

Oceano Dunes Biodiversity Management Plan

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Prepared by the California Department of Fish and Wildlife (CDFW),
in Cooperation with California State Parks (CSP)

Table of Contents

1. Introduction and Summary	3
1.1. Beach and Coastal Dune Camping	7
1.2. Public Use Numbers within the BMP Area.....	7
2. Vegetation and Plant Communities.....	8
2.1. Known Resources Present	8
2.2. Ongoing Survey and Management Actions	8
2.2.1. Surveys.....	8
2.2.2. Restoration Actions	9
2.2.3. Riparian Resources.....	10
2.3. Potential OHV Related Impacts	10
2.4. Recommended Additional Conservation Actions.....	10
3. Special Status Invertebrates.....	11
3.1. Known Resources Present	11
3.2. Ongoing Survey and Management Actions	12
3.2.1. Surveys.....	12
3.2.2. Management	12
3.2.3. Restoration Actions	12
3.3. Potential OHV Related Impacts	12
3.4. Recommended Additional Conservation Actions.....	13
4. Special Status Aquatic Species	13
4.1. Known Resources Present	13
4.1.1. Red-legged Frog	13
4.1.2. Special Status Freshwater Fishes	13
4.1.3. Ocean Fisheries	14
4.2. Ongoing Survey and Management Actions	16
4.2.1. Surveys.....	16
4.2.2. Management Actions.....	17
4.3. Potential OHV Related Impacts	19
4.3.1. Red-legged Frog	19

4.3.2.	Stream Fisheries	19
4.3.3.	Ocean Fisheries	21
4.4.	Recommended Additional Conservation Actions.....	22
4.4.1.	Red-legged Frog	22
4.4.2.	Stream Fisheries	22
4.4.3.	Ocean Fisheries	24
5.	Listed Shorebirds/Seabirds - Nesting, wintering, enclosures.....	25
5.1.	Known Resources Present	25
5.2.	Ongoing Survey and Management Actions	26
5.2.1.	Surveys.....	26
5.2.2.	Management	26
5.2.3.	Restoration Actions	27
5.3.	Potential OHV Related Impacts	27
5.4.	Recommended Additional Conservation Actions.....	28
6.	Oso Flaco Lake Complex	31
6.1.	Known Resources Present	31
6.2.	Ongoing Survey and Management Actions	32
6.2.1.	Surveys.....	32
6.2.2.	Management	32
6.2.3.	Restoration Actions	32
6.3.	Potential OHV Related Impacts	33
6.4.	Recommended Additional Conservation Actions.....	33
7.	Future Collaboration	34
8.	Literature Cited.....	36

1. Introduction and Summary

This biodiversity management plan (BMP) highlights biological resource considerations related to vehicular and Off-Highway vehicle (OHV) use in the area that geographically consists of the entirety of the Oceano Dunes State Vehicular Recreation Area (ODSVRA), as well as the portion of Pismo State Beach (PSB) south of Grand Avenue (hereafter, BMP Area), all located in San Luis Obispo County. Sand ramps at Grand and Pier Avenues currently provide the only vehicular access to ODSVRA (requires the driving of street legal vehicles on Pismo State Beach). This document also highlights biological resources of note that occur outside of but near the above referenced BMP Area, to clarify that they were specifically considered during the preparation of this document.

In response to actions by the California Coastal Commission, California State Parks (CSP) and California Department of Fish and Wildlife (CDFW) agreed to meet to inform a set of CDFW recommendations concerning biological resources in the BMP Area. This BMP is the product of that collaboration.

CSP provides for the health, inspiration, and education of the people of California by preserving land, protecting resources, and creating outdoor recreation opportunities. CSP is a State trustee agency for units of the State Park System and responsible for management, maintenance, administration, and operation of state vehicle recreation areas such as ODSVRA. (Pub. Res. Code § 5090.32 b)). The Off-Highway Motor Vehicle Recreation (OHMVR) Act of 2003 (Public Resources Code § 5090.01 et seq.) provides CSP's mandate for off-highway vehicle (OHV) recreation. CSP's OHMVR Division is charged with administering the state's OHMVR Program to provide high quality OHV recreation opportunities and to provide for the conservation of natural and cultural resources.

CDFW is responsible for management of California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. As a State trustee for natural resources, CDFW works to ensure the conservation, protection, and management of biologically sustainable populations of species.

This BMP describes certain biological resources discussed by the two departments and for which CDFW is providing recommendations. These recommendations reflect the unique and specific conditions at ODSVRA. Section 6 of this BMP focuses on the Oso Flaco Lake Complex because of CSP plans to improve the area for visitor use. CDFW appreciates the input received from CSP to inform CDFW's recommendations and recognizes the challenges CSP faces in implementing its various mandates, which often-times compete

with each other. As indicated in Section 7 of this BMP, the two departments look forward to further collaboration while navigating the opportunities that arise when managing valuable resources such as the ODSVRA and Pismo State Beach (PSB).

The major components of the BMP consider vegetation and plant communities, special status invertebrates, special status amphibians and fish, listed shorebirds/seabirds, the Oso Flaco Lake Complex, and potential OHV impacts to all of these resources. The BMP includes a suite of recommendations, some of which would result in a major change to CSP operations and some that are less prescriptive. Some of those recommendations for the most significant topics are summarized below.

- Various Resources:
 - o Establish a Natural Communities Conservation Plan (NCCP). An NCCP considers the populations (both plants and wildlife and the habitats they rely on) as a whole and would better accommodate additional management actions as mitigation elements. CDFW recommends the NCCP process be initiated in January 2021. By the end of February 2021, CDFW further recommends that CDFW and CSP identify the timeline for completion of this landscape level permit and develop interim measures to be implemented until the NCCP is completed. Further, the two departments should endeavor to complete a NCCP within five years, or sooner if feasible. In the meantime, CDFW recommends all take of State listed species (California Endangered Species Act (CESA) or Fully Protected Species (FPS)) be avoided.

- Stream Fisheries and the Arroyo Grande Creek Crossing:
 - o To reduce vehicle related impacts to Creek resources, CDFW recommends that several measures occur simultaneously:
 - Close the stream crossing to all vehicles (with an exception for health and safety purposes) when a depth-criteria for the stream flow level is reached.
 - Commit to a mobile stream crossing structure as soon as possible to reduce vehicle impacts contingent on completion of a feasibility study analyzing costs, design, and operational considerations. This study will commence not later than March 2021. CSP retains the final decision on a mobile stream crossing structure pursuant to the outcome of the feasibility study.

- Utilize the CPS reservation system and outreach technology to provide advance notice to recreationalists when a depth-criteria will trigger closure of the stream crossing to vehicles.
 - Develop and implement a study to gather site specific information and foster adaptive management concerning these measures and long-term impacts of vehicle crossings on the stream and species.

- Night Riding
 - Design and conduct a joint study by CSP and CDFW to gather site specific information and foster adaptive management concerning the impacts of night riding on natural resources and species.
 - This joint study should facilitate the integration of CSP information and data and inform the development of the NCCP. Specifically, CDFW recommends that a peer reviewed, multi-year academic study be completed and funded by CSP.
 - To ensure a true study control, night riding will be prohibited during the duration of at least half of the study along the foredunes and surf zone south of Post 4.5.
 - The study's length will not extend past the issuance of the final NCCP permit.
 - During this study period an exception for health and safety purposes will be developed.
 - Development of the NCCP will also allow for adaptive management of night riding as appropriate.

- California Least Tern and Western Snowy Plover:
 - Increase buffer zones around nest sites in the main seasonal enclosure beyond current buffer limits.
 - Close the shoreline habitat in front of the newly established 48-acre foredune to public recreation when nests are present.
 - Work with the CDFW raptor program to decrease the number of raptor relocations.
 - Limit use of mechanical trash removal equipment.
 - Allow Unmanned Aerial Vehicles (UAVs) only for CSP use and only outside of the nesting season for WSP and CLT.
 - CSP and CDFW should collaborate on studies to inform future shorebird management plans, including:
 - an assessment of existing information on nesting success, bird mortality, and bird disturbance;

- experimental placement and monitoring of WSP nesting exclosures of varying sizes in the open riding areas; and,
 - focused monitoring in 2021 to assess the efficacy of existing buffer distances and inform adaptive management.
- Oso Flaco Lake:
 - o All proposed projects, including a potential third park access point and/or trail from the new proposed campground, should avoid direct and indirect (human disturbance from increased public presence, sedimentation, water quality impacts) impacts to natural resources in the complex.
 - o Importantly, the siting decision for a potential third park access point, as well as the trail from the new campground to the OHV riding area, should avoid rare native plant populations.
 - o Adequately address issues associated with increased sedimentation associated with additional disturbance.
 - o Conduct comprehensive surveys for both marsh sandwort and Gambel's watercress
 - o Implement bullfrog removal actions to benefit California red-legged frog, tidewater goby, and steelhead smolts.

BMP Area Recreational Opportunities

PSB includes the beach, developed campgrounds (North Beach and Oceano), Pismo Dunes Natural Preserve (Dunes Preserve), and Pismo Lake. PSB also contains a concessionaire-operated golf course and restaurant, the Pismo State Beach Monarch Butterfly Grove day use area, street-legal accessible beach access between Grand and Pier Avenues that also provides access to the adjacent ODSVRA to the south, and non-motorized trails. PSB offers visitors diverse activities, including beach play, camping, surfing, swimming, fishing, equestrian riding, nature viewing, observing western monarch butterflies, and enjoying free educational programs. There are also walking trails along the coastal dune habitat and around the freshwater Oceano Lagoon.

ODSVRA offers a variety of recreational activities, including dispersed beach camping, beach play, nature exploration, fishing, horseback riding, ocean sports, and a wide range of education and safety programs. OHV recreation is allowed within the designated SVRA open riding area. An all-terrain vehicle (ATV) safety-training center is in the riding area east of the Search and Rescue base, along the "sand highway." Almost two-thirds of the SVRA outside the open riding area are closed to OHV use and protected from any type of vehicle access.

Oso Flaco Lake is a subunit of and located south of ODSVRA. It is also a pedestrian-only area. Oso Flaco Lake is a popular destination for fishing, bird watching, nature viewing, and beach play. It has a day use area with sheltered picnic tables, interpretive panels, restrooms, walking paths, and a boardwalk that crosses a portion of the lake and dunes to overlook points.

1.1. Beach and Coastal Dune Camping

PSB has two traditional campgrounds (North Beach and Oceano) with a total of 181 designated campsites. Camping within ODSVRA and the portion of PSB open to OHVs is largely a vehicle-dependent activity as campers are generally based out of vehicles driven onto the beach, and camping is only allowed within the open riding and camping area. There are no designated campsites; however, on a typical day most camping activity occurs near the shoreline, between Posts 2 and 6. During busy periods (holidays, weekends, and special events) camping activity can extend farther south and inland. Many visitors engaging in non-OHV recreation, such as camping and beachcombing, also participate in OHV recreation.

Nearly all visitor-serving facilities at ODSVRA are located within the SVRA's open riding and camping area. These facilities include vault and chemical toilets, trash disposal areas, and mobile services provided by private concessionaires (e.g., drinking water delivery, holding tank pump-out, towing). Besides vehicle recreation, the ability to camp on the beach and dunes at ODSVRA is the significant recreational attraction.

1.2. Public Use Numbers within the BMP Area

In prior years, approximately two million people visited the Oceano Dunes District annually, engaging in pedestrian, camping, and motorized vehicle activities. In general, daily visitation to ODSVRA is lowest Monday through Thursday and highest on the weekend. Seasonally, visitation increases during the summer months (late May to early September) and is lower during the fall, winter, and spring, other than holiday weekends such as Thanksgiving and Christmas. Visitation levels and recreation use types were fairly consistent from 2015-2019.

ODSVRA and PSB operates under daily vehicle limits established by California Coastal Commission Coastal Development Permit (CDP) 4-82-300-A5, which was approved in 2001. The permit establishes park use limits including beach camping (1,000 sites), street-legal day use (2,580), and OHV day use (1,720). CSP is developing a draft Public Works Plan (PWP) - which proposes long-term

mangement and operational changes at PSB and ODSVRA including vehicle attendance reductions.

Specifically, the PWP proposes year-round interim use limit reductions to 500 beach campsites, 1,000 street-legal vehicles, and 1,000 OHVs per day. These reductions of street legal vehicles to 1/3 of previous numbers, and camping inventory to 1/2 of previous numbers were considered by CDFW in the recommendations contained within this document.

2. Vegetation and Plant Communities

2.1. Known Resources Present

There are 27 special status plant species in or adjacent to the BMP Area. Plants are characterized as special status plant species if they are listed pursuant to the California Endangered Species Act (CESA), the Federal Endangered Species Act (FESA), or assigned a rank by the California Native Plant Society (CNPS).

Six of the special status plant species present in the BMP Area are listed as Threatened or Endangered pursuant to CESA or FESA. These include the State and Federally Endangered marsh sandwort (*Arenaria paludicola*), the State Threatened and Federally Endangered LaGraciosa thistle (*Cirsium scariosum* var. *loncholepis*), the State and Federally Endangered Gambel's watercress (*Nastertium gambelii*), the State Threatened beach spectacle pod (*Dithyrea maritima*), the State and Federally Endangered Nipomo Mesa lupine (*Lupinus nipomensis*), and the State Threatened surf thistle (*Cirsium rhotophilum*).

2.2. Ongoing Survey and Management Actions

2.2.1. Surveys

In 2015, a comprehensive vegetation mapping effort was conducted on the entirety of the ODSVRA (3,490 acres), PSB (1,530 acres), and adjacent acreage owned by Union Oil (34 acres), and Phillips 66 (657 acres) (MIG/TRA Environmental Sciences, Inc., 2015). Plant surveys for one or more plant species have also been conducted in 2008 (Nipomo Mesa lupine), and annually on adjacent San Luis Obispo County Land Conservancy (Conservancy) lands. CSP staff also conducted rare plant mapping in 2013 and 2014, and vegetation transect surveys from 2004-2009 in association with their habitat monitoring program. Rare Plant surveys are conducted annually by CSP and other partner organizations like the Conservancy, San Luis Obispo Resource Conservation District (RCD), and CNPS for certain plant species like Nipomo Mesa lupine. Focused surveys for other non-listed but rare plant species occurs as CSP staff and funding levels allow.

It is worth noting that in addition to vegetation and plant monitoring, small mammal monitoring within the ODSVRA vegetation islands has been conducted since 2014 through a contract with Dr. Francis Villablanca and Juliana Trunzo of California Polytechnic State University, San Luis Obispo (CalPoly). Both individuals initially helped ODSVRA refine and standardize CSP's small mammal study design and have since assisted with yearly monitoring, data analyses, and reporting. Small mammal monitoring is done by capture-mark-release-recapture on standardized live-trapping plots within ODSVRA. Captured small mammals are given a unique ear tag, identified to species, and their sex and reproductive condition is determined. The plots have been placed in contiguous habitat, or on vegetation islands in the open riding area (ORA). Each plot samples the two predominant plant alliances in the park equally: fifty-percent willow/wax myrtle and lupine/mock heather. Additionally, some plots sample ORA, immediately following closure to OHVs, and prior to plant restoration. The purpose of small mammal monitoring is to understand native small mammal abundance, distribution, and habitat use. The data and analyses inform 1) use of the ORAs by small mammals, 2) effect of ORA closure and plant restoration on small mammal abundance and diversity, 3) multi-year, species and plot specific, survivorship and population size dynamics, and 4) dispersal propensity by species.

Since 2014, the essential findings have shown the following: 1) Small mammal species distribution is consistent with the theory of island biogeography, and there is a significant relationship between island size and species diversity; more species are found on larger vegetation islands than on smaller islands; 2) Dispersal between habitat islands has been documented in all species, though deer mice and Heermann's kangaroo rats show the highest rates of traveling through the ORA; 3) Species diversity and abundance are lowest on plots that sample the ORA; some ORA plots have diversity and abundance of zero; and 4) Across the entirety of the study plots, the most common species are deer mice and Heermann's kangaroo rat, which are generally associated with the lupine/mock heather alliance. The other three most common species (Monterey big-eared wood rat, California mouse, and California pocket mouse), are generally associated with willow/wax myrtle habitat.

2.2.2. Restoration Actions

Each year, CSP implements restoration projects on an average of 12-15 acres within the BMP Area. These projects use locally collected native dune vegetation and restoration techniques that have been refined over approximately 30 years of work. Restoration activities focus on areas that have become degraded from sand movement and invasive exotic species. These restoration projects are intended to result in ecological restoration with a

specific desired plant community composition and with subsequent monitoring to record faunal response to these efforts. Restoration activities occur primarily in dune scrub and foredune habitats.

2.2.3. Riparian Resources

The BMP Area includes approximately 370 acres of riparian habitat (Arroyo Willow Thicket) associated with major water bodies including Pismo Creek, Arroyo Grande Creek, Oceano Lagoon, Meadow Creek, Pismo Lake, Oso Flaco Lake, and numerous small isolated wetlands within the active dune complex. Another 135 acres is classified as native wetland alliances and 70 acres are mapped as open water habitats, such as Oso Flaco and Pismo Lakes. Within ODSVRA the major wetlands are associated with Little Oso Flaco Lake, Oso Flaco Lake, and dune slack lakes. These riparian and native wetland areas are all protected from public vehicular impacts through fencing within and near the areas open to OHV. There are a number of pedestrian trails through riparian areas, the most notable being the pedestrian boardwalk from the day use area at Oso Flaco Lake. These trails are routinely trimmed to maintain safe access. All trimming of riparian vegetation is conducted consistent with a Streambed Alteration Agreement (1600-2012-0001-R4) issued by CDFW.

2.3. Potential OHV Related Impacts

Based on the best available information, the current riding area and operations at ODSVRA do not appear to directly threaten the existing known distributions of special status plant species within the BMP Area. However, it is likely that some of these populations (for example, surf thistle and beach spectacle pod) would recolonize what was likely previously occupied habitat if additional dune and foredune habitat were protected from direct OHV disturbance. It is important to consider facilitating recolonization of these plant species given their extreme rarity; some species like Nipomo Mesa Lupine have such a limited known range that their entire distribution occurs only within and immediately adjacent to the ODSVRA. As such, any direct or indirect impacts to these existing populations could jeopardize the continued existence of this species.

2.4. Recommended Additional Conservation Actions

In the event that CSP pursues projects that could impact one or more special status plants, including but not limited to proposed projects such as a new southern entrance, CDFW recommends that CSP establish a NCCP and receive a related permit authorization in advance of any such related project impacts. With an NCCP, CSP could consider the entirety of the conserved landscape, the various natural communities present, and CSP's existing and future

management activities to meet permit issuance under the NCCP Act's conservation standard. Furthermore, with a comprehensive view of CSP's management and development activities in an approved NCCP, future actions are already authorized.

The landscape level approach with an NCCP avoids the need for project-by-project permitting (and mitigation) required by a CESA Incidental Take Permit (ITP) issued pursuant to Section 2081(b) of the Fish and Game Code. It is important to note that CSP would need "take" authorization pursuant to CESA prior to any take of these State listed species, including but not limited to their seedbank. Given the extreme rarity of some of these plant species, including but not limited to Nipomo Mesa lupine, meeting the ITP issuance criteria would require special consideration. In contrast, an NCCP would consider the populations (both plants and wildlife and the habitats they rely on) as a whole and would better accommodate additional management actions as mitigation elements. This "broader ecosystem" approach supports considering as a possible mitigation action in the NCCP the connection of existing fenced vegetation islands (e.g., additional permanent enclosures), which would facilitate population expansions (recolonizations) of these species.

For any future projects that CSP proposes in the Oso Flaco Lake area, CDFW recommends avoidance and minimization of impacts to special status plant species that are associated with the wetland influence of the lake, such as Gambel's watercress. These plants are particularly susceptible to impacts like alteration of the hydrological regime, degradation of habitat, and hybridization with the widespread and invasive common water cress. Any proposed projects should adequately address issues associated with increased sedimentation from additional disturbance. Further, any siting of future infrastructure, including roads, should avoid rare plant populations.

3. Special Status Invertebrates

Invertebrates are considered to be special status species if they are listed, or proposed for listing, under CESA, FESA, or are ranked as imperiled by the NatureServe Network at a global or statewide level. Seven special status insect species have been recorded in, or adjacent to, ODSVRA.

3.1. Known Resources Present

The seven special status insects recorded from the BMP Area include the Oso Flaco patch butterfly (*Chlosyne leanira elegans*), Oso Flaco flightless moth (*Areniscythis brachypteris*), globose dune beetle (*Coelus globosus*), obscure bumblebee (*Bombus caliginosus*), sandy beach tiger beetle (*Cicindela hirticollis*

gravida), and Oso Flaco robber fly (*Ablautus schlingeri*). One of the most important overwintering sites for monarch butterflies (*Danaus plexippus*) in California is found outside of ODSVRA at PSB.

3.2. Ongoing Survey and Management Actions

3.2.1. Surveys

Inventories of insects have occurred sporadically at ODSVRA over the past 30 years. However, no inventory work has been conducted in the past five years. In contrast, CSP has monitored the overwintering population of monarch butterflies at PSB since 1997.

3.2.2. Management

Management actions benefitting native vegetation (active planting, invasive plant treatments, exclusion fencing, etc.) are the primary method for enhancing populations of special status invertebrates at ODSVRA. The monarch overwintering site is located outside of ODSVRA but actively managed to promote roosting/overwintering habitat for this species. In 2020, CSP finalized a management plan for the monarch overwintering site in PSB in consultation with academics and the Xerces Society.

3.2.3. Restoration Actions

Since 1989, CSP has planted and maintained 24 vegetated islands within and adjacent to the BMP Area totaling approximately 170 acres. These areas are permanently fenced off to protect them from OHV access and are managed to promote native plant communities which in turn, are expected to benefit sensitive invertebrate resources. CSP's recent closure, fencing, and commitment to restoration of an additional 48 acres of previously disturbed foredune habitat for air quality improvement will provide additional habitat for these resources. The monarch butterfly overwintering site at PSB is not impacted by OHV activities. However, the eucalyptus grove is actively managed to provide wind and thermal protection for wintering monarch clusters. CSP also plants nectar plants around the grove to enhance the area for butterflies.

3.3. Potential OHV Related Impacts

Although data sources regarding invertebrates at ODSVRA are limited, the current riding area and operations at ODSVRA do not appear to directly threaten the existing known distributions of any special status invertebrates within the BMP Area. This is largely because remaining areas with native vegetation are protected from vehicle access. However, it is likely that some of

the special status insect populations would expand if additional dune and foredune habitat were protected from direct OHV disturbance or restored with native vegetation. There would not be any impacts to the wintering monarch population since it is located on a disjunct parcel over 2.5 miles away from any OHV activity.

3.4. Recommended Additional Conservation Actions

CDFW does not have any specific additional recommendations for invertebrate species within the BMP Area.

CDFW acknowledges CSP's commitment to monarch butterfly conservation in partnership with Xerces Society and with the support of the Wildlife Conservation Board outside ODSVRA at PSB.

4. Special Status Aquatic Species

4.1. Known Resources Present

4.1.1. Red-legged Frog

The Federally Threatened and State Species of Special concern California red-legged frog (CRLF, *Rana draytonii*) is present within the BMP Area. Specifically, adults, juveniles, and tadpoles have been observed within the Arroyo Grande Creek Estuary, and adults and juveniles have been observed within Oso Flaco Lake and Little Oso Flaco Lake (Cleveland Biological 2019).

4.1.2. Special Status Freshwater Fishes

The BMP Area supports two special status freshwater fish species, the Federally Threatened steelhead (*Oncorhynchus mykiss irideus*), South-Central California Coast Distinct Population Segment, and the Federally Endangered tidewater goby (*Eucyclogobius newberryi*). Both species inhabit Arroyo Grande Creek and/or the Arroyo Grande Creek lagoon during their freshwater life stages, and Arroyo Grande Creek has been identified by the National Oceanic and Atmospheric Administration (NOAA) and the National Marine Fisheries Service (NMFS) as critical habitat for the recovery of South-Central steelhead.

4.1.2.1. Steelhead

The life cycle of steelhead generally involves rearing in freshwater for one to three years before migrating to the ocean, and spending from one to four years maturing in the marine environment before returning to spawn in freshwater. Out-migration to the ocean (i.e., emigration) usually occurs in the late winter and spring. In some watersheds, juveniles may rear in a lagoon or estuary for

several weeks or months prior to entering the ocean, and in some cases they may stay in the lagoon for years until they smolt and move out into the ocean. The timing of emigration is influenced by a variety of factors such as photoperiod, streamflow, temperature, and breaching of the sandbar at the river's mouth. These out-migrating juveniles, termed smolts, live and grow to maturity in the ocean for one to four years before returning to freshwater to reproduce. Steelhead are iteroparous (i.e., can reproduce more than once), and, to realize the evolutionary benefits of repeat spawning, must have an opportunity to both enter and exit the stream system. The migration of steelhead into freshwater spawning and rearing streams is strongly associated with higher winter and spring flows which provide a continuous hydrological connection between the ocean and upstream spawning and rearing habitats (NMFS 2013). In addition, it has also been found that steelhead that rear in lagoons have a greater survival and return rate than those rearing in rapidly moving freshwater environments.

Marine arrival timing is extremely important for smolt-to-adult survival (Scheuerell et al. 2009), and has been historically synchronized with the timing and predictability of favorable ocean conditions (Spence and Hall 2010). Given the uncertain effects of climate change on upwelling timing and intensity, impacts on juvenile survival from future shifts in migration timing are also difficult to predict (NMFS 2013).

4.1.2.2. Tidewater Goby

Generally, tidewater goby are euryhaline (tolerant of a wide variety of salinities) (Swenson 1999) and have no explicit marine life stage, but data suggest that they do disperse intermittently into the ocean during bouts of extirpation and recolonization (Dawson et al. 2001). Eggs are brooded in burrows, a brief larval stage is completed among estuarine vegetation, and adults are benthic. Reproduction usually occurs between late spring and early autumn, which is generally during a time that the Arroyo Grande Creek ocean outlet is closed.

4.1.3. Ocean Fisheries

4.1.3.1. Grunion

Most ocean fishes present in the BMP Area vicinity are not discussed here because they remain within the wetted ocean footprint, which varies within the BMP Area due to tidal cycles and storm surge. As a result, most ocean fishes have a limited potential direct interface with OHV activities. However, some fishes, such as California grunion (*Leuresthes tenuis*) utilize the beach itself during certain portions of their lifecycle. Generally, grunion leave the water at night to

spawn on beaches over a 3-4 night cycle, which coincides with a receding tide after a full and new moons. Spawning occurs from March through August, and occasionally in February and September. Peak spawning is April to June. Mature grunion may spawn during successive runs, with females spawning up to six times each season. Females lay between 1,600 and 3,600 eggs during one spawn, with larger females producing more eggs. Eggs are deposited during the highest tides of the month and incubate in the sand during the lower tides, when they will not be disturbed by wave action. The eggs are kept moist by residual water in the sand. They hatch about 10 days later, during the next high tide series, when they are inundated with sea water and agitated by rising surf. Grunion are not a special status species but are the object of a unique recreational fishery; they are famous for their unique spawning behavior. They may only be harvested by hand during the open season (June 1 through March 31) by those with a valid California sport fishing license (CDFW 2020). Grunion have been documented to run within the ODSVRA, though the status of this specific run has not been assessed. Runs of grunion, which are considered a key indicator species for Marine Protected Areas (MPA) in Southern and Central California, appear to be declining in the southern core of their range (San Diego to Los Angeles counties) but colonizing areas to the north (Martin et al. 2019). Small runs have recently been documented at ODSVRA.

4.1.3.2. Pismo Clam

Pismo clams (*Tivela stultorum*) were once prolific along central coast beaches, supporting a vibrant recreational fishery. Due to overharvest, illegal removals and other environmental conditions, the fishery has not rebounded to historical levels. Although it is currently legal to harvest clams recreationally, almost no legal-sized clams have been found in recent years. Pismo clams are not a special status species but are a highly prized for their distinctive and excellent flavor. In addition, they can grow to an exceptionally large size (up to 7 inches across).

Pismo clams feed on plankton and bits of food suspended in the water. Most Pismo clams spawn from June through September. Females may produce up to 20 million eggs per spawn. The young settle to the sandy bottom and attach themselves to sand grains by means of sticky threads. When the larvae have developed sufficiently, the threads disintegrate, and the young clams bury themselves in the sand.

Pismo clams are present within the BMP Area, though the status of this specific fishery has not been assessed.

4.2. Ongoing Survey and Management Actions

4.2.1. Surveys

4.2.1.1. Red-legged Frog

Protocol-level CRLF surveys have been conducted in CSP's Oceano Dunes District, most recently in 2017-2019. The surveys were conducted based upon U.S. Fish and Wildlife Service (USFWS) protocols (USFWS 2005). In 2017 all accessible, suitable aquatic habitat (e.g., wetlands, lakes, creeks) within the Oceano Dunes District were surveyed for CRLFs. In 2018 a subset of habitats was surveyed to determine CRLF population trends. During the 2017 and 2018 surveys, large and established populations of American bullfrogs (*Lithobates catesbeianus*) were observed in the more northern survey sites and these areas were therefore excluded from the 2019 study. Instead, the 2019 CRLF surveys focused on areas that had no known frogs or frogs, American bullfrog or CRLFs, in low numbers. The 2019 surveys were completed over a wide range of months to cover different life stages and behaviors from March to August 2019. CSP will continue to conduct surveys for CRLF in areas known to be occupied by CRLF and with a high potential to support CRLF within the BMP Area.

4.2.1.2. Special Status Freshwater Fishes

CSP began investigating and monitoring the fishery of Arroyo Grande Creek in August 2003, in part precipitated by concerns related to the federal listing of steelhead under FESA. At that time, there was generally no CSP prohibition of vehicles entering the water (including the shallows of Arroyo Grande Lagoon) as they drove along the beach. In 2005, CSP biologists discovered tidewater goby in the Arroyo Grande lagoon. CSP has continued a regular fishery inventory which is conducted on a quarterly basis. This survey sometimes covers the lagoon outlet.

Fish surveys (general inventory) have been conducted in lower Arroyo Grande Creek and the lagoon by CSP on an annual basis since 2003 using a variety of techniques (seining, and electrofishing). Specifically, monitoring methods include the use of dipnets, beach seine, and direct observation. CDFW recommends all monitoring ensure consistency with protocols identified in NMFS' California Coastal Monitoring Plan (NMFS 2016). Generally, a similar degree and type of effort is expended on each CSP survey date. Typical procedures conducted by CSP over the study periods are described below:

- The back-beach reach, lagoon-tail outlet area, and west end of the lagoon are usually subject to 5-10 seine hauls using a beach seine with

either a 3/16" or 3/64" mesh. The seine is typically swept in an arc, with a set pivot-point on shore, and closed and dragged ashore. After each haul the seine is checked for organisms and, if any are present, they are removed, identified and released.

- Electrofishing is also conducted above the head of the Arroyo Grande Creek lagoon. Effort is usually continuous from a about 1,000 feet downstream of Guiton Crossing upstream to Guiton Crossing and occasionally 100-500 feet beyond. The electrofisher is accompanied by two netters (using dipnets) who net immobilize fish and place noteworthy or representative specimens into a bucket for recovery, identification, and release. Roughly 1,000 seconds of electrofishing current is applied throughout this reach; settings are routinely 60 Hertz at 100-200 Volts DC. No mortality of steelhead has been observed due to electrofishing activities.

4.2.1.3. Ocean Fisheries

No surveys are conducted by CSP for grunion; known occurrences are based on anecdotal accounts from the public. CSP has partnered with a researcher from CalPoly on Pismo clam since 2017.

4.2.2. Management Actions

4.2.2.1. Red-legged Frog

No specific management actions are currently carried out by CSP specific to CRLF. In the future, CSP may implement additional actions through the Habitat Conservation Plan (HCP), once finalized. These actions may include habitat enhancement, control of invasive plants and animals, such as a removal program for bullfrogs and crayfish etc.

4.2.2.2. Stream Fisheries

CSP limits vehicle incursions into the Arroyo Grande Creek lagoon with posting and fencing, specifically to ensure that vehicle traffic cannot enter "ponded" lagoon areas where tidewater goby are known to occur. CSP staff's daily observations result in the expansion and/or realignment of the posting and fencing as necessary. On a few occasions, most recently in 2019 and 2020, natural hydrologic events have reshaped a portion of the lagoon which extended its margin outside the well-established vehicle boundary demarcated by closure-posts and signage. In these cases, CSP installs additional temporary posts and rope barrier to exclude the possibility of vehicle encroachment into aquatic habitat.

CSP provides educational and interpretive signage to inform the public about potential threats to water quality and aquatic habitat and to discourage depreciative behaviors (e.g., littering, unlawful collecting) that might contribute to this degradation.

Vehicle crossing closures of Arroyo Grande Creek are periodically imposed during deep- and high-flow conditions (including stormflow runoff events and high-tide seawater incursions into the lagoon). These closures are generally for public safety purposes but would likely benefit immigrating and emigrating steelhead and tidewater goby by allowing for undisturbed access between the ocean and Arroyo Grande Creek.

The following additional measures are currently implemented by CSP to minimize vehicular related impacts to Arroyo Grande Creek and its lagoon:

- Only street-legal motor vehicles are allowed to cross Arroyo Grande Creek. Non-street legal vehicle operation is confined to the camping and riding area of ODSVRA, south of beach marker post #2, approximately ¼ mile south of Arroyo Grande Creek;
- The Arroyo Grande Creek Lagoon and areas west of the lagoon where waters have pooled are posted closed to motor vehicle access;
- CSP management has annually renewed a Superintendent's Order (currently 554-005-2020) to direct vehicles driving along the beach to cross the lagoon's outlet stream (when present) as far westward, perpendicular to flow, and as close to the surf zone as practicable. Driving upstream or downstream in the creek channel or in any other manner in the creek channel is prohibited;
- If the creek crossing is posted "closed," crossing the creek is prohibited;
- Creek crossing with motor vehicles is regulated by park Visitor Services and Ranger staff daily and during periods of high stream flow and during periods of high stream flow in combination with high tides. Creek crossing may be restricted or closed at any time, depending on these conditions. Enforcement action is taken by Rangers where appropriate;
- While on the shoreline portion of the beach, vehicles are required to obey a 15-mph speed limit at all times;
- CSP allows OHVs to be trailered onto the beach. Post 2 is approximately 0.5 miles south on the beach from Arroyo Grande Creek and marks the beginning of the OHV area. All OHVs must be transported to this point before off-loading and are then allowed use of the 1,500-acre dune system at ODSVRA for OHV recreation and camping. Park visitors that take their vehicles into closed or prohibited areas, or exceed the 15-mph speed limit on the beach, are in violation of CSP regulations; and

- CSP helps avoid OHV related impacts to water quality within creeks and lagoons inhabited by steelhead through implementation of appropriate erosion control measures where needed to reduce siltation and contaminated runoff (e.g., by maintaining vegetation within buffers and/or through the use of hay bales, filter fences, vegetation buffer strips, or other accepted equivalents).

4.2.2.3. Ocean Fisheries

Neither grunion nor Pismo clam are specifically managed for by CSP within the BMP Area, though CSP's limited use of equipment for mechanical trash removal only above the mean high tide line helps trash removal related impacts to grunion eggs and larvae.

4.3. Potential OHV Related Impacts

4.3.1. Red-legged Frog

Provided that CSP continues to implement actions to preclude vehicle and OHV access to the Arroyo Grande Creek lagoon, Little Oso Flaco Lake, and Oso Flaco Lake, direct OHV impacts to CRLF are not likely.

4.3.2. Stream Fisheries

While both steelhead and tidewater goby primarily inhabit portions of Arroyo Grande Creek within and upstream of the lagoon, a contiguous undisturbed stream from the ocean to the lagoon is important for immigration and emigration. However, vehicle access to the camping and OHV riding area of ODSVRA can currently only occur from either the Grand Avenue or Pier Avenue Ramps. These two ramps are located north of Arroyo Grande Creek, and the ODSVRA is south of Arroyo Grande Creek. These two access points require that vehicles cross Arroyo Grande Creek when it is flowing, which generally occurs during the winter and spring seasons. When the lagoon mouth is typically closed (summer/fall), vehicles traverse the same path but do not contact the stream/lagoon environment since the stream is no longer flowing across the beach. While in recent years creek levels appear to be affected by water development across the watershed, in wet years, the creek could still run across the sand year round. The area of stream vehicle crossing, while the stream is flowing, is characterized as sandy beach, adjacent to the Pacific Ocean, varying in width from approximately 50 feet to several hundred feet wide, depending on tidal conditions. In this location, also referred to as the creek mouth, stream conditions also vary depending on stream flow, which can vary from several thousand cubic feet per second during high flow periods in the

winter and spring, to no outflow to the ocean during the summer and fall. Various parties' concern about related potential take of steelhead, especially at ODSVRA, is not new (CDPR 2008).

Vehicles traversing the stream while it is flowing is a concern; fish migration timing is thought to primarily occur during high flows and during hours of darkness (NMFS 2013), making vehicle crossings of the flowing stream during the winter/early spring night hours a particular concern. In addition, fish may be impacted by artificial lighting associated with vehicles (Becker et al. 2013) as well as noise (Kunc et al. 2016); this could disrupt migration patterns, including increasing offshore or lagoon holding times.

Mortality of steelhead directly impacted by vehicle crossings/OHV activities have not been observed in the BMP Area, though two adult steelhead carcasses were collected in March 2012 at or downstream of the lagoon (cause of mortality not identified). However, detection of carcasses of any life stage, if present, would be difficult to detect for the following reasons: 1) the aquatic nature of the organism makes the finding of dead specimens unlikely (rapid decomposition); 2) ongoing potential for natural predation and scavenging by wading shorebirds and other wildlife; 3) presence in generally low numbers; and 4) the species occurs in habitats that make it difficult to detect (surf zone, high stream flows, etc.). In addition, the quarterly fisheries studies conducted in the BMP Area are for census purposes and are not designed as impact studies.

Indirect impacts may occur from vehicles crossing the Arroyo Grande Creek that are leaking oil or other toxic fluids into the water. These impacts can greatly increase if a vehicle becomes stranded in the creek. Small amounts of oil or other vehicle fluids leaking into the creek mouth from a limited number of vehicles are generally diluted very quickly when the contaminated water enters the ocean. However, large amounts of fluids, either by a large quantity from one vehicle or small quantities from many vehicles during very low flows, could negatively impact water quality in the creek thus indirectly impacting any steelhead that may be present (CDPR 2008). In addition, a recent study has linked leachates from vehicle tires directly to acute mortality in coho salmon and other salmonids (Tian and Zhao et al., 2020). While all vehicle related contaminants may quickly become diluted in the stream environment by high flows or the ocean influence, brake dust, oil, and other pollutants that are typically present on the underside of vehicles are likely being introduced and can have a negative impact to the ocean environment at the Arroyo Grande site.

4.3.2.1. Upstream Water Impacts

CDFW recognizes that factors other than OHV use also affect the fisheries and notes them here. Arroyo Grande Creek is influenced by agricultural activities and managed releases from storage behind Lopez Dam. This results in unreliable surface flow, which will affect all life stages of steelhead, as well as other fish and wildlife inhabiting lower Arroyo Grande Creek. CSP has no control nor influence over the water discharges to Arroyo Grande Creek. In addition, there are concerns with Arroyo Grande Creek water quality upstream of the BMP Area associated with agricultural and other anthropogenic impacts (NMFS 2013, 2016).

In 2008, CSP staff observed and documented decimation of the lower Arroyo Grande fishery, which apparently included extirpation of the goby population, due to severe dewatering over the season. This dewatering was the most severe CSP staff observed since surveys started in early 2000's; the assumed cause was a combination of drought and other upstream impacts (Lopez Lake operation; upstream water diversions). Most aquatic species, including Tidewater Goby, subsequently recolonized this area around 2010, after the 2008-2009 severity of the dewatering event ebbed. However, the lagoon's outlet has not run year-round since 2003, and in many subsequent years the lagoon's inlet stream has dried in summer/fall as well. CSP's monitoring efforts expanded to document these dewatering events and CSP has recorded several fish-kills over the years. These fish-kills appeared related to dewatering (both rapid and seasonal) and water quality changes, as opposed to BMP Area Park operations. The most significant and recurring of these events is seasonal dewatering of the lagoon's inlet stream (lower Arroyo Grande Creek), presumably related to dam operations, stream diversion, and pumping of the Arroyo Grande subsurface flow via shallow "groundwater" pumping.

4.3.3. Ocean Fisheries

4.3.3.1. Grunion

Grunion adults and eggs could be significantly impacted by mechanical trash removal (Martin et al. 2006). However, CSP implements NOAA guidance on mechanical trash removal and grunion when they developed their mechanical trash removal program. This program has CSP performing mechanical trash removal only higher than the highest wrack line to avoid areas where grunion eggs could be deposited. Adults could be directly impacted by vehicles driving at night on the wetted sand during an active run, and it is probable that eggs and larvae would be impacted by driving on the wetted sand during all times of day when present.

4.3.3.2. Pismo Clam

While it is possible that street legal vehicles and OHVs driving on the wetted beach could impact Pismo clams, the clam population appears to have increased quite dramatically while the beach was open to recreational vehicle use over the past several years (Ugoretz 2020). In addition, clamming was excellent in the 1950's, 60's and 70's, under higher vehicle use scenarios (Mastrup 2020). As a result, it is unlikely that the Pismo clams are significantly impacted by vehicle and OHV activities in the BMP Area.

4.4. Recommended Additional Conservation Actions

4.4.1. Red-legged Frog

Any future lagoon management/restoration actions should minimize impacts to CRLF and should consider this species' needs. In addition, any future projects in the Oso Flaco Lakes Complex, including a potential third park access point and/or trail from the new proposed campground, should avoid direct and indirect (human disturbance from increased public presence, sedimentation, water quality impacts) impacts to the Oso Flaco Lakes Complex. If there are bullfrog present or detected in the future in the Arroyo Grande lagoon, CDFW recommends that CSP implement bullfrog removal actions. Bullfrog removal from the Arroyo Grande lagoon, if present, would also benefit tidewater goby and steelhead smolts.

4.4.2. Stream Fisheries

Pursuant to the draft HCP, CSP will prepare a Tidewater Goby Management Plan that addresses park operations, exotic pest species, aquatic and upland habitat management, water quality, and mosquito control (where applicable). The Tidewater Goby Management Plan will incorporate non-native predator management options, which will include an inventory of known established invasive/predatory non-native predators and a program for controlling infestations that are threats to goby populations (as funding permits). Sites where the non-natives (primarily bullfrogs, bass, and crayfish) pose the greatest or most immediate threat to goby populations will be addressed first. These measures will also likely benefit steelhead.

4.4.2.1. Arroyo Grande Creek Crossing

CDFW recognizes that protecting the resources of Arroyo Grande Creek while maintaining access to areas south of the creek requires CSP balancing of different mandates. In making this recommendation CDFW is focused solely on the biological considerations. To reduce vehicle related impacts to Arroyo

Grande Creek resources, it is recommended that CSP implement these four measures:

1) Close the stream crossing to vehicles based on a hydrologic trigger (with a public health and safety exception). The trigger would be a depth metric of the stream's flow level. CDFW recommends a depth of 12 inches. CDFW recognizes the potential impact to the ODSVRA because it would affect vehicle access to the SVRA. However, this measure is grounded in a real-time, adaptive management technique to implement protections based on actual hydrologic conditions and would be most protective of ocean water quality migrating and out-migrating steelhead, and dispersing tidewater goby.

2) Commit to a mobile stream crossing structure as soon as possible to reduce vehicle impacts contingent on completion of a feasibility study analyzing costs, design, and operational considerations. This study will commence not later than March 2021. CSP retains the final decision on a mobile stream crossing structure pursuant to the outcome of the feasibility study.

After the feasibility study, CSP would seek approvals including permits and appropriations for construction and use of a mobile stream crossing structure and require that all vehicles utilize the structure(s) for all vehicle creek crossing events when the stream is actively flowing across the beach. Designing, constructing, and deploying such a mobile stream crossing structure could replace the depth-criteria closure trigger as part of a longer-term adaptive management program. This measure would be protective of migrating fish and would prevent pollutants from being washed off vehicles into the ocean.

3) Increase use of technology for outreach on stream crossing through design and utilization of the CPS reservation e-system. This increased outreach can facilitate greater advance notice to campers and recreationalists when a depth-criteria will trigger a prohibition on vehicles crossing the stream.

4) Develop and implement a study to gather site specific information and foster adaptive management concerning these measures and long-term impacts of vehicle crossings on the stream and species.

These measures should be re-evaluated in conjunction with the possible construction of a third BMP Area access point at the southern end of the BMP Area. Overall expansion of access could allow for additional measures that would better protect the fisheries such as limiting access to the beach at Pier and Grand Avenues.

4.4.2.2. Future Studies of Arroyo Grande Creek

CSP has indicated interest in attempting to study impacts associated with the vehicle creek crossing and fish migration and outmigration. While avoiding direct vehicle contact with the live stream in general or at a minimum during the highest risk times (high flows during the evening hours) is likely to be most protective of the fisheries, additional study could generate important site-specific information.

However, a study to achieve this purpose likely requires a much more intensive and expensive fisheries study than that currently conducted in the form of quarterly census surveys. Important minimum elements of any such future study with this intended outcome would be: 1) installation of a real time flow monitor that could be correlated with fish movement; 2) installation of a DIDSON acoustic camera, one of the most promising methods for counting anadromous adults (NMFS 2016); and 3) a simultaneous real time effort to quantify vehicle impacts/crossings. However, the presence of certain non-native species (carp, bass, etc.) could make the use of a DIDSON less accurate. CDFW fisheries staff are available to work collaboratively on this study process and using results to conduct adaptive management. CSP should consider securing peer review and engaging an independent third-party like an academic institution increase the value of the results to inform adaptive management of these measures. CDFW will review the results of any such study and, in its discretion, consider modifications to the above recommendations as appropriate.

4.4.2.3. Coordination Related to Arroyo Grande Creek

CSP has already indicated it will notify CDFW immediately upon observing conditions (e.g., unnatural dewatering of stream, illegal dumping, or waste discharge) posing an apparent threat to water quality or quality in Arroyo Grande Creek and/or lagoon. In particular, the notification will occur for conditions that appear to have or potentially could have a detrimental impact to steelhead (see more detail in Future Collaboration section of this document).

4.4.3. Ocean Fisheries

4.4.3.1. Grunion

The reduction in public use numbers proposed by CSP will help reduce related impacts to grunion. Also, CSP's limited use of mechanical trash removal equipment to remove trash above the highest wrack line helps minimize mechanical trash removal related impacts to grunion eggs and larvae. Prohibiting night riding, discussed elsewhere in this document, would also help

avoid impacts to adult fish during the grunion run. This window could perhaps be narrowed if there was information available from a multi-year study on the timing and extent of the grunion run in the BMP Area.

4.4.3.2. Pismo Clam

The reduction in vehicle use numbers proposed by CSP will help reduce related impacts to Pismo Clam, if any occur. CDFW encourages the public to leave the clams in the sand to help the population expand, and to avoid disturbing clam beds. CSP implementing a similar education program in the BMP Area could help CDFW's efforts.

5. Listed Shorebirds/Seabirds - Nesting, wintering, enclosures

5.1. Known Resources Present

Three special status shorebirds/seabirds regularly utilize the BMP Area; California least tern (*Sternula antillarum browni*), western snowy plover (*Charadrius alexandrinus nivosus*), and California brown pelican (*Pelecanus occidentalis californicus*). The California least tern (CLT) is listed as endangered pursuant to both FESA and CESA. CLT is also a Fully Protected Species (FPS) pursuant to Fish and Game Code Section 3511, and as a result any project-related take of this species is prohibited unless it is a covered species under a NCCP. Western Snowy Plover (WSP) is listed as threatened under FESA and as a California SSC. California Brown Pelican (CBP) has been delisted under both FESA and CESA but is listed as an FPS (see above re: prohibitions).

Both CLT and WSP nest annually in the BMP Area. CLT are migratory and arrive and nest on site in May and leave by the beginning of September. WSP are typically present all year with nesting occurring from March through September. CBP do not nest on site but utilize the beach as a resting area throughout the year.

CLT use of ODSVRA increased rapidly in the late 1990's and reached a peak in the mid-2000's after which time the nesting population has remained relatively stable. WSP use of the BMP Area has steadily increased over the past 20 years. CBP use of the ODSVRA appears to be stable but data are largely lacking outside of the winter bird surveys conducted from October-February.

5.2. Ongoing Survey and Management Actions

5.2.1. Surveys

Nesting season surveys (March-September) for CLT and WSP have been continuously conducted on a daily basis since the 1990's. Both CLT and WSP chicks are banded to determine survival and return rates. Dusk and early night surveys are conducted to determine the location of night roosts for CLT, which are occasionally established outside of the primary colony. Wintering WSP surveys are conducted a minimum of once per week during the non-breeding season (October – February) and general wintering shorebird surveys occur occasionally during this period. CBP are largely inventoried throughout the year with all encounters with injured, sick, or dead pelicans being recorded in a database. Injured or sick pelicans are transported to a local rehabilitation facility for assessment/treatment. Since 2007, 591 instances of sick, injured, or dead pelicans have been recorded in this database.

5.2.2. Management

The overall goals of CSP management for listed shorebirds at ODSVRA are to maximize CLT and WSP nesting success while minimizing mortalities or injuries associated with visitor activities. CSP currently installs seasonal exclosure fencing and signage (March 1–September 30) around approximately 350 acres (exclosure area) to protect the main nesting colonies from vehicle and other human disturbances. All vehicle and public access are prohibited within the exclosure area and CSP rangers actively patrol and enforce regulations, including seasonal closures.

The exclosure area fencing is specifically designed to prevent access for mammalian predators and CSP also implements an active predator management program to reduce disturbance and depredation by mammalian and avian predators. The main exclosure area fencing is expanded, as needed, to provide a minimum 300-foot buffer around CLT nests and a minimum 100-foot buffer around WSP nests when nesting occurs within the exclosure area but near the open riding area. If listed shorebirds establish nests outside of the main exclosure area, individual nest exclosure areas ranging in size from 650 feet in diameter for CLT and 200 feet in diameter for WSP are installed. Current CSP practice is that in the event WSP chicks are found outside an exclosure area, they are directed back into the nearest exclosure area. In the future, CSP is proposing that some of these chicks be captured and reared at the Santa Barbara Zoo and released on site after they fledge. CDFW commits to providing input on this plan when it becomes available to CDFW for review. At the end of the nesting season, exclosure area fencing is removed and the entire 350 acres

and any individual separate enclosure areas are reopened to public access and OHV use. When seasonal enclosure area fencing is reinstalled the next March, CSP staff augments the area (see below). The specific details of these activities can be found in the CSP annual nesting season management plans (2001-2020), annual nesting reports (2004-2020), and the 2017 Wildlife Habitat Protection Plan for ODSVRA.

5.2.3. Restoration Actions

Each year, CSP fences off the ~350-acre enclosure area at the southern end of ODSVRA during the nesting season, which is then opened for OHV riding outside of the WSP/CLT nesting season. Each year prior to the WSP/CLT nesting season, once the seasonal enclosure area fencing is installed, CSP brings in branches, wrack (surf-cast kelp), woodchips, driftwood, plants, and seed to restore nesting and foraging habitat in the enclosure area. In addition, the newly installed wrack is reinoculated with invertebrates to help restore the prey base for WSP and to a lesser extent, CLT (diet primarily consists of fish). The efforts to inoculate invertebrate populations have been shown to be successful at reestablishing populations of these important prey species.

In late December 2019, CSP closed and initiated restoration activities of approximately 48 acres of foredune habitat to vehicles and camping to improve air quality conditions to meet a Stipulated Order of Abatement by the San Luis Obispo County Air Pollution Control District. This area, which accounted for 11 percent of the WSP nests in 2020, will remain permanently closed and will continue to provide additional nesting and wintering habitat for WSP.

5.3. Potential OHV Related Impacts

Vehicle use and operations at ODSVRA can impact the nesting, foraging, distribution, and wintering use of shorebirds thereby increasing the potential for their take in the BMP Area. There are several areas of concern. These include: nesting disturbance and take of CLT and WSP (Burger 1984, Burger 1995, Cox et al. 1994, Erwin 1989); take/disturbance of wintering WSP and other shorebirds (Lafferty 2001); general disturbance of sensitive bird species including night roosts for CLT and nocturnal foraging of WSP (Mad River Biologists 2005; Staine and Burger 1994), reduced access to foraging habitat by shorebirds during the nesting and wintering seasons, including WSP (Lafferty 2001); active management of WSP brood movement back into enclosure areas; the proposed capture and captive rearing of WSP that enter the active riding area; capture and relocation of raptors which prey on CLT and WSP; disturbance and potential injury to CBP which rest on the beach throughout the year; mechanical trash removal activities and driving could eliminate food sources for

adults and chicks (Hobbs III et al. 2008); and, the potential use of Unmanned Aerial Vehicles (UAV), e.g., drones, for monitoring habitat conditions.

5.4. Recommended Additional Conservation Actions

As mentioned in Section 2.4 above, CDFW recommends that CSP establish a NCCP. The NCCP could address climate change, which is anticipated to directly impact sensitive bird resources through the reduction of nesting habitat associated with sea level rise, or in the case of CLT, changes to primary marine food sources resulting from warming oceans. The NCCP would provide “take” authorization pursuant to CESA and also authorize take of FPS. The development and implementation of a NCCP to conserve sensitive resources in the BMP Area will be an important tool for conserving the biodiversity of the dunes complex.

Given the urgency of completing a permitting process, CDFW recommends CSP initiate the NCCP process by meeting with CDFW staff in January 2021. CDFW further recommends that by the end of February 2021 the two departments define a work plan and schedule to complete this process. A possible mechanism to achieve this desired outcome is to enter into a NCCP Planning Agreement by this target deadline. Such an agreement should confirm the commitment of the two departments executive engagement and leadership, which is one of the highest ranked factors in maintaining momentum during plan development. Further, the two departments should endeavor to complete a NCCP within five years, or sooner if feasible.

As part of this process CDFW recommends developing interim measures to be implemented by the end of February 2021 to maintain and improve populations of sensitive bird species until the NCCP is completed. Interim measures can be memorialized in the 2021 Nesting Season Plan and can be included in the Oceano Dunes Wildlife Habitat Protection Plan (WHPP), which is required by Public Resources Code section 5090.35 (c)(1). In the meantime, CDFW recommends all take of state listed species (CESA or FPS) be avoided.

An important specific recommendation for interim measures to be implemented starting in 2021 includes maintaining and enhancing nesting populations of CLT and WSP by increasing buffer zones around both birds’ nest sites in the main seasonal enclosure (with exceptions for health and safety if necessary) that are larger than the current buffers. The buffer size recommendations for each bird species are described below.

Other recommendations include: restricting public access to the shoreline habitat area in front of the newly established 48-acre foredune area if nests are present, working with the CDFW raptor program to decrease the number of

raptor relocations, and limiting mechanical trash removal to fewer than four times per year and only in limited areas where needed. It should be noted that CSP does not conduct trash removal activities for the purposes of removing beach wrack. In fact, CSP policies prohibit the removal of beach wrack. Instead, equipment is used to remove trash that gets buried quickly in the constantly shifting sands at ODSVRA. CSP conducts mechanical trash removal only above the mean high tide line and only in limited areas at ODSVRA.

CDFW also proposes that UAV's only be allowed for CSP use and only outside of the nesting season for WSP and CLT. Use of UAV's during the nesting season may be allowed in the future if it is confirmed that this activity does not disturb nesting shorebirds. CDFW at its discretion may include these interim steps as components of a final NCCP permit.

CDFW recognizes that its recommendations for larger buffer zones around CLT and WSP nests would require adjustments to CSP's current management practices. Approaching the buffer recommendation in the long run through the development of a NCCP and the subsequent permit for take under state law would allow for a collaborative science effort regarding buffers and adaptive management over the implementation of the term of a NCCP.

CDFW also acknowledges that CSP has already reduced vehicle use and camping compared to historical levels of those activities.

CDFW provides the recommendations to create different buffers based on an extensive literature search. Specifically, recommended buffer zones to avoid disturbance of nesting least tern colonies ranged from 328 feet (Erwin 1989, USFWS 2016), 505 feet (Rodgers and Smith 1995), 600 feet (PG&E 2015), to 1,312 feet (National Park Service 2015). Three hundred meters is equal to 984 feet. Reasons for retaining these buffers included reducing the chances that a chick was killed or injured, reducing the chances that adult birds would be flushed from nests thereby increasing the vulnerability of chicks/eggs, and minimizing the energetic costs to adults and chicks associated with flushing (Cox et al 1994, Burger 1984). Therefore, CDFW recommends a 300-meter buffer for CLT nests.

For any WSP nest outside the main seasonal enclosure or outside the 48 acre foredune area established pursuant to the Stipulated Order of Abatement with the San Luis Obispo Air Quality Control District, CDFW recommends that there be a buffer around such nest not less than 150 meters. The minimum buffer of 150 meters for nests outside of these two enclosures should be required from at least March 1 to mid-July of each year or adjusted as needed based on climate change effects to WSP life histories. The time period between late March and mid-July represents the period when pre-fledged WSP are active on-site. Pre-

fledgling means the developmental stage between hatching and becoming capable of flight.

During March 1 to mid-July, when there are nests present in the 48 acre foredune area, then vehicles are prohibited between the foredune and the mean high tide line.

CSP should enhance its monitoring program in collaboration with CDFW so that the program can monitor and detect impacts to WSP, including all relevant mortality, injury, hazing, and disturbance events. CSP should provide such data to CDFW as immediately as feasible. In the event of WSP mortality, injury, hazing, or disturbance of WSP outside of a buffer, CSP should provide immediate written notification to CDFW. For all life stages of WSP, unless there is clear evidence the event was unrelated to vehicle impacts, within 48 hours after written notification to CDFW, the buffer around WSP nests outside the main seasonal exclosure or outside the 48 acre foredune area should be increased from 150 meters to a larger size based on consultation with CDFW and USFWS. However, if CSP, CDFW, and USFWS each agree after consultation during the 48-hour window that there is a biological basis, then they may elect to not increase the buffer size. This approach to WSP should be applied on an interim basis until the final NCCP permit is issued.

To best inform long term efforts including the final NCCP permit to improve protection of WSP through nest buffer zone adaptive management, CDFW and CSP should design and collaborate on a three-year study, which will commence in 2021. The study should include:

1. Site-specific data and information on nesting success on nesting success, bird mortality, and bird disturbance by vehicles relative to recent and current management practices.
2. Experimental placement of nesting exclosures of varying sizes in the open riding zone. This experimental placement will be limited to WSP nest buffers of varying sizes for the study period that are consistent with the approaches described above for WSP.

CSP should continue focused monitoring during the 3-year study and throughout the development of the NCCP to assess the efficacy of adaptive management approaches including buffer distance. CDFW acknowledges that any buffer configuration in a NCCP permit will need to allow for emergency response access and egress and consider social equity and access consistent with Administration priorities.

CSP should continue to ensure that any CSP staff or contractors involved with handling CLT or CBP are covered under a Memorandum of Understanding (MOU) authorizing the take of FPS, which is specifically allowed for, and required by, Fish and Game Code Section 3511 for scientific research and recovery actions not related to project mitigation.

6. Oso Flaco Lake Complex

The Oso Flaco Lake Complex (OFLC) is a unique ecosystem of dune lakes located at the southern end of ODSVRA. OFLC encompasses approximately 380 acres including Oso Flaco Lake, Little Oso Flaco Lake, Oso Flaco Creek and includes 134 acres of CSP-owned lands – some of which are currently leased for agriculture uses. An existing ½ acre parking lot provides pedestrian access to an approximately one-mile foot trail at Oso Flaco Lake. CSP also holds a lease, which prohibits public access, on 658 acres of dune habitat on private land in the vicinity of the OFLC.

CSP is currently preparing a Public Works Plan (PWP) for ODSVRA which includes the potential development of a new campground, CSP maintenance yard facilities and a new southern entrance for OHV access. The proposed campground would be sited on the CSP-owned lands adjacent to Oso Flaco Lake. The specific access route from the campground to the southern entrance has not yet been determined, but the currently proposed alternative in the PWP would include acquisition of land and/or easements on private lands adjacent to ODSVRA and major road improvements to provide for a southern entrance for OHV use. Campground development would occur in two phases. Phase 1 would include 15 environmental campsites, construction of the maintenance facilities, pedestrian trails around Oso Flaco Lake, and restoration activities to provide a minimum 150-foot riparian buffer from existing riparian areas. Development of a southern entrance for OHV access and the necessary land acquisition and road improvements to facilitate the development will occur in Phase 2. Phase 2 would include the development of 200 RV sites, 100 tent sites, and 25 cabins.

6.1. Known Resources Present

The OFLC is one of the last remaining locations for two extremely rare and endemic plants, marsh sandwort (*Arenaria paludicola*) and Gambel's watercress (*Nasturtium gambelii*). Both species are listed as endangered under both CESA and FESA and persevere at only one other location outside of OFLC. Major threats to these species at OFLC include eutrophication/siltation of the lakes and creek, upstream stream channel maintenance conducted by third

parties, and in the case of Gambel's watercress, hybridization with a more common species. The OFLC and its freshwater marsh community are also important for several sensitive wildlife species. OFLC is an important feeding area for least tern chick fledglings and is occupied by California red-legged frog (*Rana draytonii*, CRLF), which are listed as threatened under FESA and a California Species of Special Concern (CSSC). In addition, several other CSSC including southern western pond turtle (*Actinemys pallida*), two striped garter snake (*Thamnophis hammondi*), yellow warbler (*Setophaga petechia*), and least bittern (*Ixobrychus exilis*) are routinely found in OFLC. While the CESA and FESA listed Nipomo Mesa lupine (*Lupinus nipomensis*) is not found within the OFLC, its only remaining known population persists on private lands and lands leased by CSP which are being considered for acquisition to provide southern access to ODSVRA.

6.2. Ongoing Survey and Management Actions

6.2.1. Surveys

Bird point count surveys have been conducted annually since 1997 during the breeding season (April-May) and winter (November-December). Protocol level surveys for California red-legged frog CRLF have been conducted in some years (see Special Status Aquatic Species Section). Surveys for the listed marsh plants were last conducted in 2020. Surveys of Nipomo Mesa lupine on the adjacent private lands have been conducted by the Conservancy since 2012.

6.2.2. Management

Current management of the area is aimed at providing non-vehicular recreational opportunities and protecting the sensitive resources of the area. Outside of the parking lot and actively cultivated lands, there is no public vehicle access within the OFLC and pedestrian access is limited to designated trails.

CSP continues to work with local nonprofit organizations to treat weed infestations on the adjacent private lands with Nipomo Mesa lupine, as a means to reduce competition with lupine and with the goal of helping the lupine populations expand.

6.2.3. Restoration Actions

Prior to CSP taking ownership of the lands encompassing the OFLC, vehicles had access to the area and siltation of Oso Flaco Lake was pronounced with little vegetation surrounding the lake. CSP subsequently closed the area to vehicle access and marsh and riparian vegetation has recovered. This recovery is

partially from the exclusion of vehicles and restoration of the adjacent lake beds, however, some increase in vegetation has been caused by eutrophication which has facilitated the development of a mature willow riparian zone along the lake edge.

6.3. Potential OHV Related Impacts

At present, OHV use and operations at ODSVRA are not directly impacting the sensitive resources of the OFLC. In addition, the development of the campground and associated structures in the currently cultivated fields will likely not result in the direct loss of these resources. However, the indirect effects from building and operating the larger campground as proposed may result in impacts to water quantity or quality and will result in increased human disturbance. These effects can likely be minimized, and potentially even improve the aquatic conditions at OFDC due to less runoff from adjacent agriculture operations and less related water use.

A greater challenge will be providing an access route from the proposed campground to the OHV riding area without impacting the critically endangered plant populations in the OFLC (marsh sandwort, Gambel's watercress) or on private lands leased by CSP with populations of Nipomo Mesa lupine. In addition to lupine, the leased lands have documented populations of other sensitive plant and animal species which could be impacted by road improvements and the increased traffic from the campground. In light of the proposed reduction to dispersed on-beach camping availability by 50% at ODSVRA and the significant need for increased access to low-cost coastal accommodations in California, CDFW understands the benefit to the public from this proposed infrastructure development. Still, road development should avoid impacts to incredibly rare plant species. If a southern park entrance is established, secondary benefits to sensitive beach resources (listed shorebirds, Arroyo Grande Creek) could occur if vehicle traffic on the beach from vehicles accessing ODSVRA from the Grand Avenue or Pier Avenue Ramps were further reduced.

6.4. Recommended Additional Conservation Actions

Recommendations related to vegetation and CRLF pertaining to the Oso Flaco Lake Complex appear in sections 2.4 and 4.4.1 above.

As detailed in Section 2.4 of this plan, CDFW recommends that CSP initiate the process of establishing an NCCP and receiving a related permit authorization in advance of any such related project impacts. Specific recommendations likely to be included in the NCCP regarding OFLC include; ceasing the agricultural

operations on CSP lands to provide a buffer from pollutants and siltation around the OFLC, developing a plan to improve water quality entering OFLC, restoring the natural hydrologic function of Oso Flaco Creek on CSP lands so that dredging is no longer necessary, and by working with CDFW to identify the least impactful access route from the proposed campground to the OHV riding area.

This process will be dependent upon additional data being gathered for the two critically endangered marsh plants at OFLC; surveys for watercress have not been conducted since 2013, but surveys for sandwort were conducted in 2020. Without current botanical surveys for both of these species, the status, genetic makeup, and associated management actions needed to prevent the extirpation of these populations cannot be assessed. Therefore, CDFW recommends that comprehensive surveys for both marsh sandwort and Gambel's watercress be conducted. Surveys for Nipomo Mesa lupine should continue to provide the data needed to fully delineate the extent of this species, and to inform necessary avoidance and minimization actions access from the campground to the OHV riding area.

7. Future Collaboration

CDFW and CSP committed to working together to enhance the conservation efforts within the BMP Area. Through ongoing collaboration efforts, both agencies agree to continue to regularly consult on current and future best management practices to be implemented at the park. Each department will designate a point of contact to coordinate, facilitate meetings and activities, as well as distribute pertinent information to the agencies' executive staff.

CDFW acknowledges a last difficult management issue is how to approach the night driving. This activity has the potential to impact a variety of species, including steelhead, grunion, and special status birds. In the spirit of collaboration, CDFW recommends approaching night driving through a pilot study between the two departments.

The aspects of this recommendation include:

- Design and conduct a joint study by CSP and CDFW to gather site specific information and foster adaptive management concerning the impacts of night riding on natural resources and species.
- This joint study should facilitate the integration of CSP information and data and inform the development of the NCCP.
- Specifically, CDFW recommends that a peer reviewed, multi-year academic study be completed and funded by CSP.

- To ensure a true study control, night riding will be prohibited during the duration of at least half of the study along the foredunes and surf zone south of Post 4.5. The study's length will not extend past the issuance of the final NCCP permit.
- During this study period an exception for health and safety purposes will be developed.
- Development of the NCCP will also allow for adaptive management of night riding as appropriate.

A Biodiversity Management Plan Team (BMP Team) will be established, with representatives from both agencies, which will meet quarterly to coordinate on ongoing conservation efforts at the Oceano Dunes District park properties and the recommendations and follow up actions outlined in this plan. The BMP Team will strive for consensus decision making when possible.

The roles and responsibilities of the BMP Team are to:

- Ensure good communication between partners and resolve communication gaps between all involved parties;
- Conduct annual consultation on the Nesting Season Management Plan in advance of the nesting season;
- Coordinate the preparation of the annual CLT and WSP nesting season report.
- Coordinate efforts to address water quantity and quality of the Arroyo Grande Creek watershed resulting from upstream management practices by third parties. This would include sharing any county reports of pollution and any CDFW, County, and/or State Water Resources Control Board, and/or Regional Water Quality Control Board enforcement actions, and relevant CDFW permits (streambed alteration agreements, etc.);
- Initiate the NCCP by January 2021 to include monthly meetings (separate from and additional to the BMP Quarterly meetings) that will focus on the development of an NCCP (additional meetings will be scheduled as needed to discuss technical issues/studies and specific recommendations/mitigations);
- Develop and carry out an effective public communications strategy between the agencies; and
- Ensure that a process for conflict resolution exists and is utilized.

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