Hollywood Beach Western Snowy Plover Habitat Expansion and Enhancement Plan

Channel Islands/Port Hueneme Harbors Maintenance Dredging Project

Ventura County, California

Prepared for:

The United States Army Corps of Engineers
Los Angeles District, Civil Works
915 Wilshire Blvd.
Los Angeles, CA 90017

Prepared by:

Merkel & Associates, Inc.
5434 Ruffin Road
San Diego, CA 92123
Phone: (858) 560-5465
Fax: (858) 560-7779

March 2025

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 INTRODUCTION AND BACKGROUND

1.1 PLAN PURPOSE

The purpose of this plan is to guide the implementation of dune habitat enhancement and expansion as well as habitat and species management and monitoring activities. This work is being undertaken for the purposes of offsetting impacts to western snowy plover and California least tern as well as environmentally sensitive habitat areas (ESHA) recognized under the California Coastal Act that occurs in association with recurrent implementation of federal maintenance dredging that is essential to maintaining harbor inlets and downcoast beaches.

In implementing its mandate for navigational dredging, the Corps is subject to federal environmental regulation, including the National Environmental Policy Act, the Endangered Species Act of 1973, and the Coastal Zone Management Act of 1972 (CZMA), among others. The maintenance dredging of Channel Islands Harbor has effects on two federally listed species, the endangered California least tern (CLT) and threatened western snowy plover (WSP), that make use of the widened beach and coastal foredune habitat that have developed within and adjacent to the sand trap due to the configuration of north entrance channel jetty and the detached breakwater that trap sand by design. The maintenance dredging of Channel Islands Harbor also has adverse effects on designated critical habitat for WSP. As a result of these effects on listed species and critical habitat, the Corps consulted with the U.S. Fish & Wildlife Service (USFWS) under section 7 of the ESA. This resulted in the issuance of a Biological Opinion (08EVEN00-2022-0085983-S7) that incorporated obligatory terms and conditions that must be incorporated for the Corps to undertake its maintenance obligations at Channel Islands Harbor to dredge in maintenance of navigation for safety and commerce. One such obligation is the development and implementation of a dune restoration plan. This document serves as that plan.

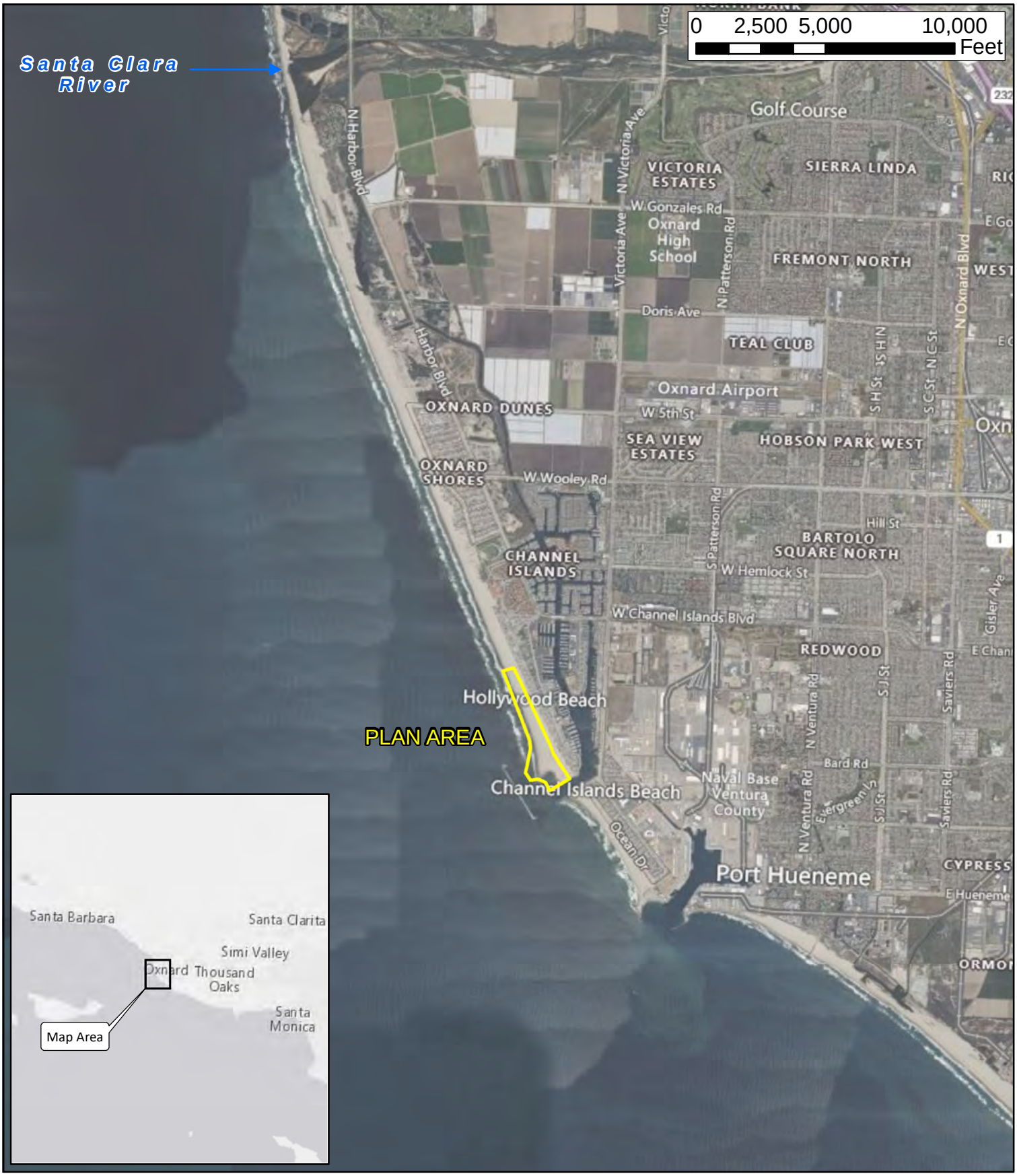
1.2 PROJECT AUTHORITY

The Channel Islands project for construction and maintenance was authorized by section 101 of the Rivers and Harbors Act of 1954 (P.L. 83-780) on the basis of House Document No. 362 (HD 83-362). HD 83-362 includes the Chief of Engineers' Report ("Chief's Report) which recommended a harbor for light-draft vessels about one mile northwest of the existing deep-draft harbor at Port Hueneme, and shore protection works to remedy the erosion caused by construction of the deep-draft harbor. The navigation improvements were to consist of an entrance channel, two parallel jetties, entrance basin, and a channel to and including an inner basin, with deposition of dredged material to restore downcoast shoreline/beaches. The shore protection works to remedy the erosion caused by construction of the deep-draft harbor at Port Hueneme was to consist of an offshore breakwater to form a sand trap and initial and then biennially dredging of approximately 1 million cubic yards of material from the sand trap and depositing the dredged material on the feeder beach on Hueneme Beach so long as Federal ownership of lands and improvements necessitates such protection. The harbor for light-draft vessels authorized by the Rivers and Harbors Act of 1954 was named Channel Islands Harbor by the local operating agency, and P.L. 90-46, approved July 4, 1967, adopted the name "Channel Islands." The project authorization was modified by section 305 of the Water Resources Development Act of 1996 (P.L. 104-303) to "authorize biennial dredging and sand bypassing at an annual downcoast replenishment rate to establish and maintain a littoral sediment balance which is estimated at 1,254,000 cubic yards per year. The cost of such dredging and sand

bypassing shall be 100 percent Federal as long as Federal ownership of the entrance channel and jetties of the Port of Hueneme necessitates restoration and maintenance of the downcoast shoreline." Dredging of Area G may go forward in cycle 2 (2026-2027) or cycle 3 (2028-2029) under this authority or per an additional dredging request from a non-federal sponsor.

1.3 PLAN REQUIREMENTS

The Biological Opinion (08EVEN00-2022-0085983-S7) calls for the implementation of a dune restoration plan. The proposed dune restoration would occur on Hollywood Beach located north of and adjacent to the Channel Islands Harbor (Figure 1). Further, in support of CZMA policies and to obtain concurrence from the California Coastal Commission (CCC) that the action is consistent with the California Coastal Act of 1976 (CCA), the Corps has incorporated additional commitments to offset permanent adverse effects to coastal strand and foredune habitat considered to be an Environmentally Sensitive Habitat Area (ESHA) that occurs as a result of the dredging and sand bypass activities. A conditional federal consistency determination concurrence was reached by the CCC on May 10, 2024 (CD-0001-24). The condition of concurrence obliged specific modifications be incorporated into the final plan and established a timeline for the implementation of the plan by the end of 2025. This final plan has been modified from the draft to incorporate the details of the condition developed by the CCC and Corps.



Hollywood Beach Western Snowy Plover Habitat Enhancement Plan Regional Map

Channel Islands/Port Hueneme Harbors Maintenance Dredging
Ventura County, California

Figure 1

The overall requirement as set forth for this dune restoration plan are as follows:

> ***Proposed Dune Restoration***
> *To offset potential impacts to western snowy plover designated critical habitat, the Corps proposes to restore/expand 13.47 acres of foredune habitat adjacent to the action area as agreed to with the Service and to mitigate permanent impacts to coastal strand and foredune ESHA at a ratio of at least 3:1 (mitigation to impact).*
>
> *The restoration effort will include beach grass (Ammophila sp.) control to zero density, recontouring of sand dunes to approximate natural dune contours using heavy equipment, restoration of native beach species using plants or seeds, and removal of non-native plant species under an integrated pest management plan and installation of symbolic fencing and resource protection advisory and interpretive signage*
>
> *The Corps will manage this area for a period of 5 years. Management activities will include maintenance of native dune vegetation, removal of non-native plant species, fencing and signage maintenance, predator exclosures for shorebird protection, and other measures intended to protect any nesting or foraging activities that may occur in this area without significantly impacting authorized recreational beach use.*
>
> *The purposes of the restoration site are to provide comparable habitat function and value for the western snowy plover to offset the temporary and recurring loss of beach that would occur whenever the Corps excavates "sand trap Area D" and to restore, expand, and enhance the dune habitat to compensate for any permanent loss of dune habitat that occurs as a result of the dredging and bypass action.*
>
> *At a minimum, weekly monitoring for California least tern and western snowy plover will occur during the nesting season over the proposed six-year action period, incorporating the habitat expansion and enhancement as well as the 5 years post - dune restoration completion to verify the restoration site is fulfilling the purpose as stated above. Annual metrics monitoring of the dune restoration will occur for 5 years post - dune restoration completion to verify the restoration site will remain functional habitat for the intended species. Pre- and post-dredging event monitoring of the coastal strand and dune will document the extent of program impact to dune habitat and a post-project quantification of impacts will be used to confirm that habitat acreage in the plan is adequate to meet at least a 3:1 offset of impact. If recurrent impacts occur within the same footprint, they will not be considered a new impact in subsequent cycles, and once mitigated it will be considered fully mitigated and not subject to future mitigation*

2.0 DREDGING AND BEACH DYNAMICS

2.1 Corps Maintenance Dredging at Channel Islands Harbor

The Channel Island Harbor inlet was designed and constructed to allow for recurrent maintenance dredging to remove littoral shoal sand from the inlet and bypass this sand down-coast of the two harbors. At Channel Islands Harbor, structural features consist of a 2,300-foot-long detached offshore breakwater, and two channel parallel entrance jetties that protect an entrance channel

leading to the harbor interior. The entrance channel and basin are 3,400 feet long and varies in width from approximately 300 feet at the entrance to 600 feet within the harbor.

Channel Islands Harbor receives sediments from upcoast beaches and streams by the southerly littoral transport system. As sand migrates southward, the offshore breakwater creates a wave shadow that drops the sediment transport energy allowing sand to settle north of the channel against the northern jetty within what has been established as a maintenance sand trap. The sand trap minimizes shoaling in the entrance channel, preventing the formation of dangerous bars across the inlet. The accumulated sand in the sand trap and the channel are dredged out periodically and passed to the beach south of Port Hueneme Harbor. This passage of sand to downcoast areas is critical to maintaining littoral transport through the littoral cell, otherwise beach and dune environments in the downcoast portions of the littoral cell are deprived of sand. This leads to narrowing of the beaches and dune losses in down coast areas along with impacts to harbor navigational safety when inadequate levels of sand bypass occur. The effects of bypass of sand from the sand trap to down coast of Port Hueneme are best visualized by examples from period of low bypass from the sand trap (2014) and periods with higher rates of sand bypass (2023) (Figure 2).

Figure 2. Difference in beach width and dune condition on Ormond Beach during periods of low sand bypass (August 27, 2014) and higher sand bypass (May 7, 2023). Note changes in beach widths and dune locations (red).

The dredge areas are divided into dredge areas: Areas A, B, C, D, E, and G (Figures 3). The Congressionally authorized depth of the entrance channel (Area A) and entrance basin (Area E) are -20 feet Mean Low Water (MLLW). Areas B, C, & D are authorized to maintenance depths of -35 feet MLLW and Area G is authorized to a depth of -25 ft MLLW.

Figure 3. Federal Navigational Dredging Template and Potential Dune and Beach Effects Area

Maintenance dredging has been conducted routinely by the Corps since the 1960s at Channel Islands Harbor. During the most recent biennial dredge cycle in Fiscal Year 2023 2,405,000 cubic yards of sand was dredged from the Channel Islands Harbor dredge template. When dredging is conducted within the sand trap Area D and to a lesser extent Area C, the beach and dunes encroaching into the sand trap are removed. In addition, the effects of dredging within the sand trap extend beyond the trap to the adjacent beach and dune environment as the beach slopes layback to a stable configuration following dredging. This layback is typically limited in distance from the boundary of

the sand trap, however, based on conservative coastal engineering projection of potential impacts due to dredging sand trap Area D to full authorized depth. This may affect a considerable amount of dune and non-dune beach as illustrated in Figure 2. Such effects would result in the temporary loss of suitable habitat for nesting, shelter, and foraging by western snowy plover.

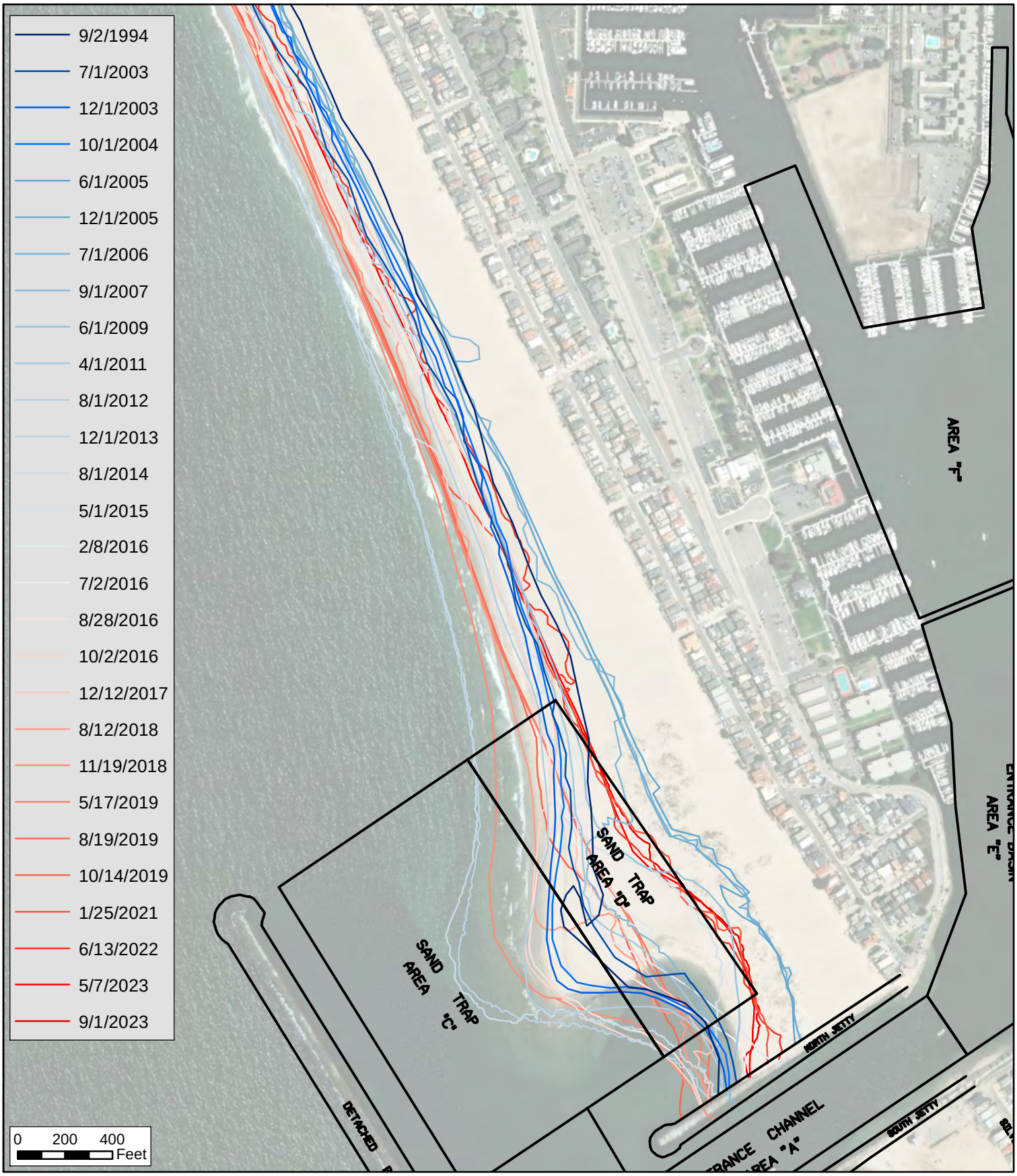
2.2 Hollywood Beach Dynamics

Hollywood Beach extends southward approximately 7,000 feet from McGrath State Beach to the north jetty of Channel Islands Harbor. At a distance of 12,000 feet updrift of Hollywood Beach is the Santa Clara River, which contributes an uneven but substantial supply of sand to the littoral cell. The southerly 1,500 feet of the beach is situated within the lee of the detached breakwater.

According to the VC Resilient Coastal Adaptation Project Sea Level Rise Adaptation Strategies Report (County of Ventura Resource Management Agency - Planning Division 2019), Hollywood Beach is one of the few areas in the unincorporated County where accretion of sand occurs over time. Despite reductions in the amount of sediment carried into the littoral cell, due to the trapping of sand at the harbor entrance and the direction of the waves and onshore winds, this beach builds both horizontally (widens), and vertically grows taller). The northern beach has been generally widening since at least 1994. This is based on widening of the dry beach as measured from the first line of residential development to the wetted beach margin (Figure 4). In 1994 the average dry beach width on the northern portions of Hollywood Beach was 272 feet, while this expanded to an extreme of 544 feet in 2016. In 2023, the northern beach areas averaged 410 feet in width.

A different condition is seen at the south end of Hollywood Beach where the channel inlet structural improvements and recurrent dredging play key roles in the development and dynamics of the beach. Within this area, the 1994 dry beach width averaged 770 feet, while the 2023 dry beach width averaged 524 feet and the maximum beach width was found in 2014 at 1,181 feet in width due to an extensive sand shoal that had developed well out into the sand trap and allowed considerable passage of sand into the channel inlet. The narrowest dry beach in this area occurred in 2005 at an average of 325 feet (Figure 4).

In the lee of the breakwater, sand piles up due to loss of wave energy and creates a large protruding shoal that extends outward from the beach into a sand trap designed into the channel configuration to capture littoral sand, reducing the influx of sand into the entrance channel of the harbor. The sand trap is regularly dredged to remove the accumulated sand as part of the navigational channel maintenance operations and the sand is passed to the south beyond the entrance to Port Hueneme to allow sand to continue to migrate down the shoreline. This creates a temporary deficit of sand behind the breakwater resulting in beach and dune erosion in proximity to the dredge footprint until beach slopes stabilize. Once this occurs, erosion ceases and littoral transport from the north reverts the southern beach behind the breakwater to a zone of accretion, building back beach width and height. Within a short period of months, the northernmost portion of the sand trap fills and begins to develop a protruding shoal of sand, that blocks sand infill along the southern edge of the sand trap adjacent to the north jetty. Over time sand extends beyond the protruding shoal to the north jetty. This process often results in a small shallow basin forming within the interior of the redeveloping beach that retains beach wrack within a pocket of the sand trap.



Hollywood Beach Dry Beach Margin
Channel Islands/Port Hueneme Harbors Maintenance Dredging
Ventura County, California

Figure 4

Beach/dune scarp development inside sand trap Area D following maintenance dredging. The flatter profile beach below is the result of erosion of a higher beach/dune elevation as the site stabilizes.

Beach rebuilding and dune development at the beach edge of the sand trap is a consistent and predictable process in response to sand transport and maintenance dredge cycles. However, the rate and extent of dune development is likely influenced by many factors that are less predictable. First, dunes generally begin to form against anchoring windbreaks. This often takes the form of woody debris derived most substantially from discharges from the Santa Clara River. The extent of debris discharge varies and thus the amount of dune generating windbreaks varies over time. The second highly variable factor influencing dune development in this area is the seedling establishment rate. This is influenced by the amount of seed produced, the seasonal rainfall conditions, and the extent of seed spread to the west of the existing dunes. A final unpredictable factor driving the rate of dune development is the extent of pedestrian and vehicle traffic within the beach area that disrupts early dune development.

Beach debris loading during winter 2022-2023 due to flood discharges from the Santa Clara River. The incorporation of this debris into the beach sand plays a role in ultimate dune development by creating hardened points in the sand that assist in forming small dune features.

At the upper portions of this newly developed sand spit, dunes begin to develop where there is beach debris or seedling plant establishment. The dunes on the upper margin of the active beach are generally sparse, low in elevation, and characterized by widely scattered plants. These foredunes are a precursor to further back dune development where the elevation of dunes increases as they are further stabilized by expanding vegetation cover that stabilizes the dunes.

It is notable that the present dividing line between what can be considered foredunes and backdune habitat has its origin in catastrophic dune losses of the seaward dunes during the 2005 El Nino Southern Oscillation (ENSO) event coupled with maintenance dredging. During this period, the shore was eroded back as much as 850 feet, laying the foundation for new beach and incipient foredune advance over the next several years.

The extent of beach and dune development at the southern end of Hollywood Beach has varied over time in response to the accumulation of sand based on variable rates of sand transport and the extent and frequency of maintenance dredging. Over the past three decades, the maximum extent of dune development has reached a high of 20.5 acres in 2014, with a low of approximately 8.5 acres in 1994. In recent years, the average extent of dunes has been between approximately 9 and 11 acres. The most variable dunes present on the beach are the foredunes that are intermittently lost to erosion from wave run-up that is facilitated by maintenance dredging within the sand trap, as well as

intermittent elevated sea level and wave energy associated with ENSO events. These dunes are therefore low in stature, sparsely vegetated, and intermixed with the more open beach environment. Where dunes are stable within the back of the dune complex, they are tall, ranging to over 10 feet in height and are stabilized by predominantly invasive species including European beach grass (*Ammophila [Calamagrostis] arenaria*) and Hottentot fig (*Carpobrotus edulis* and *C. chilensis*).

While the stable back dune habitat is not suited to supporting use by WSP, it does reduce vehicular and pedestrian traffic seaward of the dune complex. This barrier effect allows for the development of foredune habitat that, when coupled with the beach, provides suitable habitat for nesting, foraging, and roosting by WSPs. The intermittent maintenance dredging both results in a loss of dune habitat and a maintenance of the foredune complex in a state of early successional low stature and partially stabilized condition, preventing this area from developing towards the stable back dune conditions.

While the effects of dredging on the dune habitat is naturally ephemeral, the necessity to conduct dredging at a frequency suited to maintaining sediment transport through the littoral cell, navigational safety, and functional access to Channel Islands Harbor, results in a dynamic equilibrium of dune extent that is less than would otherwise occur absent dredging. However, the recurrent maintenance of the sand trap and bypassing of sand also sustains the character of dunes that do develop to the low fore dunes most suited to supporting use by plover.

Because dune development and loss occur as a continuous and recurrent process adjacent to the sand trap, the conditions differ from those associated with permanent losses such as for roadways, parking lots, or other development. Rather, the character of the active foredune is derived from the maintenance dredging, but it comes with a locally reduced overall dune footprint. If dredging were to cease, the dunes within the sand trap would become larger, but would also stabilize and grow in elevation, resulting in a reduction in function for species associated with the more active dune margin, such as snowy plover, since the offshore breakwater would eliminate natural shoreline erosion and accretion patterns that help sustain active foredunes in less developed environments. In addition, the depletion of sand from the downcoast littoral cell would result in beach and dune erosion at Port Hueneme Beach Park and Ormond Beach as was noted in 2013-2014 while the sand trap was accumulating sand without adequate bypass (Figure 2).

In planning to enhance and expand snowy plover habitat, it is important to keep the beach and dune dynamics in mind as they are critical to defining the expected consequences of restoration, both from a temporal development and climax condition, as well as the expected frequency of disturbance and necessity to pass sand downcoast to sustain offsite coastal resources.

3.0 JURISDICTION, OWNERSHIP, AND LAND USE

3.1 JURISDICTION AND STEWARDSHIP

The overall beach stewardship and land-use management on Hollywood beach is performed by Ventura County. The beach is managed Ventura County Harbor Department (Harbor Department) for public access and recreational use. The Harbor Department provides essential public services on the beach along with the Ventura County Sherriff's Department and Ventura County Fire Department.

Residents and non-profit organizations also play a role in beach management as these groups, along with Ventura County manage blow sand extending into the neighborhood and also manage stewardship of natural resources including outreach regarding beach regulations, and they perform vital functions of monitoring and reporting on the beach uses and resource status. Sand moving practices are authorized through a Commercial Activity Permit (CAP) issued by the Harbor Department. The CAP includes Best Management Practices consistent with Part A(2) of Section 8178-2.7.1.4 of the Ventura County Coastal Area Plan modifications. Homeowners on the beach are permitted by the Harbor Department to hire a private sand-moving tractor to push sand away from their properties throughout the year, even during the breeding season. Typically, the owners of the tractor company contact the monitor and discuss their routes before working on the beach.

While the Ventura County prohibits general vehicle access on the beach, vehicles regularly access the beach, including trucks, golf carts and other all-terrain vehicles (ATVs). These vehicles often use the beach after dark and on weekends and can occur near the dunes and nest areas. Access is facilitated via several openings between houses from Ocean Street to the beach. According to Ventura County Harbor Department, the designated access points are West Channel Islands Boulevard, La Brea Street, Harbor Boulevard, and Santa Cruz.

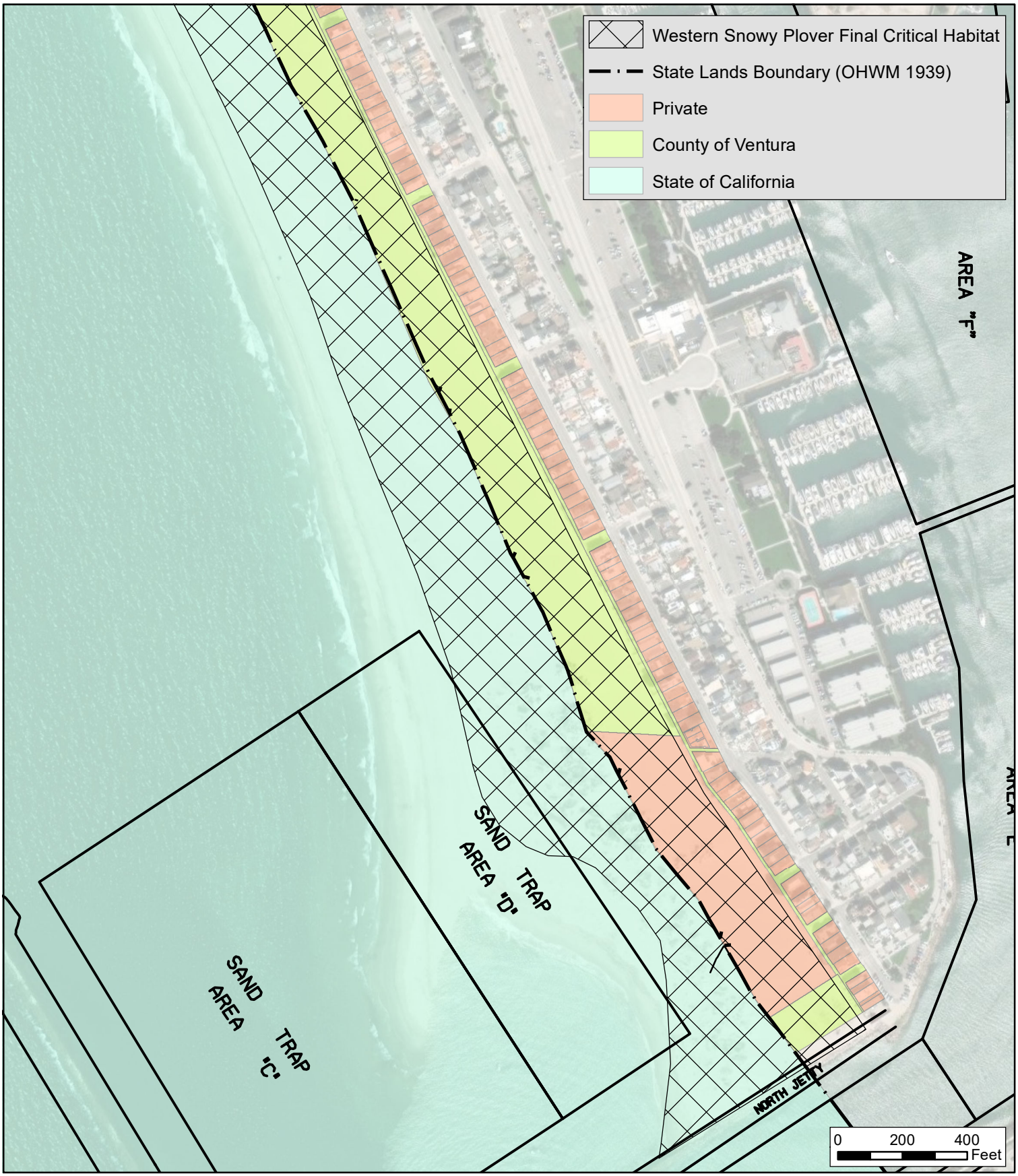
No formal management program for WSPs and CLTs is generally funded on Hollywood Beach, however, the Ventura Audubon Society (VAS) has initiated and implemented a Shorebird Recovery Program specifically for Hollywood Beach and Ormand Beach), where VAS's efforts aim to protect nesting habitat with fencing and signs, monitor wintering and breeding WSP, engage volunteers to help steward the beaches, and educate the public about the importance of these locations. In 2022 and 2023, the USACE, in association with its environmental commitments related to the dredging program have funded monitoring and management efforts.

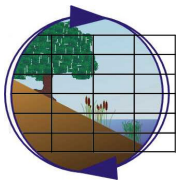
3.2 Property Ownership

Hollywood Beach ownership is held by two parties (Figure 5). The State of California, through the California State Lands Commission (CSLC), owns the offshore area and beach landward to the 1939 ordinary high-water mark (OHWM). This boundary was verified through SSLC boundary team and an AutoCAD boundary file was provided by, Joe Porter, Senior Boundary Determination Officer. This boundary was compared with the County of Ventura spatial data for property boundaries, and it was determined that the plotted shoreward state lands boundary provide by CSLC is consistent with the plotted seaward boundary of the County of Ventura parcels provided by the County of Ventura.

3.3 Hollywood Beach Land Use

The County owned parcels at the upper portion of the beach is zoned Coastal Open Space and is a county park intended for day use. The CSLC lands are not zoned and managed for public use. The wide flat high back beach breaking to a defined wetted foreshore results in a generally disjunct use pattern by the public. Many active uses occur close to the development where there are established volleyball courts and the beach is close to parking, although parking in the immediate area is somewhat limited. Conversely, users of the beach that come for the water, tend to cross the broad back beach to the crest of the foreshore and sloping





N
W E
S

Hollywood Beach Jurisdictional Boundaries
Channel Islands/Port Hueneme Harbors Maintenance Dredging
Ventura County, California

Figure 5

beach access to the wetted sand margin and surf. This results in more intensive use along the seaward and landward margins of the beach, with lesser use occurring through the central portion of the upper beach. As a result, uses of the central portion of the beach tend to be shore normal crossings of the beach (perpendicular to the shoreline) rather than broad use patterns. This is further refined within the southern portion of the beach, where crossings of the dunes follow defined routes between dune hummocks.

The county of Ventura Coastal Area Plan identifies Hollywood beach to include an existing hiking/walking trail component through county lands seaward of the first row of residential homes. This area does not include improved trails but rather is a continuous sand beach along the entire length of Hollywood Beach. Because of the presence of Channel Island harbor and no crossover bridges along the beach, the plan notes that this trail segment provides access to Channel Islands harbor and in the northerly direction could provide access through Mandalay Beach to McGrath State Beach.

The Coastal Area Plan notes that Hollywood Beach and Silver Strand have limited erosion concerns according to the Department of Navigation and Ocean Development and USACE (1979). The Plan notes that erosion at Hollywood Beach is significantly minimized by the jetty configuration at the entrance of Channel Islands Harbor and that erosion at Silver Strand is also minimal. The Coastal Area Plan notes that beach sections that become eroded are stabilized with sand replenishment by the Army Corps of Engineers as requested by the Ventura County Flood Control District as funds are available. The Coastal Area Plan establishes Beach Erosion Goal 1 "To protect public safety and property from beach erosion as provided for in existing ordinances, and within the constraints of natural coastal processes". Among the policies to implement this goal is Policy 7 – "During their scheduled dredging of Channel Islands Harbor, the Army Corps of Engineers is encouraged to replenish beaches with severe erosional losses consistent with environmental restraints on the deposition of dredge spoils."

3.4 Federal Interests

Federal Navigation Improvements

Congressionally mandated federal navigational improvements, including structures, original dredging, and recurrent maintenance occur within and adjacent to state lands along the ocean beach and nearshore waters. Similarly, but not relevant to the present action, federal channel improvement also occurs within County of Ventura properties inside Channel Islands Harbor. Under the Rivers & Harbors Act, the Army Corps is mandated to maintain these facilities and empowered to do so under the Commerce Clause in Article 1, Section 8 of the U.S. Constitution.

Western Snowy Plover Critical Habitat

Portions of Hollywood Beach have been designated critical habitat for the WSP within Unit CA 39 (USFWS 2012, 77 FR 36728). This designation overlaps both County of Ventura parcels and state lands and extends over portions of Area D within the federal channel sand trap (Figure 4). Critical habitat affects federal and federally authorized actions requiring consultation with the U.S. Fish and Wildlife Service for actions that may adversely modify critical habitat.

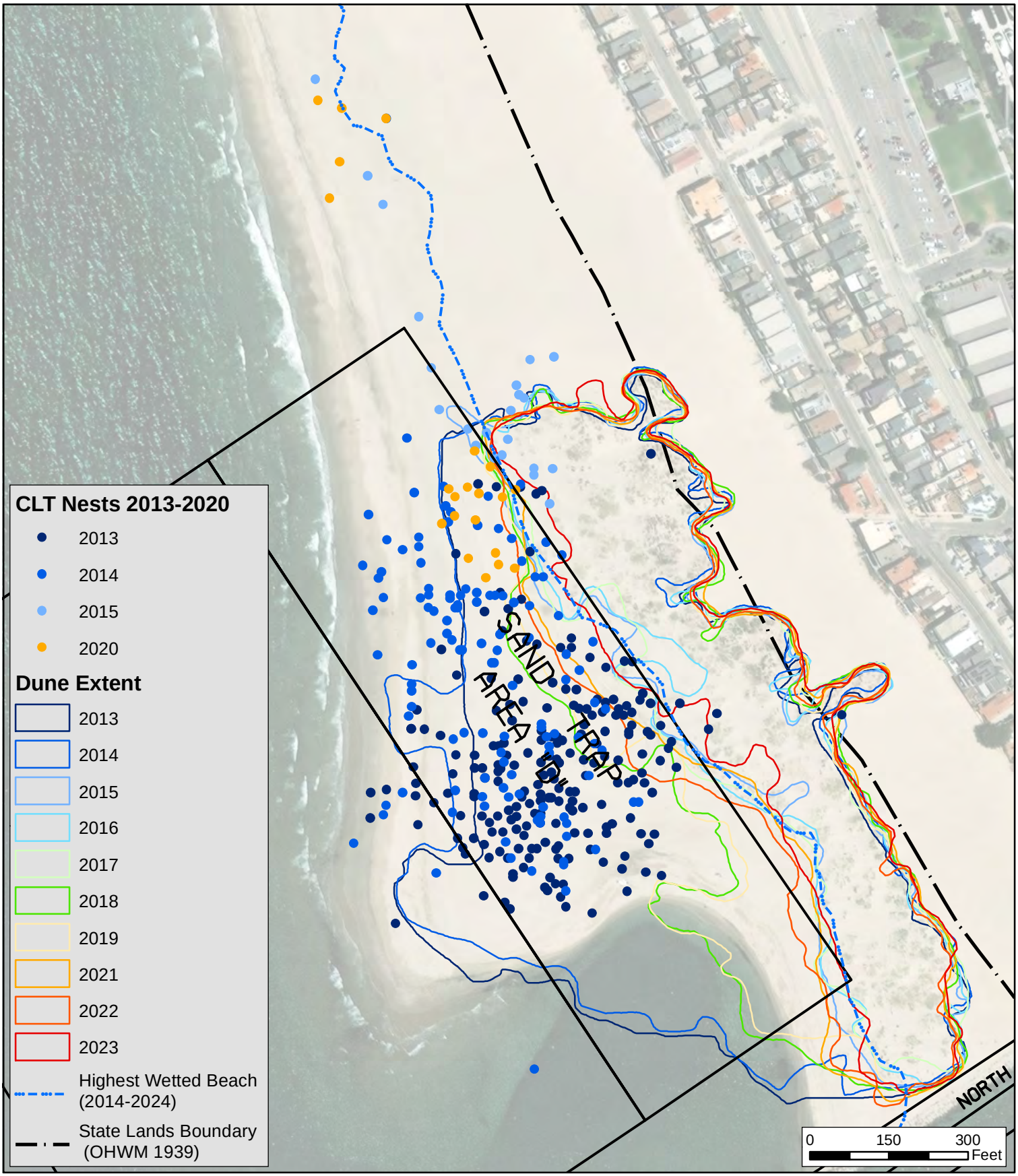
4.0 LEAST TERN AND SNOWY PLOVER UTILIZATION OF HOLLYWOOD BEACH

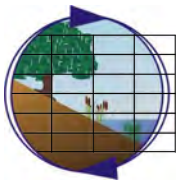
4.1. California Least Tern

Least terns are only present at Hollywood Beach during the breeding season, nominally April-September. Lower than normal funding for maintenance dredging during the winters of 2013 and 2014 resulted in an unusually large accumulation of sand within the sand trap. This extended a terminal sand shoal well into the sand trap toward the detached breakwater and led to the development of a wide and sparsely vegetated foredune habitat. The widened beach and early dune development provided ideal habitat for CLTs and attracted the establishment of 209 nests in 2013, 2,000% higher than the average for the beach (Barringer 2014). During the fall-winter of 2014, dredging operations led to the loss of a significant portion of the low lying vegetated foredune habitat, which was followed by a precipitous decline in adult presence and nesting during the 2015 breeding season (Barringer 2015) (Figure 6). Similarly, both the 2020 and 2022 breeding seasons saw the establishment of CLT nests with 26 breeding adults each year, followed by subsequent breeding seasons declines (zero nests in 2021 and 2023) (Barringer 2021, 2023, & 2024). While small nesting groups have occurred in recent years, no fledging success has been documented since 2015.

No CLTs nested on Hollywood Beach during the 2023 breeding season. However, on May 15th, a pair of CLTs landed on the beach within the fenced area but no nests were found upon inspection. Other observations were limited to flyovers and foraging behaviors in nearshore waters. CLT breeding activities and hatch success have been recorded on Hollywood Beach since 1996, with as many as 26 nests in 2022.

Two California least terns inside temporary symbolic exclosure fence (May 26, 2023)





N
W E
S

CLT Nests Relative to Sand Dune Extent 2013-2023
Channel Islands/Port Hueneme Maintenance Dredging
Ventura County, California

Figure 6

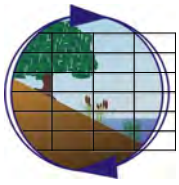
4.2. WESTERN SNOWY PLOVER

Non-breeding Season (Wintering)

Hollywood Beach has been extensively surveyed for wintering WSPs since at least 2012. The beach is a habitual wintering area for plovers. In 2023, a comprehensive monitoring program was undertaken under the environmental commitments of the dredging program and to support planning for implementation of a WSP habitat restoration and expansion plan. For this monitoring program, a total of 23 wintering snowy plover surveys were conducted from September 2022 through February 2023. The number of WSPs observed during this monitoring program was similar to recent years (Barringer 2023, and 2021). WSPs were observed during every survey conducted at Hollywood Beach, although the population displayed a declining trend following the initial surveys (Merkel & Associates 2024). On average, 62.9 plovers were counted per survey, with counts ranging from a high of 216 on January 11, 2023, to only one bird on January 24, 2023. Weekly counts were higher from September through November, with an average of 102.6 plovers per survey, compared to December through February when the average was 51.8 per survey. Weekly counts peaked in October with 103 plovers per survey, declining steadily thereafter to a low of 19.5 per survey. More than 50 plovers were recorded in 52% of the surveys. Less than five plovers were observed in two (8.7%) of the surveys. Wintering plovers were generally distributed north of the sand trap with the highest number of birds occurring between La Crescenta Street and Las Palmas Street (Figure 7). However, slight shifts in distribution occurred over the wintering season (Merkel & Associates 2024).

The plover population exhibited an initial surge during the first surveys in fall 2022, likely aided by the arrival of migrating birds. Subsequent surveys indicated a gradual decrease in numbers, which is a typical dispersal pattern. However, a notable deviation from this trend occurred during one week in January, when an abnormal aggregation of birds was sighted on the beach. This phenomenon may be attributed to a recent rainstorm that likely disrupted their beach roosting site(s), or seasonal low tide (-0.1 feet mean lower low water) that exposed nearby mudflats. Subsequent surveys showed a return to a more typical population size (Barringer 2023, and 2021).

Wintering plover outside of dredging construction safety fence at sand trap (October 25, 2022).



N
W E
S

Western Snowy Plover Distribution Heat Map

Hollywood Beach Western Snowy Plover
2022-2023 Winter and 2023 Breeding Season

Figure 7

Breeding Season

Nesting by snowy plovers has been monitored regularly at Hollywood Beach for at least 20 years. The monitoring shows a relatively consistent number of nests on the beach ranging from approximately 5-10 nests with nest counts falling outside of this range being anomalous (Figure 8). Nest hatching success in Figure 8 is based on the number of nest within which at least one egg hatched, rather than presenting the overall hatching success.

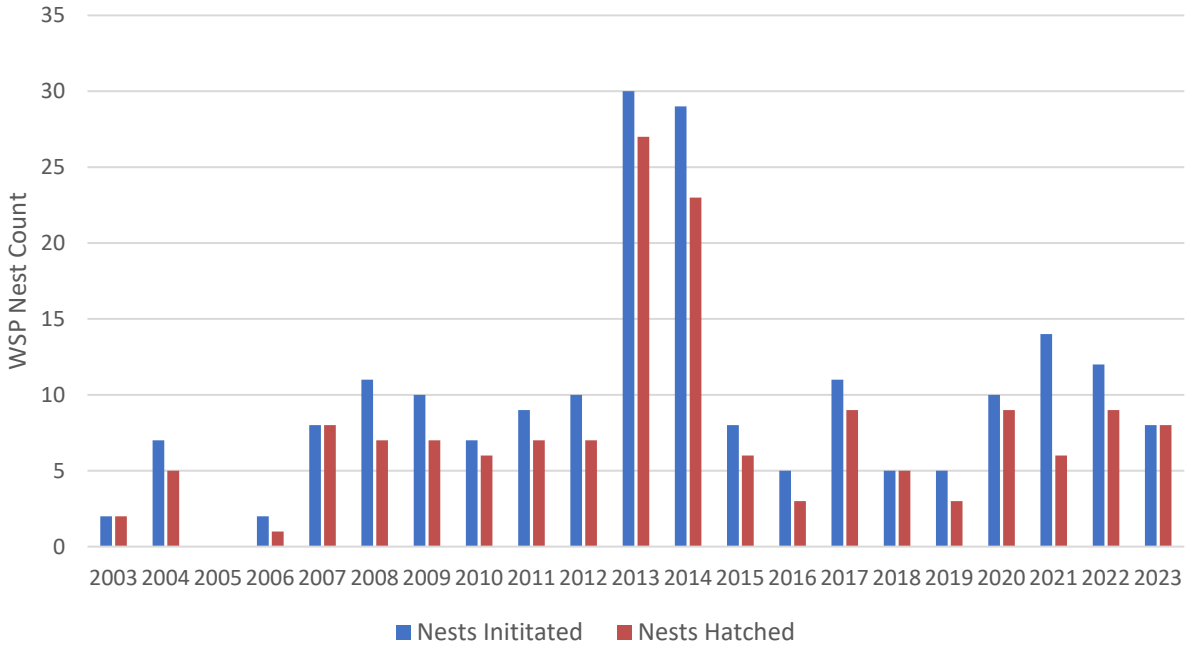
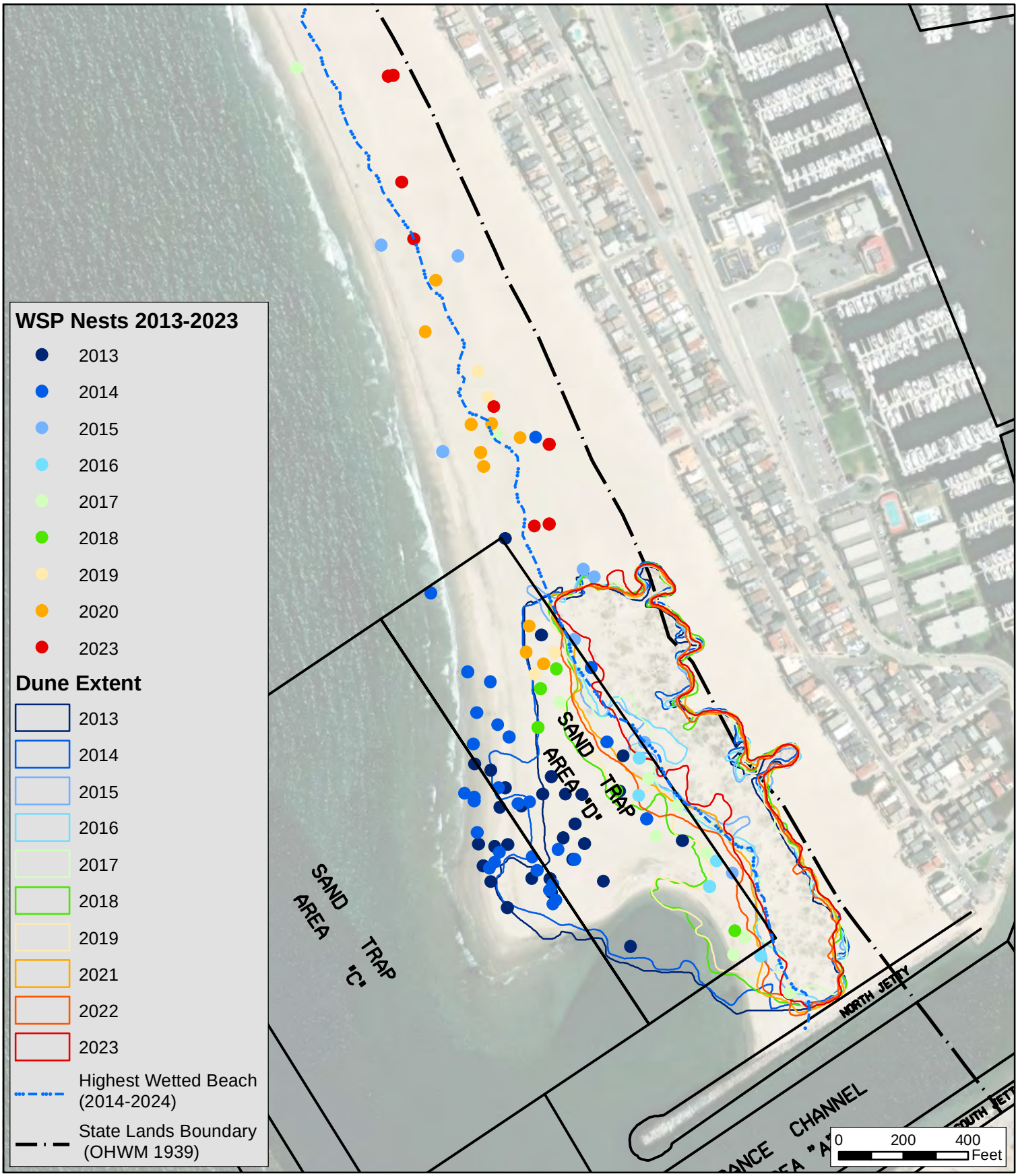
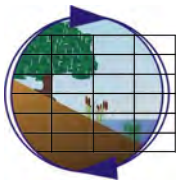


Figure 8. Western snowy plover nest count and nests yielding hatching success (2003-2023)

During the 2023 breeding season, eight plover nests were initiated. Six out of the total eight nests were placed on the open sand north of the existing dunes (Figure 3). The nesting site selections were characterized by a minimal amount of natural cover or nearby foraging resources. The other two nest sites occurred closer to dune habitat, but still north of the more developed dune complex. Of the eight nests initiated in 2023, all hatched, resulting in a total of 18 eggs (100% nest hatch rate, 90% egg hatch rate). This marks an improvement over last year's results, which showed a 75% nest hatch rate and a 71% egg hatch rate and surpasses the average nest hatch rate of 74% (calculated over 19 years of data collection—excluding the two outlier years).

The trend of nesting to the north of the dunes has persisted over the past few years, with the majority of nests now found at some distance from the dunes (Figure 9), unlike previous years when they were primarily located seaward of the dunes. The placement of nests is believed to be influenced by the availability and width of the open sand habitat (MacDonald 2010), which has decreased in front of the dunes following dredging cycles. Notwithstanding the nesting location, following hatching chicks are regularly guided to the south toward the beach rack and dune habitat where better foraging and sheltering habitat are available.





N
W E
S

WSP Nests Relative to Sand Dune Extent 2013-2023
Channel Islands/Port Hueneme Harbors Maintenance Dredging Program Ventura County, California

Figure 9

HB03 chick in debris wrack at south beach adjacent to sand trap (May 26, 2023)

In 2023, nest abandonment dropped from the previous 2022 year to only two eggs out of 20, which is more typical for Hollywood Beach. There was also only one documented human disturbance, involving the removal of a micro-exclosure (ME) from a nest within the fenced off symbolic fence area, however no plovers were nesting there at that time.

5.0 PLOVER HABITAT EXPANSION AND ENHANCEMENT PLAN

5.1. WESTERN SNOWY PLOVER CRITICAL HABITAT PRIMARY CONSTITUENT ELEMENTS

In designating critical habitat for the WSP, the USFWS identified primary constituent elements (PCEs) essential to the conservation of the Pacific Coast WSP as follows:

> *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 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 PCE 2 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 2012, 77 FR 36728)***

In addition, the final critical habitat designation (USFWS 2012, 77 FR 36728) also identifies criteria used to identify critical habitat for designation. Thise criteria along with the identified PCEs provide some guidance to habitat restoration and enhancement for snowy plovers, as does the present and historic use patterns of plovers on Hollywood Beach. Among the salient criteria for identification of critical habitat are:

> *(1) Areas throughout the range of the Pacific Coast WSP located to allow the species to move and expand. The dynamic nature of beach, dune, and similar habitats necessitates that Pacific Coast WSPs move to adjust for changes in habitat availability, food sources, and pressures on survivorship or reproductive success (Colwell et al. 2009)*
>
> *…*
>
> *(2) Breeding areas. Areas identified in the Recovery Plan (Service 2007) known to support breeding Pacific Coast WSP were selected. Selected sites include historical breeding areas and areas currently being used by breeding plovers…*

> *(3) Wintering areas. Major wintering sites not already selected under criterion 2 above were added. A "major" wintering site is defined as one that supports more wintering birds than average for the geographical region based on current or historical numbers…*
> *(4) Unique habitat. Additional sites were added that provide unique habitat, or that are situated to facilitate interchange between otherwise widely separated units…*
>
> *(5) Areas to maintain connectivity of habitat. Some areas that may be seasonally lacking in certain elements of essential physical or biological features and that contain marginal habitat were included if they were contiguous with areas containing one or more of those elements and if they contribute to the hydrologic and geologic processes essential to the ecological function of the system…*
>
> *(6) Restoration areas. We have selected some areas within occupied units that, once restored, would be able to support the Pacific Coast WSP. These areas generally are upland habitats adjacent to beach and other areas used by the species containing introduced vegetation, such as European beach grass (Ammophila arenaria), that currently limits use of the area by the species. These areas would provide habitat to off-set the anticipated loss and degradation of habitat due to sea-level rise expected from the effects of climate change or due to development. These areas previously contained and would still contain the features essential to the conservation of the species once removal of the beachgrass and restoration of the area has occurred.*

In focusing on providing value to plovers through habitat enhancement and expansion, it is important to consider the PCE's and original identification criteria applied to critical habitat designation in the context of specific circumstances existing on Hollywood Beach. In doing so, it is possible to amplify the PCEs that are being poorly met, while protecting those that are being met well. In the case of Hollywood Beach, the presence of consistent wintering and breeding by WSPs supports a need to support both uses to the extent practicable.

5.2. Hollywood Beach Conditions and Western Snowy Plover Habitat Suitability

Hollywood Beach supports several conditions that collectively favor and disfavor the utility of the habitat by WSPs, and as an ancillary condition nesting season use by CLTs.

The primary detractor to habitat suitability is the high degree of vehicles, pedestrian, and domestic animal traffic on the beach. While the broad dry beach provides good opportunity for recreational uses to occur, the use patterns are ill defined within areas lacking dune development or seasonal controls to access that are associated with erection of symbolic seasonal fencing to support WSP use. The VAS initiated Shorebird Recovery Program, providing outreach and education facilitates controlling domestic animals, and to a lesser extent vehicle traffic, yet the lack of partitioned defined beach uses limits the capacity to provide broad protection to plovers and terns against lawful exercise of public rights to utilize the beach.

The adverse effect of lacking broad partitioned land use controls over beach uses is somewhat mitigated by two factors. First, is the physical presence of the dune field at the southern end of the beach, that breaks up the beach and creates a physical barrier to intensive recreational use of the

seaward side of the dunes. This provides a protected zone wherein limited intensive recreation occurs, while public access and passive use is retained with limited conflicts to plover foraging and roosting activities along the shoreline. The second mitigating factor to high recreational disturbance, is that Hollywood Beach is a very broad beach averaging over 350 feet in width at the north end and over 500 feet in width at the south end of the beach. This means that there is a propensity for recreational uses to be aggregated either near the upper beach adjacent to the development, or along the shoreline. This results in lower traffic on the seaward portions of the high beach. While this does not provide direct protection to nesting plovers, considerable efforts of volunteers to place micro-exclosures (MEs) on discovered nests, along with a general reverence of the beach using public and County staff to not disturb the MEs and nests provides plovers with better chances of successful nesting absent these localized protection measures.

While dunes mediate the intensity of beach use, providing protection to wintering and breeding plovers, mature back dune environments do not serve directly as habitat for this species. Further, there is a generally low use of intermediately developed dunes supporting expanding vegetated cover and increasing dune height. Concurrently, there is good evidence of WSP use of small, low relief incipient foredunes that developed over short periods of time following beach disturbance. This can be seen in the development of incipient dune features in less than a year leading up to a period of low in channel entrance maintenance funding (2013-2014). The rapidly accreting beach and neonatal dunes with vegetated cover of well below 3% cover were immediately and heavily used by nesting WSPs.

Stabilized dunes of sizable vertical stature and high vegetated cover are not good habitat for WSPs at Hollywood Beach. Back dunes provide a barrier to widespread vehicle disturbance and curtail intensive foot-traffic, conversely, this barrier effect does not restrict beach access of a more passive nature, in that access through the dune complex by narrower foot trails continues to provide for surf zone access. Backdune habitats create both real and perceived threats to roosting and nesting plovers due to the presence of cover that can provide habitat for predators (e.g., rats and squirrels) and which can screen predators (e.g., domestic dogs, and feral cats). from early detection. The presence of tall dunes and high vegetation typically results in plovers avoiding these areas for activities such as nesting and roosting. During foraging activities plovers generally restrict activities to the lower elevation and less vegetated foredunes and wrack deposits on the more open beach. As a result, it should be considered that tall, heavily vegetated, back dunes do not provide intrinsic value to plovers that cannot be achieved by smaller foredunes and physical or symbolic barriers.

An additional detractor to plover habitat suitability is a mixed issue and relates to the federal navigation improvements and recurrent maintenance. The maintenance of navigation at Channel Islands Harbor results in recurrent temporary loss of dune habitat, followed by rebuilding of the beach and dunes between maintenance cycles. As noted previously, the degree of beach and dune recovery is not consistent, nor is the degree of loss when maintenance occurs. Immediately following dredging, the beach and foredunes are lost. However, the redevelopment of these dunes provides a more suitable dune environment than would occur absent the intermittent losses and redevelopment, as the dune habitat would ultimately advance towards stabilized dunes, unsuited to plover use. This is because the detached breakwater and north jetty create a protected beach environment that allow persistence of the beach and dunes at this location, even during the harshest storms that would damage more exposed beach environments. Conversely, the same physical

improvements that still and capture littoral drift sand north of the Channel Islands Harbor entrance also trap and retain drift wrack creating an enriched feeding area in the lee of the detached breakwater and north of the north jetty. The detached breakwater contributes kelp and macro algae, principally feather boa kelp, to the beach wrack that is primarily derived from discharges from the Santa Clara River. This wrack is trapped in the sands accreting in the sand trap and on the beach above the sand trap. This leads to the persistence of wrack deposits at this location that are otherwise absent along the beach further north, later in the nesting season. The wrack results in variable blown sand sculpting and the beginning of dune initiates rapidly following deposition. The integrated wrack also provides for increased seed trapping, nutrient and carbon enrichment in the sand, and retained moisture. These factors stimulate dune plant establishment and rapid development of natal dunes on building beach within the sand trap.

The Harbor Department is responsible for removal of storm deposited wrack and trash from the beach as it poses public safety and nuisance concerns. In addition to creating potential hazards to beach users, large debris and trash items also impact maintenance dredging by clogging cutterheads and pump impellers as debris accumulates within the sand trap behind the detached breakwater. This is particularly the case following large storm flow years. Not all debris is removed by the Harbor Department, with some material being left in place to augment habitat. However, the Harbor Department removes trash of all sorts, giant reed stalks and root balls, some of the large woody debris, and accumulated wrack masses that impair beach access and public use. Under this plan, it is expected that this activity will continue with trash being removed from inside and outside of the habitat areas, and non-trash debris removals occurring primarily outside of the habitat areas. It is anticipated that some of the wrack deposits outside of the habitat areas will be salvaged and moved to inside the habitat areas to enhance habitat function. It is planned that this effort will be coordinated with the Harbor Department.

5.3. Targeted Habitat Enhancements and Expansions

The Western Snowy Plover Habitat Expansion and Enhancement Plan seeks to achieve the following objectives that target retaining present beach value to plovers and terns, enhancing and restoring values that are degraded, and expanding these values within the beach in areas that are not otherwise adversely affected by necessary navigational safety and commerce mandated maintenance.

1) Remove invasive species that support stabilized back dune development and foster potential predator presence. This includes European beach grass (*Ammophila arenaria*) and hottentot fig (*Carpobrotus edulis*). *Ammophila* spp. shall be eradicated from the Hollywood Beach dune complex within a 5-year period, and hottentot fig and other noxious invasive species shall be reduced, with a goal of complete eradication of beach grass under an integrated pest management plan.

2) Reduce the maximum height of back dunes that are heavily infested by invasive beach grass and iceplant by reducing the dune slopes to 3:1 or shallower slopes more typical of southern California coastal foredunes stabilized by a native dune flora. This will require lowering several of the tallest dunes located in the northeast quadrant of the dune complex that are presently stabilized by *Ammophila* and iceplant. These dunes were not lost during the 2005

ENSO period. Surplus sand generated by recontouring these back dunes will be used to develop new back dunes within the expansion areas.

3) Expand protected beach/dune habitat areas to the north and adjacent to the existing dune complex through the use of permanent symbolic fencing and signage, and through natal dune fostering, including dune formation, and dune plant establishment. The objective is to achieve the enhancement and restoration of at least 13.47 acres of habitat suited to support use by WSP for wintering and nesting functions, and at least a 3:1 replacement of any permanent adverse impacts to coastal strand and southern foredune habitat resulting from dredging activities. Permanent impacts will be determined as the net unique area lost over the dredging program and will not be cumulative for losses that occur within the same area over repeated dredge cycles.

4) Concurrent with initial physical improvements to the habitat, this plan provides for on-going establishment maintenance for a period of 5-years to ensure success in the habitat objectives. Habitat establishment management activities include installation and maintenance of native dune vegetation, removal of non-native plant species, symbolic fencing and signage maintenance, and other measures intended to protect any nesting or foraging activities that may occur in this area without significantly impacting authorized recreational beach use.

5) Accompanying the habitat improvements, the plan also incorporates active species management for least terns and snowy plovers. This includes completion of nesting season monitoring at a minimum frequency of, weekly during the nesting season, documentation of nesting status and success rates, and nest site protection using micro-enclosures for a period of 5-years post-dune restoration, to verify the restoration site is fulfilling the purpose intended.

6) Annual metrics monitoring of the dune restoration will occur for 5 years post-dune restoration to verify the restoration site will remain functional habitat for the intended species (WSP and CLT).

The purpose of the restoration site is to provide comparable habitat function and value for the WSP to offset the temporary and recurring loss of beach that would occur whenever the Corps excavates the sand trap (Area 5).

6.0 PLAN IMPLEMENTATION ELEMENTS

6.1. PLOVER HABITAT EXPANSION AND ENHANCEMENT PLAN

The proposed plover habitat expansion and enhancement plan is intended to retain the natural resource values that develop at the south beach, compatible with existing beach recreational uses on Hollywood Beach and be consistent with advanced planning concepts for sea level rise adaptation. This would be achieved by focusing beach and dune expansion and enhancement within the central portions of the beach that receive the least amount of existing recreational use and which do not deprive the public of either the intensive recreational areas found on the back beach, or the shoreward facing recreational uses of the forebeach and seaward high beach. To ensure that the expansion does not block access, regular trailways would be provided in alignment with existing access routes from the public streets to the beach (Figure 10).

Foredunes of a low and open stature can be developed on the leading side of barrier dunes. These habitats develop where trampling does not occur and nuclei such as woody debris or plants can start to influence blow sand deposition. This habitat provides good sheltering and roosting habitat by plovers but is generally not used for nesting. As a result, the complex should also include beach areas, protected from traffic that can support nesting. Persistent protection of the beach areas at Hollywood Beach would be expected to result in a conversion of this habitat to dunes, and ultimately a reduction in nesting habitat on the beach.

At the southernmost end of the beach, the plan would principally be an enhancement plan, providing for invasive species removal, lowering and flattening the side slopes of the built-up back dunes that have achieved significant height due to sand trapping by invasive species, and monumenting access through the dunes with symbolic fencing. At the northern portion of the project the work is a habitat expansion project wherein symbolic fencing would be placed to curtail disturbance of the beach and plover roosting and nesting, woody debris would be retained and augmented for cover, forage resource enhancement, and dune development, and low dune habitat would be established along the landward portion of the expansion area.

The total area involved in the enhancement and expansion is 19.42 acres. This exceeds the commitment to restore 13.47 acres foredune habitat adjacent to the action area from the BO and would allow for offset of permanent adverse effects associated with dredging at a 3:1 ratios for up to 6.47 acres of dune habitat. The potential for permanent dune habitat impact is based on the degree of sand infill and dune development between dredge cycles, as such the net cumulative permanent adverse effects to dunes would be tracked through surveys before and after dredge cycles. Should impact levels approach the maximum level that may be accommodated by the expansion and enhancement of dunes, consideration should be given to augmenting the dune expansion area.

However, the greater size is essential to address the fact that portions of the dune enhancement area are located within the potential layback impact area of sand trap Area D and may be subject to intermittent disturbances from dredging maintenance in the future. While recurrent disturbance of dunes may occur from dredging, the plan objective is to ensure that a minimum of 13.47 acres of restored and enhanced habitat is always available for use by plovers. Further, it is not possible to completely avoid enhancement activities within dunes that may be subject to future disturbance by dredging. The following sections discuss elements to be undertaken within the expansion and

N
W E
S

Dune Restoration and Expansion Plan
Channel Islands/Port Hueneme Harbors Maintenance Dredging
Ventura County, California

Figure 10

enhancement plan area. These include funding, invasive species eradication/control, dune expansion and symbolic fencing and signage. In addition, ongoing management and monitoring is provided as discussed in subsequent sections.

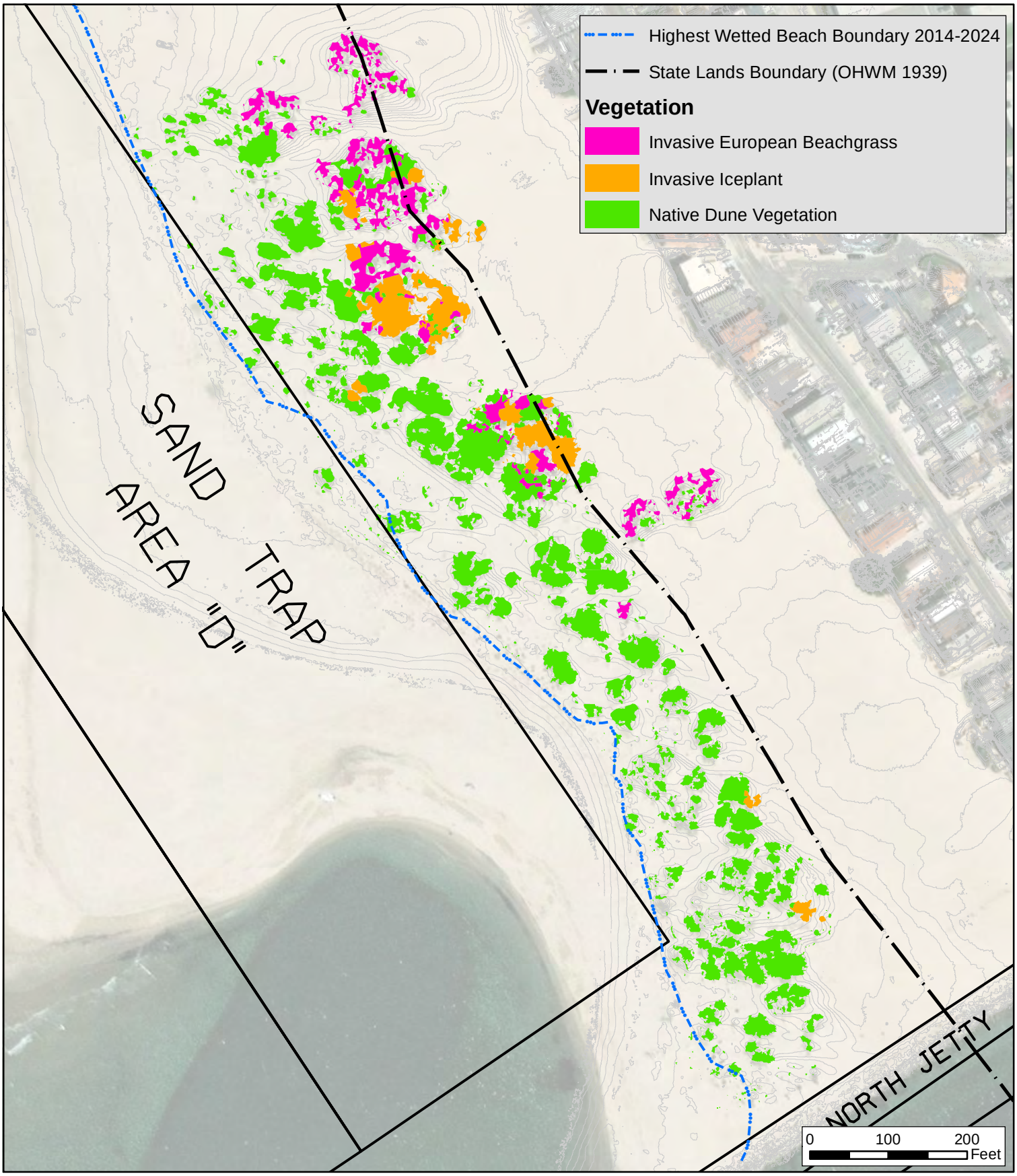
6.2. Funding Commitments

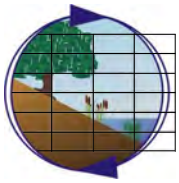
The proposed Hollywood Beach Western Snowy Plover Habitat Expansion and Enhancement Plan is expected to include a capital expenditure followed by 5-year establishment maintenance and monitoring elements during which ongoing habitat establishment and WSP and CLT stewardship management and monitoring will occur. This period also provides for adaptive management actions and assessment of metric achievement. The funding for plan implementation has been secured in the FY2025 budget such that implementation is expected to occur commencing fall 2024.

6.3. Integrated Pest Management Plan for Invasive Plant Species Eradication/Control

Integrated Pest Management (IPM) is any pest control approach that establishes a sustainable approach to managing pests by combining biological, cultural, physical and chemical tools in a way that minimizes economic, health and environmental risks.

Invasive species within the dunes are dominated by European beach grass (*Ammophila arenaria*) and hottentot fig (*Carpobrotus edulis*) and occupy approximately 0.7 acre of the dunes (Figure 11). Additional invasive species include crystalline ice plant (*Mesembryanthemum crystallinum*), wild radish (*Raphanus raphanistrum* subsp. *sativus*), and sea rocket (*Cakile maritima*) among others. Invasive plant species comprise approximately 29 percent of the vegetation present on the dunes, with native species occupying approximately 1.7 acres of the dune environment. Collectively, the





N
W E
S

Invasive/Native Species Distribution - September 2023
Channel Islands/Port Hueneme Harbors Maintenance Dredging
Ventura County, California

Figure 11

dunes are approximately 24.5 percent vegetated. Overall, this reflects a relatively high proportion of vegetation and is considered to principally be stabilized dunes. More suitable vegetation for optimal snowy plover habitat would be expected to be much lower with a cover of approximately 15 percent cover as is more typical of early foredune development as is seen within the shoreward dune margin where seasonal and dredge cycle losses and rebuilding of beach and natal dunes occurs.

The goals of this IPM are to reduce invasive plant species presence in the dunes in such a manner as to reactivate back dune environments, reduce vegetation density overall within the dunes in a manner that primarily targets reduction of non-native species, and limits future pest plant management needs to sustain the dune environment. This plan focuses on management of invasive plant species, rather than specifically targeting pest animals such as rats, squirrels, and feral cats. While these mammalian pest organisms are often present in coastal dune complexes, it is expected that they would be reduced in density concurrent with the reduction of iceplant and other dense non-native vegetation that provides food, cover, and sediment binding that allows stabile burrow construction.

European beach grass is targeted for eradication (100% removal) while the other invasive plant species are programed for significant reduction in cover, but not eradication. Specifically, this plan has a goal of 90+% reduction of hottentot fig and 70% reduction of other non-native plant species, in aggregate. The goals are based on a reduction in the percent of invasives as quantified by total ground cover. Invasive species to be controlled or eradicated are identified below. The intent for removal is to utilize a combination of physical and chemical control agents in the removals. This is also coupled with repeated treatments over the duration of the program period. This temporal treatment component to the plan is considered critical to reduce viable seed stock within the Plan area and to remove small plants that may be overlooked with single or limited treatment cycles. Treatment of invasive species is planned to occur during the spring prior to the nesting season for plovers as well as fall periods late in or after the nesting season.

For back dune habitat, where the steep dune environments have been developed by trapping of sand by beach grass and ice plant, the dune slopes are to be flattened and elevations lowered concurrent with invasive species removal. This will be followed up by repeated chemical herbicide control that will be used in an initial application period in the fall with follow up treatments occurring in early spring prior to the nesting season, and again in fall of each maintenance year as required. The specific prescription for control varies and will follow the methods recommended in Invasive Plants of California's Wildlands (Bossard et al. 2000).

European Beachgrass *(Ammophila arenaria)*

- Problems
    - Many native plant species are excluded by the dense cover formed by European beachgrass, leading to loss of plant species diversity in affected areas. Similarly, dunes covered by European beachgrass experience a reduction in arthropod diversity.
    - Reduction of open sand areas on dunes covered by European beachgrass also severely reduces availability of nesting habitat for the snowy plover.
    - Introduction of European beachgrass alters dune topology, creating steep stabilized dunes and promoting the formation of dunes parallel to the coast. Natural dune formation tends to be perpendicular to the coast and of lower elevation.

- Reproduction and Spread
    - Reproduction is primarily vegetative through rhizome growth. Rhizomes may be either vertical or horizontal. New shoots occur most commonly along vertical rhizomes, while lateral growth is attributed to horizontal rhizomes. European beachgrass is rarely established by seed. The most vigorous shoot growth occurs during the spring and slows, but does not stop, in the winter.
    - European beachgrass is perennial. Its most aggressive growth occurs under conditions of continuous sand accretion, forming stands that exclude other species.
    - European beachgrass has been shown to have high tolerance for sand burial which stimulates vertical rhizome growth as well as leaf and internode elongation.
- Control Methods
    - Physical
        - European beachgrass is manually controlled with intensive repeated digging. One case of successful manual control required weekly to monthly digging between early spring and fall. Sifting sand with rakes for rhizome fragment removal from 19.5 to 39 inches following digging may remove the need for follow-up treatment the following year. Without sand sifting, a second year of monthly digging may be required. Coastal dunes may require a third year of monthly digging.
        - One attempt to remove European beachgrass to a depth of one meter using heavy machinery (after which removed material was buried and capped with up to one meter of sand) resulted in moderate resprouting the following spring.
        - Burning and saltwater applications to eliminate European beachgrass have been unsuccessful.
    - Chemical
        - Treatment will be by glyphosate herbicide with surfactant.
        - Removal using selective application of 33% glyphosate applied with a wiper or herbicide sprayer has yielded inconsistent results, ranging from extremely successful to practically no effect. For selective control, the most effective option is to use a wiper to apply 33% glyphosate and 1 to 2.5% surfactant.
    - Planned Control at Hollywood Beach
        - The proposed control methods for Hollywood beach include both physical and chemical treatment over an initial period and follow up applications.
        - Physical removals will occur within back dune habitat where the elevations of the dunes are to be lowered concurent with invasive species removal and shallowing slope gradients to 3:1 or less, to return dunes to a more natural morphology associated with less dense native plant cover. Sand removed from dunes infested with European beachgrass will be buried in the beach through horizon flippingin consultation with the USFWS where plants will decompose, or the sand will be screened with a 0.5-inch screen to remove beachgrass rhizomes for landfill disposal.
        - Chemical treatments will occur within dune areas that are not proposed for modification and as follow up to modified dune areas. Treatment will be by glyphosate herbicide with surfactant.

- Treatments will include initial actions with spring (February-March) and fall (October-November) maintenance treatments outside of the nesting season for the remainder of the six-year program, as needed.

The typical pattern of rhizomatous spread of Eurasian dune grass is evident at Hollywood Beach within the back dune environments. Linear patterns of dune grass extent are indicative of rhizome runs that create sprawling dune grass.

Hottentot Fig *(Carpobrotus edulis)*

- Problems
  - The hottentot fig plant is able to establish itself under a wide range of soil conditions and thrive even in the presence of competitors and herbivores, allowing it to invade native habitat and effectively displace most native plant species through dominance in competing for resources including water, nutrients, light, and space. It also suppresses the growth of native seedlings as well as mature native shrubs, and it can lower the pH of the soil in loamy sand environments and alter the root system morphology of native shrubs.
  - When hottentot fig establishes itself, organic matter can build up in its surroundings, in normally sandy beach and dune soils, which can assist in the invasion of non-native species which cannot normally establish in sandy soils. Hottentot fig also stabilizes dune sands, altering natural dune formation processes in the area.
  - Hottentot fig also provides habitat that is suitable to support nest predators such as rats, ground squirrels, and ants.

- Reproduction and Spread
    - Reproduction occurs both by seed and vegetative expansion and viable plant parts. Hottentot fig flowers almost year-round, beginning in February. Each fruit produces hundreds of seeds, which are spread by herbivores. Germination is enhanced in seeds that have passed through an animal's digestive system. Any shoot segment can become a propagule, allowing for isolated segments to survive and establish.
    - Active growth occurs year-round. Individual shoot segments can grow in excess of 3 feet per year, and roots can form on the nodes of all segments in contact with the soil. The impact of this species on native competitors correlates inversely with the availability of water (i.e., the greatest impact occurs during periods of drought).
- Control Methods
    - Physical
        - Hottentot fig is easy to remove by hand. All live shoot segments must be removed from the soil to prevent resprouting. If complete removal is not possible, mulching remaining portions with removed material will prevent most resprouting. In this case, follow-up visits will be required to remove resprouts.
        - Mechanical removal by heavy equipment is effective at any time of year.
        - Burning of live or dead plants is not generally effective due to the high water content of tissues.
    - Chemical
        - Glyphosate herbicides at concentrations of 2% or higher have been effective at controlling hottentot fig. Addition of 1% surfactant increases mortality. Greater mortality has been reported when using more acidic water, thus the addition of an acidifier to hard water before mixing with glyphosate is recommended for more effective removal. It can take several weeks for the clones to die off using this method, and resprouting may occur for up to several months afterward.
    - Planned Control at Hollywood Beach
        - The proposed control methods for Hollywood beach include both physical and chemical treatment over an initial period and follow up applications.
        - Physical removals will occur within back dune habitat where the elevations of the dunes are to be lowered. Sand removed from dunes infested with hottentot fig will be buried in the beach through horizon flipping in consultation with the USFWS where plants will decompose, or the sand will be screened with a 0.5-inch screen to remove hottentot fig for landfill disposal. Mulching may be acceptable, with deep burial of mulch.
        - Chemical treatments will occur within dune areas that are not proposed for modification and as follow up to modified dune areas. Treatment will be by glyphosate herbicide with surfactant.
        - Treatments will include initial actions with spring (February-March) and fall (September-October) maintenance treatments outside of the nesting season for the remainder of the six-year program, as needed.

Other Non-native Plant Species

Crystalline Ice Plant (Mesembryanthemum crystallinum)
Wild Radish (Raphanus raphanistrum subsp. sativus)
European Sea Rocket (Cakile maritima)
Other Species Not Individually Identified

- Problems
  - Crystalline iceplant, wild radish, and sea rocket are all present in low abundance on the dunes. These species outcompete native species, increase dune stability, and increase vegetated cover levels.
  - Increased cover by these species also increases pest species that may be nest predators such as rats.
- Reproduction and Spread
  - These species are prolific seeder and spread by annual seedling recruitment from local seed sources.
  - Vegetative spread is not common.
- Control Methods
  - Planned Control at Hollywood Beach
    - The proposed control methods for Hollywood beach include both physical and chemical treatment over an initial period and follow up applications.
    - Physical removals will occur in the spring each year with follow up in the fall as may be required.
    - Chemical treatments will occur within dune areas that are not proposed for modification and as follow up to modified dune areas. Treatment will be by glyphosate herbicide with surfactant.
    - Treatments will include initial actions with spring (February-March) and fall (September-October) maintenance treatments outside of the nesting season. Annual species will also be spot treated by hand removal, herbicide treatment, and weed whacking later in the spring season prior to release of seed. Should this action be required during the snowy plover nesting season, work would be coordinated with nest monitoring biologists such that no activities occur within 200 feet of an active nest, unless adequately screened by the dune terrain. This approach to invasive species control will protect nesting birds while still ensuring that treatment can be best timed seasonally to reduce annual weed species. It is expected that treatment of annuals.

At the present time, sea rocket is sparse but widespread on the natal foredunes and beach strand where western snowy plover nest. This species provides a considerable portion of the vegetation shelter utilized by plover chicks during the nesting season. As a result, the removal of sea rocket in areas presently utilized by nesting plovers, will be delayed until adequate native plant material is available to replace the services this species provides to plovers. The determination as to when removal can occur will be determined by the nest monitoring biologist.

Herbicide Application Management

It is anticipated that herbicides will be used in the eradication/control of invasive plant species working in combination with mechanical treatment methods. Registered chemical control agents are highly effective in killing plants that cannot be readily and efficiently controlled by mechanical means to extensive below ground plant structure that can readily resprout. However, chemical agent application at Hollywood Beach, poses some risks of undesirable spread of the herbicide due to wind and/or high drainage capacity of the sandy soils. This could lead to overspray mortality of non-target plants, or discharge to ocean waters of non-degraded chemicals. To address herbicide spread concern and to be consistent with recommendations of the California Coastal Commission to use an aquatic safe herbicides and adjuvants, the following measures have been incorporated to identify specific herbicides, limit application periods to avoid unsuitable environmental conditions, and to utilize herbicides in conjunction with other control methods:

- Herbicides
    - Aquamaster (EPA Reg. No. 524-343) glyphosate herbicide applied at concentrations of 5%. Water safe surfactant Magnify Water Conditioning Agent will be added as a topical surfactant at a rate of 0.7% v/v to diluted herbicide mixture.
    - Mix water should be between a pH of 4-7. If necessary, buffer to pH range.
- Application Methods
    - Treatment application is to be by backpack sprayer or hose fed tank sprayer to handheld spray or wick applicator nozzle for spot application as needed.
    - A treatment rate of 220 ft^2/gallon (198 gallons/acre) of herbicide solution is to be used. With spot applications on the site it is anticipated across the 19.42-acre site, it is expected that discrete treatment will be approximately 1 acre or less following first year initial non-native plant coverage by mechanical and herbicide treatments. By the end of the program, it is expected that treatment will be reduced to less than 0.2 acres of herbicide treatment per treatment event.
- Treatment Condition Limitations
    - Treatment with herbicide will be performed in conjunction with mechanical control measures in order to reduce the necessity for herbicide treatments. Mechanical measures will include excavation and removal of invasives in back dune areas to harvest deep rhizomatous grass root systems and regrade back dunes, pulling of small plant occurrences, and weed whacking annuals prior to going to seed during the spring months.
    - Herbicide will be used as follow up treatments for large infestation occurrences and as a pre-treatment prior to removal to translocate herbicide to below ground structures.
    - Spray herbicide applications will not occur when wind speeds exceed 5 miles per hour. This will typically restrict spraying to morning hours before afternoon winds build.
    - Herbicide applications will not occur within 48 hours of predicted rain events, or within 72 hours following rain events.
    - Dead material will be removed from the site, left to decompose, or will be buried within the dry beach below saturation levels. Material will not be placed seaward

of the high tide line or buried within areas of the dry beach that have a recent history of erosion.

- Burial of invasive species will be coordinated with the USFWS should it occur.

6.4. Back Dune Regrading

Stabilization of the back dunes has been accommodated by development of dense invasive and native dune plants that retain sediment and prevent dune erosion. These dunes were not impacted by the 2005 combined effects of maintenance dredging and ENSO storms and sea level rise. As a result, they have persisted and continued to build in mass and elevation since the late 1990s. At the present time there are several dunes that are now 10 or more feet above the surrounding grade with side slopes as steep as 1:1 due to binding of sand by invasive species. Due to the continued building of the back dunes, some dunes now have crest elevations near 25 feet MLLW.

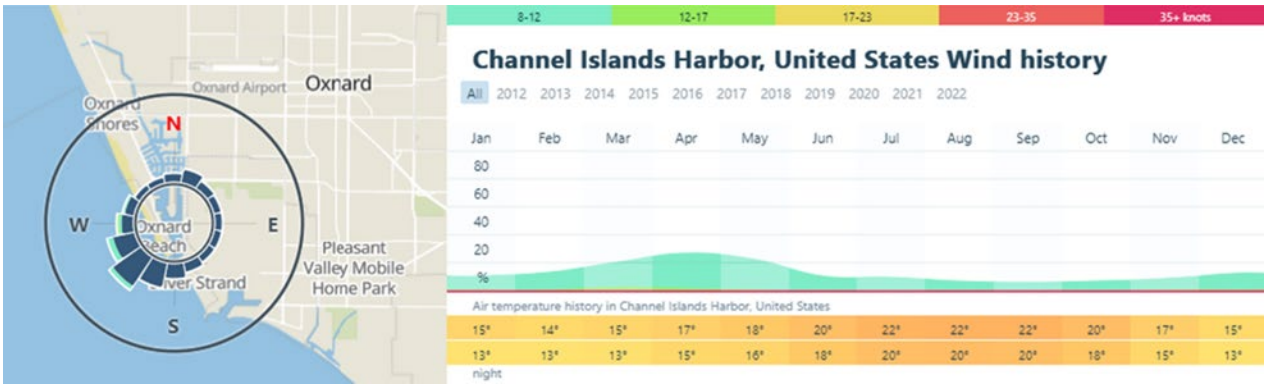
Regarding the oversized stabilized dunes that support primarily invasive beachgrass and hottentot fig would be done by shallowing the side slopes of the dunes to 3:1 or less while maintaining the outer dune footprints. This will lower the elevation of approximately 1.25 acres of stabilized dunes and flatten the slopes, and by removing the dense invasive species, allow the dunes to become active again. The volume of sand to be removed in the dune lowering is approximately 15,000-25,000 cubic yards that will be derived from the lowering dune crests and surrounding tail sand deposits. This sand will be moved to the dry fore beach where it will be utilized for dune development. Sand containing grass rhizomes or ice plant will be buried at the dune construction locations below the saturated sand elevation by a minimum of 1-foot (an elevation of approximately +2 feet MLLW within the excavated burial pit in the dry beach). No material will be buried seaward of the high tide line or within areas subject to beach retreat based on long-term, shoreline trends (Figure 3).

6.5. Dune Expansion

Capacity for Dune Development

Dune development at Hollywood Beach is not anticipated to be difficult to achieve. The wind patterns are generally from the southwest and are mild with a rising frequency of 8-12 knot winds increasing in March-May, with lower frequency winds in this range extending throughout the rest of the year. High winds are generally uncommon on the beach.

The winds at Hollywood Beach are adequate to regularly move sand across the beach creating dunes in response to accumulated debris, or fixed features on the landscape. Where dunes are not present, sand migrates eastward and accumulates adjacent to the residential neighborhood and migrates through access corridors and out on to the streets well into the neighborhood.

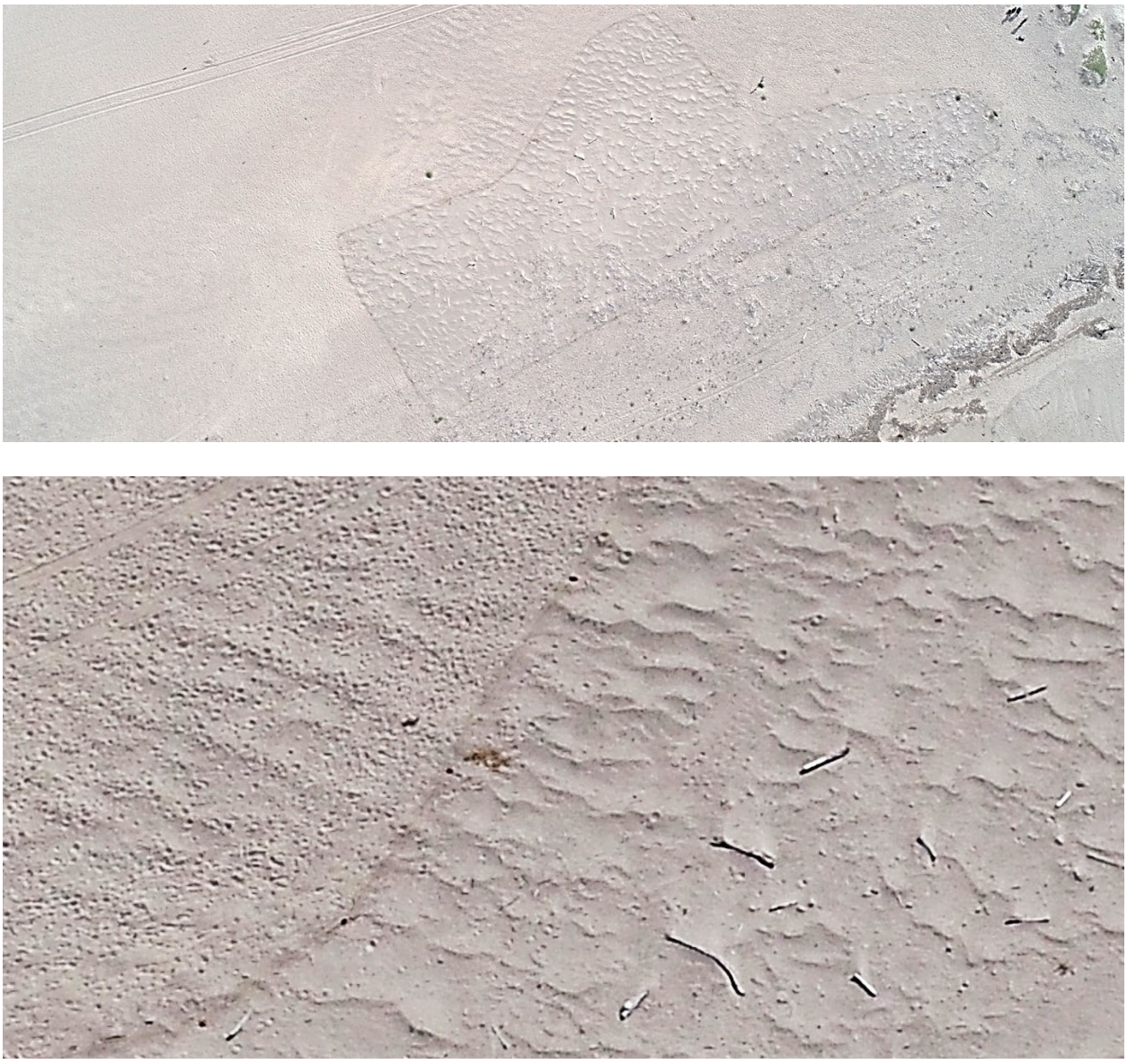


Wind rose and seasonal frequency of wind velocities by month illustrating generally low wind velocities from the southwest (windy.app)

Previously the increasing width of Hollywood Beach was noted, however due to aeolian transport of the sand from the beach face to the top of the beach and eastward, the elevation of the beach is also increasing over time. As of 2023, several portions of the high beach extend 5 or more feet above the patio elevations of the houses abutting the beach. This results in on-going needs to push sand away from the residential neighborhood.

The existing winds and abundant sand along with woody debris on the south end of the beach provide the precursors for dune development with limited intervention. This can be seen in viewing the results of erecting seasonal symbolic fencing to provide plover nesting on the beach north of the existing dunes. In 2023, a 0.38-acre open mesh fence exclosure was placed around a portion of the dry upper beach adjacent to the forebeach. This fencing was present from March 30 through September 22, 2023. During this period, the trampling effect of pedestrians, dogs, and vehicles was kept down and over the 6-month period dune initiates were beginning to develop without intervention with woody debris serving to initiate dune formation This pattern would be expected to continue and could be fostered through a combination of symbolic fencing localized sand placement, and incorporation of selected large and small woody debris to form hardened features to anchor dunes and generate desirable mounding patterns, as well as providing cover features for snowy plover chicks.

It is intended that existing driftwood debris be the primary feature utilized to anchor dunes, serving to capture blow sand for dune development as this woody debris provides both good nuclei for dune formation and sheltering structure for snowy plover chicks. However, small lathe or straw plugs or short segments of dune fencing may also be used to augment the dune development. For the more shoreward margin of the expanded dune areas, dunes will be preloaded with mechanically placed sand mounds harvested from the restoration area to more rapidly develop dune characteristics along the backside of the dune expansion area. The shoreward areas will be left low or natal dunes, best suited to use by snowy plovers for winter roosting and nesting activities.



Photograph showing the initiation of aeolian dune formation within seasonal symbolic fence exclosure placed on March 30 and removed on September 22, 2023 to protect nesting western snowy plover nest sites. Photo taken at the time the fencing was removed.

Conditions of the beach and natal dune habitat observed within the sand trap following beach loss due to prior dredging cycles reveal beach rebuilding and early initiation of dune development within the first spring-summer season following dredging. Heavy woody debris wrack loading often occurs on the lower beach with the drier upper beach becoming supratidal due to wave building coupled with blow sand movement. Dune plant recruitment occurs from seed supply within the immediate area. This includes both native and non-native species. Species represented on the beach strand and natal dunes reflect those present in the existing foredunes and are principally native dune flora. However, it is not known how far removed from the established dune field seedling recruitment would occur. Debra Berringer has reported the occurrence of *Abronia maritima* seedlings at least 0.5 miles from the dune field suggesting some long-distance dispersal can be expected.

To address concerns regarding seed availably within the dune expansion area, expanded dunes would be supplemented by minor seeding effort derived by harvesting seed from existing dune fields and raking this into sand placed at the back of the fenced areas. Native plants that are currently plentiful on Hollywood Beach include beach-bur (*Ambrosia chamissonis*), beach saltbush (*Atriplex leucophylla*), beach morning-glory (*Calystegia soldenella*), red sand verbena (*Abronia maritima*), and beach evening primrose (*Camissonia cherianthifolia*).

Seed collection will be performed within the existing dune field, by raking up seed and plant duff from around the fore dunes where limited non-native plants are present during the late summer fall period (September-October). The seed would then be raked into approximately 10 percent of the new dune habitat within the expansion area. Seed would be raked into the surface sediments in widely distributed patches to introduce dune vegetation into the sites.

Hollywood Beach sand trap high beach redevelopment March 15, 2024 following beach removal via dredging in 2023. Seedling native sand verbena and non-native sea rocket are present along with woody debris that influence sand accretion patterns.

Adaptive Management to Avoid Dune Evolution to Stability

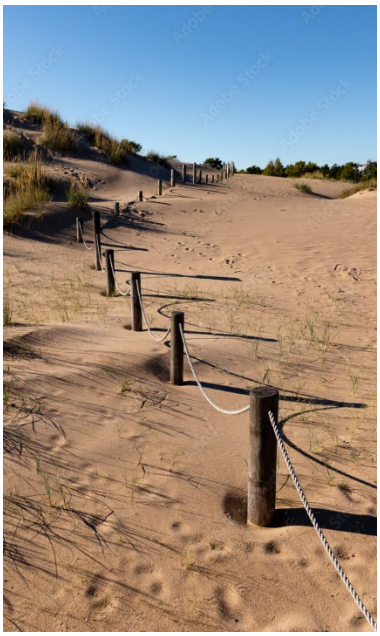
While there is little concern for the ability to develop dunes within areas that are protected from trampling, there is a concern that the dunes that do develop will become overly stable and advance to conditions that are less favorable for use by WSP and CLT. This would be expected for several reasons. First, the proposed dune development location is located back from the actively eroding and accreting shoreline. The natural storm damage that occurs seasonally washes away dunes, while depositing wrack. This provides for a rejuvenation of foredunes. However, such exposure would jeopardize the symbolic fencing, displace shoreline beach uses, and render the long-term habitat area that is developed uncertain as it would be coupled with unpredictable short-term seasonal storm events. However, moving the habitat expansion area away from the more dynamic fore beach will allow the area to stabilize, dunes to increase in height, and vegetation to expand in coverage. The net result would be expected to be development of quality dunes that have low utility for targeted avian species habitat enhancement.

To effectively control the serial progression of the habitat towards a climax condition, it is necessary to integrate disturbance of the habitat through adaptive management actions. In the case of the dunes adjacent to the sand trap, this occurs through dredging and subsequent shoreline erosion and restabilization and rebuilding. These factors would not be available to the north of the sand-trap area. As a result, an alternative source of disturbance is required to be implemented on a periodic and recurrent basis to keep the dunes in an early successional state. To achieve dune destabilization, it is expected that some degree of mechanical resculpting of the dunes will be required from time to time along with thinning of vegetation, including potential thinning of native vegetation. The determination as to when dune destabilization will occur is to be driven by adaptive management triggers for dune stability. The operative goal within the enhancement and expansion habitat is to achieve >40 percent beach strand/natal dune, >30 percent active foredune, and <30 percent stabilized back dune habitat. When greater than 30 percent of the dune habitat has reached a condition of stable back dune habitat these dunes will be targeted for destabilizing actions.

6.6. Symbolic Fencing and Signage

Symbolic Fencing

Permanent symbolic fencing is proposed to be placed landward of the highest wet beach boundary in the past 30-years and seaward of the 1939 OHWM. Fencing is intended to be open in structure such that it does not impede wind yet provides a guide to the using public that areas within the fencing are to be avoided. Proposed fencing will consist of 4x4 posts, or 5-inch diameter posts set at 8-foot centers with a single 1-inch rope. Posts will be set a minimum of 40 inches into the beach and will extend to a height of 36-42-inches above grade. The fence will be designed to allow the top rope to be removed and replaced as needed and as dictated by maintenance and adaptive management activities. Example fences are shown below.



Photographs of example post and rope symbolic fencing to be used at Hollywood Beach. Only one fence type would be used.

Fencing is not planned to be placed within proximity to the sand trap Area D since this area will continue to be used to maintain harbor navigation channels and to bypass sand to down coast beaches. As a result, localized erosion is expected to continue to occur. The results of this erosion would be to fail fencing and then bury the fencing in accreted sand as the beach relaxes and then rebuilds. Fencing in this area is not considered to be necessary as the existing dunes provide the intended reduction in pedestrian and vehicular traffic within the areas adjacent to the sand trap.

Example of symbolic fencing damage on an erosive beach. To avoid this result, fencing will not be placed near the sand trap.

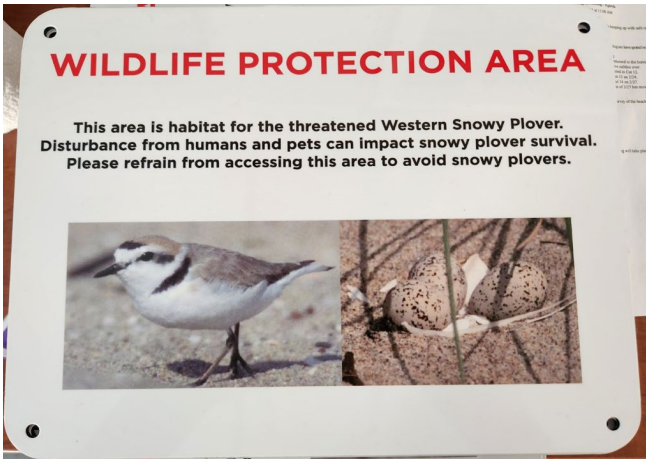
Signage

Signage proposed under the plan includes two types, resource protection advisory signage and informational interpretive panels.

Resource Protection Advisory Signage

Resource protection advisory signage is intended to include regular distribution of signs to be posted on the symbolic fencing to discourage access when the rope is up. This is an informational semi-regulatory advisory sign that would be posted approximately every 10 posts (80 feet) along the perimeter of the symbolic fence. These signs would only be up when the rope barrier is present and would include English and Spanish language versions.

This signage would be printed on a stiff aluminum stock that is laid out to be well supported by the symbolic fencing posts such that there is limited risk of vandalism and damage to the signs. Surplus signs would be printed up for replacement seasonally as required to supplement the signage as needed.



Signage to be used on symbolic fencing to be placed every 80 feet along the fence line.

Informational-Interpretive Panel

Habitat expansion and resource management can be greatly benefited by information dissemination to the using public. This will provide a greater understanding and appreciation of the resource management concerns and needs on the beach and will foster increased user support. To accomplish this, informational-interpretive panel signage is to be erected at the inland side of the multiple pathway crossing through the habitat expansion area and the existing dunes. It is expected that this will include four signs. These signs would either be three free-standing panels or a triangular kiosk design with three panels around a free-standing structure, co-located with trash cans.

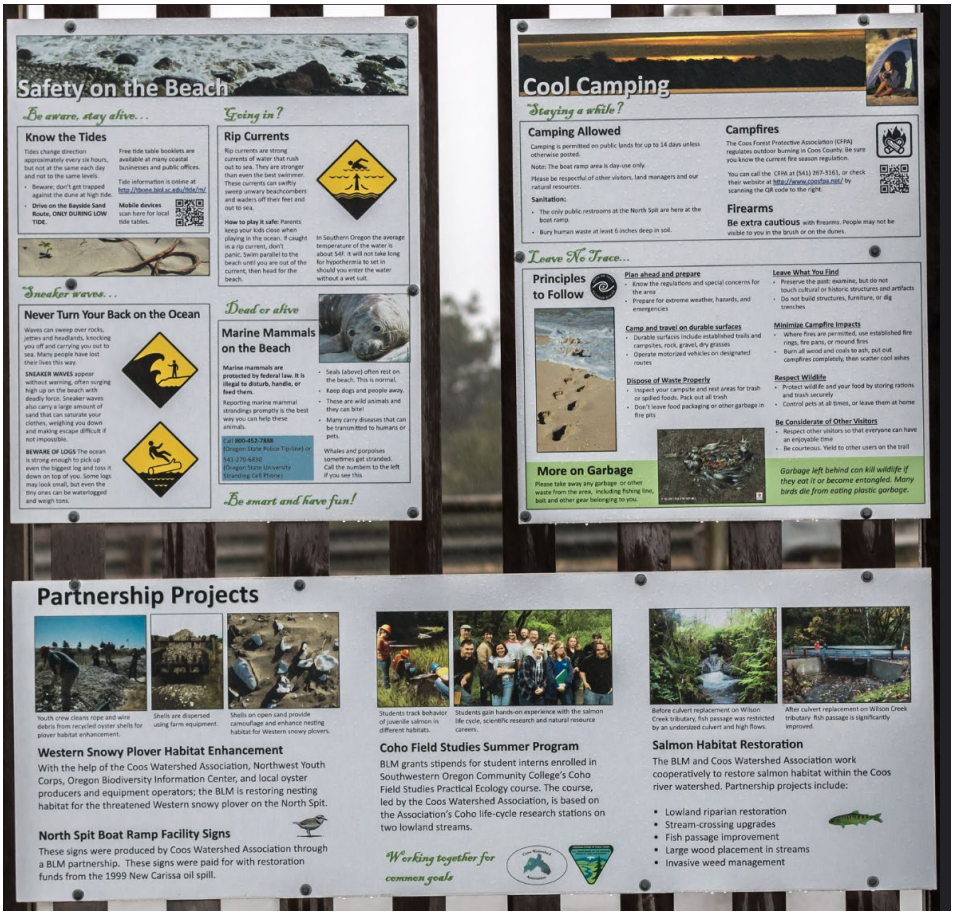
This signage is to include the following messages but should be further developed with partnership groups and stakeholders that are engaged in beach use, management, and stewardship including the County of Ventura, Ventura Audubon Society, U.S. Fish & Wildlife Service, California Coastal Commission, and adjacent property owners.

This signage is intended to convey information regarding the beach and dunes. The signage would communicate the meaning of the rope barrier being present or absent relative to habitat and species conservation practices. The signage would also provide for integration of information on beach rules and enlist the public's assistance on maintaining the expanded habitat by staying out when the rope is up- and utilizing the area to its fullest when the rope is down. The language and design for this interpretive signage has not been developed yet as the messaging will be very important and should be developed along with partners and collaborators that participate in the management of the natural resources and beach uses.

Primary messages anticipated to be covered by the signage include:

- Information on beach dynamics;
- Natural resources present on the beach/dunes including WSP and CLT and native dunes;
- Purpose of the rope fencing and requests to abide by the fencing for protection of resources;
    - Meaning of rope fence up versus rope fence down relative to access;
- Beach use rules and etiquette;
- Safety, emergency services and contact information;
- Potential coverage of special management programs underway;
    - Army Corps of Engineers maintenance dredging
    - Ventura Audubon Society Hollywood Beach Dog Rangers
    - Ventura County Beach Grooming and Trash Control
    - Back beach blow-sand management

There is potential for one of the panels to differ across the various locations so that more information can be conveyed without increasing the signage needs.



Example signage of the type proposed for the interpretive kiosk signage exhibiting multiple themes relating the restoration and stewardship of multi-resource uses at Hollywood Beach.

Example signage option configurations to be considered and selected based on further interaction with stakeholders, agency partners to consider information content, weathering and vandalism, maintenance, and viewshed impact, and content change expectations.

7.0 5-YEAR ESTABLISHMENT PERIOD MAINTENANCE AND MONITORING

Following initial implementation, the Corps will complete 5-years of follow-up implementation maintenance and stewardship activities to foster the development of the habitat functions and practices intended under the Plan and to assess the degree of success in achieving the Plan objectives.

7.1. MAINTENANCE ACTIONS

Fencing and Sign Maintenance

It is anticipated that fencing and signage will require some annual maintenance. It is expected that the maintenance requirements will diminish with time due to a reduction in vandalism to fencing and signage. However, it is expected that the overall service life of the fence will be between 6-10 years, prior to requiring significant repairs or replacement. Fencing repairs anticipated during the 5-year maintenance period are expected to occur as need to replace up to 5 percent of the fence posts and rope per year. Losses are expected due to vandalism or erosion failure, or dune development requiring posts to be dug out or raised.

Resource protection advisory signage is expected to be vandalized and stolen such that up to 10-20 percent of these signs may be lost each year, requiring replacement. Anti-tampering hardware may curb this loss but would not be used initially as it adds to the difficulty of completing regular replacement maintenance and may raise costs higher than the anticipated losses of damage of signs warrants. Instead, it is intended that signage be printed in bulk to account for anticipated losses by providing a surplus for maintenance installation.

Fencing and signage maintenance is planned to be performed prior to the onset of each plover nesting period (February-March), when present seasonal symbolic fencing is established on the beach north of the dunes. For heavy damage, signage and fencing repairs will occur as needed, while minor repairs will be conducted during the annual pre-nesting season maintenance event.

Invasive Species Eradication/Control

Invasive species eradication/control is intended to be performed twice per year for 5-consecutive years following implementation of the Plan improvements. This work will occur in the spring prior to the commencement of nesting by plovers (February-March), and in the fall (October-November) following the end of the peak summer season recreational uses. This includes continued removal of identified invasives species and any established giant reed (*Arundo donax*) that can be established following significant flood discharges from the Santa Clara River.

Beach Wrack and Debris Management

Annually in the spring debris and wrack are removed from Hollywood Beach following expulsion from the Santa Clara River. Wrack is beneficial to WSP as it attracts forage organisms such as amphipods, isopods, and kelp flies among other insects. It also provides shade and structure that benefits WSP and CLT when present at managed levels. For this reason, retaining some wrack is a beneficial habitat element for plovers. The Corps will coordinate with the County on beach debris removal in order to retain or augment wrack within the symbolic fenced areas and along the upper beach margin within the sand trap when the County removes debris. Anthropogenic debris (trash) and most *Arundo* stalk and rhizomes will not be retained within the Plan area. Managing overall beach grooming and clean-

up of wrack is beyond the scope of the present plan, but coordination with the County and capitalizing on available wrack assets over the 5-year post-implementation process will begin to foster a local program for wrack and debris management that is supportive of public use objectives, as well as natural resource goals. It is expected that this collaboration will provide operational benefits long-term that extend beyond the plan objectives. This work will occur in the spring prior to the commencement of nesting by plovers (February-March). The intent is to capitalize on seasonally replenished desirable wrack distribution and densities, while not conflicting with normal beach maintenance and grooming activities.

Nesting Season Preparation and Maintenance Actions

The Corps will implement a habitat maintenance program for CLT and WSP prior to commencement of the breeding season during each of the 5-years following plan implementation. The program will include site inspection to confirm adequate bare ground and woody and algal wrack debris is present within the exclusion areas and that fencing is in place. When nesting begins, weekly monitoring events will be undertaken until eggs are laid then this will switch to at least twice weekly monitoring events. Where appropriate, due to nesting outside of the symbolic fencing or elevated predation risk, the Corps will place micro-exclosures (MEs) over plover nests as authorized by the USFWS.

7.2. Monitoring Program

As noted in Section 5.3, several performance metrics have been established against which the project is to be evaluated. Many of these are beyond the control of the Corps and thus are not obligatory performance metrics (e.g., nesting counts or hatching success), other elements are generally within the Corps' control (e.g., invasive species control levels, and implementation scale, fencing, and signage). The program performance metrics represent goals for the project, against which the effectiveness of the enhancement will be assessed. However, the relative capacity for the Corps to control the degree of performance of the project relative to the established metrics will be used to assess the Corps' achievement of the obligations.

Performance metrics further served to guide adaptive management actions over the course of the 5-year post-implementation period. The metrics will serve as guides for implementing adaptive actions, but do not themselves dictate the actions to be taken. Rather, annual monitoring reports will be prepared that assess WSP wintering and nesting metrics, CLT nesting metrics, habitat development, invasive species status, and condition of fencing/signage and effectiveness of the human management aspects of the project.

The annual reports will be shared with partner agencies and non-governmental organizations in December of each of the 5-years to summarize the observations and assessment of performance against articulated metrics for the prior year. The findings of this report and any recommended adaptive management actions derived from the monitoring will be discussed in a meeting with partners. The Corps will then use feedback in its evaluation and determination of those actions the Corps' plans on taking in the coming year or plans to not implement at the present time. In some instances, recommended actions may not be practically implemented during the same year prior to nesting and summer peak activities. Where any adaptive management actions exceed the authorization of present work, the requisite agencies would be requested to provide guidance on how to proceed, or if the action should be undertaken.

Monitoring Program Design

Baseline monitoring was conducted in fall 2024 to document the baseline site conditions and to support future assessment of the habitat expansion and enhancement program. Monitoring will be conducted during the spring and fall of the first implementation year (2025), and during each subsequent year of the 5-year post-implementation period (2026-2030).

The spring monitoring program includes multiple elements, fixed transect sampling, fixed photo plots, and more comprehensive site assessments (Figure 12). Monitoring is planned to be conducted during the spring and fall of each year and will be utilized to both assess the status of the expansion and enhancement program relative to performance metrics, as well as serving to guide habitat maintenance activities. Spring field data will be collected on standardized datasheets (Appendix 1). Fall monitoring will include qualitative assessments and maintenance recommendations.

Belt Transect Monitoring

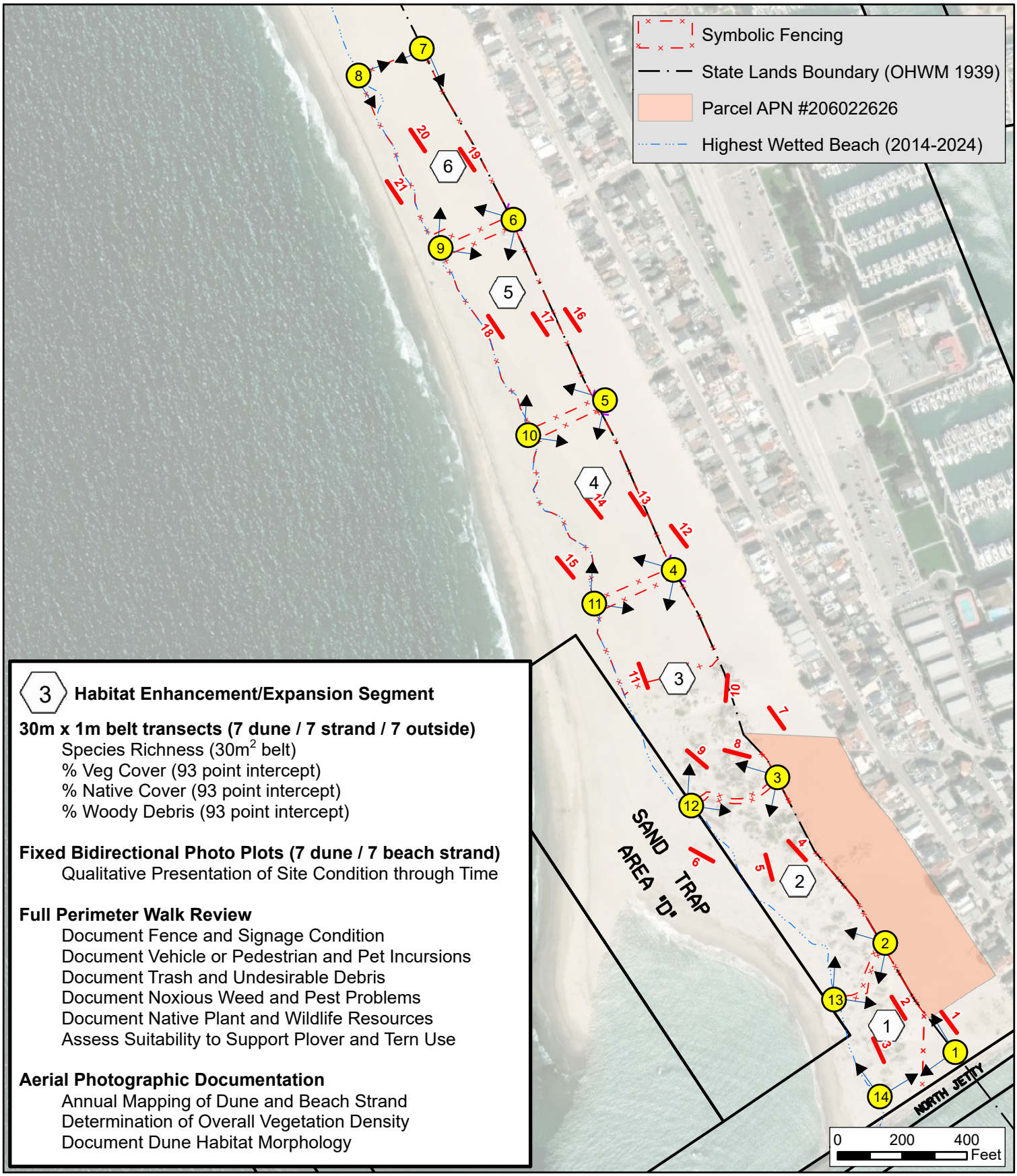
A total of 21 permanent 30m x 1m belt transects are to be established within the habitat areas. These include seven transects within dune habitat, seven transects within the seaward beach strand (natal dune) environment, and seven transects outside of the project area that will serve as reference transects for the site conditions absent restoration activities. Belt transects are to be established within the habitat enhancement and expansion areas, as well as beach areas that are adjacent but outside of the habitat areas (Figure 12). Transects will be sampled in the spring (February-March) and fall (September-October) of each year.

Sampling includes both comprehensive inventory sampling within each $30m^2$ belt transect to determine species richness, as well as point intercept sampling at each meter mark (0-30m) directly under the transect tape extended as a tight line between two fixed end points and normal to the transect at 0.5 meters to each side of the tape. This results in a total of 93 intercept points per transect. Intercept sampling will be used to determine density of parameters of interest. The data to be collected are as follows:

- **Species Richness** – Plant species lists will developed within each $30m^2$ belt transect to develop native:non-native species ratios and to monitor plant community composition within the dunes and strand habitat areas in order to assess differences across the enhanced and expanded habitats and changes expressed seasonally, and through the monitoring effort.

- **% Vegetated Cover** – Percent vegetated cover will be determined from point-intercept sampling. Plant intercepts will be recorded by species to support an analysis of percent native and non-native species cover. Target cover metrics are provided in Table 1.

- **% Non-Native Plant Cover** – This metric is to be determined from plant intercepts and will be used to assess the percent reduction in invasive species within the dunes. In completing this analysis, sea rocket (*Cakile maritima*) will be excluded from the analyses until removal efforts are directed towards this species, as it presently provides the valuable cover to western snowy plovers and its removal will be deferred until native dune plants are available to replace this habitat function. Target non-native species levels are provided in Table 1.



3 Habitat Enhancement/Expansion Segment

30m x 1m belt transects (7 dune / 7 strand / 7 outside)
- Species Richness (30m^2 belt)
- % Veg Cover (93 point intercept)
- % Native Cover (93 point intercept)
- % Woody Debris (93 point intercept)

Fixed Bidirectional Photo Plots (7 dune / 7 beach strand)
- Qualitative Presentation of Site Condition through Time

Full Perimeter Walk Review
- Document Fence and Signage Condition
- Document Vehicle or Pedestrian and Pet Incursions
- Document Trash and Undesirable Debris
- Document Noxious Weed and Pest Problems
- Document Native Plant and Wildlife Resources
- Assess Suitability to Support Plover and Tern Use

Aerial Photographic Documentation
- Annual Mapping of Dune and Beach Strand
- Determination of Overall Vegetation Density
- Document Dune Habitat Morphology

N W E S

Monitoring Program Surveying Plan
Channel Island Harbor Navigational Maintenance Dredging
Ventura County, California

Figure 12

Table 1. Habitat Monitoring and Performance Metrics

Monitoring Element	Component	Performance Metrics	Adaptive Actions
Transect Sampling	**Timing: February and September annually**		
Species Richness	All	Targeting average of not less than 2 native species per 30m^2 dune transect	Targeted seeding augmentation
% Vegetated Cover	Beach strand	>2% and <15%	Augment by seeding or reduce vegetation
	Dunes	>15% and <40%	Augment by seeding or reduce vegetation
% Non-Native Cover	European beach grass	≤5%	Continue eradication actions
	Hottentot fig iceplant	≤5%	Continue control actions
	IPS rating High or Mod.	≤5%	Continue control actions
% Woody Debris	Beach strand	>2% and <15%	Augment or remove prior to breeding season
	Dune	None established	
% Site Disturbance	Vehicle/Pedestrian/Dog	<20% of that outside of fence	Continue fencing and information outreach
Perimeter Walk	**Timing: February and September annually**		
Perimeter Walks	Fencing and signage	Fences and signs intact	Repair and replace as needed
	Vehicle, pedestrian, dog encroachment	Assessed based on transect data	Conduct corrective fencing actions, consider additional or different signage
	Trash and undesirable debris	Trash or debris accumulation visually common	Remove as needed before or after nesting season
	Non-native plants or other pest problems	Assessed based on transect data, observations used to target maintenance actions	Conduct non-native plant control actions, identify any other pests for adaptive management needs to be coordinated with agencies
	Assess suitability to support plover/tern use	Identify potential measures for improvement	Implement as practical prior to nesting season
Aerial Photography	**Timing: February and September annually**		
Aerial Photography	Quantify beach strand and dune area	13.47 ac strand and dune including 3:1 dune to impact.	Coordinate with agencies if areas fall short of need in order to identify potential corrective actions
	Overall % vegetation	>5 and < 40%	Targeted seeding or vegetation thinning
	Dune morphology	>40% beach strand/natal dunes, >30% active foredunes, <30% stable backdune	Targeted dune regrading or vegetation thinning/augmentation, evaluate performance prior to adjustment and coordinate with agencies if metric adjustment is warranted

- **% Woody Debris** – Woody debris is an important element providing shelter and foraging areas for western snowy plover, although it is regularly discharged to the beach from the Santa Clara River and can become an undesirable feature at high densities. Point-intercept sampling will be used to determine the percent cover of woody debris. These will be assessed against target objectives (Table 1) Woody debris exceeds 0.2 meters in any dimension.

- **% Site Disturbance by Vehicles/Pedestrians/Dogs** – The project includes symbolic fencing and signage intended to reduce traffic through areas utilized by western snowy plover and California least terns. To assess the effectiveness of disturbance reduction, monitoring will be performed to assess the percentage of disturbance from vehicle, pedestrian, or dog present within the habitat expansion and enhancement areas relative to disturbance outside of the symbolic fencing. The targeted objectives are provided in Table 1. This is to be based on physical observation of traffic within point intercepts for each transect.

Photo Plot Monitoring

Photographs will be collected during the spring (February) and fall (September) of each year to document site conditions prior to and following the nesting season. Images will be collected from 14 fixed positions, with photographs being taken with a consistent orientation and range of field being used for each monitoring interval. For each season, individual photo pages will be prepared for each photo plot with six images per page reflecting the chronology of site conditions over the years (2025-2030). Spring and fall photo pages will be presented separately. The photo plot monitoring is intended to provide qualitative documentation of site conditions and is not intended to be separately analyzed for quantitative data.

Habitat Perimeter Walks

During each monitoring interval during the spring (February) and fall (September) of each year the perimeter of the habitat expansion and enhancement areas will be walked to identify and document the conditions of the site, habitat protection measures, and assests and liabilities within the habitat areas. This walk is principally intended to serve as a tool to guide habitat management actions, but also includes some qualitative and quantitative action triggers (Table 1). Data will be collected by habitat enhancement or expansion segment (1-6) to assist in tracking areas requiring focused action. Specific efforts will be made to accomplish the following:

- Document Fence and Signage Conditions
- Document Vehicle, Pedestrian, and Pet Incursions
- Document Trash and Undesirable Debris
- Document Noxious Weed and Pest Problems
- Document Native Plant and Wildlife Resources
- Assess Suitability to Support Plovers and Terns

Aerial Photographic Documentation

High-resolution aerial photographs will be collected in spring and fall of each year to document the position of the wetted beach, and the extent and distribution of beach strand /natal dune habitat, active foredune, and stabilized back dunes. The mapping will support digitizing the habitat components and quantifying the extent of each. The goal of the restoration is to develop a majority

of the habitat to conditions of beach strand /natal dune habitat and active foredune, with minimal stabilized dunes. As such, performance metrics have been established for each of these habitats with the goal of maintaining >70% of the habitat in the former classes and a minimal amount of habitat supporting stabilized dunes (Table 1). The distribution of dune subtypes will serve as adaptive management triggers to reduce dune stabilization by regrading dunes or reducing vegetation.

Concurrent with the mapping of habitats, dune morphology will be evaluated using a digital terrain model (DTM) that is collected concurrent with aerial photography and used to correct image distortion over uneven landforms. The DTMs will be analyzed once per year in September and, along with the vegetation mapping, will support the mapping of the three subtype habitat classes identified above.

Plover/Tern Monitoring

During the nesting season of WSP and CLT monitoring will be conducted on a weekly basis by a qualified plover and tern monitor. Once eggs are laid the monitor will increase the frequency of monitoring to at least twice weekly to document the status of nests, broods, and fledging. The monitoring will document the locations and numbers of nests, eggs, chicks, and fledglings produced each season by species and location. The targeted goal of the restoration is to increase the success of wintering and nesting on Hollywood Beach by expanding and improving the quality and safety of nesting and wintering habitat areas. Non-obligatory metrics are to retain or increase nest start levels similar to those prior to the enhancement/expansion, while increasing the success of nesting on Hollywood Beach.

Example aerial imagery to be used for annual mapping of vegetation masses to calculate overall percent vegetated cover and to facilitated habitat subtype identification

Example Digital Terrain Model (DTM) from 2023. This model will be used to support evaluation of dune growth and stabilization through time

Reporting

Annual Reports

Annual monitoring will be followed up by the preparation and delivery of annual reports in December of each monitoring year (2025-2030). The Corps will share these reports with the USFWS and Coastal Commission Executive Director in December of the monitoring year. These annual reports will include:

- An assessment of dune habitat extent, characteristics, and quality as habitat for western snowy plover.
- An identification of any issues encountered such as trash, site erosion, invasive vegetation and other pests, as well as any vandalism.
- A description of the dune morphologic and vegetation conditions and development, including photo documentation and mapping.
- A determination as to whether the dunes have met that annual success criteria; and whether the dunes are expected to meet overall success criteria.
- Recommended and planned adaptive management actions considered for the subsequent monitoring and management year.

Final Report

A final report will be prepared at the end of the 6-year dredge period and will provide the following in a comprehensive manner that summarizes the results of the overall program, and where applicable, provides a chronology of conditions over the action period. The report will include the following:

- An assessment of dune habitat extent, characteristics, and quality as habitat for western snowy plover.
- An identification of any issues encountered such as trash, site erosion, invasive vegetation and other pests, as well as any vandalism.
- A description of the dune morphologic and vegetation conditions and development, including photo documentation and mapping.
- A determination as to whether the dunes have met that annual success criteria; and whether the dunes are expected to meet overall success criteria.
- A detailed summary and quantification of all dredging impacts to dunes that have occurred during the 6-year period along with a map of the cumulative footprint of impacts.
- An analysis of whether the habitat enhancement and expansion has met the obligations of 13.47 acres of western snowy plover and California least tern habitat and 3:1 offset of permanent dune impacts.

8.0 IMPLEMENTATION AND MAINTENANCE SCHEDULE

An overall schedule of implementation, maintenance, monitoring, and reporting has been prepared (Table 2). More detail on the scheduling of individual elements is provided in this section.

8.1. Initial Restoration Schedule

The implementation of the habitat expansion and enhancement plan is to be undertaken in three phases that will extend from winter 2024/ through December 2025 as follows (Table 2):

Phase 1: Initial Invasive Species Control (October -November 2024, Q4 2024) – This work will include reduction of biomass of iceplant and beach grass, pre-excavation herbicide treatment of beach grass to reduce viable root stock, and removals, weed whacking and spot treatment of other weeds prior to the 2025 WSP nesting season. Work also includes raking up duff to collect seed for later use.

Phase 2: Continued Invasive Species Control and Augment Woody Debris and Wrack (February-March 2025, Q1 2025) – This work will include continued reduction of weed species in the enhancement dunes and site preparation for the 2025 WSP nesting season.

Phase 3: Primary Enhancement and Expansion Activities (October -December 2025, Q4 2025) – This phase includes the excavation of non-native species, flattening slopes and reducing vegetation within existing stabilized back dunes, and developing expanded dune field to the north of the existing dunes. This phase also includes installation of fencing and signage.

8.2. Maintenance, Monitoring, and Reporting Schedule

It is anticipated that maintenance will occur on an annual basis focused prior to and immediately following each nest season (February Q1 and October-November, Q4 2026-2030, Table 2). As noted, some weed control is expected to occur on back dunes and dunes removed from nesting activities by WSP or CLT during March of each year in order to control annual plants prior to the plants developing mature seed. Monitoring to assess habitat conditions will occur prior to and following the breeding season in order to minimize disturbance of habitat areas during the nesting season. Monitoring and maintenance of nesting WSP and CLT will occur during the nesting season between March 1 and September 15 (Q1-3 of each year). Reporting will be shared in December of each monitoring year.

8.3. Delay of Action Plan

This plan is intended to be implemented by the end of the 2025 calendar year. The plan is intended to offset impacts to WSP, CLT, and dune habitat that occurs as a result of maintenance dredging deemed critical to sustain navigation and protect down coast beaches. For this reason, maintenance dredging activities are planned to occur as scheduled even if implementation of this habitat plan is delayed. As a result, it is necessary to develop a suitable "delay of action plan" to compensate for impacts that occur but which are not offset within a reasonable period, established as completion by December 31, 2025. Should a delay occur, the scale of the required restoration area will be increased by 10 percent per year of delay. The plan incorporates 19.42 acres to achieve a minimum requirement of 13.47 acres of WSP habitat including a 3:1 replacement for permanently impacted dunes. However, if greater area is needed due to scale of impact or delay in implementation, the Corps would coordinate with the USFWS and Coastal Commission to expand habitat further to the north along Hollywood Beach.

Table 2. Schedule of Activities

Action	Specific Dates	2024	2025				2026				2027				2028				2029				2030			
		Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Maintenance Dredging Cycles	Oct 1-Feb 28																									
Habitat Expansion and Enhancement Implementation																										
Invasive Species Eradication/Control	Oct-Nov & Feb-Mar																									
Dune Lowering/Construction	Jan-Feb & Sep-Dec																									
Fencing and Signage																										
Annual Management																										
Fencing and Signage Maintenance	Feb & Oct																									
Invasive Species Eradication/Control	Feb & Oct																									
Beach Wrack and Debris Management	Feb-Mar																									
Nesting Season Preparation and Maintenance	Feb																									
Dune Vegetation and Development Management	Feb & Oct																									
Nest Protection	Mar-Sep																									
Monitoring and Reporting Program																										
Nesting Season Monitoring	Mar 1-Sep 15																									
Annual Beach Strand and Dune Surveys	Sep and Mar																									
Annual Monitoring Reports	Dec																									
Final Report	Dec-30																									

9.0 REFERENCES

Barringer, D. 2013. Final 2013. Breeding Season Monitoring Report for Western Snowy Plover and California Least Tern Hollywood Beach, Oxnard, California. 34 pp.

Barringer, D. 2014. Final 2014. Breeding Season Monitoring Report for Western Snowy Plover and California Least Tern Hollywood Beach, Oxnard, California. 37 pp.

Barringer 2021: FINAL 2021 Western Snowy Plover and California Least Tern Annual Breeding Season Monitoring Report for Hollywood Beach, Oxnard, CA. 29 pp.

Barringer 2023: FINAL 2022 Western Snowy Plover and California Least Tern Annual Breeding Season Monitoring Report for Hollywood Beach, Oxnard, CA. 34 pp.

Barringer 2024: Final 2023 Western Snowy Plover and California Least Tern Annual Breeding Season Monitoring Report for Hollywood Beach, Oxnard, CA. 29 pp.

Bossard, C.C., J.M. Randall, and M. C. Hoshovsky. 2000. Invasive Plants of California's Wildlands. U.C. California Press.

Colwell, M.A., N. S. Burrell, M.A. Hardy, K. K. Kayano, J.J. Muir, W.J. Pearson, S.A. Peterson, K. A. Sesser, and R.R. Thiem. 2009. Final report: 2009 Snowy Plover breeding in coastal northern California, Recovery Unit 2. MRB Research, Inc. and California Department of Fish and Game, Sacramento, CA.

County of Ventura Resource Management Agency - Planning Division 2019. VC Resilient Coastal Adaptation Project Seal Level Rise Adaptation Strategies Report.

Federal Register. 1993. Determination of Threatened Status for the Coast Population of the Western Snowy Plover. Vol. 58, No. 42, pp. 12864-12874.

Federal Register. 2012. Revised Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover, Final Rule. Vol. 77, No. 118, pp. 36728-36869. June 19.

Hartley and Barringer 2022: Mid-Season Report 3/15/22 - 6/1/22 Ormond Beach and Hollywood Beach Western Snowy Plover and CA Least Tern. 8pp.

MacDonald, B. (2010). Habitat suitability modeling for western Snowy Plover in central California (Doctoral dissertation, California State University, Northridge).

Merkel & Associates, Inc. 2024. Hollywood Beach Western Snowy Plover Monitoring Report for 2022-2023 Winter and the 2023 Breeding season. Prepared for U.S. Army Corps of Engineers, Los Angeles District.

U.S. Fish and Wildlife Service (USFWS). 1985. Revised Recovery Plan for the California Least Tern (*Sterna antillarum brownii*), original approval April 2, 1980. USFWS, Portland, Oregon. Signed September 27.

USFWS. 1993. Determination of Threatened Status for the Coast Population of the Western Snowy Plover. Federal Register Vol. 58, No. 42, pp. 12864-12874.

USFWS. 2007. Western Snowy Plover (*Charadrius alexandrinus nivosus*) Pacific Coast Population Recovery Plan Vols. 1 and 2. California and Nevada Operations Office, Sacramento, CA. Signed August 13.

USFWS. 2012. Revised Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover, Final Rule. Federal Register Vol. 77, No. 118, pp. 36728-36869. June 19.

Appendix 1.
Field Data Sheet for Transect Monitoring

Hollywood Beach Dunes Expansion and Enhancement Transect Monitoring **M&A 18-082-06**

Channel Islands Harbor Mainteanance Dredging

Surveyors: _____ **Date:** _____

Wind Speed: _____ **Time:** _____

Transect No.:

POINT INTERCEPT:

T#_____	Right	Center	Left
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			

TRANSECT CHECKLIST:

	Photo at start and end of transect oriented down transect
	Point intercepts within 0.2 m circle at -0.5m, 0.0m, and +0.5m transect tape offset
	30m swath transect for species richness

POINT INTERCEPT DETECTION CODES: **Any plant / Any disturbance in 0.2 m circle**

S=Sand **N=Native** **D=Disturbed (pedestrian/animal, vehicle tracks)**

T=Trash **NN=Non-Native** **WD=Woody Debris >0.2m**

SPECIES RICHNESS IN 30 M^2 SWATH TRANSECT:

Presence	Species	Presence	Species
	Calamagrostis arenaria		
	Ambrosia chamissonis		
	Cakile maritima		
	Abronia maritima		
	Calystegia soldanella		
	Camissoniopsis cheiranthifolia		
	Carpobrotus (C. edulis or C. chilensis)		
	Atriplex leucophylla		
	Gazania rigens		
	Heterotheca grandiflora		
	Total Richness:		**% Native**

PLOVERS & TERNS NOTES:

GENERAL NOTES: