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ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

2013 WESTERN SNOWY PLOVER MONITORING REPORT
CHEVRON GUADALUPE RESTORATION PROJECT
SAN LUIS OBISPO COUNTY, CALIFORNIA

Prepared for:
CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
and the
UNITED STATES FISH AND WILDLIFE SERVICE

Recovery Permit TE-211100-0

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LIST OF ACRONYMS

AB	Alyssa Berry (Padre Associates, Inc.)
CCC	California Coastal Commission
CESA	California Endangered Species Act
CEMC	Chevron Environmental Management Company
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
FESA	Federal Endangered Species Act
GRP	Guadalupe Restoration Project (Site or Project)
JM	Jeanette Moore (Padre Associates, Inc.)
JL	Jennifer Langford (Padre Associates, Inc.)
KLG	Kenneth Gilliland (Padre Associates, Inc.)
KKP	Kimberly Paradis (Padre Associates, Inc.)
ML	Mailee Lewis (Padre Associates, Inc.)
ODSVRA	Oceano Dunes State Vehicular Recreation Area
RD	Rosalino Dolorez (Padre Associates, Inc.)
RWQCB	Regional Water Quality Control Board
SS	Stephanie Seay (Padre Associates, Inc.)
USFWS	U.S. Fish and Wildlife Service (or Service)
USCG	United States Coast Guard
VAFB	Vandenberg Air Force Base
WSPL	Western snowy plover
ZA	Zachary Abbey

EXECUTIVE SUMMARY

Padre biologists that perform the Western Snowy Plover (*Charadrius nivosus nivosus*) WSPL surveys have been permitted by the United States Fish and Wildlife Service (USFWS) to independently survey the WSPL under a USFWS Recovery Permit 10(a)(1)(A) TE-211100-0 and California Department of Fish and Wildlife (CDFW) Memorandum of Understanding (MOU). The USFWS require the submittal of an annual report to the Recovery Permit Coordinator at the Ventura Fish and Wildlife Service following each year the Permit is in effect. The Coastal Development Permit (CDP) for the Guadalupe Restoration Project (GRP), Condition of Approval F.62.m, requires a field-wide management plan for each sensitive species that is potentially impacted by site characterization, oil spill remediation, oil field abandonment, infrastructure removal, or other project-related activities. As part of the Sensitive Species Management Plan, (WSPL) Monitoring Program requires a written report summarizing the data collected to be submitted to Chevron Environmental Management Company.

Monitoring of breeding WSPL was conducted at the Chevron Guadalupe Restoration Project (GRP) from March 1 to September 10 , 2013. Biologists recorded WSPL present on 78 of the 80 surveys. On average, 16 birds were observed each day during the peak breeding months of April through June. A total of 45 nests were initiated in 2013. WSPL nests were present on the beach from March 15 until August 14th. Of these, 20 nests hatched successfully, 23 failed, and two had an unknown fate. WSPLs placed 19 nests on restored dunes, five of these being placed in the newly restored 7X/A-6 area. Ten (52.6 percent) of those nests placed in the restored dunes successfully hatched eggs (refer to Figure 7 - Total Snowy Plover Nests by Location). The ooverall hatching success at GRP increased from 27.5 percent in 2012 to 44 percent in 2013. In the first quarter of 2013, 7.28 acres of WSPL critical habitat was disturbed and restored back to suitable habitat before March 1. Field crews removed the A-2 pad and road along with completing the TB-4 West and A-6 West excavations. The 7X Debris Field Area that once consisted of gravel and red rock was also removed. The Debris Field Area of 7X was historically consistently very productive WSPL nesting habitat. Following excavation activities, restoration efforts included seeding the back dune areas and installation of straw plugs and sand fence for sand stabilization. The use of sand fence was limited to that which was necessary to stabilize the area without introducing excessive WSPL predator perches. Beach debris (e.g. drift wood and kelp) and wood chips were placed in the former 7X Debris Field Area for habitat enhancement.

Predators depredated 19 of the 23 nests that failed to hatch. In 2013, common ravens (*Corvus corax*) were the most significant nest predator and were confirmed to have depredated 10 nests. Coyotes (*Canis latrans*) and a gull (*Larus* spp.) depredated a single nest each. Unknown predators depredated seven nests. It is suspected that the unknown predators were common ravens, but due to the high winds after the nests were depredated, no predator tracks could be identified. Of the remaining failed nests, four were abandoned, two of which were abandoned during high winds. Peregrine falcons (*Falco peregrinus*) were present on the beach intermittently throughout the season and a pair was seen frequently near the estuary in August, however predation by falcons was not observed.

Nest exclosures were not placed on the beach during the 2013 season. The decision was made by the biologist to not use predator exclosures based on adult WSPL fatalities in previous years. This reduced the risk of coyotes being attracted to the exclosed nests and attempting to dig under the exclosures as they have been observed during previous years. In 2011 and 2012 adult WSPL fatalities were observed outside of nest exclosures. It remains unclear if the exclosures contributed to these fatalities. In 2013, no adult fatalities were observed due to predators. In 2013, four chick fatalities in separate nests were observed. All chick carcasses were located near the nest bowls of each respective nest. During three of these observations, the chicks had hatched on days with extreme winds and cold temperatures. The fourth chick had been found dead on a cold foggy morning.

In the 5X Area, Chevron contractors, under the direction of California Department of Fish and Wildlife (CDFW), USFWS, United States Coast Guard (USCG), and the Regional Water Quality Control Board (RWQCB), continued to conduct 5X beach monitoring to monitor the status of a hydrocarbon release into the ocean that was observed in 2010. WSPL did not show any signs of stress from the additional personnel on the beach.

1.0 INTRODUCTION

Padre Associates, Inc. (Padre) has prepared this report to document the results of western snowy plover (*Charadrius nivosus nivosus*) (WSPL) monitoring conducted during the 2013 breeding season at the Guadalupe Restoration Project (GRP), San Luis Obispo County, California (refer to Figure 1 - General Vicinity Map). This species is listed as threatened under the Federal Endangered Species Act (FESA). In accordance with the terms and conditions of the GRP specific Biological Opinion (1-8-03-F/C-57) issued by the United States Fish and Wildlife Service (USFWS), monitoring of WSPL activities are conducted three times per week from March 1 to September 10, 2013. The biologists that performed the surveys have been permitted by the USFWS to independently survey the WSPL under a USFWS Recovery Permit 10(a)(1)(A) TE-211100-0 and CDFW Memorandum of Understanding (MOU).

2.0 SURVEY AREA

The WSPL survey area includes the entire coastal area that forms the western edge of the GRP (refer to Figure 2 - General Field Map). The eastern boundary of the survey area can be divided into two parts. The southern portion of the east boundary is defined by the location of the former A Road, a gravel road running parallel with the beach approximately 1,000 feet (300 meters) inland from the ocean (refer to Figure 3 - Western Snowy Plover Nest Locations). North of the A Road, the eastern survey boundary is at the crest of high dunes backing the beach. The western border of the survey area is roughly the mean high tide line along the Pacific Ocean. The survey's northern border is where GRP property meets the Guadalupe-Nipomo Dunes National Wildlife Refuge. The southern border of the survey area lies on a sandspit created by the Santa Maria River. In prior years, the river has crossed near the GRP property line; however, in 2013, it was approximately 500 feet (152 meters) south of the property boundary. The length of the survey area from the northern to southern boundary is nearly 1.5 miles (2.4 kilometers) and the survey area covers approximately 97 acres (39 hectares).

The survey area is divided into five monitoring territories (refer to Figure 3 - Western Snowy Plover Nest Locations), which are from North to South: 1) Northern Territory; 2) 7X Complex; 3) A Road; 4) Restoration Dunes; and 5) Sandspit. This year the survey area was extended along the Sandspit to the south by approximately 75 yards to encompass a small portion of GRP . During past WSPL nesting seasons, this section of suitable WSPL nesting habitat was not systematically surveyed or monitored.

Habitat types within the survey area include beach, foredune, and vegetated back dunes interspersed with sandy or rocky open areas. The beach is scattered with driftwood of various sizes, kelp, wrack, and some man-made debris. During winter storms, the Santa Maria River occasionally washes the various debris down the river and onto the beach resulting in increased camouflage from predators for WSPL nests. The beach acquires a significant amount of wrack (surf-cast kelp), also aiding in the quality of the WSPL habitat. The beach width varies

throughout the year, being narrowest in late winter and building throughout the summer. In addition, the southern half of the beach generally is broader than the northern half.

The foredunes support sparse vegetation consisting of beach-bur (*Ambrosia chamissonis*), yellow sand verbena (*Abronia latifolia*), and sea rocket (*Cakile maritima*). The foredunes also provide habitat for the beach spectacle pod (*Dithyrea maritima*) and surf thistle (*Cirsium rhothophilum*), both listed as threatened under the California Endangered Species Act (CESA). Remediation of the foredune habitat an area now covered by 24 dunes was completed in 2001. This area that we now call the “Restoration Dunes” was restored and is still waiting to be signed off by the California Coastal Commission (CCC) saying that it meets the restoration performance criteria. Remediation of the A-6 West, TB-4 West, and A-2 pad and road was completed in 2013. Restoration activities continue until the area meets the restoration performance criteria set by the County and CCC. The beach and foredunes provide suitable and occupied habitat for nesting WSPL along their entire length.

MAP SOURCE: U.S.G.S 7.5' Quadrangles, Santa Maria and San Luis Obispo, California, 1981.

Figure 1. Vicinity Map

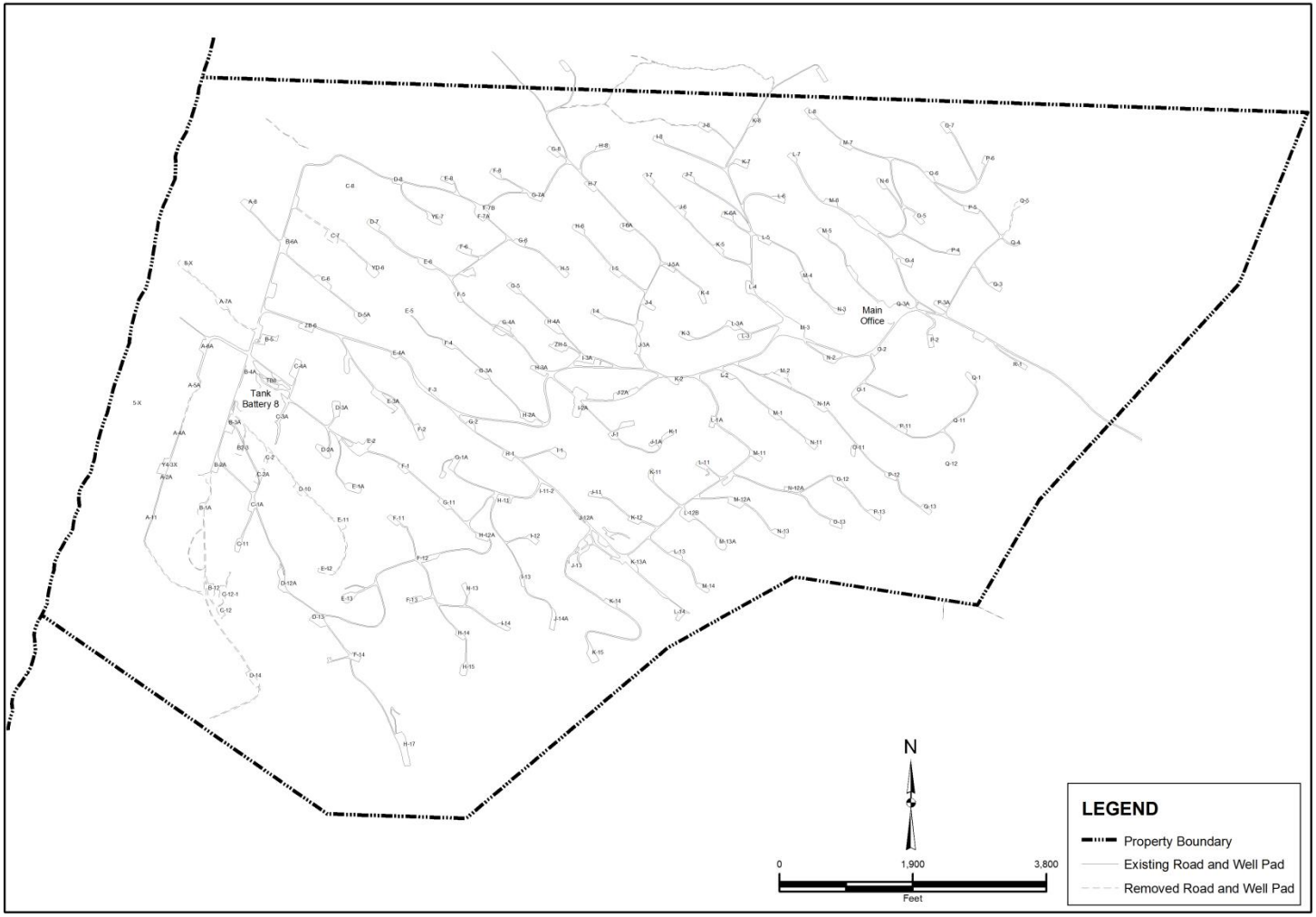

Figure 2. Field Map

Figure 3. Western Snowy Plover Nest Locations (2013)

3.0 METHODS

USFWS approved WSPL biologists surveyed all potential WSPL habitat within the survey area three times per week on non-consecutive days, when possible. Surveys were cancelled or rescheduled when it rained, when winds were strong enough to move sand across the beach (e.g., greater than 15 to 20 mph), and when the temperature exceeded 90 degrees Fahrenheit.

During each survey, the biologists followed a designated route. Beginning at the intersection of the former A Road and the B Road, the biologists walked the former A Road south to where the road turns to the southeast (refer to Figure 3). At this point, the route followed the estuary edge traveling west until reaching the southwest corner of the GRP property. From there, the biologists proceeded to the northern boundary of the survey area. Returning south from the northern boundary, the former 8X Pad area was surveyed. The biologists then walked south along the western edge of the dunes to the former 7X Road and returned to the intersection of the A Road and B Road. At least once a week the survey route was traveled in reverse. The biologists would routinely take minor deviations from this route to follows tracks or other evidence of WSPL activity. To avoid disturbing rare plant species, every monitor was familiar with special-status plant identification and was careful to avoid affecting them when surveying in the dunes.

Surveys were conducted by traveling the survey route with biologists stopping at roughly 325-foot (100 meter) intervals, scanning a 360 degree circle for WSPL, and noting the number, age, and sex of all observed birds. When a bird was seen with colored leg identification bands, extra effort was made to record the band combinations. As WSPL tend to visit their nests several times a day during nest initiation and egg-laying stages, scanning areas with dense concentrations of WSPL footprints was the primary technique used to locate active WSPL nests. Nests were also located opportunistically or by observing the behavior of adults.

During each survey, the status of every active nest was checked and assigned to one of the following categories:

- **Active/Tended** - Eggs present, with adults or fresh tracks near the nest.
- **Untended/Abandoned** - Eggs present, but no fresh tracks near the nest. Eggs partially covered in sand or present more than five days after expected hatch date.
- **Hatched** - Chicks or egg pips (small fragments of eggshell produced during hatching) present in nest. In the absence of pips, due to wind, nests that were empty on the expected hatch date without any signs of depredation.
- **Failed** - Eggs gone before expected hatch date, or physical evidence of egg loss present (e.g. broken shells, spilled yolk in nest scrape, evidence of predator presence).
- **Unknown** - This category was assigned to nests that did not leave unequivocal clues to their fate.

This nest data along with the GPS coordinates was collected each survey and written on a nest card that pertains to that individual nest. The GPS coordinates were put on a map that shows the success of the nest based on color (refer to Figure 3). Any predators or predator tracks that were observed during that survey along with human trespassers were also noted. The time of the survey, biologists present, weather, including the wind speed and temperature, prior weather, visibility, estuary height, surf conditions, and any fisherman, beachcombers, surfers, and joggers were also noted. All of this information was collected in field notebooks and input onto a database. The color combinations were reported to Point Blue Conservation Science who forwarded the observations to the parties that banded these birds. Reporting of banded WSPL observations help understand the range-wide status, movements, and distribution of the species.

Additional WSPL surveys were conducted during the monitoring of the 5X area for evidence of hydrocarbon releases into the ocean. Two separate paths were designated depending on where nests were located during the time of beach monitoring activities. One path was from the former A Road to 7X Area and out to the shoreline. The second path was south on the A Road to an open dune near 5X Area and out to the shoreline. The paths were surveyed by an approved WSPL monitor prior to any hydrocarbon monitoring activities. Additionally, approved WSPL biologists accompanied all 5X monitoring personnel during each monitoring event.

Periodically, site activities required a search for WSPL scrapes or nests outside the normal survey zone. If a proposed project would disturb an area west of the A Road, but outside the normally surveyed section or east of the former A Road in an area that had any likelihood of sheltering a WSPL nest, the WSPL monitor would be called upon to survey the area for WSPL prior to the initiation of remediation activities. The area east of the B-ponds are surveyed and cleared for foot and ORV traffic once a week. WSPL have not been seen in this area for the past few years and the vegetation continues to grow, decreasing the availability of suitable nesting habitat.

4.0 RESULTS AND DISCUSSION

4.1 WESTERN SNOWY PLOVER NUMBERS

The WSPL biologists conducted 80 surveys from March 1 to September 10 (refer to Appendix A, Table A-1, Survey Dates and Western Snowy Plover Numbers). The number of WSPL counted each month ranged from zero on August 14 to 37 birds on May 20 (refer to Figure 4 - Western Snowy Plovers Observed per Month in 2013 at GRP). Figure 4 depicts the lowest, average, and highest number of WSPL observed during a survey each month. An average of 16 WSPL were observed at the GRP during the peak breeding months of April through June.

The average number of WSPL observed from March through September is consistent with the average number of WSPL observed over the past five years. The average number of WSPL observed in 2013 (n=16) is the same as 2012 (n=16), and slightly higher than 2011 (n=15), 2010 (n=12), and 2009 (15). The increase in WSPL numbers observed in May is presumed to be due to the WSPL still moving around before choosing a location to begin the nesting cycle.

Among the WSPL observed, 49 were marked with colored identification leg bands (refer to Appendix A, Table A-2, Color Banded Western Snowy Plovers Recorded). Seven of these were confirmed as nesting on-site throughout the season. Twenty-eight of these WSPL wore band combinations reported by ODSVRA (to the north of the Site) as band colors assigned to chicks (five of which were banded in 2013).

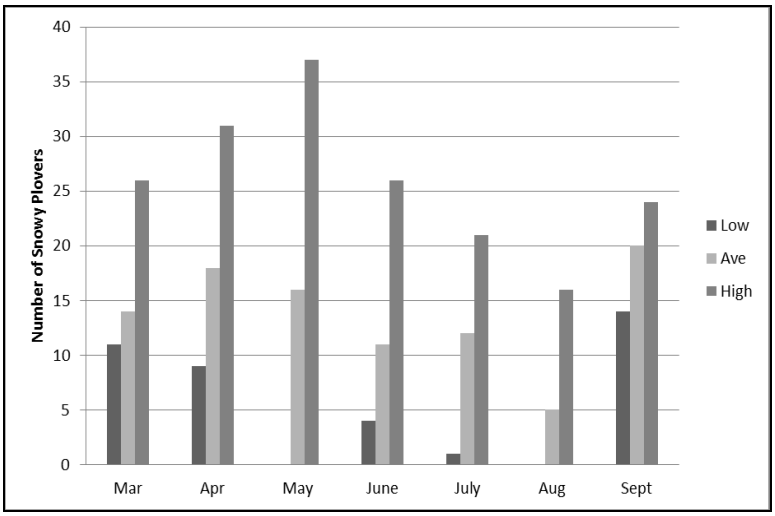

Figure 4. Western Snowy Plovers Observed per Month in 2013 at GRP

4.2 WESTERN SNOWY PLOVER NESTS

The biologists located a total of 45 WSPL nests within the survey area during the 2013 breeding season (refer to Figure 3 - Western Snowy Plover Nest Locations). The number of nests is higher than the 40 nests found in 2012. The first nest was observed on March 15 and the last nest hatched on August 14 (refer to Appendix A, Table A-3, Western Snowy Plover Nests Located). April and May were the most active nesting months (refer to Figure 5 - Number of Western Snowy Plover Nests Located in 2013 at GRP). Of the 45 nests observed, 20 hatched and 23 failed. Two nests had unknown fates. Nineteen of the failed nests were confirmed depredations. Four nests were abandoned and no nests were washed away by high tides (refer to Figure 6 - 2013 Western Snowy Plover Nest Fates at GRP).

A total of 31 nests (69 percent) were located before clutch completion (i.e., before there were three eggs in the nest), allowing an accurate expected hatch date (refer to Table 1 - Western Snowy Plover Nest Fates for 2013 Breeding Season at GRP). It is suspected that there may have been nests on the beach that common ravens depredated before they were located by the biologists. Biologists were able to assign relatively accurate hatching dates to another fourteen nests found after clutch completion due to recent nest searches in these locations.

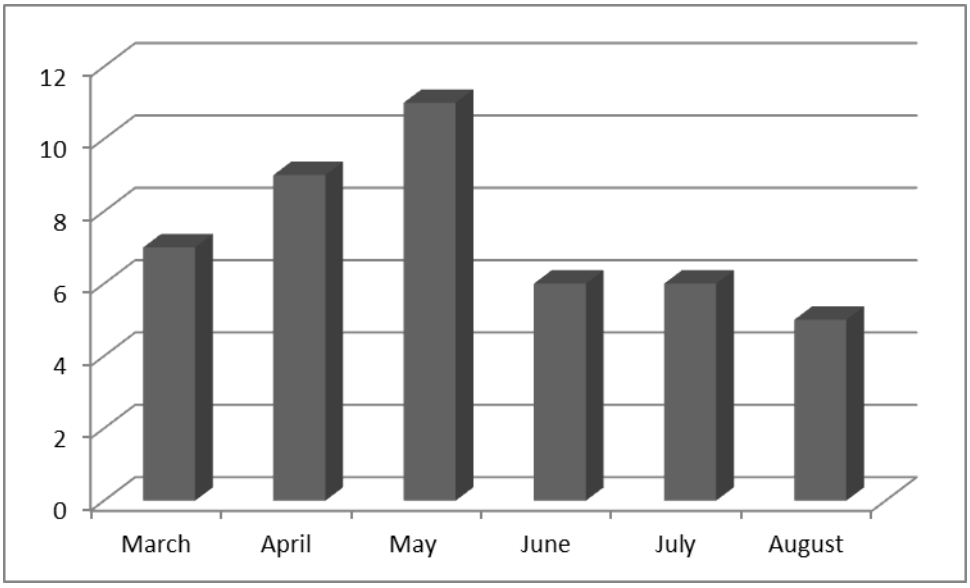

Figure 5. Number of Western Snowy Plover Nests at GRP in 2013

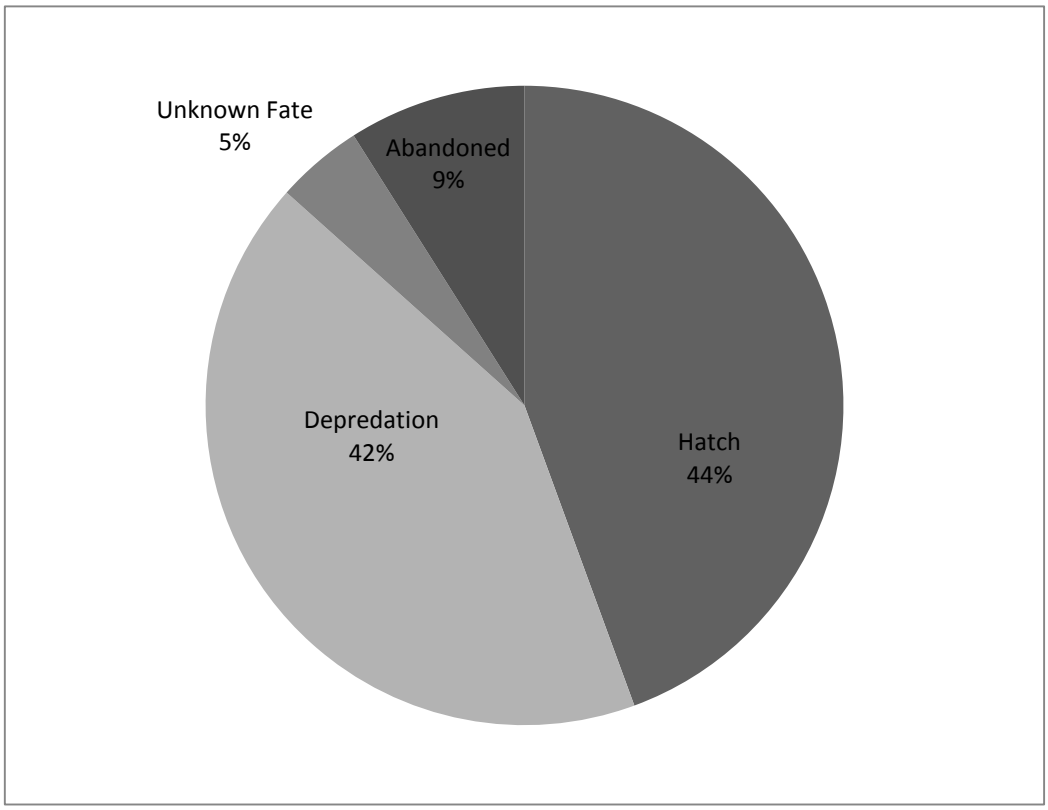

Figure 6. 2013 Western Snowy Plover Nest Fates at GRP

Table 1. 2013 Breeding Season Western Snowy Plover Nest Fates at GRP

Nests	Hatched	Failed	Fate Unknown	Total
Found Before Completion	10	20	1	31(69%)
Found Completed	10	3	1	14 (31 %)
Total	20 (44.4%)	23 (51.1%)	2 (4.4%)	45

The percentage of successful nests whose eggs hatched in 2013 increased to 44 percent from 27.5 percent in 2012 (refer to Figure 7 - Number of Western Snowy Plover Nests Located and Hatched in 2013 at GRP). In 2013, there were more eggs that hatched as compared to 2012 (51 eggs versus 27 eggs, respectively).

Fifteen nests (33 percent) were laid on the Sandspit, followed by the restored dunes (31 percent), the Northern Territory (22 percent) and 7X Complex (11 percent). The A Road supported the fewest nests, with two percent of the nests being laid in this area. Figure 8 depicts the spatial arrangements of the WSPL nests within the five monitoring territories.

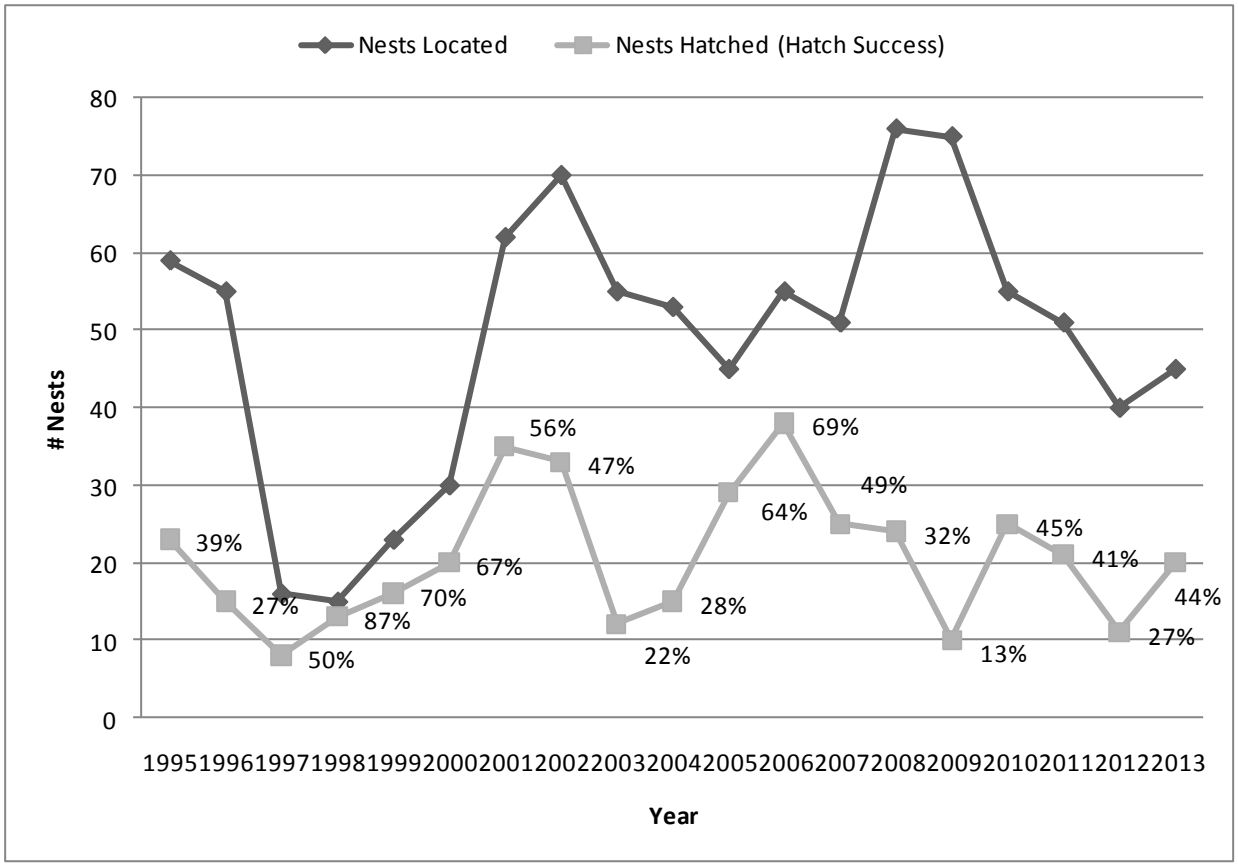

Figure 7. Number of Nests Located and Hatched between 1995 - 2013 at GRP

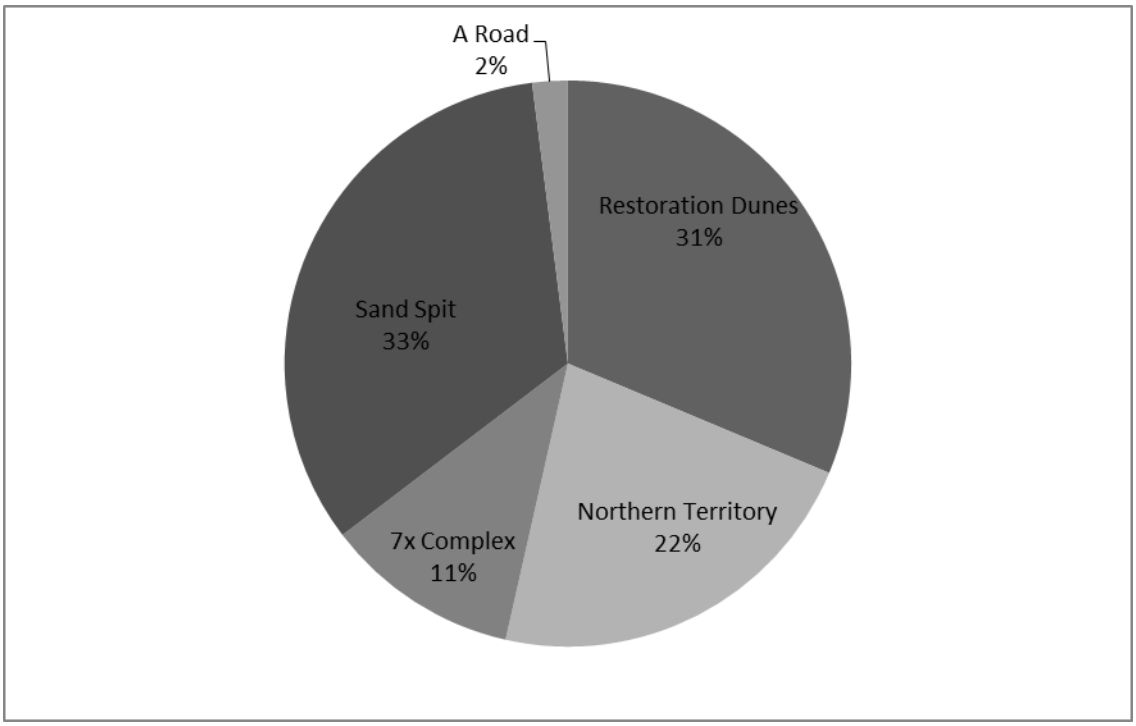

Figure 8. Total Western Snowy Plover Nests by Location in 2013 at GRP

4.3 WESTERN SNOWY PLOVER NEST DEPREDATION AND FAILURE

The most common nest predators in 2013 were avian predators. A total of 19 confirmed depredations were identified; one was confirmed coyote, one was confirmed gull, ten were confirmed common raven predations, and seven were unknown predators, but suspected to be ravens. Common ravens were the primary predator of nests during the 2013 season and direct observations of common ravens depredating WSPL nests were made. American crow (*Corvus brachyrhynchos*), northern Harrier (*Circus cyaneus*), great-horned owl (*Bubo virginianas*), peregrine falcon and red-tailed hawk (*Buteo jamaicensis*), all known WSPL nest predators, were observed within suitable WSPL habitat at GRP throughout the 2013 nesting season; however no confirmed depredations were recorded by these species.

Unknown predators were suspected to be avian if it was not windy the previous day (e.g., potential tracks were not obscured), and there were no mammalian tracks leading up to the nest. In most instances, any avian predator tracks at the nests were covered by extensive WSPL tracks following the predation, making it difficult to identify the predator species. Any predator tracks observed were measured and any egg remains were documented to further aid in predator identification.

GRP biologists coordinate closely with the neighboring WSPL sites as well as the entire Recovery Unit 5, San Simeon south to Ventura, if necessary. The WSPL biologist sends a weekly update including predator sightings to Rancho Guadalupe Park WSPL monitors, Guadalupe-Nipomo Dunes Complex monitors, ODSVRA monitors and predator personnel, USFWS, and CDFW. When common ravens or other avian WSPL predators are observed at GRP, ODSVRA monitors and USDA Wildlife Services are notified by phone immediately, especially if the avian predator is flying toward their property.

In 2013, a common raven nest was located on privately-owned agriculture land on Brown Road about 1.2 miles west of HWY 1, east of the Rancho Guadalupe Park whose adult ravens had a presumed territory that encompassed GRP and the Guadalupe-Nipomo Dunes Complex. Common ravens are often found in breeding pairs and are highly territorial, causing them to remain relatively inconspicuous with only one pair present in a large territory. A breeding pair can devastate a breeding population of WSPL over a large area in a short amount of time (Boarman and Heinrich, 1999). In early-May 2013, two adult ravens were lethally removed while at this nest by United States Department of Agriculture (USDA) Wildlife Services predator manager retained by the California State Parks. Special authorization was provided to USDA Wildlife Services representatives by the private property owner allowing the removal of these ravens. The activities of the USDA Wildlife Services representatives were performed consistent with the permits this agency has to perform this type of activity.

Following the removal of this territorial pair of adult ravens, common raven depredation on WSPL nests at GRP ceased until the first week of June when a different pair was directly observed depredating WSPL nests. This pair of ravens was observed to have flown approximately 25-30 yards from the biologists and circled down on an active WSPL nest. The biologists watched one of the ravens pick up an egg, hop a few feet away and consume the egg. The raven then went back and consumed a second egg at the nest, leaving the third egg in the nest bowl. The raven that had successfully depredated the eggs then flew north up the beach where it was met by a second raven and they continued north. The biologists observed the ravens flying low over the WSPL habitat to the north of their location. Within 35-40 minutes the ravens returned to the southern part of the beach and continued towards the Santa Maria River. As the biologists finished their survey they found the ravens had depredated eight of the eleven active WSPL nests currently at GRP. To increase the potential success of predator managers on adjacent properties, no attempts were made by the GRP biologists to haze the ravens during these observations.

Consistent with years past, common ravens were seen in 2013 on the beach near the estuary flying over the Sandspit, up through the restoration dunes, and north to the Guadalupe Nipomo Dune Complex National Wildlife Refuge. The WSPL biologists on the Rancho Guadalupe Dunes Preserve along with the Refuge reported multiple raven sightings throughout the season. Also, very similar nest depredations occurred simultaneously within suitable WSPL habitat on the properties adjacent to GRP, ODSVRA and Rancho Guadalupe Dunes County Park (S. Little, and M. Kelly, personal communication, 2013).

High winds did not play a large role in nest failure in 2013. High winds were recorded gusting above 15-20 mph on eight different occasions starting in April and continuing through the latter half of June. Winds were only recorded by biologists during the early mornings when surveys were being conducted. In 2013, many afternoons became extremely windy and two of the abandoned nests occurred during high wind events. One of the abandonments coincided with a peregrine falcon being observed on the beach near the nest. In 2012, a peregrine falcon was present on the beach coinciding with multiple nest abandonments. In 2013 the peregrines were present but other than the one abandonment, there were no other negative effects presumably caused by this species.

In 2013, one nest was depredated in the northern territory by a coyote. The nest was observed with coyote tracks leading to it, and egg fragments and wet yolk were found in the nest bowl, consistent with a coyote predation. One nest was depredated by a gull species on the Sandspit. Many gulls roost near the water's edge and gull tracks often cover the Sandspit during certain times of the year. The depredated nest had gull tracks up to the nest and no eggs or yolk present (refer to Table 2 - Causes of Western Snowy Plover Nest Loss).

Table 2. Western Snowy Plover Nest Failure at GRP in 2013

Cause	Number of Failed Nests
Depredated- Raven	10
Coyote	1
Gull sp.	1
Unknown Predator	7
Abandoned	4
Total	23

Tracks of other predators observed throughout the GRP Site during 2013 included striped skunks (*Mephitis mephitis*), wild boar (*Sus scrofa*), raccoon (*Procyon lotor*), mountain lion (*Puma concolor*), great horned owl, Virginia opossum (*Didelphis virginiana*) and possible fox species (refer to Appendix A, Table A-4 - Predator Sightings and Other Possible Threats Seen During Western Snowy Plover Surveys).

Chevron EMC approved a plan to further integrate the current predator management program at GRP to include lethal control of common ravens, and a migratory bird depredation permit application requesting these activities was submitted to the USFWS Migratory Bird Office in August 2013. It is anticipated that USFWS will approve the activities requested in the permit application to perform lethal control of common ravens at GRP, and these activities are proposed to be performed during the 2014 WSPL nesting season.

4.4 NEST EXCLOSURES

Although nest exclosures have been used at the site in past years, no nest exclosures were used in 2013. The decision was made by the biologist to not use predator exclosures based on adult WSPL fatalities in previous years. The decision was made at the beginning of the season to assess the severity of the predation on WSPL nests before using exclosures. The use of exclosures was still an option if the biologists deemed it necessary. In the past, coyotes have approached exclosures and dug under in attempt to depredate the nest. In some cases, these nests were later abandoned.

In 2011 and 2012, adult WSPL were found dead outside of exclosures. These adult mortalities were presumably caused by raptors. This event happened at two separate exclosures in the Restoration Dunes in 2011 and both exclosures were removed that morning. The dead WSPL were found with coyote tracks around them but the cause of death was uncertain. One of the nests continued to be incubated and later hatched. The second nest associated with the adult mortality was not attended to and later was considered abandoned. The eggs were eventually eaten by a coyote. In 2012 common ravens continued to take interest in nest exclosures and walked up to and approach exclosed nests. Common ravens also key into nest exclosures walking up to and around them.

Although nest exclosures have been shown to increase WSPL nest hatching success, they pose potential hazards to adult WSPL. The scientific literature and Padre biologists' professional experience with nest exclosures indicate that small raptors including American kestrels (*Falco sparvensis*) and merlins (*Falco columbarius*) can correlate the presence of exclosures with the presence of all life stages of WSPL, and may use this association to serially depredate WSPL. Therefore, due to the potential risk that exclosures pose to adult WSPL, GRP biologists elected not to exclose any WSPL nests in 2013. Throughout the range of the WSPL, many WSPL biologists are focusing their efforts on the removal of potential predators, and are working toward the elimination of exclosures due to the potential threats this method poses to the individual WSPL.

4.5 WESTERN SNOWY PLOVER EGGS AND CHICKS

The 45 recorded nests contained 119 eggs of which 51 hatched and 49 eggs were taken by predators. Of the remaining 19, six were lost to unknown causes, six were abandoned, and seven were non-viable

The biologists observed few chicks and juveniles early in the season at GRP. Chicks are not actively sought by the biologists during surveys to avoid separating attending adult birds from their chicks. Consequently, the number of chicks observed is presumed to be an underestimate. As has been observed in past years, older chicks and juveniles were more commonly observed later in the 2013 season.

From 2001 through 2013, WSPL utilized the Restoration Dunes Area for nesting. In 2001 these dunes were restored back to successful WSPL breeding habitat. In 2013, 14 nests were placed on these dunes and an additional five within the newly restored A-6 area. Of the

19 nests, 10 hatched successfully (53 percent), 4 nests were taken by common ravens, two to unknown predators, one was abandoned, and two had unknown fates. This is a 25 percent increase in the proportion of nests hatched in the Restoration Dunes when compared to 2012. In 2012, similar raven nest depredations were observed within this area.

4.6 WESTERN SNOWY PLOVER NESTING WITHIN NEWLY RESTORED BEACH EXCAVATION SITES

Remediation activities within WSPL breeding habitat are scheduled outside of the WSPL nesting season. During the first quarter of 2013, approximately 7.27 acres of WSPL critical habitat was disturbed and restored back to suitable habitat before March 1. Field crews removed the A-2 pad and road along with completing the TB-4 West and A-6 West excavations. The 7X Debris Field Area that once consisted of gravel and red rock was also removed. The Debris Field Area of 7X was historically consistently very productive WSPL nesting habitat. Following excavation activities, restoration efforts included seeding the back dune areas and installation of straw plugs and sand fence for sand stabilization. WSPL biologists referenced Krysta Fahy's dissertation on The Effect of Habitat Choice, Density and Distribution on Breeding Western Snowy Plovers and discussed with other WSPL biologists from ODSVRA regarding habitat enhancement. USFWS was also in discussion with GRP biologists about how to most effectively enhance the recently restored WSPL habitat. Native vegetation was chipped onsite and placed on the open sand. Beach debris (e.g., driftwood, kelp, and rocks) that were collected on the GRP beach were also placed in the former 7X Debris Field Area for habitat enhancement.

After the first few weeks of restoration, the wind blew the sand uncovering more gravel in the 7X Debris Field Area. Within the first two weeks of March, WSPL began constructing nest bowls in the 7X and A-6 restored areas. In 2013, five nests were placed in the 7X and A-6 areas. The nests were placed in areas that had gravel or bare sand near beach debris placed during restoration activities. No nests or scrapes were found in or near the wood chips. Three of the five nests hatched and two were depredated, one was confirmed a common raven depredation. In late-September 2013, large groups of WSPL were observed roosting in the newly restored area.

4.8 TRESSPASS INCIDENTS WITHIN WESTERN SNOWY PLOVER HABITAT

In 2013, there were four instances where human trespassers that were observed in suitable WSPL habitat at GRP. Most trespassers entered the property from the south at the Rancho Guadalupe Dunes County Park, usually crossing the Sandspit to the estuary edge and then the southern dunes. Two trespassers observed sunbathing in the habitat on the opening day of the WSPL season were asked to leave. On another instance, footprints were observed walking up to a few nests, but no nests were harmed. The biologists at the Rancho Guadalupe Dunes County Park are very helpful in keeping trespassers out of the WSPL habitat by educating visitors before they arrive on the beach. One set of tracks were observed from the Refuge onto the GRP beach, and throughout the habitat. The Refuge Manager called the GRP biologists to keep a look out for these trespassers. The biologists also saw the same tracks inland at one of the wetlands later that week. Other individuals seen during surveys included 92

fishermen, as well as various surfers and beachcombers. These visitors did not affect WSPL nesting habitat as they stayed in the water or below the high tide line. The river was constantly changing from open to closed throughout the season making some weeks impassable from the County Park to GRP.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 MONITORING STUDY CONCLUSIONS

The WSPL nests found at the GRP Site in 2013 (n=45) was higher than the number of nests found in 2012 (n=40) and lower than 2011 (n=51). The percentage of nests whose eggs hatched in 2013 increased to 44.4 percent from 27.5 percent in 2012 and was down from 45 percent in 2011. In 2013, there were more eggs that hatched as compared to 2012 (51 eggs versus 27 eggs, respectively). In 2013, 42 percent of the nests were depredated as compared to 2012 where 35 percent were depredated. It is not uncommon that fewer depredations result in fewer nests between years, but greater hatching success and nest productivity overall. When the nest failure rate is high, the birds will create more nests resulting in a greater number of overall nests. In 2013, common ravens were the main cause of nest predation. Another factor in 2013, such as nest abandonment, contributed to the failure of nests and eggs. High tides did not contribute to nest failure in 2013.

5.2 RECOMMENDATIONS

Avian predators are recognized predators of WSPL adults and chicks and their perching within the WSPL habitat should be discouraged. Therefore, signs present along the beach should continue to be outfitted with Nixalite© bird spikes to discourage raptor perching from any raptors.

Before the nesting season began, signs that had blown over during winter storms were replaced. These signs were posted on the beach to discourage human trespassers. The signs state that an intruder is entering private property and could be prosecuted. The signs in the correct locations continue to be effective in discouraging human encroachment onto the GRP. One of the signs was moved further south mid-season by the County Park monitor to better dissuade beachgoers into the WSPL habitat. More of the new signs should be available to replace signs lost to winter storms and vandalism.

Regarding the effects caused by predators on WSPL nest productivity, the 2013 nesting season is comparable to the sequence of events observed in 2012. To increase WSPL hatching success at GRP, predator management efforts will be improved using lessons learned from past monitoring and the potential integration of lethal control of common ravens at GRP. If avain predators (predominately common ravens) continue to be an increasing limiting factor for WSPL nest productivity and nest exclosures are used, they will be embedded deep into the sand to deter coyotes from digging under them. Communication should continue between the neighboring sites regarding predators and various management strategies implemented to increase snowy WSPL nesting success.

The GRP biologists plan to work with ODSVRA and USDA Wildlife Services representatives to further integrate the predator management program at GRP to include the lethal control of common ravens. GRP biologists have a migratory bird depredation permit from the USFWS Migratory Bird Office authorizing the ability to lethally remove common ravens with

various methodologies at GRP to improve WSPL nesting success. It is anticipated that these activities will be performed during the 2014 WSPL nesting season. GRP biologists will coordinate with the neighboring sites throughout the season regarding the common ravens activity in WSPL habitat.

If the WSPL biologists deem it necessary, due to loss of WSPL nests or individuals, USDA Wildlife Services may be called to assist in the lethal removal of common ravens at GRP. USDA Wildlife Services will be working with ODSVRA throughout the season; however, since common ravens are capable of causing harm to multiple WSPL beaches; it is beneficial to all neighboring sites for USDA Wildlife Services to support other beaches when available.

As stated in the permit, GRP is authorized to take up to ten common ravens, and lethal take is not to be the primary means of control. Take procedures must be consistent with those submitted to the USFWS Migratory Bird Program office. The following method(s) of take may be used: Shotgun using non-toxic shot shells (i.e. steel); air rifle with non-toxic pellets (non-lead); and trapped and euthanized by carbon dioxide inhalation. Traps authorized for use are padded leg-hold traps and Swedish goshawk traps.

To ensure that site characterization, remediation, oil field abandonment, infrastructure removal, or other project-related activities don't significantly affect the WSPL or suitable WSPL nesting habitat at GRP, monitoring, consistent with past WSPL nesting seasons, should continue in 2014. The intent of the continued effort at GRP is to monitor the status of all life stages of WSPL, as well as to adaptively manage the population and habitat to increase productivity of the species by reducing the factors that limit their productivity.

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6.0 REFERENCES

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APPENDIX A

Table A-1: Survey Dates and Western Snowy Plover Numbers, 2013

Table A-2: Color Banded Western Snowy Plovers Recorded in 2013

Table A-3: Western Snowy Plover Nests Located in 2013

Table A-4: Predator Sightings and Other Possible Threats during Western Snowy Plover Surveys, 2013

Table A-1. Survey Dates and Western Snowy Plover Numbers, 2013

Survey Date	Survey Crew	Total # of plovers
3/1/13	KP,SS	15
3/4/13	KP, JL	15
3/6/13	KP, RD	26
3/11/13	KP, ZA, RD	15
3/13/13	KP, ZA ,RD	12
3/15/13	KP, SS	11
3/18/13	KP, KG	12
3/20/13	KP, KG	11
3/22/13	KP, SS	14
3/25/13	KP, KG	11
3/27/13	KP, KG	16
3/29/13	KP, SS	14
4/1/13	KP,KG	15
4/3/13	KP, KG	9
4/5/13	KP, KG	12
4/8/13	KP, KG	28
4/10/13	KG, AB	16
4/12/13	KP, SS	10
4/15/13	KP, KG	12
4/17/13	KP, KG	21
4/19/13	KP, SS	18
4/22/13	KP, KG	23
4/24/13	KP, KG	31
4/26/13	KP, KG	27
4/29/13	KP, KG	18
5/1/13	KP, KG	24
5/3/13	KP, SS	16
5/6/13	KP, KG	20
5/8/13	KP, KG	24
5/10/13	KP, SS	13
5/13/13	KP, KG	19
5/15/13	KP,RD	3
5/17/13	KP, SS	20
5/20/13	KP, KG	37
5/22/13	KP, JM	9
5/23/13	SS, RD	0
5/24/13	KP, SS	15
5/28/13	KP, SS	14
5/29/13	KP, KG	14
6/3/13	KP, KG	19
6/5/13	KP, KG	13
6/7/13	KP, SS	26
6/10/13	KP, KG	22

Survey Date	Survey Crew	Total # of plovers
6/12/13	KP, KG	7
6/14/13	KP, RR	12
6/17/13	KP, KG	9
6/19/13	KP, KG	6
6/21/13	KP, AB	7
6/24/13	KP, ML	7
6/26/13	SS, AB	8
6/28/13	KP, SS	4
7/1/13	KP, AB	8
7/3/13	KP, AB	16
7/8/13	KG, AB	19
7/10/13	KG, AB	21
7/12/13	SS, AB	1
7/15/13	KP, KG, RZ	14
7/17/13	KP, KG, RD	10
7/19/13	SS, AB	8
7/22/13	KP, KG	20
7/24/13	KP, KG	19
7/26/13	KP, SS	9
7/29/13	KG, AB	4
7/31/13	KP, KG	7
8/2/13	KP, SS	9
8/5/13	KP, KG	8
8/7/13	KP, KG	3
8/9/13	KP, SS	4
8/12/13	KP, KG	7
8/14/13	KP, JM	0
8/15/13	AB, JM	0
8/19/13	KP, RD	1
8/21/13	KP, KG	2
8/23/13	KP, SS	3
8/26/13	KP, KG	11
8/29/13	KP, KG	16
9/3/13	SS, ML	22
9/5/13	KP, KG	14
9/9/13	KP, SS	24
Average # of western snowy plovers		**16**

Table A-2. Color Banded Western Snowy Plovers Recorded in 2013

Left Bands	Bands Right	Sex	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Total times seen	Nested at GRP	Band site (year banded)
B	GY				1	2	4				7		VAFB 09
BB	BY	J						1			1		ODSVRA 13
BB	GY	M		1		2					3	X	ODSVRA 06
BB	LY	M				1					1		ODSVRA 10
BB	RW	M			1	1					2		ODSVRA 05
BB	RY	M		1	9	4	1				15	X	ODSVRA 10
BG	BW	M			2	2	1				5		Zmudowski State Beach 09
BY	RR	M			3	1	3	1			8		Salinas 11
BY	WB	F		2	4	4	1				11		Salinas NWR 13
GA	RB	F		1			1				2		ODSVRA 04,10
GA	YW	J								1	1		ODSVRA 13
GG	AG	J						2	1	1	4		ODSVRA 13
GG	BY									1	1		ODSVRA 07
GG	LY	M				2	2	6	1		11	X	ODSVRA 12
GG	OB	J						2			2		ODSVRA 13
GG	OG	J								1	1		ODSVRA 13
GG	PY	M				1	1				2		ODSVRA 12
GW	WG	M		1							1		Oregon
NB	BW	J						1			1		VAFB 13
NB	PB	M		5	6						11	X	VAFB 11
NR	PR	F					7				7	X	VAFB 12
NW	AB	F			1	2		2			5	X	VAFB 12
NW	YG									1	1		VAFB 10
P	WBW	J								1	1		VAFB 13
PG	BB						1				1		ODSVRA 11
PG	WB	F					1				1		ODSVRA 07
PV	WG	M		1							1		ODSVRA 05
PV	WR	M		2							2		ODSVRA 13
RG	AB	M				3					3		Oregon
RP	WL	M		1							1		Pajaro Spit 12
RP	WR	M		5	4	4	1	1			15	X	Salinas S. B 06
RR	OY	M			1						1		ODSVRA 10
RR	WB	M						1			1		ODSVRA 11
RR	WG	M		2	5	2	2	1			12		ODSVRA 12
RR	WR	M		1							1		ODSVRA 10
V	BR					1					1		ODSVRA
VG	AY	F						1			1		ODSVRA 11
VG	VG	F						2			2		ODSVRA 11
VG	VW	M				2					2		ODSVRA 11
VV	BY	M				1		1			2		ODSVRA 07
VV	WG	F		2	4	3		2			11		ODSVRA 12
VV	YB	M			1						1		ODSVRA 12
Y	WRW	J								1	1		VAFB 13
XX	Yellow				1						1		Humboldt county

Color band codes: A=aqua, B= blue, G= green, K=black L-lime, N=brown, O=orange P=pink, R=red, V=violet, W=white, Y=yellow

Table A-3. Western Snowy Plover Nests Located in 2013

Nest #	Date	Initial # Eggs	Projected Hatch Date	End	Fate	Location	Notes
Drop Egg 1	3.13.13	1		3.13.13	Fail	Restored dunes	Found one egg not in a scrape.
KKP01	3.15.13	1	4.21.13	4.8.13	Unknown Predator	Northern Territory: near the sign and pole	No tracks, egg shell or yolk. Very high winds.
KKP02	3.20.13	2	4.21.13	4.24.13	Hatch	Restored dunes: just west of marker 2	All three eggs hatched. One chick lay near the nest bowl dying, no parents nearby.
KKP03	3.22.13	1		3.22.13	Abandoned	Sandspit: east of first sign	Found with one egg half buried after a very windy day.
KKP04	3.22.13	1	4.25.13	4.26.13	Hatch	7X/A-6 area: east of double sign and well	Hatch two chicks, one seen in nest bowl with third egg. Third did not hatch, banded male.
KKP05	3.25.13	1	4.25.13	4.8.13	Unknown Predator	7X/A-6 area: North east of double sign and well	No tracks, egg shell or yolk. Very high winds.
KLG06	3.27.13	1		4.1.13	Unknown Predator	Sandspit: North of fist sign	Eggs were gone, no tracks seen due to a rainy day prior. No egg shell or yolk.
KKP07	3.29.13	2	4.28.13	4.15.13	Unknown Predator	CB: South Sandspit south of first row of signs	No tracks, egg shell or yolk. Very high winds.
SMS08	3.29.13	1	4.28.13	4.8.13	Unknown Predator	Restored dunes: between marker 20 and 21	No tracks, egg shell or yolk. Very high winds. PEFA nearby on 4.3.13
KLG09	4.3.13	1		4.8.13	Abandoned	Restored dunes: behind marker 19 in gravel	1 egg completely buried, PEFA on dunes nearby for a couple of days. Very high winds.
KKP10	4.5.13	1		4.8.13	Unknown Predator	Northern Territory: south of the sign and pole	No tracks, egg shell or yolk. Very high winds.
KLG11	4.17.13	1	5.19.13	5.20.13	Hatch	8x: in the gravel on the south ridge	All three eggs hatched, two chicks seen with RP:WR male
SMS12	4.19.13	2	5.19.13	5.17.13	Hatch	CB: Sand Spit South of signs	Hatch all three eggs.
KKP13	4.19.13	2	5.19.13	5.17.13	Hatch	Restored dunes: East of marker 4	Hatched 1 egg, 1 egg was pipped, and 3rd egg
KKP14	4.26.13	3	5.23.13	5.22.13	Hatch	SS: West of two southern signs	Two eggs hatched
KLG15	5.1.13	3	5.28.13	5.28.13	Unknown fate	Restored dunes: east of marker12	All eggs gone, birds nearby, acting like chicks near but no pips seen.
KKP16	5.3.13	3	5.31.13	5.28.13	Hatch	Sandspit: South of the first sign	All three eggs hatched, one chick seen running with male.
SMS17	5.3.13	3	5.31.13	5.28.13	Hatch	County Beach side	1 egg, chick lying flat still breathing. The next day saw male with one chick, one egg unviable.
SMS18	5.3.13	3	5.31.13	6.29.13	Hatch	County Beach side	1 egg hatch, 2 unviable.

Table A-3. Western Snowy Plover Nests Located in 2013

Nest #	Date	Initial # Eggs	Projected Hatch Date	End	Fate	Location	Notes
KLG19	5.6.13	3	6.2.13	5.24.13	Hatch	Restored Dunes: gravel between marker 7 & 8	3 eggs hatched, one chick was found dead 1' away from nest. It has been extremely windy and cold.
KKP20	5.8.13	2	6.7.13	6.5.13	Fail	Restored Dunes: Just west of marker 7	Raven take, no eggs or shell, raven tracks
KLG21	5.8.13	1	6.9.13	6.5.13	Fail	Restored Dunes: southwest of marker 14 and well	Raven take, no eggs or shell, raven tracks
SMS22	5.10.13	1		5.10.13	Abandoned	Northern Territory: North of sign and pole	Looks to be abandoned, bleached egg and no nest bowl
KKP23	5.20.13	3		5.24.13	Hatch	Restored dunes: closer to the shore, west of marker 12	3 eggs hatched, one chick was found dead 1' away from nest. It has been extremely windy and cold.
SMS24	5.24.13	2	6.28.13	6.12.13	Fail	Northern Territory: north of well A8-11	Eaten by a coyote, tracks were observed walking up to the nest and then away. Crunched shell in nest bowl.
KKP25	5.24.13	1	6.24.13	6.5.13	Fail	Sandspit: 5' south of first sign.	Observed 2 eggs eaten by raven. 3rd egg was eaten later.
KKP26	5.28.13	2	6.27.13	6.7.13	Fail	A road: on the A-6 red rock pad	Raven take, no egg shell or yolk, raven tracks
KKP27	5.29.13	2	6.28.13	6.5.13	Fail	7X: In the foredune area.	Raven take, no egg shell or yolk, raven tracks
SMS28	5.31.13	1	6.30.13	6.7.13	Fail	Northern Territory: Just west of the large well	Raven tracks, no egg shell or yolk.
SMS29	5.31.13	3	6.28.13	6.5.13	Fail	Sandspit: South of the first sign.	Raven tracks, no egg shell or yolk.
KKP30	6.3.13	1	6.3.13	6.5.13	Fail	Restored dunes: West of marker 8.	Raven take, no egg or yolk. Raven tracks
KLG31	6.3.13	3	7.1.13	6.5.13	Fail	Restored Dunes: furthest south rocky area by property fence	Raven take, no egg or yolk. Raven tracks
KKP32	6.3.13	2		6.5.13	Fail	Northern Territory: south of the sign and pole	Raven take, no egg or yolk, raven tracks
SMS33	6.7.13	1	7.9.13	7.1.13	Fail	Sandspit: County Beach side at the very southern end by the last sign	No eggs, some yolk, no predator tracks
KKP34	6.12.13	3	7.8.13	7.1.13	Fail	Sandspit: County beach closer to the ledge in lots of woody debris	Gull predation, no yolk, no shell. Gull tracks at nest.
KKP35	6.14.13	3	7.11.13	7.8.13	Hatch	A-6/7X: in the gravel east of the waddle lying on the dunes	3 Chicks seen hatching, and later being brooded by male
KKP36	6.21.13	1	7.21.13	7.22.13	Hatch	Northern Territory: South of the sign and pole	2 eggs hatched, one unviable.
AJB37	6.21.13	2		7.1.13	Hatch	Northern Territory: North of the broken green chair.	Hatch; two pips seen in nest bowl. No chicks seen.
KKP38	6.28.13	3	7.25.13	7.17.13	Hatch	Northern Territory: South of the first sign	2 eggs hatched, male broken wing near nest
AJB39	7.3.13	1	8.4.13	8.5.13	Hatch	Sandspit: South of the first sign	All three eggs hatched, found pips in nestbowl. No chicks or adults seen.

Table A-3. Western Snowy Plover Nests Located in 2013

Nest #	Date	Initial # Eggs	Projected Hatch Date	End	Fate	Location	Notes
KLG40	7.8.13	1	8.8.13	8.9.13	Hatch	Sandspit south of the first sign	3 pips found in nestbowl. Adults in the area acting like chicks were nearby.
AJB 41	7.8.13	3	8.4.13	8.5.13	Hatch	Restored Dunes: West of marker 11	Hatch, 2 chicks and egg seen in nest bowl.
SMS42	7.12.13	2		7.17.13	Unknown fate	Restored Dunes: near monitoring well 5xmw36	No tracks left by nest. No eggs found, no yolk or shell. Need to go back to look for pips once again. A chick was seen in the area a few days later.
KKP43	7.15.13	2	8.13.13	8.19.13	Abandoned	Sandspit: County beach before log with branches	Abandoned, 2 eggs were bleached and no tracks near nest.
KKP44	7.15.13	1	8.15.13	8.14.13	Hatch	Restored dunes: just north of the fence	Hatched all three eggs, pips in nest bowl.
KLG45	7.31.13			7.31.13	Hatch	Restored Dunes: East of marker 12	A pair of birds had been seen in this area for a couple of weeks displaying broken wings etc. a chick was seen on the 31st.

Table A-4. Predator Sightings and Other Possible Threats during Western Snowy Plover Surveys, 2013

Predator	March	Apr	May	Jun	Jul	Aug	Total
Northern Harrier	0	1	0	0	0	0	1
Red-tailed Hawk	2	0	0	0	0	1	3
Peregrine falcon	0	4	1	3	0	6	14
Gull, Coyote, and Raccoon	Tracks from these potential predators are found throughout Snowy Plover nesting habitat						
Common Raven[1]	0	1	0	4	0	0	5
American Kestrel	0	0	0	1	0	0	1
Skunk (tracks)	1	0	0	0	0	0	1
Pig (tracks) [2]	0	0	0	3	3	8	14
Total	3	6	1	11	3	15	39

[1] Raven tracks were seen throughout the habitat on multiple days from April through June.

[2] Pig tracks were seen coming from the A Road at night and early morning walking through the restoration dunes to the shoreline. Tracks were also seen in the northern territory coming over from C8 and around the estuary on the Sandspit.