortalities occurred; however, it was suspected that the injuries could have been a result of colliding with the exclosure fence. Additional injuries with unknown causes occurred in 2009 (two injured/dead juveniles), 2010 (two injured juveniles), 2011 (one injured juvenile), 2013 (one injured juvenile), 2015 (two injured/dead juveniles), 2016 (two injured adults/juveniles), and 2017 (one injured adult). These injuries could also have been the result of colliding with the exclosure fence.

Since 2015, AMMs (e.g., marking the top of the seasonal exclosure fenceline with visible orange silt fencing) have been implemented in the HCP area to attempt to prevent mortality or injury from a CLTE striking a fence. Although a CLTE striking a fence will likely be reduced, this HCP accounts for the possibility that it could still occur. As a result, since up to six adults and/or juveniles were killed in 2014, this HCP assumes up to seven[69] adults and/or juveniles could be killed or injured in a year. In addition, because the estimate of seven adults and/or juveniles is likely based on a worst-case scenario and is likely a high estimate of take for most years, this HCP includes a 5-year estimate that assumes only 1 year within a 5-year period will result in the maximum take levels, and other years will have lower take levels. As a result, this HCP estimates that take of no more than 15 adults and/or juveniles will occur over a 5-year period due to management-related activities.

4.4.2.2.2 Take of Chicks

Covered species management activities have greatly increased CLTE reproductive success in the HCP area since 2001. As part of the conservation program in the HCP area, CDPR staff and monitors enter the seasonal exclosure to band chicks and conduct other management-related activities. CDPR staff does not capture CLTE chicks for captive rearing. CDPR staff attempt to band all hatched chicks within the HCP area each breeding season. Although no chicks have been reported as injured or killed during

[69] Although the majority of dead or injured adults/juveniles are likely found, not all dead or injured adults/juveniles are assumed to be detected due to CLTE that are scavenged or buried prior to discovery and CLTE cryptic size and coloration. Therefore, this take estimate considers a worst-case scenario where additional dead or injured adults/juveniles may not have been discovered in some years.

banding activities, chicks are captured in order to conduct the banding activities. Between 2003 and 2018, CDPR has banded between 35 and 101 CLTE chicks each year. As a result, this HCP estimates that up to 150 CLTE chicks could be banded in a year.

Entering the seasonal exclosure for monitoring activities can disturb adults causing CLTE to launch and vocalize and may draw their attention away from the nest or cause them to abandon the nest and leave chicks vulnerable to predation, inclement weather, or starvation. In addition, monitoring activities can flush chicks into the open riding area and a monitor may need to pick up the chicks and move them back to the safety of the exclosure. For example, in 2013 two chicks moved into the open riding area during banding activities and had to be picked up by a monitor and moved to safety. Chicks can also be injured by exclosure fencing, although this has only been documented in the HCP area once in 2010, when a fence wire was observed on a chick and the wing appeared to be injured. As stated previously, adults have been observed with wing injuries and are suspected or colliding with a fence (section 4.4.2.2.1). If these adults are attending chicks, the chicks could be abandoned and thus exposed to inclement weather, starvation, and/or predation. In addition, although it has not been documented in the HCP area to date, adults could be depredated at a single-nest exclosure if a predator keys in on the exclosure, thus, leaving the chicks unattended and exposed to inclement weather and/or predation. Because chick capture, injury, or mortality due to management-related activities has rarely been documented, this HCP assumes that a maximum of up to 8 chicks (i.e., four broods) in 1 year or up to 40 chicks over a 5-year period could be captured, injured, or killed due to management-related activities.

4.4.2.2.3 Take of Eggs

Overall, covered species management activities have greatly increased CLTE reproductive success in the HCP area since 2001. CLTE eggs in the HCP area are not brought to a captive rearing facility because captive rearing of CLTE is currently not an option. However, when a nest with eggs is found abandoned, CDPR currently replaces non-viable eggs from an active nest with the abandoned eggs, if possible. CDPR will continue to do this in the future.

No management-related activities have resulted in a monitor stepping on a nest and crushing eggs. In addition, no CLTE nests are known to have been abandoned due to an adult being killed or injured by striking the exclosure fence, an adult being disturbed by management-related activities, or an adult nesting within a single-nest exclosure being depredated; however, these events may go undocumented and may occur in the HCP area. Monitors entering the nesting colony also have the potential to cause CLTE to launch and vocalize and may draw the attention of CLTE away from nests or cause them to abandon the nest, which could potentially leave the eggs vulnerable to predation and inclement weather. As a result, although egg loss has not been documented, it is possible that take could occur for up to four nests (containing two eggs each) if the nest is abandoned due to management-related activities. Therefore, a maximum take of 8 eggs in a year or 40 eggs over a 5-year period could occur due to management-related activities.

Table 4-2. Summary of Estimated CLTE Take		
Nature of Take[1]	**Annual Take[2] of Individuals**	**5-year Running Take[2] of Individuals**
Park operations, recreation, and other non-covered species management activities	6 adults and/or juveniles 8 chicks 8 eggs	10 adults and/or juveniles 24 chicks 22 eggs
Covered species management-related activities[3]	7 adults and/or juveniles 8 chicks 8 eggs	15 adults and/or juveniles 40 chicks 40 eggs
Banding activities[4] (capture only)	150 chicks	Not Applicable

Notes:

[1] Take estimates include mortality and/or injury/harm unless otherwise noted

[2]In most cases, take numbers presented in this HCP are based on worst-case past observations of mortality and injury that have rarely been observed during the timeframe from 2002 to 2018 and do not happen every year. The numbers do recognize that not every egg or individual CLTE may be detected. The 5-year running average is intended to account for years in which a higher amount of take may occur and will not trigger an amendment to the HCP.

[3]The number of birds captured for banding is not included in this estimate.

[4]CDPR staff attempt to band all CLTE chicks in the HCP area. From 2003 to 2017, between 35 and 101 chicks were banded each breeding season. This estimate is intended to include any increase in future reproductive success in the HCP area.

4.4.3 Anticipated Impacts of the CLTE Taking

This section describes the overall impacts of the anticipated take of CLTE within the HCP area and discusses the overall impacts from covered activities on the entire CLTE population. The assessment of impacts takes into account the implementation of conservation and AMMs, where appropriate, which are described in greater detail in Chapter 5.

As stated previously, CLTE in the HCP area are anticipated to be predominantly affected by motorized activities, and CLTE are expected to be largely precluded from successfully breeding in the HCP area where these activities occur (Map 24). Motorized activities affect CLTE by disturbing nesting and roosting birds (section 4.4.1.1.1). Therefore, in locations where motorized activities occur in the HCP area, CLTE will likely have reduced nesting attempts. Motorized activities also reduce habitat quality (e.g., removing/destroying objects such as kelp and driftwood associated with nesting); reduce microtopographic complexity, which provides cover from predators and inclement weather; and prevent establishment of foredune vegetation, which can provide microhabitat features that can support nesting and roosting.

Non-motorized activities could also affect CLTE, including in areas where motorized recreation does not occur. CLTE will likely be precluded from successfully breeding in the HCP area where non-motorized activities occur (Map 24), depending on the type and intensity of non-motorized use. The effects of non-motorized recreation can be greater when park visitation rates are higher, such as during weekends or holidays. The effects from non-motorized activities include disturbing nesting, roosting, and foraging birds (sections 4.4.1.1.2 through 4.4.1.1.11), making it less likely that CLTE will nest in areas where non-motorized activities are present.

Since CLTE is fully protected, CDPR is preparing an NCCP to address incidental take of CLTE under CESA. Consistent with NCCP issuance criteria, the NCCP will ensure the conservation program provides a

broad-based ecosystem approach to protecting habitat, natural communities, and species diversity for CLTE to offset any impacts from covered activities.

The conservation program activities proposed for coverage under this HCP have been occurring in the HCP area for various periods of time prior to HCP preparation. For example, seasonal exclosures have been used since 1998, and the current configuration of the seasonal exclosure has been used since 2004. In addition, some recreation activities (e.g., motorized and pedestrian activities) have been occurring in the HCP for over a century (section 4.9.1). This historic, intensive use of the beaches and dunes in the HCP area likely resulted in low numbers of CLTE nesting in the HCP area long before the implementation of this HCP. Historical data indicate the HCP area likely supported very few CLTE around the time CDPR began acquiring the Oceano Dunes SVRA lands in 1974. At the time of the CLTE FESA and CESA listing as endangered in 1970, there were approximately 600 breeding pairs of CLTE nesting statewide. Early statewide survey data indicate few CLTE were nesting in the HCP area. Specifically, seven breeding pairs were found in the Oso Flaco Lake area in 1979 and 1980, two breeding pairs were found in the HCP area in 1982, and one breeding pair was found in the HCP area in 1983 (Fancher 1992).

The conservation program associated with this HCP has likely increased CLTE numbers in the HCP area from historic numbers. It has also successfully protected habitat and offset the effects of the covered activities. The conservation program is part of an ongoing program that has been particularly successful at protecting the breeding population of CLTE. This is demonstrated by looking at whether the HCP conservation program goals and objectives have been achieved, including CLTE Objective 2.1 to maintain a 5-year running average of at least 35 breeding CLTE pairs,[70] and CLTE Objective 2.2 to maintain a 3-year average of at least 1.0 fledgling per nesting pair[71] (section 5.2.1). In addition, the program has demonstrated success by increasing the number of CLTE in the HCP area compared to documented numbers prior to the conservation program's implementation.

Although the number of CLTE that breed within the HCP area varies from year to year, at least 35 breeding pairs have been estimated to be in the HCP area in the 5 years from 2014 to 2018, thus exceeding CLTE Objective 2.1. In addition, during the period from 2005 to 2018, there were an average of 41 breeding pairs (range of 23–55). This is an increase from known historic numbers, which, although not as well documented, appeared to be much lower. For example, during the 7-year period from 1991 to 1997, which is just after the first seasonal exclosure was erected, there were an average of 4 breeding pairs (range of 0–16). In addition, from 2008 through 2016, the ongoing conservation program achieved a 3-year average reproduction rate above 1.0 fledgling per nesting pair (i.e., from 2008 to 2010, from 2010 to 2012, from 2012 to 2014, and from 2014 to 2016), which exceeds Objective 2.2 to maintain a 3-year average of at least 1.0 fledgling per nesting pair (Figure 3-8).

In contrast to the previous 10 years, the 2017 CLTE breeding season was characterized by low productivity, with the lowest hatching rate (i.e., only 65 percent of nests hatched), chick fledging rate (i.e., 0.15 fledglings per nesting pair), and number of juveniles produced (i.e., only 18 percent of chicks fledged). It is suspected that predation by striped skunk (*Mephitis mephitis*) of both eggs and young chicks was a factor in the poor breeding season. Even with the poor productivity in 2017, the 3-year average from 2015 through 2017 was still 1.0 fledglings per nesting pair, which met Objective 2.2. However, from 2016 through 2018 the 3-year average dropped below the 1.0 fledglings per nesting pair

[70] CLTE breeding numbers are calculated as a range. This number will be based on the lowest number in the range.
[71] CLTE breeding numbers are calculated as a range and; therefore, fledging rates are also calculated using a range. This number will be based on the lowest number in the range.

to 0.81. Despite the recent fledgling rate, ongoing implementation of the conservation program through this HCP is anticipated to continue providing a net benefit to CLTE and fully offset any impacts from covered activities by achieving the conservation program goals and continuing to increase or maintain a CLTE population of 35 breeding pairs averaged over a running 5-year window and to maintain a 3-year average of at least 1.0 fledgling per nesting CLTE pair in the future.

The CLTE colony in the HCP area is also important for the overall CLTE population in the state since loss of breeding habitat throughout the state has resulted in a fragmented population distribution and limited number of remaining breeding sites (USFWS 2006b). On a regional level, there are very few active breeding sites along the central coast of California, and none remain between the HCP area and the San Francisco Bay. Within San Luis Obispo and Santa Barbara counties, there are four least tern colony sites with annual or intermittent use; all sites have management providing protective measures and monitoring. The HCP area is the only site in San Luis Obispo County. Rancho Guadalupe Dunes County Park, VAFB, and Coal Oil Point Reserve are in Santa Barbara County and approximately 7, 22, and 85 miles south of the HCP area colony, respectively. For this CLTE regional population, the HCP area has become an important source of productivity, producing a little more than 2.5 times as many CLTE juveniles during the period between 2004 and 2018 than the other sites (e.g., the HCP area produced 659 juveniles while the other sites combined produced 262 juveniles).

4.5 California Red-legged Frog

Avoidance and minimization of take of listed species will continue to be the primary goal of CDPR. Still, effects on CRLF and potential CRLF habitat from existing and new covered activities within suitable CRLF habitat in the HCP area are possible and are described in the following sections. Covered activities occurring outside of CRLF habitat (Map 14) are not anticipated to affect the species unless specifically discussed in the following sections. In addition, any other covered activities that are not expected to affect CRLF are not discussed further. Table 4-3 in section 4.5.2 summarizes the potential effects and potential take of CRLF from covered activities. AMMs that address the effects are provided in section 5.3.1.3.

4.5.1 Direct and Indirect Effects

Covered activities that occur within the 178 acres of suitable CRLF aquatic habitat likely affect CRLF, as described further in the following sections. Most of the covered activities that occur within CRLF aquatic habitat likely have temporary effects (e.g., increased turbidity) on CRLF aquatic habitat. In addition, many of the covered activities likely have minor effects that won't rise to a level of take of CRLF.

Covered activities that occur within 4,777 acres of suitable CRLF upland habitat (i.e., almost all of the 4,827 acres of mapped CRLF upland dispersal habitat in the HCP area) likely also affect CRLF. Most of the covered activities that occur within CRLF upland dispersal habitat likely have minor effects, as the majority of the covered activities (e.g., motorized recreation) within CRLF upland habitat occur on beaches and dunes comprised of barren sand, which has limited value for CRLF as dispersal habitat and where CRLF have rarely been observed and are not likely to occur during dispersal events.

Some existing covered activities, including habitat management, monitoring of CRLF, and water quality monitoring and improvement projects ultimately benefit CRLF and their habitat by improving habitat quality and/or providing valuable information on CRLF occurrence in the HCP area.

The following sections describe the mechanisms by which existing and new covered activities could affect CRLF. Effects will be avoided and minimized to the extent feasible through existing and new AMMs. AMMs proposed to reduce the effects are briefly mentioned here and are described in greater detail in Chapter 5.

4.5.1.1 Park Visitor Activities

Park visitor activities have not been observed impacting CRLF and likely have minimal impacts on CRLF and CRLF habitat. Specifically, more impactful forms of recreation (e.g., motorized recreation) are not permitted in CRLF aquatic habitat, and most recreation that occurs in upland habitat occurs in lower quality CRLF dispersal habitat, including beach and dune habitat. However, in rare instances, CRLF dispersing through suitable upland habitat could be directly affected if they occur in areas used by park visitors, as discussed below.

4.5.1.1.1 Motorized Recreation (CA-1)

Motorized recreation does not affect aquatic CRLF habitat, as motorized vehicles are not allowed in CRLF aquatic habitat.

Motorized recreation is permitted in 1,407 acres of suitable CRLF upland habitat; however, the effects of motorized recreation on CRLF upland habitat are not known to have occurred in the past and are expected to continue to be minimal in the future. Motorized recreation is generally limited to the beaches and dunes in the HCP area and does not permanently alter beach and dune upland habitat where CRLF occur as these areas are comprised of barren sand. Although these areas are considered suitable upland dispersal habitat for CRLF, this habitat is likely rarely used by CRLF for dispersal over more suitable habitats since these areas provide minimal cover and are generally inhospitable to CRLF.

Although rare, when environmental conditions are right, CRLF could disperse overland through habitat used by motorized vehicles. These dispersal movements are generally straight-line, point-to-point migrations rather than following specific habitat corridors (Bulger et al. 2003). Dispersal distances are believed to depend on the availability of suitable habitat and prevailing environmental conditions (USFWS 2002). Although CRLF are rarely expected to disperse through the upland habitat where motorized recreation occurs, this behavior has been observed in the Guadalupe National Wildlife Refuge (section 3.3.3; [C. Cleveland, pers. comm. 2014]), which is directly south of the HCP area. If CRLF did disperse through areas where motorized recreation occurs, CRLF could be struck by vehicles and injured or killed. However, CDPR staff have not observed a CRLF in the vegetation islands or in the open riding area to date. In addition, CRLF would most likely disperse through these types of upland habitat at night and during rain events, when motorized recreation tends to be low. As a result, the likelihood of this happening is extremely low.

4.5.1.1.2 Camping (CA-2)

Camping in the open riding area is not expected to affect aquatic CRLF habitat as this typically occurs along the shoreline and open beaches, well away from any CRLF aquatic habitat. Impacts to CRLF from camping within suitable upland habitat have not been observed in the past and are anticipated to be minimal in the future. Any impacts that do occur are expected to be similar to those described above for motorized recreation (section 4.5.1.1.1).

The two designated campgrounds within the HCP area are adjacent to Meadow Creek, Carpenter Creek, and Oceano (Meadow Creek) Lagoon. CRLF has been observed in Oceano (Meadow Creek) Lagoon as recently as 2012 (Terra Verde Environmental Consulting 2012). In addition, in 2019, although it was not positively identified, a tadpole observed in Carpenter Creek is presumed to have been a CRLF given its characteristics. Activities at the campground have not been known to impact CRLF or their habitat to date. Pedestrian activities at the campgrounds are not expected to directly impact CRLF individuals, since park visitors, including campers, are prohibited from collecting animals and plants and damaging park resources. Although rare, moving vehicles in the campground could inadvertently strike a CRLF that has left the creek or lagoon and entered the campground; however, this has never been documented in the HCP area, and the likelihood of this happening in the future is low.

Indirect effects on CRLF from camping activities include an increase in trash, which could potentially boost predator populations (e.g., raccoons) and thereby incidentally increase predation on CRLF. To minimize this effect, CDPR will continue to inform all visitors that they must dispose of their trash in a trash dumpster, and CDPR will enforce rules to ensure the campsites are maintained in a clean condition. CDPR will also continue to maintain set trash service in the developed campgrounds to ensure that the trash receptacles are regularly emptied and do not overflow, attracting predators. As a result, this impact will continue to be minimal.

4.5.1.1.3 Pedestrian Activities (CA-3)

Most pedestrian-based activities are considered to have little, if any, effect on CRLF or its habitat since CRLF tend to be found in aquatic habitats less frequented by visitors. In addition, visitor activities do not result in loss of permanent loss of aquatic or upland habitat. As a result, it is unlikely that most pedestrian activities will directly affect CRLF in the future.

Pedestrians in suitable CRLF upland habitat are unlikely to encounter a CRLF and/or kill or injure a CRLF if it is encountered. Pedestrians that cross creeks or enter lagoons could stir up sediments and produce turbid stream flow in suitable aquatic CRLF habitat. CRLF occur in a wide range of turbidity conditions ranging from clear to highly turbid, but have been observed to be more common in relatively clear water (Bobzien and DiDonato 2007). Sediment and turbidity can affect CRLF by impacting respiratory functions, burying food sources, altering pool-riffle habitats, and impacting smaller riparian and in-stream vegetation. Potential turbidity effects caused by pedestrians crossing creeks or entering lagoons are largely considered to be temporary. CDPR will also continue to monitor popular creek crossings (e.g., Carpenter Creek and Pismo Creek) for CRLF. If CRLF are observed in or near creek crossings, CDPR will continue to post signs to close the crossings and encourage the use of other paths in the HCP area. As a result, this impact will continue to be minimal.

4.5.1.1.4 Equestrian Activities (CA-7)

Most equestrian-based activities occur in the northern portion of the HCP area and are considered to have little, if any, effect on CRLF or its habitat since CRLF tend to be found in habitats where equestrian activity does not occur and/or habitats that are less frequented by visitors. As a result, it is unlikely that equestrian activities will directly affect CRLF in the future.

If horses cross creeks or enter lagoons that are suitable habitat for CRLF, they could stir up sediments and produce turbid stream flow in aquatic CRLF habitat. CRLF occur in a wide range of turbidity conditions ranging from clear to highly turbid, but have been observed to be more common in relatively clear water (Bobzien and DiDonato 2007). Sediment and turbidity can affect CRLF by impacting respiratory functions, burying food sources, altering pool-riffle habitats, and impacting smaller riparian and in-stream vegetation. Potential turbidity effects caused by horses crossing creeks or entering lagoons are largely considered to be temporary. CDPR will also continue to monitor popular creek crossings (e.g., Carpenter Creek and Pismo Creek) for CRLF. If CRLF are observed in or near creek crossings, CDPR will continue to post signs closing the crossings and encourage the use of other paths in the HCP area. As a result, this impact will continue to be minimal.

4.5.1.1.5 Holidays (CA-10)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area on holidays. Therefore, no additional effect to CRLF occurs from motorized recreation on holidays.

Effects on holidays from non-motorized recreation are considered to be similar to those described for camping (section 4.5.1.1.2) and pedestrian activities (section 4.5.1.1.3). The increase in visitors on

holidays can increase the amount of trash in the HCP area; however, this is not likely to result in additional effects on CRLF that have not previously been described.

4.5.1.1.6 Special Events (CA-11)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area during special events. Therefore, no additional effect to CRLF occurs from motorized recreation during special events. In addition, Special Event permits do not authorize activities to occur in areas that would otherwise be closed to visitors; therefore, no additional impacts from non-motorized and motorized activities occur in CRLF habitat that is typically off limits to visitors.

However, special events are potentially different from typical non-special event activities. First, many events tend to focus participants in the event area, which could mean that spectators or vendors are more concentrated in a given area than they might otherwise be during an ordinary day. Many special events occur during shoulder seasons and increase visitation at times when visitation would typically be lower. Effects on CRLF from concentrating spectators and vendors in an area is likely similar to the effects described for motorized recreation (section 4.5.1.1.1), camping (section 4.5.1.1.2), and/or pedestrian recreation (section 4.5.1.1.3). The increase in visitors during special events can increase the amount of trash in the HCP area; however, this is not likely to result in additional effects on CRLF that have not previously been described.

4.5.1.2 Natural Resources Management Program

4.5.1.2.1 Tidewater Goby and Salmonid Surveys (CA-13)

Occasionally, egg masses and CRLF individuals are present within tidewater goby survey areas. If encountered unintentionally during seining or dipnetting, CDPR biologists can affect all CRLF life stages (i.e., eggs, tadpoles, juveniles, and adults) when handling individuals and egg masses during standard fisheries surveys in Arroyo Grande Creek or during other non-routine surveys in aquatic habitats where CRLF may occur. However, fisheries biologists permitted to perform tidewater goby surveys in CRLF habitat are required by the USFWS to conduct a visual survey for CRLF prior to sampling for tidewater gobies in areas where CRLF egg masses may be present. If egg masses are discovered, sampling for tidewater gobies will continue to be postponed until the eggs have hatched, or sampling will continue to be conducted in a way that avoids all egg masses. As a result, impacts to CRLF during tidewater goby and salmonid surveys have not occurred in the past and are not expected in the future.

As part of the USFWS 10(a)(1)(A) Recovery Permit for tidewater goby, electrofishing is not allowed during tidewater goby surveys or within tidewater goby habitat; however, electrofishing is allowed in areas upstream of tidewater goby habitat under the terms of other scientific collecting permits and authorizations and is sometimes conducted for other fisheries surveys. Consequently, although unlikely, electrofishing activities could result in capture of CRLF tadpoles, juveniles, or adults. Any capture associated with electrofishing may injure or cause mortality of CRLF individuals. However, effects due to electrofishing are minimized by having a qualified biologist conduct visual surveys prior to the start of survey activities.

Fisheries surveys require biologists to stand in water and seine/dipnet or electrofish for fish. Surveys within aquatic habitats can indirectly affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment that is stirred up during seining, electrofishing, and/or dipnetting activities is minimal, localized, and temporary. As a result, this impact will not affect CRLF or their habitat in the long term.

CDPR biologists or their contractors can facilitate the introduction of amphibian chytridiomycosis during fisheries surveys. Amphibian chytridiomycosis is a disease caused by the zoospore fungus pathogen *Batrachochytrium dendrobatidis* (Bd), which can cause lethargy and weakness in adult frogs and usually results in death of tadpoles. Amphibian chytridiomycosis is transported in water or mud, including in muddy footwear. To minimize the potential to spread Bd, CDPR biologists will continue to use the Recommended Equipment Decontamination Procedures (USFWS 2005c, Cleveland 2018b, 2018a). This includes disinfecting equipment and clothing after entering a pond/stream or before entering a new pond where CRLF may occur. Bd has not been found within the HCP area and the decontamination procedures will continue to minimize the threat. As a result, impacts associated with Bd are reduced or eliminated.

4.5.1.2.2 California Red-legged Frog Surveys and Associated Management (CA-14)

Most CRLF surveys result in minimal impacts to CRLF since most surveys for CRLF are eyeshine surveys conducted from the edge of the water bodies and/or kayak and only involve visually scanning for CRLF and/or egg masses. During these surveys, care is taken not to disturb sediments, vegetation, or any visible larvae. In addition, the surveys are conducted by a qualified USFWS-approved or permitted biologist. Therefore, impacts to CRLF and/or egg masses will continue to be minimal during eyeshine surveys.

Dipnetting surveys are infrequently conducted in the HCP area. These surveys are conducted by CDPR biologists or their USFWS-approved contractors for purposes of monitoring, identification, and management of the species. CDPR biologists or their contractors could affect all life stages of CRLF (i.e., eggs, tadpoles, juveniles, and adults) when handling individuals and egg masses during CRLF monitoring surveys that involve dipnetting. During these surveys, CDPR biologists or their contractors could capture, injure, or kill a CRLF eggmass, tadpole, juvenile, or adult. To reduce impacts associated with these surveys when they do occur, they will continue to be conducted by a USFWS-approved biologist and will continue to be conducted in accordance with the USFWS Revised Guidance on Site Assessments and Field Surveys for the CRLF (USFWS 2005c). As a result, although capture of adults/sub-adults/juveniles, tadpoles, or egg masses could occur, mortality and/or injury will continue to be minimized, if not eliminated. In addition, any capture of adults/sub-adults/juveniles, tadpoles, or egg masses is expected to continue to be low due to the low number of CRLF that have been found in the HCP area during surveys to date (section 3.3.3.4).

Dipnet surveys involve biologists standing in water. Surveys within aquatic habitats affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during wading and/or dipnetting activities is minimal, localized, and temporary. As a result, this impact will not affect CRLF or their habitat in the long term.

CDPR biologists or their contractors can facilitate the introduction of amphibian chytridiomycosis when entering the water for CRLF surveys. Amphibian chytridiomycosis is a disease caused by the zoospore fungus pathogen Bd, which can cause lethargy and weakness in adult frogs and usually results in death of tadpoles. Amphibian chytridiomycosis is transported in water or mud, including in muddy footwear. Therefore, CDPR biologists will use the Recommended Equipment Decontamination Procedures (USFWS 2005c) to minimize potentially spreading Bd. This includes disinfecting equipment and clothing after entering a pond/stream or before entering a new pond where CRLF may occur. Bd has not been found within the HCP area and the decontamination procedures will continue to minimize the threat. As a result, impacts associated with Bd are reduced or eliminated.

Ultimately, CRLF surveys and associated management benefit CRLF by providing information necessary to contribute to conservation of the species.

4.5.1.2.3 Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

Only activities associated with marsh sandwort and/or Gambel's watercress are considered to have potential to impact CRLF. Listed plant monitoring, propagation, and habitat enhancement for marsh sandwort and Gambel's watercress in the HCP area to date are not known to have impacted CRLF. Monitoring of marsh sandwort and Gambel's watercress is not expected to impact CRLF since this occurs on foot by a trained botanist. Any future monitoring, propagation, and habitat enhancement activities for marsh sandwort and Gambel's watercress at Oso Flaco Lake has the potential to temporarily impact all life stages of CRLF (i.e., eggs, tadpoles, juveniles, and adults). Activities can result in injury or mortality if a CRLF is present within the work area. In addition, activities can disturb CRLF located near the work area and cause stress or cause them to move from cover where they may be exposed to predation.

To minimize impacts to CRLF associated with these activities, depending on the type of activities (e.g., ground disturbance), surveys for CRLF are conducted within 100 feet of any propagation and habitat enhancement activities in Oso Flaco Lake to ensure no CRLF are present. If a CRLF is observed, activities will continue to be delayed until the individual has moved from the area or until appropriate AMMs are in place. AMMs can include relocation, exclusion fencing, and/or biological monitoring. As a result, mortality, injury, and disturbance to CRLF will continue to be minimized.

Activities within aquatic habitats affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during activities will be minimal, localized, and temporary. As a result, this impact will not affect CRLF or their habitat in the long term.

Ultimately, listed plant habitat enhancement at Oso Flaco Lake and in other aquatic habitat where CRLF may occur, benefits CRLF by reducing invasive plants in the area and improving habitat in the HCP area for CRLF.

4.5.1.2.4 Invasive Plant and Animal Control (CA-17)

Invasive plant or animal control activities conducted in the HCP area to date are not known to have impacted CRLF. CDPR biologists can directly affect all life stages of CRLF (i.e., eggs, tadpoles, juveniles, and adults) by disturbing occupied habitat during standard invasive animal and plant control efforts. Invasive pest plant and animal control activities may require Environmental Scientists to remove pest plants and animals in suitable CRLF aquatic or upland habitat, including moist vegetated areas that CRLF can use for dispersal. However, pre-activity surveys will continue to be conducted, at the discretion of a CDPR Environmental Scientist, prior to commencing any activities that can disturb suitable CRLF aquatic or upland habitat to minimize effects of these activities on CRLF. If a CRLF is observed, activities will continue to be delayed until the individual has moved from the area or until appropriate AMMs are in place. AMMs can include relocation, exclusion fencing, and/or biological monitoring. As a result, impacts from invasive plant and animal control will continue to be minimal.

Activities within aquatic habitats affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during activities will be minimal, localized, and temporary. As a result, this impact will not affect CRLF or their habitat in the long term.

Ultimately, invasive-pest plant and animal control in aquatic and/or upland habitat where CRLF may occur benefits CRLF by reducing invasive species in the area and improving habitat in the HCP area for CRLF.

4.5.1.2.5 Water Quality Monitoring Projects (CA-19)

Water quality monitoring in the HCP area to date is not known to have impacted CRLF. Installation of water quality monitoring equipment can temporarily affect CRLF by disturbing individuals as workers enter occupied aquatic habitat. However, pre-activity surveys will continue to be conducted prior to commencing any activities disturbing suitable CRLF aquatic habitat to minimize effects of these activities on CRLF. If a CRLF is observed, activities will continue to be delayed until the individual has moved from the area or until appropriate AMMs are in place. AMMs can include relocation, exclusion fencing, and/or biological monitoring. As a result, impacts from water quality monitoring will continue to be minimal.

Maintenance of water quality monitoring equipment within aquatic habitats can affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution is taken to minimize disturbance to sediment and any sediment stirred up during activities will be minimal, localized, and temporary. As a result, this impact will not affect CRLF or their habitat in the long term.

Future projects for water quality monitoring are not known at this time. Any future projects will be evaluated for consistency with this HCP and may be permitted under a separate regulatory process, if necessary. Improvements to water quality that result from ongoing water quality monitoring and improvement projects in occupied habitat will ultimately benefit CRLF by creating more suitable habitat within the HCP area.

4.5.1.3 Park Maintenance

4.5.1.3.1 Campground Maintenance (CA-20)

The two designated campgrounds within the HCP area are adjacent to Meadow Creek, Carpenter Creek, and Oceano (Meadow Creek) Lagoon. CRLF have been observed in Oceano (Meadow Creek) Lagoon as recently as 2012 (Terra Verde Environmental Consulting 2012). In addition, in 2019, although it was not positively identified, a CRLF tadpole was potentially observed in Carpenter Creek. Maintenance vehicles at the campground can inadvertently strike a CRLF that has left the creek or lagoon and entered the campground area; however, this has never been reported in the HCP area to date. Any CRLF dispersing through the campground area is expected to occur during the night or under wet conditions; therefore, ground-disturbing maintenance activities will continue to be avoided during heavy precipitation (i.e., at least 0.5-inch of precipitation in a 24-hour period). Maintenance activities that continue in all weather will continue to be limited to housekeeping-type routine maintenance activities such as repairs to hose bibs and changing light bulbs that are not expected to impact CRLF. In addition, depending on the activities (e.g., ground disturbance, work directly adjacent to aquatic habitat), pre-activity surveys will continue to be conducted prior to campground maintenance activities. If a CRLF is observed, activities will continue to be delayed until the individual has moved from the area or until appropriate AMMs are in place. AMMs can include relocation, exclusion fencing, and/or biological monitoring. Lastly, all maintenance personnel will continue to receive a training prior to activities that, at a minimum, will cover CRLF life history and work constraints. As a result, impacts from campground maintenance activities will continue to be minimal.

4.5.1.3.2 General Facilities Maintenance (CA-21)

Mechanical trash removal is a new proposed activity. It will not occur in aquatic habitat areas or in vegetated dunes. Therefore, CRLF in aquatic habitat will not be impacted.

CRLF may disperse through upland habitat in the geographic areas proposed for mechanical trash removal north of Post 6. Mechanical trash removal could kill or injure a CRLF if it dispersed through the area while mechanical raking was occurring. However, CRLF rarely disperse through open, barren sand

areas where mechanical trash removal will occur. In addition, mechanical trash removal will not occur at night when most dispersal occurs. As a result, mechanical trash removal will be unlikely to impact CRLF.

4.5.1.3.3 Routine Riparian Maintenance (CA-26)

Riparian maintenance activities are not known to have impacted CRLF in the past. Riparian maintenance activities that can affect CRLF include the clearing of debris, vegetation, and sediment from culverts and spillways; riparian tree and shrub vegetation control (e.g., removing or trimming vegetation); and emergent and invasive species control. CRLF may occur in riparian areas where maintenance activities are located. If CRLF egg masses, tadpoles, juveniles, or adults are present in the riparian maintenance area they can be directly affected by disturbance to habitat. Individuals may be disturbed by or caught in rakes or other hand equipment used to remove sediment, debris, or vegetation. Any egg masses or larvae can also be disturbed or crushed by workers or equipment during culvert and spillway maintenance and the removal of emergent vegetation. However, culvert maintenance will continue to be conducted during periods when egg masses or larvae are unlikely to occur in the area (e.g., low flow period), to the extent feasible. In addition, a USFWS-approved biologist will conduct a survey of the work area for CRLF within 48 hours prior to any riparian maintenance activities. If CRLF adults, tadpoles, or egg masses are observed, work will not commence until AMMs are in place. Furthermore, a biological monitor will continue to be present, as necessary, during maintenance activities to ensure CRLF are not present while work is occurring. As a result, direct impacts to CRLF from riparian maintenance are not expected in the future.

Riparian maintenance activities can temporarily result in an increase in turbidity because the in-stream vegetation traps and holds sediments. Temporarily suspended sediment can affect CRLF. However, sediment stirred up during activities will continue to be minimal, localized, and temporary. In addition, heavy equipment will not be placed in the water, and back-hoe work will continue to be restricted to the roadside or upper bank with only the bucket placed in the water body. Therefore, impacts associated with suspended sediments will continue to be minimized and will not affect CRLF habitat in the long-term.

Riparian maintenance activities can indirectly attract CRLF predators into potential CRLF habitat areas. For example, temporary disturbance of stream channel soils during culvert maintenance or removal of emergent vegetation can create areas of ponded water that support bull frog and invasive red swamp crayfish, both of which prey upon CRLF. To minimize these effects, CDPR smooths these disturbed areas with the potential to pond water with a rake to avoid creation of potential habitat for CRLF predators. In addition, any CRLF predators encountered (e.g., bull frog and invasive red swamp crayfish) will be removed by a qualified biologist. Trash will also continue to be removed from the work area on a daily basis during all maintenance activities to minimize attracting potential predators (e.g., raccoons) to the work area.

CDPR biologists can facilitate the introduction of Bd, which is transported in water or mud, including in muddy footwear. Therefore, CDPR biologists will continue to use the Recommended Equipment Decontamination Procedures (USFWS 2005c) to minimize potentially spreading Bd. This includes disinfecting equipment and clothing after entering a pond/stream or before entering a water body where CRLF may occur. Bd has not been found within the HCP area, and the decontamination procedures will continue to minimize the threat. As a result, impacts from Bd are not expected.

Riparian maintenance activities can affect an annual maximum of approximately 0.3 acre of wetlands for culvert cleanout, debris removal, and emergent vegetation removal. In addition, approximately 2 miles of riparian corridor segments will continue to be subject to tree maintenance and invasive weed control as the need arises. Maintenance of these areas will continue to reoccur over the course of the permit, as

needed, when vegetation regrows. These activities can reduce aquatic and/or riparian habitat available for CRLF. However, these impacts will continue to be minor and temporary.

4.5.1.3.4 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Maintenance of trail and access corridors, including boardwalks, paths, and sand ramps are completed on an as-needed basis. The frequency of this work mainly depends on visitor use and/or any weather-related damage. Vegetation intruding onto any footpaths may need to be trimmed at least once a year and is usually completed using hand tools. Vegetation trimming does not involve plant removal or disturb soil or aquatic habitat where CRLF may occur; thus, vegetation trimming is unlikely to affect CRLF habitat or individuals. Any effects on CRLF aquatic habitat during boardwalk maintenance will continue to be minor and temporary, and potential for direct impacts to individuals will continue to be low.

4.5.1.4 Visitor Services

4.5.1.4.1 Emergency Response (CA-33)

It is necessary from time to time for law enforcement and/or medical aids to respond to an emergency that is located off a designated trail. When this occurs, there can be some trampling of vegetation near an aquatic resource or a creek might be crossed without the use of a bridge or hardened bottom. These activities can result in damage to CRLF habitat. This damage is difficult to document; however, damage to habitat is considered to be minor and temporary.

Emergency vehicle direct impacts to CRLF are difficult if not impossible to document since emergency response must be implemented immediately and quickly. It is possible, but highly unlikely, that eggs, tadpoles, juveniles, or adults can be directly affected by such an incident by being struck/crushed by a vehicle. This will especially be true for vehicles that need to drive above the 15-mph speed limit to respond to an emergency.

Emergency response activities that cross creeks can temporarily stir up sediment and increase turbidity. Sediment stirred up during activities is localized and temporary (lasting only during the emergency action) and; therefore, will not affect CRLF habitat in the long term.

4.5.1.4.2 Pismo Beach Golf Course Operations (CA-37)

CRLF has been observed in Arroyo Grande Creek and Oceano (Meadow Creek) Lagoon (Terra Verde Environmental Consulting 2012, Cleveland 2018a, 2018b) and thus has a low to moderate potential to occur in nearby Meadow Creek and Carpenter Creek[72], both of which are adjacent to Pismo Beach Golf Course. CRLF may disperse to Meadow Creek, Carpenter Creek, and/or the golf course ponds, especially during wet weather. If CRLF disperse through the golf course to reach these locations, golf course operations and maintenance activities, such as golf cart traffic and mowers, can potentially strike CRLF individuals and injure or kill them. The potential for such incidents is low because golf carts travel on small paved paths where CRLF are less likely to occur and most adult CRLF movement is during the night when no golfing activity will occur.

Maintenance activities, including mowing, are unlikely to affect CRLF because maintenance activities occur during the day when CRLF movement is less likely to occur and grass height at the golf course does not provide adequate cover for frogs. To further minimize effects from golf operations maintenance, ground-disturbing maintenance activities will continue to be delayed during heavy precipitation (i.e., at least 0.5-inch of precipitation in a 24-hour period).

[72] In 2019, although it was positively identified, a CRLF tadpole was potentially observed in Carpenter Creek.

Maintenance of water features in the golf course can potentially disturb all life stages (i.e., eggs, tadpoles, juveniles, adults) of CRLF during emergent vegetation trimming and removal or repair of bridges. However, most vegetation trimming is conducted by hand. In addition, if determined to be necessary by a CDPR Environmental Scientist (e.g., there is previous evidence of CRLF activity from surveys), pre-activity surveys will continue to be conducted prior to commencing any activities that may disturb suitable CRLF aquatic habitat to minimize effects of these activities on CRLF. If a CRLF is observed, activities are delayed until the individual has moved from the area or until appropriate AMMs are in place. AMMs can include relocation, exclusion fencing, and/or biological monitoring. As a result, direct impacts from aquatic maintenance activities will continue to be reduced or eliminated.

Activities within the golf course ponds can affect CRLF by temporarily stirring up sediment and increasing turbidity. Sediment stirred up during activities is localized and temporary and will not affect CRLF habitat in the long term.

4.5.1.4.3 Grover Beach Lodge and Conference Center (CA-38)

According to the Grover Beach Conference Center Biological Assessment (Althouse and Meade, Inc. 2005) and the Revised Final Environmental Impact Report (SWCA Environmental Consultants 2012), construction of the Grover Beach Lodge is not anticipated to affect CRLF. The Final EIR for the Grover Beach Lodge construction project states that the project will avoid direct impacts to the aquatic portions and riparian vegetation of Meadow Creek and will ultimately likely improve water quality in the creek by enhancing runoff filtration capabilities on the site. As a result, no direct impacts to CRLF are expected from the Grover Beach Lodge, and CRLF are expected to benefit from water quality improvements in the creek.

4.5.1.5 Other HCP Covered Activities

4.5.1.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Arroyo Grande, and Oso Flaco Creeks (CA-40)

Carpenter Creek is suitable habitat for CRLF and in 2019, although it was not positively identified, a CRLF tadpole was potentially observed within this creek. As a result, CRLF could occur in Carpenter Creek and might be affected by motorized vehicles crossing the creek. CRLF can be inadvertently struck by a vehicle crossing the creek; however, vehicle operators will continue to be encouraged to cross in areas with low or no flow, and all vehicles will continue to be required to travel at a speed of 15 mph or less. Therefore, effects on CRLF from vehicles crossing Carpenter Creek are anticipated to be minimal in the future even if a CRLF is observed in the creek.

Vehicles crossing aquatic CRLF habitats affect CRLF by temporarily stirring up sediment and increasing turbidity. Sediment stirred up during vehicle crossings will be localized and temporary and will not affect CRLF habitat in the long-term.

CRLF have not been observed and are not expected to occur in Arroyo Grande or Oso Flaco Creek where vehicles cross since vehicles cross the creeks near the shoreline where the water salinity is too high for CRLF to persist. As a result, no effects from vehicle crossings are considered to have occurred in these areas or are anticipated at these locations in the future.

4.5.1.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

The Pismo Creek Estuary seasonal floating bridge has not been installed at this time. The proposed floating bridge at Pismo Creek has a small potential to impact CRLF, particularly at the northern access point. However, to date, CRLF are only known from areas farther upstream of the CDPR-owned portions of Pismo Creek. Furthermore, the Pismo Creek Estuary is considered low quality suitable habitat for CRLF due to the intrusion of saltwater. Therefore, there is low potential for CRLF to be present in the area

where the floating bridge would be installed. As a result, impacts associated with the floating bridge will be minimal.

Construction activities within Pismo Creek could affect CRLF by temporarily stirring up sediment and increasing turbidity. However, caution will be taken not to stir up sediment and any sediment stirred up during activities will be minimal, localized, and temporary and will not affect CRLF habitat upstream of the project area.

4.5.1.5.3 Dust Control Activities (CA-44)

Some dust control activities are currently occurring in the HCP area, and additional dust control activities are being proposed as future activities. Future dust control activities will not occur in CRLF aquatic habitat.

Dust control activities can temporarily disturb aestivating or dispersing CRLF during activities. Impacts to CRLF were not observed during previous dust control activities. It is unlikely, but possible, that CRLF will disperse through or be found in open sand areas prior to dust control measures being installed. Individuals in a dust control work area could be injured or crushed. CDPR will implement AMMs for CRLF, as appropriate, including conducting pre-activity surveys as necessary and delaying activities until the individual moves from the work area or appropriate AMMs are in place (e.g., relocation, exclusion fencing, biological monitoring). As a result, impacts to dispersing CRLF are expected to be minimal.

Future dust control activities include planting vegetation and placing dust control devices in upland dispersal habitat and, therefore, can alter upland habitat for CRLF. Specifically, future dust control activities will permanently alter approximately 420 acres of upland habitat, and additional upland habitat will be affected by temporary wind fencing and air quality monitoring equipment installation. This habitat will vary in its suitability for CRLF dispersal since it could occur within upland habitat anywhere within the foredunes and/or backdunes. However, few CRLF have been found in the HCP area, and additional dispersal habitat will continue to be available in the HCP area outside the dust control areas. In addition, vegetation planted for dust control activities and some dust control devices provide necessary cover for CRLF if they are dispersing through the area and would benefit CRLF. Soil stabilizer, if used, would not provide CRLF habitat benefit, but the stabilizing effect is temporary.

4.5.1.5.4 Cultural Resources Management (CA-45)

To date, cultural resource management has not resulted in impacts to CRLF. If a new cultural site is found, impacts from cultural resource management would be similar to those described for general facilities maintenance (section 4.5.1.3.2).

4.5.1.5.5 CDPR Management of Agricultural Lands (CA-46)

Two ditches associated with agricultural lands contain runoff from the agricultural lands and flow to Oso Flaco Lake. CRLF have not been found within the agricultural ditches; however, CRLF adults could be present in these areas in the future and activities could disturb or injure/kill an individual (e.g., when equipment is used to remove sediment, debris, or vegetation). CDPR will continue to implement AMMs, including conducting activities during low flow periods (if feasible), having a USFWS-approved biologist conduct a focused survey of the work area (as necessary), and having a USFWS-approved biologist present (if necessary), to reduce the potential to disturb, injure, or kill CRLF. As a result, this impact will continue to be minimal.

4.5.1.5.6 Oso Flaco Lake Boardwalk Replacement (CA-48)

The Oso Flaco Lake boardwalk may eventually need to be replaced with a comparable boardwalk in roughly the same location. Most of the boardwalk is within upland habitat, but approximately 1,000 feet

of the existing Oso Flaco Lake boardwalk occurs within aquatic habitat. The boardwalk also includes two resting areas/viewing platforms within aquatic habitat. The layout and/or location of the new boardwalk might need to shift slightly to accommodate conditions at the time of replacement such as changes in codes or other operational or design considerations. Thus, although it is anticipated the replacement boardwalk will be located in roughly the same location, the HCP includes the loss of up to 1.5 acres of CRLF habitat. Replacing the entire boardwalk will cause temporary disturbance of CRLF aquatic habitat; however, pre-activity surveys will be conducted prior to commencing any activities disturbing suitable CRLF habitat to minimize effects of these activities on CRLF. If a CRLF is observed, activities will be delayed until the individual has moved from the area or until appropriate AMMs are in place. AMMs could include relocation, exclusion fencing, and/or biological monitoring. As a result, impacts from Oso Flaco Lake boardwalk replacement will be minimal.

4.5.1.5.7 Special Projects (CA-49)

Specific special projects or project designs are not known at this time. Any special projects, such as the replacement or expansion of existing facilities or the construction of new facilities will directly affect CRLF habitat if the special project occurs within CRLF habitat. Effects of special projects in CRLF upland habitat, such as installing a new vault toilet, will be similar to those discussed in dust control activities (section 4.5.1.5.3). No special projects will occur in aquatic habitat or near enough to aquatic habitat to have an effect on CRLF or suitable aquatic habitat.

4.5.1.5.8 Use of Pesticides (CA-51)

Pesticides are currently used in the HCP area in upland and near aquatic habitat; however, the effects of pesticides on CRLF are not well documented. As a result, this section discusses potential effects that could occur to CRLF.

While the risk characterization for each pesticide focuses on the potential for direct toxic effects, there is potential for indirect effects in virtually all groups of non-target organisms. Terrestrial applications of any effective herbicide are likely to alter vegetation within the treatment area. This alteration could have indirect effects on terrestrial or aquatic animals, including changes in food availability and habitat quality. These indirect effects may be beneficial to some species and detrimental to other species; moreover, the magnitude of indirect effects is likely to vary over time. While these concerns are acknowledged, they are not specific to herbicide applications in general; rather, any effective method for vegetation management, including mechanical methods that do not involve herbicide, could be associated with indirect effects on both animals and non-target vegetation.

Very few pesticides are tested for toxic effects to amphibians. Most studies look at mammals, birds, fish, and insects. In the absence of robust toxicity data for amphibians in aquatic habitats, the EPA uses fish toxicity as a surrogate. For example, in a 2008 study, EPA compiled toxicity studies for technical glyphosate (formulated without a surfactant) on species deemed suitable to act as CRLF surrogates. Results ranged from practically non-toxic to slightly toxic with the lowest (i.e., most conservative) acute toxicity LC50 value (i.e., the lethal concentration of a chemical causing 50 percent mortality of test animals) of 43 milligrams active ingredient per liter (mg/L), and the lowest no-observed-adverse-effect level of 30.6 mg/L (EPA 2008).

A description of the location where each pesticide is used in the HCP area in relation to CRLF habitat and the anticipated effects of each pesticide on CRLF follows.

Glyphosate is proposed to be used in aquatic and upland habitats in the HCP area for control of invasive plants according to the APAP, including within CRLF breeding and dispersal habitat. As stated above, glyphosate is not expected to be toxic to CRLF in aquatic habitats. Glyphosate toxicity data for amphibians that inhabit terrestrial environments is also lacking. EPA uses toxicity data from avian

receptors as a surrogate for CRLF in terrestrial environments (EPA 2008). These studies showed that glyphosate is slightly toxic to the selected avian species, with the lowest LD50 value (i.e., dose required to kill 50 percent of a population of test animals) reported as ingestion of greater than 3,196 mg of active ingredient per kilogram of body weight (EPA 2008); however, no mortalities occurred in any of the studies, so this number is likely to be strongly conservative.

Fluazifop-P-butyl has been rated as highly toxic to aquatic and terrestrial amphibians (White 2007). However, CDPR does not use Fluazifop-P-butyl near aquatic systems in the HCP area; it is only used for spot treatment in terrestrial habitats when Russian wheatgrass, veldt grass, and European beach grass are intermixed with native plants. In addition, contractors only apply Fluazifop-P-butyl when wind speeds are low (less than 10 mph) and rain is not predicted in the next 48 hours. As a result, effects from Fluazifop-P-butyl on CRLF are not expected.

The aquatic formulation of imazapyr (Habitat®) is proposed to be used in aquatic habitats, including CRLF breeding habitat, in the HCP area to control invasive plants according to the APAP. The EPA's 2007 risk assessment indicates that no direct effects are expected on either the aquatic or terrestrial phase of CRLF from imazapyr (EPA 2007). There are also no indirect effects expected for CRLF through direct effects to either its terrestrial or aquatic food sources. The effects determination for direct effects on CRLF and for indirect effects through food sources is "no effect." Some indirect effects to CRLF may occur due to direct effects on habitat and/or primary productivity (i.e., ecosystem structure and function for both the aquatic plant community and riparian vegetation).

Triclopyr is used to treat Cape ivy in the HCP area, which often occurs near aquatic habitats; therefore, this pesticide could be used near CRLF breeding habitat. Given that no scientifically valid triclopyr toxicity data are available for aquatic-phase amphibians, freshwater fish data were used as a surrogate to estimate direct acute and chronic risks to CRLF. Freshwater fish toxicity data were also used to assess potential indirect effects of triclopyr to CRLF. The EPA's 2009 risk assessment on triclopyr indicates that no direct effects are expected on either the aquatic or terrestrial phase of CRLF from triclopyr (EPA 2009). Effects on freshwater fish resulting from exposure to triclopyr indicate CRLF may be indirectly affected via reduction in available food.

Aminocyclopyrachlor is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near CRLF breeding habitat. The EPA (2010) classifies aminocyclopyrachlor as practically non-toxic or only slightly toxic to mammals, birds, fish, and aquatic invertebrates (SERA 2012). There is no information regarding the toxicity of aminocyclopyrachlor to aquatic-phase amphibians. In view of this lack of data, the EPA follows a standard approach in that freshwater fish (i.e., rainbow trout and bluegill sunfish) are used as surrogates for aquatic phase amphibians. No toxicity data are available for terrestrial-phase amphibians, so no dose-response can be derived (SERA 2012).

Chlorsulfuron is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near CRLF breeding habitat. No ecotoxicity studies have been conducted for the effects of Chlorsulfuron on amphibians, but it has been found not to pose a risk to fish or aquatic invertebrates from direct spray, off-site drift, or surface runoff (ENSR International 2005). It has been found to have a very low potential to cause adverse effects in aquatic animals (SERA 2004) and has been rated as practically non-toxic to aquatic amphibians (White 2007).

Aminopyralid is used to control Cape ivy in the HCP area, which often occurs near aquatic habitats; therefore, this pesticide could be used near CRLF breeding habitat. Only one study on the effects of Aminopyralid on amphibians has been conducted, which indicated that leopard frog larvae are no more sensitive to aminopyralid than fish (SERA 2007). Aminopyralid has been shown to be practically non-toxic to birds, fish, honeybees, earthworms, and aquatic invertebrates. There are no acute or chronic

risks to non-target endangered or non-endangered fish, birds, wild mammals, terrestrial and aquatic invertebrates, algae, or aquatic plants (EPA 2005).

Sethoxydim is sprayed by helicopter application in the backdunes to control perennial veldt grass. All helicopter applications include a 200-foot buffer from aquatic resources. Therefore, CRLF in aquatic habitat are not impacted. Neither the published literature nor the EPA files include data regarding the toxicity of sethoxydim to amphibian species. Sethoxydim is moderately to slightly toxic to fish (SERA 2001). The acute static LC50 values for technical grade sethoxydim range from 170 to 265 parts per million (mg/L) in bluegill sunfish and rainbow trout, respectively (BASF 1982 as cited in (SERA 2001)). The formulated product, Poast®, however, is much more toxic with LC50 values of 2.6 ppm in bluegill sunfish and 1.2 ppm in rainbow trout (Bowman and Howell 1991 as cited in (SERA 2001)). The higher toxicity in Poast® is likely attributable to the presence of naphtha solvent. However, CRLF in upland habitat are unlikely to be impacted since they only occur in upland habitat during dispersal events. In addition, CRLF typically disperse at night, and herbicides are only applied during the day.

Clethodim is sprayed by helicopter application in the backdunes to control perennial veldt grass. All helicopter applications include a 200-foot buffer from aquatic resources. Therefore, CRLF in aquatic habitat are not impacted. There is no information regarding the toxicity of clethodim to reptiles or terrestrial-phase amphibians in the open literature or in the available EPA studies (SERA 2014). In the absence of information on terrestrial-phase amphibians, the EPA uses birds as a surrogate. Clethodim is practically non-toxic to birds.

VectoBac G is applied by helicopter over large areas in the HCP area, which could include occupied CRLF aquatic and upland habitat. VectoBac G is toxic only to the larvae of certain diptera. It does not directly or indirectly harm other aquatic, marine, or terrestrial fauna (Swedish Chemicals Agency 2015).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA®, surfactants labeled for aquatic use. Little information is available regarding the potential effects of Competitor® or Renegade EA® on CRLF. The product safety data sheets state that these products have not been classified as environmentally hazardous (Wilbur-Ellis 2016a, 2016b). However, one study found that glyphosate-surfactant mixtures, such as Competitor®, were more toxic to western toad than glyphosate alone (Vincent and Davidson 2015).

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Based on years of survey data for covered species and implementation of specific AMMs for pesticide use (Chapter 5), pesticide use within the HCP area is expected to benefit CRLF by preventing invasive plants from taking over CRLF habitat or providing hiding places for predators. Also, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide exposure and associated risks to covered species are expected to decrease with increasing distance away from the treated field or site of application. CDPR takes extra precautions when applying pesticides near open water and wetlands and other sensitive habitats that support covered species. However, contamination may result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. AMMs listed in Table 5-4 are considered to reduce or eliminate these impacts.

4.5.2 Anticipated Take of California Red-Legged Frog

This section quantifies the potential for incidental take (i.e., harm, injury, or mortality) of CRLF due to the effects described in the preceding sections. Although many of these covered activities described are currently occurring in the HCP area, very little is known about the actual impacts on CRLF since CRLF

take associated with park visitor activities has not been observed and few CRLF have ever been documented in the HCP area. The number of CRLF that may be killed or injured because of covered activities is difficult to quantify for the following reasons: 1) the number and location of CRLF within a population vary from year to year; and 2) the aquatic nature of CRLF, and the relatively small body size of CRLF, particularly tadpoles and egg masses, makes finding a dead or injured CRLF of any life stage unlikely. Therefore, this HCP attempts to quantify take levels (i.e., harm, pursue, wound, kill, trap, capture or collect, or to attempt to engage in these activities) in the HCP area that could occur and go undetected, especially given the low abundance of CRLF in the HCP area and the difficulty in finding them.

Table 4-3 presents threshold levels of CRLF adults/sub-adults, tadpoles, and egg masses that may be detected as killed or injured over the permit term. These threshold levels represent limits for take from covered activities. The HCP also recognizes that for every CRLF found dead or injured, other individuals may be killed or injured that are not detected. As a result, the estimation of take is considered a worst-case scenario and is not expected to occur in most years, if at all.

CDPR has no records of CRLF take in the HCP area to date. Take may occur as a result of covered activities in suitable CRLF upland habitat and during covered activities within suitable CRLF aquatic habitat (Map 25). Although AMMs will be implemented to minimize take, a small amount of take may occur incidental to these activities, as described above in section 4.5.1. In addition, CRLF will be captured and relocated during dipnet surveys, if conducted, and a subset of these captured individuals could be killed or injured due to mishandling or stress.

4.5.2.1 Take of CRLF Incidental to Park Visitor Activities, Park Maintenance, Visitor Services, and Other HCP Covered Activities in Aquatic Habitat

CRLF are known to inhabit Arroyo Grande Creek, Arroyo Grande Estuary, and Oso Flaco Lake, and they may inhabit additional aquatic areas subject to park visitor activities, park maintenance, visitor services, and other HCP covered activities. Specific existing and/or new park visitor activities, park maintenance, visitor services, and other HCP covered activities that could affect CRLF in aquatic habitat include the following:

- Pedestrian activities
- Routine riparian maintenance
- Emergency response
- Pismo Beach golf course maintenance in water features
- CDPR management of agricultural lands (i.e., drainage ditch maintenance)
- Oso Flaco Lake boardwalk replacement

These activities are anticipated to occur within 178 acres of CRLF aquatic habitat. Within these 178 acres, up to 1.5 acres of CRLF aquatic habitat could be permanently affected by the replacement of the Oso Flaco boardwalk and viewing platform at Oso Flaco Lake (Table 4-4). A maximum of 1.0 acre of wetland and open water habitat will continue to be temporarily impacted each year by routine riparian maintenance, Pismo Beach golf course maintenance, and/or CDPR management of agricultural lands drainage ditch maintenance. Additionally, a maximum of 2.0 acres of riparian corridor segments will be subject to temporary spot treatments for continued tree maintenance and invasive weed control as the need arises during the life of the HCP. This short-term disruption of habitat will not result in a permanent reduction of habitat but may increase disturbance and/or the potential for mortality of CRLF that could inhabit the disturbed area.

In addition to CRLF habitat loss, this HCP proposes take authorization in aquatic habitat for CRLF adults/sub-adults/juveniles, tadpoles, and egg masses. As stated previously, CDPR has no records of CRLF take in the HCP area to date, and take of CRLF in the HCP area is difficult to quantify due to the small number of CRLF present in the HCP area and due to the small size of individuals. Between 2010 and 2019, over 50[73] observations of CRLF adults/juveniles have been recorded in or within close proximity to the HCP area, with the highest number (i.e., 43) of CRLF adults/juveniles occurring in 2019. In 2019, up to four[74] CRLF tadpoles were also observed in the HCP area. In addition, in 2019, one CRLF egg mass was observed. Only a small portion of CRLF in the HCP area are anticipated to be injured or killed due to covered activities. However, as stated previously, this HCP provides a worst-case estimate of take to account for individuals that may not have been observed injured or dead in the past. Therefore, this HCP estimates that a maximum of four adults/sub-adults/juveniles, two tadpoles, and two egg masses could be crushed, injured, or killed in a year due to covered activities in aquatic habitat. In addition, because these numbers represent maximum take that could occur in a year in the HCP area and CRLF are not likely to be injured or killed each year, this HCP provides an estimate of CRLF that could be crushed, injured, or killed over the permit term. As a result, this HCP estimates that a maximum of 20 CRLF adults/sub-adults/juveniles, 10 tadpoles, and 10 egg masses could be injured or killed due to covered activities over the permit term in aquatic habitat. Because this is a worst-case scenario, actual take is expected to be substantially lower in most years given the marginal quality of many aquatic habitats within the HCP area, the few documented sightings of CRLF within the HCP area, and the AMMs that will be implemented. Anticipated take thresholds are provided in Table 4-3.

4.5.2.2 Take of CRLF Incidental Park Visitor Activities, Park Maintenance, Visitor Services, and Other HCP Covered Activities in Upland Habitat

CRLF have never been observed in upland habitat and are only anticipated to infrequently occur in the upland habitat in the HCP area in the future during dispersal, as most of the upland area is dominated by beaches and barren sand that do not provide habitat features necessary for aestivation and other uses. Park visitor activities, park maintenance, visitor services, and other HCP covered activities that may affect CRLF within upland habitat include the following:

- Motorized activities
- Campground maintenance
- General facilities maintenance
- Oso Flaco Lake boardwalk replacement
- Emergency response
- Pismo Beach golf course maintenance
- Dust control activities
- Cultural resource management

[73] Because multiple surveys were conducted, the same individual may have been observed and counted during more than one survey.

[74] Because multiple surveys were conducted, the same individual may have been observed and counted during more than one survey. In addition, in some instances a positive identification of species was not obtained.

- Special projects

These activities are anticipated to occur within 4,777 acres of CRLF upland habitat. Within these 4,777 acres, approximately 420 acres of CRLF upland habitat may be permanently affected by future dust control activities, and up to 35 acres could be affected by special projects. Any vegetation planted for dust control should ultimately benefit CRLF as it converts open sand to a more hospitable vegetated habitat and would not be considered habitat loss. Temporary impacts to upland habitat could occur each year from dust control activities and include up to 40 acres from temporary dust control measures, such as wind fencing and straw bales, and up to 3 additional acres would be modified for temporary air quality monitoring equipment (Table 4-4).

Only adults/sub-adults/juveniles will be affected by covered activities in upland habitat since tadpoles and egg masses only occur in aquatic habitat. Park visitor activities, including motorized recreation, and management activities that occur at the Pismo Beach Golf Course, North Beach Campground, and Oceano Campground may result in mortality or injury of CRLF adults/sub-adults/juveniles dispersing through upland habitat. As stated previously, take of CRLF in upland habitat in the HCP area has not been documented, and the potential for take in this habitat is considered low. Specific locations in the HCP area where take of CRLF could occur in upland habitat are described in the following paragraphs.

CRLF has a low to moderate potential to occur in Meadow Creek and Carpenter Creek[75] adjacent to Pismo Beach Golf Course. CRLF could disperse to Meadow Creek, Carpenter Creek, and/or the golf course ponds and could be crushed or injured by golf course management, such as mowing. AMMs, including environmental awareness training for golf course maintenance staff, will continue to reduce the potential for CRLF incidental take.

Additionally, CRLF could occur in Meadow Creek and Carpenter Creek adjacent to North Beach and Oceano Campgrounds. CRLF is not currently known to occur in Meadow Creek and may have been observed in Carpenter Creek. CRLF could be present in either creek due to the proximity of known populations at nearby Arroyo Grande Creek and Oceano (Meadow Creek) Lagoon. CRLF present in these areas could disperse to Meadow Creek and Carpenter Creek and could be crushed or injured by maintenance activities (e.g., mowing) and/or park visitor vehicles could crush or injure CRLF in the campground area.

In the past 15 years, CRLF has been observed once in dunes at nearby Guadalupe-Nipomo Dunes National Wildlife Refuge (C. Cleveland, pers. comm. 2014). Consequently, there is a small potential for CRLF to attempt to disperse through the open riding area. However, CRLF tends to disperse at night during periods of wet weather when levels of motorized vehicle recreation are low; therefore, take in the open riding area is expected to be low.

This HCP proposes take authorization in upland habitat for CRLF adults/sub-adults/juveniles and estimates that a maximum of five adults/sub-adults/juveniles could be injured or killed in a year in upland habitat. In addition, because these numbers represent maximum take in a year that could occur in the HCP area, and CRLF are not likely injured or killed each year, this HCP provides an estimate of CRLF that could be crushed, injured, or killed over the permit term. As a result, this HCP estimates that a maximum of 15 CRLF adults/sub-adults/juveniles could be injured or killed over the permit term in upland habitat. This estimate is a worst-case scenario and is not expected to occur in most years. As a result, actual take is expected to be substantially lower given the marginal quality of upland habitat

[75] In 2019, although it was positively identified, a CRLF tadpole was thought to be observed in Carpenter Creek.

within the HCP area, the few documented sightings of CRLF within the HCP area, and the AMMs that will be implemented. Anticipated take thresholds are provided in Table 4-3.

4.5.2.3 Take of CRLF Incidental to Natural Resources Management Activities in Aquatic Habitat

CRLF are likely to inhabit aquatic areas subject to measures intended to benefit CRLF and other covered species, including the following:

- CRLF surveys
- Tidewater goby and salmonid surveys
- Listed plant monitoring, propagation, and habitat enhancement
- Invasive pest plant and animal control
- Water quality monitoring and improvement projects

Only CRLF dipnet/seine surveys (if conducted) or tidewater goby and salmonid surveys can potentially result in injury or mortality of CRLF. Although AMMs are implemented to minimize loss of CRLF from these activities, mortality and/or injury could still occur. This HCP estimates that a maximum of 2 adults/sub-adults/juveniles, 10 tadpoles, and 10 egg masses could be injured or killed in a year due to CRLF dipnet/seine surveys and/or tidewater goby and salmonid surveys. In addition, because these numbers represent the maximum take that could occur in a year in the HCP area and because CRLF are not likely to be injured or killed each year, this HCP provides an estimate of CRLF that could be crushed, injured, or killed over the permit term. Therefore, it is anticipated that a maximum of 20 adult/sub-adults/juveniles, 50 tadpoles, and 50 egg masses could be crushed, injured, or killed over the permit term as a result of CRLF dipnet/seine surveys and/or tidewater goby and salmonid surveys. Anticipated take thresholds are provided in Table 4-3.

CRLF dipnet/seine surveys are not regularly conducted in the HCP area but may be conducted, if necessary. Dipnet/seine surveys result in capture of larval CRLF. In addition, at times, an amphibian species cannot be identified during visual surveys and may need to be captured to accurately identify the species. This HCP anticipates that no more than 20 CRLF adult/sub-adults/juveniles and 50 tadpoles will be captured each year during dipnet/seine surveys, if they occur. Handling of egg masses is not authorized by a 10(a)(1)(A) permit and would require specific justification and permitting (USFWS 2017b).

Table 4-3. Summary of Effects on CRLF and Estimated CRLF Take

Covered Activity	Acres within Which Activity Occurs	Estimated Maximum Annual Take	Estimated Take Individual CRLF over the Permit Term
All covered activities in aquatic habitat other than Natural Resource Management Activities	178 acres	4 adults/sub-adults/ juveniles 2 tadpoles 2 egg masses	20 adults/sub-adults/ juveniles 10 tadpoles 10 egg masses

Table 4-3. Summary of Effects on CRLF and Estimated CRLF Take			
Covered Activity	**Acres within Which Activity Occurs**	**Estimated Maximum Annual Take**	**Estimated Take Individual CRLF over the Permit Term**
All covered activities occurring in CRLF upland habitat other than Natural Resource Management Activities	4,777 acres	5 adults/sub-adults/ juveniles	15 adults/sub-adults/ juveniles
Natural Resource Management Activities	Within 178 acres of CRLF aquatic habitat and 4,777 acres of upland habitat	2 adults/sub-adults/ juveniles 10 tadpoles 10 egg masses	20 adults/sub-adults/ juveniles 50 tadpoles 50 egg masses
CRLF Dipnet Surveys (capture only)	178 acres	20 adults/sub-adults/ juveniles 50 tadpoles	N/A

Table 4-4. Summary of Estimated Loss of CRLF Habitat		
	Annual estimated *temporary* habitat disruption	**Total estimated *permanent* loss of habitat**
CRLF aquatic habitat	3.0 acres riparian, wetland, and open water	1.5 acres – Oso Flaco boardwalk replacement
CRLF upland habitat	40 acres from temporary dust control measures	3 acres[76] – dust control monitoring devices 35 acres – special projects

4.5.3 Anticipated Impacts of the CRLF Taking

This section describes the overall impacts for the anticipated take of CRLF within the HCP area and discusses the overall impacts from covered activities on the entire CRLF population. The assessment of impacts takes into account the implementation of conservation and AMMs, where appropriate, which are described in greater detail in Chapter 5.

CRLF are currently threatened by human activities, many of which operate concurrently and cumulatively with each other and with natural disturbances (e.g., droughts and floods) (USFWS 2002). Current factors associated with declining populations of the frog include degradation and loss of its

[76] Although the location of some meteorological monitoring stations may not be permanent, this HCP assumes that up to 3 acres of dispersal habitat could be occupied by monitoring stations at any given time. Vegetation planting associated with dust control activities is not considered a permanent loss of habitat since CRLF can use this habitat for cover and dispersal.

habitat through agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, invasive plants, impoundments, water diversions, degraded water quality, and introduced predators (Hayes and Jennings 1988). These factors have resulted in the isolation and fragmentation of habitats within many watersheds, often precluding dispersal between sub-populations and jeopardizing the viability of metapopulations. The fragmentation of existing habitat and the continued colonization of existing habitat by invasive species may represent the most significant current threat to CRLF.

Within the HCP area CRLF have been found in Arroyo Grande Creek and estuary, Meadow Creek, Oso Flaco Lake, Little Oso Flaco Lake, and Oceano (Meadow Creek) Lagoon. Although presence/absence surveys have been conducted in the HCP area, no population assessments have been performed in areas where CRLF occur.

Conservation goals and objectives listed in section 5.2.2 and AMMs listed in section 5.3.1.3 endeavor to fulfill several of the recovery objectives listed in the Recovery Plan. Specifically, Objective 2.2 and Objective 3.1 are designed to protect and/or restore aquatic habitats and associated uplands. Objective 2.1 is designed to minimize aquatic predator expansion and reduce existing predator populations. In addition, AMMs listed in section 5.3.1.3 will continue to minimize impacts to CRLF during population surveys.

The permanent loss of less than one percent of modeled suitable aquatic and upland habitat within the HCP area resulting from covered activities will not substantially affect the species' population and distribution on site. Within the HCP area, CDPR will limit encroachment, when necessary, by closing suitable CRLF habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano (Meadow Creek) Lagoon, Arroyo Grande Creek, Arroyo Grande Creek Lagoon, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential CRLF habitat. CDPR will also continue to remove invasive plant and animal species, as feasible, within aquatic habitat for CRLF to benefit this species. As a result, suitable habitat for CRLF will continue to be present within the HCP area, and CRLF are still expected to occur within these habitats. In addition, Arroyo Grande Creek and other aquatic habitat within the HCP area will continue to provide connectivity of aquatic habitats in San Luis Obispo County and allow for dispersal opportunities in the area.

Although this HCP includes mortality or injury of up to 55 adults/sub-adults, 60 tadpoles, and 60 egg masses from all HCP covered activities, including natural resource management, over the life of the permit, this take number is a worst-case scenario and this amount of take is unlikely to occur due to the few documented sightings of CRLF within the HCP area and the implementation of AMMs listed in section 5.3.1.3. Because CRLF population numbers do not necessarily indicate stability (i.e., a population may have large numbers of individuals one year and then decline another), long-term evidence of successful reproduction (i.e., presence of juveniles) and survivorship into different age classes provides a better indication of population stability, persistence, and resilience (USFWS 2002). Within the HCP area, few CRLF have been observed, and a stable population is not known to exist on site. However, CDPR will continue to conduct surveys for CRLF in the HCP area to monitor for changes in the population size or habitat. As a result, CRLF within the HCP area will not be substantially affected. In addition, CRLF populations are not expected to be affected over the species' much larger range in California.

4.6 Tidewater Goby

Avoidance and minimization of take of listed species will continue to be the primary goal of CDPR. Still, effects on tidewater goby and potential tidewater goby habitat from existing and new covered activities in the HCP area are possible and are described in the following sections. Covered activities occurring outside of tidewater goby habitat (Map 15) are not anticipated to affect the species unless specifically

discussed in the following sections. In addition, any other covered activities that are not expected to affect tidewater goby are not discussed further. Table 4-5 in section 4.6.1.5.3 summarizes the potential effects and potential take of tidewater goby from covered activities. AMMs that address the effects are provided in section 5.3.1.4.

4.6.1 Direct and Indirect Effects

Covered activities that can affect tidewater goby occur within 45 acres of tidewater goby habitat. Of this area, 10 acres occur where street legal vehicle activity is allowed, and 35 acres are open to pedestrians or CDPR personnel only.

Covered activities that occur within tidewater goby habitat are considered to have minor, temporary effects on tidewater goby habitat; however, some injury or mortality of tidewater goby can still occur (section 4.6.1.5.3).

Some existing covered activities, including habitat management, fisheries monitoring, and water quality monitoring and improvement projects ultimately benefit tidewater gobies and their habitat by improving habitat quality and/or providing valuable information on tidewater goby occurrences in the HCP area.

The following sections describe the mechanisms by which existing and new covered activities can affect tidewater goby. Effects will continue to be avoided and minimized, to the extent feasible, through AMMs. AMMs reducing the effects are briefly mentioned here and are described in greater detail in section 5.3.1.4.

4.6.1.1 Park Visitor Activities

4.6.1.1.1 Motorized Recreation (CA-1)

For the specific effects of vehicles crossing Arroyo Grande Creek, see section 4.6.1.5.1. No other effects on tidewater goby from public motorized recreation are known to occur.

4.6.1.1.2 Pedestrian Activities (CA-3)

Pedestrian activities have not been documented impacting tidewater goby; however, any impacts are difficult to observe, and some impacts can occur. Pedestrian activities will continue to have mostly minor effects on tidewater goby, such as a temporary increase in turbidity when crossing suitable tidewater goby habitat. Even in areas of high visitor use, pedestrians are considered to pose little to no threat to tidewater gobies and/or their habitat. However, pedestrian activities could affect tidewater goby in limited circumstances as described below.

Visitors wading in the Pismo Creek and Arroyo Grande Creek estuaries can trample or injure tidewater gobies or collapse tidewater goby breeding burrows. Visitors wading and/or swimming in Pismo Creek estuary and Arroyo Grande estuary can also disturb habitat, injure/kill fish, or make individuals more susceptible to predation by startling them from protected areas and/or making them more visible to predators. However, the ponded areas of Arroyo Grande Creek will continue to be closed to pedestrians during the peak tidewater goby breeding season (generally early spring to late summer) to minimize the disturbance to breeding tidewater gobies. In addition, a floating bridge (section 4.6.1.5.2) may be installed in the future across the Pismo Creek estuary to minimize disturbance to tidewater gobies in this area. Overall, impacts from wading visitors are considered minor and will continue to be minimal in the future.

In large enough amounts, loss of bank and in-stream vegetation due to visitors building small rock dams and rock crossings or collecting driftwood for campfires can lead to an increase in water turbidity and a

decrease in water quality. In addition, pedestrians crossing creeks can stir up sediments and temporarily increase turbidity. In large amounts, temporarily suspended sediment can adversely affect aquatic species, including tidewater gobies. Increased turbidity can reduce visibility for tidewater gobies, which could result in reduced foraging success, difficulty escaping from predators, and reduced reproductive success. Increased sediment during the tidewater goby breeding season can cover coarse sand and/or fill the interstitial spaces between the sands, limiting oxygen to tidewater goby eggs. Layers of silt on top of coarse sand can also make the substrate unavailable for spawning. However, sediment stirred up during activities, including creek crossings, rock dam construction, and driftwood collection is typically minimal, localized, and temporary and does not affect tidewater goby or tidewater goby habitat in the long term. This impact will continue to be minimal in the future.

4.6.1.1.3 Dog Walking (CA-6)

Like pedestrians, dogs have not been documented impacting tidewater goby, but any impacts are difficult to observe and can occur. In general, dogs wading and swimming in estuaries and creeks occupied by tidewater goby can affect water quality by depositing waste, trampling vegetation, and temporarily increasing turbidity, thereby temporarily affecting spawning habitat, foraging, ability to escape from predators, and reproductive success. However, dogs will continue to be required to be on a leash no longer than 6 feet and remain under the control of an owner at all times, and mutt mitts will continue to be provided in the HCP area. As a result, impacts from dog walking are considered minimal and will be minimal in the future.

4.6.1.1.4 Equestrian Recreation (CA-7)

Horses also have similar effects on tidewater goby as pedestrians and dogs wading and swimming in estuaries occupied by tidewater goby (section 4.6.1.1.2 and 4.6.1.1.3). Equestrians, however, generally cross Arroyo Grande Creek upstream of tidewater goby habitat; therefore, equestrians typically avoid potential tidewater goby habitat. Any impacts to tidewater goby from equestrian recreation are considered minimal and will be minimal in the future.

4.6.1.1.5 Holidays (CA-10)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area on holidays. Therefore, no additional impact to tidewater goby occurs from motorized recreation on holidays.

Effects on holidays from non-motorized recreation are similar to those described for pedestrian activities (section 4.6.1.1.2). Additional visitors on holidays could increase the amount of trash in the HCP area or the number of visitors/dogs that wade within estuaries and creeks; however, this increase would not likely result in additional effects on tidewater goby that have not previously been described.

4.6.1.1.6 Special Events (CA-11)

In accordance with the Oceano Dunes CDP (CDP-4-82-300-A5), Oceano Dunes SVRA does not allow additional vehicles to enter the HCP area during special events, and no additional effects on tidewater gobies have been observed from motorized recreation during special events. In addition, Special Event Permits do not authorize activities to occur in areas that will otherwise be closed to visitors; therefore, no additional impacts from non-motorized and motorized activities occur in tidewater goby habitat that is typically off limits to visitors.

Special events are potentially different from typical non-special event activities. First, many events tend to focus participants in the event area, which could mean that spectators or vendors are more concentrated in a given area than they might otherwise be during an ordinary day. However, any increase in visitors during special events does not likely to result in an increase of visitors in tidewater

goby habitat. Furthermore, any increase in visitors during special events will not result in additional effects on tidewater goby that have not previously been described.

4.6.1.2 Natural Resources Management

4.6.1.2.1 Covered Species Management

Tidewater Goby and Salmonid Surveys (CA-13)

Only CDPR biologists and/or contractors with a 10(a)(1)(A) Recovery Permit for tidewater goby and/or USFWS/NOAA Fisheries approval conduct tidewater goby and salmonid surveys. CDPR biologists and/or contractors can capture all life stages of tidewater goby during seining associated with regular fisheries monitoring. In the HCP area since 2005, between zero and tens of thousands of tidewater gobies have been captured during surveys (Table 3-15). Tidewater gobies can also be injured or even killed during seining associated with monitoring fisheries populations, although this is rare and has only been documented on a few occasions with a maximum of three individuals being injured or killed. Mortality or injury can occur if fish become tangled in seine nets, burrows are trampled during survey work, and/or spawning substrates are disrupted during survey activities. AMMs are in place to minimize the potential for mortality and/or injury during tidewater goby and salmonid surveys, including, but not limited to, having a USFWS- and/or NOAA-fisheries approved biologist conduct the surveys, conducting the surveys in accordance with the guidelines described in the Recovery Plan for tidewater goby (USFWS 2005b), using the smallest and lightest seine nets practicable, immediately releasing any tidewater gobies that appear stressed, and limiting dipnetting and seining to no more that 40 percent of the survey area (or 20 percent during the breeding season). In addition, no electrofishing is allowed in tidewater goby habitat to avoid injuring or killing a tidewater goby during electrofishing activities. As a result, impacts from tidewater goby and salmonid surveys are minimal and will continue to be minimal or eliminated in the future.

Surveys can also stir up sediments and temporarily increase turbidity. Increased turbidity can reduce visibility for tidewater gobies, which could result in reduced foraging success, difficulty escaping from predators, and reduced reproductive success if this occurs in the breeding season. However, sediment stirred up during activities is minimal, localized, and temporary and does not affect tidewater gobies or their habitat in the long term.

Ultimately, tidewater goby surveys benefit tidewater goby by providing information necessary to contribute to conservation of the species.

California Red-legged Frog Surveys and Associated Management (CA-14)

When possible and appropriate, eyeshine surveys will continue to be conducted for CRLF within tidewater goby habitat to minimize disturbance to tidewater gobies and incidental capture of tidewater gobies in a dipnet. Eyeshine surveys have little (if any) impact on tidewater gobies since they are conducted out of water or from a kayak.

When dipnet surveys are necessary to survey for CRLF, tidewater gobies could be captured in dipnets if the surveys occur in tidewater goby habitat. Tidewater goby egg burrows can also be disturbed or crushed if the dipnet survey is conducted during the tidewater goby breeding season. In addition, captured tidewater goby individuals could be injured or even killed when caught in the dipnet. However, CRLF dipnet surveys will continue to be conducted in a manner that minimizes disturbance to aquatic habitat when the CRLF habitat overlaps with tidewater goby habitat, and any captured fish that show signs of stress will be released immediately at the capture site. As a result, impacts from CRLF surveys will continue to be minimized.

Dipnet surveys could also stir up sediments and temporarily increase turbidity since surveyors must enter the water on foot to conduct the survey. Increased turbidity can reduce visibility for tidewater gobies, resulting in reduced foraging success, difficulty escaping from predators, and reduced reproductive success if the survey occurs during the breeding season. However, sediment stirred up during activities is minimal, localized, and temporary, and does not affect tidewater goby or its habitat in the long term.

Invasive Plant and Animal Control (CA-17)

Invasive plant and animal control activities may require CDPR Environmental Scientists to remove pest plants and animals in tidewater goby habitat (see section 4.6.1.5.3 for pesticide discussion). CDPR biologists can temporarily disturb tidewater goby individuals and habitat during invasive animal and plant control efforts. In addition, CDPR biologists can inadvertently step on tidewater goby burrows or injure tidewater goby individuals if these activities occur during the breeding season. To minimize these impacts, activities within tidewater goby habitat will continue to be avoided, if possible. If it is not possible to avoid activities in tidewater goby habitat and activities require that work be conducted in the water, only one person will enter the water to ensure disturbance to tidewater goby and its habitat is minimized. As a result, these impacts are considered minimal.

Invasive plant and animal control activities can also indirectly affect tidewater goby by temporarily stirring up sediment and increasing turbidity, as described previously. Sediment stirred up during activities is minimal, localized, and temporary and does not affect tidewater goby or its habitat in the long term. In addition, to prevent erosion and sedimentation in tidewater goby habitat, vegetation removal and bank disturbance associated with invasive plant control will continue to be kept to a minimum.

Water Quality Monitoring Projects (CA-19)

Installation of water quality monitoring equipment (e.g., gauges, telemetry) can temporarily affect tidewater goby by disturbing individuals during installation, removal, operation, and maintenance of instruments. Monthly or bi-monthly grab samples may also be collected in Oso Flaco, Pismo, and Arroyo Grande estuaries. The chances of a tidewater goby being inadvertently collected by a water (grab) sample is very low. In addition, these activities will continue to be monitored by qualified biologists, so effects will continue to be localized, temporary, and minor.

Water quality monitoring activities can also indirectly affect tidewater goby by temporarily stirring up sediment and increasing turbidity, as described previously. Sediment stirred up during activities is minimal, localized, and temporary and does not affect tidewater goby or its habitat in the long term.

4.6.1.3 Park Maintenance

4.6.1.3.1 Routine Riparian Maintenance (CA-26)

Riparian maintenance activities that can affect tidewater goby include culvert maintenance and emergent vegetation removal when these activities are located near or within occupied habitat. Culvert maintenance occurs in Carpenter Creek, where tidewater goby was first recorded in 2012. Tidewater goby has the potential to persist in the creek in the future. As a result, riparian maintenance activities in Carpenter Creek can impact tidewater goby. However, as Carpenter Creek dries, tidewater goby are found in pools, which often form at a distance from the culverts and vegetation that are impacted by the maintenance activities; therefore, direct impacts from culvert maintenance and vegetation removal do not occur when the water pools. Tidewater goby individuals, however, can be injured or killed, and egg burrows can be crushed during these activities if the water encroaches on the riparian maintenance work area and tidewater goby are present near the culverts or vegetation. To minimize these effects,

maintenance activities will continue to be conducted during the dry season or when the creek is not actively flowing or at its lowest flow, if possible. In addition, all maintenance personnel will continue to receive training prior to activities that, at a minimum, covers tidewater goby life history and work constraints. A pre-activity survey will also continue to be conducted prior to performing activities in tidewater goby habitat. As a result, these impacts will continue to be minimized.

Culvert maintenance occasionally requires a backhoe bucket to enter the water. The bucket can stir up sediments and temporarily affect downstream water quality by increasing turbidity. In addition, removing vegetation around the culverts can stir up sediments and increase turbidity. Increased turbidity can reduce visibility for tidewater gobies, which could result in reduced foraging success, difficulty escaping from predators, and reduced reproductive success if this occurs during the breeding season. However, sediment stirred up during activities is minimal, localized, and temporary and does not affect tidewater goby or its habitat in the long term. In addition, to prevent erosion and sedimentation in tidewater goby habitat, vegetation removal and bank disturbance associated with riparian maintenance activities will continue to be kept to a minimum.

Riparian maintenance activities can affect tidewater goby habitat if an equipment leak or spill occurs and enters the water. Refueling and maintenance of equipment will continue to occur at least 60 feet from riparian habitat and appropriate spill containment will continue to be kept on site at all times so any spills can be cleaned immediately. As a result, effects on water quality from riparian maintenance activities are minimal.

4.6.1.3.2 Minor Grading (CA-30)

Most grading activities will continue to occur on land and will not occur in or near tidewater goby habitat; therefore, these activities do not affect tidewater goby. In the future, if grading activities occurred in or near tidewater goby habitat, tidewater gobies could be injured or killed during these activities and egg burrows could be crushed if the activities occurred in the breeding season. To reduce the potential to injure or kill tidewater goby or crush egg burrows, CDPR will continue to ensure that no heavy equipment is placed in the water body during minor grading. As a result, direct impacts from minor grading would not occur.

Any personnel that enter the water during minor grading can stir up sediments, temporarily affecting downstream water quality by increasing turbidity. Increased turbidity can reduce visibility for tidewater gobies, resulting in reduced foraging success, difficulty escaping from predators, and reduced reproductive success if the activity occurs during the breeding season. However, sediment stirred up during activities is minimal, localized, and temporary and will not affect tidewater goby or its habitat in the long term.

Minor grading activities can affect tidewater goby habitat if an equipment leak or spill occurs nearby tidewater goby habitat and enters the water. Refueling and maintenance of equipment will continue to occur at least 60 feet from riparian habitat and appropriate spill containment will continue to be kept on site so any spills can be cleaned immediately. As a result, effects on water quality from riparian maintenance activities are minimal.

4.6.1.4 Visitor Services

4.6.1.4.1 Ranger, Lifeguard, and Park Aide Patrols (CA-32)

For the specific effects on tidewater goby from patrols crossing Pismo/Carpenter and Arroyo Grande Creeks, see section 4.6.1.5.1. No other effects on tidewater goby occur from these patrols.

4.6.1.4.2 Emergency Response (CA-33)

From time to time, law enforcement and/or medical aid must respond to emergencies. When this occurs, some trampling of riparian vegetation may occur or a creek (e.g., Carpenter Creek) may be crossed without the use of a bridge or hardened bottom. Impacts to tidewater goby from emergency activities are not known; though highly unlikely, eggs, juveniles, or adults could be crushed, injured, or killed by such an incident. Potential damage to habitat is likely minor and temporary since any impacts would occur from a vehicle driving through quickly or from foot traffic associated with the emergency.

Emergency vehicles crossing creeks or emergency personnel entering water bodies occupied by tidewater gobies can stir up sediments, temporarily affecting downstream water quality by increasing turbidity. Increased turbidity can reduce visibility for tidewater gobies, resulting in reduced foraging success, difficulty escaping from predators, and reduced reproductive success if the activity occurs during the breeding season. However, sediment stirred up during activities will be minimal, localized, and temporary and will not affect tidewater gobies or their habitat in the long term.

4.6.1.5 Other HCP Covered Activities

4.6.1.5.1 Motorized Vehicle Crossing of Pismo/Carpenter, Oso Flaco, and Arroyo Grande Creeks (CA-40)

Tidewater gobies in the HCP area are believed to be flushed from the northern San Luis Obispo County estuary populations during high-volume storm events and transported, via the north-south longshore current, to estuaries to the south, including the HCP area. Tidewater gobies flushed from Pismo Creek estuary or other northern estuaries, may enter Arroyo Grande Creek estuary during or just after storm events. Therefore, the mouth of Arroyo Grande Creek has potential to function as a migration route for tidewater gobies during high-flow, winter flood events (D. Rischbieter, pers. comm. 2012). A recent discovery (Rischbieter 2017) of two tidewater goby individuals at the mouth of Oso Flaco Creek also makes Oso Flaco Creek a potential migration route for tidewater gobies. Arroyo Grande Creek is crossed by the public, as well as CDPR staff. Oso Flaco Creek is only crossed by CDPR maintenance and monitoring crews and no public vehicles are allowed. All vehicles cross the creeks near the shoreline. No impacts to tidewater goby egg burrows occur from vehicles crossing these creeks because the respective shallow sandy stream segments, where such crossing occurs, is not suitable habitat for tidewater goby spawning or rearing. Under normal conditions (i.e., dry weather or low-volume storm events), routine vehicle traffic crossing at Arroyo Grande Creek or Oso Flaco Creek likely has no impact on tidewater goby or its habitat because vehicles are prohibited from crossing the creek in any manner other than crossing as close to the ocean waterline as possible. In general, fish typically do not use the surf-line outlet reach. Ponded areas of Arroyo Grande Creek, where tidewater goby does occur, are posted as closed to vehicles, thus protecting tidewater goby from vehicles. Therefore, vehicle crossing of the creek at the waterline is unlikely to affect tidewater goby individuals.

Under certain conditions, especially in the winter, the extent of the ponded areas in Arroyo Grande Creek can shift significantly between tides and sometimes even between successive wave sets. Even though motor vehicles are prohibited from traversing these ponded areas, it is not feasible for CDPR staff to move fencing and closure signage each time the area changes, and visitors may not know they are prohibited from driving through the ponded areas. Under such circumstances, it is possible individual tidewater gobies could be disturbed or even injured or killed by vehicles driven by visitors across Arroyo Grande Creek. However, because of the transitory nature of the ponding in these beach areas, it is unlikely that breeding burrows occur in the area. Therefore, no impacts tidewater goby burrows occur.

CDPR staff and/or contractor vehicles do not cross through ponded areas at the mouth of Pismo Creek. Patrol vehicles may infrequently drive through the Pismo/Carpenter Creek confluence when traveling to the North Beach Campground and could destroy breeding burrows and/or kill/injure individual tidewater gobies in that area. However, CDPR staff and/or contractors will continue to avoid crossing through ponded water where possible. If ponded water cannot be avoided, CDPR staff and/or contractors will attempt to cross at the shallowest area possible to minimize impacts to tidewater gobies. Therefore, impacts to tidewater gobies from crossing the Pismo/Carpenter Creek confluence are presumed to be minimal.

Crossing creeks could stir up sediment, which could affect downstream reaches of creeks by increasing turbidity. However, the quality of habitat in the lowest reaches (i.e., sand banks, sandy channel) of the creeks does not appear to be significantly altered by vehicle traffic, owing largely to the naturally transitory and dynamic nature of sandy features near the surf line and through the beach (Rischbieter 2006). In addition, any effects from increased turbidity are minor, localized, and temporary and do not affect tidewater gobies in the long term.

4.6.1.5.2 Pismo Creek Estuary Seasonal (Floating) Bridge (CA-41)

The Pismo Creek Estuary seasonal floating bridge has not been installed at this time. The bridge is expected to reduce erosion and sedimentation into the Pismo Creek estuary by reducing the number of pedestrians walking through the mouth of the creek. Therefore, the bridge is expected to benefit tidewater goby and its habitat by reducing the temporary effects from turbidity and the potential for tidewater goby individuals to be injured or killed.

The bridge could block passage for fish when it is installed. To allow movement of all fish species as well as an exchange of fresh and saltwater, even during low flows, the interlocking pieces of the bridge will be constructed to create wide openings under the bridge. In addition, the bridge will be removed if water levels are so low that it is not allowing the free movement of fish in the estuary. As a result, this impact will be minimal.

The bridge could result in shadow or other disturbances to the surface of the water when pedestrians cross the bridge, which could cause temporary disturbances to tidewater goby. However, the bridge will cover a very small area of the estuary and such disturbances are expected to result in only minor effects on tidewater goby or its habitat.

4.6.1.5.3 Use of Pesticides (CA-51)

Pesticides are currently used in the HCP area near aquatic habitat; however, the effects of pesticides on tidewater goby are not well documented. As a result, this section discusses potential effects that could occur to tidewater goby.

While the risk characterization for each pesticide focuses on the potential for direct toxic effects, potential for indirect effects exists in virtually all groups of non-target organisms. Terrestrial applications of any effective herbicide are likely to alter vegetation within the treatment area. This alteration could have indirect effects on terrestrial or aquatic animals, including changes in food availability and habitat quality. These indirect effects may be beneficial to some species and detrimental to other species; moreover, the magnitude of indirect effects is likely to vary over time. While these concerns are acknowledged, they are not specific to herbicide applications in general. Any effective method for vegetation management, including mechanical methods that do not involve herbicide, could be associated with indirect effects on both animals and non-target vegetation.

A description of the location where each pesticide is used in the HCP area in relation to tidewater goby habitat and the anticipated effects of each pesticide on tidewater goby follows.

Glyphosate and the aquatic formulation of imazapyr (Habitat®) are proposed to be used in aquatic habitats for control of invasive plants according to the APAP, including in tidewater goby habitat. Glyphosate has been used to control invasive plants since the 1970s. During this period, there have been no documented cases of adverse effects on fish associated with glyphosate (Giesy et al. 2000). Both imazapyr and glyphosate have very low toxicity to fish, posing virtually no risk of fish kills. In aquatic areas, herbicides are generally applied during a low or receding tide when water is not present, so residual amounts that may reach the water on the returning tide are small and rapidly diluted. The risk characterization for aquatic animals is somewhat less variable than for aquatic plants. Except for an accidental spill, exposure scenarios involving fish do not appear to present a risk (SERA 2011a). Exposure for fish from imazapyr can occur via direct contact to surface water that may contain the herbicide due to runoff after ground application. Imazapyr was undetectable in the initial tidal exchange waters following the direct application of the compound to estuarine sediments in field tests by the Washington State University. Bioaccumulation of imazapyr in aquatic organisms is low; therefore, the potential of exposure through ingestion of exposed aquatic invertebrates or other food sources to fish is reduced. Imazapyr is considered practically non-toxic (insignificant) to fish based on tests conducted using standardized EPA protocols (Washington Department of Agriculture 2017).

Fluazifop-P-butyl has been rated as slightly to moderately toxic to cold water fish (White 2007). However, CDPR does not use Fluazifop-P-butyl near aquatic systems in the HCP area; it is only used for spot treatment in upland habitat when Russian wheatgrass, veldt grass, and European beach grass are intermixed with native plants.

Triclopyr is used to treat Cape ivy in the HCP area, which typically occurs on or near willows in freshwater aquatic habitats; therefore, this pesticide is not expected to be used near tidewater goby habitat. In addition, triclopyr amine salt formulation, which is the formulation used in the HCP area, is rated as practically non-toxic to cold water and warm water fish (White 2007).

Aminocyclopyrachlor is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near tidewater goby habitat. The EPA (2010) classifies aminocyclopyrachlor as practically non-toxic or only slightly toxic to mammals, birds, fish, and aquatic invertebrates (SERA 2012).

Chlorsulfuron is used to control iceplant in the HCP area, which sometimes occurs near aquatic habitats; therefore, this pesticide could be used near tidewater goby habitat. Indirect exposure to birds, fish, or amphibians to chlorsulfuron can occur when they eat contaminated prey or vegetation. Direct exposure can occur when birds, fish, or amphibians contact chlorsulfuron residues with their skin or eyes or when they inhale chlorsulfuron vapors or particulates. CDPR's current application rates and use patterns for chlorsulfuron pose a negligible risk to wildlife. Fish do not appear particularly susceptible to chlorsulfuron toxicity (SERA 2004). Chlorsulfuron does not bioaccumulate (i.e., build up) in wildlife or fish; therefore, the risk to fish that eat exposed aquatic insects or other contaminated food sources is low.

Aminopyralid is used to control Cape ivy in the HCP area, which typically occurs on or near willows in freshwater aquatic habitats; therefore, this pesticide is not expected to be used near tidewater goby habitat. In addition, in Dow AgroSciences laboratory testing, aminopyralid has been shown to be "practically non-toxic" (Class 0) to birds, fish, honeybees, earthworms, and aquatic invertebrates, which is the EPA's least toxic category (EPA 2005, DOW Chemical Company AgroSciences 2008).

Clethodim has been rated as slightly to moderately toxic to fish and aquatic invertebrate species (SERA 2014). However, CDPR does not use clethodim near aquatic systems in the HCP area and a 200-foot buffer is implemented during clethodim use around aquatic resources. Clethodim is only used in upland habitat when for veldt grass removal.

Sethoxydim has been rated as moderately to slightly toxic to aquatic species (SERA 2001). However, CDPR does not use sethoxydim near aquatic systems in the HCP area and a 200-foot buffer is implemented during sethoxydim use around aquatic resources. Sethoxydim is only used in upland habitat when for veldt grass removal.

VectoBac G is applied by helicopter over large areas in the HCP area, which could include tidewater goby habitat. VectoBac G is toxic only to the larvae of certain diptera. It does not harm other aquatic, marine or terrestrial fauna (Swedish Chemicals Agency 2015).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA®, surfactants labeled for aquatic use. Little information is available regarding the potential effects of Competitor® and Renegade EA® on tidewater goby. The product safety data sheets for these surfactants state that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016a).

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Based on years of survey data for covered species and implementation of specific avoidance and minimization measures for pesticide use, pesticide use within the HCP area is expected to benefit tidewater goby by preventing aquatic invasive plants from reducing tidewater goby habitat quality. Also, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide exposure and associated risks to covered species are expected to decrease with increasing distance from the treated field or site of application. CDPR takes extra precautions when applying pesticides near open water and wetlands and other sensitive habitats that support covered species. However, contamination may result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. AMMs listed in section 5.3.1.4 are considered to reduce or eliminate these impacts.

4.6.2 Anticipated Take of Tidewater Goby

This section quantifies the potential for incidental take (i.e., harm, injury, or mortality) of tidewater goby due to the effects described in the preceding sections. Although many of these covered activities described are currently occurring in the HCP area, very little is known about the actual impacts on tidewater goby since tidewater goby take associated with park activities has not been observed. The number of tidewater gobies that may be killed or injured due to covered activities is difficult to quantify for the following reasons: 1) tidewater goby is difficult to detect because of its small body size, 2) finding a dead or injured specimen is unlikely and has rarely been observed by CDPR (D. Rischbieter, pers. comm. 2019), 3) finding a carcass and assigning a cause of death can be problematic, especially in the presence of numerous scavengers that are likely to find the animals soon after they die, and 4) the populations of tidewater goby in the HCP area are influenced by seasonal and/or annual events (e.g., drought or flood events) and thus fluctuate within the HCP area. Therefore, this HCP attempts to quantify take levels (i.e., harm, pursue, wound, kill, trap, capture or collect, or to attempt to engage in these activities) in the HCP area that could occur and go undetected, especially given the difficulty in observing tidewater goby.

Table 4-3 presents threshold levels of tidewater goby individuals that may be detected as killed or injured at which point consultation with the USFWS must be reinitiated. These threshold levels represent limits for take from covered activities. The HCP also recognizes that for every tidewater goby found dead or injured, other individuals may be killed or injured that are not detected. As a result, the estimation of take is considered to be a worst-case scenario and is not expected to occur in most years if at all.

Tidewater gobies have been killed or injured during fisheries surveys and may be taken by these activities in the future. In addition, tidewater gobies may be killed or injured during dipnet surveys associated with CRLF monitoring activities if they occur. Finally, tidewater gobies may be injured or killed by visitors or CDPR staff driving through occupied habitat (i.e., ponded areas of Arroyo Grande Creek and the confluence of Pismo Creek and Carpenter Creek), as well as by non-motorized park visitors.

CDPR has no records of tidewater goby injury or mortality from park visitor activities and only two have been observed injured or killed during tidewater goby surveys. Although AMMs will be implemented to minimize take Table 5-5, a small amount of take may still occur. In addition, tidewater gobies will be captured during seining surveys and a subset of these captured individuals could be injured or killed due to stress.

4.6.2.1 Take of Tidewater Goby Incidental to Non-Motorized Park Visitor Activities

Park visitor activities including walking dogs, equestrians, and pedestrians wading in tidewater goby habitat (i.e., Pismo Creek and Arroyo Grande Creek estuaries) can injure or kill tidewater goby individuals or collapse or crush tidewater goby burrows. Incidental take of tidewater goby individuals and/or their burrows from park visitors is difficult to document but is likely rare and localized. Thus, if five tidewater gobies are found dead or injured over a 5-year period, the USFWS must be contacted immediately to determine if additional measures are necessary.

4.6.2.2 Take of Tidewater Goby and Habitat Incidental to Motorized Vehicles

Under normal conditions (i.e., dry weather or low-volume storm events), routine vehicle traffic crossing at Arroyo Grande Creek likely has no impact on tidewater goby or its habitat because vehicles are prohibited from crossing the creek in any manner other than crossing as close to the ocean waterline as possible. In general, tidewater gobies typically do not use the surf-line outlet reach.

Ponded areas of Arroyo Grande Creek, where tidewater gobies do occur, are posted as closed to vehicles, thus protecting tidewater goby and breeding burrows from vehicles. However, under certain conditions, especially in the winter, the extent of the ponded areas in Arroyo Grande Creek can shift significantly between tides and sometimes even between successive wave sets. Even though motor vehicles are prohibited from traversing these ponded areas, it is not feasible for CDPR staff to move fencing and closure signage each time the area changes, and visitors may not know they are prohibited from driving through the ponded areas. As a result, a visitor may drive through Arroyo Grande Creek and injure or kill a tidewater goby. CDPR vehicles are less likely to mistakenly cross through ponded areas at the mouth of Oso Flaco Creek, Pismo Creek, or Arroyo Grande Creek. However, when traveling to North Beach Campground, patrol vehicles drive through the Pismo Creek and Carpenter confluence and, although unlikely, may collapse or crush a breeding burrow or injure/kill tidewater goby individuals. Thus, if five tidewater gobies are found dead or injured over a 5-year period, the USFWS must be contacted immediately to determine if additional measures are necessary.

A maximum of 5 acres of tidewater goby habitat may be temporarily affected by motorized vehicles driving through suitable habitat (Table 4-6; Map 26) if the ponded areas shift. The 5 acres include potentially ponded areas of Arroyo Grande Creek and the confluence of Carpenter Creek and Pismo Creek.

4.6.2.3 Take of Tidewater Goby Incidental to Fisheries and Amphibian Surveys

Tidewater gobies are captured during the surveys conducted to monitor the population. Between 2005 and 2018, anywhere from zero to hundreds of thousands of tidewater gobies have been captured during these surveys. As a result, this HCP estimates that hundreds of thousands of tidewater gobies could be captured annually during fisheries surveys (Table 4-5).

Incidental take of tidewater gobies in the form of injury or death during capture and handling could also occur from species monitoring, as identification of tidewater goby or CRLF tadpoles requires seining or dipnetting in tidewater goby habitat at Arroyo Grande Creek estuary and Pismo Creek estuary. Mortality or injury can occur if a tidewater goby becomes tangled in a seine or dipnet or is trampled during survey work (including those that may be trampled when inside a burrow).

Between 2008 and 2018, a maximum of three individuals were documented as being incidentally harmed during fisheries surveys. No tidewater goby has been documented as being incidentally harmed during amphibian surveys to date. The current allowable incidental take associated with the 10(a)(1)(A) Recovery Permit for tidewater goby in the HCP area is 10 individuals at a single location in 1 year and a total of 100 individuals during the term of the 10(a)(1)(A) Recovery Permit (i.e., 4 years). Therefore, to comply with the 10(a)(1)(A) Recovery Permit take limits, if 10 tidewater gobies are injured or killed during capture and handling for fishery and amphibian surveys in a year and 125 over a 5-year period, the USFWS must be contacted immediately to determine if additional measures are necessary (Table 4-5).

Table 4-5. Summary of Effects on Tidewater Goby and Allowable Tidewater Goby Take

Activity	Allowable Annual Take of Individual Tidewater Goby	Allowable Take of Individual Tidewater Goby over a 5-year Period	Allowable Take of Individual Tidewater Goby over the Permit Term
Non-motorized park visitor activities	N/A	5	25
Motorized park visitor activities	N/A	5	25
Fisheries and amphibian surveys[1]	10	125	625
Fisheries and amphibian surveys (capture only)	100,000s	N/A	N/A

[1] This estimate only includes take that is incidental to the activity and results in harm or mortality of the species. This estimate does not include capture of individuals as a result of the survey.

Table 4-6. Summary of Estimated Loss of Tidewater Goby Habitat

	Annual estimated *temporary* habitat disruption	Total estimated *permanent* loss of habitat
Tidewater goby habitat	5.0 acres (motorized vehicles)	0

4.6.3 Anticipated Impacts of the Tidewater Goby Taking

This section describes the overall impacts for the anticipated take of tidewater goby within the HCP area and discusses the overall impacts from covered activities on the entire tidewater goby population. The assessment of impacts takes into account the implementation of conservation and AMMs, where appropriate, which are described in greater detail in Chapter 5.

Population dynamics are not well documented for tidewater goby. Deriving population size estimates for the tidewater goby is difficult because of the variability in local abundance. In addition, seasonal changes in distribution and abundance further hamper efforts to estimate population size, especially for a short-lived species. Tidewater goby populations also fluctuate greatly with changing environmental conditions (e.g., drought, El Niño) among years; this environmental variation is a normal phenomenon, but one that makes the determination of trends difficult (USFWS 2005b). Both drought and flood events can locally extirpate tidewater goby (Rischbieter 2009a, 2015), as can habitat disturbances such as artificial lagoon breaching (Swift et al. 2018). Recolonization can subsequently occur from other local waters, which in turn can be followed by development of once-again thriving populations (Rischbieter 2017).

Swift et al. (1989) reported 87 localities where the tidewater goby was historically known to occur, although 134 localities were known at the time of publication of the Recovery Plan (USFWS 2005b). Twenty-three (17 percent) of the 134 documented locations were considered extirpated, and 55 to 70 (41 to 52 percent) localities are naturally so small or have been so degraded over time that long-term persistence is uncertain (USFWS 2005b).

Currently, at least two range-wide tidewater goby studies are underway or have been recently completed. Tidewater goby presence/absence surveys, habitat assessments, and specimen collections were completed in 122 coastal wetlands in the fall of 2014, 2015, 2017, and 2018 (Spies and Jacobs In Preparation) . Surveys spanned from Salmon Creek, Sonoma County, to San Luis Rey River, San Diego County, and took between 8 and 10 weeks to complete each year. The primary focus of these extensive survey efforts was to gather multiple years of range-wide occupancy data to properly inform a new metapopulation viability analysis model and establish a baseline for continued work across the region (Spies and Jacobs, in preparation).

An additional range-wide eDNA study has also been completed. Sutter used environmental DNA (eDNA) to monitor the presence or absence of tidewater goby throughout their range. This study distinguished results between the “northern” tidewater goby (*Eucyclogobius newberryi*) and the newly described southern populations (*E. kristinae*). Across their combined geographic range, a total of 209 sites were surveyed from Del Norte to San Diego counties between May and September of 2016. Among these sites, 12 were dry during the survey; among the 197 sites with water present, tidewater goby were detected at 81 out of 175 sites, and southern tidewater goby were detected at 4 out of 22 sites.

As described above, estimating tidewater goby population size is complicated because the populations are controlled by environmental conditions. For example, when lagoons are breached due to flood events during the rainy seasons, tidewater goby populations decrease and then recover during the following summer. Swift et al (1989) estimated that individual tidewater gobies within a population at Aliso Creek Lagoon ranged from 1,000 to 1,500 in the late winter–early spring and 10,000 to 15,000 tidewater goby in the late summer–early fall. In the HCP area, regular fisheries surveys have been conducted at Arroyo Grande Creek since 2003. Population size has regularly fluctuated from zero to tens of thousands.

The conservation program for the HCP area strives to fulfill several of the recovery objectives by including seasonal monitoring of the Arroyo Grande Creek Lagoon and periodic monitoring of Pismo Lagoon and Oso Flaco Lagoon (if present) to assess the status of tidewater goby populations.

This HCP will continue to conserve all of the modeled potential suitable habitat within the HCP area. The tidewater goby population in the HCP area naturally fluctuates due to environmental conditions on a seasonal basis. The annual temporary disruption of 10 percent of modeled suitable habitat within the HCP area (where Pismo Creek and Arroyo Grande Creek flow over their sandbars) will not substantially affect the species’ distribution on site since suitable habitat will still remain available. Although a

maximum take of 135 individual tidewater gobies (i.e., 10 from park visitor activities and 125 from natural resources activities) over a 5-year period or of 675 individual tidewater gobies (i.e., 50 from park visitor activities and 625 from tidewater goby natural resources activities) over the permit term is listed in Table 4-5, this is a worst-case scenario and the actual take of tidewater gobies is anticipated to be much lower. Therefore, a maximum take of 135 individuals over a 5-year period or 675 over a 25-year period from covered activities will not substantially affect the species' population on site because take is expected to be much lower and—although the overall population of tidewater gobies in the HCP area fluctuates—tidewater goby population size has been documented up to tens of thousands in a year. Overall, the population of tidewater goby in the HCP area is expected to continue to contribute to the overall metapopulation dynamics and long-term viability of the Conception Recovery Unit.

4.7 Summary of the Potential for Take

Table 4-7 summarizes CDPR's assessment of the potential for each covered activity to cause incidental take, both prior to and with implementation of AMMs. As noted in section 4.1, not every effect is considered take. Further, this HCP assesses the likelihood of take based on whether take is "reasonably certain" to occur, considering both direct and indirect effects (USFWS and NOAA Fisheries 2016). This standard is applied in the following order: 1) Is the species present within the affected area? 2) if so, could the species be exposed to stressors caused by the covered activities? and 3) if so, would the species' biological response to that exposure correspond to the definition of take? The ''reasonable certainty'' standard does not require a guarantee that a take will result, rather, only that there is a rational basis for a finding of take.

Using this approach, the following activities have been determined to not cause take of any of the covered species even in the absence of AMMs: Street Sweeping (CA-25), ASI Courses (ATV and RUV) (CA-35), Grover Beach Lodge and Conference Center (CA-38), and Maintenance of a Bioreactor on Agricultural Lands (CA-47). The following activities have been determined to not cause take of any of the covered species once AMMs are implemented: Habitat Restoration Program (CA-16), Campground Maintenance (CA-20), Wind Fencing (CA-23), Sand Ramp and Other Vehicular Access Maintenance (CA-24), Perimeter and Vegetation Island Fencing (CA-27), Minor Grading (CA-30), Boardwalk and Other Pedestrian Access Maintenance (CA-31), Replacement of the Safety and Education Center (CA-43), and Cultural Resources Management (CA-45).

Table 4-7. Potential for Take without AMMs and with AMM Implementation

Covered Species:	SNPL		CLTE		CRLF		Goby	
Covered Activity	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs
Park Visitor Activities								
CA-1 Motorized Recreation	Y	Y	Y	Y	Y	Y	N	N
CA-2 Camping	Y	Y	Y	Y	Y	Y	N	N
CA-3 Pedestrian Activities	Y	Y	Y	Y	Y	Y	Y	Y
CA-4 Bicycling and Golfing	Y	Y	Y	Y	N	N	N	N

Table 4-7. Potential for Take without AMMs and with AMM Implementation

Covered Species:	SNPL		CLTE		CRLF		Goby	
Covered Activity	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs
CA-5 Fishing	Y	Y	Y	Y	N	N	N	N
CA-6 Dog Walking	Y	Y	Y	Y	Y	Y	Y	Y
CA-7 Equestrian Recreation	Y	Y	Y	N	Y	Y	Y	Y
CA-8 Boating/Surfing	Y	Y	Y	Y	N	N	N	N
CA-9 Aerial/Wind-Driven Activities	Y	Y	Y	N	N	N	N	N
CA-10 Holidays	Y	Y	Y	Y	Y	Y	Y	Y
CA-11 Special Events	Y	Y	Y	Y	Y	N	Y	N
Natural Resources Management								
CA-12 SNPL and CLTE Management	Y	Y	Y	Y	N	N	N	N
CA-13 Tidewater Goby and Salmonid Surveys	Y	Y	Y	N	Y	Y	Y	Y
CA-14 CRLF Surveys and Management	Y	Y	Y	N	Y	Y	Y	Y
CA-15 Listed Plant Management	Y	Y	Y	N	Y	Y	N	N
CA-16 Habitat Restoration Program	Y	Y	Y	N	N	N	N	N
CA-17 Invasive Plant and Animal Control	Y	Y	Y	N	Y	Y	Y	Y
CA-18 Habitat Monitoring System Implementation	Y	Y	Y	Y	N	N	N	N
CA-19 Water Quality Monitoring Projects	Y	Y	Y	N	Y	Y	Y	Y
Park Maintenance								
CA-20 Campground Maintenance	N	N	N	N	Y	N	N	N

Table 4-7. Potential for Take without AMMs and with AMM Implementation

Covered Species:	SNPL		CLTE		CRLF		Goby	
Covered Activity	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs
CA-21 General Facilities Maintenance	Y	Y	Y	Y	N	N	N	N
CA-22 Trash Control	Y	Y	Y	Y	N	N	N	N
CA-23 Wind Fencing	Y	N	Y	N	N	N	N	N
CA-24 Sand Ramp and Other Vehicular Access Maintenance	Y	N	N	N	N	N	N	N
CA-25 Street Sweeping	N	N	N	N	N	N	N	N
CA-26 Routine Riparian Maintenance	N	N	Y	N	Y	Y	Y	Y
CA-27 Perimeter and Vegetation Island Fencing	Y	N	Y	N	N	N	N	N
CA-28 Cable Fence Maintenance and Replacement	Y	Y	Y	N	N	N	N	N
CA-29 Heavy Equipment Response	Y	Y	Y	Y	N	N	N	N
CA-30 Minor Grading	Y	N	Y	N	N	N	N	N
CA-31 Boardwalk and Other Pedestrian Access Maintenance	Y	N	Y	N	Y	N	N	N
Visitor Services								
CA-32 Ranger, Lifeguard, and Park Aide Patrols	Y	Y	Y	Y	N	N	N	N
CA-33 Emergency Response	Y	Y	Y	Y	Y	Y	N	N
CA-34 Access by Non-CDPR Vehicles	Y	Y	Y	Y	N	N	N	N
CA-35 ASI Courses (ATV and RUV)	N	N	N	N	N	N	N	N
CA-36 Beach Concessions	Y	Y	Y	Y	N	N	N	N
CA-37 Pismo Beach Golf Course Operations	N	N	N	N	Y	Y	N	N

Table 4-7. Potential for Take without AMMs and with AMM Implementation								
Covered Species:	**SNPL**		**CLTE**		**CRLF**		**Goby**	
Covered Activity	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs	Without AMMs	With AMMs
CA-38 Grover Beach Lodge and Conference Center	N	N	N	N	N	N	N	N
CA-39 Natural History and Interpretation Programs	N	N	Y	Y	N	N	N	N
Other HCP Covered Activities								
CA-40 Motorized Vehicle Crossing of Creeks	Y	Y	Y	Y	Y	Y	Y	Y
CA-41 Pismo Creek Estuary Seasonal (Floating) Bridge	Y	Y	Y	Y	Y	N	Y	Y
CA-42 Riding in 40 Acres	N	N	Y	Y	N	N	N	N
CA-43 Replacement of the Safety and Education Center	Y	N	Y	N	N	N	N	N
CA-44 Dust Control Activities	Y	Y	Y	N	Y	N	N	N
CA-45 Cultural Resources Management	Y	N	Y	N	Y	N	N	N
CA-46 CDPR Management of Agricultural Lands	N	N	N	N	Y	Y	N	N
CA-47 Maintenance of a Bioreactor on Agricultural Lands	N	N	N	N	N	N	N	N
CA-48 Oso Flaco Lake Boardwalk Replacement	N	N	Y	Y	Y	Y	N	N
CA-49 Special Projects	Y	Y	Y	Y	Y	N	N	N
CA-50 Reduction of the Boneyard and 6 Exclosures	Y	Y	Y	Y	N	N	N	N
CA-51 Use of Pesticides	Y	N	Y	N	Y	Y	Y	Y
CA-52 CDPR UAS Use for Park Activities	Y	Y	Y	Y	N	N	N	N

4.8 Listed Plants

4.8.1 Methods to Assess Effects of Covered Activities on Listed Plants

FESA does not prohibit take of listed plant species; however, section 7 of FESA requires that issuance of an ITP must not jeopardize any listed species, including plants. In addition, CDPR is committed to its policy of avoidance and minimization of take of listed species, including loss or other harm to listed plant species. CDPR has included six listed plant species in this HCP in order to evaluate the impacts of the HCP on these listed plant species. For the six listed plant species, maximum allowable temporary and permanent impacts on modeled habitat acreages (Map 16) were identified (Table 4-8). The impact analysis was conducted by intersecting a GIS overlay of covered activities with the modeled habitat of each species.

In addition to the impacts to listed plant species habitat, impacts to individual known plant occurrences were evaluated. Potential direct effects on listed plants were analyzed based on occurrence data in the CNDDB and CDPR records, as well as by mapping covered activities in relation to potential listed plant species habitat.

4.8.2 Direct and Indirect Effects

Existing and new covered activities that can affect listed plants occur within 1,362 acres of suitable listed plant habitat. Of this area, 550 acres occur in areas where motorized vehicles are allowed, and 812 acres are open to pedestrians and/or CDPR staff only. Covered activities that occur within listed plant habitat are considered to have minor and temporary effects on suitable habitat for listed plants, though impacts to listed plants can still occur (section 4.8.2.5.7). Some existing covered activities, including habitat management and water quality monitoring projects, ultimately benefit listed plants and their habitat by improving and adding suitable habitat for listed plants. In addition, CDPR will actively participate in experimental planting and recovery of listed plants, which is expected to result in additional listed plant species in the HCP area.

Avoidance and minimization of loss of or other harm to listed species will continue to be the primary goal of CDPR. Still, effects of existing and new covered activities on listed plant species and potential listed plant habitat in the HCP area are possible and are described in the following sections. Activities occurring outside of listed plant species habitat (Map 16) do not affect the listed plants unless specifically discussed in the following sections. Table 4-8 in section 4.8.2.5.7 summarizes the potential effects and potential take of listed plant species from covered activities. AMMs that address the effects are provided in section 5.3.1.

4.8.2.1 Park Visitor Activities

4.8.2.1.1 Motorized Recreation (CA-1)

Impacts on listed plants due to motorized recreation in the past have been difficult to assess and have not been documented in the open riding area. In general, areas open to motorized recreation (and areas where most non-designated camping occurs) almost entirely consist of bare sand and do not contain listed plant species. Although unlikely, some listed plant species could occur within sand dune areas and/or areas with sparse vegetation open to motorized recreation and may go undetected. However, no listed plant species have been detected in areas open to motorized recreation since 2003 when surf thistle and beach spectaclepod were discovered in a revegetation area in the foredunes of the open riding area between beach Posts 7 and 8 (L. Gardner, pers. comm. 2003). If listed plant species occur in the areas where motorized recreation is allowed, these activities can crush or destroy listed plant species individuals. Motorized recreation is considered to have a minimal direct effect on listed plant

individuals to date due to lack of occurrences and suitable habitat in those areas and this is expected to continue in the future.

In the past, indirect impacts to listed plants due to motorized recreation have been difficult to assess and have not been documented in the open riding area. Listed plant species, including La Graciosa thistle, beach spectaclepod, and surf thistle, have previously been observed in the vegetation islands in the open riding area. Direct impacts to listed plants in the vegetation islands are not known to occur since these areas are fenced off and motorized recreation is prohibited from entering these areas. However, motorized vehicles adjacent to vegetation islands can destabilize substrates in the HCP area and, ultimately, result in increased erosion, especially during wind events. This destabilized material can coat vegetation and interfere with normal gas exchange, photosynthesis, or pollination. In addition, motor vehicles are known to inadvertently spread invasive plants (e.g., on tires) by moving seeds or plant segments if they move from one place with invasive species to a less impacted area. As a result, motorized recreation is considered to have a minimal effect on listed plant individuals adjacent to motorized activities.

Motorized vehicle recreation degrades or modifies potentially suitable habitat for listed plant species, including surf thistle and beach spectaclepod, that would otherwise occur in sparsely vegetated or coastal dune habitat and prevents these species from establishing within the foredunes. As a result, motorized recreation has likely kept some listed plants from growing in the open riding area. Section 4.9.3 describes impacts to La Graciosa thistle critical habitat.

4.8.2.1.2 Pedestrian Activities (CA-3)

Beach spectaclepod, surf thistle, and La Graciosa thistle have the potential to occur in the vegetation islands and in other areas open to pedestrians near Oso Flaco Lake and South Oso Flaco (Map 18, Map 19, and Map 20). The vegetation islands and the vegetation surrounding Oso Flaco Lake are fenced to protect the fragile dune ecosystem from OHVs, but access by pedestrians is allowed. Therefore, pedestrians walking through vegetation islands and the vegetation surrounding Oso Flaco Lake and South Oso Flaco can trample beach spectaclepod, surf thistle, and La Graciosa thistle individuals and disturb their habitat. Pedestrians can also facilitate the spread of invasive species, which could outcompete listed plant species. Potential impacts to listed plants from visitor activities may be exacerbated during periods of high visitor use, such as holidays (e.g., July 4). However, fencing is installed around vegetation islands, which often deters pedestrians from entering. In addition, vegetation in many of these areas is dense and pedestrians typically do not walk through vegetated areas. In addition, if listed plant populations are found where pedestrian use is heavy, fencing and educational signage will continue to be utilized to protect listed species. Informal trails entering listed plant habitats will also continue to be closed and restored to pre-trail conditions to avoid negative impacts on listed plant species from pedestrians. As a result, the impact to listed plant species from pedestrian activities is considered minimal. Section 4.9.3 describes impacts to La Graciosa thistle critical habitat.

4.8.2.1.3 Fishing (CA-5)

Fishing is allowed within the HCP area year-round. Shore fishing within the ocean does not impact listed plant species since these activities occur on the wet sand, subject to tidal flows and/or the ocean where no suitable habitat for listed plant species is present. Fishing, including in non-motorized boats, can occur within Oso Flaco Lake where listed plant species, including marsh sandwort, La Graciosa thistle, and Gambel's watercress are known to or have potential to occur. Impacts on listed plants from fishing and boating in Oso Flaco Lake are not known. In general, people fishing along the lake shoreline and/or launching boats from the lake shoreline could trample listed plant individuals in these areas. In addition, people and boats could inadvertently facilitate the spread of invasive species (e.g., on shoes, clothing, or

boats) by moving seeds or plant segments if they move from one place with invasive plants to a less impacted area. Invasive species could outcompete special-status plant species. Fish consumption advisories are posted at Oso Flaco Lake due to high levels of pesticides. As a result, fishing in Oso Flaco Lake is not a regular activity. In addition, known listed plant populations are flagged and/or fenced to prevent impacts. As a result, effects on listed plants resulting from fishing are considered minimal, and this is expected to remain the same in the future.

4.8.2.1.4 Equestrian Recreation (CA-7)

Impacts to special-status plants due to equestrian recreation have been difficult to assess in the past, and they have not been documented in the HCP area. Equestrians use the beaches and trails in the HCP area, including the Dunes Preserve. Equestrians traveling through the Dunes Preserve disturb designated La Graciosa thistle critical habitat (section 4.9.3; Map 18) and other suitable La Graciosa thistle habitat (Map 16) in the HCP area. However, to date, equestrians traveling through these areas have typically stayed on sandy trails and have rarely traveled off-trail, and this is expected to remain the same in the future. As a result, effects from equestrians considered minor and temporary in nature. Section 4.9.3 describes impacts to La Graciosa thistle critical habitat.

4.8.2.1.5 Boating/Surfing (CA-8)

Impacts from boating can occur in Oso Flaco Lake, as described above for fishing in section 4.8.2.1.3.

4.8.2.2 Natural Resources Management Program

4.8.2.2.1 Listed Plant Management – Monitoring, Propagation, and Habitat Enhancement (CA-15)

The Oceano Dunes District manages and restores vegetation in areas occupied or potentially occupied by listed plant species to benefit these and other native species. These management measures include monitoring and enhancing habitat for listed plant species populations, including removing invasive species and monitoring the response of the listed plant species to habitat restoration. In addition, CDPR plans to propagate and conduct experimental outplanting of listed plant species in the future.

Monitoring and habitat enhancement activities provide a net benefit for the listed plant species; however, some listed plant individuals could be affected during these activities. A listed plant could be inadvertently missed during monitoring and pre-restoration surveys and could be stepped on by field survey crews or work crews. To reduce these impacts, CDPR conducts annual surveys for listed plant species. In addition, biologists limit the amount of time they spend in occupied habitat to reduce the risk of trampling a listed plant species. As a result, effects from these activities are considered minimal.

Prescribed fire is used infrequently to manage invasive plant species in the foredunes and can present a threat to La Graciosa thistle, beach spectaclepod, and surf thistle. Areas occupied by marsh sandwort, Gambel's watercress, and Nipomo Mesa lupine do not receive prescribed fire treatments and, therefore, are not be affected by prescribed fire activities. While conducting prescribed fire activities, La Graciosa thistle, beach spectaclepod, and surf thistle could be damaged or burned, despite best efforts to exclude the fire from the occupied listed plant habitat. To reduce these impacts, CDPR marks listed plant species and establishes a fire line of mineral soils around known populations, and a trained botanist remains on site during all fire activities. In addition, heavy equipment, including fire engines, are required to stay out of sensitive habitat, and locations for the placement and staging of heavy equipment are clearly marked on a map. As a result, effects from fire treatments are considered minimal.

Propagating listed species will require collecting seed or plant materials and cultivating the species in the greenhouse, and ultimately transplanting individuals into suitable habitat. These activities will provide a net benefit for the listed plant species; however, some listed plant individuals could be

affected during these activities. A plant could be inadvertently missed while gathering materials for propagation, and propagated individuals could be damaged or destroyed in the greenhouse or during transplanting. To minimize any impacts that could occur during experimental propagation and outplanting, CDPR will coordinate with the Wildlife Agencies and all work will be conducted in accordance with federal and state regulations protecting listed plant species.

Overall, monitoring, propagation, experimental outplanting, and habitat enhancement activities provide a net benefit for the listed plants and other native plant species by removing invasive weedy species, thereby reducing competition from these species for space, light, water, and nutrients. Experimental propagation and outplanting also benefit listed plant species by contributing to the recovery of listed plant species.

4.8.2.2.2 Habitat Restoration Program (CA-16)

Yearly vegetation planting is considered to have low potential to directly or indirectly affect listed plant species because vegetation projects typically occur in areas with bare sand that do not support listed plant species or in areas, including previously restored sites, that are not known to contain listed plant species. If listed plant individuals are present, they could be trampled during vegetation planting activities, but vegetation is primarily planted adjacent to existing vegetated areas, including vegetation islands, and is not planted immediately in areas that could be occupied by listed plants. As a result, the risk of damaging existing listed plant populations is low. Vegetation projects are also designed to match the existing plant community composition in the area to ensure that additional species planted are compatible with listed plant species and that any additional species will not outcompete existing listed plant species. In addition, plant materials from local genetic stock are used to minimize the chance of introducing plants not adapted to local conditions. As a result, effects from habitation restoration are considered minimal.

Seed collection for restoration can occur in areas within or near listed plant habitat. Therefore, listed plant species can be inadvertently trampled while collecting seeds. However, seed collection is conducted by experienced Environmental Scientist staff and/or botanists who know the location of the listed plant species. As a result, effects from seed collection are considered minimal.

4.8.2.2.3 Invasive Plant and Animal Control (CA-17)

Effects on listed plant species from invasive plant and animal control (not specifically targeted at benefitting listed plant species) will be similar to those described in section 4.8.2.2.1 and section 4.8.2.5.7 for listed plant monitoring, propagation, and habitat enhancement. The greatest threats during these activities are trampling, inadvertent spraying, and physical disruption to listed plants while manually removing invasive vegetation. Pre-project surveys, buffer zones, and hand pulling methods will continue to be utilized to avoid any unnecessary impacts. In addition, biological monitors will be present at all phases of the work and will be responsible for work crew education; conduct regular inspection of marked populations of listed species to ensure that they remain marked and clearly visible to work crews; and monitor work crews to ensure that they are observing the precautions and prohibitions regarding avoiding damage to listed plant species. The biological monitor will also have the authority and responsibility of stopping work if unanticipated damage to listed species is occurring. As a result, impacts from invasive plant and animal control will continue to be minimal.

4.8.2.3 Park Maintenance

4.8.2.3.1 General Facilities Maintenance (CA-21)

In the future, CDPR would be using a tractor-towed rake or similar device to collect nails, broken glass, and other debris that may pose a hazard to visitors or wildlife from high use. This mechanical trash

removal may be implemented year-round from the Grand Avenue entrance area south and inland, within open sand areas, avoiding areas within 500 feet of any known SNPL or CLTE nesting area. Mechanical trash removal will maintain a buffer of at least 200 feet from all vegetated areas and will be set back at least 1,000 feet from creeks and lagoons. Although unlikely, some listed plant species could occur within sand dune areas and/or areas with sparse vegetation north of Post 6 including, surf thistle, La Graciosa thistle, and beach spectaclepod. If listed plant species were to occur in the areas where mechanical trash removal is allowed, these activities could crush or destroy listed plant individuals. However, mechanical raking would be conducted to remove litter in areas where recreation activities have been concentrated and the substrate is already highly disturbed. These areas are unlikely to support listed plants due to the high level of recreation. As a result, impacts from mechanical trash removal would be minimal.

4.8.2.3.2 Routine Riparian Maintenance (CA-26)

The Oceano Dunes District protects riparian habitat by maintaining roads, culverts, spillways, trees and shrubs, and controlling emergent species and invasive species populations within riparian corridors in the HCP area. Routine riparian maintenance has not resulted in the loss of listed plant species to date. Listed plants, including marsh sandwort, Gambel's watercress, La Graciosa thistle, and beach spectaclepod are, however, known to occur at some or all of the routine riparian maintenance locations. Therefore, riparian maintenance has the potential to directly impact listed plant species if they occur in an area designated for maintenance activities. However, CDPR implements AMMs as a part of conducting riparian maintenance, including in accordance with their existing Lake and Streambed Alteration Agreement from the CDFW. These AMMs include conducting pre-activity surveys annually prior to commencing activities, flagging the area that supports the species, and avoiding flagged areas (section 5.3). As a result, these effects are considered minimal.

To date, marsh sandwort and/or Gambel's watercress have not been observed within the Oso Flaco Lake culvert. However, the possibility exists that either marsh sandwort or Gambel's watercress could be attached to plants or root balls that are clogging the culvert. Should this happen, it will require the plant to be removed from the culvert. Every effort will be made to identify listed plants before removal of vegetation in the culvert occurs to allow the opportunity to salvage the plant by moving it to another location. Although marsh sandwort or Gambel's watercress will be salvaged if possible, some individuals could be destroyed. Any removal or salvage of Gambel's watercress or marsh sandwort would require consultation with the USFWS and/or CDFW prior to implementation. In addition, any listed plant left in the culvert will likely be damaged because of high flows. As a result, any Gambel's watercress or marsh sandwort individuals that are blocking the culvert will be lost regardless of maintenance activities. Although marsh sandwort or Gambel's watercress will be salvaged if possible, some individuals could be lost.

4.8.2.3.3 Heavy Equipment Response (CA-29)

Heavy equipment response does not occur within open water habitat; therefore, Gambel's watercress and marsh sandwort are not impacted. Beach spectaclepod or surf thistle can be directly harmed during a heavy equipment response in occupied habitat in the HCP area (e.g., near the Oso Flaco boardwalk). These plants can be driven over or crushed by vehicles or attendant personnel and habitat can be temporarily damaged. To reduce any impacts from heavy equipment response, CDPR will continue to implement AMMs as a component of utilizing heavy equipment, including conducting pre-activity surveys, as determined to be necessary by a CDPR Senior Environmental Scientist, and flagging areas that support plant species (section 5.3). In addition, heavy equipment response operations are extremely rare in areas where listed plants occur; thus, the effect of these operations on listed plants is considered minimal.

4.8.2.3.4 Boardwalk and Other Pedestrian Access Maintenance (CA-31)

Boardwalk and other pedestrian access maintenance occur within the HCP area once a year. Special-status plant species are not typically located directly adjacent to these areas. However, if any listed plant species occupy habitat requiring clearing for pedestrian access purposes, they could potentially be damaged and/or removed or trampling by field crews. However, most work only includes trimming vegetation encroaching on footpaths with hand tools; therefore, listed plants are unlikely to be impacted since they would not be expected to be encroaching on the boardwalks or trails. In addition, any damage to habitat is expected to be minor and temporary as a result of foot traffic in the area. In addition, these impacts will continue to be avoided through the implementation of AMMs (section 5.3). Specifically, CDPR will continue to conduct pre-activity surveys and flagging areas that support listed plant species; thus, the potential effect of these operations on listed plants will continue to be minimal.

Deconstruction and installation of a replacement boardwalk in upland habitats has potential to directly and indirectly affect listed plant species. Project activities such as grading and excavation activities could have both direct and indirect impacts on listed plants that might occur within the project area. Project activities may affect these plants through direct disturbance of vegetation, modification or destruction of habitat, or through damage to underground root structures. Equipment use, soil disturbance, and worker foot traffic may result in the injury or mortality of individual listed plants. Excavation and grading activities may result in the mechanical or physical removal of vegetation and modification of the seed bank due to grading or disturbance. To minimize these impacts, prior to any replacement activities, botanical surveys will be conducted in the area, and any listed plants will be flagged and protected from disturbance. Effects on listed species from upland boardwalk replacement will be minimal.

Project activities may also cause an increase in invasive plant cover. Invasive plants degrade habitat quality for native plants and animals by altering vegetative structure and/or outcompeting native plants. However, CDPR actively removes invasive plants from the HCP area as part of the invasive plant and animal control activity (CA-17). As a result, indirect impacts to listed plants from boardwalk replacement will be minimal.

4.8.2.4 Visitor Services

4.8.2.4.1 Emergency Response (CA-33)

Emergency response activities by nature require a quick response for public safety; therefore, protection of natural resources may not be possible during an emergency response. Effects on listed plant species from emergency response activities is considered to be similar to those listed under Heavy Equipment Response (section 4.8.2.3.3) except that implementing protection measures may not be possible and emergency response, although extremely rare, can occur within aquatic habitats and impact aquatic special-status plant species such as marsh sandwort and Gambel's watercress. Within the HCP area, emergency responses are extremely rare where listed plants occur, and destruction of sensitive habitat has not been documented to date. As a result, the potential effect of these activities on listed plants is considered minimal.

4.8.2.5 Other HCP Covered Activities

4.8.2.5.1 Pismo Creek Estuary and Seasonal (Floating) Bridge

The District has proposed installing a seasonal, floating pedestrian bridge across Pismo Creek estuary to provide pedestrian access from the Pismo Coast RV Resort to Pismo State Beach. Installing the bridge should reduce the pedestrian impact on Pismo Creek by reducing erosion and providing an alternative to walking through the mouth of the creek for pedestrians wishing to walk up coast. Listed plant species are not known to occur at the Pismo Creek estuary bridge location; however, suitable habitat is present

for some listed plant species, including La Graciosa thistle, beach spectaclepod, and surf thistle. As a result, overall impacts to listed plants in the area and their habitat would be beneficial since the bridge would prevent existing trampling of vegetation by pedestrians and protect any listed plant species that may be present.

Although unlikely, beach spectaclepod, surf thistle, and La Graciosa thistle have the potential to occur along Pismo Creek estuary. Equipment use and worker foot traffic during construction of the bridge could result in the injury or mortality of individual listed plants if they are present in the work area. Construction activities could also result in mechanical or physical removal of vegetation and modification of the seed bank due to grading and/or excavation. Finally, construction activities and/or pedestrian traffic across the bridge once it is operational could introduce invasive weeds to the area, which could outcompete listed plant species. However, CDPR would conduct a survey for special-status plant species prior to the start of construction during the appropriate phenological period, if determined to be necessary by a CDPR Senior Environmental Scientist. Any special-status plant species found would be flagged and/or fenced off and avoided during construction. In addition, BMPs to minimize to prevent accidental spills and erosion will be employed during all construction activities. CDPR will also continue to provide educational content to workers and pedestrians in the area, which includes information on what they can do to prevent introducing invasive species. With implementation of these measures, impact on special-status plants would be minimal.

4.8.2.5.2 Riding in 40 Acres (CA-42)

Potentially suitable habitat for listed plant species could occur in the 40 Acres site (Map 8), though this area has not been recently surveyed for occurrences of listed plant species and listed plants were not planted there. If the Oceano Dunes District pursues the option of opening the 40 Acres site to motor vehicle recreation, planning will include surveys for listed plant species within all areas under consideration for vehicular recreation to ensure impacts to listed plants are minimized. In addition, trails and other areas open to vehicles will be sited with adequate buffers from any occurrences of listed plants found in the 40 Acres site (section 2.2.5.2). Listed plant occurrences found in the 40 Acres site will also be fenced to protect populations from trampling by park visitors. As a result, these effects will be minimal.

An increase in use of adjacent, open habitat could increase wind-blown sand that eventually covers listed plant populations adjacent to the trail. The amount of wind-blown sand that will result from opening parts of the 40 Acres is unknown at this point and will depend on how much scrub is removed.

4.8.2.5.3 Dust Control Activities (CA-44)

Dust control measures that have been implemented included surveys for listed plant species and avoidance of any listed plants observed; no listed plants were known to be impacted. The location of future backdune acreage to be planted for dust control or used for wind fencing is not determined but could overlap with suitable habitat for listed plant species. Direct effects on listed plant species could include trampling or removal during work activities. Indirect effects could include habitat alteration (i.e., changing species composition as a result of altered wind, sand transport, moisture content, etc.). In general, dust control activities occur in open sand between vegetation patches. The potential magnitude of impacts on listed plants will continue to be lowest when dust control activities take place in open sand habitat because these areas support little to no dune vegetation or habitat for listed plant species. As program activities approach the edge of vegetation islands and other vegetated areas, the potential to impact listed plants and their habitat will increase. However, dust control project requirements include AMMs (section 5.3), such as pre-work surveys for all listed plants, flagging and protection for all listed plants, establishment of 25-foot avoidance areas around all listed plants, and restoration of

disturbed habitat to avoid impacts to listed plant species. In addition, planting native vegetation within the HCP area will likely create new suitable habitat for listed plant species. Therefore, impacts to listed plants as a result of dust control activities will continue to be minimal and may be beneficial.

4.8.2.5.4 Cultural Resources Management (CA-45)

Cultural resources management currently occurs in terrestrial habitats in the HCP area and is not known to have impacted special-status plants to date. However, should a cultural resource site be located in an area occupied by listed plants, testing, data recovery, stabilization, or restoration of the site could directly impact listed plant habitat and result in loss of individuals. To minimize the potential to impact listed plants, prior to the start of any cultural resources management activities in listed plant species' habitat, a biologist with experience in identifying the listed species will conduct surveys for listed plant species throughout the affected area. Any plant encountered will be marked on a map, flagged or fenced, and avoided to the maximum extent possible. Therefore, effects on listed plant species will continue to be minimal.

4.8.2.5.5 Oso Flaco Lake Boardwalk Replacement (CA-48)

Deconstruction and installation of a replacement boardwalk have potential to directly and indirectly affect listed plant species. Project activities such as dredging, pile driving, and dewatering activities could have both direct and indirect impacts on listed plants that might occur within the project area. Project activities may affect these plants through direct disturbance of vegetation, modification or destruction of habitat, or through damage to underground root structures. Equipment use and worker foot traffic may result in the injury or mortality of individual listed plants. Excavation activities may result in the mechanical or physical removal of vegetation and modification of the seed bank due to grading or disturbance. To minimize these impacts, prior to any replacement activities, botanical surveys will be conducted in the area and any listed plants will be flagged and protected from disturbance. Effects on listed species from boardwalk replacement will be minimal.

Project activities in water may also affect listed plants indirectly through temporary increases in turbidity and decreases in water quality from dredging, pile driving, as well as from temporary fills such as cofferdams or access ramps. Project activities may also cause an increase in invasive plant cover. Invasive plants degrade habitat quality for native plants and animals by altering vegetative structure and/or outcompeting native plants. However, CDPR actively removes invasive plants from the HCP area as part of the invasive plant and animal control activity (CA-17). In addition, any increases in turbidity or decreases in water quality would be temporary and relatively short in duration lasting only during any work within open water. As a result, indirect impacts to listed plants from boardwalk replacement will be minimal.

4.8.2.5.6 Special Projects (CA-49)

Installation, operation, and maintenance of new facilities have potential to directly or indirectly affect listed plant species. Facilities could be installed on open sand, near vegetation islands, and/or backdunes. Equipment use and worker foot traffic during construction of the special project could result in the injury or mortality of individual listed plants. Construction activities could also result in mechanical or physical removal of vegetation and modification of the seed bank due to grading and/or excavation. Finally, construction activities could introduce invasive weeds to the area, which could outcompete listed plant species. The Oceano Dunes District, however, has some flexibility to install these facilities in locations and in a manner that avoids negatively impacting listed plant species. In addition, to minimize the potential impacts to listed plants, prior to the start of any special project installation in listed plant species habitat, a biologist with experience in identifying the listed species will conduct surveys for listed

plant species throughout the proposed special project area. Any listed plant encountered will be marked on a map, flagged, or fenced, and avoided. Therefore, effects on listed plant species will be minimal.

Special projects may also result in the permanent loss of up to 35 acres of La Graciosa thistle, beach spectaclepod, and/or surf thistle habitat (Table 4-8), although CDPR has some flexibility to install special project facilities in locations and in a manner that avoids negatively impacting native vegetation communities and/or special-status plant habitat.

4.8.2.5.7 Use of Pesticides (CA-51)

The use of herbicides and surfactants could kill individual covered plant species if applied in sensitive habitat. The potential impact of each pesticide used in the HCP area follows.

Glyphosate has been used to control invasive plants since the 1970s. Glyphosate is metabolized by some, but not all plants. Foliar exposures to glyphosate are much more toxic than soil exposures. The lesser toxicity of glyphosate in soil exposure is probably attributable, at least in part, to the tight binding of glyphosate to some types of soils (SERA 2011a).

Imazapyr (Habitat®)kills a wide variety of plants and can be relatively persistent. The most sensitive species appear to be aquatic macrophytes, and aquatic algae appear to be much less sensitive. Some species of plants, develop resistance to imazapyr (Washington Department of Agriculture 2017).

Fluazifop-P-butyl kills annual and perennial grasses but is not known to harm broad-leaved plants (i.e., dicots).

Triclopyr is a dicot-specific herbicide (White 2007).

Aminocyclopyrachlor is an auxin-mimicking herbicide that interferes with normal plant growth.[77] It affects actively growing tissue rather than mature tissue. It is more effective on dicots (e.g., broadleaved plants) than monocots (e.g., grasses; SERA 2012).

Chlorsulfuron is recommended for pre-emergent and early post-emergent control of annual, biennial, and perennial broadleaf weeds. It can affect some non-target plants, including both terrestrial and aquatic plants. Chlorosulfuron inhibits acetolactate synthase (ALS), which is an enzyme that is essential for plant growth. As a result, at certain doses, chlorsulfuron can inhibit growth of non-target plants (SERA 2004).

Dicots are substantially more sensitive to aminopyralid than monocots (EPA 2005, DOW Chemical Company AgroSciences 2008).

Clethodim is used for the control of grassy weeds and only affects grass species. There is no indication that clethodim adversely affects dicots (SERA 2014).

Sethoxydim kills grasses and has little to no impact on broadleaf herbs or woody plants (SERA 2001).

Surfactants are used to improve the spreading, dispersing/emulsifying, sticking, absorbing, and/or pest-penetrating properties of the spray mixture. CDPR uses Competitor® and Renegade EA®, surfactants labeled for aquatic use. Little information is available regarding the potential effects of Competitor® and Renegade EA® on non-target plants. The product safety data sheets for these surfactants state that the product has not been classified as environmentally hazardous (Wilbur-Ellis 2016a).

[77] Auxin is a hormone that regulates plant growth.

Crosshair® is used as a drift retardant. As a result, it reduces impacts associated with drift that could occur during herbicide application.

Overall, the intent of herbicide use is to eliminate invasive weeds within the HCP area. Invasive and non-native weeds are a known threat to native plant populations since they can outcompete native plant species. Based on years of survey data for covered species and implementation of specific AMMs for herbicide use (Chapter 5), herbicide use for invasive plant removal within the HCP area results in an overall beneficial effect to these species and La Graciosa thistle critical habitat by reducing the number of invasive and non-native species.

Contamination of special-status plants from herbicides could result from application drift, rainfall runoff, or residue leaching through the soil into groundwater. However, given the assumptions of drift and downstream transport (i.e., attenuation with distance), pesticide/herbicide exposure and associated risks to listed plant species are expected to decrease with increasing distance from the treated field or site of application. CDPR does not apply herbicides during inclement weather to reduce impacts from drift on non-target vegetation. The application of herbicides is also conducted by trained applicators accompanied by a CDPR Environmental Scientist and/or qualified botanist. CDPR also takes extra precautions applying herbicides near open water and wetlands and other sensitive habitats that support listed species. AMMs listed in Chapter 5 are considered to reduce or eliminate any impacts.

4.8.3 Anticipated Impacts on Listed Plant Species

As stated previously, there are no federal prohibitions under the FESA for the take of listed plants on non-federal lands, unless taking of those plants is in violation of state law. However, before the USFWS issues a permit, the effects of the permit on listed plants must be analyzed because section 7 of FESA requires that issuance of an ITP must not jeopardize any listed species, including plants. Maintaining consistency with section 7(a)(2) of FESA, section 10 prohibits the issuance of an ITP that will appreciably reduce the likelihood of the survival and recovery in the wild (i.e., "jeopardize") of any endangered or threatened species, including plants. Although not specifically addressed by section 10, listed plants can be covered by HCPs under the USFWS's "No Surprise" assurance rule, discussed in section 6.5.2.

Based on the locations of listed plant occurrences, numerous covered activities, including pedestrian activities, the natural resources management program, park maintenance, and visitor services, have the potential to affect listed plants as discussed in section 4.8.2. Numerous measures to avoid and minimize impacts to listed plants for these covered activities will continue to be implemented throughout the permit term (section 5.3) and theses are expected to minimize any impacts. However, this HCP anticipates that a small amount of impacts to each listed plant species to maintain vital infrastructure (e.g., routine riparian maintenance and culvert cleanout) and to enhance habitat for the plant species is unavoidable. The impact limits for each listed plant species are discussed in the following sections. Impacts to listed plant species habitat are provided in Table 4-8.

4.8.3.1 Anticipated Impacts on Marsh Sandwort and Gambel's Watercress

It is unknown how many marsh sandwort and Gambel's watercress individuals persist in the Oso Flaco Lake area. Twenty-five marsh sandwort individuals were reported in 2005, but although the most recent survey in 2018 confirmed the species was still present, the number of individuals was not quantified. Gambel's watercress was last observed at Oso Flaco Lake in 2018, but surveyors did not determine population numbers. Covered activities that may impact these species include riparian maintenance and activities that will assist with the recovery of these species.

Individual marsh sandwort and Gambel's watercress could be impacted if they occur within culverts and other areas where cleaning and vegetation removal is necessary to maintain the integrity of

infrastructure. Individuals could be translocated to suitable habitat within the same watershed if riparian maintenance and culvert cleanout activities cannot avoid impacts to these species. Translocated individuals will not be counted as impacted if monitoring indicates that each individual has survived at least 2 years after translocation.

Marsh sandwort and Gambel's watercress could also be impacted by activities implemented to enhance and restore habitat and assist with the recovery of these species in the HCP area, as discussed in section 2.2.2.1. These enhancement and restoration activities include monitoring listed plant populations and clearing native and non-native vegetation from occupied habitat. Small numbers of individuals could be lost during implementation of these activities. Overall, enhancement and restoration activities will have a net benefit on these species by removing competitive, invasive species and restoring and enhancing habitat. Monitoring will demonstrate whether management actions are effective and are maintaining and/or increasing the size of the population. Impacts to these plants that could occur during monitoring and enhancement/restoration activities will not contribute to the impact limit.

AMMs will ensure that riparian maintenance and habitat enhancement/restoration activities will continue to avoid or minimize impacts to occurrences of these plant species in the HCP area; however, complete impact prevention may be unavoidable. Due to the extremely limited populations of marsh sandwort and Gambel's watercress in the HCP area, it is anticipated that no more than 15 individuals of each species will be impacted over the permit term. Individuals that cannot be avoided will be translocated, as feasible, to suitable habitat nearby. In addition, up to 500 square feet of habitat for marsh sandwort and Gambel's watercress could be impacted by riparian maintenance activities associated with culvert cleanout.

4.8.3.2 Anticipated Impacts on La Graciosa Thistle

In recent years, La Graciosa thistle numbers have declined in the HCP area, potentially due to encroaching vegetation. Only 3 individuals were found during 2012 surveys, 37 were observed in 2013, and only 1 was seen in 2015. However, 58 individuals were observed in 2017 after the area received significant amounts of winter rainfall. Covered activities that may impact this species include management activities undertaken to protect, restore, and recover populations in the HCP area, including weed control (i.e., prescribed fire and herbicide), propagation, and habitat enhancement and restoration. Management activities implemented to protect, restore, and recover populations in the HCP area will have a net benefit on this species by removing competitive non-native species and otherwise enhancing habitat. AMMs will continue to be implemented to minimize impacts of plant propagation, weed control, and habitat enhancement activities on this plant species; however, complete impact prevention may be unavoidable and small numbers may be lost during implementation of these activities. Monitoring will demonstrate whether management actions are effective and are maintaining and/or increasing the size of the population. Impacts to La Graciosa thistle are expected to be no more than 25 individuals over the permit term, with no more than one in any calendar year. In addition, up to 549 acres of temporary impacts could occur to La Graciosa thistle habitat from these activities and construction of special projects, and up to 35 acres of permanent impact could occur to La Graciosa thistle habitat from special projects.

4.8.3.3 Anticipated Impacts on Nipomo Mesa Lupine

The population of Nipomo Mesa lupine in the HCP area is scattered across a 2-mile stretch of backdune. The population reached a significant high in 2013 with 1,677 individuals and an all-time low in 2008 with 139 individuals. The 2016–2017 season began with consistent rains and mild temperatures, which made for a successful flush of early germinates. In 2017, a total of 911 *L. nipomensis* individuals were recorded. Of the plants located, 465 of the 911 individuals achieved seed set, resulting in a 51-percent effective population for the 2016–2017 season (LCSLO 2017). General climatic changes and habitat

fragmentation due to human impact are major reasons why Nipomo Mesa lupine numbers are seeing dramatic fluctuations and general decreases. It is also possible that low genetic diversity and the small 3-mile radius in which this population is found contribute to the low percentage of individuals setting seed (LCSLO 2017). Each year there is strong evidence of negative effects of herbivory by pocket gophers (*Thomomys bottae*) and major habitat loss throughout the coastal dune scrub habitat by the invasive species perennial veldt grass. Environmental conditions such as the amount of precipitation and frequency and timing of rain events have also been suggested as some of the major factors affecting the fluctuations from year to year (LCSLO 2017).

Impacts to Nipomo Mesa lupine are anticipated during habitat enhancement activities, including invasive species management. Prescribed fire is only used in the foredunes to remove invasive grass species and will not be used in Nipomo Mesa lupine habitat; however, herbicides are used to remove invasives in the Phillips 66 leasehold, and Nipomo Mesa lupine could be trampled during these activities and/or impacted by spry drift from herbicide treatments. Management activities implemented to protect, restore, and recover populations in the HCP area have a net benefit on this species by removing competitive invasive species and otherwise enhancing habitat. However, small numbers of individuals could be lost during implementation of these actions. Monitoring will demonstrate whether management actions are effective and are maintaining and/or increasing the size of the population.

Impacts to Nipomo Mesa lupine are expected to be no more than 100 individuals over the permit term, with no more than 5 per any calendar year. In addition, up to 117 acres of Nipomo Lupine habitat could temporarily impacted during habitat enhancement activities.

4.8.3.4 Anticipated Impacts on Beach Spectaclepod and Surf Thistle

Almost 1,500 individual beach spectaclepod individuals and over 2,000 surf thistle individuals were counted in 2019 within the HCP area in the South Oso Flaco area. Covered activities that may impact these species include park visitor activities, cultural resources management, and management activities undertaken to protect, restore, and recover populations in the HCP area including weed control, propagation, and habitat enhancement and restoration. Management activities implemented to protect, restore, and recover populations in the HCP area have a net benefit to these species by removing competitive invasive species and otherwise enhancing habitat. However, a small number of individuals could be lost during implementation of these actions. AMMs will continue to minimize impacts to these two listed plant species; however, complete impact prevention may be unavoidable. Monitoring will demonstrate whether management actions are effective and are maintaining and/or increasing the size of the population.

No more than 100 individuals each of beach spectaclepod and surf thistle are expected to be impacted over the permit term. In addition, up to 870 acres of temporary impacts could occur to beach spectaclepod and surf thistle habitat from these activities and construction of special projects, and up to 35 acres of permanent impact could occur to beach spectaclepod and surf thistle habitat from special projects.

Table 4-8. Maximum Allowable Permanent and Temporary Impacts to Listed Plant Species Habitat						
	Number of Individuals Impacted over the Permit Term	**Total Modeled Habitat**	**Maximum Allowable Temporary Impact to Modeled Habitat from Covered Activities**	**Proportion**	**Maximum Allowable Permanent Impact to Modeled Habitat from Covered Activities**	**Proportion**
Marsh sandwort	15	11 acres	500 ft^2	<0.01%	0 acres	0%
Gambel's watercress	15	11 acres	500 ft^2	<0.01%	0 acres	0%
La Graciosa thistle	25	549 acres	549 acres	100%	35 acres	0.06%
Nipomo Mesa lupine	100	117 acres	117 acres	100%	0 acres	0%
Beach spectaclepod	100	870 acres	870 acres	100%	35 acres	0.04%
Surf thistle	100	870 acres	870 acres	100%	35 acres	0.04%

4.8.4 Overall Impacts to Listed Plant Species

While take of listed plants is not prohibited under FESA (16 U.S Code 1531 et seq.), the impacts of the covered activities on the listed plants, as species and across their ranges, are identified and mitigated.

4.8.4.1 Marsh Sandwort

Marsh sandwort is extremely rare with one wild population occurring at Oso Flaco Lake and one introduced population at Morro Bay (USFWS 2008c, CNDDB 2016).

Conservation goals and objectives listed in section 5.2.6 and AMMs listed in section 5.3 endeavor to fulfill several of the recovery objectives for this species. CDPR will continue to monitor and document these species and work to expand the existing populations in the HCP area by protecting and enhancing habitat. The goals and objectives in this HCP protect, maintain, and enhance habitats by protecting water quality, restoring habitat, removing invasive species, and avoiding habitat and occurrences during covered activities.

All known populations of marsh sandwort occur in areas with limited access by the public. Because of their limited distribution, the modification of marsh sandwort or its habitat will not be allowed, except in the case of safety issues (e.g. replacing a failing culvert in suitable habitat). Even then, the habitat disturbance will be temporary in nature, and if any of these species are encountered and could be impacted during culvert replacement, they will be transplanted, if feasible.

Twenty-five marsh sandwort individuals were reported in the HCP area in 2005, and the species was confirmed present in 2018, although the number of individuals was not quantified. No permanent loss

of marsh sandwort habitat will occur under this HCP, and the loss of 15 individuals over the course of the permit term will not substantially affect the marsh sandwort population and distribution on site, especially since individuals that could be impacted will be transplanted, as feasible, and CDPR will continue to monitor transplanted individuals. In addition, CDPR will continue to remove invasive species at Oso Flaco Lake, which will improve habitat for this species. Finally, although this HCP anticipates 15 individuals could be lost, this is a worst-case scenario, and it is likely that only a few (if any) individuals will actually be impacted. Therefore, Oso Flaco Lake will likely continue to be a location for the only extant, wild population of this species.

4.8.4.2 Gambel's Watercress

Four populations of Gambel's watercress are currently known to exist, including two populations on VAFB, one population at Oso Flaco Lake, and one introduced population in the Guadalupe-Nipomo Dunes National Wildlife Refuge, which may not be viable. Some observers indicated the populations in San Luis Obispo County appear to show introgression with *N. officinale* (white or common watercress; USFWS 2009f, 2011c, CNDDB 2017). Pure Gambel's watercress is currently known from the populations on VAFB in Santa Barbara County and one population that was introduced in 2008 within the Guadalupe-Nipomo Dunes National Wildlife Refuge, where a combination of 600 marsh sandwort and Gambel's watercress plants were planted at eight sites (Table 3-21). The plants have not fully established at the refuge, and the USFWS does not consider it to be a viable population (USFWS 2011c).

Conservation goals and objectives listed in section 5.2.6 and AMMs listed in section 5.3 endeavor to fulfill several of the recovery objectives listed above. CDPR will continue to monitor and document Gambel's watercress and work to expand the existing populations in the HCP area by protecting and enhancing its habitat. The goals and objectives in this HCP protect, maintain, and enhance habitats by protecting water quality, restoring habitat, removing invasive species, and avoiding habitat and occurrences during covered activities.

All known Gambel's watercress populations occur in areas with limited access by the public. Because of their limited distribution, the modification of Gambel's watercress or its habitat will not be allowed, except in the case of safety issues (e.g., replacing a failing culvert in suitable habitat). Even then, the habitat disturbance will be temporary in nature, and any Gambel's watercress that could be impacted will be transplanted, if feasible.

Gambel's watercress was observed in the HCP area at Oso Flaco Lake in 2013 and again in 2018, but access to count individuals was limited. No permanent loss of habitat will occur under this HCP, and the loss of 15 individuals over the course of the permit term will not substantially affect the Gambel's watercress population and distribution on site, especially since individuals that are encountered and could be impacted will be transplanted, as feasible, and CDPR will continue to monitor the transplanted individuals. In addition, CDPR will continue to remove invasive species and monitor water quality at Oso Flaco Lake, which will ultimately improve habitat for this species. Finally, although this HCP anticipates that 15 individuals could be lost, this is a worst-case scenario, and it is likely that only a few (if any) individuals will actually be impacted. Therefore, Oso Flaco Lake will likely continue to provide some of the only remaining suitable habitat for this species.

4.8.4.3 La Graciosa Thistle

La Graciosa thistle has only been found on the coast of southern San Luis Obispo and northern Santa Barbara counties. La Graciosa thistle has probably always had a limited range, but it has declined significantly in population numbers and number of occurrences in the past 20 years. According to the 5-year review completed by the USFWS in 2011, there are only eight extant occurrences of La Graciosa

thistle among four populations at Callender Dune Lakes, Oso Flaco, Guadalupe Dunes, and the Santa Maria River (USFWS 2011d).

The habitat that La Graciosa thistle occurs in has disappeared and degraded due to development and urbanization, which is the main threat to the persistence of La Graciosa thistle. Development and urbanization cause direct habitat loss and fragmentation, as well as degradation due to erosion, sedimentation, nutrient loading, and invasive species. Biostimulation, a process in which nutrients are added to the environment to accelerate the growth of certain bacteria, also threatens La Graciosa thistle habitat. Other activities such as oil extraction, ground water diversion, and grazing are additional threats. Rising sea levels from global climate change and lowering water levels from drought and possibly groundwater over use in dune lakes also threaten coastal La Graciosa thistle habitat.

Conservation goals and objectives listed in section 5.2.6 and AMMs listed in section 5.3 endeavor to fulfill several of the recovery objectives listed. CDPR will continue to monitor and document these species and work to expand the existing populations in the HCP area by protecting and enhancing habitat. The goals and objectives protect, maintain, and enhance La Graciosa thistle habitat by protecting and restoring habitat, removing invasive species, and avoiding habitat and occurrences during covered activities.

A loss of up to 25 La Graciosa thistle individuals due to covered activities could occur during the permit term (i.e., no more than one per calendar year). However, although this HCP anticipates that 25 individuals could be lost, this is a worst-case-scenario, and it is likely that fewer individuals will actually be impacted. In addition, if habitat cannot be avoided during covered activities, there may potentially be a permanent loss of up to 35 acres of La Graciosa thistle habitat. However, CDPR will avoid impacting La Graciosa thistle and its habitat to the extent feasible, and this HCP likely overestimates the amount of impacts that will occur. In addition, a total of 549 acres of La Graciosa thistle habitat is present in the HCP area; therefore, a loss of 35 acres over the permit term will not significantly impact La Graciosa thistle habitat on site since 514 acres of suitable habitat will still remain. Furthermore, most of the 35 acres of habitat that is mapped is not known to support La Graciosa thistle and is likely only marginally suitable habitat since it contains bare ground or minimal vegetation. CDPR will also continue to remove invasive species in the HCP area, which will ultimately improve habitat for this species. Because a large amount of suitable habitat for La Graciosa thistle will remain in the HCP area, the HCP area will also continue to provide connectivity to nearby sites where La Graciosa thistle has been observed.

4.8.4.4 Nipomo Mesa Lupine

The single remaining population of Nipomo Mesa lupine is threatened by habitat fragmentation, climate change, low genetic diversity, herbivory by pocket gophers, and habitat loss due to invasive veldt grass that aggressively invades dunes on the Nipomo Mesa. Nipomo Mesa lupine also has an affinity for growing on and near sand access roads that are used by CDPR staff to access the Phillips 66 Leasehold, leading to some mortality by vehicle damage. Another cause for concern is that all known members of the species occur in several distinct patches within a 3-square-mile area, leaving the population highly susceptible to local-disturbance events.

CDPR will continue to monitor and document these species and work to expand the existing populations in the HCP area by protecting and enhancing habitat. Conservation goals and objectives listed in section 5.2.6 and AMMs listed in section 5.3 protect, maintain, and enhance Nipomo Mesa lupine habitat by protecting and restoring habitat; removing invasive species; avoiding habitat and occurrences during covered activities, to the extent feasible; and minimizing impacts in habitat by implementing AMMs, such as timing activities to occur prior to the blooming period.

With the conservation goals, objectives, and AMMs in place, no permanent loss of habitat for Nipomo Mesa lupine will occur under this HCP. This HCP estimates a loss of 100 individuals over the course of the permit term (or no more than 5 in any calendar year); however, CDPR will avoid impacts to this species to the extent feasible and this estimate is likely a worst-case scenario. In addition, any impacts to this species in the HCP area would be the result of habitat enhancement and restoration that would ultimately benefit the species by removing non-native, invasive species that are known to outcompete Nipomo Mesa lupine. As a result, the HCP area will continue to provide some of the last remaining habitat for this species.

4.8.4.5 Surf Thistle and Beach Spectaclepod

Surf thistle is known from 19 sites and is endemic to the ocean bluffs and ocean-facing foredunes along the coast of California from Point Conception to Pismo Beach (CNDDB 2017). The species was threatened by oil production, missile facility construction, beach users, recreational vehicles, cattle, and invasive iceplants. At the time of listing in 1990, approximately 57 percent of the recorded locations were on VAFB (CDFG 2005).

Beach spectaclepod is known from 25 sites and is found sporadically along the coast from northern Baja California to San Luis Obispo County and on two of the California Channel Islands (CNDDB 2017).

CDPR will continue to monitor and document these two species and work to expand the existing populations in the HCP area by protecting and enhancing habitat. Conservation goals and objectives listed in section 5.2.6 and AMMs listed in section 5.3 protect, maintain, and enhance beach and foredune habitat by protecting and restoring habitat, removing invasive species, and avoiding habitat and species occurrences during covered activities.

CDPR will avoid impacting surf thistle and beach spectaclepod, if possible. The loss of 100 individuals for each species over the course of the permit term will not substantially affect either species' population and distribution on site, since over 2,000 surf thistle individuals and over 1,400 beach spectaclepod individuals have been observed on site in the past. In addition, this estimate is a worst-case-scenario, and it is likely that fewer individuals will actually be impacted.

Up to 35 acres of beach spectaclepod and/or surf thistle habitat could also be permanently lost; however, CDPR will avoid impacting this habitat if possible. In addition, a total of 870 acres of suitable habitat for surf thistle and beach spectaclepod is present in the HCP area; therefore, a loss of 35 acres over the permit term will not significantly impact habitat for these species on site, since 835 acres of suitable habitat will still remain. CDPR will also continue to remove invasive species in the HCP area, which will ultimately improve habitat for these species. In addition, the HCP area will continue to provide suitable habitat for both species and, thus, continue to contribute to the amount of habitat available on the Central Coast.

4.9 Effects on Critical Habitat

As defined in FESA, critical habitat is a specific geographic area that contains features essential for the conservation of a listed species and that may require special management and protection. In determining critical habitat for listed species, the USFWS must identify the physical and biological features essential to the conservation of the species. Such features "support the life-history needs of the species, including but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features… Features may include habitat characteristics that support ephemeral or dynamic habitat conditions" (50 CFR §424.02).

The USFWS has designated critical habitat for SNPL, CRLF, tidewater goby, and La Graciosa thistle. Critical habitat for SNPL, tidewater goby, and La Graciosa thistle is present within the HCP area. No

California red-legged frog designated critical habitat is present within the HCP area (USFWS 2006b). Critical habitat descriptions in the following discussion are from the respective Final and Proposed Rules for each species designating critical habitat.

Under FESA, if a proposed action (in this case, USFWS issuance of an ITP) will adversely affect designated critical habitat, a federal agency must consult with the USFWS to determine if the proposed activities might result in the "destruction or adverse modification" of critical habitat. "Destruction or adverse modification…" is defined as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include … those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (50 CFR §402.2). The USFWS issues a biological opinion at the conclusion of the consultation process evaluating effects on critical habitat and other relevant FESA matters. The evaluation considers conservation activities within critical habitat included as part of the proposed action to mitigate the adverse effects of the action on critical habitat (USFWS 2016).

The definition of "destruction or adverse modification" requires that the USFWS consider effects on both the survival and recovery of listed species, consistent with the definition of conservation (50 CFR §424.02). The analyses of effects on critical habitat in this HCP are consistent with this definition.

4.9.1 Western Snowy Plover

The USFWS finalized the current critical habitat designation for the Pacific Coast SNPL population in 2012 (USFWS 2012a). The designation includes 24,527 acres in 60 units in Washington, Oregon, and California. The Pismo Beach/Nipomo Dunes unit (Unit CA 31) contains critical habitat within the HCP area.

Pismo Beach/Nipomo Dunes (Unit CA 31) includes 1,652 acres, of which 780 acres (47 percent of Unit CA 31; 3 percent of all designated SNPL critical habitat) occurs within the HCP area in Pismo State Beach and Oceano Dunes SVRA. The HCP area critical habitat extends along the coast from just north of Arroyo Grande Creek south through the southern end of Oceano Dunes SVRA (Map 10). The entire Unit CA 31, including locations outside the HCP area, extends about 12 miles along the coast from the north side of Arroyo Grande Creek at the south end of Strand Way to about 0.4 mile north of Mussel Point (USFWS 2011e) and includes portions of the Guadalupe-Nipomo Dunes National Wildlife Refuge, which is owned and managed by USFWS; the Guadalupe Restoration Project, the former oil field that is owned and managed by Chevron Corporation; Rancho Guadalupe County Park, which is owned and managed by the County of Santa Barbara; and private property, including Corralitos Ranch just north of VAFB.

The SNPL critical habitat designation concluded that the physical and biological features essential to the conservation of the species[78] included sandy beaches, dune systems immediately inland of an active beach face, salt flats, mud flats, seasonally exposed gravel bars, artificial salt ponds and adjoining levees, and dredge spoil sites, with:

1. Areas that are below heavily vegetated areas or developed areas and above the daily high tides;
2. Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or low-water flow and annual high tide or high-water flow, subject to inundation

[78] At the time critical habitat was designated, the USFWS referred to the physical or biological features essential for the conservation of this species as primary constituent elements (PCEs). The term PCE is no longer included in the FESA regulations.

but not constantly under water, that support small invertebrates, such as crabs, worms, flies, beetles, spiders, sand hoppers, clams, and ostracods, that are essential food sources;

3. Surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates that supports and attracts small invertebrates described in physical and biological features 2 (above) for food, and provides cover or shelter from predators and weather, and assists in avoidance of detection (crypsis) for nests, chicks, and incubating adults; and
4. Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and for normal behavior (USFWS 2012a).

The critical habitat designation noted that the HCP area includes the following physical and biological features essential to SNPL: wind-blown sand dunes, areas of sandy beach above and below the high tide line with occasional surf-cast wrack supporting small invertebrates, and generally barren to sparsely vegetated terrain (USFWS 2012a).

4.9.1.1 Past and Present Activities

When taking into consideration the effects of covered activities in the HCP area on critical habitat, it is important to understand the history of activities in the HCP area that were occurring prior to the HCP. The following paragraphs provide a brief history of activities in the HCP area.

Recreation in the HCP area precedes CDPR acquisition of the HCP area. Therefore, recreation and other uses of the beach and dunes within the HCP area, and corresponding management, have evolved over time. As early as 1900, people rode horses and buggies on the shoreline. In addition, a two-story dance pavilion (i.e., Oceano Pavilion) was constructed on the beach just south of Pier Avenue, and soon after, a 1,000-foot pier was constructed at the end of Pier Avenue. Much of the pier was removed in 1931 to make room for auto racing, but the pavilion remained until 1961 (Hammond 2004). In 1907, construction of another large dance pavilion (i.e., the La Grande Pavilion) and pier was completed on what is now referred to as Pavilion Hill in the north end of Oceano Dunes SVRA (Map 3). At about the same time, people started driving cars on the beach and even explored the dunes on early motorcycles. Early advertisements for lots in Oceano described a strand “18 miles long of clean white sand” boasting “the fastest automobile track in America” (Austin and Hammond 2010). By 1915, photos show long lines of automobiles parked on the beach. After World War II, and especially with the growth of dune buggies in the late 1950s and 1960s, motorized vehicles traversed the publicly- and privately-owned beach and dunes from the north end of Pismo Beach, all the way to Point Sal in Santa Barbara County. Camping along the beach and in the dunes also grew in popularity.

CDPR acquired 140 acres of land in the HCP area in 1934, which it developed by 1947 as the Oceano Campground. In 1949, CDPR acquired the Pismo Beach Pier from the County. Acquisition of major portions of Pismo State Beach continued into the 1960s. In 1974, CDPR purchased the first portion of Oceano Dunes SVRA when it acquired 847 acres (from about Post 7 to Post 8) with the intent of continuing the existing OHV recreation. At the time of acquisition, access to the beach and dunes was largely uncontrolled, and vehicles stretched bumper to bumper for 5 or 6 miles along the beach on major holidays (CDPR 1975). In addition, at that time, some vehicles accessed Oceano Dunes SVRA from private lands along Oso Flaco Road.

Having assembled most of the operational boundaries of the current state beach and Oceano Dunes SVRA by 1982, CDPR established the current formal entrance stations and fenced boundaries, pursuant to CDP 4-82-300. These boundaries demarcated the motorized and non-motorized recreation areas and

reduced motorized access to much of the HCP area and surrounding lands. In 1991, CDPR erected the first seasonal exclosure as part of its resource management program.

4.9.1.2 Effects of Covered Activities on Critical Habitat

In the final rule designating SNPL critical habitat in the HCP area (USFWS 2012a), the USFWS acknowledged that portions of Oceano Dunes SVRA have been degraded by recreation activities. For example, past and ongoing motorized and pedestrian recreation in the HCP area disturb SNPL, particularly during the breeding season, when park visitation rates are high. However, this habitat degradation did not preclude the USFWS from designating these areas as critical habitat if the areas contain physical or biological features essential to the conservation of the SNPL and otherwise meet the definition of critical habitat. The USFWS noted use of an area for recreational activities does not preclude the use of the area by SNPL (USFWS 2012a).

While some covered activities have occurred for much longer, almost all of the covered activities have been occurring in the HCP area for over 20 years, including at the time when the USFWS designated SNPL critical habitat. For example, at least some covered activities currently occur within and will continue to occur within almost all of the 780 acres of SNPL critical habitat in the HCP area. These activities will be conducted in the same manner as they were conducted at the time critical habitat was designated. Within the critical habitat, 352 acres of critical habitat will be open to motorized recreation and camping at least part of the year (i.e., the new foredune and additional foredune vegetation will permanently close off 52 acres of critical habitat, and the Southern Exclosure will be erected during the SNPL and CLTE breeding season and closed to all recreation during this time). Approximately 254 acres open to motorized recreation will continue to be closed via seasonal exclosures to motorized activities during the SNPL and CLTE breeding season. Additionally, 60 acres (i.e., the 6 Exclosure) will continue to be closed to motorized vehicles during the SNPL and CLTE breeding season until certain criteria are met and the 6 Exclosure can be reduced (section 5.2.3). Ultimately, approximately 60 acres of critical habitat could be open again to motorized recreation year-round as a result of removing the 6 Exclosure (East Boneyard Exclosure only contains approximately 0.3 acres of SNPL critical habitat).

Heavy recreational use in critical habitat was occurring within the HCP area at the time critical habitat was designated, and seasonal exclosures were not included as part of the critical habitat designation; therefore, critical habitat for SNPL will not be adversely changed by ongoing recreational activities or a reduction in the seasonal exclosure. Heavy recreational use in the HCP area may continue to make some designated SNPL critical habitat largely unsuitable for nesting or wintering activities. Specifically, SNPL may continue to use areas that are heavily used by humans, but productivity may be limited. For example, motorized activities can reduce prey availability (i.e., reducing habitat quality by altering or reducing wrack, which provides essential habitat for talitrids); reduce habitat quality (e.g., removing/destroying objects such as kelp and driftwood associated with nesting); reduce microtopographic complexity, which provides cover from predators and inclement weather; and prevents the establishment of foredune vegetation, which can provide microhabitat features that can support nesting and roosting.

SNPL typically nest within critical habitat in the seasonal exclosure area, which will not be impacted by mechanical trash removal given that mechanical trash removal will not be conducted within 500 feet of any known nesting area. Mechanical trash removal could occur within SNPL critical habitat that is outside the seasonal exclosure. Mechanical trash removal will not be conducted at or below the active wrack line; therefore, these activities are not anticipated to impact any physical and biological features related to shoreline habitat areas for SNPL feeding (i.e., foraging habitat) at or below the wrack line. Mechanical trash removal could remove favorable constituents within SNPL nesting habitat (i.e., primary and secondary habitat) outside the seasonal exclosure by altering dune composition and topography.

Specifically, mechanical trash removal could reduce micro-topography and organic surface materials (e.g., driftwood) that are scattered throughout the HCP area above the wrack line. Most mechanical trash removal will be conducted to remove litter in areas where recreation activities have been concentrated. These areas have always supported marginally suitable SNPL nesting habitat due to the ongoing high level of recreation (i.e., presence of humans, pets, vehicles, and/or human attracted predators),[79] and SNPL are not currently known to nest in these areas. CDPR also implements habitat enhancement (CA-12b), which helps offset the impacts of vehicle activity occurring in the exclosure area during the winter and is also expected to offset some impacts of mechanical trash removal on breeding SNPL to ensure that favorable nesting habitat remains in the HCP area despite these covered activities. Specifically, the habitat enhancement activity includes collecting wrack and placing it on the shoreline of the Southern Exclosure at the beginning of the breeding season to provide cover for nesting SNPL and inoculating the wrack with talitrids (commonly called beach hoppers) to ensure a sustainable population of wrack-associated invertebrates, which are SNPL prey, are present in main SNPL breeding and foraging area (i.e., the exclosure area).

Although mechanical trash removal will only occur above the active wrack line, mechanical trash removal during the summer could remove scattered debris (e.g., driftwood and kelp) from the previous winter wrack line still present in the beach area above the active wrack line, which is likely important habitat for wrack-associated beach invertebrates. If mechanical trash removal occurs frequently, this material may not have time to naturally develop again, and species richness, abundance, and biomass of wrack-associated invertebrates that are important SNPL prey resources could decline. As a result, wintering SNPL could be impacted by a reduced prey source. CDPR will implement AMM 109, which includes implementing a study to determine the impact of mechanical trash removal on wrack-associated invertebrates. If a significant decline in invertebrates is observed, CDPR will implement additional measures to reduce the impact, such as conducting habitat enhancement in mechanical trash removal areas, reducing the frequency of mechanical trash removal, and/or reducing the mechanical trash removal locations.

Fifty-two acres of critical habitat will be affected by vegetation planting associated with the new PMRP dust control activities. Additionally, some air quality monitoring equipment may be installed within SNPL critical habitat, although such installations are assumed to be temporary. Dust control projects will not be conducted at or below the wrack line; therefore, these projects are not anticipated to impact any physical and biological features related to foraging habitat. Vegetation planted in critical habitat could make these areas largely unsuitable for SNPL nesting by reducing the amount of open, wide beaches necessary for SNPL breeding habitat. Areas with air quality monitoring equipment would also be unsuitable for nesting, although if the equipment is removed the impact would cease. The critical habitat areas outside the seasonal exclosure are already subject to ongoing recreation and a high level of disturbance, and most SNPL are known to nest within the seasonal exclosure during the breeding season, which will not be impacted by new dust control projects. For example, from 2016 and 2018, between 95 and 98 percent of SNPL nesting within the protected seasonal exclosure area. SNPL are not currently known to nest in the majority of critical habitat present outside the seasonal exclosure, although they will occasionally nest in such habitat outside the seasonal exclosure (e.g., Arroyo Grande Creek and in the open riding area). In addition, the added foredune vegetation would be set back from the shoreline, and the randomly spaced native vegetation would avoid creating areas of heavy

[79] USFWS acknowledged that habitat at Oceano Dunes SVRA was already degraded at the time of listing by recreation activities, but it did not preclude the USFWS from designating it as critical habitat (USFWS 2012a).

vegetation; therefore, the areas would retain most of the physical and biological features essential to the conservation of SNPL. Overall, vegetation planting in 52 acres of critical habitat will only modify approximately 6.7 percent of the total critical habitat in the HCP area, approximately 3 percent of total critical habitat in Unit CA 31, and approximately 0.2 percent of the total critical habitat range-wide.

Despite the potential effect on critical habitat described above, CDPR has intensively monitored and managed habitat for breeding and overwintering SNPL in the HCP area for decades and will continue to do so in the future. Implementation of this HCP (i.e., implementation of the conservation program and AMMs, resource monitoring, and adaptive management, Chapter 5), will continue to minimize any effects on critical habitat and, ultimately, SNPL reproductive success. The conservation program (e.g., use of seasonal exclosures to close off some portion of suitable/critical habitat for SNPL during the breeding season, predator management, enforcement of park rules, enhancement of active breeding habitat) detailed in this HCP is designed to contribute to the recovery of SNPL by continuing to protect large nesting habitat areas, adults, eggs, and young from and minimizing conflicts with recreation, park operations and management, and predators.

4.9.2 Tidewater Goby

The revised Final Rule designating critical habitat for tidewater goby was published on February 6, 2013 (USFWS 2013d). In its designation, the USFWS determined that the physical and biological features essential to the conservation (referred to at the time of designation as PCEs) of the tidewater goby are:

1. Persistent, shallow (in the range of about 0.3 to 7 feet), still-to-slow-moving, aquatic habitat most commonly ranging in salinity from 0.5 ppt to about 10 to 12 ppt, which provides adequate space for normal behavior and individual and population growth;
2. Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;
3. Submerged and emergent aquatic vegetation, such as sago pondweed *(Stuckenia pectinata*), ditchgrass (*Ruppia maritime*), common cattail (*Typha latifolia*), and bulrush (*Scirpus* sp.) that provides protection from predators; and
4. Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity (USFWS 2008c).

The USFWS designated a total of approximately 10,003 acres of critical habitat for tidewater goby in January 2008 (USFWS 2008c), including 18 acres in Pismo Creek and lagoon (Unit SLO-11; Map 15) because this area was believed to be threatened by coastal development, channelization, and non-point and point source pollution (USFWS 2008c, 2013d). The 2013 revised Final Rule designating critical habitat for tidewater goby increased the critical habitat at Pismo Creek by 2 acres, bringing the total to 20 acres in this area. The critical habitat unit at Pismo Creek Lagoon in Pismo State Beach (Unit SLO-11) is within the HCP area. This designated habitat unit provides the following essential functions for species recovery:

1) space for individual and population growth and for normal behavior;
2) food, water, air, light, minerals, or other nutritional or physiological requirements; and,
3) cover and shelter (USFWS 2008c).

Across the mouth of Pismo Creek's estuarine lagoon, an intermittent sandbar occasionally forms during the late spring, summer, and/or fall that closes or partially closes the lagoon, thereby providing relatively stable conditions and fulfilling physical and biological feature 4 above. According to the USFWS

(USFWS 2008c), physical and biological features 1, 2, and 3 (above) occur throughout the unit, although their precise locations may change in response to seasonal fluctuations in precipitation and tidal inundation. Within the critical habitat in the HCP area, tidewater goby were found to be "common" in February 2008 (C. Swift, pers. comm. 2008) and September 2007 (Rischbieter 2008). Tidewater goby has been confirmed present every year since (e.g., Rischbieter pers. comm. 2017a). Prior to the 2008 and 2007 surveys, presence of tidewater goby was last confirmed in 1999 (C. Swift, pers. comm., as cited in (USFWS 2005b). The Pismo Creek Lagoon goby population is important as it is considered to be a source population for other areas, possibly including Arroyo Grande Creek.

Habitat at Pismo Creek is threatened by coastal development, water diversion, and channelization (USFWS 2008c). Although much of the tidewater goby critical habitat at Pismo Creek occurs within the boundaries of the HCP area, all of the threats to that habitat listed in the critical habitat designation (coastal development, water diversion, channelization, water pollution, and cattle grazing) occur off site and are generally out of the control of CDPR. All the habitat impacts, such as increased turbidity, will be temporary amid a dynamic tidal system.

The USFWS also added a new critical habitat unit at Oso Flaco Lake (Unit SLO-12). Unit SLO-12 encompasses approximately 171 acres and comprises 165 acres of CDPR lands and 6 acres of private lands. The USFWS defined this critical habitat unit as an area "outside the geographical area occupied by the species at the time of listing, is not known to be currently occupied, and there are no historical tidewater goby records for this location" (USFWS 2013d). However, the USFWS found this unit is essential for the conservation of the species because "it provides habitat to nearby occupied units and is identified in the Recovery Plan as a potential introduction site, and could provide habitat for maintaining the tidewater goby metapopulation in the region" (USFWS 2013d). It is suspected that this unit has the potential to provide habitat for tidewater goby that disperse from Arroyo Grande Creek and the Santa Maria River and allow for connectivity between populations; however, water quality impairments may prevent tidewater goby from establishment at this area. Of note, tidewater goby occupancy of this area was recorded for the first time during surveys conducted in March of 2017 after weeks of drought-alleviating rain, when two adult tidewater gobies were collected within a short reach extending from the surf zone to where Oso Flaco Creek exits the dunes (D. Rischbieter, pers. comm. 2017a).

Covered activities under the HCP are more likely to impact individual fish, rather than the habitat for an entire population. Park visitors may inadvertently harm individual fish or destroy nests while playing in lagoon waters. Maintenance or law enforcement vehicles passing through creek mouths could trample individual fish (although gobies generally do not use this area during normal flow conditions). Fish monitoring methods such as seining in the lagoon or electroshocking in the creek just upstream from the lagoon have the potential to cause injury or mortality to individual fish; however, established AMMs will continue to reduce negative effects. These covered activities do not modify critical habitat features or impair the quality of habitat.

4.9.3 La Graciosa Thistle

The La Graciosa thistle critical habitat was designated November 3, 2009 (USFWS 2009e). Approximately 24,103 acres were designated as critical habitat in San Luis Obispo and Santa Barbara counties (the Callender-Guadalupe Dunes critical habitat unit). The physical and biological features essential to the conservation (referred to at the time of designation as PCEs) of La Graciosa thistle specific to the Santa Maria Dunes Complex and the Callender-Guadalupe Dunes critical habitat unit where the HCP Area is situated include:

1. "Mesic areas associated with: (a) margins of dune swales, dune lakes, marshes, and estuaries that are associated with dynamic (changing) dune systems including the Santa Maria Valley

Dune Complex; (b) margins of dynamic riparian systems including the Santa Maria River and (c) freshwater seeps and intermittent streams found in other habitats, including grassland, meadow, coastal scrub, chaparral, and oak woodland. These areas provide space needed for individual and population growth including sites for germination, reproduction, seed dispersal, seed bank, and pollination;

2. Associated plant communities including: Central dune scrub, coastal dune, coastal scrub, freshwater seep, coastal and valley freshwater marsh and fen, riparian scrub (e.g., mule fat scrub, willow scrub), oak woodland, intermittent streams, and other wetland communities, generally in association with the following species: *Juncus* spp. (rush), *Scirpus* spp. (tule), *Salix* spp. (willow), *Toxicodendron diversilobum* (poison oak), *Distichlis spicata* (salt grass), *Baccharis pilularis* (coyote brush), and *B. douglasii* (*Douglas' baccharis*);
3. Soils with a sandy component including but not limited to dune sands, Oceano sands, Camarillo sandy loams, riverwash, and sandy alluvial soils; and
4. Features that allow dispersal and connectivity between populations, particularly natural aeolian geomorphology in the Santa Maria Dune Complex that is not confined by barriers or wind-blocks such as large manmade structures, tree rows, or windbreaks (allowing uninterrupted winds across these areas)."

Because the sand dune habitat is a dynamic system, unvegetated areas are also included as physical and biological features essential to La Graciosa thistle to account for migration of vegetated habitat patches over time (USFWS 2009e). The critical habitat designated in the HCP area includes physical and biological features necessary for the survival of the species, including vegetated habitat patches and open sand dune swales. Any conversion of this habitat will result in loss of physical and biological features essential to the conservation of the species.

La Graciosa thistle critical habitat encompasses 2,749 acres within the HCP area (Map 18). One or more covered activities, including motorized activities, pedestrian and equestrian recreation, natural resource management, riding in 40 Acres, cultural resource management, and special projects may occur within 2,046 of those 2,749 acres (Map 27), but most of these activities will cause minor and/or temporary effects, and most are ongoing. Permanent changes to La Graciosa thistle critical habitat are anticipated to be negligible. Activities that could impact La Graciosa thistle critical habitat are described in more detail below.

Motorized Recreation. There are approximately 94 acres of critical habitat comprised of sandy dunes that are open to motorized recreation. These are outside of the vegetation islands and do not currently contain the physical and biological features for La Graciosa thistle in appropriate quantity and spatial arrangement necessary to provide the features essential to the conservation of La Graciosa thistle. These areas were designated as critical habitat because the vegetation islands may migrate beyond their current boundaries in the foreseeable future (USFWS 2009e) and, as a result, could be considered suitable habitat for La Graciosa thistle at that time. Additionally, approximately 4.8 acres of critical habitat currently closed to recreation within 40 Acres may be opened to motorized recreation on a seasonal basis, and a motorized trail system may also be installed in the area. Motorized recreation may affect critical habitat by crushing vegetation, seedlings, and seeds of plants representative of the vegetation islands, including La Graciosa thistle that may occur outside of the protected vegetation islands thereby preventing migration of vegetation in these islands into the areas open to riding. Motorized recreation may indirectly affect the vegetation islands by increasing sand movement into the vegetated islands and other vegetated critical habitat.

Pedestrian Recreation. Pedestrian activity is generally allowed throughout La Graciosa thistle critical habitat, including vegetated areas such as the vegetation islands and the area around Oso Flaco Lake. Pedestrian activity in vegetated areas is uncommon, however, and potential effects of these activities are anticipated to be very low, as occasional walking through vegetation is not expected to adversely, nor permanently, affect vegetation. No pedestrian activities are allowed in the Phillips 66 leasehold area; therefore, critical habitat in this area will not be affected.

Equestrian Recreation. Equestrian recreation is allowed within La Graciosa thistle critical habitat in the Dunes Preserve and the vegetated islands, but not within La Graciosa thistle critical habitat around Oso Flaco Lake. Equestrians rarely enter the vegetation islands and generally stay on trails through other vegetated areas; therefore, equestrian recreation is not anticipated to adversely affect critical habitat. Equestrian use in the open dunes is not anticipated to be frequent or intensively localized around existing vegetation islands and other vegetated habitat; therefore, it is not anticipated to prevent migration of vegetation.

Cultural Resources Management, Dust Control, and Special Projects. Up to 145 acres[80] of La Graciosa thistle critical habitat may be affected by cultural resource management, dust control activities, the construction of special projects, and the 40 Acres trail due to ground disturbance or new vegetation planting associated with these activities. These activities would result in an actual change in existing habitat conditions, as opposed to the conditions resulting from ongoing recreation, but not all such changes would be adverse (e.g., vegetation plantings for dust control). Specifically, a new facility constructed as a special project within La Graciosa thistle critical habitat would permanently remove critical habitat. The dust control activities will primarily be installed in sandy dune habitat, so no impacts to existing mesic habitats are expected, and any vegetation installed potentially provides new habitat for La Graciosa thistle colonization. Similarly, sensitive cultural resources sites are typically protected from recreation activities and thus may also benefit La Graciosa thistle by prohibiting recreation activities from La Graciosa thistle habitat. Additionally, since much of the La Graciosa thistle critical habitat designation avoided the sandy dune habitat open to riding, dust control activities such as additional wind fencing and vegetation planting may largely be outside the boundaries of designated critical habitat. Overall, removing up to 35 acres of critical habitat for special projects and cultural resource management activities only represents 0.01 percent of the total amount of critical habitat currently available within the HCP area. In addition, AMMs listed in section 5.3 (e.g., restoring vegetation to pre-activity conditions) will be implemented for these activities and are expected to avoid or minimize effects on La Graciosa thistle critical habitat.

Natural Resources Management Activities. Temporary and indirect effects on La Graciosa thistle habitat could occur during natural resource management activities, such as habitat restoration, invasive plant control, and plant species monitoring. However, these effects will continue to be minimized by implementation of AMMs in section 5.3. In addition, these natural resource management activities benefit La Graciosa thistle and its habitat.

4.10 Cumulative Impacts

Cumulative effects are the incremental environmental effects of the action together with the effects of the past, present, and reasonably foreseeable future actions, regardless of which agency (i.e., federal or

[80] Total includes 5 acres of cultural resource management measures, 94 acres subject to motorized recreation that could be closed for dust control, 3 acres of wind fencing to be converted to vegetation, 3 acres of temporary air quality monitoring equipment, 35 acres of special projects, and 5 acres of trail riding in 40 Acres.

non-federal) or person undertakes those actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over time (40 CFR §1508.7). An analysis of cumulative effects is not required in an HCP; however, we include a brief analysis here to support the federal Biological Opinion that will conclude the USFWS section 7 internal consultation process (section 1.5).

As described above, the impacts of covered activities were assessed relative to the conditions in the HCP area. Development and other activities in the surrounding communities, which are outside the scope of this HCP, may contribute to cumulative impacts on covered species. Thus, other activities and projects in the region that are not covered by this HCP may, in conjunction with this HCP, affect the covered species. Specific projects not covered in the HCP that may impact the covered species are described below. Additional potential cumulative impacts are described in the EA for this HCP. The cumulative impact analysis addresses a relatively local geographic area that includes Pismo Beach, Grover Beach, and Lopez Dam.

4.10.1 Urban Growth

Future development on land surrounding the HCP area, including the cities of Pismo Beach and Grover Beach, will continue during the life of the HCP. Continued development may have a cumulative effect on all or some of the covered species, depending on the location of the development. For example, development near or on the beach could reduce foraging and/or wintering habitat for SNPL. In addition, development that result in loss of wetlands or other waters and/or stormwater runoff from urban landscapes would degrade CRLF and tidewater goby habitat, as well as CLTE foraging habitat. Some, or all, of these losses may be offset by mitigation. However, it is unknown at this time whether mitigation will make up for the lost functions and values of the existing habitat. Therefore, the precise impact of cumulative future growth is unknown.

4.10.2 Ongoing and Routine Agriculture

Ongoing and routine agricultural activities outside and nearby the HCP lands may have some cumulative impacts on the covered species. Ongoing agriculture and herbicide/pesticide use could limit or degrade water quality for CRLF, tidewater goby, and CLTE foraging habitat. Groundwater pumping reduces streamflows, sometimes severely. Since the impacts of ongoing and routine agricultural activities are generally unregulated, and mitigation is not required for impacts associated with these activities, some adverse effects on covered species is expected. However, the precise impacts of ongoing and routine agriculture, and thus, the cumulative effects, are not known.

4.10.3 Operation of Lopez Dam

Operation of Lopez Dam affects the quality and quantity of the aquatic habitat in Arroyo Grande Creek. Changes to streamflow would continue to affect habitat for CRLF and tidewater goby.

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Chapter 5. Conservation Program/Measures to Minimize and Mitigate for Impacts

5.1 Summary of Conservation Program

CDPR is committed to continuing its policy of avoidance and minimization of take of listed species in the management of Pismo State Beach and Oceano Dunes SVRA. This chapter describes the conservation program for this HCP. The conservation program will be implemented to protect and promote recovery for listed and covered species in the HCP area by protecting and, where appropriate, enhancing their populations. The conservation program is a program of conservation measures (i.e., actions taken to avoid or minimize take, compensate for loss of habitat, or provide for the conservation of covered species) that, when implemented, will achieve the biological goals and objectives of this HCP. The conservation program relies on several types of conservation measures including avoidance and minimization, habitat enhancement, habitat restoration, habitat creation, and population enhancement. Recovery and protection of the covered species through the conservation program will be accomplished by the following:

- Managing habitat components to benefit covered species
- Minimizing human alteration or disturbance of native habitats
- Reducing conflicts between covered species and park users
- Restoring native habitats
- Monitoring the success of these efforts

The HCP area will continue to be managed for covered species largely in the same manner it has been for over a decade. However, CDPR is proposing a management change associated with the seasonal exclosures (section 2.2.5.10) for the SNPL and CLTE. Specifically, CDPR intends to no longer fence off the East Boneyard portion of the Southern Exclosure (approximately 49 acres) during the breeding season. In addition, if the conditions described below (section 5.2.3) are met, CDPR proposes slowly reducing the size of the 6 Exclosure.

5.2 Biological Goals and Objectives for Covered Species

Section 10(a)(2)(A) of FESA requires that an HCP specify the measures that the permittee will take to minimize and mitigate to the maximum extent practicable the impacts of take on any federally listed animal species as a result of activities addressed by the HCP.

As part of the “Five Point” Policy adopted by the USFWS in 2000, HCPs must establish biological goals and objectives (65 *Federal Register* 35242, June 1, 2000). The biological goals of an HCP are the broad, guiding principles for the operating conservation program and the rationale behind the minimization and mitigation strategies. The purpose of the biological goals is to ensure that the operating conservation program in the HCP is consistent with the conservation and recovery goals established for the species. The goals are also intended to provide to the applicant an understanding of why these actions are necessary. These goals are developed based upon the species’ biology, threats to the species, the potential effects of the covered activities, and the scope of the HCP. The biological objectives of an HCP are the different component or measurable targets needed to achieve the biological goals.

The primary purpose of an HCP is to minimize and mitigate take of a covered animal species that occurs from otherwise lawful activities that are conducted in accordance with laws and regulations pertaining to ongoing land use. The ongoing operations of the Oceano Dunes District described above in section 2.2 are the activities covered by the HCP.

SNPL and CLTE take may occur from direct mortality or injury and from disturbance due to the close proximity of human activities to roosting, foraging, breeding, and non-breeding (SNPL) habitat, and rearing of young that occurs on open beaches and dunes. The HCP conservation program for SNPL and CLTE has two elements: 1) manage take through the strict implementation of take AMMs; and 2) mitigate take by enhancing and protecting habitat and controlling for predators to maintain high levels of breeding, nesting, and fledging success in the HCP area, allowing for natural variation in these demographic parameters.

For CRLF, tidewater goby, and listed plant species, take is most likely to result from habitat disturbance or destruction due to public encroachment into occupied habitat. However, some small areas of habitat may be destroyed and individuals of the species injured or killed. For these species, the conservation program will include a combination of take AMMs along with habitat enhancement and restoration to increase populations and improve habitat quality within the HCP area.

The overall goal of the HCP for all covered species is to sustain or increase local populations of the covered species and to maintain, enhance, and/or restore habitats and naturally functioning ecosystems within the context of fulfilling the mission of the Oceano Dunes District to provide recreational opportunities.

5.2.1 Western Snowy Plover Goals and Objectives

As presented in section 3.3.1.4.1, monitoring programs from 2001 to 2018 indicate a general increase of the SNPL population in the HCP area. Overall management actions directed toward enhancing SNPL reproduction have been successful. The following goals and objectives are based on maximizing the success of implemented conservation strategies employed in the HCP area to date. The overall biological goals of the HCP for SNPL are to minimize take to the maximum extent practicable and to promote the health and viability of SNPL populations both locally and range-wide. The specific biological goals and objectives that will be implemented to achieve these goals follow. AMMs (section 5.3.1.1) will play a key role in meeting the SNPL goals and objectives.

Goal 1: Continue to contribute to SNPL recovery locally and range-wide.

Objective 1.1: Manage the SNPL population breeding in the HCP area to meet or exceed the CDPR target of 155 breeding SNPL averaged over a moving 3-year window.

This objective was developed based on *The Recovery Plan for the Pacific Coast Population of the Western Snowy Plover* (USFWS 2007a). The Recovery Plan sets Management Potential Breeding Numbers for different coastal areas from Washington to southern California. These are target population sizes that USFWS believes are achievable under an intensive management scheme. The Management Potential Breeding Numbers were developed by the USFWS technical subteam of the SNPL Recovery Team. These numbers are based on survey data at breeding locations and expert opinion regarding the feasibility of management options and the extent and quality of habitat. These numbers were derived independently of the recovery criteria, so they do not exactly match the recovery criteria. The sum total of the Management Potential Breeding Numbers is about 20 percent higher than the recovery criteria subpopulation sizes (USFWS 2007a).

Some of the USFWS targets are designated for geographic areas that encompass breeding locations rather than specific ownership parcels. This is the case for the Pismo Beach/Nipomo Dunes (Unit CA-83)

management area that encompasses Oceano Dunes SVRA and Pismo State Beach (Table B-1 of the Recovery Plan; USFWS 2007a). In addition to Oceano Dunes SVRA and Pismo State Beach, this area includes potentially suitable SNPL habitat on the Guadalupe Dunes National Wildlife Refuge, the Guadalupe Restoration Project (property owned by Chevron Corporation), Rancho Guadalupe County Park, and privately-owned land. The recommended population target for this area is 350 adult SNPL.

To determine how the HCP could help meet the Recovery Plan population targets, it was necessary to determine population targets for the portion of the Pismo Beach/Nipomo Dunes management area owned by CDPR and covered in this HCP. Because there is a paucity of historical data on SNPL numbers along the different coastline segments of the Pismo Beach/Nipomo Dunes management area, the analysis initially used relative proportions of miles of shoreline suitable for SNPL nesting, as mapped in the Recovery Plan, to directly apportion the Management Potential Breeding Numbers in the Recovery Plan to the HCP area.

Within the Pismo Beach/Nipomo Dunes management area, 13.3 miles of sandy shore are considered potentially suitable SNPL breeding habitat. The HCP area includes 5.9 miles of that sandy shore, or 44.4 percent of the potentially suitable habitat in the Pismo Beach/Nipomo Dunes management area. Assuming that all the potential nesting habitat is of equal quality, the Management Potential Breeding Number for Oceano Dunes SVRA/Pismo State Beach is 155 adult SNPL (44.4 percent of 350 adults).

All miles of sandy shoreline in the Pismo Beach/Nipomo Dunes management area may not provide equivalent potential nesting habitat. Additional analysis was thus conducted, partitioning the Management Potential Breeding Numbers for Unit CA-83 using the area of potentially suitable habitat for each subdivision within the Guadalupe/Nipomo Dunes area, rather than shoreline miles. Each subdivision was weighted by its relative "habitat suitability" for SNPL using an index of habitat suitability for the subdivisions in the Guadalupe/Nipomo Dunes region provided in MacDonald et al. (2010).

MacDonald et al. (2010) developed habitat suitability values by identifying environmental variables that best predict the occurrence of SNPL. Variables included elevation, slope gradient, distance from the coast, distance from streams and estuaries, distance from major rivers, landward boundary (e.g., dune, bluff), beach substrate (e.g., sand, gravel), beach width plus adjacent sand dunes/river sandbars, wave height, wind speed, and air/sea temperature. Applying the habitat suitability values and aerial measures of available potential habitat resulted in a Management Potential Breeding Number of 155 adult SNPL for the HCP area (Table 5-1). Given that this outcome is the same as the analysis produced based solely on shoreline length, this HCP uses 155 breeding adult SNPL as a population objective.

Table 5-1. Breeding Adult SNPL Management Potential Breeding Numbers Apportioned to the Subdivisions of Pismo Beach/Nipomo Dunes (Unit CA-83) Area

Sites	Mean Habitat Suitability Value (HSV)[1]	Area (m^2)[2]	HSV Area[3]	Percent Contribution to Total[4]	Apportioned Mgmt. Potential[5]
Oceano Dunes SVRA – Day Use Area	0.839	368,850.4	309,465.5	5.0	17.5
Oceano Dunes SVRA	0.739	1,982,033.7	1,464,722.9	23.7	82.9
Oceano Dunes SVRA Oso Flaco Natural Area	0.768	1,263,065.3	970,034.2	15.7	54.9
Subtotal HCP Area		**3,613,949.4**	**2,744,222.6**		***155.3***

Table 5-1. Breeding Adult SNPL Management Potential Breeding Numbers Apportioned to the Subdivisions of Pismo Beach/Nipomo Dunes (Unit CA-83) Area

Sites	Mean Habitat Suitability Value (HSV)[1]	Area (m^2)[2]	HSV Area[3]	Percent Contribution to Total[4]	Apportioned Mgmt. Potential[5]
Guadalupe-Nipomo Dunes National Wildlife Refuge	0.737	1,096,719.1	808,282.0	13.1	45.7
Guadalupe Restoration Project	0.791	1,604,080.8	1,268,827.9	20.5	71.8
Rancho Guadalupe Dunes Preserve	0.805	1,044,292.1	840,655.2	13.6	47.6
Mussel Rock Beach	0.792	527,435.9	417,729.3	6.8	23.6
Paradise Beach	0.755	138,140.6	104,296.1	1.7	5.9
Total Unit CA-83		**8,024,617.9**	**6,184,013.1**		**350[6]**

Notes:

[1] Mean HSV for Unit CA-83 were obtained from Table 7 in MacDonald et al. (2010).

[2] The total area of the sub-site (MacDonald 2010).

[3] The percent of the total area based on the mean HSV.

[4] The percent the HSV area contributes to the total Unit CA-83 area.

[5] The management potential for the individual unit based on the total Unit CA-83 management potential.

[6] The Management Potential Breeding Number of 350 SNPL for Unit CA-83 was apportioned based on HSVs for each subdivision from (MacDonald et al. 2010) and the area of each subdivision.

Objective 1.2: Maximize the reproductive success of SNPL in the HCP area to maintain a 3-year moving average of at least 1.0 fledgling per male.

In addition to a population-based objective, CDPR will continue to implement conservation actions to maintain a fledge rate necessary to sustain the SNPL population in the HCP area. Objective 1.2 is based on the Recovery Plan, which suggests 1.0 fledged young per breeding male is necessary for population stability and ≥1.2 fledged young per breeding male for population growth (USFWS 2007a). Assessing the status of the number of fledged young per breeding male requires knowing the number of breeding males and the number of young that they fledge. These data will continue to be obtained through the intensive monitoring program (including banding SNPL chicks) (section 5.4.1).

Intensive habitat enhancement and protection of nesting SNPL from predators and park visitors has made it possible to attain a level of reproductive success necessary to achieve Objective 1.2; since 2002, SNPL productivity in the HCP area has been sufficient for population growth in 8 of 10 years (Table 3-8, Figure 3-1). For the 14-year period from 2002 to 2015, the annual average number of juveniles fledged per breeding male was 1.47; the number of fledglings per breeding male exceeded 1.2 in 11 of the 14 years (Table 3-8, Figure 3-3). Since the 2013–2015 3-year period, the moving 3-year average fledglings per breeding male has exceeded 1.0 (Table 3-8, Figure 3-4).

Objective 1.3: Increase the habitat quality through habitat enhancement and restoration.

This objective is designed to maintain and improve habitats for nesting, resting, and foraging SNPL. Habitat enhancement and restoration has been successful in reclaiming SNPL habitat in other locations

throughout California and Oregon. Following the SNPL and CLTE breeding season (i.e., between October and February), camping, street-legal vehicles, and OHVs are allowed in portion of the Southern Exclosure. Recreational use in this area results in large areas of flattened terrain and barren sand with very limited scattered debris and vegetation. As a result, each year Oceano Dunes SVRA staff place material in the 6, 7, and 8 exclosures to enhance SNPL breeding habitat and offer more areas of cover for SNPL that can provide shelter from wind and blowing sand, reduce exposure to predators, and augment potential nesting substrate. Habitat enhancement activities begin in February or March prior to nest initiation and consist of adding natural materials such as, driftwood, woodchips, and wrack to the exclosures and shoreline. Habitat enhancement will not occur within 100 feet of the eastern exclosure fence that borders the open riding area in order to discourage SNPL from nesting near activities that could disturb breeding birds.

Habitat restoration in the HCP area could provide additional nesting and wintering habitat for SNPL by creating more open beach and/or adjacent foredune areas through the removal of invasive species. With the removal of invasive species and recontouring of the dune areas (i.e., North and South Oso Flaco), SNPL may begin to use these areas for nesting and wintering activities.

Objective 1.4: Reduce predation.

Predators are one of the primary causes for the loss of SNPL adults, eggs, and chicks. This objective involves managing predator populations by deterring predators, relocating predators, and/or lethally removing predators to reduce predation on SNPL adults, juveniles, chicks, and eggs (section 2.2.2.1.2).

Objective 1.5: Reduce disturbance by recreational users and predators.

This objective involves protecting nesting SNPL, their nests, and chicks from predators and park users that may inadvertently or otherwise cause harm by using exclosures and symbolic fencing (section 2.2.2.1.1).

Virtually all SNPL nests at Oceano Dunes SVRA will receive some type of fence protection (generally, only those few nests that are not discovered by monitors do not receive some type of fence protection). CDPR will maintain the current relative size and configuration of the seasonal exclosure (i.e., Southern Exclosure and North Oso Flaco Exclosure) throughout this HCP's permit term, except for the removal of the exclosure fencing around East Boneyard (section 2.2.5.10). The size of the 6 Exclosure may also be reduced if the conditions described in section 5.2.3 are met. Nests that are found in the open riding area (outside of the seasonal exclosure) will be protected with single-nest exclosures (section 2.2.2.1.1).

Goal 2: Minimize conflicts between park users, park operations, and SNPL through a combination of avoidance and minimization measures and enforcement of park rules and regulations.

Objective 2.1: Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of SNPL, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on these species, and the importance of working together to conserve these species and their habitat.

Objective 2.2: Provide adequate enforcement to ensure that park visitors do not violate restrictions that protect SNPL and their habitat.

Objective 2.3: Implement recreation and other use restrictions to avoid and minimize take of SNPL.

Objective 2.4: Conduct all maintenance and other park operations in a manner that avoids and minimizes take of SNPL.

5.2.2 California Least Tern Goals and Objectives

As presented in section 3.3.1.4.1, monitoring programs from 2001 to 2017 indicate an increase of the CLTE population in the HCP area. Overall management actions directed towards enhancing CLTE reproduction have been successful. The following goals and objectives are based on maximizing the success of implemented conservation strategies employed in the HCP area to date. The overall biological goals of the HCP for CLTE are to minimize take to the maximum extent practicable and to promote the health and viability of CLTE populations both locally and range-wide. The specific biological goals and objectives that will be implemented to achieve these goals follow. AMMs (section 5.3.1.1) will play a key role in meeting the CLTE goals and objectives.

Goal 1: Continue to contribute to CLTE recovery locally and range-wide.

Objective 1.1: Maintain a 5-year running average of 35 breeding pairs of CLTE in the HCP area.

The most recent completed USFWS 5-Year Review for CLTE recommended revising the current Recovery Plan because "current estimates of population and productivity necessary for downlisting and delisting may not be practicable or applicable, per advances in tern ecology, habitat management, and population viability analysis" (USFWS 2006b). Therefore, this objective for CLTE was developed to be set at an achievable and sustainable number of breeding pairs based on the recent size of the population of CLTE breeding in the HCP area and inferred management potential based on the management actions implemented since 2001 (when the Southern Exclosure was first erected as far north as Post 7).

CLTE population sizes can exhibit large annual fluctuations, so the population size goal is based on a moving average across a 5-year window, rather than single annual population sizes. From 1998 to 2015, an average of 36 pairs of CLTE nested in the HCP area; however, numbers fluctuated greatly between 4 and 55 pairs.

Even at intensively managed sites such as the HCP area, large fluctuations in population size, such as between 1999 and 2000, indicate few CLTE may attempt to breed in some years and that after such occurrences it may take more than 1 year to return to previous numbers (Figure 3-5). Uncontrollable circumstances that could lead to low numbers of nesting CLTE include depleted food resources, a major population decline throughout the range, disease, or a shift of birds to another breeding area. Therefore, the status of the population will be assessed based on a 5-year running average of breeding pairs while considering demonstrated population fluctuations. Nevertheless, under the intensive management regime currently employed (and recommended for this HCP's conservation program) it should be possible for CDPR to sustain a 5-year running average of at least 35 CLTE breeding pairs, as this has been attained since the 2001–2005 5-year period (Figure 3-7).

Objective 1.2: Maximize the reproductive success of CLTE in the HCP area to maintain a 3-year moving average of at least 1.0 fledgling per nesting pair.

Minimizing threats (e.g., predators, disturbance from park visitors) to nesting CLTE, eggs, and young is a critical component of the CLTE conservation program in the HCP area. Objective 1.2 is based on delisting criteria from the Recovery Plan for the CLTE (USFWS 1985), which states that "each of the 'secure' coastal management areas must have a 5-year mean reproductive rate of 1.0 fledged per breeding pair." Recent data suggest that a rate of less than 1.0 young fledged per breeding pair is adequate for population growth, so the delisting criteria may be higher than necessary for recovery (USFWS 2006b). CDPR has elected to use the delisting criteria as a basis for this goal, as management actions have been successful in elevating the number of fledged per breeding pair above 1.0 young fledged per breeding pair for the four most recent 3-year periods (Table 3-10, Figure 3-8). Should new, lower delisting criteria for number of fledged per breeding pair be issued with a new CLTE recovery plan, CDPR may adopt the

new delisting criteria[81], in consultation with USFWS, if fledge rates per breeding pair have consistently fallen below 1.0 in the HCP area.

Objective 1.3: Increase the habitat quality through habitat enhancement and restoration.

This objective is designed to maintain and improve habitats for nesting, resting, and foraging CLTE. Habitat enhancement and restoration has been successful in reclaiming CLTE habitat in other locations throughout California. Following the CLTE breeding season (i.e., between October and February), camping, street-legal vehicles, and OHVs are allowed in portion of the Southern Exclosure. Recreational use in this area results in large areas of flattened terrain and barren sand with very limited, scattered debris and vegetation. As a result, each year Oceano Dunes SVRA staff place material in the 6, 7, and 8 exclosures to enhance CLTE breeding habitat and offer more areas of cover for CLTE that can provide shelter from wind and blowing sand, reduce exposure to predators, and augment potential nesting substrate. Habitat enhancement activities begin in February or March prior to nest initiation and consist of adding natural materials such as driftwood, woodchips, and wrack to the exclosures and shoreline. Habitat enhancement will not occur within 100 feet of the eastern exclosure fence that borders the open riding area in order to discourage CLTE from nesting near activities that could disturb breeding birds.

Objective 1.4: Reduce predation.

Predators are one of the primary causes for the loss of CLTE adults, eggs, and chicks. This objective involves managing predator populations by deterring predators, relocating predators, and/or lethally removing predators to reduce predation on CLTE adults, juveniles, chicks, and eggs (section 2.2.2.1.2).

Objective 1.5: Reduce disturbance by recreational users and predators.

This objective involves using exclosures (section 2.2.2.1.1) to protect nesting CLTE, their nests, and chicks from predators and park users that may inadvertently or otherwise cause harm.

Virtually all CLTE nests at Oceano Dunes SVRA will receive some type of fence protection (generally, only those few nests that are not discovered by monitors do not receive some type of fence protection). CDPR will maintain the current relative size and configuration of the seasonal exclosure (i.e., Southern Exclosure and North Oso Flaco Exclosure) throughout this HCP's permit term, except for the removal of the exclosure fencing around East Boneyard (section 2.2.5.10). The size of the Southern Exclosure will be increased to the extent bumpouts are needed to maintain an approximately 330-foot buffer between CLTE nests and areas open to the public. The size of the 6 Exclosure may be reduced if the conditions described in section 5.2.3 are met. Nests that are found in the open riding area (outside of the seasonal exclosure) will be protected with single-nest exclosures (section 2.2.2.1.1).

Goal 2: Minimize conflicts between park users, park operations, and CLTE through a combination of avoidance and minimization measures and enforcement of park rules and regulations.

Objective 2.1: Provide effective outreach and education to CDPR staff, volunteers, concessionaires operating in the HCP area, and the public on the ecology of CLTE, the significance of the HCP area habitats for this species and its recovery, the importance of CDPR's protection and monitoring efforts, the impacts of predators on this species, and the importance of working together to conserve the species and its habitat.

[81] The criteria that must be met for CLTE to reduce the 6 Exclosure size (section 5.2.3) will not be changed even if CDPR adopts the new delisting criteria.

Objective 2.2: Provide adequate enforcement to ensure that park visitors do not violate restrictions that protect CLTE and its habitat.

Objective 2.3: Implement recreation and other use restrictions to avoid and minimize take of CLTE.

Objective 2.4: Conduct all maintenance and other park operations in a manner that avoids and minimizes take of CLTE.

5.2.3 Changes to the 6 Exclosure for Western Snowy Plover and California Least Tern

The following criteria[82] for SNPL and CLTE must be met before the 6 Exclosure can be reduced in size (section 2.2.5.10):

- Breeding SNPL population size ≥ 155 for 3 consecutive years, including the year before the 6 Exclosure is reduced in size (SNPL Objective 1.1).
- SNPL fledge rate ≥ 1.0 fledglings per male for same 3 consecutive years, including the year before the 6 Exclosure is reduced in size (SNPL Objective 1.2).
- Breeding CLTE population size ≥ a 5-year running average of 35 nesting pairs,[83] including the year before the 6 Exclosure is reduced in size.
- CLTE fledge rate averages ≥ 1.0 fledglings per pair[84] over the same 5 consecutive years, including the year before the 6 Exclosure is reduced in size.

To date, no changes in the 6 exclosure size have occurred. At this time, the criterion for SNPL population size has been met consistently from 2011 to 2018; the criterion for SNPL fledge rate criterion has been met consistently from 2013 to 2018; the CLTE population size criterion was met consistently from 2012 to 2017, but dropped below 35 pairs to 30–33 pairs in 2018; and the CLTE fledge rate criterion was met consistently from 2006 to 2011 and 2013 to 2016, but dropped below 1.0 fledglings per pair in 2012 and well below 1.0 fledglings per pair in 2017. CLTE fledge rate was between 1.06 and 1.17 per pair in 2018.

If these conditions are met in the future, the 6 Exclosure may, at CDPR's discretion, be reduced cautiously in annual 328-foot increments[85] (section 2.2.5.10). This increment represents approximately 12 percent of the current total length of the 6 Exclosure, ensuring that while the new area kept open to recreation each year provides a meaningful change in shoreline available to visitors, it is still small enough to be closely monitored for potential conflict. Subsequent to the 6 Exclosure reduction, if the remaining protected area fails to meet the criteria listed above for either species, the 6 Exclosure will be restored in the following breeding season in consultation with the USFWS. Decisions to restore the 6 Exclosure fence to ensure the criteria are met will be based on the best available science and could include additional management actions (e.g., predator management) in addition to restoring the fence

[82] Criteria to reduce the 6 Exclosure were obtained from recommendations originally provided in (Page 2011). The SNPL population size criterion was based on the estimated management potential for SNPL in the HCP area section (5.2.1). The SNPL fledge rate criterion was based on the USFWS recovery plan estimate for the number of fledged young per breeding male necessary for population stability. The CLTE population size criterion is based on average numbers of CLTE that are considered to be possible to maintain based on past numbers of CLTE present in the HCP area. The CLTE fledge rate criterion is based on past estimates of CLTE fledglings per pair in the HCP area and as a number that is more than adequate for population growth.

[83] CLTE breeding numbers are calculated as a range. This number will be based on the lowest number in the range.

[84] CLTE breeding numbers are calculated as a range; therefore, fledging rates are also calculated using a range. This number will be based on the lowest number in the range.

[85] As noted in section 2.2.5.10, CDPR may implement alternative incremental reductions, such as by adjusting the eastern fence, to better suit SNPL and CLTE management.

size. The 6 Exclosure will be restored to its full extent if the criteria are not met. However, if the protected area criteria listed above are met in subsequent years for both species, then the fencing may once again begin to be reduced in 328-foot increments so that, if criteria listed above are sustained over the requisite number of seasons, the entire approximately 60-acre 6 Exclosure fence may ultimately be removed.

CDPR will reduce exclosures at its discretion (and by the allowed rates) based on factors including, but not limited to:

- CDPR confirmation that targets have been achieved
- Operational considerations/Environmental safeguards
- Biological considerations
- Programmatic considerations

5.2.4 California Red-legged Frog Goals and Objectives

Throughout its range, factors associated with declining CRLF populations include degradation and loss of habitat through agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, invasive plants, impoundments, water diversions, degraded water quality, use of pesticides, and introduced predators. The reason for the decline and degree of threats vary by geographic location (USFWS 2002). For CRLF in the HCP area, take that might occur will result from habitat disturbance or destruction due to public encroachment and park operations and management. For this species, the conservation program will include a combination of take AMMs along with habitat restoration to increase populations and improve habitat quality within the HCP area. Biological goals and objectives for CRLF were developed using ecological life history and natural community descriptions and CRLF management recommendations in the federal Recovery Plan (USFWS 2002).

The conservation program emphasizes protecting and enhancing CRLF aquatic and upland habitat to maintain or increase populations. Habitat will be protected from park visitors and park staff activities, invasive predators will be controlled, and aquatic vegetation will be managed to improve habitat. AMMs (section 5.3.1.3) will play a key role in meeting the CRLF goals and objectives.

Goal 1: Minimize the effects of park operations, park visitor activities, and management activities on suitable CRLF habitat.

Objective 1.1: When necessary to limit encroachment, close suitable habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano (Meadow Creek) Lagoon, Arroyo Grande Creek, Arroyo Grande Creek Lagoon, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential CRLF habitat.

Objective 1.2: Protect habitat by closing informal trails adjacent to occupied aquatic habitat.

Goal 2: Manage invasive plants and animals to enhance suitable habitat and protect all CRLF life stages.

Objective 2.1: Control invasive aquatic predators of CRLF.

Invasive predators prey upon multiple CRLF life stages (e.g., egg, tadpole, adult) and can have a large impact on a population (USFWS 2002). Invasive predators of CRLF, including bullfrogs, mosquitofish, largemouth bass, and crayfish, are known to occur in Pismo Creek, Arroyo Grande Creek, and Oso Flaco

Lake. CDPR will monitor and control populations of invasive predators, focusing efforts first on locations where invasive predators pose the greatest or immediate threat to CRLF.

Objective 2.2: Enhance CRLF habitat by managing aquatic vegetation.

Eradicating or reducing the cover, biomass, and distribution of non-native invasive plants will enhance CRLF habitat. Species needing control efforts in the HCP area include Cape ivy, Boston ivy, pampas grass, poison hemlock, and Italian thistle. The aggressive growth pattern of all these species will eventually displace even the most established native plant community. Routine vegetation management currently occurs at Oso Flaco area, Oceano (Meadow Creek) Lagoon and Lagoon Trail, Meadow Creek, and Pismo Lake spillway. Other areas that may need vegetation management include Arroyo Grande Creek and lagoon, and dune lakes and wetlands. Breeding adults are often associated with dense, shrubby riparian or emergent vegetation and areas with deep (>27 inches), still, or slow-moving water (USFWS 2001a, 2002). Besides control of invasive plant species, vegetation management often includes removal of emergent vegetation and debris, as aquatic areas become choked with vegetation making it inhospitable for CRLF.

Goal 3: Minimize upstream water quality and quantity effects on CRLF and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.

Objective 3.1: Conduct outreach to, and work with, willing landowners upstream of the HCP area and the Regional Water Quality Control Board (RWQCB), whose activities affect water quality and quantity in the HCP area. Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds.

Urbanization and agricultural activities upstream of the HCP area influence water quality and quantity in the HCP area's streams and lakes. In addition to modifying water quantity, land use practices can impact water quality, which in turn may have negative effects on habitats downstream. Impacts include changes in sediment load and concentrations of nutrients, salts, metals, and agrochemicals, the influx of pathogens, and a change in the temperature regime. A decrease in water quality can adversely affect CRLF and other native wetland species (USFWS 2002).

Draw-down of water levels upstream of the HCP area can impact populations of species downstream. Monitoring described in sections 5.4.2.2 and 5.4.2.3 will allow CDPR to determine if CRLF habitat quantity or quality is compromised. Where the cause of impacts to water flows or quality is outside of CDPR control, CDPR will work with off-site landowners as feasible (with support from USFWS) to provide suitable aquatic CRLF habitat.

CDPR will notify appropriate federal and state authorities immediately upon observation of upstream disturbance (unnatural dewatering of stream, illegal dumping or waste discharge, etc.) if it appears that the disturbance is having or potentially could have a detrimental impact to CRLF.

CDPR will work through existing and future stakeholder groups to secure a reliable supply of surface water to support CRLF. This effort will be focused on sustainable groundwater use. CDPR will also participate in ongoing regional efforts to manage surface water in Arroyo Grande Creek to advocate for continued water supply at the estuary. If a watershed assessment or other watershed-based program commences that could help the watershed as a whole, then CDPR will evaluate participation in such a program.

5.2.5 Tidewater Goby Goals and Objectives

Throughout its range, factors associated with declining populations of tidewater goby include modification and loss of habitat as a result of coastal development, channelization of habitat, diversions

of water flows, groundwater overdrafting, and alteration of water flows. Potential threats to the tidewater goby include discharge of agricultural and sewage effluents, increased sedimentation due to cattle grazing and feral pig activity, summer breaching of lagoons, upstream alteration of sediment flows into the lagoon areas, introduction of invasive species, habitat damage, and watercourse contamination resulting from vehicular activity in the vicinity of lagoons (USFWS 2005b). Biological goals and objectives for tidewater goby were developed using ecological life history and natural community descriptions (Chapter 3) and management recommendations for tidewater goby in the final federal Recovery Plan (USFWS 2005b) and the USFWS 5-year review (USFWS 2007d).

For tidewater goby, the conservation program emphasizes protecting the existing populations at Arroyo Grande Creek Lagoon and Pismo Creek Lagoon. Habitat will be protected from park visitors and park staff activities, invasive predators will be controlled, and attempts will be made to influence better management of water supply and quality to improve habitat, as feasible. For tidewater goby in the HCP area, take that might occur will result from habitat disturbance or destruction due to public encroachment and park operations and management. AMMs thus play an important role in the conservation program for tidewater goby (section 5.3.1.4).

Goal 1. Minimize the effects of park operations, park visitor activities, and management activities on tidewater goby habitat.

Objective 1.1: Protect tidewater goby habitat by closing informal trails in and adjacent to occupied and potential habitat. Informal trails found within riparian habitat adjacent to Arroyo Grande and Pismo creeks will be blocked and restored to original conditions.

Objective 1.2: Protect tidewater goby habitat in Arroyo Grande Creek by enforcing crossing guidelines.

Objective 1.3: Protect tidewater goby habitat in Pismo Creek Lagoon by pursuing installation of proposed improvements to Pismo Creek.

CDPR commissioned a study to investigate the critical issues affecting the Pismo Creek Lagoon and to consider alternatives for improvement that will be supported by stakeholders (CSLRCD 2011). A few of the proposed improvements that were acceptable to all stakeholders, including permitting agencies, included barrier dune stabilization, a floating pedestrian bridge, and creek bank stabilization and habitat improvement. Oceano Dunes SVRA will pursue the installation of proposed improvements suggested by the Coastal San Luis Resource Conservation District over the course of the permit term. These include barrier dune stabilization, a floating pedestrian bridge, and creek bank stabilization and habitat improvement. The floating bridge is already a covered activity (section 2.2.5.1). Some of these activities, including creek bank stabilization, may face Coastal Act or other permitting challenges outside of CDPR control.

Goal 2: Manage invasive animals to protect all life stages of tidewater goby.

Objective 2.1: Control invasive aquatic predators of tidewater goby.

When an invasive fish is introduced, whether intentional or accidental, potential negative consequences include suppression of native fish populations through competition, predation and/or hybridization, and disruptions to habitats and ecosystem function. In general, there are three options for management of invasive fishes: no action, control and containment of the species within defined spatial areas, and eradication. There may also be instances where an invasive species is actively spread or populations are enhanced for a variety of legal and unregulated purposes related to their economic and/or social benefits and irrespective of their impacts in the environment (e.g., mosquitofish for mosquito control). With the Meadow Creek flood gates periodically releasing freshwater and periodically allowing invasive fish species into the Arroyo Grande Creek Lagoon, CDPR will work towards control and containment of

invasive species under this HCP as eradication will not be possible. CDPR will thus need to work with the operator of the floodgates (San Luis Obispo County Public Works) to develop operations and maintenance plans that protect the habitat values in the Arroyo Grande Creek Estuary. That could mean control of invasive fish and other activities that will protect native fish (goby and steelhead) and CRLF.

Although CDPR is not directly responsible for impacts associated with invasive species found within Pismo and Arroyo Grande Creeks, continuing management shall take place in an effort to control invasive predators. Since 2003, numerous invasive fish species have been observed within Arroyo Grande Creek Lagoon, including mosquitofish, largemouth bass, and various other sunfishes (Rischbieter 2008). The impact of these invasive species on tidewater goby is unknown. Consequently, CDPR will continue to monitor populations of these invasive predators and implement several management measures to provide additional protection to aquatic resources, including tidewater goby.

Goal 3: Minimize the effects of upstream water quality and quantity disturbances to tidewater goby suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners and water agencies.

Objective 3.1: Conduct outreach to, and work with, willing landowners upstream of the Oceano Dunes District whose activities affect water quality and quantity in the HCP area, working in conjunction with the RWQCB.

Upstream of the HCP area, agriculture plays a large role in water quality and quantity in the streams and lakes of the watershed. In addition to modification of the hydroperiod, land use practices can have important impacts on water quality, which in turn may have negative or, in some cases, positive effects on downstream uses of water. Impacts include changes in sediment load and concentrations of nutrients, salts, metals, and agrochemicals, the influx of pathogens, and a change in the temperature regime. A decrease in water quality can impact native fisheries and other aquatic vertebrates. A CDPR representative will continue to work with conservation partners and agency staff to focus on watershed restoration in the Arroyo Grande Creek, Pismo Creek, and Oso Flaco watersheds. These efforts are largely focused on sustainable habitat, water quality, and water quantity and will benefit numerous aquatic species, including tidewater goby and CRLF.

Additionally, CDPR will work through existing and future stakeholder groups to secure a reliable supply of surface water to support tidewater goby in Arroyo Grande Creek. This effort will be focused on sustainable groundwater use, especially in the lower portion of the Arroyo Grande Creek watershed. CDPR will also participate in ongoing regional efforts to manage surface water in AG Creek to advocate for continued water supply at the estuary.

Goal 4: Evaluate the suitability of potential tidewater goby habitat in the HCP area.

Objective 4.1: Cooperate with USFWS efforts to evaluate habitat conditions of other potential tidewater goby habitat within the HCP area.

The tidewater goby recovery plan identifies Oso Flaco Lake as a potential tidewater goby introduction location, and Oso Flaco Lake is designated as critical habitat (USFWS 2005b). CDPR is not proposing goby introduction as part of this HCP. CDPR will, however, assist USFWS with data collection in Oso Flaco Lake or other potential tidewater goby habitat.

5.2.6 Marsh Sandwort, La Graciosa Thistle, Surf Thistle, Beach Spectaclepod, Nipomo Mesa Lupine, Gambel's Watercress Goals and Objectives

Range-wide factors associated with declining populations of marsh sandwort, La Graciosa thistle, surf thistle, beach spectaclepod, Nipomo Mesa lupine, and Gambel's watercress include habitat degradation

or destruction, adverse effects from biostimulation, and competition with invasive species for light, water, nutrients, and space. Other threats include the occurrence of sudden disastrous events due to the small size and isolation of the remaining population, and in the case of Gambel's watercress, biological and genetic factors such as genetic swamping from the closely related, introduced species, common watercress.

The conservation program emphasizes protecting the existing populations within the HCP area. Habitat will be protected from park visitors and park staff activities, invasive species will be controlled, habitats will be restored, and CDPR will work with landowners upstream to improve water quality. Impacts occurring to these species in the HCP area are through public encroachment and park operations and management in occupied habitat. AMMs thus play an important role in the conservation program for these species. The primary focus is to avoid or minimize impacting individuals of each covered species and of high-quality habitat, such as fragile dunes, that may be affected by covered activities.

Goal 1. Protect and enhance habitat for marsh sandwort, La Graciosa thistle, surf thistle, beach spectaclepod, Nipomo Mesa lupine, and Gambel's watercress within the HCP area to sustain or increase their populations.

Objective 1.1: Restore listed plant habitat.

A program to restore La Graciosa thistle, beach spectaclepod, and surf thistle habitat that includes seeding and planting of native foredune and dune scrub vegetation is currently being conducted by CDPR (CDPR 2012a). A program of selective propagation of specific plant species to augment existing populations and adjacent unoccupied habitats may be developed if monitoring shows that CDPR or public activities are negatively impacting individuals or populations. CDPR will monitor the propagation of listed plant species and their habitats for the life of the permit (section 5.4.4).

Objective 1.2: Protect listed plants from public encroachment.

Because La Graciosa thistle critical habitat has been designated (USFWS 2009e) in the vegetation islands within the open riding area, should La Graciosa thistle be found to occur within the vegetation islands, these individuals will be fenced and protected from public encroachment. Other listed plants will be protected from public encroachment using fencing, as necessary.

Objective 1.3: Close informal trails in and adjacent to listed plant species habitats and restore to original conditions.

Goal 2: Manage invasive plants to protect listed plant species habitat.

Objective 2.1: Control non-native invasive plant species. Invasions of non-native plants create a serious threat to ecosystem function, native biological diversity, and many listed plant species.

Goal 3: Minimize upstream water quality effects on marsh sandwort and Gambel's watercress and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.

Objective 3.1: Conduct outreach to, and work with, willing landowners upstream of the HCP area whose activities affect water quality and quantity at Oso Flaco Lake. The Oceano Dunes District will collaborate with willing upstream landowners and the RWQCB to improve water quality in the Oso Flaco drainage to improve habitat for marsh sandwort and Gambel's watercress. If a watershed assessment or other watershed-based program commences that could help the Oso Flaco watershed, then the Oceano Dunes District will evaluate the benefits of participation in such a program for the covered species.

Goal 4: Collaborate with external agencies and institutions to propagate and outplant listed plants to HCP area lands.

Objective 4.1: Coordinate with USFWS and other agencies and institutions, including botanical gardens, to explore opportunities for propagation and outplanting of listed plants in the HCP area to enhance existing populations and to support new populations of listed plant species in currently unoccupied but suitable habitat.

5.3 Avoidance, Minimization, and Mitigation Measures

CDPR's primary objective will continue to be avoidance and minimization of take of listed species. In addition, Section 10(a)(2)(A) of FESA requires that an HCP specify the measures that the permittee will undertake to minimize and mitigate to the maximum extent practicable the impacts of the take. This HCP adheres to CDPR's objective and FESA's hierarchical requirement to first implement avoidance and minimization and then, if necessary, implement mitigation measures (section 5.3.2).

5.3.1 Measures to Avoid and Minimize Impacts

The following tables describe the existing and new AMMs for each species. Each species' AMMs are then sorted according to the covered activities described in section 2.2.

5.3.1.1 Western Snowy Plover

The majority of AMMs for SNPL are part of the ongoing SNPL and CLTE management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., Pismo Creek Estuary seasonal bridge, CDPR UAS use), and the AMMs for these activities are new as well. The table below lists the AMMs that will reduce potential effects from covered activities for SNPL (section 4.3.1). Covered activities that do not have effects on SNPL are not listed in the table.

Table 5-2. Avoidance and Minimization Measures for SNPL

Covered Activity	Potential Effects	Avoidance and Minimization Measures (AMMs)
Park Visitor Activities		
Motorized recreation **(CA-1)**	• Adults/juveniles/chicks struck by vehicles • Breeding/foraging/roosting disturbance • Chicks separated from adult(s) and inadequately attended or exposed to predation/inclement weather • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed • Chicks/eggs abandoned when adults are disturbed, killed, or injured • Eggs crushed	**AMM 1** CDPR will continue to create educational content on the Oceano Dunes SVRA and Pismo State Beach websites that includes life history information and measures being taken to protect all HCP covered species found at the parks. Information can be updated as needed and visitors can find out what the parks are doing and what they can do to protect the covered species. Covered species information will continue to be included as part of ongoing interpretative programs as well. **AMM 2** Signs explaining SNPL natural history and protection measures in place in the HCP area will continue to be posted for information and education of visitors in the HCP area. Interpretive panels at beach access points (e.g., Sand Highway, Oso Flaco Lake, Pier Avenue, and Grand Avenue) and signs identifying closed areas will continue to be erected to increase public awareness of threats to nesting SNPL and to inform the public of the park's management efforts to protect special-status species. CDPR will also continue to provide a low wattage radio station with a repeated recording of park information, including information about protection of sensitive species. The radio station plays 7 days a week, 24 hours a day and provides updated information on measures taken to protect SNPL. Information on SNPL

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		will also continue to be posted on the Oceano Dunes SVRA and Pismo State Beach websites. **AMM 3** CDPR will continue to enforce resource protection regulations. All exclosed and symbolically fenced areas will continue to be posted with signs in English and Spanish. State Park rangers will continue to have the responsibility to enforce park regulations enacted to protect SNPL, including issuing citations for incidents of trespass into the area closed for nesting. In addition, resource staff monitors will continue to contact visitors who violate park regulations and, where appropriate, contact rangers who will issue a citation. **AMM 4** Posted speed limits will continue to be enforced throughout the HCP area. **AMM 5** CDPR will continue to fence off the Southern Exclosure and North Oso Flaco during the breeding season (March 1 through September 30) to limit vehicle and human disturbance to SNPL nesting areas (and to protect SNPL from terrestrial predators). **AMM 6** A buffer zone a minimum of 100 feet that prohibits camping or parking vehicles will continue to be established outside and around nest exclosures. **AMM 7** Habitat enhancement will continue to be avoided within 100 feet of the fence that borders the open riding area to discourage recreation near nesting that may cause disturbance to breeding birds. **AMM 8** Daily monitoring will continue to take place during and immediately after the SNPL breeding season (when exclosure fencing is removed) to enable better identification of potential human use-related threats to SNPL and to summon law enforcement assistance, if

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		needed, to prevent or eliminate any human use related threats to the species. **AMM 9** If a SNPL is found injured or dead, USFWS will continue to be contacted within 3 working days of finding the bird. **AMM 10** Any SNPL breeding activity in the riding area (e.g., tracks, scrapes, or pairs observed) will continue to be monitored closely. These areas will continue to be marked and rechecked during the day, and one person will continue to be assigned each morning to recheck any potential breeding areas. All SNPL tracks outside the seasonal exclosure will continue to be followed to check for potential nests. Any nest found will continue to be protected with a large single-nest (i.e., 100-foot radius) exclosure to protect nests from people and predators, as determined to be necessary. If feasible and necessary, a westerly travel corridor will be erected to provide safe foraging for chicks. **AMM 11** If a SNPL nest is established within the open riding area, but within 500 feet of the existing seasonal exclosure, fencing will continue to be erected to enlarge the exclosure to encompass the nest site (if topography allows and if safe public traffic patterns are available). Fencing will continue to be placed a minimum of 100 feet from the nest site. **AMM 12** When two or more nests in the open riding area are located within 500 feet of each other and are 500 feet or more away from the seasonal exclosure, they will continue to be encompassed into a new large seasonal exclosure if topography allows. Seasonal exclosures so erected include fencing that extends to the surf line, if chick travel corridors establish that need, so as to provide a secure travel corridor for foraging activity for SNPL

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		chicks. Fencing for such new seasonal exclosures will continue to be maintained a minimum distance of 100 feet from the nest site. **AMM 13** If an SNPL nest is initiated inside the Southern Exclosure and close to the exclosure fence bordering the riding area, CDPR staff will continue to install additional fencing (i.e., "bumpout") to maintain a perimeter of a minimum of 100 feet from the open riding and camping area to the nest. These bumpouts will continue to be monitored regularly. If an incubating bird is disturbed by normal recreational activity, the bumpout will be increased in size, as needed. All nests are monitored for disturbance, and any nest that is disturbed by regular recreation activity may receive a bumpout. This additional fencing will continue to remain in place during the period when nests are active or chicks are found in this area. Once chicks move out of the area or reach fledge age, the bumpouts will be removed. **AMM 14** Circular and/or 10-foot-by-10-foot nest exclosures will continue to be used, if deemed necessary by staff, for SNPL nest protection. These exclosures are constructed using 2-inch by 4-inch wire no-climb fence, and 0.5-inch by 0.5-inch mesh netting is placed on top. The exclosures are secured with metal posts. When appropriate, they are buried 8 inches deep. **AMM 15** Mini exclosures measuring approximately 3 feet by 3 feet by 3 feet will continue to be used in the HCP area. These are constructed with 2-inch by 4-inch wire non-climb fence with a top of the same material. When appropriate, they are buried 4–8 inches deep. CDPR may use additional mini-exclosures, experimenting with different size, orientation, and/or material as new information becomes available on mini-exclosures from other sites.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 16 At least one CDPR vehicle or trailer will continue to be available throughout the SNPL breeding season to carry all tools and equipment necessary to immediately construct a single-nest exclosure or bumpout. **AMM 17** Prior to a known nest hatching outside a seasonal exclosure and within an area open to motor vehicles (e.g., open riding area), monitors will continue to oversee the erection of signs and/or symbolic fencing to provide a safe passage until the brood reaches a non-vehicle use area of Oceano Dunes SVRA. Qualified monitors will continue to attempt to follow the broods if a brood is observed leaving the single-nest or smaller exclosures, to identify threats to brood movement or safety, and to obtain assistance as necessary from Oceano Dunes SVRA patrol staff. **AMM 18** Should broods engage in foraging activity in the wrack line or other movement outside the seasonal exclosures, vehicle traffic flow will continue to be diverted or regulated to allow safe movement of the brood. **AMM 19** Monitors will continue to search for SNPL chicks in the riding area daily. During the chick-rearing period, one person will be assigned each morning to survey the open riding area surrounding exclosures and other known SNPL nesting sites for chicks that have wandered out of protected fenced areas during the night. Monitors will continue to take appropriate action to protect and direct chicks into the fenced areas, as described in section 2.2.2.1.2. **AMM 20** CDPR will continue to place temporary signs in areas where SNPL are known to congregate to alert drivers of their presence and to emphasize a 15-mph speed limit. If possible, increased enforcement of speed limits will occur in areas where large numbers of SNPL are roosting.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 21 Weekly monitoring for the location of SNPL within the HCP area will continue to occur during the non-breeding season (October 1 through February 29), as staff levels and weather conditions allow. Monitoring will be increased if necessary (e.g., during storm events). **AMM 22** When, despite CDPR's efforts[86] to protect nests and/or move chicks back into the safety of the seasonal exclosure, chicks and eggs are still at risk of being injured or killed by covered activities not related to covered species management (e.g., motorized recreation or new proposed activities), CDPR may capture up to 12 eggs (i.e., 4 nests) and/or 12 chicks (i.e., 4 broods) for captive rearing each year. In all cases, the need for captive care is determined by a qualified Environmental Scientist and is used selectively. It is also dependent on an approved facility having the capacity to accept the eggs and/or chicks. If CDPR has captured 8 eggs or 8 chicks for captive rearing during one breeding season pursuant to this AMM, CDPR will contact the USFWS and discuss whether modified or additional AMMs (e.g., expanding the exclosure along the shoreline to provide additional protected foraging habitat, increasing monitoring, and/or increasing signage) are appropriate to minimize risk of additional injury or mortality and ensure no more than 12 eggs and 12 chicks are captured for captive rearing[87].

[86] At times, based on Senior Environmental Scientist professional discretion, CDPR may determine that SNPL eggs and/or chicks should be collected and transferred to an approved wildlife facility without an attempt to protect them on-site because protecting eggs and/or directing chicks back to the exclosure will not eliminate the threat of covered activities.

[87] Capture associated with this AMM is a new covered activity proposed under the HCP, which is different from ongoing capture associated with natural resources management activities. This AMM is meant to address capture when eggs and chicks are threatened by non-covered species management activities, such as motorized recreation.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		Because this measure involves capture, which is considered take under FESA, it is included within CA-12b. **AMM 23** During the non-breeding season, if determined to be necessary to protect wintering SNPL, CDPR staff will temporarily close the beach within the HCP area, including the Arroyo Grande Creek crossing and the Grand Avenue park entrance, to motor vehicles during storm events with anticipated high tides and/or large surf until such conditions or hazards no longer exist. Beach conditions will be regularly monitored, and vehicle use will be allowed again only after CDPR staff has determined that it can occur without causing harm to SNPL, public safety is no longer an issue, and resource protection measures are no longer necessary. **AMM 24** CDPR peace officers will continue to provide focused enforcement of HCP area regulations (e.g., 15-mph speed limits). CDPR peace officers will continue to respond to requests by monitors for assistance with SNPL protection and security. Enforcement of laws affecting safety of SNPL will continue to be the highest non-emergency Law Enforcement priority. **AMM 25** During anticipated high visitor-use periods, such as Memorial Day Weekend, Labor Day Weekend, July 4 Weekend (or as determined by historic visitor attendance records), monitoring staff will continue to be on site for extended hours to monitor within the open riding area and identify threats to all life stages of SNPL from public recreational activity. **AMM 26** During non-holiday weekends (i.e., Friday and Saturday), a minimum of two CDPR peace officers will continue to be on duty and available from 0600 through 2400 each day to enforce regulations (e.g., 15-mph speed limit, dog leash

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		laws, litter). During non-holiday weekdays (i.e., Sunday through Thursday), a minimum of two CDPR peace officers will continue to be on duty from 0700 through 2000 each day to enforce regulations. **AMM 27** During holiday periods, one monitor will continue to be assigned to ensure that no unauthorized entry is made into the north end of the Southern Exclosure during both daylight and evening hours. **AMM 28** During major holiday periods, CDPR peace officers will continue to be on duty 24 hour/day. From 0700 to 2000, a minimum of three ranger/peace officers will continue to be on duty. From 2000 to 0200, a minimum of two ranger/peace officers will continue to be on duty. During mid-day periods, when visitor attendance is highest, as many as four ranger/peace officers will continue to be on duty. Rangers/peace officers will enforce all regulations (e.g., 15-mph speed limit, dog leash laws, litter) in the HCP area. **AMM 29** CDPR will continue to use an adaptive management approach, where information and experience from previous breeding seasons is used to develop additional appropriate AMMs in subsequent seasons to minimize or eliminate impacts to SNPL from covered activities. **AMM 30** CDPR will continue to implement management measures and modify protocols in accordance with ongoing adaptive management and based on recommendations in annual monitoring reports. **AMM 31** Oceano Dunes SVRA will continue to participate in the Region 5 working group for SNPL recovery.
	• Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash associated with recreational activity	**All AMMs apply, as appropriate.**

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 32 Trash dumpsters will continue to be provided near the OHV staging area near Post 2. The location of the trash dumpsters will be changed, as necessary, to avoid disturbance to any nearby active SNPL nests. **AMM 33** CDPR will continue to use trash dumpsters/receptacles designed to prevent access by predators such as gulls. CDPR will continue to explore options to reduce the movement of trash from the dumpsters and reduce predator presence at the dumpster sites. **AMM 34** CDPR will continue to remove or modify signs, fence posts, and other man-made features to eliminate perches for predators in areas where they could impact SNPL. **AMM 35** As appropriate and dictated by field conditions, CDPR will continue to have the option to install single-nest exclosures on SNPL nests in South Oso Flaco or in other areas where they are deemed vulnerable to predators. **AMM 36** Fencing will continue to be buried, as feasible, to limit terrestrial predators from undermining the fence. **AMM 37** In coordination with USFWS, the predator management plan will continue to be reviewed and updated annually, if necessary, to identify appropriate responses to predators. **AMM 38** When additional options for managing predators are needed, selective live-trapping and relocation of avian predators will continue to be conducted by authorized staff or subcontractor, and selective live-trapping and relocation or lethal removal of mammalian and avian predators will be conducted by USDA Wildlife Services (or other authorized subcontractor). **AMM 39** CDPR staff will continue to remove animal carcasses in or adjacent to nesting and brood-rearing habitat. **AMM 40** Where feasible, CDPR staff will continue to haze predators to flush them from sensitive areas. Hazing

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		techniques used include firing a bird whistler and approaching predators where appropriate. CDPR will continue to coordinate closely with predator specialists regarding the location of known or potential nests and brood activity, prior to the specialists conducting work. **AMM 41** All visitors will continue to be informed that they are to deposit their trash in dumpsters/receptacles provided. All campers will continue to be offered plastic garbage bags. All park staff will continue to carry trash bags in each vehicle and make them available to visitors for removing trash and litter from visitor use areas. **AMM 42** CDPR will continue to manually remove litter and garbage from beaches within existing budget and staff limitations.
	• Breeding/foraging/roosting habitat quality reduced • Chicks, eggs, adults, juveniles potentially exposed to predation and/or inclement weather by altered habitat	**All AMMs apply, as appropriate.** **AMM 43** CDPR will continue to place woodchips, large woody material, beach wrack, and native plants throughout the seasonal exclosures to serve as natural shelter. Woodchips will continue to be spread in patches in the 6, 7, and 8 exclosures in areas of barren sand and over thinning woodchip patches remaining from the previous year(s). **AMM 44** CDPR staff will continue to collect wrack in the open riding area and disperse it in the Southern Exclosure. In addition to providing cover, wrack on the shoreline provides a food resource supporting invertebrates, which in turn are prey for SNPL chicks, juveniles, and adults. **AMM 45** Talitrids (beach hoppers) will continue to be collected from outside the vehicle use area north of Grand Avenue or from South Oso Flaco. Staff will continue to inoculate the wrack addition areas of the Southern Exclosure shoreline

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		with talitrids in order to establish a breeding population and increase SNPL food resources. **AMM 46** The Superintendent may consider implementing additional habitat enhancement measures if Environmental Scientists determine such measures may aid in meeting the criteria laid out in biological objectives for SNPL (section 5.2.1). If implemented, the value of any additional habitat enhancement measure to nesting SNPL and CLTE will be studied to evaluate the measure's effectiveness at improving reproductive success and to determine whether and how the measure should be implemented in future seasons.
Camping **(CA-2)**	• Similar to motorized recreation activities	**All AMMs apply, as appropriate.**
Pedestrian activities **(CA-3)**	• Breeding/foraging/roosting disturbance • Chicks and eggs picked up by visitors • Chicks/eggs abandoned when adults are disturbed, injured, or killed • Chicks separated from adult(s) and inadequately fed or exposed to predation/inclement weather • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed	**All AMMs apply, as appropriate.** **AMM 47** If an SNPL nest is established within 150 feet of a restroom facility, permanent restrooms buildings will continue to be closed to public use and exclosure fencing will continue to surround and isolate the restroom to prevent public use. In addition, chemical toilets will continue to be relocated to a minimum distance of 330 feet from any SNPL nest site. **AMM 48** CDPR will continue to use symbolic fencing, consisting of a single strand of rope strung between posts with signage, at South Oso Flaco to protect upper beach and dune habitat for nesting. **AMM 49** In instances where pedestrian activity is observed disturbing SNPL, CDPR will continue to ask visitors to relocate farther away from nests or broods, and symbolic fencing at South Oso Flaco will continue to be adjusted as needed.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 50 Symbolic fencing will continue to be erected at the terminus end of the boardwalk trail at the beach to direct visitors to the wet sand area of the beach and away from potential SNPL nesting and chick-rearing areas. **AMM 51** During daylight hours on major holiday periods, one CDPR peace officer will continue to be assigned to patrol the beach. Duties include patrolling outside the nesting exclosure areas to ensure that no entry is made into the exclosures.
	• Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash associated with pedestrian activities	**All AMMs apply, as appropriate.**
Bicycling and golfing **(CA-4)**	• Similar to pedestrian activities	**All AMMs apply, as appropriate.**
Fishing **(CA-5)**	• Similar to pedestrian activities	**All AMMs apply, as appropriate.**
	• Adults/juveniles/chicks potentially entangled in discarded fishing line/hooks • Chicks, eggs, adults, juveniles potentially exposed to predation by discarded bait	**AMM 52** Public outreach to fisherman in the Oso Flaco Lake area will continue to be conducted by CDPR staff regarding SNPL life history and AMMs. **AMM 53** Anglers will continue to be encouraged to properly dispose of fishing lines, hooks, and bait at various locations within the park where trash receptacles are located.
Dog walking **(CA-6)**	• Similar to pedestrian activities	**All AMMs apply, as appropriate.** **AMM 54** Dogs within the HCP area will continue to be required to be on a leash no longer than 6 feet at all times and within the owner's complete control. **AMM 55** Dogs, other than service dogs, will continue to be banned in the Oso Flaco Area.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 56 Waste bag locations will continue to be provided in the HCP area. **AMM 57** CDPR will continue to enforce dog leash and dog waste regulations, especially in areas where SNPL could be impacted. Resource staff monitors and/or park rangers will continue to contact visitors violating park regulations and, where appropriate, rangers will continue to issue a citation.
Equestrian recreation **(CA-7)**	• Similar to pedestrian activities	**All AMMs apply, as appropriate.** **AMM 58** Horses will continue to be banned in the Oso Flaco Area.
Boating/surfing **(CA-8)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Aerial/wind-driven activities **(CA-9)**	• Foraging/breeding/roosting disturbance	**AMM 59** Pursuant to Superintendent's Order (section 1.5.7), CDPR will continue to prohibit kite flying and kiteboard launching and landing south of the Pier Avenue ramp during the SNPL breeding season (March 1 through September 30). **AMM 60** Open water kite surfing, as well as launching and landing, will continue to be prohibited south of Post 6 during the SNPL breeding season (March 1 through September 30).
Holidays **(CA-10)**	• Effects for all covered activities on holidays are not expected to be different from those on non-holidays	**All AMMs apply, as appropriate.** **AMM 61** Fireworks will continue to be prohibited in the HCP area. **AMM 62** On July 4, CDPR Visitor Service Staff or CDPR Volunteers will continue to be assigned to the large Southern Exclosure to help stop the use of fireworks over the area.
Special events **(CA-11)**	• Effects based on the specific event activity(ies) permitted (see section 2.2.1.12)	**All AMMs apply, as appropriate.**

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 63 All permits authorizing special events will continue to include AMMs to reduce disturbance to SNPL. Specific AMM recommendations will be based on past experience and dependent on the event location, timing, and potential to impact covered species. **AMM 64** CDPR will continue to monitor special events to ensure participants follow SNPL protective measures. **AMM 65** All UAS operators will follow the current CDPR policies regarding UAS use. **AMM 66** Specific AMMs for UAS use will be included in the permit that all UAS operators must obtain from CDPR. For example, non-CDPR UAS will not be allowed south of Post 5 during the breeding season and will be limited along the shoreline whenever necessary to avoid impacting SNPL. In addition, a USFWS-approved monitor will accompany non-CDPR UAS operators at any time of year if it is determined there is potential to impact covered species. Stable flight paths are preferred to minimize the UAS being perceived as a predator.
Natural Resources Management		
SNPL fencing, monitoring, and management **(CA-12a and 12b)**	• Chicks crushed by vehicle • Breeding/foraging/roosting disturbance • Chicks separated from adult(s) and inadequately fed or exposed to predation/inclement weather • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed • Chicks/eggs abandoned when adults are disturbed, injured, or killed	**All AMMs apply, as appropriate.** **AMM 67** Seasonal exclosure and symbolic fencing will continue to be installed and completed by the March 1 start of the SNPL breeding season. **AMM 68** Monitors will continue to be those individuals approved by the USFWS and/or listed on appropriate permits for the covered activities. **AMM 69** Single-nest or smaller exclosures will continue to be erected when at least two eggs have been laid, for nests in the non-motorized area, to help reduce abandonment threat.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 70 Fence maintenance and bumpout installation will continue to be timed to avoid high wind periods and other periods deemed critical for chick or nest survival, like extreme temperatures. **AMM 71** Monitors will continue to escort maintenance vehicles driving through the closed shoreline, as necessary. All CDPR staff driving within the closed shoreline area will continue to be trained on how to operate a vehicle on the shoreline when SNPL broods are present to avoid collision or other harm, e.g., scanning in front of vehicle, driving where chicks are less likely to occur, avoiding wrack, and keeping speeds at or below 5 mph. **AMM 72** Monitors will continue to conduct surveys prior to conducting fence maintenance activities. If nesting SNPL could be impacted by activities, monitors will postpone maintenance, if appropriate. Monitors will remain on site during fence maintenance/ installation conducted by hand to monitor nearby nests and minimize disruption to SNPL. **AMM 73** If any chicks are flushed out of the exclosure, monitors will continue to follow and protect chicks until they move back inside the exclosure as described in section 2.2.2.1.2. **AMM 74** Camera training will continue to be given by staff who are permitted by USFWS to use nest monitoring cameras. Training will continue to occur outside the nesting area using fake nests on which the trainee can practice. Training will continue to include reading the instruction manual of each camera system, practicing efficient camera installation, and proper placement and concealing of cameras. After the initial training, the trainee will continue to accompany the permitted staff during camera installation on two or more active nests, as well as lead the camera installation while under the guidance of the

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		permitted staff. Cameras will continue to only be placed if the wind speed is below 15 mph, the sand temperature is below 83°F, or if it is not raining. **AMM 75** Camera set-up will continue to be delayed if there has been a recent sighting of a predator. **AMM 76** Monitors will continue to evaluate whether a nest is a good candidate for predator monitoring prior to installing still or video cameras. Still or video cameras will not be placed in areas where they are readily visible to the public. **AMM 77** Cameras will continue to be installed when the nest has a complete clutch when possible. In some instances, as determined by the Senior Environmental Scientist, a camera needs to be installed prior to the nest having a complete clutch. In these instances, the camera will continue to be installed with minimal disturbance to SNPL, and a CDPR Environmental Scientist will continue to remain on-site to ensure the adult returns to the nest. **AMM 78** Trail cameras will continue to be placed a minimum of 10 feet away from the selected nest. Time spent near the nest and total equipment set-up will continue to be limited to less than fifteen minutes. **AMM 79** Monitors will continue to monitor the nest after cameras are deployed to ensure the bird returns to the nest. If the bird does not return within 20 minutes, monitors will continue to remove the cameras immediately and cameras will not be replaced at that nest. **AMM 80** Monitors will continue to check nests with cameras daily, using binoculars or a spotting scope to ensure the adult is present and not disturbed by the camera. Monitors will continue to remove the cameras immediately if there is evidence that the placement and/or operation of the

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		camera is jeopardizing the safety of individual nests, eggs, and young.
	• Chick and adult mortality/injury during banding • Chicks/eggs crushed by vehicle or monitor • Chicks flushed into the open riding area • Chicks injured or killed due to adult aggression from brood movement caused by monitoring activities • Adults killed or injured by striking protective fencing • Adults, juveniles, chicks, eggs depredated at single-nest exclosures	**All AMMs apply, as appropriate.** **AMM 81** CDPR will continue to use a master bander for the SNPL breeding season. The master bander will continue to be responsible for the banding of all SNPL chicks, and if determined necessary, banding of SNPL adults. The master bander will continue to work in consultation with and under the direction of the Senior Environmental Scientist. The banding of newly hatched SNPL chicks will continue to follow protocols approved by USFWS. The master bander will continue to report all banding data and records per guidelines established by the USFWS. **AMM 82** To minimize the risk of additional injury or mortality associated with leg bands, monitors will continue to capture birds that show signs of leg injury due to bands as soon as possible and remove the bands. **AMM 83** Monitors will continue to only enter the seasonal exclosures during appropriate weather conditions (e.g., low to no wind, no rain, outside periods of extreme temperatures). Monitors will also continue to survey the area for potential predators prior to entering the seasonal exclosures and will not enter the exclosure until potential predators are absent from the area. **AMM 84** Monitors will continue to be aware of the location of nests, broods, and adults when monitoring within the seasonal exclosures and along the shoreline, and all efforts will continue to be made to minimize disturbance to reduce the likelihood of adults moving off the nest, broods moving into the territory of another nest, and/or chicks being separated from attending adults.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 85 Monitors will continue to visually check the area under and surrounding any vehicle that has been idle near the seasonal exclosure and in the open riding area to ensure SNPL individuals are not present underneath the vehicle. **AMM 86** The top of the Southern Exclosure fencing will continue to be lined with a strip of thicker plastic fencing (orange silt construction fencing cut into approximately 1-foot sections), which will cover most of the western and northern fenced areas to increase the fence visibility to flying birds. If staff resources are available, some of the eastern fenceline and bumpout fencing will also be lined with this strip. **AMM 87** Monitors will continue to inspect the integrity of exclosures regularly. **AMM 88** Single-nest exclosures will continue to be monitored closely to identify if predators are keying in on them. **AMM 89** Monitors will continue to closely survey the east fence of the Southern Exclosure when banding or other monitoring activities are taking place on foot inside the fenced area during the chick-rearing period. They will continue to take appropriate action to coax any SNPL chicks that move out of the exclosure back into the exclosure and will ascertain if they remain there after the monitoring activities in the exclosure have ended. **AMM 90** CDPR will continue to salvage eggs and chicks as part of the ongoing covered species management program, as determined to be necessary by a qualified biologist and in coordination with the USFWS, to be raised in captivity by an approved wildlife facility. Chicks will continue to be raised in a manner that does not imprint on humans and released back into the wild when fledged. Captive care will continue to only be used selectively and not as a

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		substitute for responding to the primary causes of elevated egg or chick abandonment rates.
Tidewater goby and salmonid surveys **(CA-13)**	• Chicks/eggs crushed by vehicle or monitor • Breeding/foraging/roosting disturbance	**All AMMs apply, as appropriate.** **AMM 91** Daily SNPL monitoring during the SNPL breeding season will continue to include areas where fisheries surveys would occur. Fisheries surveys will continue to be adjusted if daily SNPL monitoring determines that SNPL breeding would be affected, including by postponing surveys within 300 feet of an SNPL nest. **AMM 92** Fisheries survey staff will continue to include personnel experienced with conducting fisheries surveys within SNPL habitat and may include permitted SNPL monitors.
CRLF surveys **(CA-14)**	• Chicks/eggs crushed by vehicle or monitor • Breeding/foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Listed plant mgmt. activities **(CA-15)**	• Chicks/eggs crushed by vehicle or monitor • Breeding/foraging/roosting disturbance	**All AMMs apply, as appropriate.** **AMM 93** If surveys are necessary during the breeding season and in a known or potential nesting area, one or two experienced biologists will continue to conduct listed plant surveys. Established protocols for the surveys require that any biologist conducting the work be a skilled botanist with experience in identifying the target plant species or be accompanied by a botanist. The biologist must also be a skilled SNPL monitor included on the List of Authorized Individuals for the HCP area 10(a)(1)(A) Recovery Permit or approved by the USFWS at least 30 days prior to the start of activities or must be accompanied by a biologist with these qualifications.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 94 Prior to conducting botanical surveys, the team will continue to review records of all known SNPL nesting sites in the survey area. No surveys are conducted within 150 feet of known nesting sites until the nest fates are determined (i.e., hatch or fail), and the brood and attending adult are known to have left the area. No surveys or walking within sight of nests occurs for nests that are close to hatch or newly hatched. **AMM 95** Botanical surveys may be conducted in areas without known nests; however, the team will continue to follow existing nest search protocols to identify new nests, breeding behavior, and the presence of adults tending broods. **AMM 96** If new nests, breeding behavior, or adults tending broods are observed in an area during surveys, the team will continue to immediately leave the area until the nest fates are determined or breeding/brooding activity is no longer occurring in the area. **AMM 97** Botanical surveys will continue to take the minimum time necessary for data collection to avoid disturbance to breeding birds in the area. Botanical survey will continue to take no longer than 15 minutes at each site within the breeding area. **AMM 98** All botanical surveys will continue to be conducted under similar constraints as nest search surveys including during appropriate weather conditions, wind conditions, times when predator activity is not occurring, and other precautions per SNPL monitoring protocol in the HCP area.
Habitat restoration program **(CA-16)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Invasive plant and animal control **(CA-17)**	• Foraging/roosting disturbance	**AMM 99** Invasive plant or animal control will continue to be conducted when SNPL are not observed to be present.
Habitat Monitoring System (HMS) implementation **(CA-18)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Water quality monitoring projects **(CA-19)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Park Maintenance		
General facilities maintenance **(CA-21)**	• Breeding/foraging/roosting disturbance • Chicks/eggs abandoned when adults are disturbed, injured, or killed • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed • Adults/juveniles/chicks struck by vehicles • Eggs crushed	**All AMMs apply, as appropriate.** **AMM 100** CDPR will continue to train park staff and "visiting rangers" annually, or as needed, to ensure that staff can do their jobs with minimal impact to SNPL. At a minimum, staff will continue to receive information about basic SNPL biology, listing status, and relevant park rules and regulations and how to respond to observed violations of park rules and regulations that protect SNPL. **AMM 101** All CDPR staff will continue to observe closures, speed limits, and other restrictions aimed at protecting SNPL and CLTE, unless emergency conditions warrant otherwise. **AMM 102** CDPR monitors will continue to conduct surveys to ascertain the presence of SNPL nests, adults, and chicks within and adjacent to potential maintenance areas, if such activities must be carried out during the breeding season (March 1 through September 30) in and adjacent

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		to areas where SNPL are potentially nesting, foraging, or roosting. If CDPR monitors find that the activities may impact, disturb, or result in take of adult birds, chicks, or eggs, the activities will be delayed until the monitor determines SNPL will not be impacted. **AMM 103** CDPR monitors will continue to evaluate the potential for maintenance activities that occur during the non-breeding season (October 1 through February 29) to impact or disturb non-breeding SNPL or to modify SNPL breeding habitat. Activities will continue to be modified, as necessary, to minimize disturbance or impacts to breeding habitat. **AMM 104** Mechanical trash removal will not occur in areas where any SNPL are present. **AMM 105** Mechanical trash removal will only occur above the highest high tide, avoid all wrack/surf cast kelp, avoid all live vegetation, and avoid lagoons and flowing creeks. **AMM 106** Equipment will observe all speed limits and will not exceed 10 mph. **AMM 107** Mechanical trash removal will not be conducted within 500 feet of any known nesting area. **AMM 108** Natural resources staff will inspect and approve the area subject to mechanical trash removal prior to each deployment. Natural resources staff will remain on site or be immediately available for monitoring purposes. **AMM 109** In conjunction with mechanical trash removal, CDPR will implement a study to establish baseline conditions of invertebrate populations, including talitrids, and to determine the impact of mechanical trash removal on these populations. The study will, at a minimum, compare invertebrate abundance in mechanical trash removal areas to baseline conditions prior to the start of

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		mechanical trash removal to areas where mechanical trash removal is absent. If CDPR finds a significant decline in invertebrate numbers in mechanical trash removal areas, additional measures will be implemented (e.g., habitat enhancement measures, reduction in frequency of mechanical trash removal, and/or reduction in mechanical trash removal locations).
	• Limited potential breeding habitat reduced by the footprint of vault toilets	**All AMMs apply, as appropriate.**
Trash control **(CA-22)**	• Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash	**All AMMs apply, as appropriate.**
Wind fencing installation, maintenance, and removal **(CA-23)**	• Foraging and roosting disturbance	**All AMMs apply, as appropriate.**
Sand ramp and other vehicular access maintenance **(CA-24)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.** **AMM 110** During the breeding season, the sand ramps will continue to be inspected a minimum of once per day to identify SNPL individuals and nests. This will continue to occur during the daily survey. During the non-breeding season, the sand ramps will continue to be regularly inspected for roosting activity. No work occurs if birds are roosting within 150 feet of the work area until the birds leave the area on their own accord.
Perimeter and vegetation island fence installation, maintenance, and removal **(CA-27)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Cable fence maintenance and replacement **(CA-28)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Heavy equipment response in all areas of SVRA of Oceano Dunes District **(CA-29)**	• Similar to general facilities maintenance	**All AMMs apply, as appropriate.**
Minor grading (less than 50 cubic yards) **(CA-30)**[88]	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Boardwalk and other pedestrian access maintenance **(CA-31)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Visitor Services		
Ranger, lifeguard, and park aide patrols **(CA-32)**	• Similar to general facilities maintenance activities	**All AMMs apply, as appropriate.**
Emergency response **(CA-33)**	• Similar to general facilities maintenance activities	**All AMMs apply, as appropriate.** **AMM 111** Emergency responders will continue to be informed of the locations of areas that are sensitive (e.g., seasonal

[88] AMMs to reduce the effects of grading to maintain the seasonal exclosure are included in CA-12a: Installation and Maintenance of Western Snowy Plover and California Least Tern Protection Fence. AMMs to reduce the effects of grading to maintain the boundary fence are included in CA-28: Cable Fence Maintenance and Replacement.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		exclosures, shoreline foraging/brooding areas), to the extent feasible. If possible, qualified biologists will continue to escort emergency vehicles into and out of areas that are sensitive. **AMM 112** Locations of non-breeding flocks of SNPL will continue to be identified and appropriate signage displayed to advise all visitors and emergency responders of the location of sensitive resource areas.
Access by non-CDPR vehicles **(CA-34)**	• Adults/juveniles/chicks struck by vehicles • Foraging/roosting disturbance • Chicks/eggs abandoned when adults are disturbed, killed, or injured • Chicks separated from adult(s) and inadequately fed or exposed to predation/inclement weather • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed • Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash	**All AMMs apply, as appropriate.**
Beach concessions **(CA-36)**	• Similar to access by non-CDPR vehicles	**All AMMs apply, as appropriate.** **AMM 113** A focused training program will continue to be provided for all concessionaires and OHV rental employees each year. The training program will consist of, at a minimum, a description of SNPL and its life history and park rules and regulations protecting SNPL. Concessionaires and OHV rental employees will continue to be provided with information handouts consisting of photographs and covered species information. These information handouts will continue to be provided to customers and other members of the public to encourage them to recognize and avoid covered species.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Other HCP Covered Activities		
Motorized vehicle crossing of creeks **(CA-40)**	• Adults/juveniles/chicks struck by vehicles • Nesting/foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Pismo Creek estuary seasonal (floating) bridge **(CA-41)**	• Foraging/roosting disturbance	**AMM 114** If, in the opinion of the Senior Environmental Scientist or monitors, visitor activities are significantly disrupting SNPL foraging and/or roosting behavior, the bridge will be closed to public use until the birds have left the area.
Replacement of the Safety and Education Center **(CA-43)**	• Chicks/eggs crushed by vehicle • Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Dust control activities **(CA-44)**	• Adults/juveniles/chicks struck by vehicles • Breeding/foraging/roosting disturbance • Eggs crushed • Chicks/eggs abandoned when adults are disturbed, killed, or injured • Chicks separated from adult(s) and inadequately fed or exposed to predation/inclement weather • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed • Adults, juveniles, chicks, eggs more susceptible to predation due to increased vegetation • Breeding/foraging/ roosting habitat altered	**All AMMs apply, as appropriate.**
Cultural resources management **(CA-45)**	• Breeding/foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Special projects **(CA-49)**	• Breeding/foraging/roosting disturbance • Breeding habitat reduced by footprint of small project	**All AMMs apply, as appropriate.**

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Reduction of the Boneyard Exclosure **(CA-50)**	• Reduction in protected nesting habitat	**All AMMs apply, as appropriate.**
Use of pesticides **(CA-51)**	• Breeding/foraging/roosting disturbance • Exposure from contact with contaminated prey or vegetation • Exposure from contact with residues, inhalation of vapors	**All AMMs apply, as appropriate.** **AMM 115** When pesticide application must occur near SNPL breeding habitat, work will continue to be conducted between October 1 and February 28 to avoid the breeding season. A qualified biologist will continue to conduct a survey for SNPL 24 hours prior to the application and instruct the work crew on their identification and biology. If SNPL is observed, all work will be stopped immediately until the CDPR biologist arrives and assesses the situation to determine if the work can proceed. **AMM 116** Pesticides will continue to be applied when wind speed is below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side. **AMM 117** Pesticide application will continue to be postponed if soil moisture is at field capacity and a storm event, forecasted by the National Oceanic and Atmospheric Administration (NOAA) or National Weather Service (NWS), is to occur within 48 hours following application; or a storm event likely to produce runoff from the treated area is forecasted by NOAA/NWS to occur within 48 hours following the application. **AMM 118** CDPR will continue to ensure that all workers are trained in the safe and effective use of pesticides in sensitive habitats. **AMM 119** CDPR will continue to ensure that trained resource personnel are present at all phases of the work to ensure that pesticide application activities do not result in impacts to covered species.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 120 If pesticides are spilled, they will continue to be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and are familiar with the use of absorbent materials. Spills will continue to be cleaned up according to label instructions, and all equipment used to remove spills will continue to be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements. **AMM 121** Post-treatment, CDPR will continue to initiate monitoring, which typically consists of mapping, photo documentation, regular inspections, and depending on location and species, some formalized monitoring resulting in several years' worth of data and subsequent reporting. **AMM 122** CDPR will continue to take the following steps when using herbicide: ● Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information. ● CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or covered species, then an application will continue to be made.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		• All pesticide applications will continue to be made according to the product label in accordance with regulations of the EPA, California Environmental Protection Agency (CalEPA), California Division of Occupational Safety and Health (Cal OSHA), DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.
CDPR UAS use for park activities **(CA-52)**[89]	• Breeding/foraging/roosting disturbance	*Year-Round* **AMM 123** UAS will be flown with remote control and a built-in screen that shows battery life. The UAS will be equipped with software or other safeguard to ensure it will alert the operator when it reaches a minimum safe amount of battery life required for a return flight. **AMM 124** UAS operators will attend a formal training and be certified as a Pilot in Command prior to conducting solo flights. **AMM 125** UAS operators will have an established flight plan with a specific purpose determined following all Federal Aviation Administration (FAA) regulations. **AMM 126** UAS will be kept in view of the operator at all times. **AMM 127** UAS operators will not conduct flights in the HCP area without approval from the Senior Environmental Scientist.

[89] AMMs for UAS use may be modified based on best available science and new information on the impacts of drone use on wildlife.

		Breeding Season **AMM 128** All flights within 328 feet of SNPL nesting or brood-rearing habitat will require a USFWS-approved monitor to pilot or assist with flight logistics and monitoring, regardless if birds are confirmed in the area prior to flight. **AMM 129** Prior to flying the UAS into or near (within 328 feet of) nesting or chick-rearing areas, the permittee will follow all existing monitoring guidelines that have been established with USFWS. **AMM 130** UAS will not enter or fly within 328 feet of the SNPL nesting areas if the wind speed is above 15 mph or strong enough to move sand (or will be before or after completion of set up and exit from the exclosure), the sand temperature is 83°F, or if it is raining. **AMM 131** UAS flights will be initiated at least 328 feet from the closest known SNPL nest. The take-off and landing area will be clearly marked. If possible, take-off and landing areas will be out of direct sight from known nests. **AMM 132** UAS will only be deployed when a qualified biologist is confident the activity will not jeopardize the safety of SNPL individuals, nests, eggs, and young. **AMM 133** Prior to every UAS flight, a qualified biologist will scan the area for SNPL. If no birds are observed, the UAS flight can commence with monitoring, as appropriate. If a SNPL is observed in the area, it must be monitored by a qualified biologist during the remainder of the flight. If significant disturbance to SNPL is observed, the biologist may recommend increasing the altitude of the drone (but still remaining below 400 feet to follow FAA guidelines) and/or guiding the drone to a safer area. **AMM 134** The UAS will be kept at least 100 feet above the ground at all times to reduce disturbance to nesting birds and below 400 feet to follow FAA guidelines. **AMM 135** The flight plan will not include erratic flight patterns that could be interpreted as an avian predator by SNPL.

Table 5-2. Avoidance and Minimization Measures for SNPL		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		Non-breeding Season **AMM 136** UAS will only be deployed when a qualified biologist is confident that the activity will not jeopardize the safety of SNPL individuals. **AMM 137** Prior to every UAS flight, a qualified biologist will scan the area for SNPL. If no birds are observed, the UAS flight can commence with monitoring, as appropriate. If an SNPL is observed in the area, it must be monitored by a qualified biologist during the remainder of the flight. If significant disturbance to SNPL is observed, the biologist may recommend increasing the altitude of the drone (but still remain below 400 feet to follow FAA guidelines) and/or guiding the drone to a safer area. **AMM 138** Take-off and landing areas will be clearly marked in the field and should be out of sight from known individuals. **AMM 139** If SNPL are present, the UAS will fly at least 100 feet above ground at all times to reduce disturbance to SNPL and will be kept at below 400 feet to follow FAA guidelines. **AMM 140** The flight plan will not include erratic flight patterns that could be interpreted as an avian predator by SNPL.

5.3.1.2 California Least Tern

The majority of AMMs for CLTE are part of ongoing the SNPL and CLTE management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., Pismo Creek Estuary seasonal bridge, CDPR UAS use) and the AMMs for these activities are new as well. The table below lists the AMMs that will reduce potential effects from covered activities for CLTE (section 4.4.1). Covered activities that do not have effects on CLTE are not listed in the table.

Table 5-3. Avoidance and Minimization Measures for CLTE

Covered Activity	Potential Effects	Avoidance and Minimization Measures (AMMs)
Park Visitor Activities		
Motorized recreation **(CA-1)**	• Adults/juveniles/chicks struck by vehicles • Breeding/roosting disturbance • Chicks separated from adult(s) • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed • Chicks/eggs abandoned when adults are disturbed, killed, or injured • Eggs crushed	**AMM 1** CDPR will continue to create educational content on the Oceano Dunes SVRA and Pismo State Beach websites that includes life history information and measures being taken to protect all HCP covered species found at the parks. Information can be updated as needed and visitors can find out what the parks are doing and what they can do to protect the covered species. Covered species information will continue to be included as part of ongoing interpretative programs as well. **AMM 2** Signs explaining CLTE natural history and protection measures in place in the HCP area will continue to be posted for information and education of visitors in the HCP area. Interpretive panels at beach access points (e.g., Sand Highway, Oso Flaco Lake, Pier Avenue, and Grand Avenue) and signs identifying closed areas will continue to be erected to increase public awareness of threats to nesting CLTE and to inform the public of the park's management efforts to protect special-status species. CDPR will also continue to provide a low wattage radio station with a repeated recording of park information, including information about protection of sensitive species. The radio station will play 7 days a week, 24 hours a day and provides updated information on measures taken to protect CLTE. Information on CLTE

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		will also continue to be posted on the Oceano Dunes SVRA and Pismo State Beach websites. **AMM 3** CDPR will continue to enforce resource protection regulations. All enclosed areas will continue to be posted with signs in English and Spanish. State Park rangers will continue to have the responsibility to enforce park regulations enacted to protect CLTE, including issuing citations for incidents of trespass into the area closed for nesting. In addition, resource staff monitors will continue to contact visitors violating park regulations and, where appropriate, contact rangers who will continue to issue a citation. **AMM 4** Posted speed limits will continue to be enforced throughout the HCP area. **AMM 5** CDPR will continue to fence off the Southern Exclosure and North Oso Flaco during the breeding season (March 1 through September 30) to limit vehicle and human disturbance to CLTE nesting areas (and to protect CLTE from terrestrial predators). **AMM 6** Habitat enhancement will continue to be avoided within 100 feet of the fence that borders the open riding area to discourage recreation near nesting that may cause disturbance to breeding birds. **AMM 7** Daily monitoring will continue to take place during the CLTE breeding season to enable better identification of potential human use related threats to CLTE and to summon law enforcement assistance, if needed, to prevent or eliminate any human use related threats to the species. **AMM 8** If a CLTE is found injured or dead, USFWS and/or CDFW will be contacted within 30 minutes of finding the bird.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 9 The open riding area and other potential habitat outside the seasonal exclosures will continue to be inspected a minimum of once per day to identify CLTE individuals and nests. Any CLTE breeding activity in these areas (e.g., tracks, scrapes, pairs observed, or nesting flight behavior) will continue to be monitored closely. These areas will continue to be marked and rechecked during the day and one person will be assigned each morning to recheck any potential breeding areas. All CLTE tracks outside the seasonal exclosures will continue to be followed to check for potential nests. Any nest found will continue to be immediately protected with a large single-nest (i.e., 330-foot radius) exclosure to protect nests from people and predators. If feasible, a travel corridor will be erected to provide a safe passage for chicks to the existing seasonal exclosure. **AMM 10** If a CLTE nest is established within the open riding area, but within 500 feet of the existing seasonal exclosure, fencing will continue to be erected to enlarge the exclosure so as to encompass the nest site (if topography allows and if safe public traffic patterns are available). Fencing will continue to be placed at a minimum of 330 feet away from the nest site. **AMM 11** When two or more nests in the open riding area are located within 500 feet of each other and are 500 feet or more away from the seasonal exclosure, they will continue to be encompassed into a new large seasonal exclosure if topography allows. Fencing for such new seasonal exclosures will continue to be maintained a minimum distance of 330 feet from the nest site. **AMM 12** If a CLTE nest is initiated inside the Southern Exclosure and close to the exclosure fence bordering the riding

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		area, CDPR staff will continue to install additional fencing (i.e., "bumpout") to maintain a perimeter of a minimum of 330 feet from the open riding and camping area to the nest. The public is excluded from these bumpouts, but permitted monitors still enter the buffer area as needed for monitoring. These bumpouts will continue to be monitored regularly. If an incubating bird is disturbed by normal recreational activity, the bumpout will be increased in size, as needed. All nests are monitored for disturbance, and any nest that is disturbed by regular recreation activity may receive a bumpout. This additional fencing will continue to remain in place during the period when nests are active or chicks are found in this area. Once chicks move out of the area or reach fledge age, the bumpouts will be removed. **AMM 13** At least one CDPR vehicle or trailer will continue to be available throughout the CLTE breeding season to carry all tools and equipment necessary to immediately construct a single-nest exclosure or bumpout. **AMM 14** A 330-foot minimum buffer from recreation activities will continue to be established around all CLTE nests. This distance will be increased if any take (e.g., mortality, injury) or CLTE reacting negatively to normal recreational activities is observed. **AMM 15** If CLTE chicks are observed traveling outside of a single-nest exclosure, CDPR monitors will continue to increase the exclosure in size up to a 600-foot radius. Silt fencing will continue to be used to reduce CLTE travel outside the exclosure. CDPR will continue to coordinate with USFWS regarding the setback distances if the recommended setback distances cannot be achieved.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 16 CDPR monitors will continue to monitor the location of the CLTE night roost each night as viewing conditions allow. CDPR has a protocol in place to protect the night roost if it is found in an area where birds would be vulnerable from recreation activity, including closing off the area with fencing and implementing a 330-foot buffer around the night roost location. Fencing will continue to be added as deemed necessary by the Senior Environmental Scientist of other qualified biologist and fencing will continue to be removed once the night roost is no longer present. This protocol will continue to be implemented if this situation occurs. **AMM 17** CDPR peace officers will continue to provide focused enforcement of HCP area regulations (e.g., posted speed limits). CDPR peace officers will continue to respond to requests by monitors for assistance with CLTE protection and security. Enforcement of laws affecting safety of CLTE will continue to be the highest non-emergency Law Enforcement priority. **AMM 18** During anticipated high visitor-use periods, such as Memorial Day Weekend, Labor Day Weekend, July 4 Weekend (or as determined by historic visitor attendance records), monitoring staff will continue to be on site for extended hours to monitor within the open riding area and identify threats to all life stages of CLTE from public recreational activity. **AMM 19** During non-holiday weekends (i.e., Friday and Saturday), a minimum of two CDPR peace officers will continue to be on duty and available from 0600 through 2400 each day to enforce regulations (e.g., 15-mph speed limit, dog leash laws, litter). During non-holiday weekdays (i.e., Sunday through Thursday), a minimum of two CDPR

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		peace officers will continue to be on duty from 0700 through 2000 each day to enforce regulations. **AMM 20** During holiday periods, one monitor will continue to be assigned to ensure that no unauthorized entry is made into the north end of the Southern Exclosure during both daylight and evening hours. **AMM 21** During major holiday periods, CDPR peace officers will continue to be on duty 24 hour/day. From 0700 to 2000, a minimum of three ranger/peace officers will be on duty. From 2000 to 0200, a minimum of two ranger/peace officers will continue to be on duty. During mid-day periods, when visitor attendance is highest, as many as four ranger/peace officers will continue to be on duty. Rangers/peace officers will continue to enforce all regulations (e.g., 15-mph speed limit, dog leash laws, litter) in the HCP area. **AMM 22** CDPR will continue to use an adaptive management approach, where information and experience from previous breeding seasons is used to develop appropriate AMMs in subsequent seasons to minimize or eliminate impacts to CLTE from covered activities. **AMM 23** CDPR will continue to implement management measures and modify protocols in accordance with ongoing adaptive management and based on recommendations in annual monitoring reports (section 5.7).
	• Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash associated with recreational activity	**All AMMs apply, as appropriate.** **AMM 24** Trash dumpsters will continue to be provided near the OHV staging area near Post 2. The location of the trash dumpsters will be changed, as necessary, to avoid disturbance to any nearby active CLTE nests.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 25 CDPR will continue to use trash dumpsters/receptacles designed to prevent access by predators such as gulls. CDPR will continue to explore options to reduce the movement of trash from the dumpsters and reduce predator presence at the dumpster sites. **AMM 26** CDPR will continue to remove or modify signs, fence posts, and other human-made features to eliminate perches for predators in areas where they could impact CLTE. **AMM 27** In coordination with USFWS, the predator management plan will continue to be reviewed and updated annually, if necessary, to identify appropriate responses to predators. **AMM 28** When additional options for managing predators are needed, selective live-trapping and relocation of avian predators will continue to be conducted by authorized staff or subcontractors, and selective live-trapping and relocation or lethal removal of mammalian and avian predators will continue to be conducted by USDA Wildlife Services (or other authorized subcontractor). **AMM 29** CDPR staff will continue to remove animal carcasses in or adjacent to nesting and chick-rearing habitat. **AMM 30** Where feasible, CDPR staff will continue to haze predators to flush them from sensitive areas. Hazing techniques used include firing a bird whistler and approaching predators where appropriate. CDPR will continue to coordinate closely with predator specialists regarding the location of known or potential nests and chick activity, prior to the specialists conducting work. **AMM 31** All visitors will continue to be informed that they must deposit their trash in dumpsters/receptacles provided. All campers will be offered plastic garbage bags. All park staff will continue to carry trash bags in each vehicle and

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		make them available to visitors for removing trash and litter from visitor use areas. **AMM 32** CDPR will continue to manually remove litter and garbage from beaches. **AMM 33** Exclosure fencing will continue to be buried, as feasible, to limit terrestrial predators from undermining the fence.
	• Breeding/foraging/roosting habitat quality reduced • Chicks, eggs, adults, juveniles potentially exposed to predation and/or inclement weather by altered habitat	**All AMMs apply, as appropriate.** **AMM 34** CDPR will continue to place woodchips, large woody material, beach wrack, and native plants throughout the seasonal exclosures to serve as natural shelter. Woodchips will be spread in patches in the 6, 7, and 8 exclosures in areas of barren sand and over thinning woodchip patches remaining from the previous year(s). **AMM 35** CDPR staff will continue to collect wrack in the open riding area and disperse it in the Southern Exclosure. **AMM 36** Driftwood will continue to be placed throughout the Southern Exclosure to serve as natural shelter for CLTE chicks. Tern shelters are also be used, as necessary and feasible. **AMM 37** The Superintendent may consider implementing additional habitat enhancement measures if Environmental Scientists determine such measures may aid in meeting the criteria laid out in biological objectives for CLTE (section 5.2.2). If implemented, the value of any additional habitat enhancement measure to nesting SNPL and CLTE will be studied to evaluate the measure's effectiveness at improving reproductive success and to determine whether and how the measure should be implemented in future seasons.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Camping **(CA-2)**	• Similar to motorized recreation activities	**All AMMs apply, as appropriate.**
Pedestrian activities **(CA-3)**	• Breeding/foraging/roosting disturbance • Chicks and eggs picked up by visitors • Chicks/eggs abandoned when adults are disturbed, injured, or killed • Chicks separated from adult(s) and inadequately fed • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed	**All AMMs apply, as appropriate.** **AMM 38** If a CLTE nest is established within 330 feet of a restroom facility, permanent restrooms buildings will continue to be closed to public use and exclosure fencing will continue to surround and isolate the restroom to prevent public use. In addition, chemical toilets will continue to be relocated to a minimum distance of 330 feet from any CLTE nest site. **AMM 39** If, in the opinion of the Senior Environmental Scientist or monitors, visitor activities are significantly disrupting CLTE behavior, the footbridge hand railing at Oso Flaco Lake will continue to be closed to public use, or types or public use on the boardwalk will continue to be temporarily prohibited until CLTE have left the lake area. **AMM 40** During daylight hours on major holiday periods, one CDPR peace officer will continue to be assigned to patrol the beach. Duties include patrolling outside the nesting exclosure areas to ensure that no entry is made into the exclosures.
	• Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash associated with recreational activity	**All AMMs apply, as appropriate.**
Bicycling and golfing **(CA-4)**	• Similar to pedestrian activities	**All AMMs apply, as appropriate.**

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Fishing **(CA-5)**	• Similar to pedestrian activities, although disturbance can be for extended periods given the stationary nature of fishing • Adults/juveniles/chicks potentially entangled in discarded fishing line/hooks • Chicks, eggs, adults, juveniles potentially exposed to predation by discarded bait	**All AMMs apply, as appropriate.** **AMM 41** Public outreach to fisherman in the Oso Flaco Lake area will continue to be conducted by CDPR staff regarding CLTE life history and AMMs. **AMM 42** Anglers will continue to be encouraged to properly dispose of fishing lines, hooks, and bait at various locations within the park where trash receptacles are located.
Dog walking **(CA-6)**	• Similar to pedestrian activities	**All AMMs apply, as appropriate.** **AMM 43** Dogs within the HCP area will continue to be required to be on a leash no longer than 6 feet at all times and within the owner's complete control. **AMM 44** Dogs, other than service dogs, will continue to be banned in the Oso Flaco area. **AMM 45** Waste bag locations will continue to be provided in the HCP area to encourage pet owners to pick up dog waste. **AMM 46** CDPR will continue to enforce dog leash and dog waste regulations, especially in areas where they could impact CLTE. Resource staff monitors and/or park rangers will continue to contact visitors violating park regulations and, where appropriate, rangers will continue to issue a citation.
Equestrian recreation **(CA-7)**	• Same as pedestrian activities	**All AMMs apply, as appropriate.** **AMM 47** Horses will continue to be banned in the Oso Flaco area.
Boating/surfing **(CA-8)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Aerial/wind-driven activities **(CA-9)**	• Foraging/breeding/roosting disturbance	**AMM 48** Pursuant to Superintendent's Order (section 1.5.7), CDPR will continue to prohibit kite flying and kiteboard launching and landing south of the Pier Avenue ramp during the SNPL and CLTE breeding season (March 1 through September 30). **AMM 49** Open water kite surfing, as well as launching and landing, will continue to be prohibited south of Post 6 during the CLTE breeding season (March 1 through September 30).
Holidays **(CA-10)**	• Effects for all covered activities on holidays are not expected to be different from those on non-holidays	**All AMMs apply, as appropriate.** **AMM 50** Fireworks will continue to be prohibited in the HCP area. **AMM 51** On July 4, State Park Visitor Service Staff or State Park Volunteers will continue to be assigned to the large Seasonal Exclosure to help prevent the use of fireworks over the area.
Special events **(CA-11)**	• Effects based on the specific event activity(ies) permitted (see section 2.2.1.12)	**All AMMs apply, as appropriate.** **AMM 52** All permits authorizing special events will continue to include AMMs to reduce disturbance to CLTE. Specific AMM recommendations will be based on past experience and dependent on the event location, timing, and potential to impact covered species. **AMM 53** CDPR will continue to monitor special events to ensure participants follow CLTE protective measures. **AMM 54** All UAS operators will follow the current CDPR policies regarding UAS use. **AMM 55** Specific AMMs for UAS use will be included in the permit that all UAS operators must obtain from CDPR. For example, non-CDPR UAS will not be allowed south of Post 5 during the breeding season and will be limited whenever necessary to avoid impacting CLTE. In addition, a USFWS-approved monitor will accompany

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		non-CDPR UAS operators at any time of year if it is determined there is potential to impact covered species. Stable flight paths are preferred to minimize the UAS being perceived as a predator.
Natural Resources Management		
CLTE fencing, monitoring, and management **(CA-12a and 12b)**	• Chicks crushed by vehicle • Breeding/foraging/roosting disturbance • Chicks separated from adult(s) and inadequately fed • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed • Chicks/eggs abandoned when adults are disturbed, injured, or killed	**All AMMs apply, as appropriate.** **AMM 56** Seasonal exclosures and symbolic fencing will continue to be installed prior to the March 1 start of the CLTE breeding season. **AMM 57** Monitors will continue to be those individuals approved by the USFWS and listed on appropriate permits for the covered activities. **AMM 58** Single-nest exclosures (330-foot radius) will continue to be erected as close to initiation of incubation as possible to help reduce abandonment threat. **AMM 59** Fence maintenance and bumpout installation will continue to be timed to avoid high wind periods and other periods deemed critical for chick or nest survival like extreme temperatures. **AMM 60** Monitors will continue to escort maintenance vehicles driving through the closed shoreline, as necessary. **AMM 61** Monitors will continue to conduct surveys prior to conducting fence maintenance activities. If nesting CLTE could be impacted by activities, monitors will postpone maintenance, if appropriate. Monitors will continue to remain on site during fence maintenance/ installation activities conducted by hand to monitor nearby nests and minimize disruption to CLTE. **AMM 62** Monitors will continue to remain on site during fence installation to attempt to reduce disturbance that will result in chicks leaving the exclosure. If any chicks are flushed

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		toward the exclosure boundary or out of the exclosure, monitors will continue to follow and protect chicks to keep them in the exclosure and/or until they move back inside the exclosure. **AMM 63** Camera training will continue to be given by staff who are permitted by USFWS to use nest monitoring cameras. Training will continue to occur outside the nesting area using fake nests on which the trainee can practice. Training will continue to include reading the instruction manual of each camera system, practicing efficient camera installation, and proper placement and concealing of cameras. After the initial training, the trainee will continue to accompany the permitted staff during camera installation on two or more active nests, as well as lead the camera installation while under the guidance of the permitted staff. **AMM 64** Cameras will continue to only be placed if the wind speed is below 15 mph, the sand temperature is below 83°F, or if it is not raining. **AMM 65** Camera set-up will continue to be delayed if there has been a recent sighting of a predator. **AMM 66** Monitors will continue to evaluate whether a nest is a good candidate for predator monitoring prior to installing still or video cameras. Still or video cameras will not be placed in areas where they are readily visible to the public. **AMM 67** Cameras will continue to be installed when the nest has a complete clutch. **AMM 68** Trail cameras will continue to be placed a minimum of 10 feet away from the selected nest. Time spent near the nest and total equipment set-up will continue to be limited to less than 5 minutes.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 69 Monitors will continue to monitor the nest after cameras are deployed to ensure the bird returns to the nest. If the bird does not return within 20 minutes, monitors will continue to remove the cameras immediately and cameras will not be replaced at that nest. **AMM 70** Monitors will continue to check nests with cameras daily using binoculars or a spotting scope to ensure the adult is present and not disturbed by the camera. Monitors will continue to remove the cameras immediately if there is evidence that the placement and/or operation of the camera is jeopardizing the safety of individual nests, eggs, and young.
	• Chick mortality/injury during banding • Chicks/eggs crushed by vehicle or monitor • Chicks flushed into the open riding area • Adults killed or injured by striking protective fencing	**All AMMs apply, as appropriate.** **AMM 71** CDPR will continue to use a master bander for the CLTE breeding season. The master bander will continue to be responsible for the banding of all CLTE chicks. The master bander will continue to work in consultation with and under the direction of the Senior Environmental Scientist. The banding of newly hatched CLTE chicks will continue to follow protocols approved by USFWS and CDFW. The master bander will continue to report all banding data and records per guidelines established by the USFWS. **AMM 72** Monitors will continue to only enter the seasonal exclosures during appropriate weather conditions (e.g., low to no wind, no rain, outside periods of extreme temperatures). Monitors will also continue to survey the area for potential predators prior to entering the seasonal exclosures and will not enter the exclosure until potential predators are absent from the area.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 73 Monitors will continue to be aware of the location of nests, chicks, and adults when monitoring within the seasonal exclosures and along the shoreline and all efforts will continue to be made to minimize disturbance to reduce the likelihood of adults moving off the nest, chicks moving into the territory of another nest, chicks moving into the open riding area, and/or chicks being separated from attending adults. If any chicks are flushed toward the exclosure boundary or out of the exclosure, monitors will continue to follow and protect chicks to keep them in the exclosure and/or until they move back inside the exclosure. **AMM 74** Monitors will continue to visually check the area under and surrounding any vehicle that has been idle near the seasonal exclosure and in the open riding area to ensure CLTE individuals are not present underneath the vehicle. **AMM 75** The top of the Southern Exclosure fencing will continue to be lined with a strip of thicker plastic fencing (orange silt construction fencing cut into approximately 1-foot sections), which will cover most of the western and northern fenced areas to increase the fence visibility to flying birds. If staff resources are available, some of the eastern fenceline and bumpout fencing will also be lined with this strip. **AMM 76** Monitors will continue to inspect the integrity of the exclosures regularly. **AMM 77** Monitors will continue to closely survey the east fence of the Southern Exclosure when banding or other monitoring activities are taking place on foot inside the fenced area. Any CLTE chicks that move outside of the exclosure fence will continue to be monitored until they are safely

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		within the exclosure fence and no longer subject to disturbance.
Tidewater goby and salmonid surveys **(CA-13)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.** **AMM 78** Daily CLTE monitoring during the CLTE breeding season will continue to include areas where fisheries surveys would occur. Fisheries surveys will continue to be adjusted if daily CLTE monitoring determines CLTE foraging and/or breeding would be affected, including by postponing surveys within 330 feet of a CLTE nest. **AMM 79** Fisheries survey staff will continue to include personnel experienced with conducting fisheries surveys within CLTE habitat and may include permitted CLTE monitors.
CRLF surveys **(CA-14)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.** **AMM 80** A qualified biologist will continue to survey for foraging or roosting CLTE prior to activities. If foraging or roosting CLTE are observed, activities will be delayed until the bird(s) are no longer in the area.
Listed plant mgmt. activities **(CA-15)**	• Chicks/eggs crushed by vehicle or monitor • Breeding/foraging/roosting disturbance	**All AMMs apply, as appropriate.** **AMM 81** When surveys are necessary during the breeding season and in a known or potential nesting area, one or two experienced biologists will continue to conduct listed plant surveys. Established protocols for the surveys require that any biologist conducting the work be skilled botanist with experience in identifying the target plant species or be accompanied by a botanist. The biologist must also be a

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		skilled CLTE monitor included on the List of Authorized Individuals for the HCP area 10(a)(1)(A) Recovery Permit or approved by the USFWS at least 30 days prior to the start of activities or be accompanied by a biologist with these qualifications. **AMM 82** Prior to conducting botanical surveys, the team will review records of all known CLTE nesting sites in the survey area. No surveys are conducted within 330 feet of known nesting sites until the nest fates are determined (i.e., hatch or fail), and the attending adult is known to have left the area. No surveys or walking within sight of nests occurs for nests that are close to hatch or newly hatched. **AMM 83** Botanical surveys may be conducted in areas without known nests; however, the team will continue to follow existing nest search protocols to identify new nests, breeding behavior, and the presence of adults tending chicks. **AMM 84** If new nests, breeding behavior, or adults tending chicks are observed in an area during surveys, the team will continue to immediately leave the area until the nest fates are determined or breeding/ chick-rearing activity is no longer occurring in the area. **AMM 85** Botanical surveys will continue to take the minimum time necessary for data collection to avoid disturbance to breeding birds in the area. Botanical survey will continue to take no longer than 15 minutes at each site with a known population. **AMM 86** All botanical surveys will continue to be conducted under similar constraints as nest search surveys including during appropriate weather conditions, wind conditions, times when predator activity is not occurring, and other

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		precautions per CLTE monitoring protocol in the HCP area.
Habitat restoration program **(CA-16)**	• Roosting disturbance	**All AMMs apply, as appropriate.**
Invasive plant and animal control **(CA-17)**	• Foraging/roosting disturbance	**AMM 87** Invasive plant or animal control will continue to be conducted when CLTE are not observed to be present.
Habitat Monitoring System (HMS) implementation **(CA-18)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Water quality monitoring projects **(CA-19)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Park Maintenance		
General facilities maintenance **(CA-21)**	• Breeding/foraging/roosting disturbance • Chicks/eggs abandoned when adults are disturbed, injured, or killed • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed • Adults/juveniles/chicks struck by vehicles • Eggs crushed	**All AMMs apply, as appropriate.** **AMM 88** CDPR will continue to train park staff and "visiting rangers" annually, or as needed, to ensure that staff are able to do their jobs with minimal impact to CLTE. At a minimum, staff will continue to receive information about basic CLTE biology, listing status, and relevant park rules and regulations and how to respond to observed violations of park rules and regulations that protect CLTE. **AMM 89** All CDPR staff will continue to observe closures, speed limits, and other restrictions aimed at protecting CLTE, unless emergency conditions warrant otherwise.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 90 CDPR staff will continue to conduct surveys to ascertain the presence of CLTE nests, adults, and chicks within and adjacent to potential maintenance areas, if such activities must be carried out during the breeding season (March 1 through September 30) in and adjacent to areas where CLTE are potentially nesting, foraging, or roosting. If CDPR staff finds that the activities may impact, disturb, or result in take of adult birds, chicks, or eggs, the activities will continue to be delayed until CDPR staff determines CLTE will not be impacted. **AMM 91** Mechanical trash removal will not occur in areas where any CLTE are present. **AMM 92** Mechanical trash removal will only occur above the highest high tide, avoid all wrack/surf cast kelp, avoid all live vegetation, and avoid lagoons and flowing creeks. **AMM 93** Equipment will observe all speed limits and will not exceed 10 mph. **AMM 94** Mechanical trash removal will not be conducted within 500 feet of any known nesting area. **AMM 95** Natural resources staff will inspect and approve the area subject to mechanical trash removal prior to each deployment. Natural resources staff will remain on site or be immediately available for monitoring purposes.
	• Limited potential breeding habitat reduced by the footprint of vault toilets	**All AMMs apply, as appropriate.**
Trash control **(CA-22)**	• Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash	**All AMMs apply, as appropriate.**

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Wind fencing installation, maintenance, and removal **(CA-23)**	• Roosting/breeding disturbance	**All AMMs apply, as appropriate.**
Sand ramp and other vehicular access maintenance **(CA-24)**	• Roosting/breeding disturbance	**All AMMs apply, as appropriate.** **AMM 96** During the breeding season, the sand ramps will continue to be inspected a minimum of once per day to identify CLTE nests. This will continue to occur during the daily survey.
Routine riparian maintenance **(CA-26)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.** **AMM 97** CLTE will continue to be protected from harm during maintenance activities conducted at the Oceano (Meadow Creek) Lagoon, Pismo Lake, and Oso Flaco Lake through monitoring of the treatment activity by qualified biologists. If any activities are scheduled when CLTE are known to be present (generally between April 15 and September 15) qualified biologists will continue to be on site during activities taking place at these locations. If CLTE are not foraging nearby or biologists observing CLTE foraging activity determine that CLTE will not be disturbed by the activities, it may proceed as planned. However, if CLTE are present and have the potential to be disturbed, the biologist will continue to direct activities to stop within 250 feet of the bird until it leaves on its own accord.
Perimeter and vegetation island fence installation, maintenance, and removal **(CA-27)**	• Foraging/roosting disturbance • Nest disturbance	**All AMMs apply, as appropriate.**

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Cable fence maintenance and replacement **(CA-28)**	• Roosting disturbance • Nest disturbance	**All AMMs apply, as appropriate.**
Heavy equipment response in all areas of SVRA of Oceano Dunes District **(CA-29)**	• Similar to general facilities maintenance	**All AMMs apply, as appropriate.**
Minor grading (less than 50 cubic yards) **(CA-30)**[90]	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Boardwalk and other pedestrian access maintenance **(CA-31)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Visitor Services		
Ranger, lifeguard, and park aide patrols **(CA-32)**	• Similar to general facilities maintenance activities	**All AMMs apply, as appropriate.**
Emergency response **(CA-33)**	• Similar to general facilities maintenance activities	**All AMMs apply, as appropriate.** **AMM 98** Emergency responders will continue to be informed of the locations of areas that are sensitive (e.g., seasonal

[90] AMMs to reduce the effects of grading to maintain the seasonal exclosure are included in CA-12a: Installation and Maintenance of SNPL and CLTE Protection Fence. AMMs to reduce the effects of grading to maintain the boundary fence are included in CA-28: Cable Fence Maintenance and Replacement.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		exclosures, shoreline foraging areas), to the extent feasible. If possible, qualified biologists will escort emergency vehicles into and out of areas that are sensitive.
Access by non-CDPR vehicles **(CA-34)**	• Adults/juveniles/chicks struck by vehicles • Foraging/roosting disturbance • Chicks/eggs abandoned when adults are disturbed, killed, or injured • Chicks separated from adult(s) and inadequately fed • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed • Chicks, eggs, adults, juveniles potentially exposed to predation by increased trash	**All AMMs apply, as appropriate.**
Beach concessions **(CA-36)**	• Similar to access by non-CDPR vehicles	**All AMMs apply, as appropriate.** **AMM 99** A focused training program will continue to be provided for all concessionaires and OHV rental employees each year. The training program will consist of, at a minimum, a description of CLTE life history and park rules and regulations protecting CLTE. Concessionaires and OHV rental employees will continue to be provided with information handouts consisting of photographs and covered species information. These information handouts will continue to be provided to customers and other members of the public to encourage them to recognize and avoid covered species.
Natural history and interpretation programs **(CA-39)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.** **AMM 100** CDPR will continue to hold large group natural history and interpretation programs at Oso Flaco Lake when CLTE are not present or modify the program by observing CLTE behavior to avoid significant disturbance.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Other HCP Covered Activities		
Motorized vehicle crossing of creeks **(CA-40)**	• Adults/juveniles/chicks struck by vehicles • Roosting disturbance	**All AMMs apply, as appropriate.**
Pismo Creek estuary seasonal (floating) bridge **(CA-41)**	• Foraging/roosting disturbance	**AMM 101** If, in the opinion of the Senior Environmental Scientist or monitors, visitor activities are significantly disrupting CLTE foraging and/or roosting behavior, the bridge will be closed to public use until the birds have left the area.
Dust control activities **(CA-44)**	• Adults/juveniles/chicks struck by vehicles • Breeding/foraging/roosting disturbance • Eggs crushed • Chicks/eggs abandoned when adults are disturbed, killed, or injured • Chicks separated from adult(s) and inadequately fed • Eggs buried by sand, exposed to predation, or not properly incubated when adults are disturbed • Adults, juveniles, chicks, eggs more susceptible to predation due to increased vegetation • Breeding/foraging/ roosting habitat altered	**All AMMs apply, as appropriate.**
Cultural resources management **(CA-45)**	• Breeding/foraging/roosting disturbance	**All AMMs apply, as appropriate.**
Oso Flaco Lake boardwalk replacement **(CA-48)**	• Foraging/roosting disturbance	**All AMMs apply, as appropriate.** **AMM 102** As feasible, boardwalk construction activities will be scheduled when CLTE are unlikely to be present (generally mid-September to mid-April). **AMM 103** If boardwalk replacement activities are scheduled when CLTE are known to be present, qualified biologists will monitor construction activities. If CLTE are not foraging nearby or biologists observing CLTE foraging activity

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		determine that CLTE will not be disturbed by the activities, work may proceed as planned. However, if CLTE is present and has the potential to be disturbed, the biologist will continue to direct activities within 250 feet of the CLTE to stop until it leaves on its own accord.
Special projects **(CA-49)**	• Breeding/foraging/roosting disturbance • Breeding habitat reduced by footprint of small project	**All AMMs apply, as appropriate.**
Reduction of the Boneyard and 6 exclosures **(CA-50)**	• Reduction in protected nesting habitat	**All AMMs apply, as appropriate.**
Use of pesticides **(CA-51)**	• Breeding/foraging/roosting disturbance • Exposure from contact with contaminated prey or vegetation • Exposure from contact with residues, inhalation of vapors	**All AMMs apply, as appropriate.** **AMM 104** When pesticide application must occur near CLTE breeding habitat, work will continue to be conducted between October 1 and February 28 to avoid the breeding season. **AMM 105** Pesticides will continue to be applied when wind speeds are below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side. **AMM 106** Pesticide application will continue to be postponed if soil moisture is at field capacity and a storm event, forecasted by the National Oceanic and Atmospheric Administration (NOAA) or National Weather Service (NWS), is to occur within 48 hours following application; or a storm event likely to produce runoff from the treated area is forecasted by NOAA/NWS to occur within 48 hours following the application. **AMM 107** CDPR will continue to ensure that all workers are trained in the safe and effective use of pesticides in sensitive habitats.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 108 CDPR will continue to ensure that trained resource personnel are present at all phases of the work to ensure that pesticide application activities do not result in impacts to covered species. **AMM 109** If pesticides are spilled, they will continue to be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and are familiar with the use of absorbent materials. Spills will continue to be cleaned up according to label instructions, and all equipment used to remove spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements. **AMM 110** Post-treatment, CDPR will continue to initiate monitoring, which typically consists of mapping, photo documentation, regular inspections, and depending on location and species, some formalized monitoring resulting in several years' worth of data and subsequent reporting. **AMM 111** CDPR will continue to take the following steps when using herbicide: ● Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information. ● CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		made without negatively impacting water quality or covered species, then an application will continue to be made. • All herbicide applications will continue to be made according to the product label in accordance with regulations of the EPA, CalEPA, Cal OSHA, DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.
CDPR UAS use for park activities **(CA-52)**	• Breeding/foraging/roosting disturbance	**AMM 112** UAS will be flown with remote control and a built-in screen that shows battery life. The UAS will be equipped with software or other safeguard to ensure it will alert the operator when it reaches a minimum safe amount of battery life required for a return flight. **AMM 113** UAS operators will attend a formal training and be certified as a Pilot in Command prior to conducting solo flights. **AMM 114** UAS operators will have an established flight plan with a specific purpose determined following all Federal Aviation Administration (FAA) regulations. **AMM 115** UAS will be kept in view of the operator at all times. **AMM 116** UAS operators will not conduct flights in the HCP area without approval from the Senior Environmental Scientist. **AMM 117** All flights within 328 feet of CLTE nesting or chick-rearing habitat will require a USFWS-approved monitor to pilot or assist with flight logistics and monitoring, regardless if birds are confirmed in the area prior to flight. **AMM 118** Prior to flying the UAS into or near (within 328 feet of) nesting or chick-rearing areas, the permittee will follow all

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		existing monitoring guidelines that have been established with USFWS. **AMM 119** UAS will not enter or fly within 328 feet of the CLTE nesting areas if the wind speed is above 15 mph or strong enough to move sand (or will be before or after completion of set up and exit from the exclosure), the sand temperature is 83°F, or if it is raining. **AMM 120** UAS flights will be initiated at least 328 feet from the closest known CLTE nest. The take-off and landing area will be clearly marked. If possible, take- off and landing areas will be out of direct sight from known nests. **AMM 121** UAS will only be deployed when a qualified biologist is confident the activity will not jeopardize the safety of CLTE individuals, nests, eggs, and young. **AMM 122** Prior to every UAS flight, a qualified biologist will scan the area for CLTE. If no birds are observed, the UAS flight can commence with monitoring, as appropriate. If a CLTE is observed in the area, it must be monitored by a qualified biologist during the remainder of the flight. If significant disturbance to CLTE is observed, the biologist may recommend increasing the altitude of the drone (but still remain below 400 feet to follow FAA guidelines) and/or guiding the drone to a safer area. **AMM 123** When CLTE are present in the area of interest, the UAS will fly at the highest possible altitude to collect the necessary data. If any CLTE show an inclination to mob, the UAS will be directed upward (but still below the FAA ceiling of 400 feet) and quickly away from the incoming CLTE. Until a qualified biologist deems the UAS is not a threat to their colony the flight will be aborted.

Table 5-3. Avoidance and Minimization Measures for CLTE		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 124 The UAS will be kept at least 100 feet above the ground at all times to reduce disturbance to nesting birds and below 400 feet to follow FAA guidelines. **AMM 125** The flight plan will not include erratic flight patterns that could be interpreted as an avian predator by CLTE.

5.3.1.3 California Red-legged Frog

The majority of AMMs for CRLF are part of ongoing the natural resources management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., Pismo Creek Estuary seasonal bridge, Oso Flaco boardwalk replacement) and the AMMs for these activities are new as well. The table below lists the AMMs to reduce potential effects from covered activities for CRLF. Covered activities that do not have effects on CRLF are not listed in the table.

Table 5-4. Avoidance and Minimization Measures for CRLF

Covered Activity	Potential Effects	Avoidance and Minimization Measures (AMMs)
Park Visitor Activities		
Motorized recreation **(CA-1)**	• Dispersing individuals struck by vehicles	**AMM 1** CDPR will continue to provide educational content on the Oceano Dunes SVRA and Pismo State Beach websites which include life history information and measures being taken to protect all HCP covered species found at the parks. Information can be updated as needed and visitors can find out what the parks are doing and what they can do to protect the covered species. Covered species information will be included as part of ongoing interpretative programs as well. **AMM 2** Posted speed limits will continue to be enforced throughout the HCP area. **AMM 3** CDPR will continue to implement management measures and modify protocols in accordance with ongoing adaptive management and based on recommendations in annual monitoring reports (section 5.6).
Camping **(CA-2)**	• Dispersing individuals exposed to increased predation due to trash	**AMM 4** Trash dumpsters will continue to be provided throughout the HCP area. Trash receptacles are designed to prevent access by potential predators. CDPR will continue to explore options to reduce the movement of trash from the dumpsters and reduce predator presence at the dumpster sites. **AMM 5** All visitors will continue to be informed they are to deposit their trash in dumpsters/ receptacles provided. All campers are offered plastic garbage bags. Maintenance staff will continue to carry trash bags in each vehicle and

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		make them available to visitors for removing trash and litter from visitor use areas. **AMM 6** As staff levels and funding allow, CDPR will continue to manually remove litter and garbage from aquatic areas that could support CRLF. **AMM 7** Qualified CDPR staff and consultants working under CDPR's tidewater goby 10(a)(1)(A) Recovery Permit (or approved by USFWS) will continue to euthanize invasive species (e.g., mosquitofish, largemouth bass, and crayfish) encountered during surveys for tidewater goby. Removing invasive predators from tidewater goby habitat will also benefit CRLF. Tidewater goby and CRLF habitats overlap in Arroyo Grande Creek. **AMM 8** CDPR will continue to monitor populations of invasive predators during fisheries surveys and CRLF surveys. If removing invasive predators incidentally during fisheries surveys does not sufficiently control these species, then additional removals may be deemed necessary. **AMM 9** If staff biologists encounter invasive predator species during activities, those species will continue to be removed by qualified biologists at that time.
Pedestrian activities **(CA-3)**	• Individuals exposed to increased turbidity	**AMM 10** CDPR will continue to monitor the Carpenter Creek and Pismo Creek pedestrian crossings for CRLF. If CRLF are observed in or near locations where pedestrians are known to cross and deemed vulnerable to pedestrian activity as determined by a CDPR Environmental Scientist, CDPR will continue to post signs closing crossings and/or encourage use of other paths in the HCP area, depending on the intensity of disturbance.
Equestrian recreation **(CA-7)**	• Individuals exposed to increased turbidity	**All AMMs apply, as appropriate.**

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Holidays **(CA-10)**	• Effects for all covered activities on holidays are not expected to be different from those on non-holidays	**All AMMs apply, as appropriate.**
Special events **(CA-11)**	• Effects based on the specific event activity(ies) permitted, but similar to motorized recreation (CA-1), camping (CA-2), and pedestrian activities (CA-3)	**All AMMs apply, as appropriate.** **AMM 11** All permits authorizing special events will continue to include AMMs to reduce disturbance to CRLF. Specific AMM recommendations will be based on past experience and dependent on the event location, timing, and potential to impact covered species.
Natural Resources Management		
Tidewater goby and salmonid surveys **(CA-13)**	• Individuals disturbed/injured/captured • Egg masses damaged	**AMM 12** A visual survey for CRLF and CRLF egg masses will continue to be conducted prior to sampling in areas where CRLF may be present. If CRLF are present, surveys will continue to be postponed until the CRLF has left the area or appropriate AMMs are in place. If egg masses are present, sampling will continue to be postponed until the eggs have hatched or the survey will continue to be conducted to avoid all egg masses. **AMM 13** If CRLF are incidentally captured during surveys, they will continue to be checked for injury and released immediately at the capture site. This information will continue to be included in the annual report to USFWS. A CNDDB form will also continue to be completed for any CRLF observations. **AMM 14** If CRLF are injured or killed during surveys, it will be reported to the USFWS as part of the annual report (section 5.7).

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
	• Individuals exposed to increased risk of disease	**AMM 15** Surveyors will continue to follow the USFWS Recommended Equipment Decontamination Procedures, which provides guidance for disinfecting equipment and clothing after entering a pond and before entering an aquatic resource.
CRLF surveys and associated management **(CA-14)**	• Individuals disturbed/injured/captured • Egg masses damaged • Individuals exposed to increase risk of spread of disease	**AMM 16** A USFWS-approved biologist will continue to conduct CRLF surveys in accordance with the USFWS Revised Guidance on Site Assessments and Field Surveys for the CRLF. **AMM 17** CDPR will continue to eradicate or reduce the cover, biomass, and distribution of non-native invasive plants to enhance CRLF habitat. Routine vegetation management will continue to occur at Oso Flaco area, Oceano (Meadow Creek) Lagoon and Lagoon Trail, Meadow Creek, and Pismo Lake spillway. Other areas where vegetation management may occur include Arroyo Grande Creek and Lagoon and dune lakes and wetlands. Vegetation management also includes removal of emergent vegetation and debris, as necessary to improve potential CRLF habitat.
Listed plant mgmt. activities **(CA-15)**	• Individuals exposed to increased turbidity	**AMM 18** Any time a work activity will need to be conducted on the bed, banks, or channel of an aquatic habitat with the potential to support CRLF, appropriate steps will continue to be taken to minimize turbidity from activities. If possible, activities will continue to be conducted from outside the wetted area or from stream banks or other upland areas. If activity is necessary in wetted areas, work will continue to be limited to the maximum necessary to achieve desired outcome and care will be taken to reduce turbidity, especially during critical periods like when egg masses are present or tadpoles are present in the water.

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
	• Individuals and/or egg masses disturbed	**AMM 19** Depending on the type of activity (e.g., ground disturbance), immediately prior to the start of listed plant management activities near potentially occupied CRLF habitat, a qualified biologist will continue to conduct surveys for CRLF up to 100 feet outside the project boundaries. **AMM 20** If a CRLF is found within 100 feet of plant management activities in CRLF habitat, activities will continue to be delayed until the individual has moved from the area on its own accord or until appropriate AMMs are in place. AMMs can include such measures as relocation, exclusion fencing, and/or biological monitoring during activities.
Invasive plant and animal control **(CA-17)**	• Individuals exposed to increased turbidity	**All AMMs apply, as appropriate**
	• Individuals and or egg masses disturbed/injured/captured	**All AMMs apply, as appropriate.**
	• Individuals benefited by decreased predation risk	**AMM 21** CDPR will continue to discourage the release of mosquitofish into any known or potential CRLF breeding habitat.
Water quality monitoring projects **(CA-19)**	• Individuals exposed to increased turbidity • Individuals and/or egg masses disturbed	**All AMMs apply, as appropriate.**
Park Maintenance		
Campground maintenance **(CA-20)**	• Dispersing individuals crushed/injured	**All AMMs apply, as appropriate.** **AMM 22** Where appropriate and necessary, before any activities occur, a qualified biologist will continue to conduct a training session for all maintenance personnel. The

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		training, at a minimum, covers CRLF life history and work constraints. **AMM 23** Non-emergency activities with potential to crush CRLF will continue to be suspended during heavy precipitation events (i.e., at least 0.5 inch of precipitation in a 24-hour period) near potentially occupied CRLF habitat.
Routine riparian maintenance **(CA-26)**	• Individuals and egg masses crushed/injured/disturbed	**AMM 24** Culvert maintenance will continue to be conducted during periods when egg masses or larvae are unlikely to occur in the project area (e.g., low flow period), to the extent feasible. **AMM 25** A USFWS-approved biologist will continue to conduct focused surveys of the work sites no more than 2 weeks before the onset of activities associated with projects within suitable habitat for CRLF (e.g., culvert maintenance). If CRLF adults, tadpoles, or eggs are found, work will not commence until AMMs are in place. If any CRLF are found, a CNDDB report will continue to be submitted **AMM 26** A USFWS-approved CRLF monitor will continue to be on site during maintenance associated with projects within suitable habitat for CRLF (e.g., culvert maintenance). If CRLF is detected within the project area, work will continue to stop until the animal is no longer present or until appropriate AMMs are in place. AMMS can include such measures as relocation, exclusion fencing with additional monitoring to prevent take along fenceline, and/or biological monitoring during maintenance activities. **AMM 27** CRLF life-stages found in the work area will be relocated upon determination by the USFWS-approved biologist that an appropriate relocation site exists and relocation is the preferred avoidance method. The biologist will be allowed sufficient time to move CRLF from the work site

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		before activities begin. Only USFWS-approved biologists will participate in activities associated with capturing, handling, and monitoring CRLF. The biologists will follow safe-handling practices as outlined in the Declining Amphibians Population Task Force Code of Practice (Appendix J). **AMM 28** Heavy equipment will continue to not be placed in the water body during operation of any culvert maintenance. Back-hoe work will continue to be restricted to the roadside or upper bank and only the bucket is placed in the water body. **AMM 29** CDPR staff will continue to limit the amount of disturbance to vegetation, banks, and streambed. Work and entrance into the work area will continue to be restricted to established areas. **AMM 30** All refueling, maintenance, and staging of equipment and vehicles will continue to occur at least 60 feet from riparian habitat or water bodies in a location where a spill will not drain directly toward aquatic habitat. **AMM 31** All vehicles and equipment will continue to be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. Prior to the start of maintenance activities, all equipment will continue to be inspected for leaks. **AMM 32** A spill plan will continue to be in place for prompt and effective response to an accidental spill. The spill plan will continue to include, at a minimum, immediately notifying the biologist of any hazardous spills and immediately cleaning up spills. All Park staff will continue to be informed of the importance of preventing spills and appropriate measures to take when a spill happens.

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 33 All equipment and vehicles under-carriages will continue to be inspected periodically. Equipment that has been parked for more than 15 minutes near potentially occupied CRLF habitat will continue to be re-inspected prior to moving.
	• Individuals exposed to increased predation	**All AMMs apply, as appropriate.** **AMM 34** After removal of emergent vegetation in the stream channel, disturbed areas with the potential to pond water will continue to be smoothed with a rake to avoid creation of potential habitat for CRLF predators, including bull frogs and crayfish.
	• Individuals exposed to increased turbidity	**All AMMs apply, as appropriate.**
	• Individuals exposed to increase risk of spread of disease	**All AMMs apply, as appropriate.**
	• Temporary disturbance of approximately 0.3 acre of wetlands	**All AMMs apply, as appropriate.**
Boardwalk and other pedestrian access maintenance **(CA-31)**	• Individuals disturbed	**All AMMs apply, as appropriate.** **AMM 35** Crews will continue to use hand tools to trim all vegetation.
Visitor Services		
Emergency response **(CA-33)**	• Individuals struck by vehicles • Breeding and/or dispersal habitat damaged • Individuals exposed to increased turbidity	**All AMMs apply, as feasible and appropriate.**
Pismo Beach Golf Course operations **(CA-37)**	• Dispersing individuals injured/crushed	**All AMMs apply, as appropriate.**

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Other HCP Covered Activities		
Motorized vehicle crossing of Creek **(CA-40)**	• Individuals struck by vehicles • Individuals disturbed • Individuals exposed to increased turbidity	**All AMMs apply, as appropriate.** **AMM 36** During times when there is ponded water at either Pismo Creek or Carpenter Creek estuaries, staff will continue to periodically review conditions and identify any issues that may result from vehicle crossings in this area. If, in the opinion of approved biologists, a vehicle crossing would present a threat to any life stages of CRLF, staff will continue to close this access until conditions have changed.
Dust control activities **(CA-44)**	• Aestivating and/or dispersing individuals crushed/injured/disturbed	**All AMMs apply, as appropriate.**
Cultural resources management **(CA-45)**	• Aestivating and/or dispersing individuals crushed/injured/disturbed	**All AMMs apply, as appropriate.** **AMM 37** Should an aestivating CRLF be found during excavation associated with cultural resource activities, all work will stop and will not begin again until the frog is no longer present. If activities need to proceed, the USFWS will be contacted and consulted on appropriate AMMs. AMMS can include such measures as relocation, exclusion fencing, and/or biological monitoring during activities.
CDPR management of agricultural lands (**CA-46**)	• Aestivating and/or dispersing individuals crushed/injured/disturbed	**All AMMs apply, as appropriate.**
Oso Flaco Lake boardwalk replacement **(CA-48)**	• Same as riparian maintenance activities • Potential loss of aquatic habitat	**All AMMs apply, as appropriate.** **AMM 38** Boardwalk replacement will be constructed during a period when egg masses are unlikely to occur in the project area. A USFWS-approved biologist will survey the work site 2 weeks before the onset of activities. If CRLF

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		adults, tadpoles, or eggs are found, work will not commence until avoidance measures are in place. **AMM 39** Any CRLF life-stages found in the project work area may be relocated upon determination by the USFWS-approved biologist that an appropriate relocation site exists and relocation is the preferred avoidance method. The approved biologist will be allowed sufficient time to move CRLF from the work site before work activities begin. Only USFWS-approved biologists will participate in activities associated with the capture, handling, and monitoring of CRLF. **AMM 40** Before any project activities occur, a USFWS-approved biologist will conduct a training session for all construction personnel. At a minimum, the training will include a description of the CRLF and its habitat, the importance of the CRLF and its habitat, the general measures that are being implemented to conserve the CRLF as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books, and briefings may be used in the training session, provided a qualified person is on hand to answer any questions. **AMM 41** A USFWS-approved biologist will be present at the work site until the removal of all CRLF, instruction of workers, and habitat disturbance have been completed. After this time, the contractor or permittee will designate a person to monitor on-site compliance with all minimization measures. The USFWS-approved biologist will ensure that this individual receives training outlined in AMM 34 and in the identification of CRLF. The monitor and the USFWS-approved biologist will have the authority to halt any action that might result in impacts that exceed the levels anticipated by the USFWS.

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Special projects **(CA-49)**	• Individuals exposed to increased turbidity • Water quality decreased • Permanent and/or temporary loss of upland habitat • Individuals crushed/injured	**All AMMs apply, as appropriate.**
Use of pesticides **(CA-51)**	• Disturbance of habitat • Exposure from contact with contaminated prey or vegetation • Exposure from contact with residues, inhalation of vapors	**All AMMs apply, as appropriate.** **AMM 42** When pesticide application must occur near CRLF breeding habitat, a qualified biologist will continue to conduct a survey for CRLF 24 hours prior to the application and will continue to instruct the work crew on their identification and biology. If CRLF is observed, all work will continue to cease immediately until the CDPR biologist arrives and assesses the situation to determine if the work can proceed. **AMM 43** Pesticides will continue to be applied at wind speeds below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side. **AMM 44** Pesticide application will be postponed if soil moisture is at field capacity and a storm event, forecasted by the National Oceanic and Atmospheric Administration (NOAA) or National Weather Service (NWS), is to occur within 48 hours following application; or a storm event likely to produce runoff from the treated area is forecasted by NOAA/NWS to occur within 48 hours following the application. **AMM 45** CDPR will continue to ensure that all workers are trained in the safe and effective use of pesticides in sensitive habitats. **AMM 46** CDPR will continue to ensure that trained resource personnel are present at all phases of the work to ensure

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		that pesticide application activities do not result in impacts to covered species. **AMM 47** If pesticides are spilled, they will continue to be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and are familiar with the use of absorbent materials. Spills will continue to be cleaned according to label instructions, and all equipment used to remove spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements. **AMM 48** Post-treatment, CDPR will continue to initiate monitoring, which typically consists of mapping, photo documentation, regular inspections, and depending on location and species, some formalized monitoring resulting in several years' worth of data and subsequent reporting. **AMM 49** CDPR will continue to take the following steps when using herbicides: • Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information. • CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or

Table 5-4. Avoidance and Minimization Measures for CRLF		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		covered species, then an application will continue to be made • All herbicide applications will continue to be made according to the product label in accordance with regulations of the EPA, CalEPA, Cal OSHA, DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.

5.3.1.4 Tidewater Goby

The majority of AMMs for tidewater goby are part of ongoing the natural resources management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., Pismo Creek Estuary seasonal bridge), and the AMMs for these activities are new as well. The table below lists the AMMs to reduce potential effects from covered activities for tidewater gobies. Covered activities that do not have effects on tidewater gobies are not listed in the table.

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby

Covered Activity	Potential Effects	Avoidance and Minimization Measures (AMMs)
Park Visitor Activities		
Motorized recreation **(CA-1)**	• Individuals disturbed/crushed/injured	**AMM 1** CDPR will continue to provide educational content on the Oceano Dunes SVRA and Pismo State Beach websites which include life history information and measures being taken to protect all HCP covered species found at the parks. Information is updated as needed and visitors can find out what the parks are doing and what they can do to protect the covered species. Covered species information will continue to be included as part of ongoing interpretative programs as well. **AMM 2** The Arroyo Grande Creek Lagoon and areas west of the lagoon where waters have pooled will continue to be posted closed to motor vehicle access. **AMM 3** Pursuant to Superintendent's Order, visitors will continue to be prohibited from crossing Arroyo Grande Creek in any other manner than by crossing the creek as close to the ocean waterline as possible and parallel to the ocean waterline. Driving upstream or downstream in the creek channel or in any other manner in the creek channel will continue to be prohibited. **AMM 4** Crossing of Arroyo Grande Creek by motor vehicles will continue to be regulated by park Visitor Services and Ranger staff daily during periods of high stream flow and during periods of high stream flow in combination with high tides. Creek crossings may be restricted or closed at

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		any time, depending on these conditions. Rangers will continue to take enforcement action, where appropriate. **AMM 5** Specific guidelines for closure of Arroyo Grande Creek to vehicular crossings by the public will continue to be implemented. **AMM 6** As necessary, after major flows or other natural events that change the physical habitat characteristics of the lagoons, CDPR staff will continue to realign the area closed to motor vehicles to prevent vehicle access into areas that could support tidewater goby.
Pedestrian activities **(CA-3)**	• Individuals disturbed • Burrows collapsed • Individuals exposed to increased turbidity • Individuals exposed to increased predation • Foraging activities and reproductive success reduced	**AMM 7** The ponded areas of Arroyo Grande Creek will continue to be closed to the public. **AMM 8** CDPR will continue to monitor the Carpenter Creek and Pismo Creek crossings for tidewater goby. If tidewater gobies are observed in or near locations where pedestrians are known to cross, CDPR will continue to post signs closing these areas to pedestrians and encourage use of other paths in the HCP area. **AMM 9** CDPR will continue to pursue installing the seasonal floating bridge (CA-41) across the Pismo Creek estuary if it is found to be beneficial and feasible.
Dog walking **(CA-6)**	• Individuals disturbed • Individuals exposed to increased turbidity • Water quality decreased by depositing waste and/or trampling vegetation • Individuals exposed to increased predation • Foraging activities and reproductive success reduced	**All AMMs apply, as appropriate.** **AMM 10** Dogs will continue to be required to be on a leash no longer than 6 feet at all times and within complete control of its owner within the HCP area. **AMM 11** Waste bags will continue to be provided in the HCP area to encourage pet owners to pick up dog waste. **AMM 12** CDPR will continue to manually remove litter and garbage from tidewater goby habitat.

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Equestrian recreation **(CA-7)**	• Individuals disturbed/injured • Burrows collapsed • Individuals exposed to increased turbidity • Water quality decreased due to depositing waste and/or trampling vegetation • Foraging activities and reproductive success reduced	**All AMMs apply, as appropriate.**
Holidays **(CA-10)**	• Effects for all covered activities on holidays are not expected to be different from those on non-holidays	**All AMMs apply, as appropriate.** **AMM 13** During anticipated high visitor use periods as determined by historic visitor-attendance records (e.g., Memorial Day Weekend, July 4 Weekend, Labor Day Weekend) monitoring and law enforcement staff will continue to provide frequent observations of the vehicle/pedestrian crossing areas at Arroyo Grande Creek, Carpenter Creek, and Pismo Creek.
Special events **(CA-11)**	• Effects based on the specific event activity(ies) permitted	**All AMMs apply, as applicable** **AMM 14** All permits authorizing special events will continue to include AMMs to reduce disturbance to tidewater goby. Specific AMM recommendations will be based on past experience and dependent on the event location, timing, and potential to impact covered species.
Natural Resources Management		
Tidewater goby and salmonid surveys **(CA-13)**	• Individuals exposed to increased turbidity • Individuals and egg burrows disturbed • Individuals captured/injured/killed	**AMM 15** A USFWS- and/or NOAA Fisheries-approved biologist will continue to conduct the surveys. **AMM 16** Surveys will continue to be conducted in accordance with the survey guidelines in Appendix F of the tidewater goby recovery plan for the species (USFWS 2005) or in accordance with any subsequent revisions the USFWS or NOAA may develop during the permit term. **AMM 17** The USFWS- and/or NOAA Fisheries-approved biologist will continue to use minnow traps, dipnets, seine nets,

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		and hoop nests that do not have woven mesh larger than 2 to 4 millimeters in width. **AMM 18** Disturbance and damage to burrows, eggs, and young will continue to be minimized through the use of the smallest seines and lightest seine weights practicable. **AMM 19** Any tidewater gobies exhibiting signs of stress will continue to be immediately released at the capture location. **AMM 20** Dipnetting and seining will continue to be limited to no more than 40 percent of the project area, excluding stream channels, unless the surveys are to be conducted during the breeding season (generally April through mid-June). Seining during the breeding season will continue to be limited to affect no more than 20 percent of the habitat. **AMM 21** Prior to activities that may involve handling tidewater gobies, the surveyor will continue to ensure that hands are free of sunscreens, lotion, nicotine, and insect repellent. **AMM 22** No electrofishing will continue to occur in tidewater goby habitat. If electrofishing is authorized for salmonid surveys, and tidewater gobies are subsequently found in an area they were previously not known to occur, electrofishing will continue to cease immediately. **AMM 23** To prevent the introduction of new invasive animal and plant species, all CDPR staff and/or contractors will continue to be required to ensure that work boots, vehicles, and equipment that will enter the water have been cleaned. See CRLF AMM 11. **AMM 24** CDPR will continue to conduct fishery monitoring surveys to follow, document, and report on the likely future recolonization of restored wetted areas by several aquatic species, including tidewater goby. This information will

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		continue to be provided to resource agencies and used to contribute to the recovery of tidewater goby. **AMM 25** Qualified CDPR staff and consultants working under CDPR's tidewater goby 10(a)(1)(A) Recovery Permit (or approved by USFWS) will continue to euthanize invasive species (e.g., mosquitofish, largemouth bass, and crayfish) encountered during surveys for tidewater goby. **AMM 26** If staff biologists encounter non-native predator species during activities, those species will continue to be removed by qualified biologists at that time.
CRLF surveys **(CA-14)**	• Egg burrows disturbed • Individuals captured/injured/killed • Individuals exposed to increased turbidity	**All AMMs apply, as appropriate.** **AMM 27** When possible and appropriate, eyeshine surveys for CRLF will continue to be conducted to minimize disturbance to tidewater gobies and tidewater goby habitat. **AMM 28** CRLF dipnet surveys, if conducted in the HCP area, will be conducted in a manner that minimizes disturbance to aquatic habitat that could overlap with tidewater goby habitat.
Invasive plant and animal control **(CA-17)**	• Individuals exposed to increased turbidity • Individuals disturbed/injured	**All AMMs apply, as appropriate.** **AMM 29** To prevent erosion and sedimentation, vegetation removal and bank disturbance will continue to be kept to the minimum amount necessary to complete the task. **AMM 30** Activities within tidewater goby habitat will continue to be avoided, if possible, or kept to a minimum. If activities require that personnel work in the water, only one person will enter the water while the remaining personnel conduct work from land. **AMM 31** Precautions will continue to be taken to avoid damage to non-target vegetation.

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Water quality monitoring projects **(CA-19)**	• Individuals exposed to increased turbidity • Individuals disturbed/injured	**All AMMs apply, as appropriate.** **AMM 32** CDPR will continue to work with public agencies, landowners, and stakeholders to secure a sustained water inflow into the estuary, focused on sustainable groundwater use and maintenance of instream flows in the lower mile of Arroyo Grande Creek. **AMM 33** CDPR will continue to work with the County on their operations and maintenance of the Sand Canyon Flapgate to minimize impacts to goby from sediment, invasive aquatic species, and other similar threats.
Park Maintenance		
Routine riparian maintenance **(CA-26)**	• Individuals exposed to increased turbidity • Individuals/egg burrows disturbed	**All AMMs apply, as appropriate.** **AMM 34** Prior to the onset of activities that could affect tidewater goby habitat, qualified biologists will continue to conduct a training session for all personnel. At a minimum, the training will include a description of tidewater goby and its habitat and AMMs that should be implemented. The training session will be repeated for any new personnel at the work site. **AMM 35** If activities are proposed near occupied tidewater goby habitat, as feasible, CDPR staff will continue to limit project activities in the channel and along stream banks to the drier period of the year (generally May 1 to December 1) or when the stream is not actively flowing, or at its lowest flow, and when there is no measurable rain forecasted within 48 hours of work activities. **AMM 36** If work near occupied tidewater goby habitat is proposed, non-erodible filter screens will continue to be placed at the inlet and outflow of the culvert and filter screens and/or

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		wattles will continue to be placed around the work area during activities to minimize sediment from entering the water. **AMM 37** Activities and entrance into the work area will continue to be restricted to established areas. **AMM 38** A USFWS-approved biologist will continue to conduct a pre-activity survey for tidewater goby in occupied tidewater goby habitat prior to commencing activities. If tidewater goby is observed in the work area or water is present in the work area and it cannot be determined if tidewater goby is present, the Environmental Scientist will continue to determine the appropriate measures taken to protect the tidewater goby population. These measures could include, but are not limited to, establishing fencing or otherwise demarcating a barrier between the work site and the tidewater goby population and/or relocation by a USFWS-approved biologist. **AMM 39** Heavy equipment will not be placed in the water body during operation of any culvert maintenance. Back-hoe work will continue to be restricted to the roadside or upper bank and only the bucket will be placed in the water body. **AMM 40** All refueling, maintenance, and staging of equipment and vehicles will continue to occur at least 60 feet from riparian habitat or water bodies in a location where a spill will not drain directly toward aquatic habitat. **AMM 41** Appropriate spill containment and clean-up materials will continue to be stored on site during activities. A spill plan will continue to be in place for prompt and effective response to an accidental spill. All Park staff will continue to be informed of the importance of preventing spills and appropriate measures to take when a spill happens.

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Minor grading (less than 50 cubic yards) **(CA-30)**	• Individuals exposed to increased turbidity • Individuals disturbed/crushed/injured	**All AMMs apply, as appropriate.** **AMM 42** Heavy equipment will continue to not be placed in the water body during operation of any minor grading.
Visitor Services		
Ranger, lifeguard, and park aide patrols **(CA-32)**	• Individuals disturbed/crushed/injured • Water quality decreased	**All AMMs apply, as appropriate.**
Emergency response **(CA-33)**	• Habitat damaged • Individuals exposed to increased turbidity	**All AMMs apply, as feasible and applicable.**
Motorized vehicle crossing of Pismo/Carpenter and Arroyo Grande creeks **(CA-40)**	• Individuals disturbed/crushed/injured • Water quality decreased	**All AMMs apply, as appropriate.** **AMM 43** During times when there is ponded water at either Pismo Creek or Carpenter Creek estuaries, staff will continue to periodically review conditions and identify any issues that may result from vehicle crossings in this area. If, in the opinion of approved biologists, a vehicle crossing would present a threat to any life stages of tidewater goby, staff will continue to close this access until conditions have improved. **AMM 44** CDPR staff that may drive through these crossings will continue to receive training regarding tidewater goby. The training will continue to include a description of tidewater goby and its habitat and AMMs that continue to be implemented.

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Pismo Creek estuary seasonal (floating) bridge **(CA-41)**	• Individuals disturbed	**AMM 45** To allow movement of all fish species as well as an exchange of fresh and saltwater, the interlocking pieces of the bridge will be constructed to create wide openings under the bridge. Openings will be designed as wide as possible while maintaining structural integrity to ensure water flow even when the bridge sits on the bed of the estuary during low flows. **AMM 46** If water levels are so low that the bridge is not allowing the free movement of fish in the estuary, the bridge will be removed until there is sufficient water to allow the bridge to float.
Use of pesticides **(CA-51)**	• Habitat disturbance • Exposure from contact with contaminated prey or vegetation • Exposure from contact with residues, inhalation of vapors	**All AMMs apply, as appropriate.** **AMM 47** When pesticide application must occur near tidewater goby habitat, a qualified biologist will continue to conduct a survey for tidewater goby 24 hours prior to the application and will continue to instruct the work crew on their identification and biology. If tidewater goby is observed, all work will continue to cease immediately until the CDPR biologist arrives and assesses the situation to determine if the work can proceed. **AMM 48** Herbicides used in tidewater goby habitat will continue to be limited to those designed for aquatic applications as specified in the APAP, and will continue to be applied directly to Elymus, Ammophila and Arundo on a low or receding tide when water is not present, so residual amounts that may reach the water on the returning tide are small and rapidly diluted. **AMM 49** Pesticides will continue to be applied at wind speeds below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side.

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 50 Pesticide application will continue to be postponed if soil moisture is at field capacity and a storm event, forecasted by the National Oceanic and Atmospheric Administration (NOAA) or National Weather Service (NWS), is to occur within 48 hours following application; or a storm event likely to produce runoff from the treated area is forecasted by NOAA/NWS to occur within 48 hours following the application. **AMM 51** CDPR will continue to ensure that all workers are trained in the safe and effective use of herbicides in sensitive habitats. **AMM 52** CDPR will continue to ensure that trained resource personnel are present at all phases of the work to ensure that herbicide application activities do not result in impacts to covered species. **AMM 53** If pesticides are spilled, they will be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and will be familiar with the use of absorbent materials. Spills will be cleaned up according to label instructions, and all equipment used to remove spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements. **AMM 54** Post-treatment, CDPR will continue to initiate monitoring, which typically consists of mapping, photo documentation, regular inspections, and depending on location and species, some formalized monitoring resulting in several years' worth of data and subsequent reporting.

Table 5-5. Avoidance and Minimization Measures for Tidewater Goby		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 55 CDPR will continue to take the following steps when using herbicide: ● Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information. ● CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or covered species, then an application will continue to be made. ● All herbicide applications will continue to be made according to the product label in accordance with regulations of the EPA, CalEPA, Cal OSHA, DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.

5.3.1.5 Listed Plants

The majority of AMMs for listed plants are part of ongoing the natural resources management program in the HCP area. Almost all AMMs have previously been implemented, although some activities are new (e.g., riding in 40 Acres) and the AMMs for these activities are new as well. The table below lists the AMMs to reduce potential effects from covered activities on La Graciosa thistle, surf thistle, beach spectaclepod, Nipomo mesa lupine, marsh sandwort, and Gambel's watercress. Covered actions that do not have effects on these plants are not listed in the table. Potential effects listed are relevant to all listed plant species unless otherwise specified.

Table 5-6. Avoidance and Minimization Measures for Plants

Covered Activity	Potential Effects	Avoidance and Minimization Measures (AMMs)
Park Visitor Activities		
Pedestrian activities **(CA-3)**	• Beach spectaclepod, surf thistle, and La Graciosa thistle trampled	**AMM 1** CDPR will continue to provide educational content on the Oceano Dunes SVRA and Pismo State Beach websites including life history information and measures being taken to protect all HCP covered species found at the parks. Information can be updated as needed and visitors can find out what the parks are doing and what they can do to protect the covered species. Covered species information will continue to be included as part of ongoing interpretative programs as well. **AMM 2** In areas where the public is allowed in occupied habitat, plants will continue to be fenced to deter pedestrians from entering the sensitive areas. If a population is found where there is heavy public activity like the Dune Preserve or Grand Dunes areas, fencing and signage will continue to be installed. **AMM 3** Informal trails in and adjacent to listed plant species habitats will continue to be closed and restored to original conditions. **AMM 4** Habitat restoration will continue to be conducted to benefit beach spectaclepod, surf thistle, and La Graciosa thistle. **AMM 5** A program of selective propagation of specific listed plant species to augment existing populations and adjacent unoccupied habitats will be developed if monitoring shows

Table 5-6. Avoidance and Minimization Measures for Plants		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		CDPR or public activities negatively impacting individuals or populations. **AMM 6** CDPR will continue to implement management measures and modify protocols in accordance with ongoing adaptive management and based on recommendations in annual monitoring reports (section 5.6).
Natural Resources Management		
Listed plant mgmt. activities **(CA-15)**	• Plants trampled/crushed	**AMM 7** Staff with specific training in the identification of listed plant species will continue to survey areas with known populations. Surveys will continue to be conducted annually or as necessary based on the level of management needed. **AMM 8** Prior to the onset of activities that could affect listed plant habitat, a qualified biologist will continue to conduct a training session for all personnel. At a minimum, the training will continue to include a description of relevant plants and their habitat and AMMs that should be implemented. The training session will continue to be repeated for any new personnel. **AMM 9** Staff will continue to be urged to limit time in occupied habitat to reduce the potential for trampling listed plants. CDPR staff will continue to limit the amount of disturbance to vegetation to the minimum necessary to complete the project. Work and entrance into the work area will continue to be restricted to established areas. **AMM 10** Water quality monitoring and improvement projects will continue to be conducted to benefit marsh sandwort and Gambel's watercress.

Table 5-6. Avoidance and Minimization Measures for Plants		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
	• Plants burned during prescribed fire activities for listed species management	**All AMMs apply, as appropriate.** **AMM 11** Prior to initiating a prescribed burn, populations of listed plant species will continue to be clearly marked on the ground, and non-native vegetation will be pulled by hand to establish a fire line of mineral soil around all known populations of listed plant species. The fire line will continue to be the minimum necessary to protect known listed plant populations. **AMM 12** Fire personnel, pesticide applicators, and restoration crews will continue to receive training prior to construction activities. The training will continue to include information regarding identification of listed plant species, the life history of listed species, instructions to avoid damage to listed species, and the need to remain out of the restricted areas and within the work areas and access routes. **AMM 13** Heavy equipment, including fire engines and pumper trucks, will continue to be located outside of sensitive habitat. Locations for the placement and staging of heavy equipment are always clearly marked on a map, as well as on the ground. **AMM 14** A trained botanist will continue to be present during fire activities. The monitor will have the authority and responsibility to stop work if unanticipated damage to listed plant species occurs.

Invasive plant and animal control **(CA-17)**	• Plants trampled/crushed • Plants burned during prescribed fire activities during non-listed species management • Plants sprayed during herbicide application	**All AMMs apply, as appropriate.** **AMM 15** Prior to conducting treatment, the project area will continue to be surveyed by a trained botanist for listed plant species. Every effort will be made to locate populations of listed plant species, identify their location on a map, and clearly mark their locations on the ground before work crews and equipment are allowed in the treatment area. **AMM 16** Only workers with specific training in the identification of listed plant species will continue to work in areas with known populations. **AMM 17** If listed species are found within 100 feet of surface-disturbing activities, they will continue to be avoided by a marked and/or fenced buffer of 25 feet within the project area or other distance as identified by the qualified botanist. Fencing and/or flagging will be removed at the completion of activities. **AMM 18** If plants are found during pre-activity surveys and cannot be avoided, plants will continue to be salvaged and relocated. **AMM 19** Non-native vegetation will continue to be cleared by hand and/or with herbicide, using experienced herbicide applicators, within and near listed plant populations. Herbicide application will typically be used sparingly and will be done under the close supervision of an experienced botanist. **AMM 20** Attention will be given to access corridors, treatment sites that include on-the-ground activities, and previously known populations of listed plants. **AMM 21** Trained resource personnel will continue to be present at all phases of the work to ensure that activities will not result in damage to listed species. **AMM 22** Records will continue to be kept of all invasive plant and animal control management activities. These records will continue to include an assessment of the target invasive

Table 5-6. Avoidance and Minimization Measures for Plants		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		plant population, treatment employed, location of area treated, supervisor of treatment, date of treatment, amount of pesticides used and weather condition during treatment.
Park Maintenance		
Routine riparian maintenance **(CA-26)**	• La Graciosa thistle, Gambel's watercress, and marsh sandwort damaged	**All AMMs apply, as appropriate.** **AMM 23** When necessary and appropriate, a qualified botanist will continue to conduct pre-activity surveys to confirm absence of marsh sandwort, La Graciosa thistle, and Gambel's watercress prior to commencing ground-disturbing activities in potential habitat areas. If the plants are found during pre-activity surveys, including any Gambel's watercress hybrids, the botanist will flag the area inform all workers of the need to stay out of flagged area.
Heavy equipment response in all areas of SVRA of Oceano Dunes District **(CA-29)**	• Plants trampled/crushed	**All AMMs apply, as appropriate.**
Minor grading (less than 50 cubic yards) **(CA-30)**	• Plants trampled/crushed	**All AMMs apply, as appropriate.**
Boardwalk and other pedestrian access maintenance **(CA-31)**	• Plants trampled/crushed • Plants uprooted/removed • Temporary loss of habitat	**All AMMs apply, as appropriate.**

Table 5-6. Avoidance and Minimization Measures for Plants		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
Visitor Services		
Emergency response **(CA-33)**	• Plants trampled/crushed	**All AMMs apply, as appropriate.**
Other HCP Covered Activities		
Riding in 40 Acres **(CA-42)**	• Loss or degradation of potentially suitable habitat	**All AMMs apply, as appropriate.** **AMM 24** All trails and other areas open to vehicles will be sited with adequate buffers from any occurrences of listed plants.
Cultural resources management **(CA-45)**	• Plants uprooted/damaged/removed	**All AMMs apply, as appropriate.** **AMM 25** Plant populations will continue to be restored if a cultural resource project disturbs or destroys a plant population.
Special projects **(CA-49)**	• Permanent and/or temporary loss of potentially suitable habitat	**All AMMs apply, as appropriate.**
Use of pesticides **(CA-51)**	• Habitat disturbance • Exposure to contaminated water and residues • Direct exposure to chemicals	**All AMMs apply, as appropriate.** **AMM 26** CDPR will continue to ensure that formal surveys are conducted for the covered plant species prior to work commencing on the project site. Surveys will continue to be conducted by trained botanists and field assistants. Since population numbers are relatively low, surveys focus on determining the location, distribution, and abundance of covered species. CDPR will continue to ensure that all covered species locations are flagged to alert workers of their presence. Authorized staging areas and access routes will continue to be flagged. All equipment and labor crews will continue to remain in staging areas staging areas or on the designated access

Table 5-6. Avoidance and Minimization Measures for Plants		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		routes to reduce the potential for impacts to covered plant species and their habitat. **AMM 27** After treatments are initiated, additional surveys will continue to be conducted to identify new populations of covered plants. Regular monitoring of the treatment area will continue to determine the effects of the treatments on the existing populations and their habitat. **AMM 28** Pesticides will continue to be applied at wind speeds below 10 mph at the perimeter of the application site as measured by an anemometer on the upwind side. **AMM 29** Pesticide application will continue to be postponed if soil moisture is at field capacity and a storm event, forecasted by the National Oceanic and Atmospheric Administration (NOAA) or National Weather Service (NWS), is to occur within 48 hours following application; or a storm event likely to produce runoff from the treated area is forecasted by NOAA/NWS to occur within 48 hours following the application. **AMM 30** CDPR will continue to avoid occupied covered plant habitat, as feasible. If covered plant habitat must be impacted, CDPR will continue to establish a buffer zone of no less than 15 feet (but typically 25 feet) around individual covered plant species identified during surveys, as feasible. Only hand-weeding will continue to be permitted in these buffer zones. If a buffer cannot be implemented, CDPR will continue to take appropriate precautions, as determined by the Senior Environmental Scientist. Precautions can include timing the herbicide activities so that they occur prior to the covered plant blooming period, using a monocot focused herbicide, and/or having an experienced herbicide applicator

Table 5-6. Avoidance and Minimization Measures for Plants		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		conduct the activities under the direction of a qualified botanist. **AMM 31** CDPR will continue to only allow trained, skilled botanists to enter areas where covered plant species occur during treatments. **AMM 32** CDPR will continue to ensure that pesticide applications near known populations of the covered plant species are conducted under the direction of a qualified biological monitor. **AMM 33** CDPR will continue to ensure that all workers are trained to identify covered plant species that may occur at project site prior to work commencing on site. CDPR will continue to instruct workers how to avoid inadvertent adverse impacts to these species. **AMM 34** CDPR will continue to ensure that all workers are trained in the safe and effective use of herbicides in sensitive habitats. **AMM 35** CDPR will continue to ensure that trained resource personnel are present at all phases of the work to ensure that herbicide application activities do not result in impacts to covered species. **AMM 36** If herbicides are spilled, they will be prevented from entering any water bodies to the extent practicable. CDPR staff and contractors will continue to be trained to contain any spilled material and are familiar with the use of absorbent materials. Spills will continue to be cleaned according to label instructions, and all equipment used to remove spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will continue to report spills as required by CDPR policy and in a manner consistent with local, state, and federal requirements.

Table 5-6. Avoidance and Minimization Measures for Plants		
Covered Activity	**Potential Effects**	**Avoidance and Minimization Measures (AMMs)**
		AMM 37 Post-treatment, CDPR will continue to initiate monitoring, which typically consists of mapping, photo documentation, regular inspections, and depending on location and species, some formalized monitoring resulting in several years' worth of data and subsequent reporting. **AMM 38** CDPR will continue to take the following steps when using herbicide: ● Prior to treatment, CDPR's PCA or qualified staff will continue to evaluate sites within the HCP area for invasive species removal. Weed populations will continue to be targeted based on site and weather conditions, historic weed growth, or other information. ● CDPR will continue to determine the appropriate method for treating a target area (e.g., manual removal, aerial application, backpack sprayer, truck mounted sprayer). If the application can be made without negatively impacting water quality or covered species, then an application will continue to be made ● All herbicide applications will continue to be made according to the product label in accordance with regulations of the EPA, CalEPA, Cal OSHA, DPR, and the local Agricultural Commissioner. CDPR's PCA and DPR-licensed Qualified Applicator License (QAL) holders will continue to regularly monitor updates and amendments to the label so that applications are in accordance with label directions.

5.3.2 Measures to Mitigate Unavoidable Impacts

Implementation of AMMs (section 5.3.1) does not necessarily relieve a permittee (or eligible third party) from also having to implement mitigation measures to compensate for impacts to covered species or their habitats. Mitigation measures (MMs) may be required under either of the following circumstances:

1. If one or more applicable AMM cannot be fully implemented.
2. If unavoidable impacts to covered species or their habitat may occur regardless of full implementation of all AMMs.

Overall, CDPR implements the conservation program, including the AMMs and meeting the biological objectives of the program, which has been successful at offsetting the impacts to covered species from covered activities and allowing CDPR to contribute to covered species recoveries locally and range-wide. For example, the seasonal exclosure that is erected each breeding season to protect SNPL and CLTE has been successful at protecting breeding habitat for SNPL and CLTE and increasing reproductive success for these species. The predator management program also appears to be successful at offsetting impacts associated with a potential increase in predators in the HCP area. In addition, the habitat restoration efforts and fencing of the vegetation islands appears to be successful at offsetting impacts to listed plant species. As a result, additional mitigation measures are not necessary.

5.4 Monitoring

This section describes the HCP's monitoring program, which may evolve during the life of the HCP through the adaptive management process. Given CDPR's mission and statutory mandate to protect biological resources, much of the program described here has been implemented in the HCP area for many years. Adaptive management will be used to add new monitoring techniques (based on advancements in monitoring methods and changes in the type of information or data needed), modify the monitoring methods, or eliminate monitoring methods that prove ineffective or that have unanticipated impacts on covered species. To maintain a comparable dataset, CDPR will implement the monitoring methods in this section as long as the methods are providing useful information and no changes to the monitoring program have been identified. Any changes to the monitoring program will be reported in the Annual Report (section 5.7).

There are three types of monitoring: (1) compliance monitoring, which tracks the permit holder's compliance with the requirements specified in the HCP and ITP; (2) effects monitoring, which tracks the impacts of the covered activities on the covered species; and (3) effectiveness monitoring, which tracks the progress of the conservation program in meeting the HCP's biological goals and objectives (includes species surveys, reproductive success, etc.). The monitoring program described in this section provides data serving all three types of monitoring, as appropriate.

5.4.1 Western Snowy Plover and California Least Tern

Monitoring SNPL and CLTE populations to estimate distribution, abundance, survival, reproduction, and threats is vital for generating data necessary to evaluate the effectiveness of the conservation program and AMMs. Data collected from monitoring will be used to help revise management and AMMs within an adaptive management framework (section 5.6). The primary objectives of the monitoring program are to:

- Obtain an accurate assessment of the number of breeding pairs of SNPL and CLTE in the HCP area
- Monitor distribution and abundance of SNPL during the non-breeding season

- Determine the fates of all SNPL and CLTE nests
- Estimate the fledge rates of SNPL and CLTE chicks
- Document locations of SNPL and CLTE broods
- Identify and help minimize threats to SNPL and CLTE
- Help implement management actions aimed at protecting birds and their nests (e.g., inspect and repair nest exclosures, call park rangers to enforce restrictions on closures)
- Determine nest fates and the causes of nest failures
- Identify potential causes and document adult, juvenile, chick, and egg mortality, injury, abandonment, or disturbances
- Document occurrence and sign of predators
- Identify the location of CLTE night roost(s) and estimate the number of birds at the roost(s)
- Document characteristics of SNPL and CLTE habitat
- Evaluate the effectiveness of habitat enhancement actions

CDPR will continue to monitor populations of breeding and over-wintering SNPL and breeding CLTE using methods that have been refined over the last decade and detailed in the most recent annual report (Appendix E; (CDPR 2017a). CDPR has developed its monitoring protocol for SNPL and CLTE with guidance from USFWS, CDFW, and a scientific advisory committee (referred to as the Scientific Subcommittee in CDP 4-82-300 A5) composed of biologists from USFWS, CDFW, CDPR, and other technical specialists, as appropriate, to ensure monitoring activities relate specifically to recovery and management objectives and are consistent with the monitoring guidelines in the SNPL Recovery Plan (USFWS 2007a). The results from monitoring will continue to be included in annual reports produced by CDPR and submitted to the Wildlife Agencies (section 5.7).

5.4.1.1 Monitoring for Threats to Western Snowy Plovers and California Least Terns

5.4.1.1.1 Breeding Season Monitoring

Daily monitoring will continue to occur in SNPL and CLTE breeding habitat from March 1 through September 30 to identify and ameliorate threats to SNPL and CLTE, to locate nests, and to collect data to estimate population sizes, survivorship, and reproductive success. Typically, a minimum of three monitors will be present during the morning and early afternoon. As the season progresses, monitoring will increase to include the late afternoon and early evening hours.

Monitoring will involve walking to assess or find new nests, as well as scanning nests and broods from parked vehicles outside the seasonal exclosure. The open riding area will be monitored by vehicle on a daily basis along defined transects as any nest initiated in this area will be at risk from recreational activities and require immediate protection. The Dunes Preserve will be monitored on foot. Oso Flaco, as well as Arroyo Grande Creek, Carpenter Creek, and Pismo Creek Lagoon will be monitored on foot and from a vehicle. Early-morning transect surveys will be conducted daily in the open riding area, with particular attention paid to the Southern Exclosure boundary, to look for any CLTE or SNPL chick tracks outside of these protected areas. The Southern Exclosure will be monitored periodically by entering the Southern Exclosure on foot as well as by observing the Southern Exclosure with binoculars and spotting scopes from a vehicle outside the exclosure or on the shoreline. The careful use of a vehicle as a blind has proven effective in monitoring nests, broods, and predators. Vehicle surveys on the shoreline of the Southern Exclosure and Oso Flaco will be conducted during low tide by driving slowly on the smooth,

hard-packed sand of the lower exposed intertidal zone. Observations will be made from a parked vehicle with the area in front of the vehicle carefully scanned before proceeding to the next observation point.

Monitoring will be conducted in a manner to minimize disturbance or adverse effects on adult birds, nests, and chicks. When a monitor enters the 6 or 7 exclosures on foot when chicks are present, monitors in one to four vehicles will be positioned in the open riding area along the east side of the exclosure to watch for disturbance to birds. Monitors will search for chick movement and, if necessary, redirect chicks moving toward the open riding area back towards protected areas.

Monitors will attempt to follow broods hatched within the open riding area when they leave their single-nest exclosures, identify threats to brood movement or safety, obtain assistance as necessary from Oceano Dunes SVRA patrol staff, and oversee the erection of signs and/or symbolic fencing to assure brood safety until they reach a non-vehicle use area of Oceano Dunes SVRA. Should broods engage in foraging activity in the wrack line near exclosures, vehicle traffic will be diverted or regulated to allow safe movement of the brood. If chicks remain in harm's way despite CDPR's efforts to move them into a non-vehicle use area, CDPR will capture them for captive rearing, as described in section 2.2.2.1.2.

Rangers and maintenance crews will be notified if a nest is sighted within the open riding area. If needed, the fence crew will be dispatched and a ranger will respond for traffic control.

5.4.1.1.2 Non-breeding Season Monitoring

During the months of October through February, weekly surveys are conducted for non-breeding SNPL. During these surveys, monitors drive vehicles and walk, searching for non-breeding SNPL, including foraging and/or roosting flocks, in the following areas:

- Approximately 0.5-mile north of Pismo Pier to Grand Avenue
- Grand Avenue south to Post 2
- Post 2 to southern shoreline riding area boundary
- Oso Flaco (southern shoreline riding area boundary to Oceano Dunes SVRA southern boundary)

As part of this monitoring effort, additional speed limit signs are posted near any foraging and/or roosting flocks of wintering SNPL, and enforcement is increased in these areas.

5.4.1.2 Monitoring for Predators

Predators are monitored from late-February/March through early September by CDPR and contractors to collect information on predator presence in and around the HCP area. Monitors on foot and from vehicles directly observe mammalian and avian predators and their sign (e.g., tracks, scat, regurgitated pellets, prey remains, depredated nests) and record species, type of sign, behavior (if observed), duration of observation, direction of travel, and any characteristics that may identify an individual predator.

Observations of species known to be predators of CLTE and SNPL will be documented as both number of days detected, as well as number of occurrences (mammalian) or sightings (avian). The number of days detected describes the total number of days presence was documented in the nesting area, as described in the SNPL and CLTE Annual Report (Appendix F).

The behavior of gulls will also be recorded as a part of general predator monitoring, as gulls are a known predator of SNPL and CLTE eggs and chicks. Monitors will continue to survey gulls to document their distribution and abundance in the HCP area. Monitors count gull numbers at the trash dumpster area

near Post 2 one to two times per week, in addition to conducting general gull monitoring around the Southern Exclosure and Oso Flaco as Environmental Scientist staff are available.

5.4.1.3 Banding Western Snowy Plovers and California Least Terns

Banding adult birds (SNPL only) and chicks (SNPL and CLTE) helps to improve the accuracy of estimates of population size, survivorship, reproduction, dispersal and site fidelity, which enables a more informed assessment of the effectiveness of management activities. CDPR will continue to band SNPL and CLTE chicks. CLTE and SNPL chicks in the HCP area will typically be banded between 1 and 3 days of age. To facilitate identification of individuals without having to recapture birds, SNPL and CLTE chicks receive color-band combinations that can be identified at a distance through binoculars or a spotting scope. CLTE chicks will be banded with numbered aluminum USFWS band on one leg and a blank aluminum band on the other leg and will receive unique color-band combinations by covering both aluminum bands with colored tape. Because of the larger SNPL population size in the HCP area, there are not enough color-band combinations to uniquely color band each chick. Therefore, all SNPL chicks from the same nest will receive unique color-band combinations, so that chicks will have a color-band combination that identifies them as belonging to a specific brood. CLTE chicks will be weighed prior to banding, as feasible. Banding materials used for SNPL and CLTE chicks may change over time depending on the most current available accepted USFWS protocols as determined by the master bander.

Banding methods will not compromise the safety of chicks and will include the following protocols:

- Broods will not be disturbed during climatic conditions such as high wind and extreme cold or heat.
- Chicks will only be pursued for a short period of time, typically less than 2 minutes for a single capture attempt and less than 20 minutes in a single day attempting to capture an individual chick.
- Chicks will be captured by hand, and, when possible, close to the nest location.
- Chicks will be released together after banding of all chicks is completed.

5.4.1.4 Permitting for Monitoring and Banding

All monitoring and banding activities will be conducted under applicable USFWS and CDFW permits. USFWS requires that biologists meet minimum training requirements for different levels of SNPL monitoring activities (USFWS 2007a). All persons monitoring SNPL and CLTE for this HCP will meet current USFWS training requirements and will be permitted by the USFWS, as applicable. Monitoring will be conducted by trained CDPR staff or contracted professionals, as appropriate, to help ensure retention of monitors through the end of the season and for consistency in data collection.

5.4.1.5 Estimating the Size of Breeding Populations

Annual estimates of the distribution and abundance of breeding SNPL and CLTE are necessary to detect long-term trends in population size and to evaluate the effectiveness of conservation measures. Annual estimates of breeding SNPL and CLTE have been obtained in the HCP area for over 2 decades and will continue to be obtained through the HCP term. Methods used to estimate the size of the breeding SNPL and CLTE populations are described further in the following sections.

5.4.1.5.1 Western Snowy Plover

The abundance of SNPL is estimated using intensive monitoring of banded birds in the HCP area and supplemented with annual breeding-season window surveys. The USFWS coordinates breeding-season window surveys (generally during the last week in May for the HCP area) to obtain a minimum estimate

of the number of breeding SNPL at current, historic, and potential breeding sites throughout the SNPL's geographic range from Washington to California, including the HCP area (section 3.3.1.1). Breeding-season window surveys will continue to be conducted according to protocols developed by the USFWS and published in the SNPL Recovery Plan (Appendix I; (USFWS 2007e).

Intensive SNPL monitoring in the HCP area in recent years has allowed a more accurate estimate of the number of breeding SNPL in the HCP area than provided by USFWS breeding-season window surveys. Individually banded snowy plover adults provide the most accurate means to identify breeding population size, but currently too few banded adults are in the HCP area to rely solely on this method. A minimum number of breeding females is derived from the maximum number of nests active on the same day plus any additional nests hatching 1 day before or initiated 1 day after this date. A minimum number of breeding males is estimated from the highest same day count of active nests and broods (males typically raise the chicks; males with broods 3 weeks of age or older are not included if they could be associated with a new nest) and number of nests initiated the day after the high count. Beginning in 2009, staff compiled numbers of color-banded adults confirmed breeding; staff adds any number of this group not accounted for on the same day high count, including nests or broods with unknown adults, to the same day high count for the appropriate sex. In 2018, using a database query, staff created a more accurate method to determine high counts of unbanded males and females actively associated with a nest on any given day and a total number of uniquely banded males and females associated with a nest at any point in the season.

5.4.1.5.2 California Least Tern

Nesting CLTE are intensively monitored in the HCP area (section 5.4.1.6). Monitors check the status of nests and broods daily, which allows for an estimate of the number of breeding pairs. The number of breeding pairs can be represented as a range of breeding pairs. The estimated minimum number of pairs is equal to the maximum number of concurrently active nests and broods. The estimated maximum number of pairs is equal to the minimum number of pairs plus one-half of the value of the minimum number of pairs subtracted from the total number of nests:

Max. no. pairs = min. no. pairs + [(total no. nests - min. no. pairs) / 2]

This assumes nests in addition to those accounted for by the minimum number of pairs are equally divided between renesting pairs and new pairs.

Banding CLTE chicks to brood in 2005, and to individual since 2006, has provided for increased accuracy in counting the number of active CLTE broods on a given date.

5.4.1.6 Monitoring Nesting Success and Fledge Rates of Western Snowy Plover and California Least Tern

In addition to monitoring for threats to SNPL and CLTE, monitors will continue to focus efforts on locating and protecting nests, determining the fate of nests, determining survivorship from chick to fledgling stage, and verifying the recruitment of fledglings into the breeding population of SNPL and CLTE. Monitoring will include the following tasks:

- Counting adult and juvenile SNPL and CLTE
- Locating scrapes and nests
- Floating SNPL eggs to help estimate hatch rates
- Tracking nests to determine their fate

- Collecting behavioral observations
- Tracking chick locations and development
- Recording evidence and observations of predator and human activity
- Noting violations of regulations
- Engaging in informal public contact
- Implementing species-specific protection measures, such as erecting exclosures, and noting where signs and fencing need repair
- Making necessary repairs to the seasonal exclosures, if feasible, or notifying park maintenance staff, if needed

An important goal of the SNPL and CLTE monitoring program is to find and monitor all SNPL and CLTE nests and determine the fates of nests and chicks. Nest locations will be mapped using GPS. Some nests may not be mapped using GPS, for example, if it is not possible to map a nest without disturbing the birds, or if nests fail before a GPS unit is available. In such cases, GPS locations can be estimated based on landmarks and descriptive notes. Nesting attempts known only by detection of broods will be referred to as nests with unknown locations. SNPL and CLTE clutch initiation dates can be estimated from egg-laying dates when known. When SNPL and CLTE nests are found at full clutch, eggs will be floated to better estimate initiation and expected hatch dates. Nests will not be disturbed for egg floating during climatic conditions such as high wind and extreme cold or heat or if approaching the nest will disturb nearby broods. Only those individuals approved by USFWS will float SNPL and CLTE eggs.

The fate of nests will be defined as follows:

Hatch: Nest will be considered to have hatched if at least one egg hatches.

Abandoned pre-term: Nest is abandoned prior to the expected hatch date; causes may include, but are not limited to, disturbance or adult mortality.

Abandoned suspected due to wind: Nest is abandoned pre-term during periods of high wind; eggs may be typically found almost or completely buried.

Abandoned post-term: Nest is abandoned after the expected hatch date; this category includes nests with nonviable eggs.

Abandoned, unknown if pre- or post-term: Nest is abandoned, but it is unknown if abandonment is pre- or post-term.

Depredated: Nest is lost to a predator. If possible, the predator will be identified to species or group (mammalian, avian).

Flooded: Nest is overwashed by tide or flooded by a shifting creek or expanding lagoon.

Failed with unknown cause: Nest that disappears before the expected hatch date with cause of failure undetermined.

Unknown fate: When it is unknown whether the nest hatches or fails.

Banding and observing combinations on chicks are critical to accurately assessing fledge rates. Monitors will typically search for chicks daily once nests begin hatching, recording observed band combinations to assess survivorship. SNPL chicks surviving to 28 days or older from the time of hatching will be considered fledged. CLTE chicks surviving to 21 days or older will be considered fledged.

In the HCP area, juvenile CLTE can disperse over a large area, so monitoring areas that are frequented by CLTE improves the efficiency of monitoring efforts to observe banded birds, estimate juvenile survivorship, and identify threats to survival. CLTE frequent bodies of freshwater, such as Oso Flaco Lake, as such areas can provide a source of prey fish in addition to the near-shore ocean. Nearby freshwater lakes will be periodically monitored for foraging CLTE (section 2.2.2.1.2).

5.4.1.7 Monitoring Night Roost and Freshwater Lake Use for California Least Tern

During the breeding season, CLTE may assemble in a night roost. Monitors will record the night roost location and total numbers of individuals present as CLTE arrive at dusk. Night-vision equipment will be available and used for this task, as needed, but it has a limited range for viewing from a distance. As are result, there will be occasions when CLTE will be heard vocalizing and not seen because they arrive after it is too dark to see. Therefore, counts will be at a minimum due to the limited visibility of night roosts.

Small freshwater lakes will also be periodically surveyed for CLTE use. During the surveys, the monitors will determine if the lakes provide additional appropriately sized fish to feed chicks. Monitors will also observe the direction of adult CLTE flight in order to determine the directions of other foraging sources.

5.4.1.8 Protocol for Dead or Injured Western Snowy Plover and California Least Tern and Abandoned Eggs

If monitors find an injured or dead bird, dead chick, or abandoned egg, they will document the occurrence in a logbook or other suitable recording system. Documentation will include the location of the individual, carcass, or eggs; details observed of the animal and surrounding area; and other relevant circumstances leading up to the discovery, including tracks in the surrounding area. Any CDPR staff member who finds an injured individual, carcass, or egg will contact the SNPL and CLTE monitors. When a SNPL or CLTE egg, carcass, or injured bird is found that has been crushed or could have been impacted by one of the covered activities, CDPR staff (e.g., CDPR resource personnel/rangers) will be notified immediately. Under current management[91], CDPR notifies USFWS and/or CDFW within 24 hours of an injured or dead SNPL (USFWS only) or CLTE being found. CDPR rangers will write up an Incident Report. Pictures will be taken of the incident site, with scale included, and the surrounding area. Carcasses that are recovered will be placed into a plastic bag, and the monitor that retrieves the carcass will use disposable gloves and a facemask to protect against potential disease carried by the bird. The bird will be placed into the refrigerator if storage is needed; as directed by USFWS and/or CDFW, the specimen will either be placed in a freezer or will be packed with ice in a cooler and sent via next- or same-day air to a qualified facility (e.g., CDFW Marine Wildlife Veterinary Care and Research Center in Santa Cruz) for necropsy to determine the cause of death. Only monitors with a scientific collecting permit will handle eggs and carcasses. Results of necropsies are reported in the annual report for SNPL and CLTE (section 6.4.1).

If the eggs are abandoned, monitors will differentiate, where possible, between abandonment due to adult mortality or due to other reasons. Non-viable intact SNPL eggs will be transferred to appropriate egg depositories (e.g., the Santa Barbara Natural History Museum). SNPL eggs will be deemed non-viable as determined by a qualified CDPR Environmental Scientist from field monitoring and floating information. Eggs will be examined for signs of viability or hatch and may be salvaged after coordination with the USFWS. In limited circumstances, CDPR monitors may replace non-viable eggs with potentially

[91] CDPR may continue to report dead or injured birds within 24 hours; however, less frequent reporting (e.g., reporting in the annual report) may be appropriate once the HCP is finalized.

viable eggs from abandoned nests. Eggs will be deemed viable based on field observations. Egg replacement will be conducted in coordination with the USFWS.

5.4.2 California Red-legged Frog

Protocol surveys were conducted during the spring and summer of 2017 and 2019. Sites surveyed included Pismo Lake, Pismo Beach Golf Course, Pismo Lagoon, Carpenter Creek, Oso Flaco Lake, Little Oso Flaco Lake, Oso Flaco Creek, Oceano Lagoon, Arroyo Grande Estuary, Meadow Creek, and Arroyo Grande Creek. CRLF individuals were observed in Little Oso Flaco Lake, Arroyo Grande Creek, and Arroyo Grande Estuary. Previous monitoring for CRLF was conducted at Oso Flaco Lake and Meadow Creek in 2003, and more recent surveys were done at Meadow Creek near the Monarch Grove in 2012. One survey was conducted in a sediment basin near the Oso Flaco Lake parking lot in 2013 as well as in Oso Flaco Creek. Similar surveys may occur annually if SVRA staff are available and resources allow. Surveys will be conducted at all known and potential CRLF habitats (e.g., Pismo Lake, Oso Flaco Lake, Little Oso Flaco Lake, Oso Flaco Creek, Meadow Creek, Oceano Lagoon, Pismo Lagoon, Pismo State Beach Golf Course, Dune Lakes, and Arroyo Grande Creek). Monitoring CRLF will generate data necessary to evaluate the effectiveness of the AMMs. Data collected from monitoring will be used to help refine management and AMMs within an adaptive management framework (section 5.6). The primary objectives of the monitoring program are to:

- Assess the population status of CRLF (e.g., distribution, index of abundance)
- Identify and monitor threats to CRLF to inform potential responsive management actions
- Help implement management actions aimed at protecting CRLF and its habitat
- Identify and document impacts to CRLF
- Document occurrence and sign of invasive species that effect CRLF
- Document characteristics of CRLF habitat
- Evaluate the effectiveness of habitat enhancement actions

The results from monitoring will continue to be reported in annual reports produced by CDPR and submitted to the Wildlife Agencies (section 6.4.1). The following methods are subject to modification within an adaptive management framework based on advances in monitoring methods and changes in the type of information or data needed and subject to review by USFWS.

5.4.2.1 Monitor Population of California Red-legged Frog

A comprehensive survey to document presence of CRLF in potentially suitable habitat, numbers of individuals, quality of habitat, and habitat disturbances (if any) is conducted as time and staff allows. A full park survey can occur annually if SVRA staff are available and resources allow. Surveys are conducted at all known and potential CRLF habitats (e.g., Pismo Lake, Oso Flaco Lake, Little Oso Flaco Lake, Oso Flaco Creek, Meadow Creek, Oceano Lagoon, Pismo Lagoon, Pismo State Beach Golf Course, Dune Lakes, and Arroyo Grande Creek). Surveys typically begin in January and are completed by the end of September. Multiple survey visits are conducted throughout this survey year. Two day surveys and four night surveys will typically be conducted during the breeding season between October 1 and June 30, and one day and one night survey will typically be conducted during the non-breeding season between July 1 and September 30. At least one survey will be conducted prior to August 15. All surveys will be visual unless a CRLF is observed. If a CRLF is observed, Oceano Dunes SVRA biologists may conduct dipnet surveys (see below for details on dipnet surveys). The surveyor will walk along the entire shore or bank, visually scanning all shoreline or streambank areas and/or uses kayaks to survey

appropriate habitat along the shoreline, as necessary when the shoreline is inaccessible. When duckweed or other floating vegetation is present, the surface of the water will be scanned. Care will be taken not to disturb sediments, vegetation, or any visible larvae. When walking on the bank, care will be taken not to crush root balls, overhanging banks, and streamside vegetation that might provide shelter for frogs. When conducting night surveys, flashlights and headlamps using four to six D batteries or one 6-volt battery will be used in order not to harm frogs with bright spotlights (USFWS 2000a). Limited dipnetting of tadpoles and possible capture and handling of adults or juveniles may also occur. These surveys will be conducted by a biologist with a 10(a)(1)(A) Recovery Permit for CRLF or a biologist previously approved by the USFWS. These surveys will be conducted consistent with the USFWS survey guidelines (USFWS 2005c) and the Declining Amphibian Task Force Fieldwork Code of Practice (Appendix J;(USFWS 2005c).

5.4.2.2 Monitoring Habitat Quality

During the CRLF surveys, CDPR will conduct qualitative monitoring of CRLF habitat at Oso Flaco Creek, Oso Flaco Lake, Pismo Creek, and Arroyo Grande Creek to assess the condition of these habitats and identify potential threats that may exist due to presence of invasive species (section 2.2.2.1.4), erosion, bank degradation, or other habitat changes or impacts from covered activities in adjacent areas. Staff will document observations of informal trails, vegetation trampling, litter, indications of fishing, or signs of other recreation activities that could affect CRLF.

5.4.2.3 Monitoring Water Quality

The sources of waters that supply water to CRLF habitat in the HCP area are outside the HCP area and, therefore, out of CDPR control. CDPR will contribute to watershed efforts by monitoring water quality in the HCP area and working with off-site landowners, as feasible, to continue to provide suitable habitat for CRLF (e.g., flows that maintain water levels through late July; (USFWS 2002); salinities less than 3 ppt when eggs are present and less than 6 ppt when larvae, tadpoles, or adults are present; and temperatures throughout the water column below 71.6°F). If feasible, CDPR will measure water quality bimonthly at locations with known CRLF populations.

5.4.3 Tidewater Goby

CDPR will continue to monitor tidewater goby populations to document their distribution in the HCP area, estimate abundance, and assess threats to tidewater goby. Tidewater goby monitoring is vital for generating data necessary to evaluate the effectiveness of the conservation and AMMs. Data collected from monitoring will be used to help revise management and AMMs within an adaptive management framework (section 5.6). The primary objectives of the monitoring program are to:

- Assess the population status of tidewater goby in the HCP area (e.g., distribution, index of abundance)
- Identify and help minimize threats to tidewater goby, where feasible
- Help implement management actions aimed at protecting tidewater goby and its habitat (e.g., adjust closure boundaries, call park rangers to enforce restrictions on closures)
- Gather information about tidewater goby's use of HCP area water bodies (e.g., lagoons)
- Evaluate whether any CDPR activities may be impacting the fishery or aquatic habitat, and document the impacts of habitat disturbance caused by upstream water management activities
- Identify and document impacts to tidewater goby
- Document occurrence and sign of invasive species that impact tidewater goby

- Document characteristics of tidewater goby habitat
- Evaluate the effectiveness of habitat enhancement actions

The results from monitoring will continue to be reported in annual reports produced by CDPR and submitted to the Wildlife Agencies (section 5.7). The following methods are subject to modification within an adaptive management framework based on advances in monitoring methods, Recovery Permit conditions, and changes in the type of information or data needed and subject to review by USFWS.

5.4.3.1 Fisheries Monitoring

Fisheries surveys have been conducted within Arroyo Grande Creek approximately four times per year since 2003 (Rischbieter 2004, 2005, 2006, 2008, 2009a, 2009b, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018). The primary purpose of these surveys is to evaluate the composition and document trends of native fish populations in the HCP area. In addition, these surveys are intended to gather information about various species' use of the habitats within the HCP area, evaluating whether covered activities may be impacting fisheries and aquatic habitat, and documenting the impacts of habitat disturbance caused by upstream water management activities (Rischbieter 2010). Most information sought is qualitative, while quantitative evaluation has been limited to routine estimation of the approximate abundance of netted individuals of respective species collected.

Fisheries surveys will continue to be conducted approximately four times a year at Arroyo Grande Creek and lagoon, at least annually at Pismo Creek Lagoon, which includes Carpenter Creek, and at least once every 5 years at Oso Flaco Lake and Creek. Portions of Meadow Creek will be surveyed at the same time as Arroyo Grande Creek when, in the opinion of the qualified biologist, conditions for sampling appear suitable. Surveys will be conducted using dipnets, beach seine, direct observation, and/or electrofishing. Only methods appropriate for the location and conditions will be used. All surveys will be conducted by a qualified biologist with a USFWS 10(a)(1)(A) Recovery Permit for tidewater goby.

Seining will include conducting 4 to 10 seine hauls. The seine will typically be swept in an arc, with a set pivot point on shore. It will be closed and dragged ashore. Longer hauls will be conducted on dates when low numbers of fish are present. The seine will be checked after each haul for presence of organisms. The organisms will be removed, identified, and released.

Electrofishing will be conducted in a continuous or intermittent effort from a relatively easy access point. Electrofishing is most likely to be conducted in the head of the Arroyo Grande Creek Lagoon, but in some cases will be limited to areas upstream of the confluence of lower Los Berros Creek, depending on the current distribution of tidewater goby. The distance covered during electrofishing will also be dictated by the hydrologic conditions. The electrofisher will be accompanied by two netters who will lift immobilized fish with dipnets. Species will be identified and released (and allowed to recover in a bucket, if appropriate). No electrofishing will be conducted where tidewater goby are present.

At least 15 days prior to the commencement of surveys, the USFWS-permitted biologist will advise the appropriate USFWS field office (currently the Ventura field office) of planned survey activities. Summary reports will be completed and submitted to USFWS at year's end (by January 31) following completion of all surveys. If tidewater gobies have been found in a new location, the permitted biologist must report to the appropriate USFWS field office immediately. If, during a scheduled survey, the permitted biologist experiences unintended tidewater goby mortality, the permitted biologist must report in writing within one working day. Annual Summary Reports will include each fish sampling episode and descriptions of locations sampled, techniques, species collected, relative abundance observed, habitat and water quality conditions at time of survey, and any relevant anecdotal information or insight to help put observations or recommendations in context.

Timing of surveys will be scheduled to coincide with seasonal fishery presence, seasonal and episodic hydrologic (stream course) changes, and other factors that may influence the interaction between park visitors and aquatic resources.

5.4.3.2 Monitoring for Public Use and Upstream Influences

Aquatic areas that support tidewater goby and are near public use areas will be monitored regularly to ensure that public encroachment is not having a negative impact on tidewater goby habitat. Monitors will document observations of any new trails, vegetation trampling, litter, signs of fishing, or signs of other recreation activities that could affect tidewater goby. During monitoring, any litter found will be removed. These additional surveys will be scheduled based on notable hydrologic events or occurrence of other known disturbances, coordinated in advance with USFWS, when appropriate. Appropriate federal and state authorities will be immediately notified upon observation of upstream disturbance (e.g., unnatural dewatering of stream, illegal dumping or waste discharge) if it appears the disturbance is having, or potentially could have, a detrimental effect on tidewater goby habitat.

Although a staff gauge installed in 2008 was once used to monitor relative water levels in Arroyo Grande Creek, the gauge is no longer used. Instead, the County maintains a lagoon water level gauge and telemetry system at the downstream end of its flood control facility and posts current and limited historic water levels online.

5.4.4 Marsh Sandwort, La Graciosa Thistle, Surf Thistle, Beach Spectaclepod, Nipomo Mesa Lupine, Gambel's Watercress

CDPR will continue to conduct monitoring of listed plant populations to document distribution in the HCP area, estimate abundance, and assess threats. Monitoring of these plant populations is vital for generating data necessary to evaluate the effectiveness of the conservation and AMMs. Data collected from monitoring will be used to help revise management and AMMs within an adaptive management framework (section 5.6). The primary objectives of the monitoring program are to:

- Identify and help minimize threats to listed plant species
- Help implement management actions aimed at protecting listed plant species and their habitats (e.g., adjust closure boundaries, call park rangers to enforce restrictions on closures)
- Evaluate whether any CDPR activities may be impacting the listed plant's habitats and document the impacts of habitat disturbance caused by upstream water management activities
- Identify and document impacts to listed plants
- Document occurrence of invasive species that affect listed plants
- Document characteristics of listed plant species' habitats
- Evaluate the effectiveness of habitat enhancement actions
- Document the status of populations over time

The results from monitoring will be included in annual reports produced by CDPR and submitted to the Wildlife Agencies (section 5.7). The following methods are subject to modification within an adaptive management framework based on advances in monitoring methods and changes in the type of information or data needed and are subject to review by USFWS.

5.4.4.1 Monitor Populations of Marsh Sandwort, La Graciosa Thistle, Surf Thistle, Beach Spectaclepod, Nipomo Mesa Lupine, and Gambel's Watercress

Targeted surveys for listed plant species will continue to be conducted regularly to assess the status of plant species, measuring trends and changes in population size to help determine the effectiveness of management actions and identify new or emerging threats during the term of this HCP. Surveys will be performed to document listed plant species in the vegetation islands, foredunes, and backdunes (in coordination with the USFWS as necessary). The evaluation will include documenting species populations, counting individual plants, percent cover, and presence of non-native invasives. Digital technology will be used to record locations and other attributes of the listed plant populations. Aerial or satellite photographs will be used to monitor the increase or decline of listed species populations and habitats on an as-needed basis.

Survey results will be reported annually as described in section 5.7. Through these surveys, CDPR Environmental Scientists will increase their understanding of the relative abundance of listed plant species and the distribution and relative abundance of invasive, non-native plant species, such as European beachgrass and Russian wheatgrass. These surveys will also provide an opportunity to assess any additional threats that may exist due to erosion, invasive or non-native species, or other habitat changes or impacts from activities in adjacent areas.

5.4.4.2 Monitor Exotic Plant Treatment Options

CDPR will monitor the effects of various treatment options on populations of listed plant species and their habitats to assist with determining preferred treatments to improve habitat conditions. If monitoring is required during the SNPL and CLTE breeding season, CDPR will work with USFWS to conduct this work in a manner that avoids impacts to SNPL and CLTE.

5.5 Performance Standards and Success Criteria

5.5.1 Western Snowy Plover

Table 5-7 outlines the success criteria and performance standards associated with the objectives that will provide a basis for determining success of the overall conservation program. The rationale behind these criteria are based on the SNPL Recovery Plan and are discussed in depth in section 5.2.1.

Table 5-7. Biological Goals, Objectives, and Success Criteria for SNPL

GOAL:

1. Continue to contribute to SNPL recovery locally and range-wide.

Objectives:	Success Criteria/Performance Standards:
1.1 Manage the SNPL population breeding in the HCP area to meet or exceed the CDPR target of 155 breeding SNPL averaged over a moving 3-year window.	Success will be achieved when the 3-year average for the HCP area meets or exceeds the following target: 1.1.1 The number of breeding SNPL adults in the HCP area meets or exceeds 155.
1.2 Maximize the reproductive success of SNPL in the HCP area to maintain a 3-year moving average of at least 1.0 fledgling per male.	Success will be achieved when the 3-year average for the HCP area meets or exceeds the following target: 1.2.1 The number of fledglings per male in the HCP area meets or exceeds 1.0.
1.3 Increase the habitat available through habitat enhancement and restoration.	Success will be achieved when: 1.3.1 CDPR is actively eradicating non-native plants found within SNPL breeding habitat. 1.3.2 Cover and food resources are provided in the seasonal exclosures to ensure success of objectives 2.1 and 2.2. 1.3.3 CDPR actively maintains suitable sparse SNPL breeding habitat in the seasonal exclosure area.
1.4 Reduce predation.	Success will be achieved when: 1.4.1 Predation of nesting SNPL is being actively managed, potential SNPL predators in the HCP area are removed, and predation is reduced. 1.4.2 Predator management plans are developed and implemented in the HCP area, and these plans are updated as needed to identify appropriate responses to predators. 1.4.3 Predator management actions are implemented in a timely manner.

Table 5-7. Biological Goals, Objectives, and Success Criteria for SNPL	
1.5 Reduce disturbance by recreational users and predators.	Success will be achieved when: 1.5.1 Take does not exceed levels established in the HCP (section 4.3.2). 1.5.2 Monitors and park staff do not observe any take resulting from trespassing into SNPL nesting areas. 1.5.3 Where needed, single-nest exclosures within the open riding area are erected within 2 hours of discovery of a nest with one or more eggs by monitors or park personnel. 1.5.4 All exclosures are constructed with predator-proof fencing. 1.5.5 All repairs to exclosure fencing are completed within 24 hours of the damage being discovered by or reported to CDPR staff.
GOAL: **2. Minimize conflicts between park users, park operations, and SNPL through a combination of avoidance and minimization measures and enforcement of park rules and regulations.**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 Provide adequate enforcement to ensure that park visitors do not violate restrictions that protect SNPL and their habitat.	Success will be achieved when: 2.1.1 Adequate enforcement staff is available to deter and respond to violations observed or reported in the HCP area.
2.2 Implement recreation and other restrictions to avoid and minimize take of SNPL.	Success will be achieved when: 2.2.1 Take does not exceed levels established in the HCP (section 4.3.2). 2.2.2 Monitors and park staff do not observe any take resulting from trespassing in SNPL protected areas.
2.3 Conduct all maintenance and other park operations in a manner that avoids and minimizes take of SNPL.	Success will be achieved when: 2.3.1 All maintenance and other park personnel receive a training that informs them of SNPL life history and regulations protecting them. 2.3.2 All maintenance and other park personnel know how to respond to violations of park regulations or SNPL take. 2.3.3 All park staff comply with closures, speed limits, and other restrictions aimed at protecting SNPL, unless emergency conditions warrant otherwise.

5.5.2 California Least Tern

Table 5-8 outlines the success criteria and performance standards associated with the objectives that will provide a basis for determining success of the overall conservation program. The rationale behind these criteria are based on the CLTE Recovery Plan and are discussed in depth in section 5.2.2.

Table 5-8. Biological Goals, Objectives, and Success Criteria for CLTE

GOAL: **1. Continue to contribute to CLTE recovery locally and range-wide**	
Objectives:	**Success Criteria/Performance Standards:**
1.1 Maintain a 5-year running average of 35 breeding pairs of CLTE in the HCP area.	Success will be achieved when the *5-year average* for the HCP area meets or exceeds the following targets: 1.1.1 The minimum number of breeding CLTE pairs in the HCP area meets or exceeds 35.
1.2 Maximize the reproductive success of CLTE in the HCP area to maintain a 3-year moving average of at least 1.0 fledgling per nesting pair.	Success will be achieved when the *3-year moving average* for the HCP area meets or exceeds the following targets: 1.2.1 The minimum number of fledglings per pair in the HCP area meets or exceeds 1.0.
1.3 Increase the habitat available through habitat enhancement and restoration.	Success will be achieved when: 1.3.1 CDPR is actively conducting habitat enhancement each year within CLTE breeding habitat, and CLTE are observed using the organic material for nesting and shelter. 1.3.2 CDPR actively maintains suitable sparse CLTE breeding habitat in the Southern Exclosure area.
1.4 Reduce predation.	Success will be achieved when: 1.4.1 Predation of nesting CLTE is being actively managed, and potential CLTE predator populations in the HCP area are reduced. 1.4.2 Predator management plans are developed and implemented in the HCP area, and these plans are updated as needed to identify appropriate responses to predators. 1.4.3 Predator management actions are implemented in a timely manner.

Table 5-8. Biological Goals, Objectives, and Success Criteria for CLTE	
1.5 Reduce disturbance by recreational users and predators.	Success will be achieved when: 1.5.1 Take does not exceed levels established in the HCP (section 4.4.2). 1.5.2 Monitors and park staff do not observe any take resulting from trespassing in CLTE protected areas. 1.5.3 Where needed, single-nest exclosures within the open riding area are erected within 2 hours of discovery of a nest with one or more eggs by monitors or park personnel. 1.5.4 All exclosures are constructed with predator-proof fencing. 1.5.5 All repairs to exclosure fencing are completed within 24 hours of the damage being discovered by or reported to CDPR staff.
GOAL: **2. Minimize conflicts between park users, park operations, and CLTE through a combination of avoidance and minimization measures and enforcement of park rules and regulations.**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 Provide adequate enforcement to ensure that park visitors do not violate restrictions that protect CLTE and its habitat.	Success will be achieved when: 2.1. Adequate enforcement staff is available to deter and respond to violations observed or reported in the HCP area.
2.2 Implement recreation and other restrictions to avoid and minimize take of CLTE.	Success will be achieved when: 2.2.1 Take does not exceed levels established in the HCP (section 4.4.2). 2.2.2 Monitors and park staff do not observe any take resulting from trespassing in CLTE protected areas.
2.3 Conduct all maintenance and other park operations in a manner that avoids and minimizes take of CLTE.	Success will be achieved when: 2.3.1 All maintenance and other park personnel receive a training that informs them of CLTE life history and regulations protecting them. 2.3.2 All maintenance and other park personnel know how to respond to violations of park regulations or CLTE take. 2.3.3 All park staff comply with closures, speed limits, and other restrictions aimed at protecting CLTE, unless emergency conditions warrant otherwise.

5.5.3 California Red-legged Frog

Table 5-9 outlines the success criteria and performance standards associated with the objectives that will provide a basis for determining success of the overall conservation program. The rationale behind these criteria are based on the CRLF Recovery Plan and are discussed in depth in section 5.2.4.

Table 5-9. Biological Goals, Objectives, and Success Criteria for CRLF

GOAL: **1. Minimize the effects of park visitor activities on suitable CRLF habitat (Map 14)**	
Objectives:	**Success Criteria/Performance Standards:**
1.1 When necessary, to limit substantial encroachment that could significantly degrade suitable CRLF habitat, close suitable habitat with symbolic fencing and signage, including Pismo Creek Lagoon, Pismo Lake, Meadow Creek, Carpenter Creek, Oceano (Meadow Creek) Lagoon, Arroyo Grande Creek, Arroyo Grande Lagoon, Oso Flaco Lake, Oso Flaco Creek, and numerous unnamed water bodies within the dune system that provide existing and potential CRLF habitat.	Success will be achieved when: 1.1.1 Negative impacts to CRLF or aquatic habitat from substantial public encroachment are not observed.
1.2 Protect habitat by closing informal trails adjacent to occupied aquatic habitat.	Success will be achieved when: 1.2.1 Established trails near aquatic habitat are marked, and informal trails are closed and restored.
GOAL: **2. Manage non-native plants and animals to enhance suitable habitat and protect all CRLF life stages.**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 Control non-native aquatic predators of CRLF.	Success will be achieved when: 2.1.1 Within 10 years from time of HCP implementation, CDPR is conducting control of problematic infestations of non-native predators and invasive plant species at high priority sites. 2.1.2 Monitors and park staff do not observe any release of non-native predators (e.g., mosquito fish, crayfish, largemouth bass) into aquatic habitat.
2.2 Enhance CRLF habitat by managing aquatic vegetation.	2.2.1 CDPR is actively eradicating non-native plants found with CRLF aquatic habitat

Table 5-9. Biological Goals, Objectives, and Success Criteria for CRLF

GOAL:

3. Minimize upstream water quality effects on CRLF and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.

Objectives:	Success Criteria/Performance Standards:
3.1 Conduct outreach to, and work with, willing landowners upstream of the HCP area whose activities affect water quality and quantity in the HCP area. Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds.	**3.1.1** All staff members and willing landowners are trained on CRLF life history and measures that can be implemented to protect CRLF and their habitat. **3.1.2** Erosion control measures are implemented in the HCP area to reduce siltation and contaminated runoff (e.g., by maintaining vegetation within buffers and/or through the use of straw bales, filter fences, vegetation buffer strips, or other accepted equivalents) to protect CRLF aquatic habitat. **3.1.3** CDPR encourages upstream land owners to cooperate and reduce impacts to water quality and quantity. CDPR obtains agreements with upstream land owners when possible.

5.5.4 Tidewater Goby

Table 5-10 outlines the success criteria and performance standards associated with the objectives that will provide a basis for determining success of the overall conservation program. The rationale behind these criteria are based on the tidewater goby Recovery Plan and are discussed in depth in section 5.2.5.

Table 5-10. Biological Goals, Objectives, and Success Criteria for Tidewater Goby

GOAL: **1. Minimize the effects of park visitor activities on suitable tidewater goby habitat**	
Objectives:	**Success Criteria/Performance Standards:**
1.1 Protect tidewater goby habitat by closing informal trails in and adjacent to occupied and potential habitat.	Success will be achieved when: **1.1.1** Established trails near occupied habitat are marked, and informal trails are closed and restored.
1.2 Protect tidewater goby habitat in Arroyo Grande Creek by enforcing crossing guidelines.	Success will be achieved when: **1.2.1** CDPR staff is trained in and follows all creek crossing guidelines. **1.2.2** CDPR staff consistently educate the public about, implement, and enforce creek crossing guidelines.
1.3 Protect tidewater goby habitat in Pismo Creek Lagoon by pursuing installation of proposed improvements to Pismo Creek.	Success will be achieved when: **1.3.1** Erosion control measures are implemented in Pismo Creek to stabilize the bank and sedimentation is reduced. **1.3.2** CDPR is actively eradicating non-native plants within Pismo Creek.
GOAL: **2. Manage non-native plants and animals to protect all life stages of tidewater goby.**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 Control non-native aquatic predators of tidewater goby.	Success will be achieved when: **2.1.1** Within 10 years from time of HCP implementation, CDPR is conducting control of problematic infestations of non-native predators and invasive plant species at all high priority sites. **2.1.2** Monitors and park staff do not observe any release of non-native predators (e.g., mosquito fish, crayfish, largemouth bass) into aquatic habitat.

Table 5-10. Biological Goals, Objectives, and Success Criteria for Tidewater Goby

GOAL: **3. Minimize upstream water quality/quantity effects on tidewater goby and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners and water agencies.**	
Objectives:	**Success Criteria/Performance Standards:**
3.1 Conduct outreach to, and work with, willing landowners and water agencies upstream of the HCP area whose activities affect water quality and quantity in the HCP area. Outreach and cooperative efforts with upstream land and water managers will seek to reduce impacts to water quality and quantity in target watersheds.	Success will be achieved when: **3.1.1** All staff members and willing landowners are trained on tidewater goby life history and measures that can be implemented to protect tidewater goby and their habitat. **3.1.2** Erosion control measures are implemented in the HCP area to reduce siltation and contaminated runoff (e.g., by maintaining vegetation within buffers and/or through the use of straw bales, filter fences, vegetation buffer strips, or other accepted equivalents) to protect tidewater goby aquatic habitat. **3.1.3** CDPR encourages upstream land owners and water agencies to cooperate and reduce impacts to water quality and quantity. CDPR obtains agreements with upstream land owners and water agencies, when possible.
GOAL: **4. Evaluate the suitability of potential tidewater goby habitat in the HCP area.**	
Objectives:	**Success Criteria/Performance Standards:**
4.1 Cooperate with USFWS efforts to evaluate habitat conditions of other potential tidewater goby habitat within the HCP area.	Success will be achieved when: **4.1.1** CDPR assists USFWS with habitat evaluation and data collection, as appropriate, in Oso Flaco Lake and stream.

5.5.5 Marsh Sandwort, La Graciosa Thistle, Surf Thistle, Beach Spectaclepod, Nipomo Mesa Lupine, Gambel's Watercress

Table 5-11 outlines the success criteria and performance standards associated with the objectives that will provide a basis for determining success of the overall conservation program. The rationale behind the criteria for marsh sandwort and Gambel's watercress are based on the Recovery Plan. Rationale behind the criteria for listed plant species are discussed in depth in section 5.2.6.

Table 5-11. Biological Goals, Objectives, and Success Criteria for Listed Plants

GOAL:

1. Protect and enhance habitat for marsh sandwort, La Graciosa thistle, surf thistle, beach spectaclepod, Nipomo Mesa lupine, and Gambel's watercress within the HCP area to sustain or increase their population.

Objectives:	Success Criteria/Performance Standards:
1.1 Restore listed plant habitat.	Success will be achieved when: **1.1.1** New populations and/or areas of suitable habitat for La Graciosa thistle, surf thistle, beach spectaclepod, Gambel's watercress, marsh sandwort, and Nipomo Mesa lupine are found in the HCP area. **1.1.2** Existing occupied sites are successfully managed as evidenced by increased population trends, low cover of invasive species, and successful management of other threats.
1.2 Protect listed plants from public encroachment.	Success will be achieved when: **1.2.1** Monitors and park staff do not observe any adverse impacts resulting from trespassing in fenced or other protected areas. **1.2.2** All La Graciosa thistle found in the vegetated islands within the open riding area are adequately protected (e.g., fenced or other suitable measures). **1.2.3** CDPR is actively eradicating non-native plants found within listed plant habitat. **1.2.4** Interpretive signs are posted in all areas where they are deemed necessary to keep public from trampling plants.
1.3 Informal trails in and adjacent to listed plant species habitat will be closed and restored to original condition.	Success will be achieved when: **1.3.1** Established trails near occupied habitat are marked, and informal trails are closed and restored. **1.3.2** CDPR discourages the proliferation of and or use of non-designated trails through the use of improved directional and regulatory signs, barriers, and fences and through the rehabilitation of closed trails. The more sensitive areas in terms of proximity of public

Table 5-11. Biological Goals, Objectives, and Success Criteria for Listed Plants	
	uses to listed plants will be protected at a higher level.
GOAL: **2. Manage invasive plants to protect listed plant species habitat.**	
Objectives:	**Success Criteria/Performance Standards:**
2.1 Manage invasive plants to protect listed plant species' habitat.	Success will be achieved when: **2.1.1** Within 10 years from time of HCP implementation, CDPR is conducting control of problematic infestations of invasive plant species at all high priority sites.
GOAL: **3. Minimize upstream water quality effects on marsh sandwort and Gambel's watercress and suitable habitat within the HCP area by facilitating cooperative management efforts with willing landowners.**	
Objectives:	**Success Criteria/Performance Standards:**
3.1 Conduct outreach to, and work with, willing landowners upstream of the HCP area whose activities affect water quality and quantity in the HCP area. Outreach and cooperative efforts with upstream land managers will seek to reduce impacts to water quality and quantity in target watersheds.	Success will be achieved when: **3.1.1** Erosion control measures are implemented in the HCP area to reduce siltation and contaminated runoff (e.g., by maintaining vegetation within buffers and/or through the use of straw bales, filter fences, vegetation buffer strips, or other accepted equivalents) to protect marsh sandwort and Gambel's watercress habitat. **3.1.2** CDPR encourages upstream land owners to cooperate and reduce impacts to water quality and quantity. CDPR obtains agreements with upstream land owners, when possible.
GOAL: **4. Collaborate with external agencies to propagate and outplant listed plants to HCP area lands.**	
Objectives:	**Success Criteria/Performance Standards:**
4.1 Coordinate with USFWS and other agencies to explore opportunities for propagation and outplanting of listed plants in the HCP area to enhance existing populations and to support new populations of listed plant species in currently unoccupied but suitable habitat.	Success will be achieved when: **4.1.1** CDPR and external agencies collaborate to develop outplanting plans for listed plant species.

5.6 Adaptive Management

Adaptive management is an iterative system of decision making that is particularly useful in the face of uncertainty. Adaptive management is a process that allows flexible management, such that actions can be adjusted as uncertainties become better understood or as conditions change—a "learning by doing approach"—that reduces the uncertainty inherent in resource management. Adaptive management should identify and address the uncertainty by incorporating a range of previously agreed-upon alternatives for addressing those uncertainties, integrating a monitoring program that detects the necessary information, and utilizing a feedback loop that links implementation and monitoring to a decision-making process that results in appropriate changes in management. Adaptive management should help the permittee achieve the biological goals and objectives of the HCP.

5.6.1 Adaptive Management Approach

The adaptive management strategy will be an integral part of an operating conservation program that addresses the uncertainty in the conservation of a species covered by an HCP. For the purposes of this HCP, adaptive management is an iterative decision-making process used to examine the effectiveness of the conservation program (e.g., AMMs and monitoring) for meeting this HCP's biological goals and objectives and, if necessary, adjusting management actions based on what is learned. New scientific information and changed conditions or circumstances (section 6.5.1) will also be evaluated to identify modifications to the conservation program components, such as modifications to AMMs.

Monitoring the outcomes of management through the performance standards and success criteria is the foundation of an adaptive approach. The biological monitoring program for the covered species will provide the information and data to assess the effectiveness of the conservation program in meeting the HCP's biological goals and objectives. The adaptive management process helps the conservation program achieve the biological goals and objectives by providing the framework for improving management, monitoring, and AMMs. As part of the adaptive management program, data are evaluated and management actions adjusted based on the relative success of the management actions in meeting the biological goals and objectives.

Based on ongoing adaptive management and monitoring of the covered species and scientific information currently available, CDPR expects that the management actions contained in this HCP represent the best management practices at this time. Therefore, the HCP's conservation program is expected to effectively achieve the HCP's biological goals and objectives. However, there is some uncertainty with resource management techniques and a risk that habitat conditions will change in unexpected ways. The natural systems that the covered species are a part of are inherently variable. Numerous factors (including management actions) affect how a population will respond to natural and human-related influences making the science of managing and predicting the responses of covered species to management inherently uncertain. Furthermore, new, different management techniques not identified in the HCP may become available that may be more effective in achieving the biological goals and objectives of the HCP. Adaptive management will be utilized to provide management flexibility to best afford protection for the covered species, including in the context of Changed Circumstances (section 6.5.1).

This section explains where current levels of uncertainty may necessitate future modifications to the conservation program, potential strategies to address these uncertainties, how the HCP's adaptive management process provisions will work, and how revisions under the adaptive management program will be made.

5.6.2 Role of Monitoring in Adaptive Management

CDPR is responsible for monitoring the status of the covered species and the effectiveness of the conservation program. The monitoring program is detailed in section 5.4 and will evaluate the success of the management measures in preserving the quality of existing habitat, preserving covered species populations, and the species' responses to habitat conditions. Monitoring is the cornerstone of adaptive management as it yields results that inform the management decisions. The performance standards and success criteria (section 5.5) provide a means to measure whether the conservation program is successful. Therefore, monitoring will continue to provide data that CDPR can rely on to identify successful management and monitoring techniques that achieve the HCP's biological goals and objectives, and it will identify any ineffective management and monitoring techniques. Thus, the monitoring program ultimately provides the valuable information for assessing the success of the conservation program in meeting the HCP's biological goals and objectives.

5.6.3 Modifications to the Conservation Program

The ability to modify the conservation program in the future, through the adaptive management process, will provide CDPR the flexibility needed to make management decisions to improve the efficacy and efficiency of the conservation program in achieving the HCP's biological goals and objectives. Adaptive management will also occur when AMMs do not produce the desired outcome or when a population of a covered species exhibits a decreasing trend in size beyond the fluctuations expected with natural variation. In these cases, AMMs will be modified and/or new measures will be implemented to improve the outcome for the covered species. Modifications made through adaptive management will generally reflect changes to the management of habitat and improvements to, or addition of new, AMMs. To summarize, future modifications to the conservation program through the adaptive management process will likely take place in the following situations:

- In response to a decline in the population of a covered species.
- When new information from relevant research or programs managing for the covered species elsewhere indicates that a feasible and superior alternative method for achieving the biological goals and objectives exists.
- When monitoring indicates that the expected or desired result of a management action did not take place or when monitoring indicates that alternative actions will produce better results.
- When future recovery plans for the covered species recommend recovery strategies (and management actions) that differ from the measures described in this HCP.
- When take of covered animal species approaches or exceeds permitted levels. AMMs may need to be revised if take of covered animal species approaches or exceeds allowable limits. If this is the case, then CDPR and the Wildlife Agencies will meet and confer to determine if the HCP AMMs need to be improved. If measures are determined to be inadequate, or if new techniques are available to more effectively avoid and minimize take, then revisions to the AMMs will be made as soon as practicable.
- When additional threats are identified through monitoring in the HCP area or other monitoring in the region.

Actions associated with adaptive management will be limited to:

- Modifications to the management actions or monitoring methods and timing.
- Modifications to monitoring protocols to improve effectiveness.

- Changes to the management techniques or monitoring methods based on recovery strategies in future recovery plans for the covered species that differ from the measures described in this HCP.
- Additional or different management actions in response to changed circumstances (section 6.5.1), such as non-native species or disease introduction, fire, drought, and climate change.
- Changes to Best Management Practices and AMMs.
- Agreed-upon changes to the size of the Southern Exclosure, as described in section 2.2.2.1.1, if the conditions described in section 5.2.3 are met.
- Minor changes of additions to the Covered Activities that do not introduce significant new biological impacts.

Any changes made pursuant to this section will be described in the Annual Report (section 6.4.1).

5.6.4 Triggers for Revisions to the Conservation Program

If biological monitoring reports indicate a consistent local population decline for a covered species,[92] if take of a covered animal species approaches or exceeds allowable limits, or if other performance standards are not met, then CDPR and USFWS will meet and confer to determine if inadequate management actions (e.g., conservation actions, monitoring actions, and avoidance and minimization measures) by CDPR are responsible for or are contributing to population declines. CDPR will revise the management actions in this HCP if inadequate management actions on the part of CDPR are determined to be responsible (in whole or in part) for such population declines or take beyond allowable limits is observed, or if new techniques are available for more effectively implementing management actions as agreed upon by CDPR and USFWS, as soon as practicable and in accordance with the process set forth in section 6.6.

This HCP includes population and reproductive thresholds for SNPL, whereby if the population size or reproductive rate falls below the threshold, additional management actions will be implemented. Population thresholds and an explanation of the thresholds follow:

- The SNPL threshold will be triggered if the HCP area breeding SNPL population percentage of the Unit CA-83 management potential falls below the range-wide average percentage of the 3,000 adult SNPL Recovery Plan target or the Management Potential Breeding Number of 155 (see Goal 1 in section 5.2.1), whichever is lower. The population threshold will be calculated using a moving 3-year window to account for range-wide population fluctuation. This threshold was developed to reflect the existing state of the entire U.S. Pacific Coast SNPL population in relation to the SNPL Recovery Plan target of 3,000 adult SNPL. For example, from 2016 to 2018, the average annual total breeding population size throughout the SNPL range was 2,330 birds, based on range-wide window surveys for the U.S. Pacific Coast (USFWS 2017a). To compare the recent range-wide annual average to the SNPL Recovery Plan target, the annual average is multiplied by 1.3, the factor used by USFWS to correct for undercounts on the window survey, and divided by the range-wide 3,000-bird target. This calculation indicates that the average annual range-wide SNPL population from 2016 to 2018 was at almost 101 percent of the 3,000-

[92] CDPR will monitor regional population trends for covered species to determine if population declines in the HCP area are local or region-wide. CDPR will not be responsible for population declines of covered species that are region-wide.

bird target (i.e., [2,330 X 1.3] / 3000). Therefore, for this time period, during which the range-wide average was slightly exceeding the Recovery Plan goals, the HCP area would have needed to achieve an average population of at least 155 birds. The number of breeding SNPL in the HCP area has exceeded the threshold since the 2008-2010 3-year period as shown in Table 3-8 and Figure 3-2.

- The CLTE threshold will be triggered if the 5-year average number of breeding CLTE pairs falls below 35. CLTE population sizes can exhibit large annual variation. Few CLTE may attempt to breed in some years, and after these low breeding years it may take more than 1 year to return to previous numbers (Table 3-10). From 1998 to 2017, an average of 37 pairs of CLTE nested in the HCP area; however, numbers fluctuated greatly between 4 and 55 pairs. Therefore, the status of the CLTE population will be assessed based on a 5-year running average of breeding pairs to take into account demonstrated population fluctuations. Under the intensive management regime currently employed in the HCP area (and recommended for this HCP's conservation program) it should be possible for CDPR to sustain a 5-year running average of at least 35 CLTE breeding pairs, as this has generally been attained since the 2001–2005 5-year period (Figure 3-7).93 Therefore, 35 breeding pairs of CLTE across a 5-year window was determined to be an appropriate criterion.

Should the adaptive management actions not be successful in raising the population and reproductive rates to the specified thresholds within the specified timeframe, CDPR and USFWS will determine if inadequate management actions by CDPR are responsible for or are contributing to population declines. If inadequate management actions on the part of CDPR are determined to be responsible (in whole or in part) for such population declines, or if new techniques are available for more effectively implementing management actions, then CDPR will revise the management actions in this HCP (section 5.6.3), as agreed upon by CDPR and USFWS, as soon as practicable.

Under the adaptive management provisions, the HCP can be modified, in coordination with the USFWS, to improve the efficacy and efficiency of the conservation program in achieving the HCP's biological goals and objectives or address new scientific information and/or changed circumstances, as discussed above in section 5.6.3. Changes to the HCP that are substantial in scope and are beyond the scope of the adaptive management program will require the amendment of the ITP and additional review and approval under FESA, CEQA, and NEPA, as described in section 6.6.

5.6.5 Adaptive Management Process

The USFWS HCP and ITP Handbook (2016) suggests that key components in making the adaptive process meaningful include careful planning through establishing goals and objectives, identifying uncertainties, incorporating a range of management options, implementing a sufficient monitoring program to determine success of the management actions, and a feedback loop from the results of the monitoring program that allows for change in the management strategies. Figure 5-1 presents a conceptual model of the adaptive management feedback loop. The purpose of the adaptive management feedback loop is to ensure that the biological goals and objectives for covered species are being met.

CDPR and USFWS will review the annual reports, including monitoring results and proposed changes or modifications to the conservation program, and will compare the results of monitoring to the goals and

[93] The 2009–2013 breeding season dropped just below 35, to 34 breeding pairs.

objectives for each species. The goal of the collaborative partner review of the annual report will be to measure progress and evaluate plan success through the following:

- Assessing status of populations of covered species
- Assessing progress towards achieving the HCP's biological goals and objectives
- Approving or denying modifications to the conservation program recommended in the annual report
- Suggesting modifications in addition to those recommended in the annual report, if necessary

The structure of the review, annual report requirements, and framework for implementing changes to the HCP identified in the adaptive management process are further described in Chapter 6.

The HCP is intended to contribute to the recovery of the covered species to the maximum extent feasible, consistent with the HCP's other goals and objectives, within the funding levels established in the HCP and within CDPR's mandate for the Oceano Dunes District. It is the intent of the HCP not to preclude or undermine recovery efforts for any of the covered species. Specifically, the HCP will incorporate modifications and/or revisions to the conservation program recommended by the Wildlife Agencies within the adaptive management process and recommendations contained in future recovery plans when such recommendations:

- Are expected to increase the effectiveness of the HCP's conservation and mitigation programs by identifying relevant new information, approaches, techniques, or species protection needs;
- Can be achieved within the HCP area;
- Fit within the overall intent, framework, and funding levels of the HCP; and
- Do not exceed the level of mitigation or financial compensation contemplated in the original HCP, pursuant to the "No Surprises" policy.

All such revisions to the HCP based on future recovery plans will be subject to the adaptive management revisions process described above.



Source: Adapted from ICLEI – Local Governments for Sustainability

Figure 5-1. Adaptive Management Process

5.6.6 Public Emergency Response

If habitat for a covered species is threatened by fire, flood, or similar emergency, emergency response personnel shall be permitted full access to the area as necessary to protect human life, property and/or plant, fish, and wildlife. If disturbance of habitat is necessary to protect life or to prevent the catastrophic loss of property, emergency personnel will, where time permits, attempt to contact the Resource Agencies (e.g., USFWS) for input on how best to respond to the emergency to maximize preservation of plant, fish, and wildlife species while preserving life and preventing the catastrophic loss of property. If time does not permit such coordination, CDPR will be authorized to permit emergency personnel to disturb habitat as necessary to preserve life and prevent the catastrophic loss of property. After the emergency relief process begins, CDPR will consult with the Resource Agencies to determine the schedule and need for rehabilitating the habitat.

5.7 Reporting

Annual Reports will be submitted to the USFWS. The annual report will include management actions performed that year and results of the year's monitoring activities. Annual reports may include recommended modifications to the conservation program (e.g., management actions, monitoring protocols, and avoidance and minimization measures) as outlined in sections 5.6.3 and 5.6.4.

Annual Reports to the USFWS will include a description of circumstances that made adaptive management necessary and how it was implemented. Further discussion of annual report requirements is provided in section 6.4.1.

Chapter 6. Plan Implementation

This chapter describes how the HCP will be implemented and the persons and entities responsible for its implementation.

6.1 Permittee – CDPR

CDPR is the Permittee. The HCP will be implemented out of the Oceano Dunes District, with the District Superintendent having implementation responsibility supported by District and other CDPR staff. The District Superintendent can issue orders addressing the covered activities, including:

- Temporary beach or other park area closures needed to protect wildlife resources.
- Strict enforcement of laws and regulations governing the park, including, but not limited to, no-entry areas, dogs in prohibited areas, dogs off leash in leash-only areas, horses off trails, and motorized vehicle restrictions.
- Permanent closures of trails or beaches.

The District Superintendent will need assistance from OHMVR Division Headquarters and CDPR management to obtain the necessary funding and in providing overall support of the HCP.

6.2 Permitting Agency – USFWS

The USFWS has authority for issuing the ITP and will be responsible for enforcing the provisions of the HCP and permit, assuring CDPR's compliance with the HCP, reviewing annual status reports, and responding to requests for amendments. The USFWS will also maintain and provide information regarding current survey protocols.

Once the USFWS issues the ITP, primary responsibility for implementing the HCP will rest with CDPR. However, the USFWS will receive reports concerning the HCP's implementation and will provide input on CDPR's implementation of the HCP's conservation program, as well as guidance on how to respond to changed circumstances (section 6.5).

6.3 Other Regulatory Agencies

6.3.1 CDFW

CDFW is not a permitting agency for the federal ITP supported by this HCP. It is anticipated, however, that CDFW will consult this HCP as part of its review of supporting documents in consideration of issuing an ITP pursuant to California Fish and Game Code section 2835 (NCCP) or 2081.

6.3.2 California Coastal Commission

The California Coast Commission (CCC) is not a permitting agency but may comment on the HCP and may have some review authority under the Coastal Zone Management Act.

6.4 Plan Oversight

6.4.1 Annual Report

CDPR will submit an Annual Report to USFWS that describes the habitat management and monitoring activities that took place throughout the HCP area during the preceding year and the scope of any

adaptive management modifications to the conservation program recommended for the upcoming year. The Annual Report will include, at a minimum, the following information:

- A summary of the covered activities executed during the reporting period.
- A summary of the impacts from covered activities (e.g., acres graded, amount of vegetation removed, facilities constructed), if any occurred.
- A summary of handling, relocation, and incidental take of any covered animal species that occurred, including cause of take, form of take, take amount, location of take and time of day, and deposition of dead or injured individuals.
- Monitoring results for covered species, including analysis, which may include compliance, effects, and effectiveness.
- A description of AMMs implemented and/or their status.
- A description of circumstances that made adaptive management action necessary, if any, and how it was implemented or is proposed for implementation.
- A discussion of any changed or unforeseen circumstances, including any recommended changes to the conservation program.
- A summary of proposed or approved amendments, if any.
- Funding expenditures and estimates.

The Annual Report will be due January 1 of each calendar year, or portion of a calendar year, during which the ITP will be in effect. If CDPR cannot provide the Annual Report by January 1, it will request an extension by December 15.

6.4.2 Special Projects Consistency Review

As discussed in section 2.2.5.9, special projects are those activities that are not considered routine but are required to meet a facility's need (e.g., installing vault toilets, rerouting trails). Such projects fall into two categories:

- Replacement/expansion of existing facilities in the existing facility footprint
- New facilities that are consistent with existing facilities, not to exceed 35 acres over the permit term

Prior to special project construction that could impact covered species (e.g., projects within primary SNPL and CLTE habitat), CDPR will submit to USFWS a description of the special project to be implemented, the location of the special project, the impacts associated with the special project, and AMMs that will be implemented during construction of the special project. The USFWS will review the project information and ensure that it is consistent with the conservation program in the HCP. The USFWS will provide CDPR with an email response regarding the project consistency with the HCP and approve, approve with additional conditions, or reject the project within 15 days of receiving the project information.

6.5 Changed and Unforeseen Circumstances

Section 10 regulations require that an HCP specify the procedures to be used for dealing with changed and unforeseen circumstances that may arise during the implementation of the HCP. In addition, the

HCP Assurances ("No Surprises") Rule (50 CFR §§17.22 (b)(5) and 17.32 (b)(5)) defines changed and unforeseen circumstances and describes the obligations of the permittee and the USFWS.

The purpose of the "No Surprises Rule" is to provide assurance to non-federal permittees participating in habitat conservation planning under FESA that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the permittee.

6.5.1 Changed Circumstances

Changed circumstances are defined under the federal "No Surprises Rule" in 50 CFR section 17.3 as "changes in circumstances affecting a species or geographic area covered by a conservation plan or agreement that can reasonably be anticipated by plan or agreement developers and the USFWS and that can be planned for (e.g., the new listing of species, or a fire, or other natural catastrophic event in areas prone to such event)." Changed circumstances must be identified and planned for in the HCP. Anticipating and addressing these changed circumstances adds to the conservation value of the HCP by reducing the potential risks associated with the changed circumstance and provides the USFWS with additional assurance that CDPR will take certain actions if such an event occurs. It also provides CDPR with the assurance that it will not be held accountable to fully compensate for impacts of natural events or incidents that are outside of its control.

If additional conservation and mitigation measures are deemed necessary to respond to changed circumstances and these additional measures were already provided for in the HCP's operating conservation program (including AMMs and mitigation measures expressly agreed to in the HCP), then the permittee will implement those measures as specified in the HCP. However, if additional measures are deemed necessary to respond to changed circumstances and such measures were not provided for in the HCP's operating conservation program, the USFWS will not require these additional measures absent the consent of CDPR, provided that the HCP is being "properly implemented" (i.e., the commitments and the provisions of the HCP have been or are fully implemented).

Changed circumstances potentially affecting the HCP area are defined as future events for which it is reasonably foreseeable that such an event could occur during the life of the HCP, and that may negatively affect the covered species and/or their associated habitat within the HCP area. For each changed circumstance, the HCP identifies additional conservation and mitigation measures that will be used to respond to the changes in circumstance. To fund the remedial management to address changed circumstances as well as adaptive management, CDPR will use the existing annual budget and contingency funds (section 7.1). If additional funds are needed to address changed circumstances, CDPR will seek HCP funding augmentation via discretionary reallocation of funds already allocated to the Oceano Dunes District or request a budget amendment. CDPR will guarantee that it will request sufficient funding from the legislature on an annual basis to properly implement the HCP (section 7.3). Changed circumstances addressed by this HCP include the following:

- New species listings
- Vandalism
- Drought
- Fire
- Flooding/high tides
- Non-native species or disease introduction

- Predators
- Climate change or sea level rise
- High winds

6.5.1.1 New Species Listings

Over the 25-year term of the HCP, a species may be listed as threatened or endangered under FESA that is not covered in this HCP, and USFWS may designate critical habitat in conjunction with the listing. If a non-covered species becomes listed, the following remedial measures will be taken.

- The potential impacts of covered activities on a newly listed species and its designated critical habitat will be evaluated, including an assessment of the presence of suitable habitat in the impact area.
- CDPR will develop measures to avoid take of the newly listed animal species until the HCP is amended to cover the species or will comply with FESA via other means (e.g., individual section 7 or 10 consultations).

Should a species not covered by the HCP be listed, proposed, or petitioned for listing, CDPR may request that USFWS add the species to the section 10(a)(1)(B) permit. In determining whether or not to seek incidental take coverage for the species, CDPR will consider, among other things, whether the species is present in the permit area and if otherwise lawful activities could result in incidental take of the species. If incidental take coverage is desired, the HCP and permits could be modified or amended (section 6.6). CDPR will use contingency funds (section 7.1) for this purpose. If the cost to address the newly covered species exceeds the allocated annual budget and contingency fund, CDPR will pursue reallocation of funds or request additional funds as outlined in section 7.3. Alternatively, CDPR could apply for new and separate permits subject to separate funding.

6.5.1.2 Vandalism

Vandalism and other intentional, destructive, illegal human activities have occurred within the HCP area in the past and are reasonably likely to occur in the future. Therefore, vandalism and other intentional, destructive, illegal human activities are considered changed circumstances. For example, destruction of signs, exclosure fences, symbolic fencing, and illegal dumping are considered vandalism. If one of these circumstances occurs and results in adverse impacts on covered species or associated habitat, CDPR will determine the extent of the damage.

In the past, CDPR has addressed these circumstances within its allotted current annual budget. In the future, if one of these circumstances occurs, CDPR, with the concurrence of USFWS, will determine the extent of the damage and identify and implement an appropriate response. CDPR will use a variety of management techniques to control vandalism and to repair damage due to vandalism. These measures may include repairing damaged fencing, installing an alternate type of fencing, repairing signs, or creating obstacles to limit access. The HCP annual budget has been estimated with the assumption that some level of vandalism will occur; therefore, it already accounts for the material, staff time, and equipment costs necessary to repair these damaged areas. CDPR has also included additional contingency funds (section 7.1), to address more extensive vandalism that could occur requiring remedial action exceeding the annual budget. If the cost to repair the vandalism exceeds the allocated annual budget and contingency fund, CDPR will pursue reallocation of funds or request additional funds as outlined in section 7.3.

6.5.1.3 Drought

Drought is a natural part of a Mediterranean climate system to which species and natural communities have adapted. However, a prolonged drought could occur, which could cause serious damage to the HCP-area covered species and habitat. Defining when a drought occurs is difficult because there is no universal definition of the conditions that constitute a drought. A generic definition might be a "persistent and abnormal moisture deficiency having adverse impacts on vegetation, animals, or people" (U.S. Department of Commerce, National Weather Service). A drought is generally perceived as a serious departure from normal precipitation conditions.

The California Department of Water Resources (DWR) has used two primary criteria for identifying drought conditions, including runoff and reservoir storage. However, conditions often vary from region to region, or within a region, and potential changes in rainfall conditions due to climate change are still unknown. Because droughts of up to 6 years have occurred in the last 25 years (DWR 2015), for purposes of this HCP, a drought of 6 years or less is a changed circumstance and a drought longer than 6 years is an unforeseen circumstance and would be addressed in accordance with section 6.5.2. Impacts from drought conditions are likely to impact tidewater goby and CRLF the most.

If a drought of up to 6 years occurs and results in adverse impacts on covered species or associated habitat, CDPR will determine the extent of the damage and notify USFWS of the changed circumstance, or USFWS may notify CDPR. CDPR will ensure that the damage caused by the drought is assessed. Any remedial actions recommended by USFWS will be consistent with the scope and extent of the AMMs and mitigation measures defined in this HCP (section 5.3.1 and 5.3.2) and within the funding allocated for HCP and adaptive management implementation as outlined in section 5.6 and will include a solution that is accepted by both CDPR and the USFWS. CDPR will be responsible for implementation of such measures and will use available HCP funding, including contingency funding, (section 7.1) for this purpose. If the cost to implement the measures exceeds the allocated annual budget and contingency fund, CDPR will pursue reallocation of funds or request additional funds as outlined in section 7.3. There are few, if any, actions that CDPR could undertake that would ameliorate drought conditions lasting longer than 6 years; thus, a drought lasting longer than 6 years is an unforeseen circumstance.

6.5.1.4 Fire

Fire is a natural component of many ecosystems and natural community types. Fires have occurred in or near the HCP area in the past and could continue to occur within the HCP area. The source of the fire is dependent on the source of ignition, including human mechanisms (e.g., vehicles, cigarettes, campfires) and natural mechanisms (e.g., lightning strike). In general, the California Department of Forestry and Fire Protection has rated the fire potential in the HCP area as moderate. This classification was derived from a combination of fuels, terrain, weather, and other relevant factors.

Fire potential in the HCP area is typically greatest in the months of June through September, when dry vegetation occurs with low humidity. Generally, the vegetation communities within the HCP area are adapted to frequent fire regimes and are expected to naturally recover from fire. However, unnaturally intense fires could damage biological resources and covered species. The coastal areas of San Luis Obispo County have only experienced a few small wildland fires. Therefore, based on historical wildfires, it is expected that the HCP area could experience a small wildland fire that burns up to 20 percent of covered species habitat in the HCP area every 10 years, and this event is considered a changed circumstance. A wildfire that occurs more than once in 10 years or burns more than 20 percent of covered species habitat is considered an unforeseen circumstance.

CDPR will include fire management and protection measures that will minimize the risk of damage to covered species habitats and natural communities from fire outside the normal range. Preventive

measures may include fire management measures such as redesigning, reconfiguring, and/or reviewing fuel breaks (e.g., Oceano Campground); working with local fire agencies to improve fire suppression and preparedness and strategies to protect habitat during fire response; and contacting firefighting authorities to identify appropriate strategies to fight fires to minimize habitat damage.

If this changed circumstance occurs in the HCP area, as defined above, CDPR will notify the USFWS of this changed circumstance. CDPR will ensure that the damage caused by the fire is assessed and will ensure the implementation of the following actions:

- Within 1 year after the fire, initiate the appropriate actions, such as habitat restoration, invasive species control, and/or erosion control, in the affected areas to ensure the re-establishment of listed plants and other native vegetation through active or passive means, as appropriate.
- Implement measures through the adaptive management program (section 5.6) in ways consistent with permit obligations.
- If deemed necessary, ensure appropriate erosion control structures and applications (e.g., seeding) are in place prior to the following rainy season.

CDPR will be responsible for implementation of such measures and will use contingency funds (section 7.1) for this purpose. If the cost to implement the measures exceeds the allocated annual budget and contingency fund, CDPR will pursue reallocation of funds or request additional funds as outlined in section 7.3.

6.5.1.5 Flooding/High Tides

Over the years, the HCP area and vicinity have experienced flooding events that have resulted in property damage. Floods in the area have caused streams and creeks to overflow and inundate surrounding areas and trees to fall and damage surrounding habitat or structures. King tides can inundate habitat or cause saltwater intrusion in creeks and lakes or creeks to fill with sediment. These issues may be exacerbated with climate change (section 6.5.1.8). Flooding associated with a 100-year event or greater and high tides associated with a 1 percent exceedance probability level or less is considered unforeseen circumstances.

The effects of flooding/high tides on the HCP's covered species would depend on several factors, including the severity of the event, the event duration, and the type of habitat affected. Overall, the adverse effects of flood events on the HCP's covered species are expected to be relatively minor, largely because many of the HCP's covered species are either adapted to flooding (e.g., the California red-legged frog) or are capable of fleeing the harm of such events (e.g., birds). However, in some cases, flood damage to covered species habitat in the HCP area could be significant and could include pond/lagoon damage, sedimentation, downed trees and shrubs, deposits of debris into creeks, and bank destabilization.

If flooding or high tide damage that threatens known populations of covered species occurs in the HCP area during the term of the permit, CDPR, in consultation with USFWS, will develop a plan for implementing measures to correct for flood damage. Measures will include, but not be limited to, the removal of sediment or debris, replacing downed fencing, bank stabilization, erosion control, replanting vegetation, and any other measures determined by consensus agreement between CDPR and the USFWS. CDPR will be responsible for implementation of such measures and will use contingency funds (section 7.1) for this purpose. If the cost to implement the measures exceeds the allocated annual budget and contingency fund, CDPR will pursue reallocation of funds or request additional funds to implement these measures as outlined in section 7.3. CDPR may begin implementing remedial measures

prior to consulting with the USFWS to prevent further loss of habitat or other adverse effects to covered species.

6.5.1.6 Non-native Species or Disease Introduction

Invasive species currently inhabit the HCP area. The conservation program (Chapter 5) includes measures to reduce and prevent infestation of invasive species. Non-native plants and animals will be monitored and mapped as described in section 2.2.2.3. However, a new, aggressive invasive species could possibly invade the HCP area. Similarly, infestations of a new disease that affects covered or dominant species (e.g., chytrid fungus) in the HCP area could be introduced and have a dramatic effect on covered species and/or covered species habitat.

Large infestations (i.e., affecting greater than 50 percent of the HCP area) of a new or existing disease, invasive plant, or invasive animal can become very expensive to control and could substantially impact the operating budget for the HCP. Therefore, for the purposes of this HCP, infestations of new or existing diseases, invasive species, or spread of existing invasive species beyond 50 percent of the baseline condition within the HCP area are considered unforeseen circumstances. The monitoring program (section 5.4) will identify existing invasive species in the HCP area so that new invasive species can be identified quickly and removed.

If a new non-native plant or animal infestation occurs that poses an imminent threat to known populations of any covered species, and control of the infestation will require expenditure of funds in excess of those anticipated for implementation of this HCP, then CDPR, in consultation with USFWS, will assess the extent of the damage. CDPR will prepare a report within 90 days of the discovery of the infestation that describes the extent of the problem and identifies a range of remedial actions. The report will be submitted to USFWS for review. CDPR, in consultation with USFWS, will determine within 90 days what measures will be implemented to address the problem. CDPR has included funds in the annual HCP budget to control known populations of invasive exotic species including veldt grass, European beachgrass, iceplant/hottentot fig, and Russian wheat. Additional funding from the HCP annual budget can also be redirected to new infestations that threaten to degrade occupied habitat of HCP covered species.

Diseases in the HCP area could include chytrid fungus and ranavirus, among others. However, it is unknown whether these diseases are a problem for the covered species populations in the HCP area due to a lack of data. In general, the effects of diseases on the survival and reproduction of covered species in the HCP area is not known. When a disease that could impact a covered species or covered species habitat is detected, CDPR will contact USFWS to collaborate on determining the best method of measurement, monitoring, and eradicating or controlling the disease before it spreads beyond the 50 percent threshold of unforeseen circumstances. Planned responses to the spread of disease will include determining the best method for measurement and tracking the extent, preparing a damage assessment report, recommending and planning actions to address the disease to the extent possible, and responding through the adaptive management program (section 5.6) in ways consistent with permit obligations. HCP contingency funds (section 7.1) could be used to address response to disease affecting the covered species but that exceeds the annual budget. If the cost to implement the response measures exceeds the allocated annual budget and contingency fund, CDPR will pursue reallocation of funds or request additional funds as outlined in Section 7.3. A disease that has spread beyond a level that can be effectively controlled (e.g., on a Countywide or Regionwide basis) will be considered an unforeseen circumstance beyond the scope of this HCP.

6.5.1.7 Predators

Predators are currently monitored in the HCP area from February through September by CDPR and contractors to collect information on predator presence in and around the HCP area. Predator management, including hazing, trapping, and lethal removal, is conducted, as appropriate, to remove predators that are a threat to covered species (section 2.2.2.1.2). Ongoing predator monitoring and management in covered species habitat is expected to alert biologists of any significant changes in predation and trigger a step-up control program for that particular problem. However, at times, a predator can move into covered species habitat quickly and cause harm or mortality of covered species prior to being trapped or lethally removed. If a major change in predation of a covered species is observed, such that more than 50 percent of a covered species population is impacted in 1 year, this will be considered a changed circumstance. If an increase in predators occurs that requires expenditure of funds in excess of those needed for normal predator management, CDPR, in consultation with USFWS, will assess the extent of the damage to the covered species. CDPR will prepare a damage assessment report within 60 days of the discovery of the problem that describes the extent of the problem and identifies a range of remedial actions. The report will be submitted to USFWS for review. CDPR, in consultation with USFWS, will determine within 30 days what remedial measures will be implemented to address the problem. CDPR will be responsible for increasing the level of effort associated with the predator management program and will use contingency funds (section 7.1) for this purpose. If the cost to implement the measures exceeds the allocated annual budget and contingency fund, CDPR will pursue reallocation of funds or request additional funds as outlined in Section 7.3.

6.5.1.8 Climate Change or Sea Level Rise

Climate change refers to a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties using statistical tests or other means, and that persists for an extended period, typically decades or longer (Cubasch et al. 2013). There are many indicators of climate change. These indicators include physical responses, such as changes in surface temperature, atmospheric water vapor, precipitation, severe events, glaciers, ocean and land ice, and sea level. Climate change is also predicted to include secondary effects such as sea level rise and changing climatic patterns that may affect the frequency of disturbance events such as flooding and fire.

In coastal areas, one of the primary concerns associated with global climate change is the potential for sea levels to rise and for the frequency and intensity of coastal storm events to increase. Until 2050, there is strong agreement among the various climate models for the amount of sea level rise that is likely to occur. After mid-century, estimates of sea level rise become more uncertain; sea level rise projections vary with future projections due in part to modeling uncertainties, but primarily due to uncertainties about future global greenhouse gas emissions and uncertainties associated with the modeling of land ice melting rates.

Potential impacts of climate change within the HCP area include:

- **Reduced groundwater recharge**. The region may see more severe, but not more frequent, rainfall events, leading to quick pulses of runoff. Poor land use practices upstream of the HCP area prevent much of the rain from infiltrating into the ground. This would potentially impact covered species at Pismo Creek, Pismo Lake, Arroyo Grande Creek, Oso Flaco Creek, and Oso Flaco Lake.
- **Exacerbated impacts of groundwater pumping**. Groundwater pumping leads to the lowering of water tables, causing low flows and dry periods in rivers and streams, contraction of riparian areas and wetlands, and stress to aquatic organisms. Because groundwater use by agriculture and local communities is not monitored, a sustainable level of use has not been identified. As

climate change progresses, current usage rates would likely lead to increasingly severe negative impacts to aquatic systems at Pismo Creek, Pismo Lake, Arroyo Grande Creek, Oso Flaco Creek, and Oso Flaco Lake.

- **Coastal flooding of low-lying areas**. Coastal storms can cause coastal flooding of low-lying areas, inundating economically important infrastructure. The erosive impact of storms could also cause severe damage to coastal developments and facilities. Flooding and high tides potentially affecting the covered species and/or covered species habitat are addressed above in section 6.5.1.5.
- **Fish population impacts**. Climate change is expected to impact fish populations directly through warming ocean waters, increasing ocean acidity, changing currents and nutrient availability, and inundation of coastal wetlands.
- **Increased beach erosion**. Beach erosion will increase in many areas. Other coastal areas may see more sediment deposition (see below).
- **Increased sedimentation**. Sedimentation is likely to increase in marshes, estuaries, and coastal streams. Potential fire and severe storms could exacerbate already high rates of sediment runoff. This could lead to shallower, warmer water, with complete loss of some estuaries due to sedimentation combined with sea level rise.
- **Inundation of coastal marshes and wetlands**. Sea level rise is expected to cause inundation of coastal marshes and wetlands. Many species, including SNPL and CLTE may be affected.
- **Saltwater intrusion**. Saltwater is likely to intrude into estuaries and creeks along the coast, especially in the Arroyo Grande watershed. Flooding could occur in the Arroyo Grande and Grover Beach areas. Willow habitats could be threatened by saltwater, especially near Pismo Beach.
- **Decline in important coastal habitats**. Coastal dune scrub and willow thickets, as well as other important habitats, may decline from changes in temperature, precipitation, and salinity associated with climate change.
- **Shifts in species phenology, ranges, and distribution**. Climate change may precipitate changes in phenology and shifts in the range and distribution of species. A number of ecological responses to climate change in combination with other non-climate stressors could occur in the HCP area. For example, the timing of seasonal events, such as migration, flowering, and egg laying may shift earlier or later. Such shifts may affect the timing and synchrony of events that must occur together. In addition, climate change could play a role in shifting the range and distribution of species and natural communities. This is of particular concern for narrowly distributed species that already have restricted ranges such as the listed plant species in this HCP.

CDPR's response to climate change and, therefore, the delineation of changed circumstances for climate change, is more appropriately gauged by the character and magnitude of the physical and biological changes in covered species and associated habitat types within the HCP area. A major focus of the conservation program is enhancing and actively managing habitat within the HCP area to address various factors that threaten persistence of the covered species populations, including, but not limited to, exotic species. Importantly, the HCP monitoring program is designed to detect changes in the covered species populations and habitats that may result directly or indirectly from climate change. Effects of climate change are also addressed through the closely related remedial responses to changed circumstances of fire, drought, flood, and invasive species. Because of the high level of uncertainty of

how natural communities and species will respond to climate change, remedial actions would be implemented through the adaptive management program (section 5.6), consistent with the scope and extent of the AMMs and mitigation measures defined in this HCP (section 5.3.1 and 5.3.2) and limited to the funding allocated for HCP implementation and adaptive management. Management strategies can be adjusted over time as part of the adaptive management process to address climate change issues. Such remedial actions may include those listed below:

- Modified or enhanced monitoring to detect ecological responses to climate change, including threat monitoring.
- Status and trends monitoring of target species identified as the most vulnerable to climate change.
- Targeted control of invasive species that respond positively to climate change.

In addition, if rising sea levels result in a net loss of covered species habitat over the term of the HCP, CDPR will discuss with the USFWS appropriate implementation measures to address these changes. Future actions responding to this changed circumstance will be determined by consensus agreement between CDPR and the USFWS, limited by the funding allocated for HCP and adaptive management implementation, and will be based on the nature and extent of the effects associated with rising sea levels. If the cost to implement the measures exceeds the allocated annual budget and contingency fund, CDPR will pursue reallocation of funds or request additional funds as outlined in Section 7.3.

6.5.1.9 High Winds

Wind speeds[94] between 0 and 30 mph regularly occur in the HCP area (CDPR 2015b, 2016, 2017a). Wind speeds between 30 and 45 mph occasionally occur in the HCP area and can cause damage to covered species, especially SNPL and CLTE eggs and chicks. As a result, it is appropriate to treat sustained high winds (i.e., winds between 30 and 45 mph) as a changed circumstance. Wind speeds above 45 mph rarely occur in the HCP area and are therefore considered an unforeseen circumstance.

The effects of high winds on the HCP's covered species would depend on several factors, including the severity of the event, the event duration, and the type of covered species habitat affected. Overall, the adverse effects of high wind events on the HCP's covered species are expected to be relatively minor, largely because many of the HCP's covered species are either adapted to high wind or are capable of fleeing the harm of such events. However, in some cases, high wind damage to the HCP area could be significant and could include directly killing a covered species, including adults, juveniles, or eggs (e.g., if sand buries a nest with eggs), damaging or destroying protective fencing, or damaging or destroying suitable habitat on which covered species rely for breeding, feeding, and sheltering.

Should high winds occur within the HCP area as defined in this section, CDPR will notify USFWS of this changed circumstance. CDPR will ensure that the damage caused by the high winds is assessed and recommend remedial actions. Any remedial actions will be consistent with the scope and extent of the AMMs and mitigation measures defined in this HCP (section 5.3.1 and 5.3.2**)**. Measures will include replacing downed fencing, replanting vegetation, removing debris and downed trees, and any other measures determined by consensus agreement between CDPR and the USFWS. CDPR will be responsible for implementation of such measures and will use contingency funds (section 7.1) for this purpose. If the

[94] Wind speeds in the HCP area are measured at an anemometer at 10 meters in height.

cost to implement the measures exceeds the allocated annual budget and contingency fund, CDPR will pursue reallocation of funds or request additional funds as outlined in section 7.3.

6.5.2 Unforeseen Circumstances

Unforeseen circumstances are defined in 50 CFR section 17.3 as changes in circumstances that affect a species or geographic area covered by the HCP that could not reasonably be anticipated by plan developers and the USFWS at the time of the HCP's negotiation and development and that result in a substantial and adverse change in status of the covered species. The purpose of the "No Surprises Rule" is to provide assurances to non-federal landowners participating in habitat conservation planning under the FESA that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of unforeseen circumstances, without the consent of the permittee.

In case of an unforeseen event, the permittee will immediately notify the USFWS staff who have functioned as the principal contacts for the HCP. In determining whether such an event constitutes an unforeseen circumstance, the USFWS will consider, but not be limited to, the following factors: size of the current range of the affected species; percentage of range adversely affected by the HCP; percentage of range conserved by the HCP; ecological significance of that portion of the range affected by the HCP; level of knowledge about the affected species and the degree of specificity of the species' conservation program under the HCP; and whether failure to adopt additional measures will appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

If the USFWS determines that additional AMMs and/or mitigation measures are necessary to respond to the unforeseen circumstances where the HCP is being properly implemented, the additional measures required of the permittee must be as close as possible to the terms of the original HCP and must be limited to modifications within any conserved habitat area or to adjustments within lands or waters that are already set aside in the HCP's operating conservation program. Additional measures will involve the commitment of additional land or financial compensation or restrictions on the use of land or other natural resources otherwise available for modification or use under original terms of the HCP only with the consent of the permittee. Thus, in the event that unforeseen circumstances adversely affect any of the covered species during the life of this HCP, the permittee will not be required to provide additional financial compensation, land, or land restrictions beyond those required by the HCP at the time of issuance of the ITP without its consent. This prohibition does not; however, affect the requirements for responding to changed circumstances as described in section 6.5.1.

6.6 Amendments

Amendments to the ITP and the HCP may be proposed by CDPR and/or USFWS. Any amendments made must be in accordance with all applicable legal requirements, including, but not limited to, FESA, NEPA, USFWS permit regulations, and CEQA permit regulations. The party proposing the amendment(s) will provide to the other two parties a written statement of the reasons for the amendment(s) and an analysis of the effect of the amendment(s) on the environment, covered species, and the implementation of the HCP. The categories of amendments that are recognized, in order of significance, include administrative changes, minor modifications, and major amendments. Each amendment type is described in more detail in the following sections.

6.6.1 Administrative Changes

Administrative changes are internal changes or corrections to HCP implementation that do not require preauthorization from USFWS. Administrative changes will not result in any changes to the impacts analysis, conservation program, or decision documents. Administrative changes will be made in writing

and documented by CDPR. USFWS will be provided a summary of administrative changes in each annual report. Examples of administrative changes are listed below.

- Day-to-day implementation decisions, such as modifying timelines for installing exclosures where the ultimate date of exclosure completion is not modified.
- Conducting additional monitoring surveys.
- Modifying HCP monitoring protocols to align with USFWS monitoring protocols as they may be modified in the future.
- Adopting new monitoring protocols that may be promulgated by USFWS in the future.
- Annual adjustments to the HCP funding program to keep pace with inflation.
- Minor administrative changes, including, but not limited to, change in personnel or mailing addresses.

6.6.2 Minor Amendments

Minor amendments are changes that do not adversely affect the impact assessment or intent of the conservation program described in the HCP and do not adversely affect the ability of CDPR to achieve the biological goals and objectives of the HCP. Minor amendments will also not change the amount of take, add new species, or significantly change the boundaries of the HCP. In addition, minor amendments will not change the scope or nature of the covered activities and will not trigger a new NEPA analysis. Minor amendments do not require an amendment to the permits, but they do require pre-approval by USFWS before being implemented. Examples of minor modifications are listed below.

- Corrections of errors in the HCP that do not change the intended meaning or obligations.
- Corrections of spelling errors.
- Correction of any tables or appendices in the HCP to reflect previously approved amendments to the HCP or the permit.
- Minor corrections to the HCP boundaries or other insignificant mapping errors.
- Updates to the land cover map or to species occurrence data that are consistent with the predictions and expectations of the HCP.
- Minor changes to the biological goals or objectives in response to adaptive management.
- Modifying the design of studies or implementing new studies.
- Modification of monitoring protocols to improve the effectiveness of monitoring efforts, but not in response to changes in monitoring protocols from USFWS.
- Modification of existing or adoption of additional AMMs that improve the likelihood of achieving HCP species objectives.
- Discontinuing implementation of AMMs if they are ineffective.
- Adoption of new AMMs that improve the likelihood of achieving the biological goals and objectives.
- Minor changes to the reporting protocol.

- Modification of existing or adoption of new performance standards and success criteria if monitoring, research, and/or new information indicate that the initial performance standards and success criteria need revision.
- Modification of existing or adoption of additional covered species objectives where such changes are consistent with achieving covered species and overall HCP goals.
- Changes to the funding sources.
- Use of new pesticides consistent with manufacturer's label as long as the USFWS have analyzed and agreed that no new impacts to covered species will occur.
- Any other types of modifications to the HCP that are minor in relation to the HCP's goals and that USFWS has analyzed and agreed to.

6.6.2.1 Minor Amendment Process for Section 10(a)(1)(B) Permit

Minor amendments may be made to the HCP by CDPR and/or USFWS. Except where another process is specifically identified under the terms of the HCP with respect to particular types of modifications or as provided below, the party proposing a minor amendment must provide notice to the other parties. Such notice will include a statement of the reasons for the proposed amendment and an analysis of its environmental effects, including its effects on the implementation of the HCP and on covered species.

The parties will use best efforts to respond to proposed amendments within 60 days of receipt of such notice. Except as otherwise provided under the terms of the HCP, proposed amendments will become effective upon all other parties' written approval or as otherwise provided under the terms of the HCP.

USFWS may object to a proposed minor amendment only upon a written statement that the federal permit or the HCP would not meet the requirements of FESA section 10(a)(2)(B). USFWS will not propose or approve minor amendments to the HCP if USFWS determines that such modifications will: 1) result in operations under the HCP that are significantly different from those analyzed in connection with the original HCP; 2) result in adverse effects on the environment that are new or significantly different from those analyzed in connection with the original HCP; or 3) allow significant additional take not analyzed in connection with the original HCP. Where possible, before rejecting a proposed minor amendment, USFWS will first consult CDPR and suggest reasonable conditions or alterations to the proposal which, if agreed to by CDPR, would permit USFWS to approval the proposed minor amendment.

CDPR can object to a proposed minor amendment upon any reasonable basis. If, for any reason, a receiving party reasonably objects to a proposed minor amendment, and the objection is not resolved by any conditions or alterations, the proposed minor amendment will be processed as a major amendment of the federal and/or state permit.

6.6.3 Major Amendments

Major amendments to the HCP and permit are changes that may affect the impact analysis or the scope of the HCP and conservation program. Major amendments to the HCP may also increase the amount of take, add new species, or change significantly the boundaries of the HCP. Major amendments require amending the HCP and the ITP through the same formal process as the original HCP and permit, including NEPA/CEQA review, a Federal Register notice, an internal section 7 consultation with the USFWS. Major amendments will often require additional public review and comment.

CDPR will submit a major amendment to USFWS in a report that includes a description of the need for the amendment, an assessment of its impacts, and any alternatives by which the objectives of the

proposal might be achieved. Examples of changes that will require a major amendment include, but are not limited to, those listed below.

- Revisions of the permit area boundary, including revisions necessary due to land acquisition, that do not qualify for a minor modification.
- Addition of species to the covered species list.
- Increasing the allowable take limit for existing covered activities, changing the form of take, or adding new covered activities to the HCP.
- A major change to a conservation program milestone (e.g., extending a deadline).
- Revisions to any important action or component of the conservation program under the HCP, including funding, that may substantially affect levels of authorized take, effects of the covered activities, or the nature or scope of the conservation program.
- A major change in the biological goals and objectives or AMMs if monitoring or research indicates that that a biological goal or objective and/or AMM is not attainable.
- Modifications to covered activities that could affect levels of authorized take.
- Extending the permit term beyond 25 years.
- Changing the funding so that it affects the ability of the permittee to implement the HCP.

6.6.3.1 Major Amendment Process for the Section 10(a)(1)(B) Permit

To amend the section 10(a)(1)(B) permit, the Applicant will submit a formal application to USFWS. This application must include a revised HCP, a permit application form, any required fees, and the required compliance document under NEPA. The appropriate NEPA compliance process and document will depend on the nature of the amendment being proposed. A new scoping process may be required, depending on the nature of the amendment. If additional scoping is deemed appropriate and necessary, USFWS will publish a Notice of Intent in the Federal Register to initiate the scoping process. Upon submission of a completed application package, USFWS will publish a notice of the proposed application in the Federal Register, initiating the NEPA and HCP review process. After public comment, USFWS may approve or deny the permit amendment application.

6.7 Enforcement

The provisions of this HCP are enforceable through the terms and conditions of the ITP issued by the USFWS.

6.8 Suspension/Revocation

The USFWS may suspend or revoke the permit if CDPR fails to implement the HCP in accordance with the terms and conditions of the permits or if suspension or revocation is otherwise required by law. Suspension or revocation of the section 10(a)(1)(B) permit, in whole or in part, by the USFWS will be in accordance with 50 CFR sections 13.27-29, 17.22 (b)(5), and 17.32 (b)(5), as may be amended over time.

6.9 Federal Permit Renewal

When the ITP expires, CDPR is no longer protected from take that may occur as a result of its management of the HCP area, provided that the covered species are still listed at the expiration of the

permit. Upon expiration, the section 10(a)(1)(B) permit may be renewed without the issuance of a new permit, provided that the permit is renewable, and that biological circumstances and other pertinent factors affecting covered species are not significantly different than those described in the original HCP (50 CFR §13.22). To renew the permit, CDPR will submit to the USFWS, in writing, all of the following:

- A request to renew the permit.
- Reference to the original permit number.
- Certification that all statements and information provided in the original HCP and permit application, together with any approved HCP amendments, are still true and correct, and inclusion of a list of changes.
- A description of any take that has occurred under the existing permit.
- A description of any portions of the project still to be completed, if applicable, or what activities under the original permit the renewal is intended to cover.

If the USFWS concurs with the information provided in the request, it will renew the permit consistent with permit renewal procedures required by federal regulation 50 CFR section 13.22. If CDPR files a renewal request and the request is on file with the issuing USFWS office at least 30 days prior to the permit's expiration, the permit will remain valid while the renewal is being processed, provided the existing permit is renewable. However, CDPR may not take listed species beyond the quantity authorized by the original permit or change the scope of the HCP. If CDPR fails to file a renewal request within 30 days prior to permit expiration, the permit will become invalid upon expiration. CDPR must have complied with all annual reporting requirements to qualify for a permit renewal.

6.10 Permit Transfer

Permit transfers usually are the result of an exchange in the ownership of the covered lands (i.e., HCP area). The new owner will assume the responsibilities associated with the HCP and will also expect to receive the benefits of the permit. An assumption agreement will be prepared and will outline the roles and responsibilities of all the parties including the USFWS and address any outstanding obligations and how they will be completed. The assumption agreement will be a joint submittal by the transferor and transferee as prescribed by 50 CFR section 13.25 or it can resemble a memorandum of understanding.

A partial permit transfer can also be obtained and works the same way as a full permit transfer, except that only a portion of the HCP responsibilities or permit area will change ownership. The division of the HCP area and covered species will be addressed in the assumption agreement and ITP.

The administrative process to transfer a permit is similar to the minor amendment process (section 6.6.2) and will not require public notices. In a complete transfer, the USFWS will issue an amended permit to the new owner. In a partial transfer, the USFWS will issue an amended permit to the original permittee and a new permit to the new owner. Any permit issued will retain the expiration date of the original permit; however, the permittee or transferee can request a permit renewal to alter the expiration date.

In the event of a full or partial permit transfer, the new owner(s) will submit: a new permit application form (3-200-56), a permit fee, and written documentation providing assurances pursuant to 50 CFR section 13.25 (b)(2) that the new owner will provide sufficient funding for the HCP and will implement the relevant terms and conditions of the permit, including any outstanding minimization and mitigation. The new owner(s) will commit to all requirements regarding the take authorization and mitigation obligations of this HCP unless otherwise specified in writing and agreed to in advance by the USFWS.

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Chapter 7. Funding

7.1 Costs of HCP Implementation

Implementing the HCP will require the expenditures of funds by CDPR equal to the funds spent on the conservation program in the 2019/2020 Fiscal Year. The estimates account for all personnel time and equipment. All amounts are in 2019 dollars unless otherwise noted.

Table 7-1 outlines the annual costs to implement the covered activities by major expenditure category. The Oceano Dunes District estimates that the annual implementation cost of the HCP will be approximately $2,500,000 (Table 7-1).

Table 7-1. Annual HCP Expenses Fully Implemented

Expenditure	Annual Cost
Staff Costs	$1,132,146
Staff Benefits	$472,783
Materials	$150,000
Vehicle Use	$89,000
Contracts	$566,400
One-Time Expense	$25,000
Contingency/Changed Circumstances[1]	$50,000
Total Annual HCP Expenditure[2]	*$2,485,330*

Notes:
[1]If funding is needed beyond the contingency amount, CDPR will pursue reallocation of funds or request additional funds as outlined in Section 7.3.
[2]Total does not add up precisely due to rounding of underlying values.

Table 7-2 breaks out the annual cost of implementing the HCP by major expense categories for each taxon or taxonomic group (in the case of plants).

Table 7-2. Annual HCP Implementation Costs Per Covered Species by Taxon (taxonomic group for plants) and Expense Category

Taxon	Staff Salary	Staff Benefits	Materials	Vehicles	One-Time Costs	Contracts	Total
SNPL/CLTE	$1,017,957[1]	$399,744[1]	$139,000	$85,000	$25,000	$546,400[2]	$2,213,101
CRLF	$14,646	$6,591	$1,000	$2,000	-	$10,000[3]	$34,236
Tidewater Goby	$12,548	$5,647	$2,000	$1,000	-	-	$21,195
Listed Plants	$25,465	$11,459	$1,000	$1,000	-	$10,000[3]	$48,924
Reporting	$62,530	$28,139	$7,000	-	$25,000	-	$122,669
Other Items of Expense	-	-	-	-	$45,205	-	$45,205

Total[4]	$1,133,146	$451,579	$150,000	$89,000	$95,205	$566,400	$2,485,330

Notes:

[1] Salary and benefits includes field time for monitors and operational costs such as signage; exclosure fence installation, maintenance, and removal; public outreach; habitat enhancement; and law enforcement specific to covered species protection.

[2] Includes banding, predator control, exclosure fence installation and removal, habitat enhancement.

[3] Includes monitoring.

[4] Totals may not add up precisely due to rounding.

Most of the annual funding to implement the HCP covers the management activities and AMMs associated with the SNPL and CLTE management program. Annual costs specific to that part of the conservation program are provided in Table 7-3.

Table 7-3. SNPL and CLTE Tasks Full HCP Implementation Costs

	Staff Salary	Staff Benefits	Contracts	Equipment	Other Expense	Total
Monitoring	$789,151	$355,118	-	$25,000	$65,000	$1,234,269
Banding	-	-	$131,000	-	-	$131,000
Predator Control	-	-	$250,000	-	-	$250,000
Exclosure Fence Installation and Removal	$106,964	$48,134	$101,000	$100,000	$18,000	$374,099
Exclosure Fence Maintenance	$23,441	$10,549	-	-	$2,000	$35,990
Habitat Enhancement	$98,400	$44,280	$20,000	$4,000	-	$166,680
Total	$1,017,957	$458,081	$502,000	$129,000	$85,000	$2,213,101

Note: Totals may not add up precisely due to rounding.

Over the projected 25-year term of the HCP, the estimated total costs of implementing the HCP are expected to run between approximately $80 to $91 million in inflation-adjusted dollars. Table 7-4 shows the breakout in inflation-adjusted costs at varying rates of inflation.

Table 7-4. Costs Over the Life of the HCP

Estimated Annual Cost (2018 Dollars)	Annual Inflation Rate (%)	Years	Implementation Over 25-Year Life of HCP
$2,485,330	2	25	$79,605,860
$2,485,330	2.5	25	$84,893,311
$2,485,330	3	25	$90,613,298

CDPR will pay all costs associated with implementing the HCP's conservation strategy, including AMMs. In recognition of the fact that future costs for these activities, especially activities that are not yet being implemented, are estimates, the actual incurred costs may be less or more than is shown. If the actual costs for HCP implementation are higher than estimated in Table 7-1 through Table 7-3, CDPR agrees to pay the actual costs.

7.2 Funding Source(s)

Administrative costs to implement the management actions described in the HCP will be borne through the state-administered OHV Trust Fund (Oceano Dunes SVRA only).

The OHMVR Program, including funding for SVRA operations, receives no direct support from the state's General Fund. Instead, all funding comes from the OHV Trust Fund. Monies deposited into the OHV Trust Fund are generated by user fees associated with OHV recreation, including fuel taxes from gasoline consumed during OHV recreation on public lands, OHV registration fees, entrance fees generated at SVRAs, and Interest and miscellaneous income.

CDPR will include in its annual budget request, at a minimum, funding for the following:

- AMMs
- Monitoring of covered species
- Habitat restoration and maintenance efforts
- Predator management activities
- Law enforcement/beach patrol activities
- Public outreach and education programs
- Project administration
- Agency coordination

7.3 Funding Mechanism and Management

The State of California operates on a July 1 through June 30 fiscal year and only authorizes budgets on an annual basis. Accordingly, specific monetary commitments are subject to approval through the annual process as defined by law and policy. Multi-year budgets are typically only available from outside funding sources, such as grants. CDPR cannot guarantee acceptance of grant monies unless it has received authorization from the State of California legislature to apply for and accept these funds. However, CDPR is committed to the success of this HCP and will guarantee that it will request sufficient funding from the legislature on an annual basis to properly implement the HCP and fulfill the terms and commitments of the ITP.

In the event of a changed circumstance that requires additional funds above the annual allocation, CDPR will seek HCP funding augmentation via discretionary reallocation of funds already allocated to the Oceano Dunes District (see Table 7-5). If additional funds are needed, CDPR could pursue discretionary reallocation of funds already allocated to the department or request a budget amendment through the Department of Finance and the state legislature.

To demonstrate its ability to cover the costs of fulfilling the HCP obligations, CDPR has provided the following table from the Oceano Dunes District's Annual budget to the USFWS:

Table 7-5. Oceano Dunes District Fiscal Year 2018/19 Allocation			
Activity Code	**Description**	**Funding Source**	**Amount**
10273	Oceano District-Home Base	OHV Trust Fund	$7,922,600
12014	Pismo State Beach State Park and Recreation Fund (SPRF)	SPRF	$2,300,000
10207	Oceano Visitor Center	OHV Trust Fund	$805,000
		TOTAL BUDGET	$11,027,600

The above reflects CDPR's allocation of budget dollars for the Oceano Dunes District for fiscal year 2018/19 and is indicative of the trend for future fiscal years, reflecting budgeted dollars that can be used for the purposes of meeting the District's obligations under this HCP, should the annual allocation intended for the project be insufficient.

CDPR employs permanent full-time Environmental Scientists who are qualified and responsible for organizing and implementing natural resource management activities to preserve and protect the resources within the HCP area. Oceano Dunes District Environmental Scientists will organize and implement the work necessary to fulfil the requirements of the HCP. Additionally, CDPR Rangers and Maintenance staff ensure recreational use is consistent with all rules and regulations. The Environmental Scientists will consult and/or contract with qualified experts as needed to fulfill requirements under the HCP.

In conjunction with the annual monitoring report, CDPR will prepare an annual budget for the upcoming implementation year. The budget will account for CDPR's planned activities, including those related to the implementation of conservation measures expected during the upcoming year. The budget will set out projected expenditures and the funding for those expenditures. The information in the budget along with the Annual Report will contain sufficient information to demonstrate CDPR's ability to meet its financial obligations under the HCP. Whenever funding for implementation of the HCP conservation measures is considered insufficient to meet the commitments outlined in the HCP or to properly implement the HCP, CDPR will consult with the USFWS to determine what actions may be necessary with respect to meeting the commitments of the permit and/or avoiding the risk of taking covered animal species. CDPR understands that failure to provide adequate funding and consequent failure to implement the terms of this HCP in full could result in temporary permit suspension or permit revocation.

Chapter 8. Alternatives

8.1 Summary

FESA requires that section 10 permit applicants specify in the HCP what alternative actions to the taking of federally listed species were considered and the reasons why those alternatives were not selected. The *Habitat Conservation Planning and Incidental Take Permit Processing Handbook* (USFWS and NOAA Fisheries 2016) identifies two alternatives commonly considered in HCPs: 1) an alternative that would reduce take below levels anticipated for the project and 2) a no action alternative in which no permit would be issued and take would be avoided. This section of the HCP discusses alternatives considered, including a no action alternative and a reduced take alternative. For the reasons described below these alternatives were not selected.

8.2 No Action Alternative

The No Action alternative assumes that no federal section 10(a)(1)(B) ITP will be issued to CDPR for the ongoing operations and maintenance of the park units, and existing uses in the HCP area will continue at current levels into the future. However, CDPR would continue to strive to ensure no take of state and federally listed species occurs.

Under this alternative, CDPR would continue to enforce regulations and implement AMMs to prevent take of SNPL, CLTE, CRLF, tidewater goby, and listed plants during covered activities. In addition, as funding and resources allowed, CDPR might expand its protection of covered species (e.g., increasing monitoring). Without the ITP mandates, however, some of the funding currently used to implement the rigorous monitoring and predator management programs could be redirected to other operations and needs within the Oceano Dunes District. This could interfere with CDPR's ability to successfully implement AMMs and could reduce overall breeding success and/or leave covered species vulnerable to injury or mortality in the HCP area.

CDPR would continue to address covered species issues and implement AMMs on a case-by-case basis. However, despite the implementation of AMMs, take of covered animal species may not be avoided altogether while continuing operations. Therefore, the No Action alternative could require additional USFWS and CDPR staff time, as well as enforcement actions by the USFWS that could result in operation shutdowns and conflict with the Oceano Dunes District mandate to provide OHV and other public recreation (Public Resources Code § 5090.01 et seq.).

This action was rejected because it does not provide CDPR with the legal protection afforded by an USFWS ITP allowing continued operation of recreation activities in the HCP area.

8.3 Maintain Northern Exclosure Boundary Alternative

This alternative entails implementing the proposed HCP as described in Chapter 2, but the 6 Exclosure would not be reduced in size or eventually eliminated; thus, the existing protective fencing for SNPL and CLTE and OHV and camping opportunities in this area would remain the same.

This alternative was not selected because CDPR determined that the conservation program proposed under the HCP provides adequate AMMs, and the criteria that are required to reduce the 6 Exclosure (section 5.2.3) ensure that take of SNPL and CLTE as a result of reducing the exclosure size will be minimized. Overall, reducing or eventually eliminating the 6 Exclosure ensures CDPR can better meet the recreational needs of the public under the HCP as proposed.

8.4 Increased Patrols and/or Staffing Alternative

Under the increased patrols and/or staffing alternative, CDPR would implement the HCP as proposed but would also increase the number of biological staff present in the HCP area to monitor covered species and compliance with covered species regulations. CDPR would also possibly increase the number of covered species surveys and law enforcement patrols in the HCP area. In the past 10 years, CDPR has already doubled the number of biological staff present in the HCP area, which has led to an increase in frequency and time spent monitoring for covered species, including during the SNPL non-breeding season. This alternative was thus rejected because given the current staffing levels, increasing the number of staff and/or patrols adds additional cost without appreciably reducing species effects or improving outcomes.

8.5 Project-by-Project Permitting

CDPR evaluated the possibility of obtaining ITPs for individual maintenance and/or recreation activities, but rejected this alternative because of cost, staffing, and effectiveness considerations. Project-by-project permitting would require multiple permit applications, including possibly multiple HCPs. This alternative would thus require a significant amount of USFWS and CDPR staff time. It would also likely be less effective at protecting covered species than a single, comprehensive program.

Chapter 9. Maps

Map 1. HCP Area and Vicinity

Map 2. HCP Area Overview

Map 3. Oceano Dunes District Land Use and Facilities

Map 4. Oceano Dunes District Land Use and Facilities Detail

Map 5. Oceano Dunes District Snowy Plover and Least Tern Management

Map 6. Recreational Restrictions

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Map 8. Covered Activities Modifying Existing Operations and Facilities

Map 9. Vegetation Types in the HCP Area

Map 10. Western Snowy Plover Breeding Habitat, Critical Habitat Unit, and Recovery Unit in the HCP Area

Map 11. Western Snowy Plover Nesting Locations (2005-2018)

Map 12. California Least Tern Breeding and Foraging Habitat in the HCP Area

Map 13. California Least Tern Nesting Locations (2005-2018)

Map 14. California Red-legged Frog Potential Habitat and Recovery Plan Unit in the HCP Area

Map 15. Tidewater Goby Habitat and Critical Habitat in the HCP Area

Map 16. Modeled Plant Habitat in the HCP Area

Map 17. Marsh Sandwort Occurrences in and near the HCP Area

Map 18. La Graciosa Thistle Occurrences and Critical Habitat in and near the HCP Area

Map 19. Surf Thistle Occurrences in and near the HCP Area

Map 20. Beach Spectaclepod Occurrences in and near the HCP Area

Map 21. Nipomo Mesa Lupine Occurrences in and near the HCP Area

Map 22. Gambel's Watercress Occurrences in and near the HCP Area

Map 23. Western Snowy Plover Habitat and Covered Activities

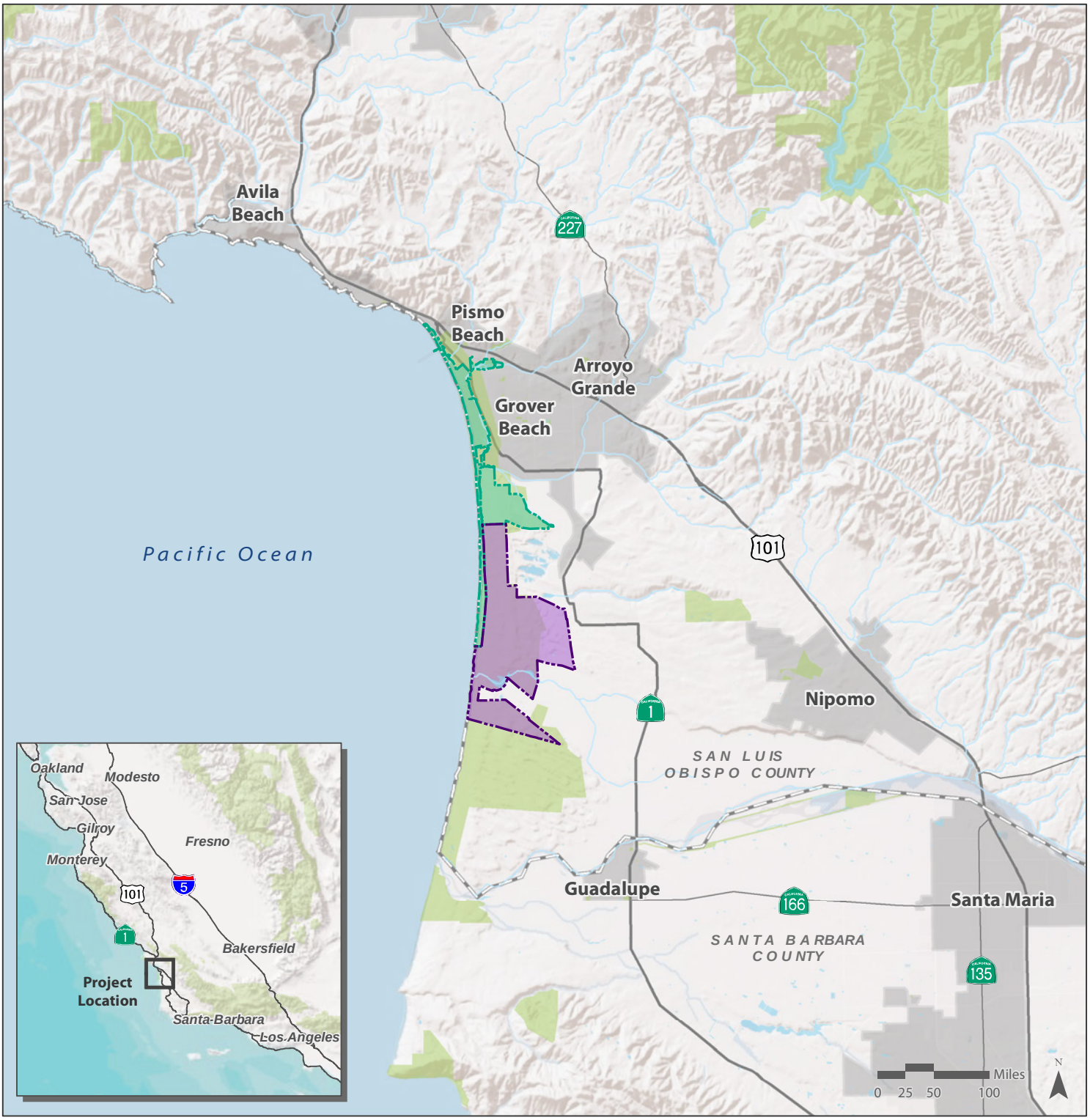
Map 24. California Least Tern Habitat and Covered Activities

Map 25. California Red-legged Frog Habitat and Covered Activities

Map 26. Tidewater Goby Habitat and Covered Activities

Map 27. Modeled Plant Habitat and Covered Activities

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HCP Area

- Oceano Dunes SVRA
- Pismo State Beach

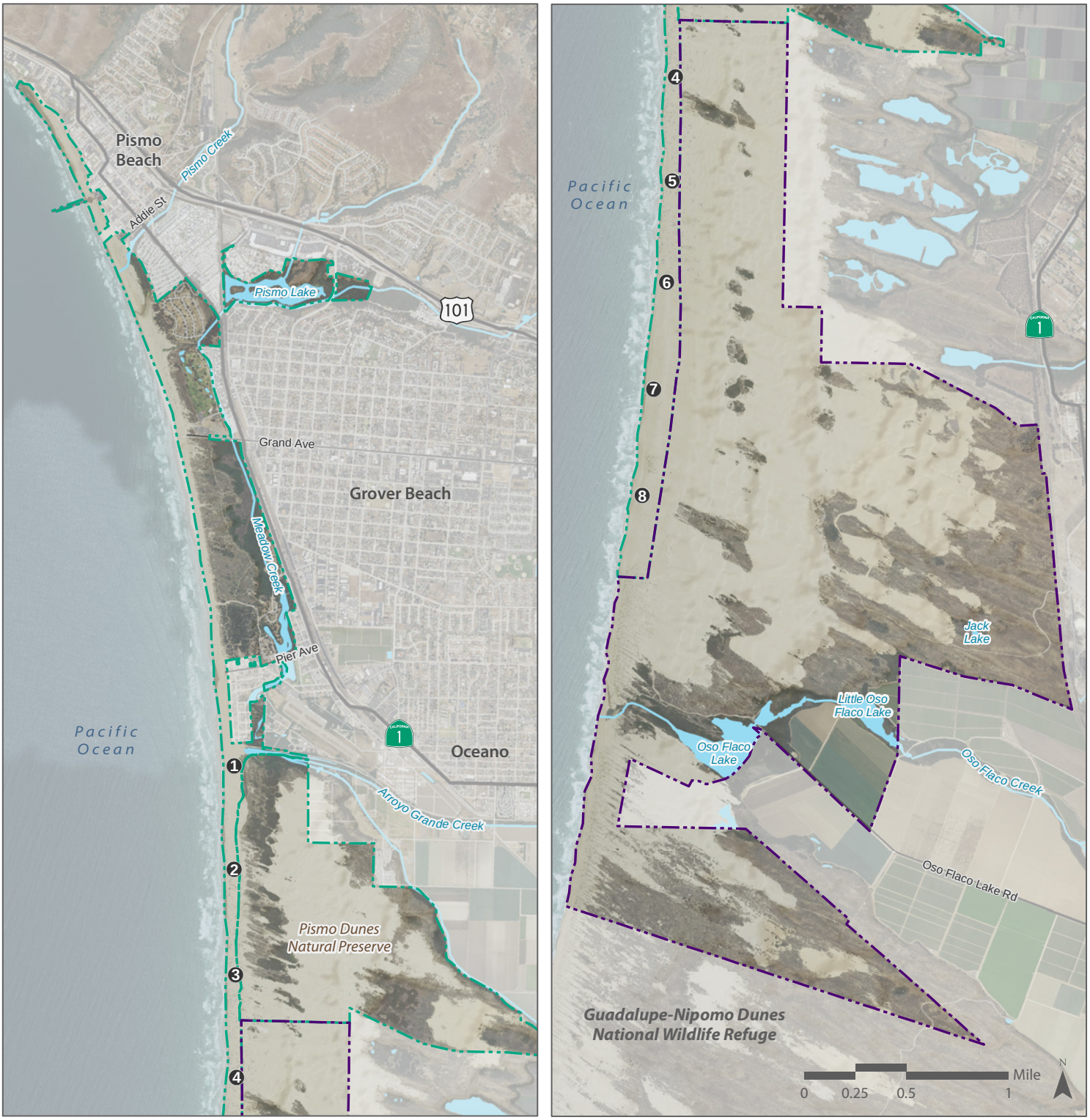
Base Map Features

- Public park land
- Urban area
- County boundary
- Waterbody
- Stream
- Highway
- Major road

July 2020
Source: CDPR, 2020; SLO Co Open GIS, 2017; MIG, 2020

Map 1 HCP Area and Vicinity

Oceano Dunes District Habitat Conservation Plan



HCP Area Boundaries

- Oceano Dunes SVRA
- Pismo State Beach

Base Map Features

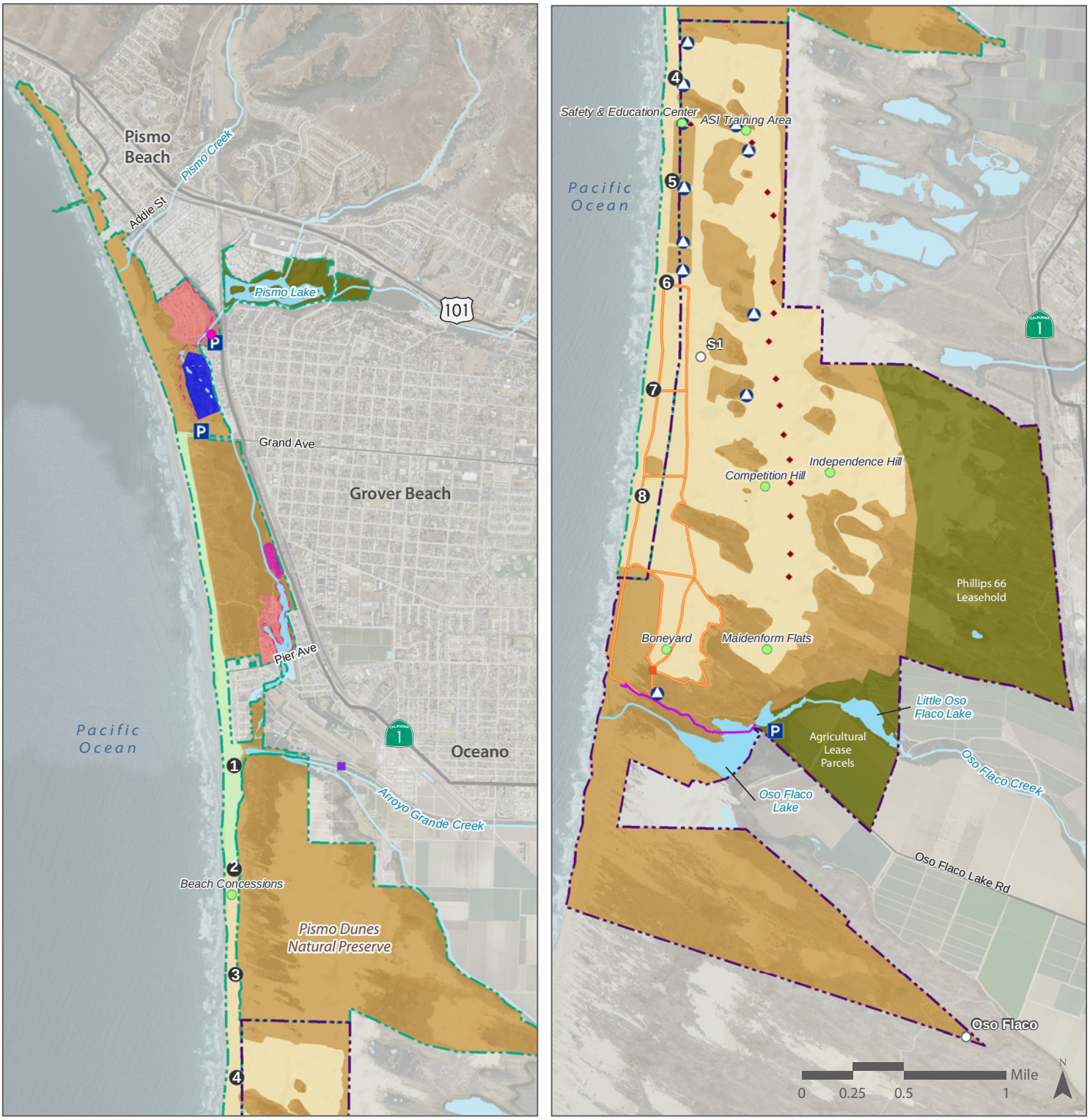
- Marker post
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2020
Source: CDPR, 2020; MIG, 2020

Map 2 HCP Area Overview

Oceano Dunes District Habitat Conservation Plan



Land Use & Facilities

- Campground
- Golf course
- Ranger station
- Street legal vehicles only
- Open to riding and camping
- Closed to motorized vehicles
- Closed to all public use
- Trail
- Oso Flaco boardwalk
- Parking
- Restrooms
- Boneyard gate
- Guiton crossing
- Air quality monitor
- OHV landmark
- Monarch butterfly grove
- Sand Highway*

Base Map Features

- Oceano Dunes SVRA
- Pismo State Beach
- Seasonal exclosure
- Marker post
- Waterbody
- Stream
- Highway
- Access road

*Approximate location

July 2020
Source: CDPR, 2020; MIG, 2020

Map 3 Land Use and Facilities

Oceano Dunes District Habitat Conservation Plan



Land Use & Facilities

- Campground
- Golf course
- Ranger station
- Street legal vehicles only
- Open to riding and camping
- Closed to motorized vehicles
- Closed to all public use
- Trail
- Unofficial trail*
- Wind fencing
- Parking
- Guiton crossing
- Monarch butterfly grove
- Pismo Lake spillway

Base Map Features

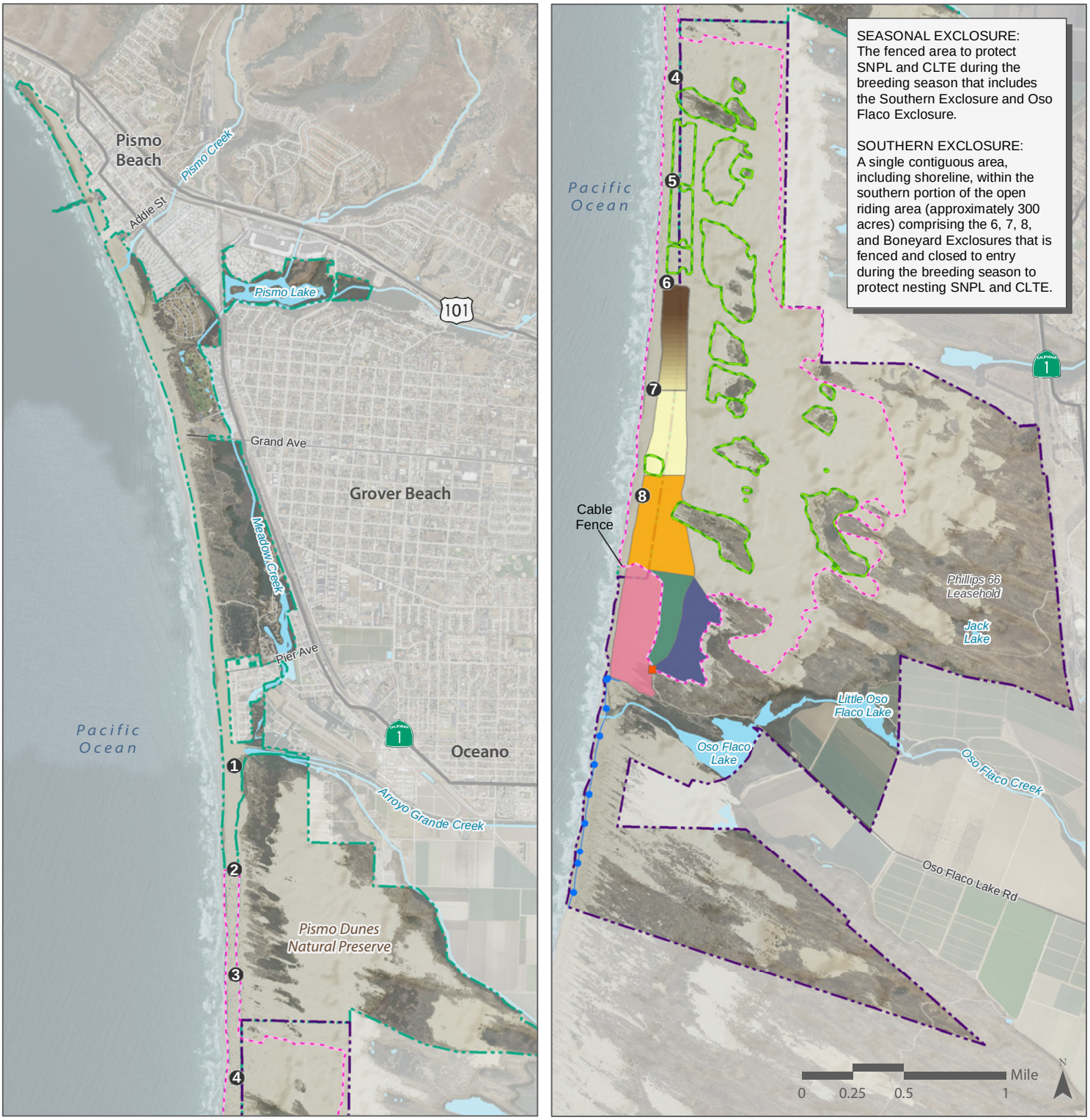
- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

*Approximate location

July 2020
Source: CDPR, 2020; MIG, 2020

Map 4 Land Use and Facilities Detail

Oceano Dunes District Habitat Conservation Plan



Seasonal Exclosures

- 6 Exclosure
- 7 Exclosure
- 8 Exclosure
- East Boneyard
- West Boneyard
- North Oso Flaco

Fencing & Boundaries

- Vegetation island and dust control fencing
- Riding area boundary
- S. Oso Flaco symbolic fence
- Boneyard gate

Base Map Features

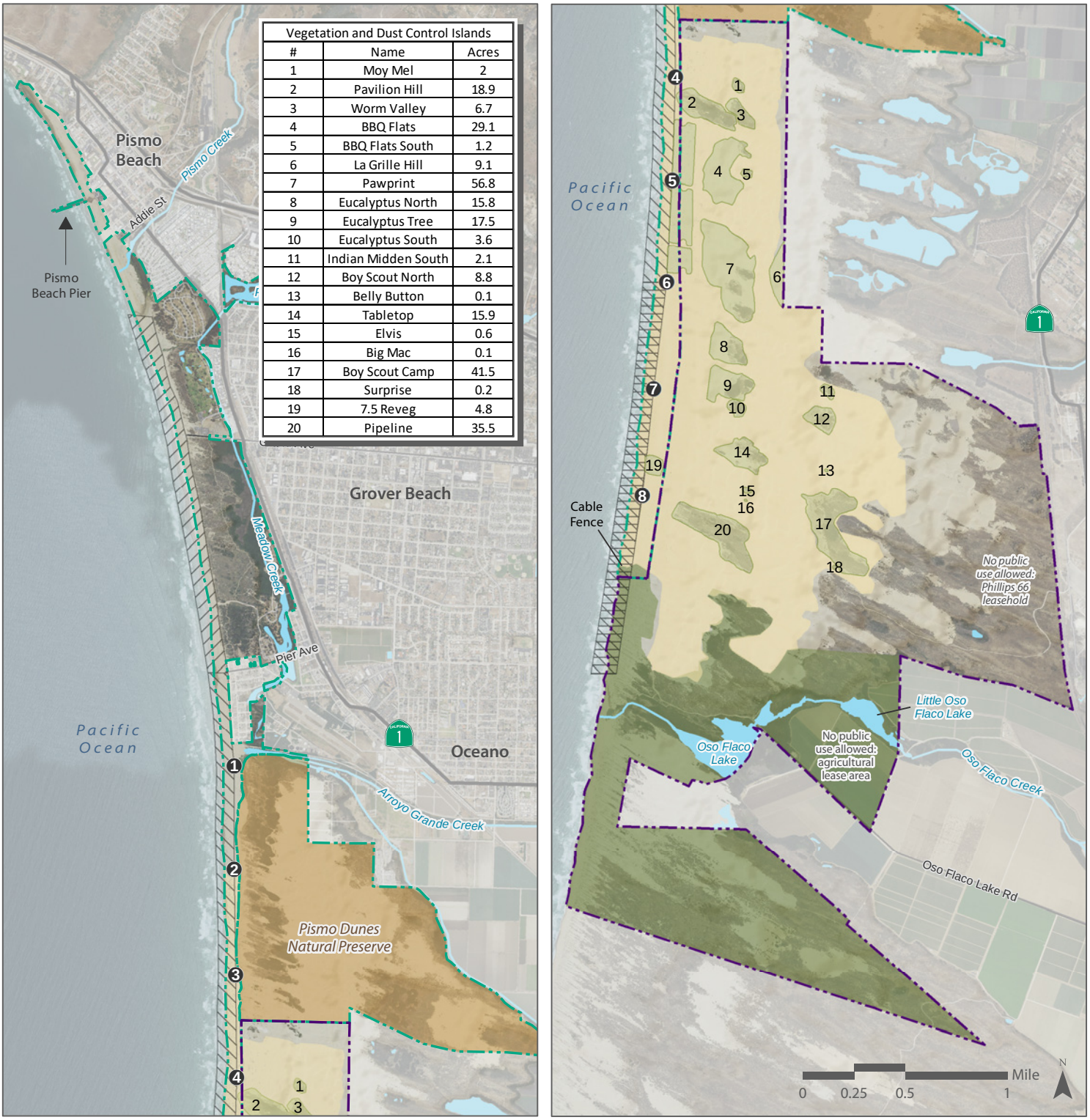
- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2020
Source: CDPR, 2020; MIG, 2020

Map 5 Western Snowy Plover and California Least Tern Management

Oceano Dunes District Habitat Conservation Plan



Recreational Restrictions

- Dogs prohibited
- Dogs and horses prohibited
- Open to riding and camping
- Vegetation and dust control islands - closed to riding and camping

Kiteboarding landing/launching

- Wet/dry allowed
- Wet only
- Seasonal

Base Map Features

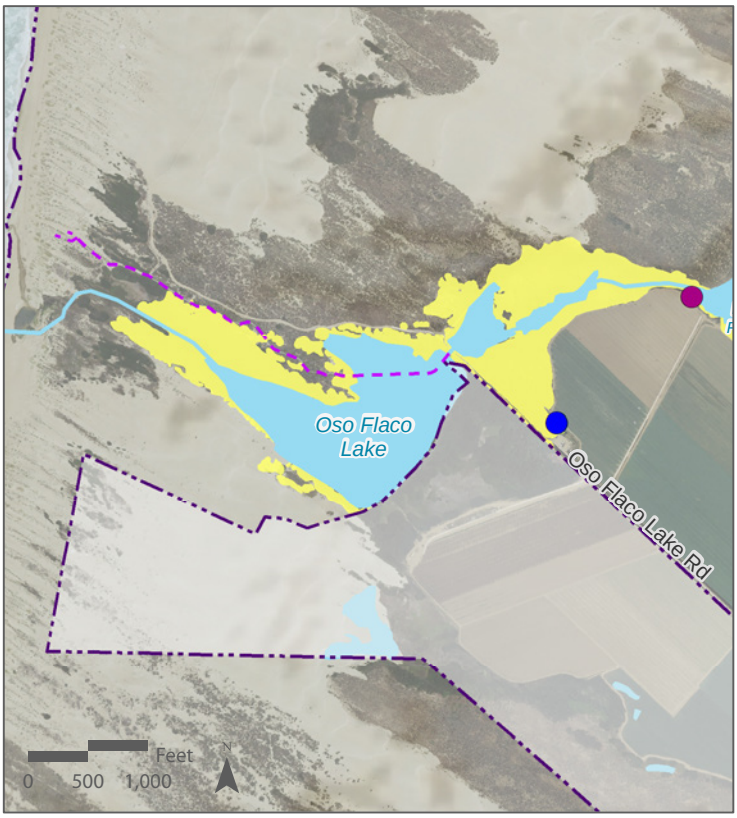
- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

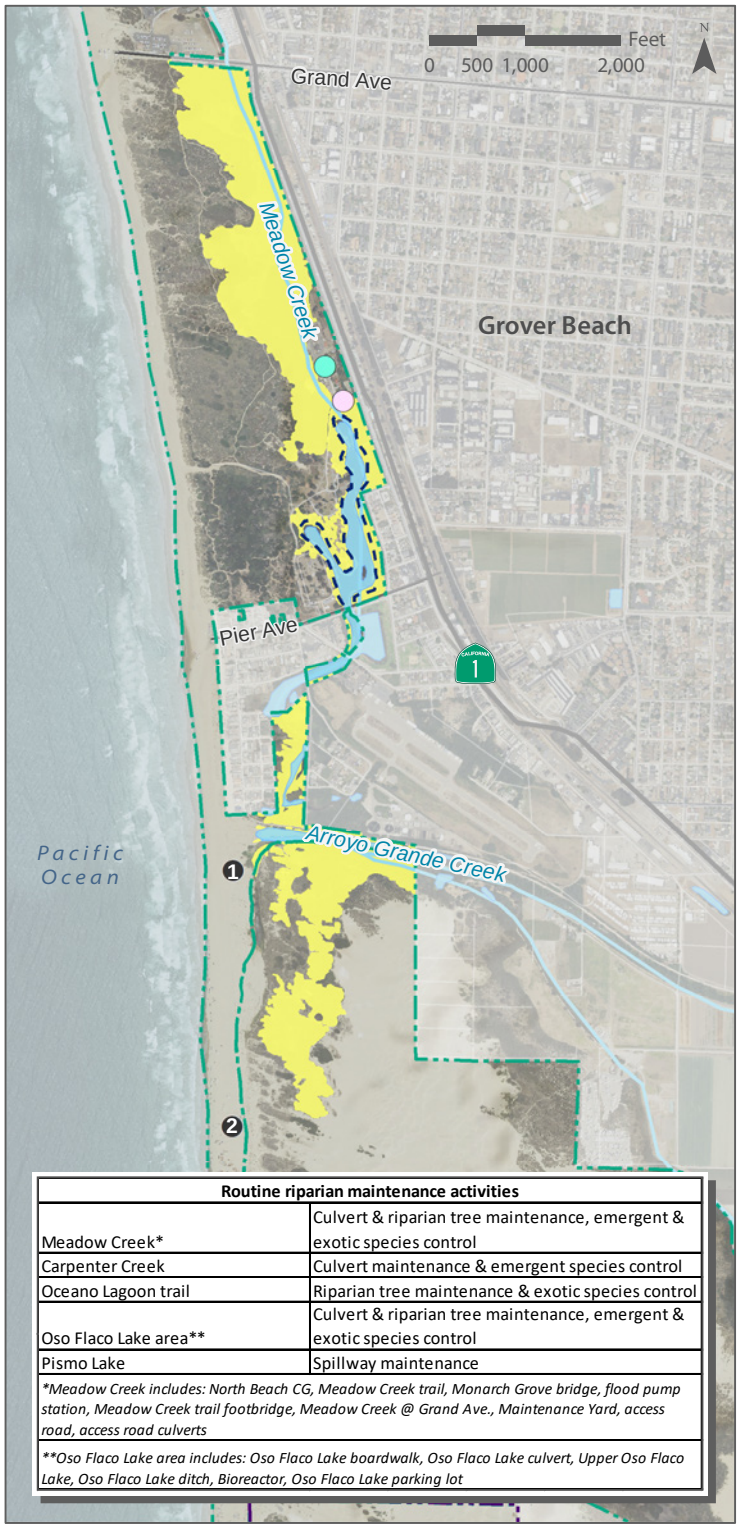
July 2020
Source: CDPR, 2020; MIG, 2020

Map 6 Recreational Restrictions

Oceano Dunes District Habitat Conservation Plan







Routine riparian maintenance activities	
Meadow Creek*	Culvert & riparian tree maintenance, emergent & exotic species control
Carpenter Creek	Culvert maintenance & emergent species control
Oceano Lagoon trail	Riparian tree maintenance & exotic species control
Oso Flaco Lake area**	Culvert & riparian tree maintenance, emergent & exotic species control
Pismo Lake	Spillway maintenance
*Meadow Creek includes: North Beach CG, Meadow Creek trail, Monarch Grove bridge, flood pump station, Meadow Creek trail footbridge, Meadow Creek @ Grand Ave., Maintenance Yard, access road, access road culverts	
**Oso Flaco Lake area includes: Oso Flaco Lake boardwalk, Oso Flaco Lake culvert, Upper Oso Flaco Lake, Oso Flaco Lake ditch, Bioreactor, Oso Flaco Lake parking lot	

Riparian Maintenance Locations

- Potential future riparian vegetation maintenance area
- Carpenter Creek
- Access road
- Maintenance yard
- Oso Flaco ditch
- Oso Flaco Creek bioreactor
- Pismo Lake spillway

Trails

- Boardwalk Trail
- Meadow Creek Trail
- Oceano Lagoon Trail

Base Map Features

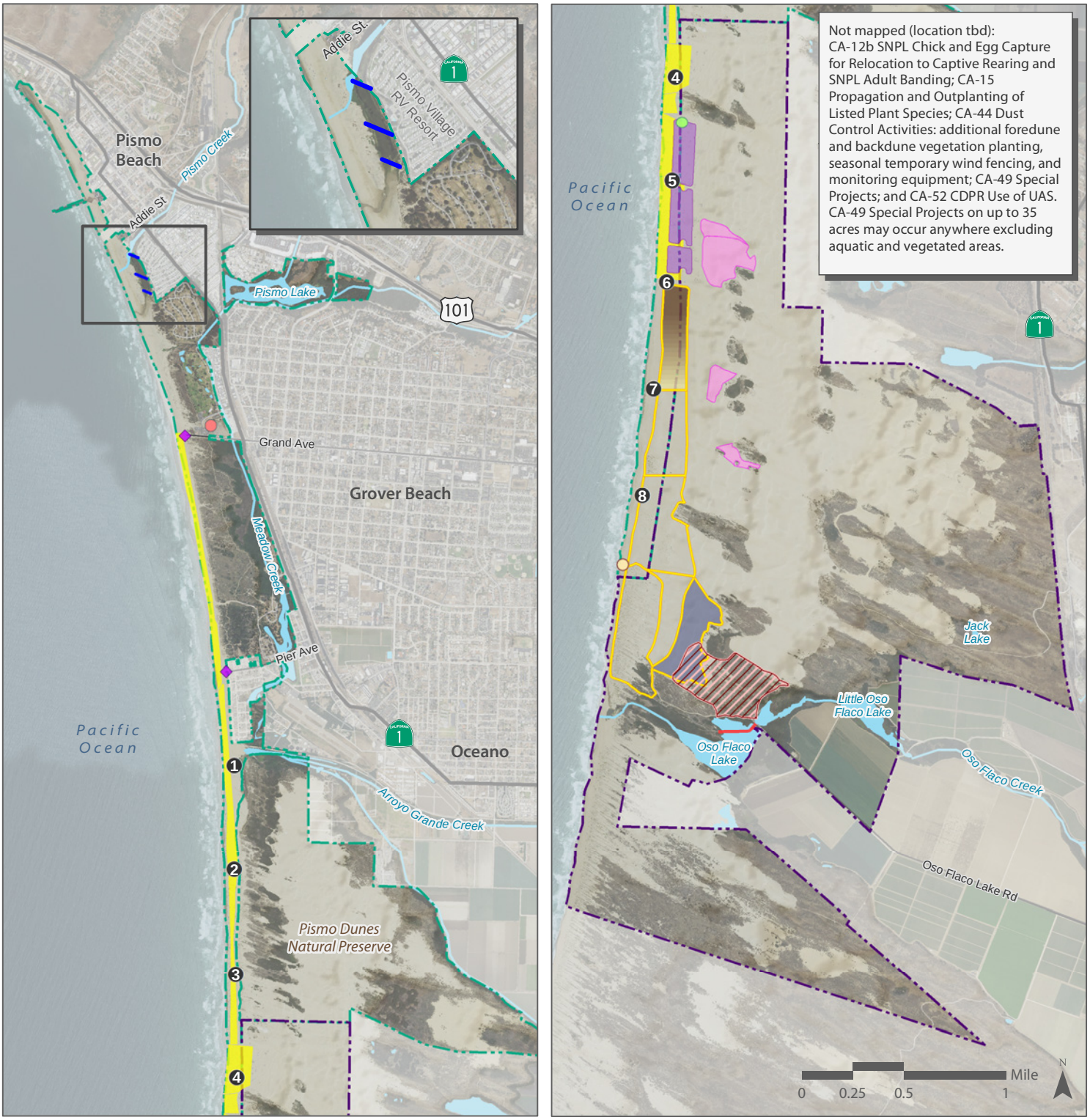
- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2020
Source: CDPR, 2020; MIG, 2020

Map 7 Riparian Maintenance Locations

Oceano Dunes District Habitat Conservation Plan



Covered Activities

- CA-21 Mechanical trash removal*
- CA-28 Cable fence replacement
- CA-38 Grover Beach Lodge
- CA-41 Pismo Creek Estuary bridge options
- CA-42 Riding in 40 Acres*
- CA-43 Safety & Education Center replacement
- CA-44 PMRP, Track-out device
- CA-44 PMRP, Foredune to be planted
- CA-44 PMRP, Wind fencing converting to vegetation
- CA-48 Oso Flaco Lake boardwalk replacement
- CA-50 6 Exclosure reduction*
- CA-50 Boneyard Exclosure reduction*

Base Map Features

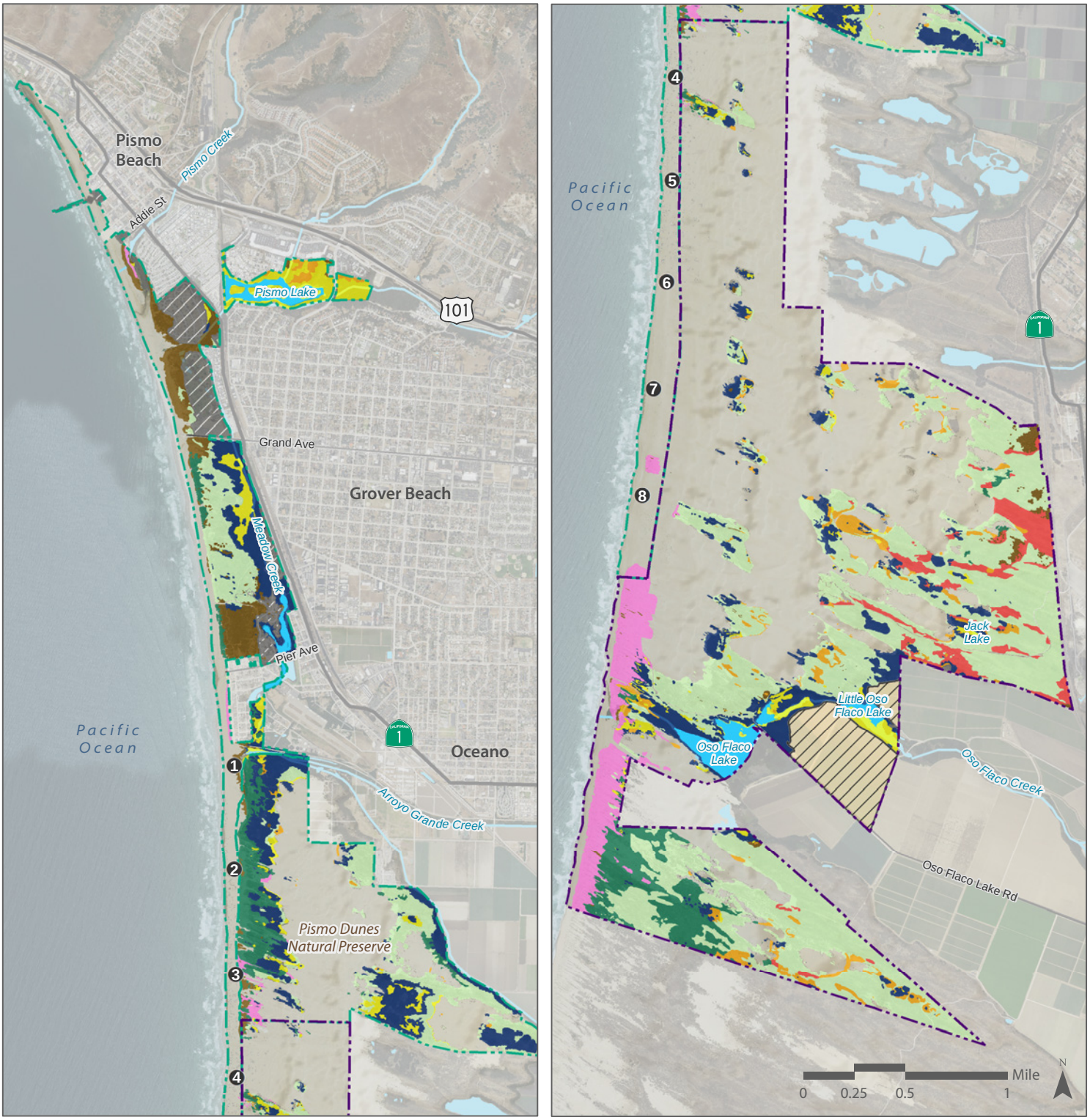
- Oceano Dunes SVRA
- Pismo State Beach
- Seasonal exclosure
- Marker post
- Waterbody
- Stream
- Highway
- Access road

*Approximate location

July 2020
Source: CDPR, 2020; MIG, 2020

Map 8 Covered Activities Modifying Existing Operations and Facilities

Oceano Dunes District Habitat Conservation Plan



Vegetation Types

- Agriculture
- Arroyo willow thicket
- Dune mat
- European beach grass sward
- Native upland alliance
- Native wetland alliance
- Non-native alliance
- Open water
- Perennial veldt grass stand
- Silver dune lupine-mock heather scrub
- Disturbed/developed

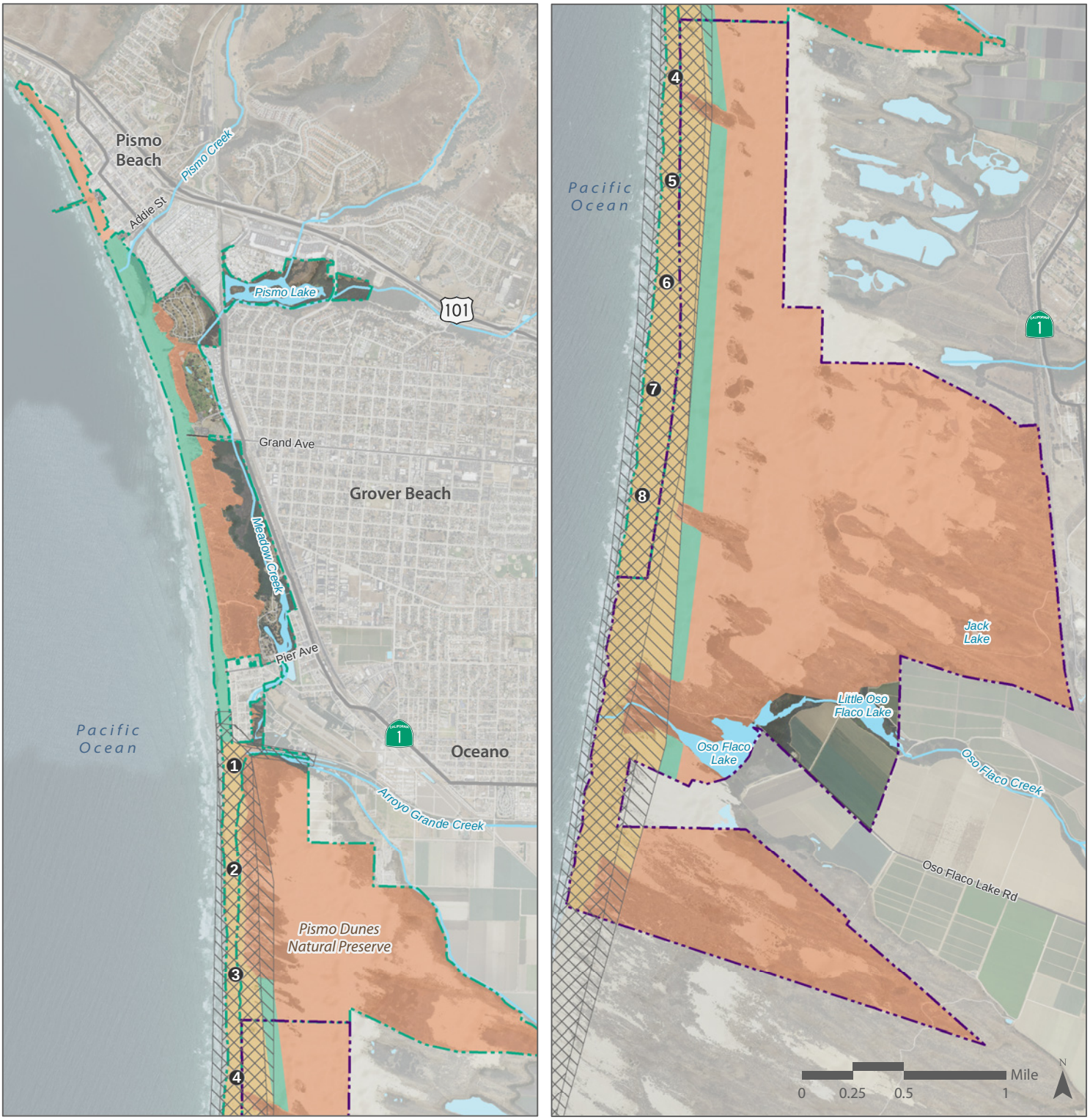
Base Map Features

- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

July 2020
Source: CDPR, 2020; MIG, 2020

Map 9 Vegetation Types

Oceano Dunes District Habitat Conservation Plan



SNPL Habitat

- Primary habitat
- Secondary habitat
- Tertiary habitat
- SNPL critical habitat - CA 31
- SNPL recovery plan unit - CA 83

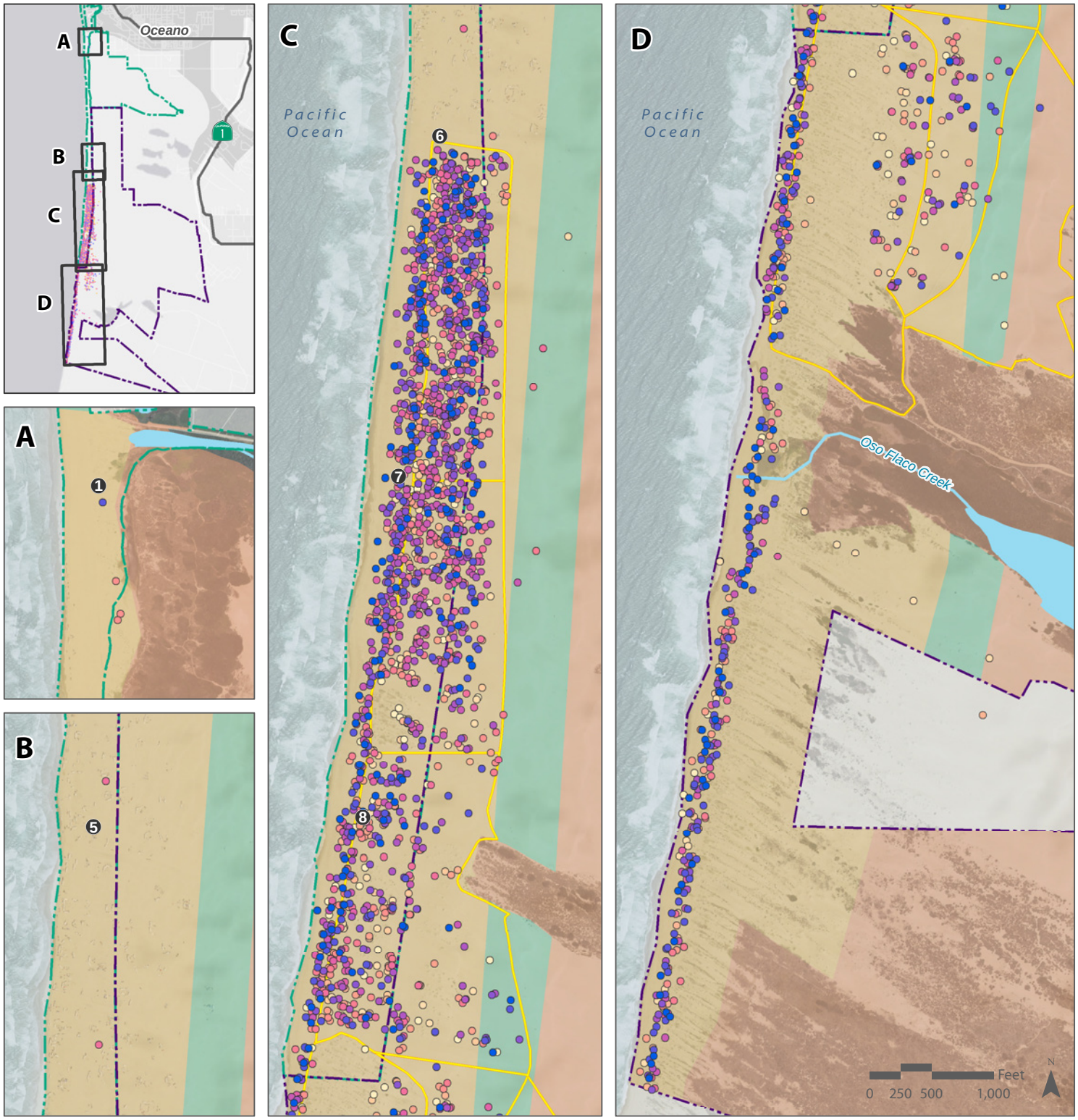
Base Map Features

- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

July 2020
Source: CDPR, 2020; MIG, 2020

Map 10 Western Snowy Plover Breeding Habitat, Critical Habitat Unit, and Recovery Unit

Oceano Dunes District Habitat Conservation Plan



SNPL Nest Locations

2005	2012
2006	2013
2007	2014
2008	2015
2009	2016
2010	2017
2011	2018

SNPL Habitat

- Primary habitat
- Secondary habitat
- Tertiary habitat

Base Map Features

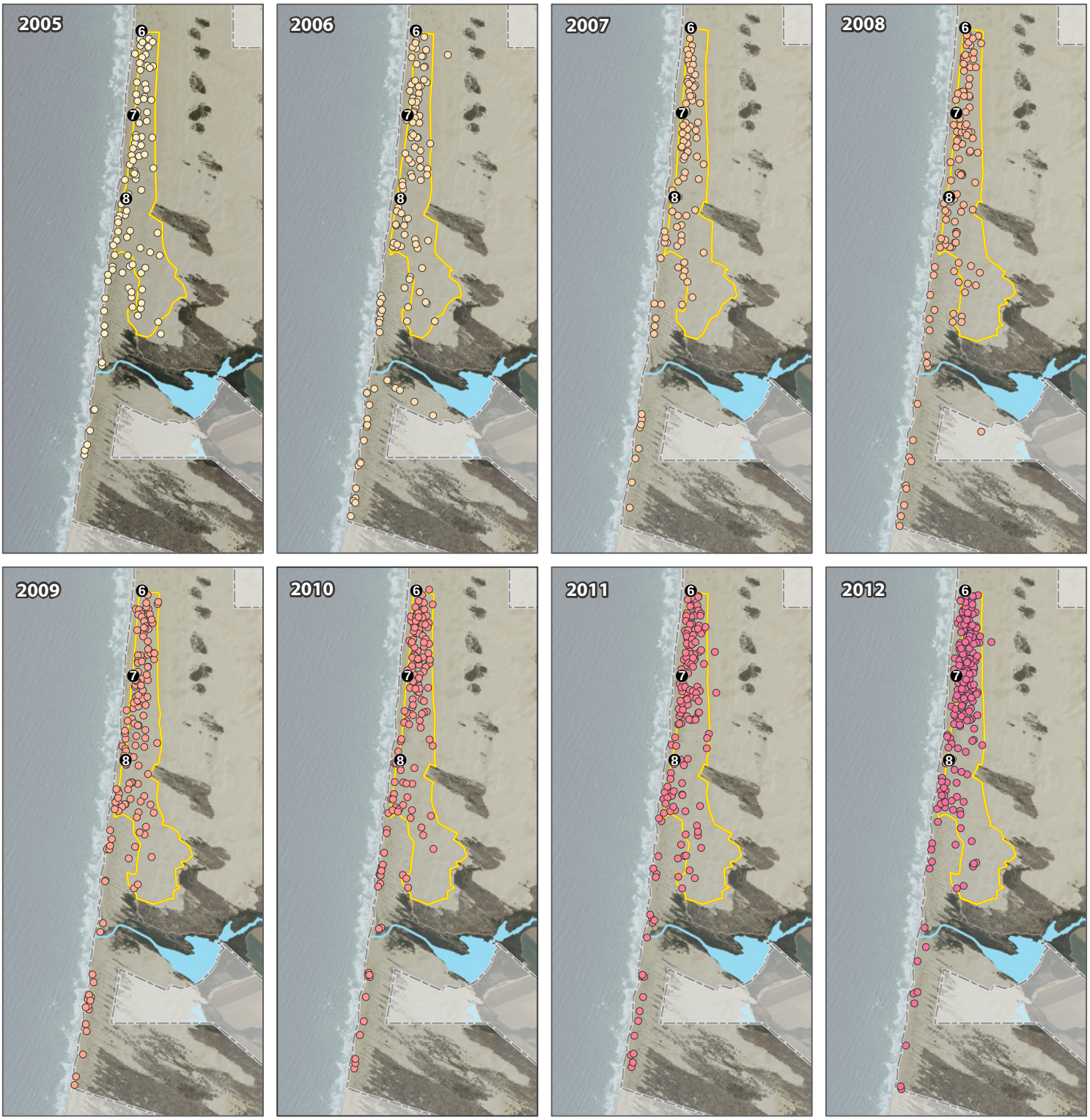
- Oceano Dunes SVRA
- Pismo State Beach
- Seasonal exclosure
- Marker post
- Waterbody
- Stream

MIG

July 2020
Source: CDPR, 2020; MIG, 2020

Map 11a Western Snowy Plover Nesting Locations (2005-2018)

Oceano Dunes District Habitat Conservation Plan



SNPL Nest Locations

- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012

Base Map Features

- Marker post
- Exclosure boundary
- Outer park boundary
- Waterbody
- Stream

0 0.25 0.5 1 Mile

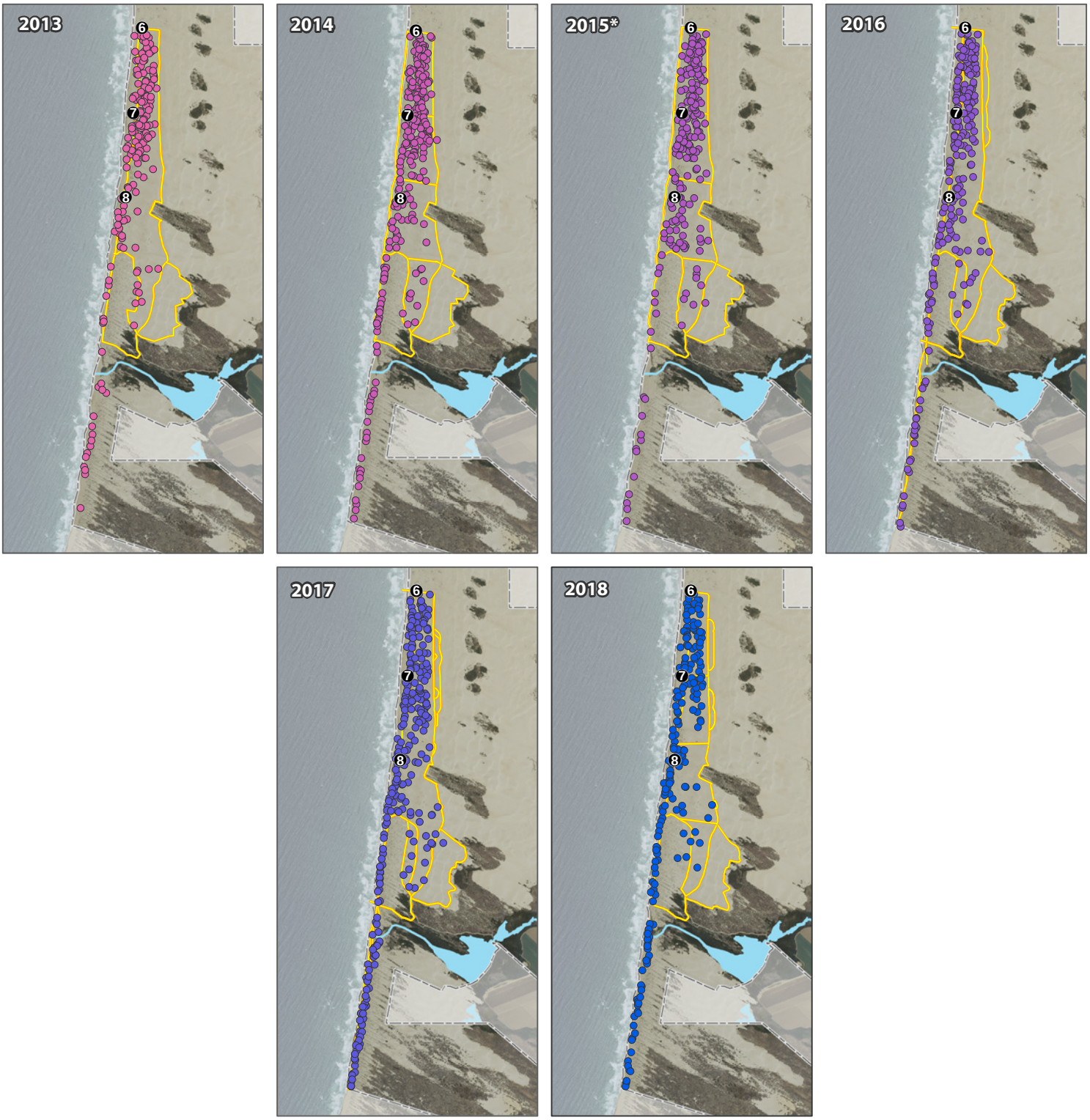
N

MIG

July 2020
Source: CDPR, 2020; MIG, 2020

Map 11b Western Snowy Plover Nesting Locations (2005-2012)

Oceano Dunes District Habitat Conservation Plan



SNPL Nest Locations

- 2013
- 2014
- 2015
- 2016
- 2017
- 2018

Base Map Features

- Marker post
- Exclosure boundary
- Outer Park boundary
- Waterbody
- Stream

0 0.25 0.5 1 Mile

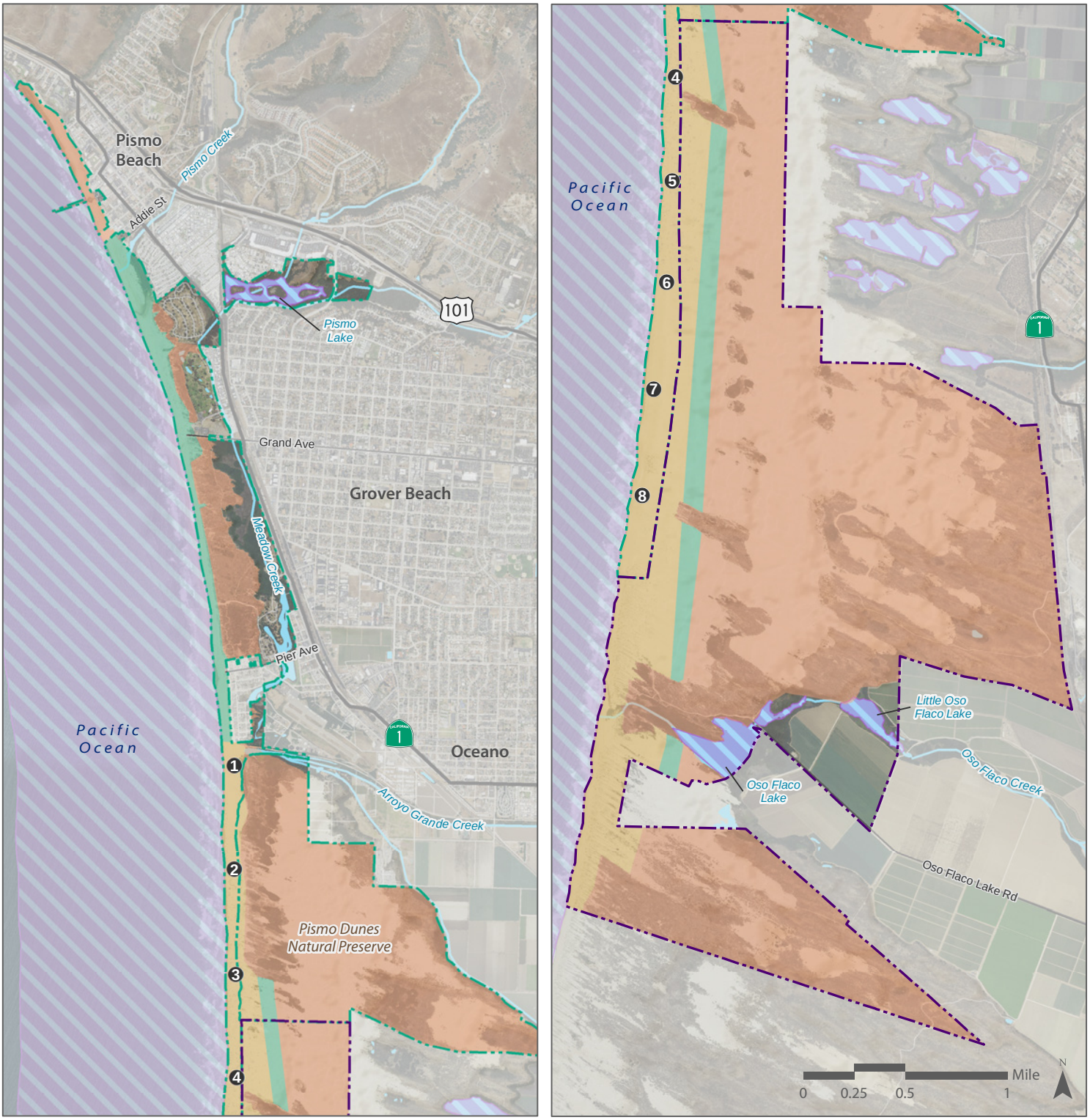
N

July 2020
Source: CDPR, 2020; MIG, 2020

*Data for 2015 seasonal exclosure boundary not available; 2014 seasonal exclosure boundary shown.

Map 11c Western Snowy Plover Nesting Locations (2013-2018)

Oceano Dunes District Habitat Conservation Plan



CLTE Habitat

- Primary habitat
- Secondary habitat
- Tertiary habitat
- Foraging habitat

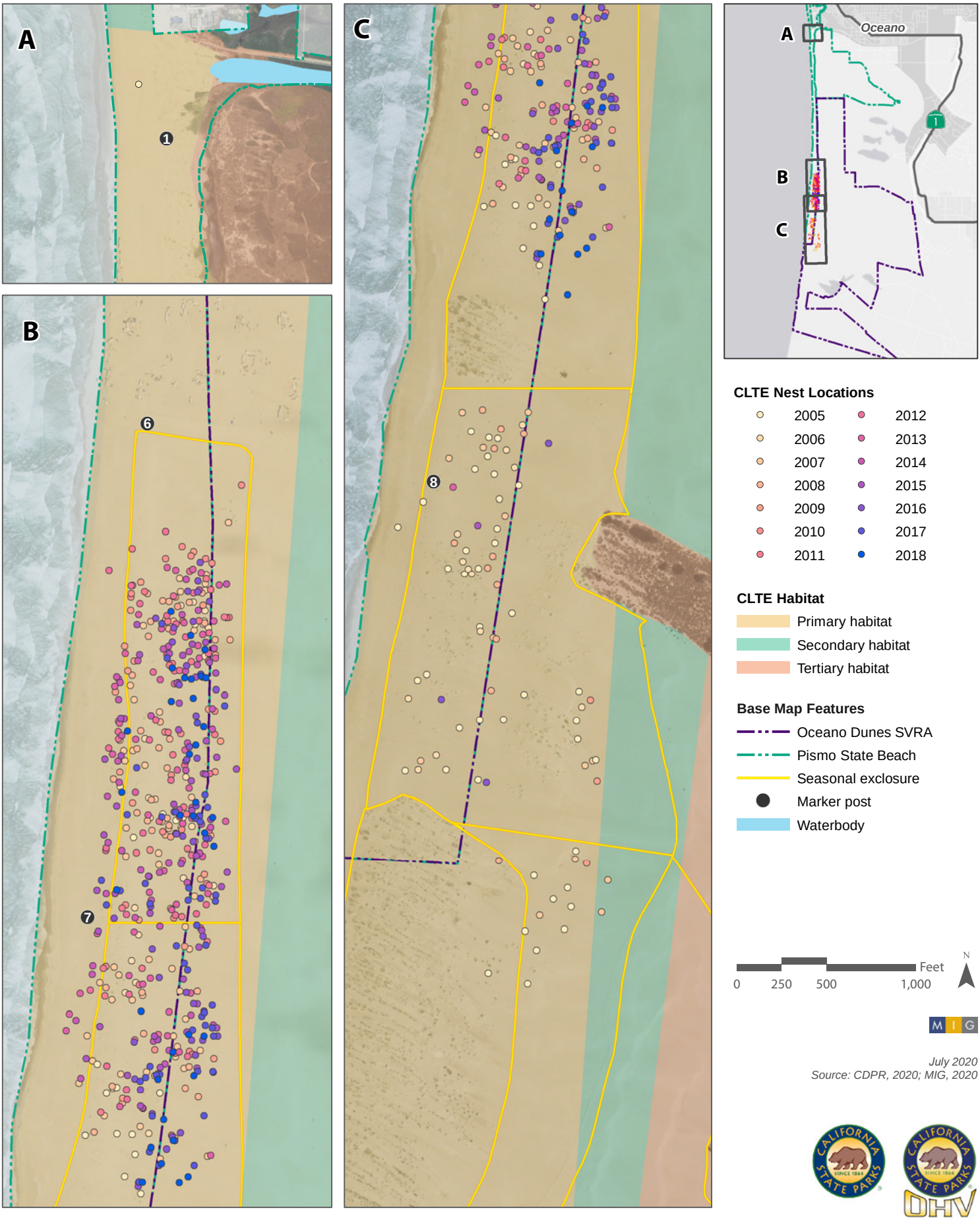
Base Map Features

- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

July 2020
Source: CDPR, 2020; MIG, 2020

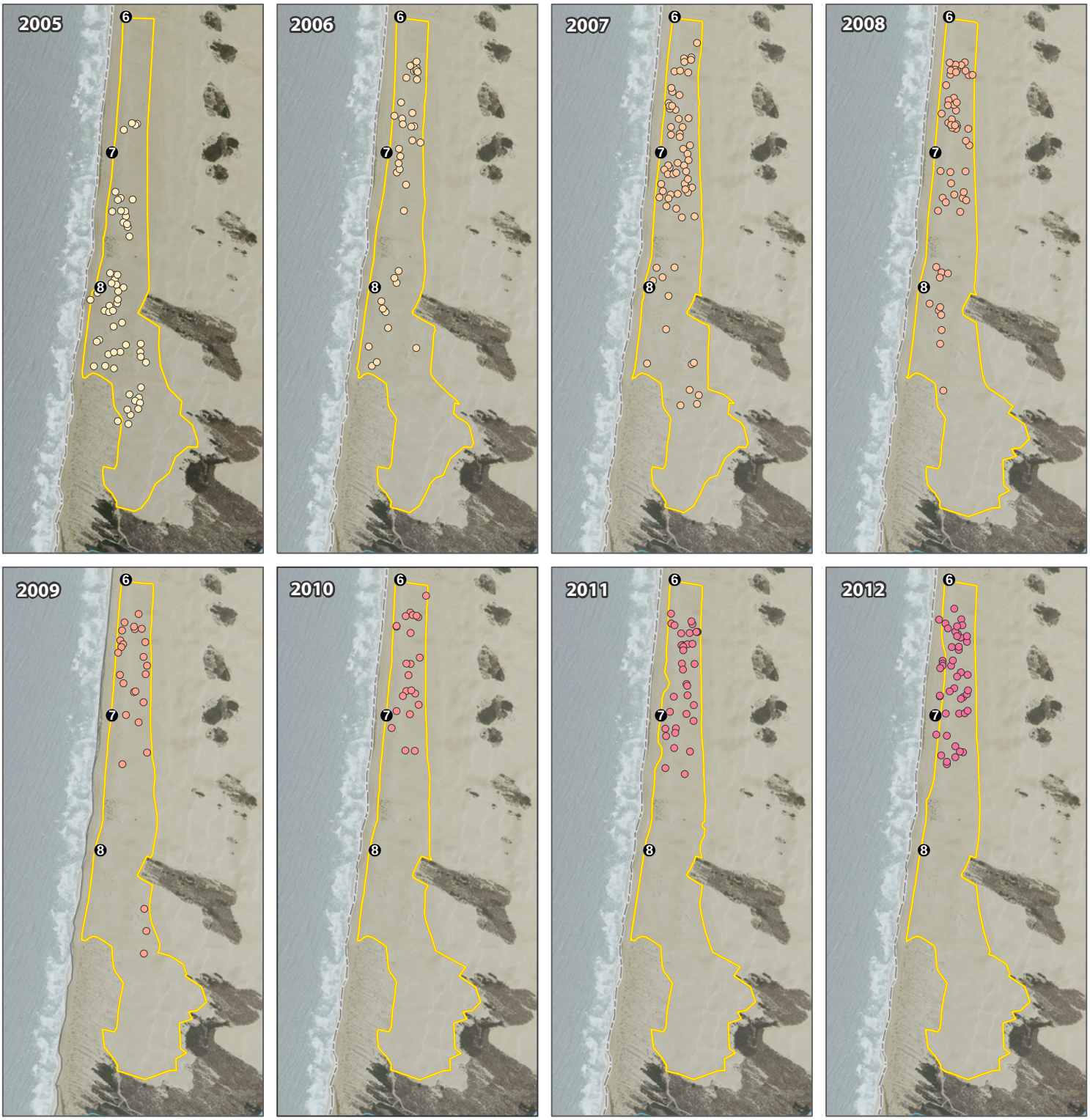
Map 12 California Least Tern Breeding and Foraging Habitat

Oceano Dunes District Habitat Conservation Plan



Map 13a California Least Tern Nesting Locations (2005-2018)

Oceano Dunes District Habitat Conservation Plan



CLTE Nest Locations

- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012

Base Map Features

- Marker post
- Exclosure boundary
- Outer park boundary

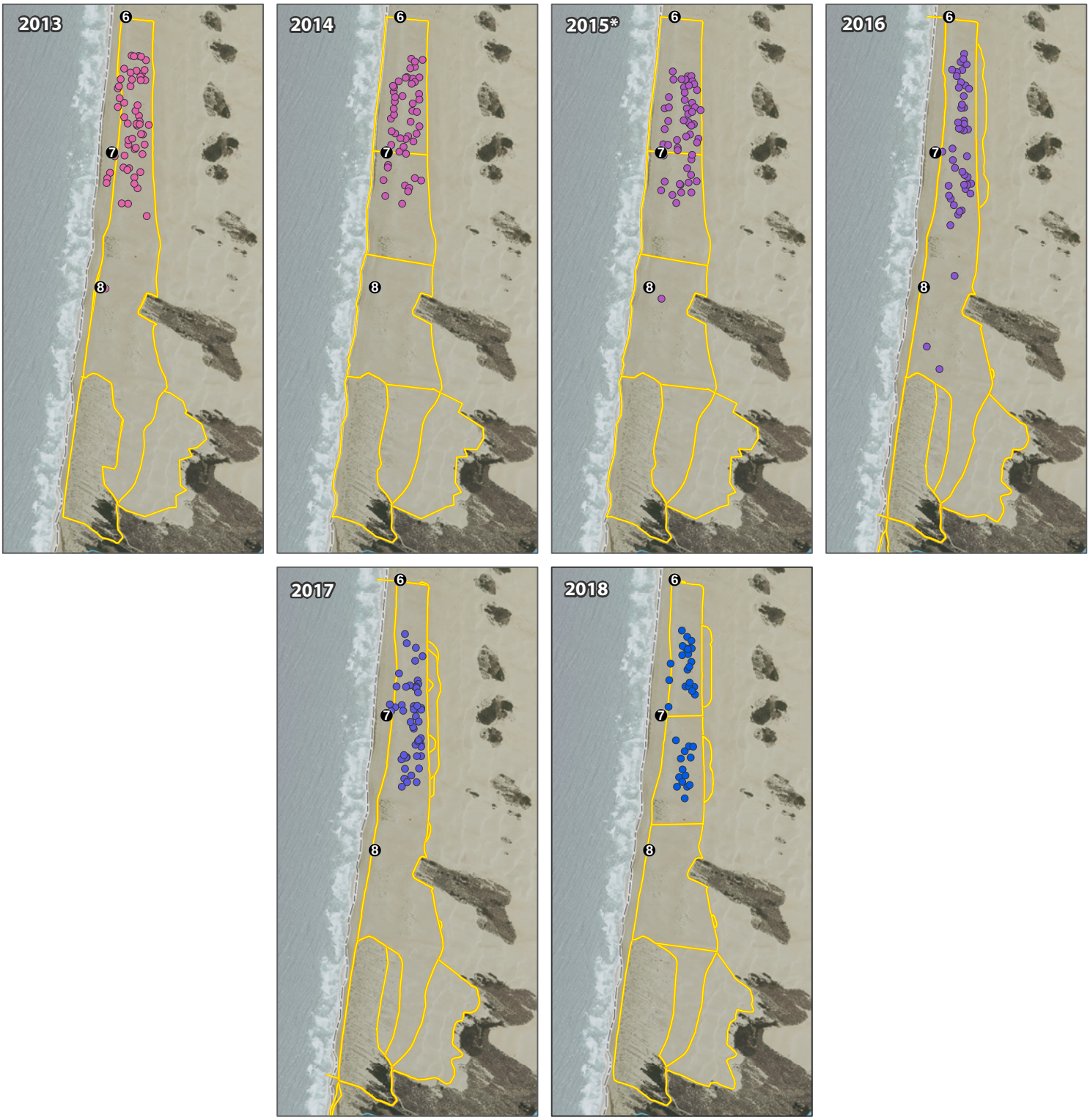
0 0.25 0.5 Mile

N

July 2020
Source: CDPR, 2020; MIG, 2020

Map 13b California Least Tern Nesting Locations (2005-2012)

Oceano Dunes District Habitat Conservation Plan



CLTE Nest Locations

- 2013
- 2014
- 2015
- 2016
- 2017
- 2018

Base Map Features

- Marker post
- Exclosure boundary
- Outer Park boundary

0 0.25 0.5 Mile

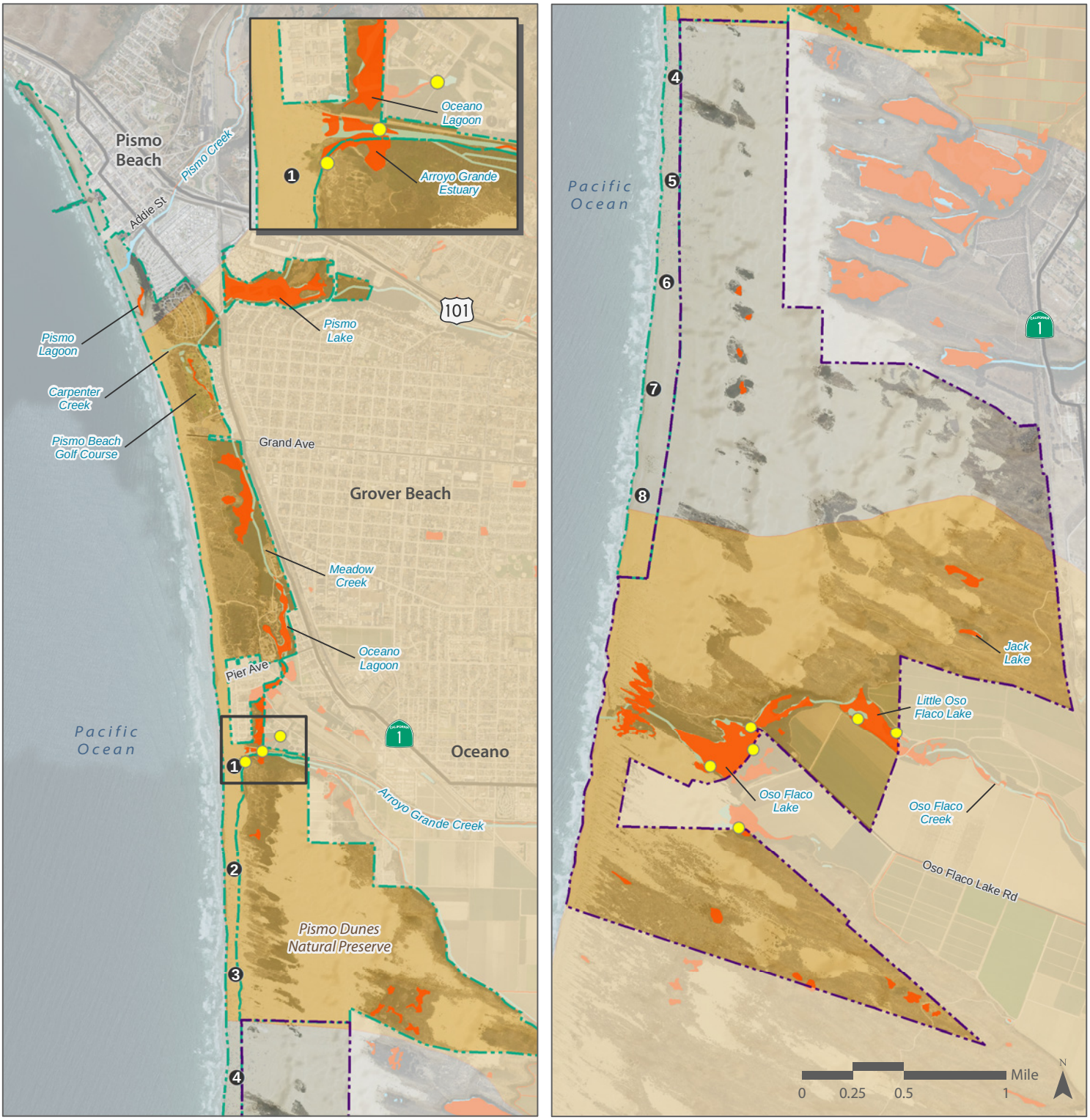
N

July 2020
Source: CDPR, 2020; MIG, 2020

*Data for 2015 seasonal exclosure boundary for 2015 not available; seasonal exclosure boundary for 2014 mapped.

Map 13c California Least Tern Nesting Locations (2013-2018)

Oceano Dunes District Habitat Conservation Plan



CRLF Habitat

- CRLF occurrence - survey data
- Potential CRLF breeding habitat - USFWS National Wetland Inventory
- CRLF recovery plan unit - core area 23

Base Map Features

- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

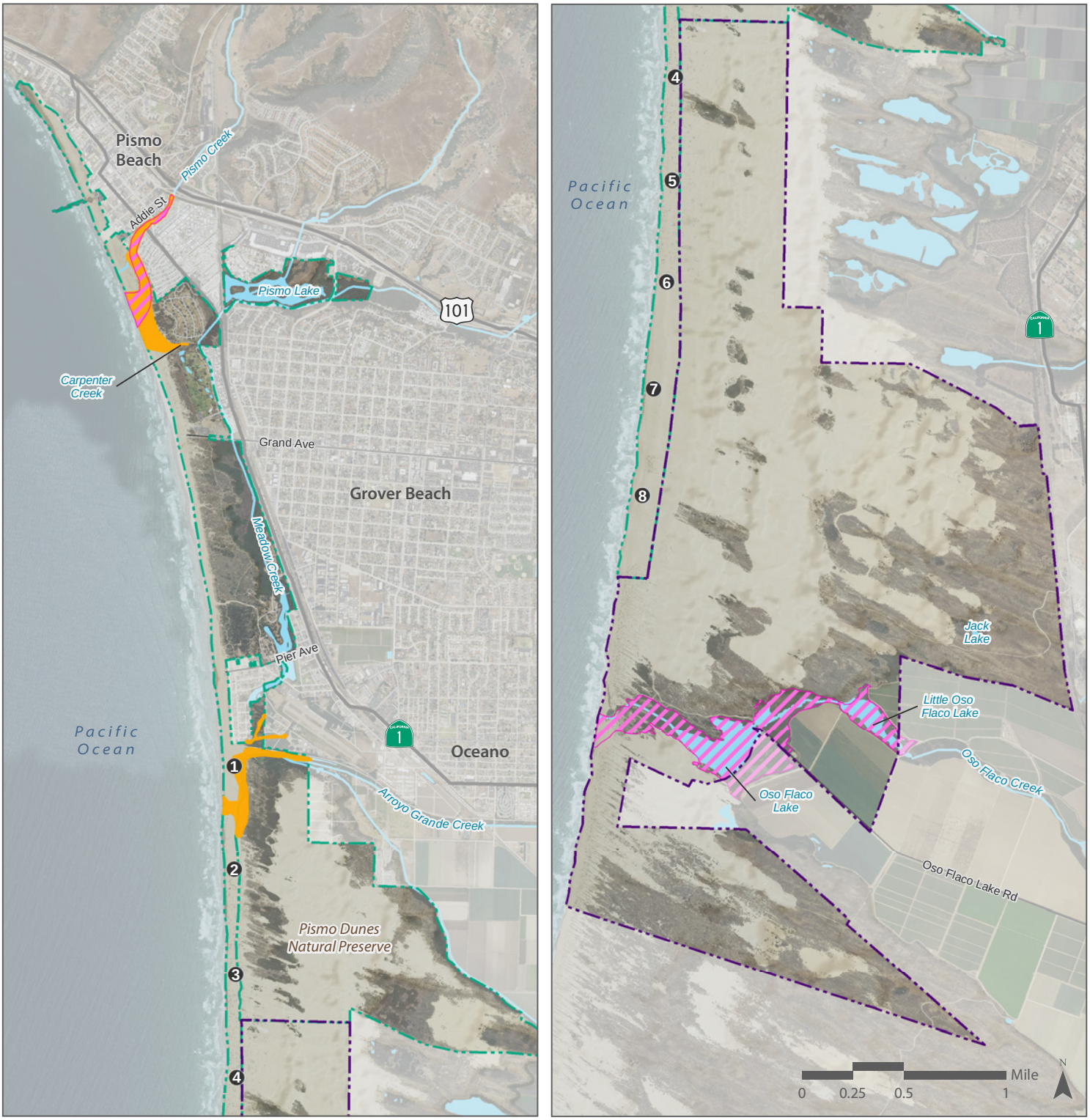
Note: CRLF upland habitat is located throughout the HCP area wherever wetlands are absent. Wetland habitat includes: riverine, lake, freshwater pond, freshwater emergent, and estuarine wetlands.

MIG

July 2020
Source: USFWS, 2016
CDPR, 2020; MIG, 2020

Map 14 California Red-legged Frog Occurrences, Potential Habitat, and Recovery Plan Unit

Oceano Dunes District Habitat Conservation Plan



Tidewater Goby Habitat

- Tidewater goby critical habitat
- Tidewater goby occupied habitat

Base Map Features

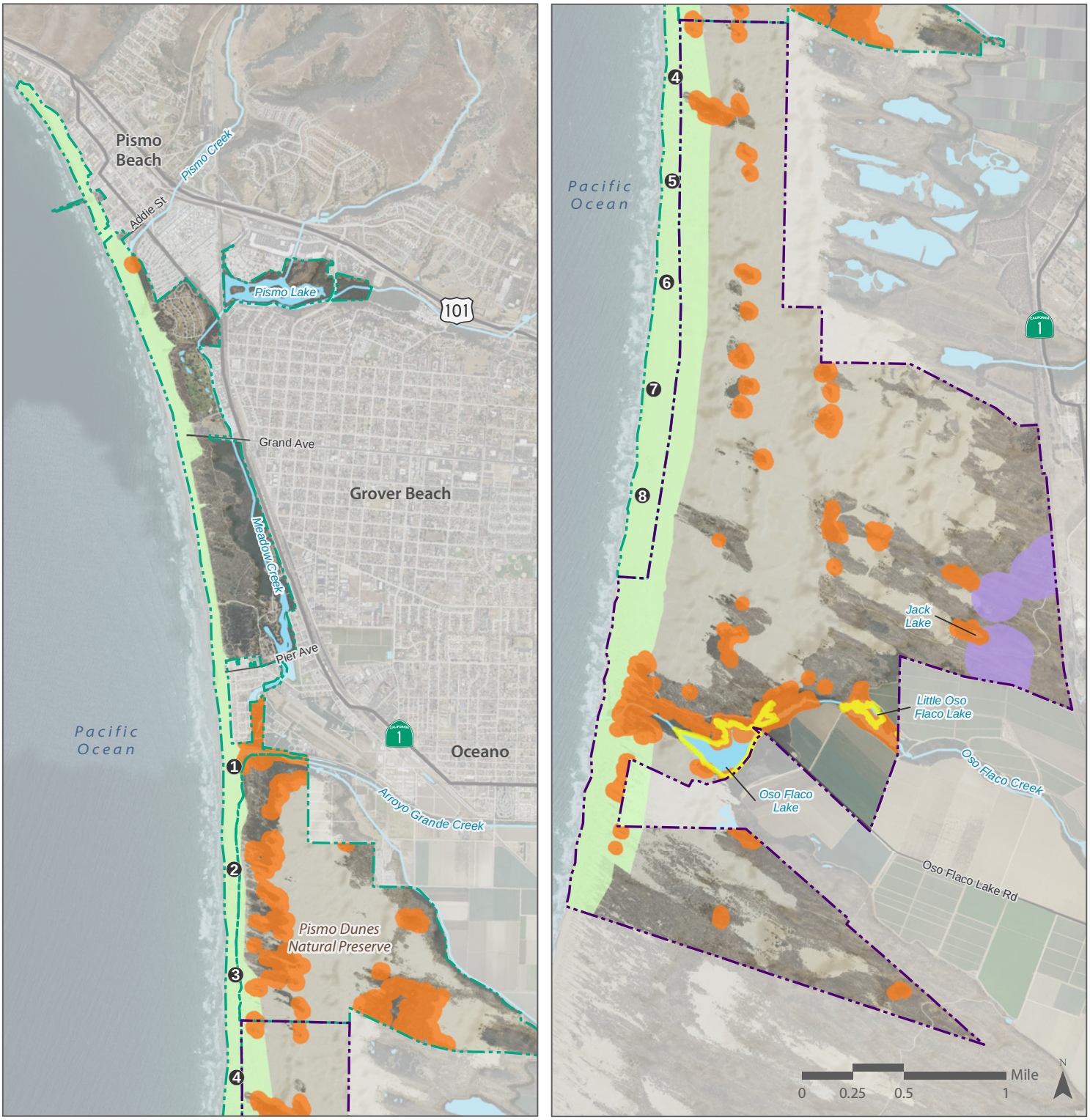
- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2020
Source: USFWS, 2016
CDPR, 2020; MIG, 2020

Map 15 Tidewater Goby Habitat and Critical Habitat

Oceano Dunes District Habitat Conservation Plan



Sensitive Plant Habitat

- Marsh sandwort / Gambel's watercress: 11 acres
- La Graciosa thistle: 559 acres
- Surf thistle / Beach spectaclepod: 896 acres
- Nipomo Mesa lupine: 117 acres

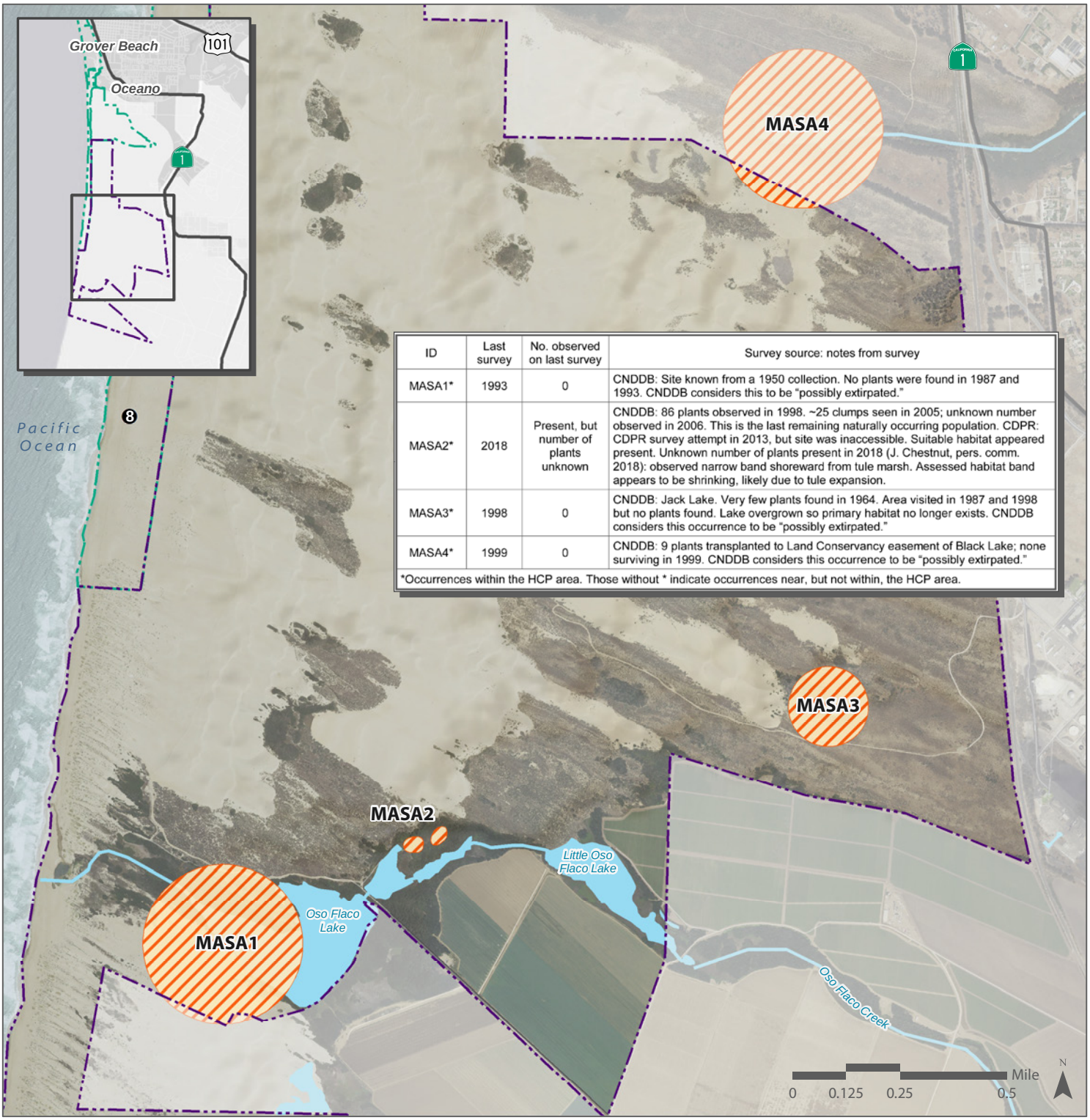
Base Map Features

- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

July 2020
Source: CDPR, 2020; MIG, 2020

Map 16 Modeled Plant Habitat in the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last survey	No. observed on last survey	Survey source: notes from survey
MASA1*	1993	0	CNDDB: Site known from a 1950 collection. No plants were found in 1987 and 1993. CNDDB considers this to be "possibly extirpated."
MASA2*	2018	Present, but number of plants unknown	CNDDB: 86 plants observed in 1998. ~25 clumps seen in 2005; unknown number observed in 2006. This is the last remaining naturally occurring population. CDPR: CDPR survey attempt in 2013, but site was inaccessible. Suitable habitat appeared present. Unknown number of plants present in 2018 (J. Chestnut, pers. comm. 2018): observed narrow band shoreward from tule marsh. Assessed habitat band appears to be shrinking, likely due to tule expansion.
MASA3*	1998	0	CNDDB: Jack Lake. Very few plants found in 1964. Area visited in 1987 and 1998 but no plants found. Lake overgrown so primary habitat no longer exists. CNDDB considers this occurrence to be "possibly extirpated."
MASA4*	1999	0	CNDDB: 9 plants transplanted to Land Conservancy easement of Black Lake; none surviving in 1999. CNDDB considers this occurrence to be "possibly extirpated."
*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.			

Marsh Sandwort

Marsh sandwort occurrences

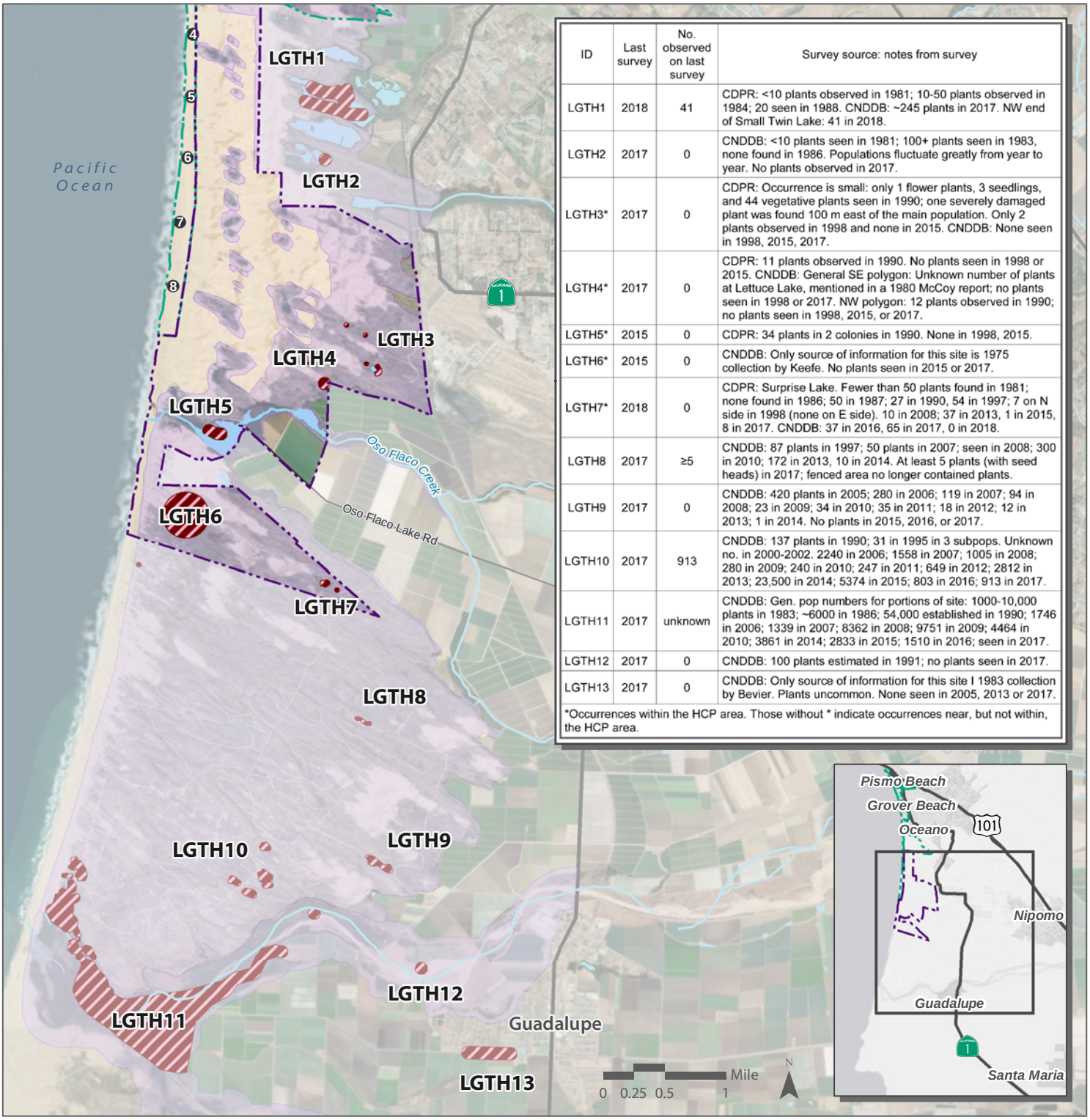
Base Map Features

Oceano Dunes SVRA
Pismo State Beach
Marker post
Waterbody
Stream
Highway
Access road

July 2020
Source: CDPR, 2020; CNDDB 2019; MIG, 2020

Map 17 Marsh Sandwort Occurrences in and near the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last survey	No. observed on last survey	Survey source: notes from survey
LGTH1	2018	41	CDPR: <10 plants observed in 1981; 10-50 plants observed in 1984; 20 seen in 1988. CNDDB: ~245 plants in 2017. NW end of Small Twin Lake: 41 in 2018.
LGTH2	2017	0	CNDDB: <10 plants seen in 1981; 100+ plants seen in 1983, none found in 1986. Populations fluctuate greatly from year to year. No plants observed in 2017.
LGTH3*	2017	0	CDPR: Occurrence is small: only 1 flower plants, 3 seedlings, and 44 vegetative plants seen in 1990; one severely damaged plant was found 100 m east of the main population. Only 2 plants observed in 1998 and none in 2015. CNDDB: None seen in 1998, 2015, 2017.
LGTH4*	2017	0	CDPR: 11 plants observed in 1990. No plants seen in 1998 or 2015. CNDDB: General SE polygon: Unknown number of plants at Lettuce Lake, mentioned in a 1980 McCoy report; no plants seen in 1998 or 2017. NW polygon: 12 plants observed in 1990; no plants seen in 1998, 2015, or 2017.
LGTH5*	2015	0	CDPR: 34 plants in 2 colonies in 1990. None in 1998, 2015.
LGTH6*	2015	0	CNDDB: Only source of information for this site is 1975 collection by Keefe. No plants seen in 2015 or 2017.
LGTH7*	2018	0	CDPR: Surprise Lake. Fewer than 50 plants found in 1981; none found in 1986; 50 in 1987; 27 in 1990, 54 in 1997; 7 on N side in 1998 (none on E side). 10 in 2008; 37 in 2013, 1 in 2015, 8 in 2017. CNDDB: 37 in 2016, 65 in 2017, 0 in 2018.
LGTH8	2017	≥5	CNDDB: 87 plants in 1997; 50 plants in 2007; seen in 2008; 300 in 2010; 172 in 2013, 10 in 2014. At least 5 plants (with seed heads) in 2017; fenced area no longer contained plants.
LGTH9	2017	0	CNDDB: 420 plants in 2005; 280 in 2006; 119 in 2007; 94 in 2008; 23 in 2009; 34 in 2010; 35 in 2011; 18 in 2012; 12 in 2013; 1 in 2014. No plants in 2015, 2016, or 2017.
LGTH10	2017	913	CNDDB: 137 plants in 1990; 31 in 1995 in 3 subpops. Unknown no. in 2000-2002. 2240 in 2006; 1558 in 2007; 1005 in 2008; 280 in 2009; 240 in 2010; 247 in 2011; 649 in 2012; 2812 in 2013; 23,500 in 2014; 5374 in 2015; 803 in 2016; 913 in 2017.
LGTH11	2017	unknown	CNDDB: Gen. pop numbers for portions of site: 1000-10,000 plants in 1983; ~6000 in 1986; 54,000 established in 1990; 1746 in 2006; 1339 in 2007; 8362 in 2008; 9751 in 2009; 4464 in 2010; 3861 in 2014; 2833 in 2015; 1510 in 2016; seen in 2017.
LGTH12	2017	0	CNDDB: 100 plants estimated in 1991; no plants seen in 2017.
LGTH13	2017	0	CNDDB: Only source of information for this site I 1983 collection by Bevier. Plants uncommon. None seen in 2005, 2013 or 2017.

*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.

La Graciosa Thistle

- La Graciosa thistle critical habitat
- La Graciosa thistle occurrence

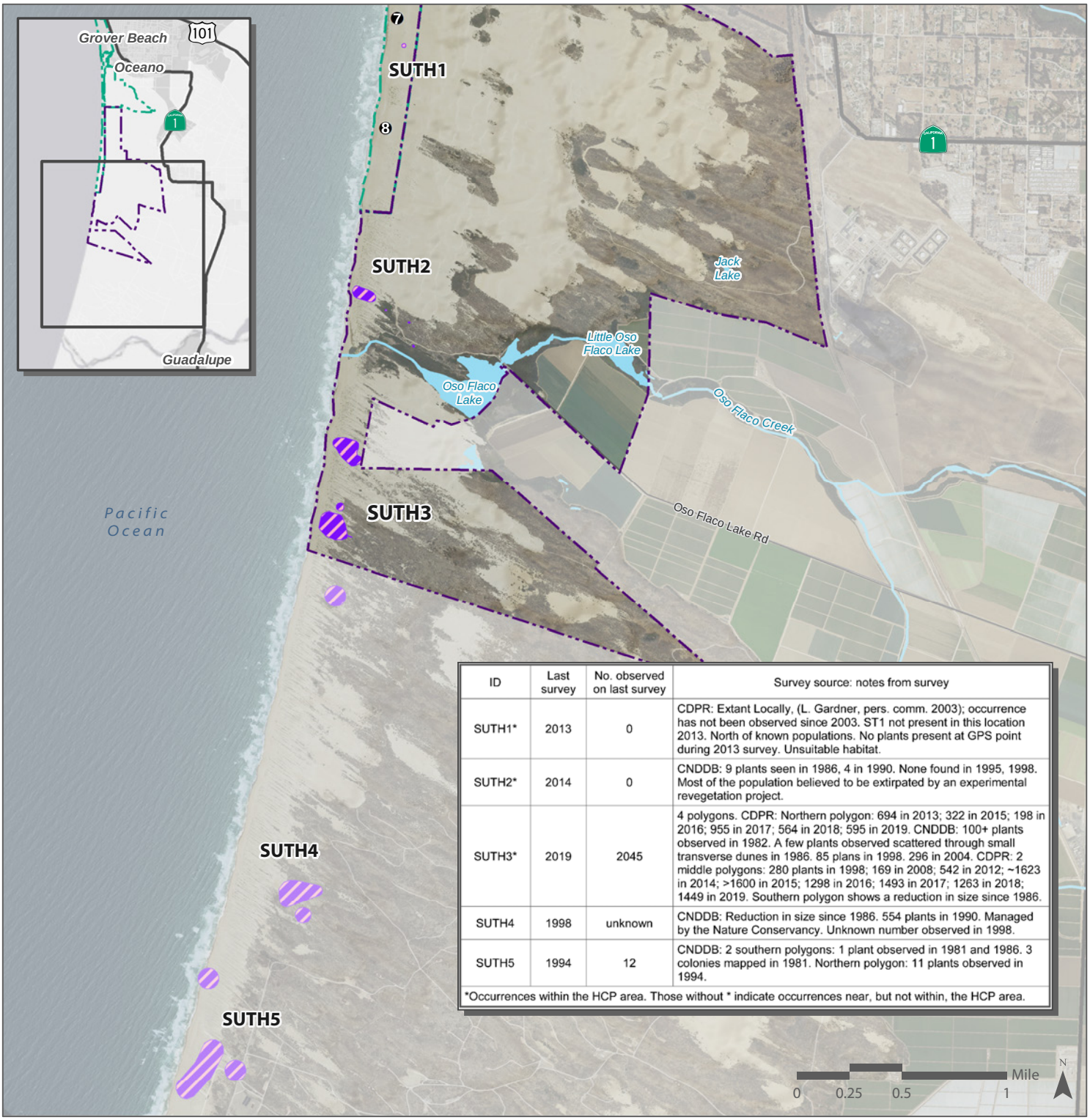
Base Map Features

- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

MIG

July 2020
Source: USFWS, 2009; CDPR 2020; CNDDB, 2019; MIG, 2020

Map 18 La Graciosa Thistle Occurrences and Critical Habitat in and near the HCP Area



ID	Last survey	No. observed on last survey	Survey source: notes from survey
SUTH1*	2013	0	CDPR: Extant Locally, (L. Gardner, pers. comm. 2003); occurrence has not been observed since 2003. ST1 not present in this location 2013. North of known populations. No plants present at GPS point during 2013 survey. Unsuitable habitat.
SUTH2*	2014	0	CNDDB: 9 plants seen in 1986, 4 in 1990. None found in 1995, 1998. Most of the population believed to be extirpated by an experimental revegetation project.
SUTH3*	2019	2045	4 polygons. CDPR: Northern polygon: 694 in 2013; 322 in 2015; 198 in 2016; 955 in 2017; 564 in 2018; 595 in 2019. CNDDB: 100+ plants observed in 1982. A few plants observed scattered through small transverse dunes in 1986. 85 plans in 1998. 296 in 2004. CDPR: 2 middle polygons: 280 plants in 1998; 169 in 2008; 542 in 2012; ~1623 in 2014; >1600 in 2015; 1298 in 2016; 1493 in 2017; 1263 in 2018; 1449 in 2019. Southern polygon shows a reduction in size since 1986.
SUTH4	1998	unknown	CNDDB: Reduction in size since 1986. 554 plants in 1990. Managed by the Nature Conservancy. Unknown number observed in 1998.
SUTH5	1994	12	CNDDB: 2 southern polygons: 1 plant observed in 1981 and 1986. 3 colonies mapped in 1981. Northern polygon: 11 plants observed in 1994.

*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.

Surf Thistle

Surf thistle populations

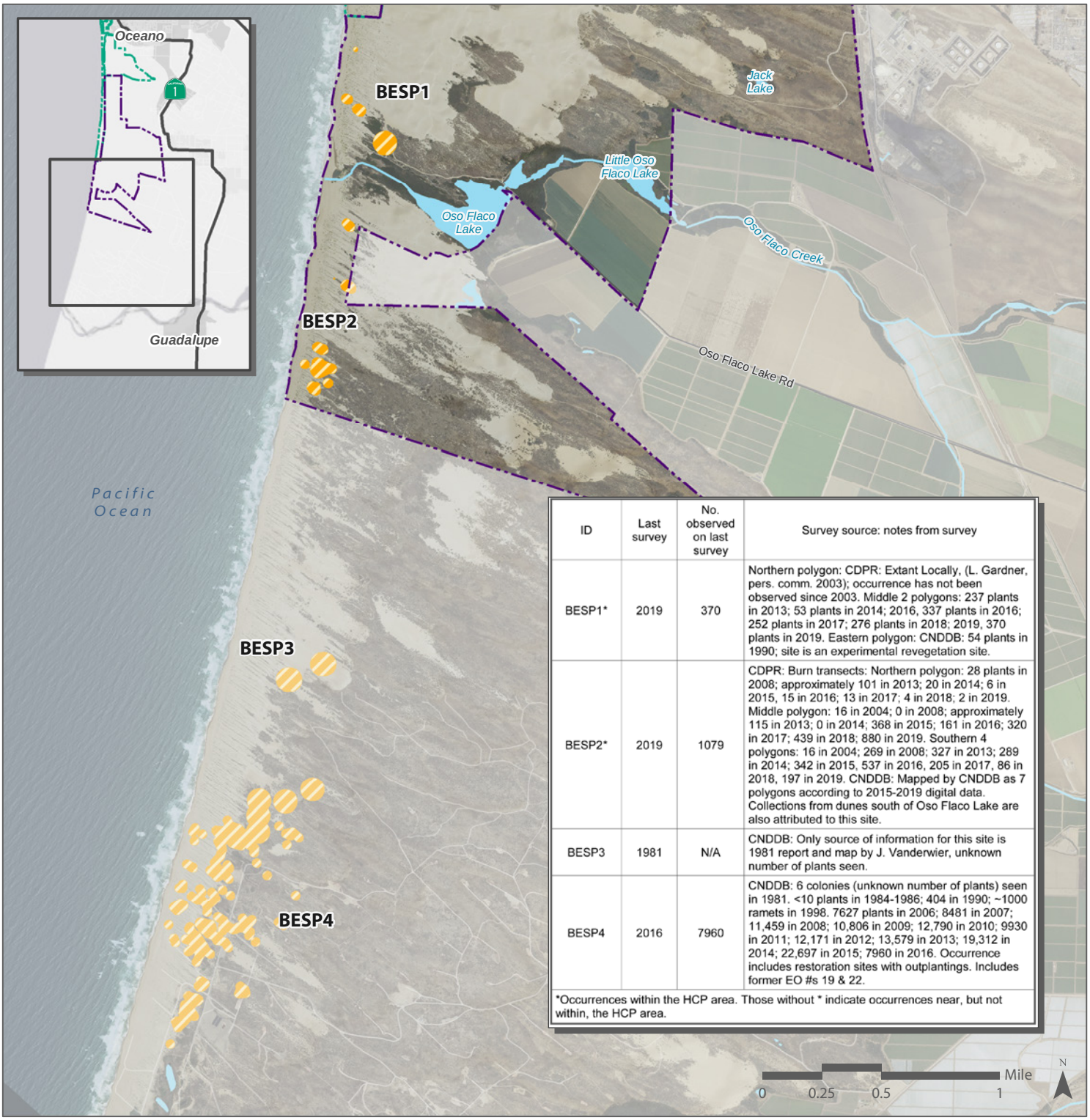
Base Map Features

Oceano Dunes SVRA
Pismo State Beach
Marker post
Waterbody
Stream
Highway
Access road

July 2020
Source: CDPR, 2020; CNDDB 2019; MIG, 2020

Map 19 Surf Thistle Occurrences in and near the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last survey	No. observed on last survey	Survey source: notes from survey
BESP1*	2019	370	Northern polygon: CDPR: Extant Locally, (L. Gardner, pers. comm. 2003); occurrence has not been observed since 2003. Middle 2 polygons: 237 plants in 2013; 53 plants in 2014; 2016, 337 plants in 2016; 252 plants in 2017; 276 plants in 2018; 2019, 370 plants in 2019. Eastern polygon: CNDDB: 54 plants in 1990; site is an experimental revegetation site.
BESP2*	2019	1079	CDPR: Burn transects: Northern polygon: 28 plants in 2008; approximately 101 in 2013; 20 in 2014; 6 in 2015, 15 in 2016; 13 in 2017; 4 in 2018; 2 in 2019. Middle polygon: 16 in 2004; 0 in 2008; approximately 115 in 2013; 0 in 2014; 368 in 2015; 161 in 2016; 320 in 2017; 439 in 2018; 880 in 2019. Southern 4 polygons: 16 in 2004; 269 in 2008; 327 in 2013; 289 in 2014; 342 in 2015, 537 in 2016, 205 in 2017, 86 in 2018, 197 in 2019. CNDDB: Mapped by CNDDB as 7 polygons according to 2015-2019 digital data. Collections from dunes south of Oso Flaco Lake are also attributed to this site.
BESP3	1981	N/A	CNDDB: Only source of information for this site is 1981 report and map by J. Vanderwier, unknown number of plants seen.
BESP4	2016	7960	CNDDB: 6 colonies (unknown number of plants) seen in 1981. <10 plants in 1984-1986; 404 in 1990; ~1000 ramets in 1998. 7627 plants in 2006; 8481 in 2007; 11,459 in 2008; 10,806 in 2009; 12,790 in 2010; 9930 in 2011; 12,171 in 2012; 13,579 in 2013; 19,312 in 2014; 22,697 in 2015; 7960 in 2016. Occurrence includes restoration sites with outplantings. Includes former EO #s 19 & 22.

*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.

Beach Spectaclepod

Beach spectaclepod populations

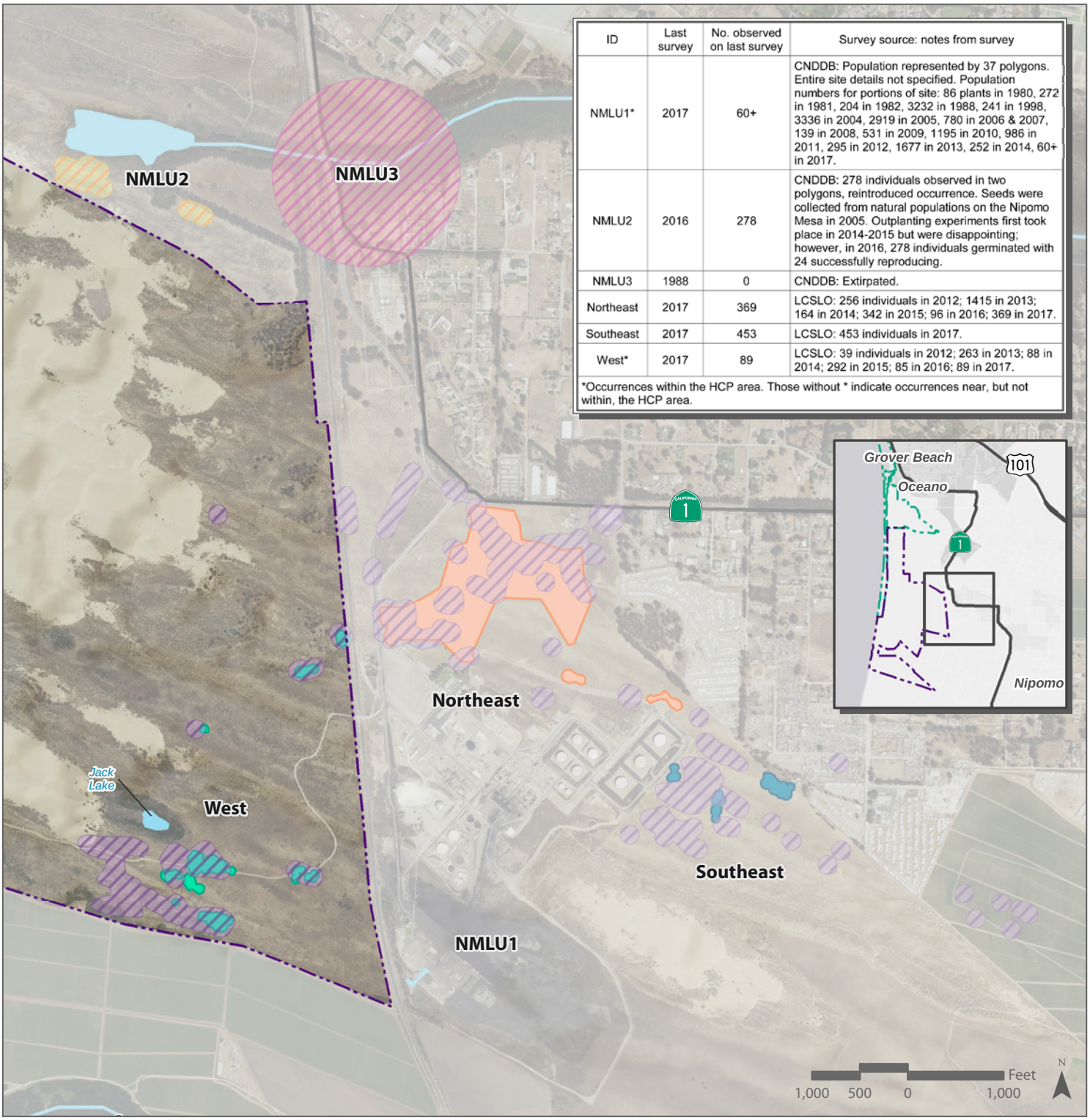
Base Map Features

Oceano Dunes SVRA
Pismo State Beach
Marker post
Waterbody
Stream
Access road

July 2020
Source: CDPR, 2020; CNDDB 2019; MIG, 2020

Map 20 Beach Spectaclepod Occurrences in and near the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last survey	No. observed on last survey	Survey source: notes from survey
NMLU1*	2017	60+	CNDDB: Population represented by 37 polygons. Entire site details not specified. Population numbers for portions of site: 86 plants in 1980, 272 in 1981, 204 in 1982, 3232 in 1988, 241 in 1998, 3336 in 2004, 2919 in 2005, 780 in 2006 & 2007, 139 in 2008, 531 in 2009, 1195 in 2010, 986 in 2011, 295 in 2012, 1677 in 2013, 252 in 2014, 60+ in 2017.
NMLU2	2016	278	CNDDB: 278 individuals observed in two polygons, reintroduced occurrence. Seeds were collected from natural populations on the Nipomo Mesa in 2005. Outplanting experiments first took place in 2014-2015 but were disappointing; however, in 2016, 278 individuals germinated with 24 successfully reproducing.
NMLU3	1988	0	CNDDB: Extirpated.
Northeast	2017	369	LCSLO: 256 individuals in 2012; 1415 in 2013; 164 in 2014; 342 in 2015; 96 in 2016; 369 in 2017.
Southeast	2017	453	LCSLO: 453 individuals in 2017.
West*	2017	89	LCSLO: 39 individuals in 2012; 263 in 2013; 88 in 2014; 292 in 2015; 85 in 2016; 89 in 2017.

*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.

Nipomo Mesa Lupine Occurrences

CNDDB survey data
- NMLU1 population
- NMLU2 population
- NMLU3 population

SLO Land Conservancy survey data (2012-2017)
- Northeast region
- Southeast region
- West region

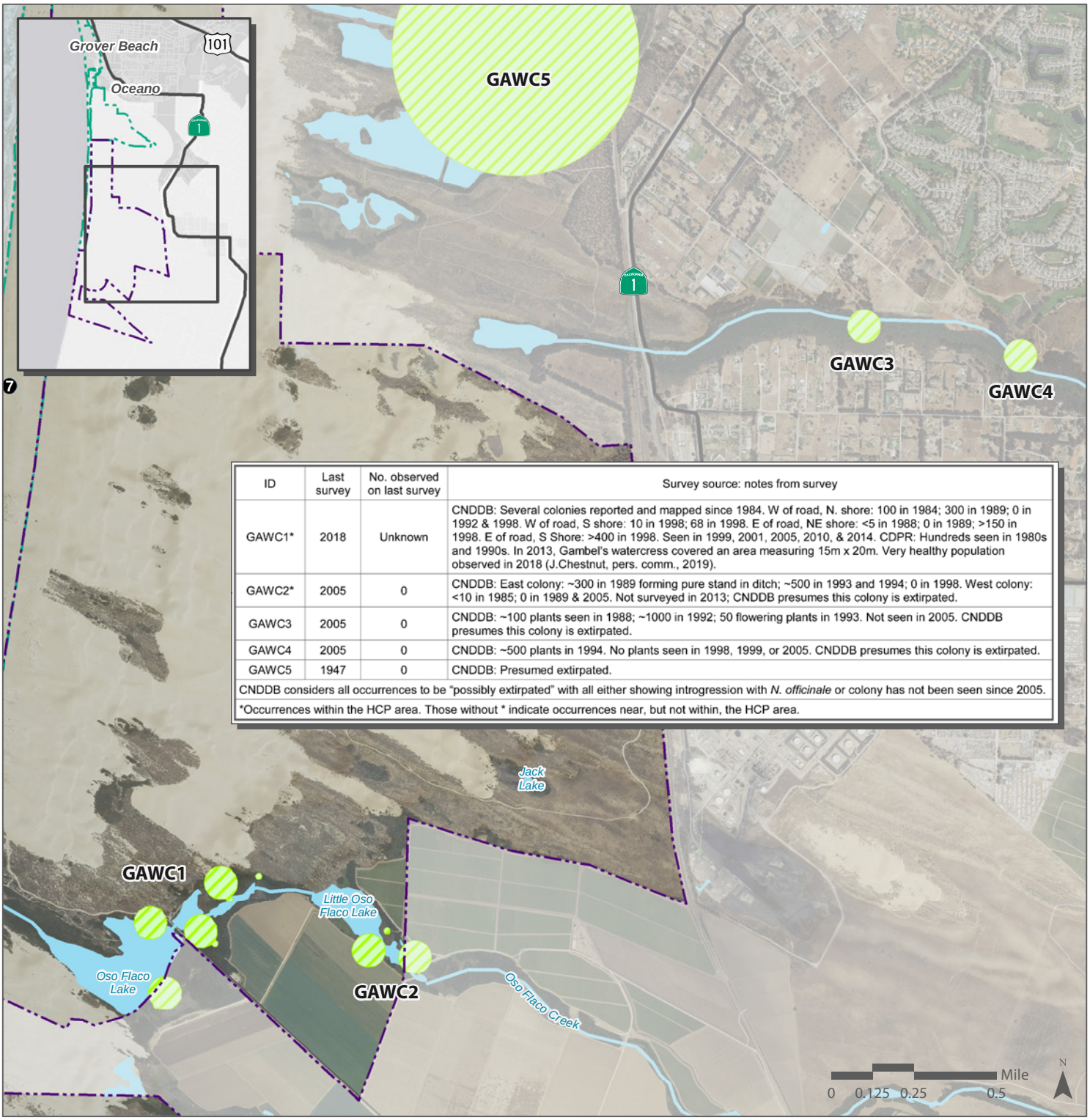
Base Map Features
- Oceano Dunes SVRA
- Pismo State Beach
- Waterbody
- Stream
- Highway

MIG

July 2020
Source: CDPR, 2020; CNDDB 2019; Land Conservancy of San Luis Obispo, 2019; MIG, 2020

Map 21 Nipomo Mesa Lupine Occurrences in and near the HCP Area

Oceano Dunes District Habitat Conservation Plan



ID	Last survey	No. observed on last survey	Survey source: notes from survey
GAWC1*	2018	Unknown	CNDDB: Several colonies reported and mapped since 1984. W of road, N. shore: 100 in 1984; 300 in 1989; 0 in 1992 & 1998. W of road, S shore: 10 in 1998; 68 in 1998. E of road, NE shore: <5 in 1988; 0 in 1989; >150 in 1998. E of road, S Shore: >400 in 1998. Seen in 1999, 2001, 2005, 2010, & 2014. CDPR: Hundreds seen in 1980s and 1990s. In 2013, Gambel's watercress covered an area measuring 15m x 20m. Very healthy population observed in 2018 (J.Chestnut, pers. comm., 2019).
GAWC2*	2005	0	CNDDB: East colony: ~300 in 1989 forming pure stand in ditch; ~500 in 1993 and 1994; 0 in 1998. West colony: <10 in 1985; 0 in 1989 & 2005. Not surveyed in 2013; CNDDB presumes this colony is extirpated.
GAWC3	2005	0	CNDDB: ~100 plants seen in 1988; ~1000 in 1992; 50 flowering plants in 1993. Not seen in 2005. CNDDB presumes this colony is extirpated.
GAWC4	2005	0	CNDDB: ~500 plants in 1994. No plants seen in 1998, 1999, or 2005. CNDDB presumes this colony is extirpated.
GAWC5	1947	0	CNDDB: Presumed extirpated.
CNDDB considers all occurrences to be "possibly extirpated" with all either showing introgression with *N. officinale* or colony has not been seen since 2005.			
*Occurrences within the HCP area. Those without * indicate occurrences near, but not within, the HCP area.			

Gambel's Watercress

Gambel's watercress occurrences

Base Map Features

Oceano Dunes SVRA
Pismo State Beach
Marker post
Waterbody
Stream
Highway
Access road

MIG

July 2020
Source: CDPR, 2020; CNDDB 2019; MIG, 2020

Map 22 Gambel's Watercress Occurrences in and near the HCP Area

Oceano Dunes District Habitat Conservation Plan



Covered Activities, Land Use & Park Facilities

- Vegetation and dust control islands
- Oso Flaco boardwalk
- S. Oso Flaco symbolic fence
- Wind fencing
- Boneyard gate
- Restrooms
- S1 air monitoring site
- Riparian maintenance location
- Pedestrian bridge*
- Sand Highway*
- CA-44 PMRP, Track-out device
- CA-44 PMRP, Foredune to be planted
- CA-44 PMRP, Wind fencing converting to vegetation
- CA-50 6 Exclosure reduction*
- CA-50 Boneyard Exclosure reduction*

Land Use

- Campground or golf course
- Pedestrians only
- Open to riding and camping
- Street legal vehicles only

Kiteboarding landing/launching

- Wet/dry allowed
- Wet only
- Wet only; seasonal

SNPL Habitat

- Primary habitat
- Secondary habitat
- Tertiary habitat

Base Map Features

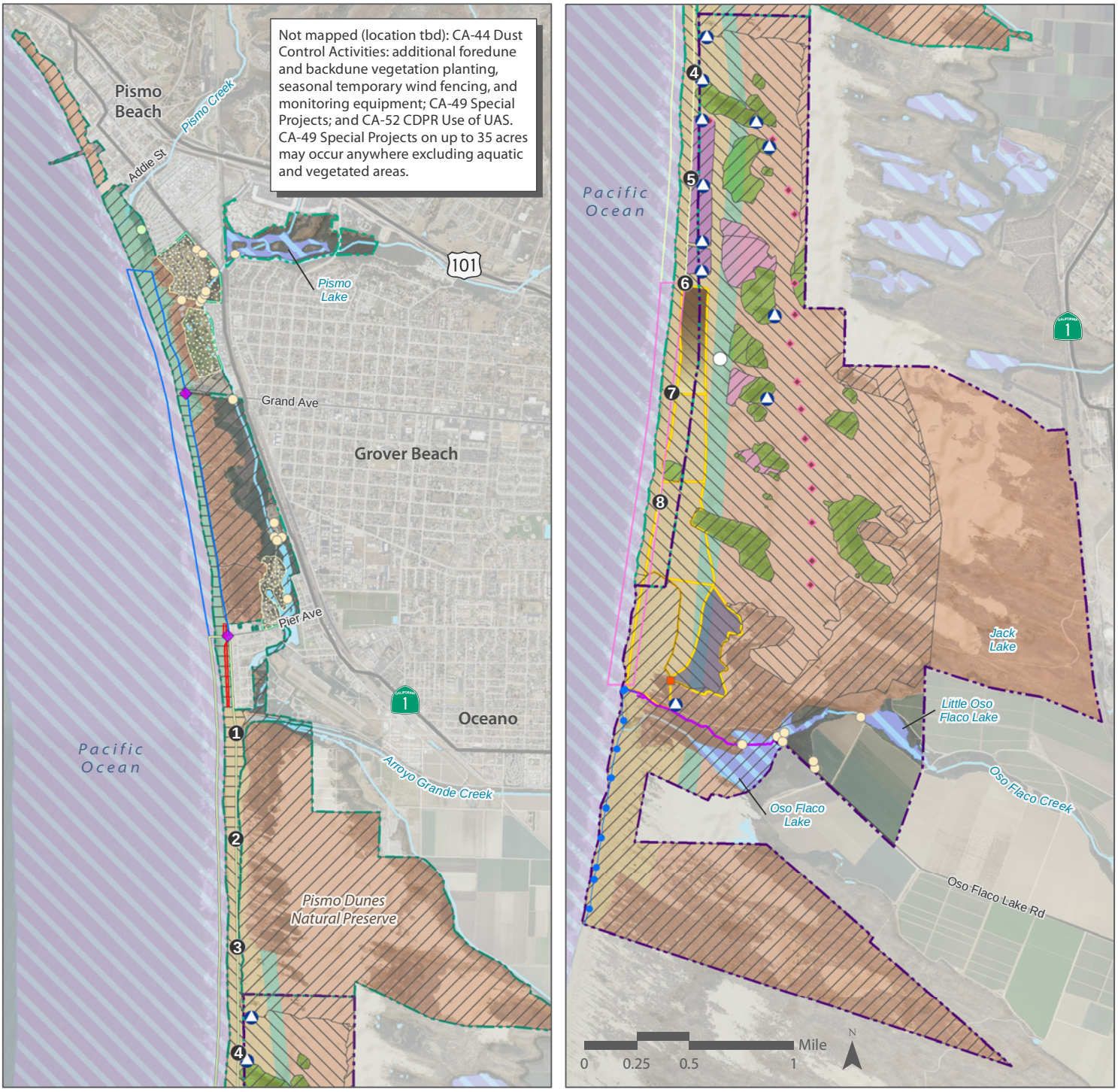
- Oceano Dunes SVRA
- Pismo State Beach
- Seasonal exclosure
- Marker post
- Waterbody
- Stream
- Highway
- Access road

July 2020
Source: CDPR, 2020
MIG, 2020

*Approximate location

Map 23 Western Snowy Plover Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan



Covered Activities, Land Use & Park Facilities

- Vegetation and dust control islands
- Oso Flaco boardwalk
- S. Oso Flaco symbolic fence
- Wind fencing
- Boneyard gate
- Restrooms
- S1 air monitoring site
- Riparian maintenance location
- Pedestrian bridge*
- Sand Highway*
- CA-44 PMRP, Track-out device
- CA-44 PMRP, Foredune to be planted
- CA-44 PMRP, Wind fencing converting to vegetation
- CA-50 6 Exclosure reduction*
- CA-50 Boneyard Exclosure reduction*

Land Use

- Campground or golf course
- Pedestrians only
- Open to riding and camping
- Street legal vehicles only

Kiteboarding landing/launching

- Wet/dry allowed
- Wet only
- Wet only; seasonal

CLTE Habitat

- Primary habitat
- Secondary habitat
- Tertiary habitat
- Foraging habitat

Base Map Features

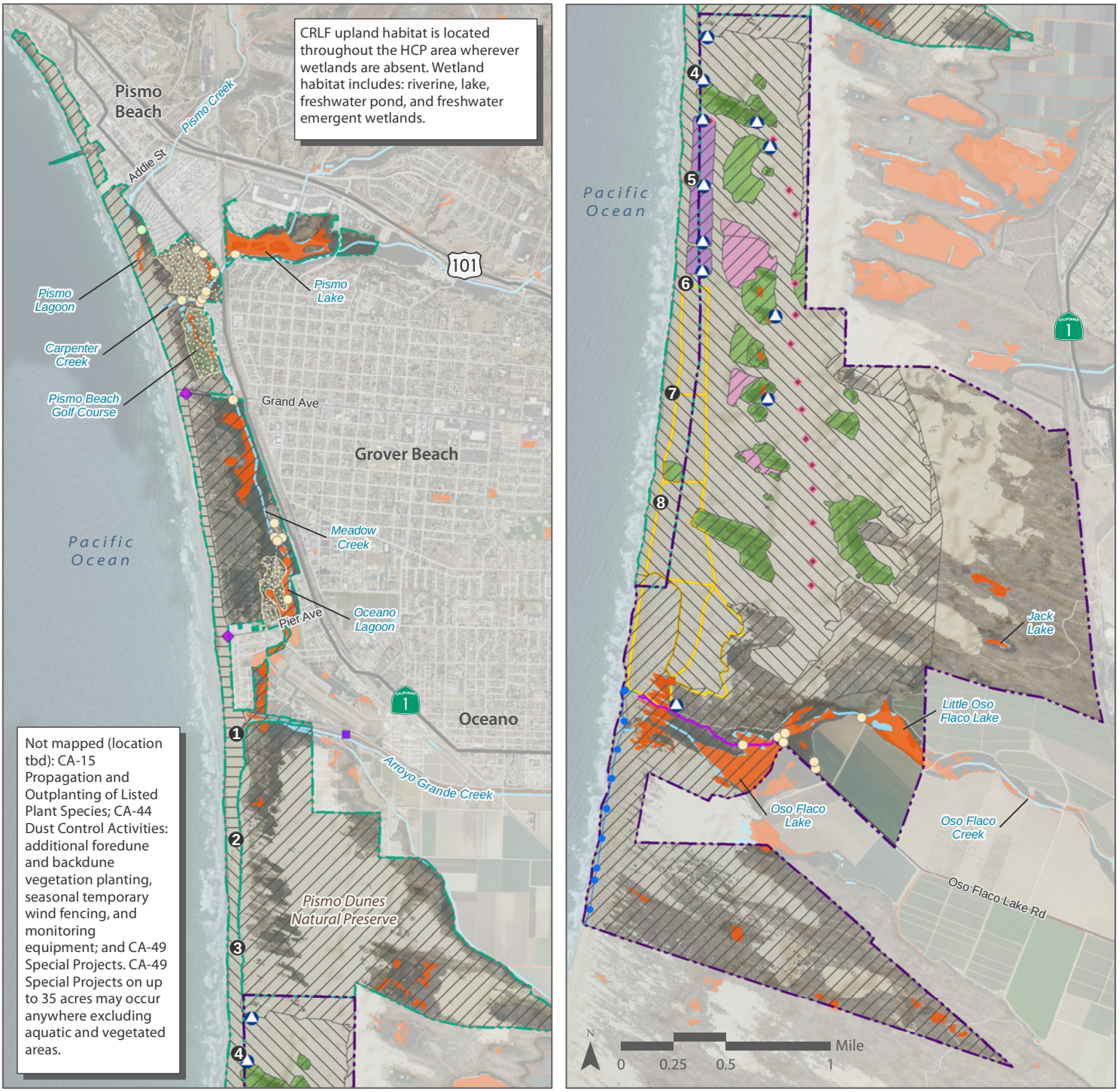
- Oceano Dunes SVRA
- Pismo State Beach
- Seasonal exclosure
- Marker post
- Waterbody
- Stream
- Highway
- Access road

July 2020
Source: CDPR, 2020
MIG, 2020

*Approximate location

Map 24 California Least Tern Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan



CRLF Habitat

- Potential CRLF breeding habitat - USFWS National Wetland Inventory

Covered Activites, Land Use & Park Facilities

- CA-44 PMRP, Track-out device
- CA-44 PMRP, Foredune to be planted
- CA-44 PMRP, Wind fencing converting to vegetation
- Vegetation and dust control islands
- Oso Flaco boardwalk
- S. Oso Flaco symbolic fence
- Restrooms
- Boneyard gate
- Guiton crossing
- Pedestrian bridge*
- Riparian maintenance location
- Sand Highway*

Land Use

- Campground or golf course
- Pedestrians only
- Open to riding and camping
- Street legal vehicles only

Base Map Features

- Oceano Dunes SVRA
- Pismo State Beach
- Seasonal exclosure
- Marker post
- Waterbody
- Stream
- Highway
- Access road

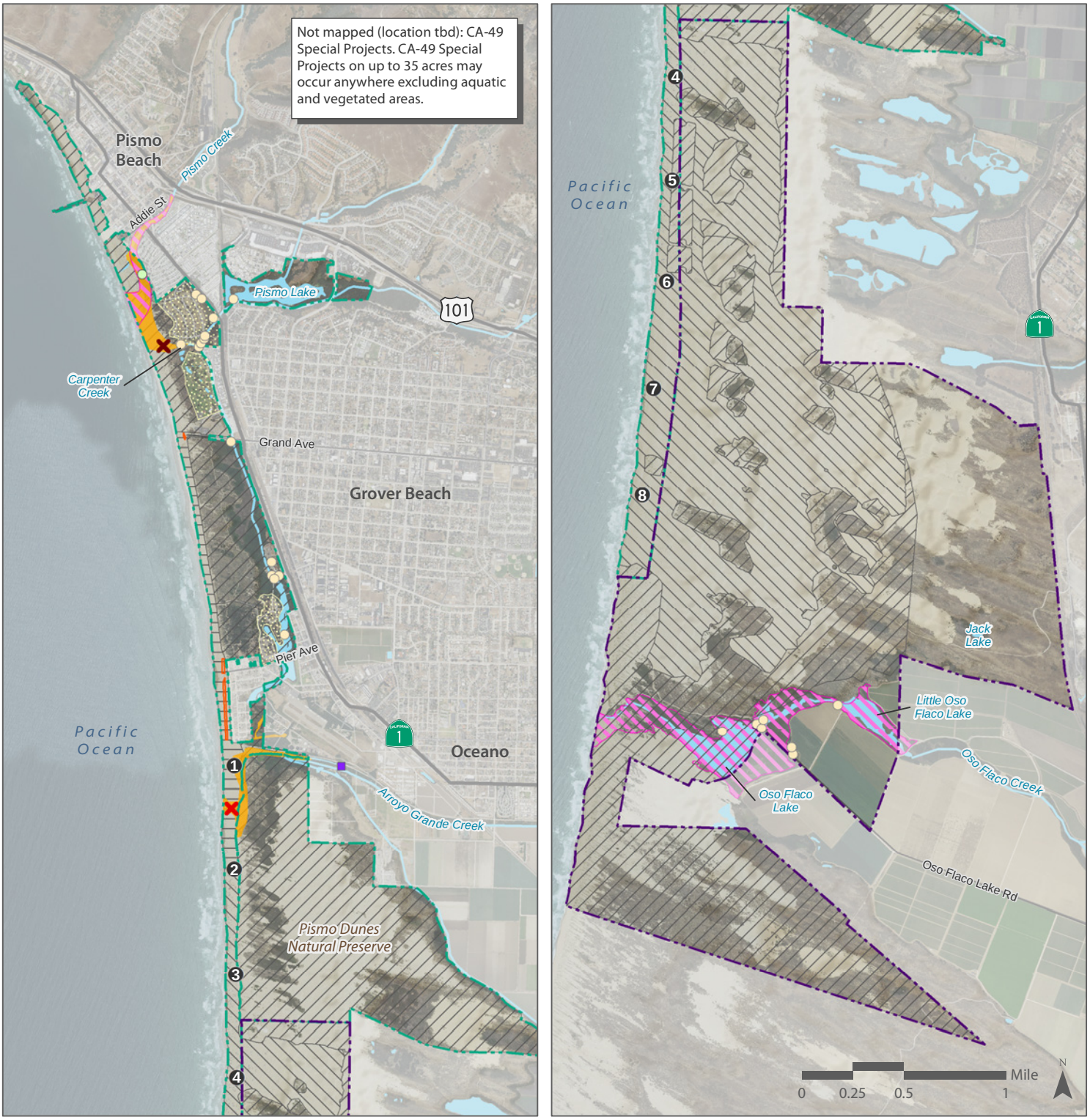
*Approximate location

MIG

July 2020
Source: USFWS, 2016
CDPR, 2020; MIG, 2020

Map 25 California Red-legged Frog Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan



Tidewater Goby Habitat

- Tidewater goby critical habitat
- Tidewater goby occupied habitat

Covered Activities & Land Use

- Wind fencing
- Guiton crossing
- Pedestrian bridge*
- Riparian maintenance
- Vehicle crossing
- CDPR vehicle crossing only

Land Use

- Campground or golf course
- Pedestrians only
- Open to riding and camping
- Street legal vehicles only

Base Map Features

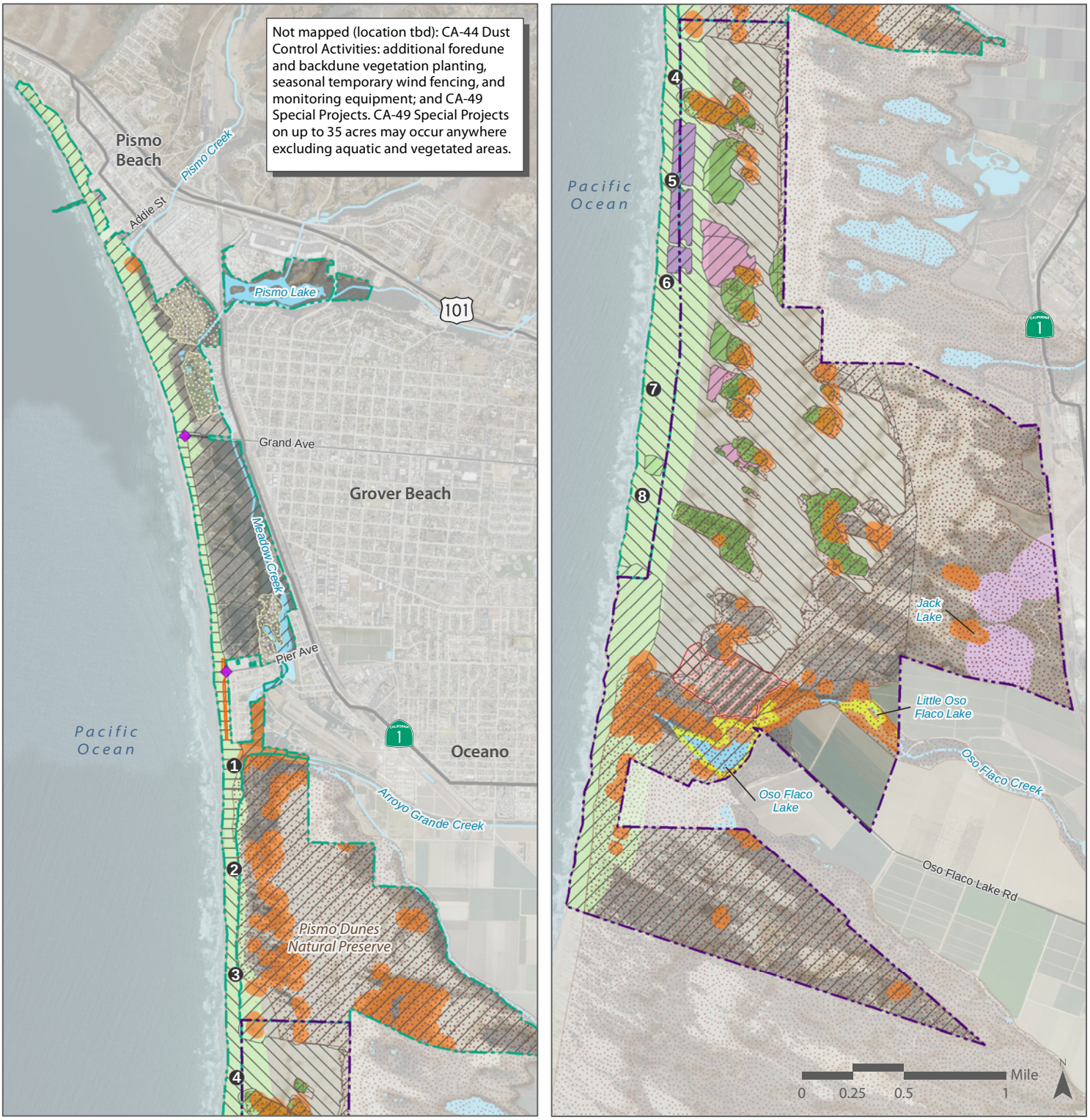
- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

*Approximate location

July 2020
Source: USFWS 2016
CDPR, 2020; MIG, 2020

Map 26 Tidewater Goby Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan



Sensitive and Critical Plant Habitat

- Marsh sandwort / Gambel's watercress
- La Graciosa thistle
- Nipomo Mesa lupine:
- Surf thistle / Beach spectaclepod
- La Graciosa thistle critical habitat

Covered Activities & Land Use

- Wind fencing
- Vegetation and dust control islands
- CA-42 Riding in 40 Acres*
- CA-44 PMRP, Track-out device
- CA-44 PMRP, Foredune to be planted
- CA-44 PMRP, Wind fencing converting to vegetation

Land Use

- Campground or golf course
- Pedestrians only
- Open to riding and camping
- Street legal vehicles only

Base Map Features

- Oceano Dunes SVRA
- Pismo State Beach
- Marker post
- Waterbody
- Stream
- Highway
- Access road

*Approximate location

July 2020
Source: CDPR, 2020; MIG, 2020

Map 27 Modeled Plant Habitat and Covered Activities

Oceano Dunes District Habitat Conservation Plan

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