

ANNUAL REPORT
FOR THE WESTERN SNOWY PLOVER
AT SAN LUIS OBISPO COAST DISTRICT IN 2013

Submitted by

California State Parks
San Luis Obispo Coast District
750 Hearst Castle Road
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Recovery Permit #TE-082237-4.3

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INTRODUCTION

This report summarizes the nesting activity during the 2013 breeding season of the Western snowy plover (WSP) (*Charadrius nivosus*) in California State Parks (CSP) San Luis Obispo Coast District (District) at Hearst San Simeon State Park (HSSSP), Villa Creek Beach within Estero Bluffs State Park (EBSP), Morro Strand State Beach (Morro Strand), and the Sandspit within Montana de Oro State Park (MDO) (Appendix 1). At each beach, nesting activity was monitored from March 4th through September 21st. The current management within the District for the WSP consists of monitoring breeding and wintering activities, habitat protection through symbolic fencing and signage, predator management, public outreach and education, enforcing CSP regulations, and habitat enhancement through exotic plant eradication.

The District's goals and objectives for WSP management follow those of the Systemwide Management Guidelines developed by CSP Natural Resources Division. During the 2013 breeding season, the District also continued to implement "Western Snowy Plover Conservation Guidelines" which were developed by the District. The main goal is to achieve an increase in breeding adult WSP and provide long-term protection of breeding and wintering WSP and their habitat.

Nest numbers and distribution, nest fates, and current management measures are discussed and future management recommendations to enhance WSP survival and reproductive success are made within this report. These activities were conducted under permits from the United States Fish and Wildlife Service (USFWS), as well as, from the California Department of Fish and Wildlife. USFWS Recovery Permit No. TE-082237-4.3 was issued to CSP with Nicholas Franco, District Superintendent, as the principle officer. Authorized individuals listed on the permit are Lisa Andreano, Charlotte Bailey, Brian Barandon, Sarah Blaser, Virginia Brown, Sarah Bull, Matt Campbell, Vince Cicero, Lauren Danner, Jeff Ebner, Torrey Edell, Matthew Fresquez, Rose Graef, Danielle Guest, Jodi Isaacs, Stephanie Little, Jacob Long, Allyson Marisch, Kimberly May, Jodie Nelson, Regena Orr, Bonnie Phillips, Allen Potthoff, John Sayers, Taryn Schingler-Kinney, Aaron Sims, Greg Smith, Jackie Vargo, Michael Walgren, Rachel Wilson, and Aurianna Woodson. Individual California Department of Fish and Wildlife Scientific Collecting Permits have been issued to Lisa Andreano, Brian Barandon, Virginia Brown, Vincent Cicero, Jodi Isaacs, Regena Orr, John Sayers, and Michael Walgren.

METHODS

Survey Area

The beaches monitored by the District during the 2013 WSP breeding season are located along 45 miles of coastline in San Luis Obispo County, California. All of the beaches are within the USFWS Recovery Unit Five for the WSP.

Hearst San Simeon State Park (CA-69 through CA-77)

The beaches within HSSSP stretch 18 miles from the San Luis Obispo County line south to Cambria (Appendix 1). The beaches north of San Simeon Creek Beach were acquired by CSP in 2005. Some of the beaches have little visitation compared to the other beaches within the District.

San Carpoforo (CA-69)

The northern most beach in the District, San Carpoforo, falls under joint jurisdiction of the United States Forest Service and CSP. WSP utilize approximately a one eighth mile stretch of a wide, fairly level area which is a mixture of sand and/or cobblestone substrate. The general nesting area is bordered to the north and east by San Carpoforo Creek, creating a small sandspit. To the north is a pocket beach bounded by steep, rocky bluffs which is unsuitable WSP nesting habitat. East of the creek is a sandy area with sparse vegetation. Beyond the creek on the north end of the beach is another large sandy area littered heavily with driftwood and low growing vegetation which adjoin a steep, densely vegetated hill that slopes up to Highway One. The west side is bordered by ocean. The San Carpoforo beach area is highly dynamic depending upon tides and creek level.

Point Sierra Nevada (CA-71)

This beach is approximately one half mile long and fairly narrow with marginal habitat. The beach is bordered by rocky bluffs to the north and south, a wide dune area to the east, and the ocean to the west.

Arroyo de la Cruz (CA-72)

Arroyo de la Cruz is a fairly wide, approximately one quarter mile long mostly sand beach with cobblestone areas. It is bordered by Arroyo de la Cruz Creek to the north early in the season and bluffs later in the season, when the creek no longer flows out to the ocean. To the south is a steeply sloping, heavily vegetated area, and bluffs.

Sidney's Lagoon (also known as Arroyo de la Corral) (CA-73)

WSP utilize most of this small sandy beach. The main nesting area is a fairly level, sparsely vegetated dune area less than one eighth mile long. It is bordered on the north by a small pocket beach and a grassy hill. The south end is bordered by rocky outcroppings. The beach slopes fairly steeply down to a seasonal drainage which borders the east side. The drainage runs along Highway One.

Piedras Blancas (CA-74)

This narrow sandy beach is approximately half a mile in length, bordered to the north by bluff backed beach and rocks and to the east by coastal scrub. The beach narrows at a small drainage to become dune backed. The south end of this beach is bordered by rocky outcroppings and to the west by ocean.

Arroyo Laguna (CA-75)

This approximately one mile long beach is varied and was divided into two sections for convenience. The northern third informally referred to as “Castles” is bordered to the north by Arroyo Laguna Creek and rocky outcroppings and bluffs and to the east by grassland, which was formerly grazed by cattle. The southern two thirds, known locally as “Richters,” is a wide sandy beach backed by dunes. At the southern end of this beach are rocky outcroppings. Near the south end of this section Oak Knoll Creek flows to the ocean during the rainy season.

San Simeon Creek Beach (CA-77)

WSP utilize a one quarter mile stretch of beach adjacent to San Simeon Creek mouth. The area is bound by coastal bluffs to the south, ocean to the west, San Simeon Creek to the north, and a small unnamed tributary to the east. Highway One runs along the eastern edge of the site.

Villa Creek Beach (CA-78)

Villa Creek Beach is located north of the town of Cayucos along Highway One (Appendix 1). It is situated at the northern boundary of EBSP and is one third of a mile in length. Villa Creek runs through the northwestern portion of the property. A large rocky outcropping sits to the west of the creek mouth with a small sandy beach area that develops later in the breeding season as the creek flow diminishes. This area is referred to as “West of Villa Creek” and has occasionally been used for nesting. Near the east bank of the creek are mudflats and annual grassland. This area is referred to as the “back area” and has been used for nesting in prior years. A sandy beach and a small sandspit border the south side of the creek mouth. The main section of beach used for nesting consists of dark, medium grained sand on a narrow sloping beach, which is widest at the north and south ends. The beach is backed by driftwood, coastal scrub, and some low coastal foredunes. This area is also considered part of the “back area.” During the nesting season, change in beach topography and width were frequently noticed from week to week due to the effects of wind, rain, tide, and surf. In 2011, Villa Creek Beach and the WSP nesting habitat displayed a significant increase in driftwood. Residual levels of accumulated wood debris remained in 2013.

Public access to Villa Creek Beach is from the Bluff Trail. In 2007, an improved access point to the Bluff Trail was allowed that cuts through the grassland south of the wetland area. This is the only access point; all other previously used access points have been closed.

In 2013, the California Department of Transportation completed a restoration project along Highway One which included current access points to EBSP, as well as, the

vestigial access points near Villa Creek Beach. The project formalized parking areas by re-grading the surface and defining parking boundaries with boulders and new vegetation. Previously closed off access points, which led through a wetland and WSP habitat, were further blocked with vegetation and new fencing.

Immediately south of Villa Creek Beach are two pocket beaches backed by bluffs and bordered on the north and south by rocky outcroppings. The northern pocket beach is slightly larger than the southern. Both can be influenced by tide. These pocket beaches have been used in past years as nesting sites by WSP. Two nests were found on the pocket beach directly south of Villa Creek Beach in 2013.

In addition to Villa Creek Beach, another portion of EBSP, Cayucos Point, has been used as a nesting site in previous years, although no nests have been found since 2008. Cayucos Point is north of San Geronimo Creek and is located approximately one and a half miles south of Villa Creek Beach. This is a small sandy bluff backed beach with offshore rocks and a rock reef.

Morro Strand State Beach (CA-80)

Morro Strand is comprised of two units with the northern unit located three miles north of the City of Morro Bay (City) and the southern unit located within the City (Appendix 1).

The northern unit of Morro Strand, referred to as Old Creek, is approximately one and a third miles in length. WSP sporadically have wintered at Old Creek but have not been known to nest there. Most of the beach is a narrow strip backed by steep bluffs topped with houses. The main beach is approximately a quarter mile in length and is backed by two parking lots with coastal salt marsh and a small riparian area between them. To the northwest and southeast of the main beach are houses. Old Creek runs through the middle of the beach.

The southern unit is approximately two miles long, extending from the area adjacent to the Morro Strand Campground south to the CSP boundary west of Highway 41. This area was monitored during the 2013 breeding season. WSP habitat on Morro Strand is broken up into four sections separated by ten beach access corridors spread throughout the length of the beach. The Campground section has corridors located at the campground kiosk, the north bathroom, the south bathroom, and the southern end of the campground. The Beach Tract segment has a row of houses backing the foredunes and access corridors located at Hatteras Street, Easter Street, Sienna Street, and Azure Street. The Cloisters section entails the area from the Azure Street access south to the boardwalk beach access from the Cloisters housing development. This section is broken up into approximately equal halves by a seasonal drainage referred to as North Playa. The High School section extends from the Boardwalk Corridor to the CSP boundary west of Highway 41.

The Campground and Beach Tract sections consist of flat sandy beach backed by low foredunes vegetated by non-native ice plant (*Carpobrotus spp.*) and sea rocket (*Cakile maritime*), as well as native sand verbena (*Abronia spp.*) and beach bur (*Ambrosia*

chamissonis). The Cloisters and High School sections consist mostly of flat sandy beach with areas of small to medium size cobbles. Smaller foredunes along this stretch of beach are vegetated mostly with sand verbena and sea rocket, while the larger dunes are vegetated with a mixture of native plants and non-native European beach grass (*Ammophila arenaria*). Efforts continue to eradicate these non-native species. See the Habitat Enhancement section within Current Management for more information.

Sandspit (CA-81)

The Sandspit is a barrier dune system located between the Pacific Ocean and the Morro Bay Estuary within the communities of Morro Bay and Baywood/Los Osos. The Sandspit falls under joint jurisdiction of the City and CSP, with a small portion being privately owned. With exception to the small privately owned segment, the northernmost mile of beach is City property, while the remaining southern area is within MDO (Appendix 1). The CSP boundary has not always been demarcated clearly. In addition, CSP manages the habitat in this area by installing symbolic fencing and signage. Therefore, the nests found on the private property are included with the CSP nest numbers.

The length of the contiguous beach from the northern tip of the Sandspit to the southern end at Hazard Canyon is approximately five and a half miles. The northernmost half mile of the Sandspit contains two jetties, which protect the Morro Bay Harbor entrance and is referred to as the Jetty Beach. South of the Jetty Beach the majority of the Sandspit consists of a sandy beach with low, sparsely vegetated foredunes that are backed by higher, more stabilized, densely vegetated dunes. Large barren sand sheets are scattered throughout the dune system. In contrast, the southern-most mile of beach is backed by steep sandy bluffs reaching approximately 75-100 feet above sea level. The majority of the eastern edge (bayside) of the Sandspit provides little suitable habitat for WSP and was not monitored this season.

The Sandspit has seven Rescue Markers at roughly half mile intervals starting at Rescue Marker One located near Army Road in the south and ending at Rescue Marker Seven located just before the South Jetty in the north. These markers are used to divide the beach into smaller areas when monitoring in order to better analyze the data collected.

Prior to 2012, southern access to the Sandspit consisted of four symbolically fenced access trails within MDO. In 2012, Shark's Inlet Corridor, an additional symbolically fenced access corridor leading from Shark's Inlet on the east side to the Sandspit beach between Rescue Marker One and Rescue Marker Two on the west side, was created. Shark's Inlet Corridor provides clear definition of boundaries with symbolic fencing channeling the foot traffic into a narrow area. Before 2012, WSP monitors documented frequent and regular trespassing violations through the nesting habitat in this general area. Fewer violations in the general area have been observed since.

Northern access to the Sandspit consists of three access corridors (one on CSP property and two on City property) linking the east (bay) side to the west (beach) side. These

three corridors, as well as the northern tip of the Sandspit, are often accessed by boat, canoe, kayak, and surfboard.

Monitoring

The beaches within HSSSP were monitored approximately once per week from the beginning of March until the end of July.

Beginning March 4th, monitoring was conducted five to seven days a week at Villa Creek Beach, Morro Strand, and the Sandspit. Nest searches were conducted three times a week inside the symbolic fencing and two to four times a week outside of the fencing. This was the third year monitoring was conducted on the weekends. Monitoring occurred 25 times on the weekends between March 23rd and August 3rd. Weekend monitoring was conducted outside the symbolic fencing primarily to have a greater CSP presence on the beaches during the busier summer months. In September, monitoring was reduced to two days per week, since all of the nests had hatched.

All WSP monitors have been trained by USFWS authorized individuals. Monitoring was conducted in the morning or early afternoon from approximately 8:00 am to 2:00 pm. Portions of EBSP were walked once a week to check pocket beaches for WSP nests and breeding activity. The Sandspit was monitored by two people to allow for adequate coverage with the division between the northern and southern portions occurring half way between Rescue Marker Three and Four at a location referred to as Rocky Mounds. The back dune area on the westernmost side of the Sandspit was checked occasionally for WSP nests and breeding activity. The back dune monitoring was conducted on one of the days when the regular monitoring was conducted from outside the symbolic fence. Monitoring was done on foot with the use of binoculars.

Monitoring activity included observing adult WSP behavior, locating scrapes and nests, mapping nest locations utilizing Global Positioning System (GPS) technology, tracking nests to determine their fate, floating nests found at three eggs, recording evidence and observations of predator and human activity, recording evidence and observations of chicks, constructing single nest enclosures at Morro Strand and Villa Creek Beach, and repairing and maintaining signs and symbolic fencing. All data (including photographs of the nest and nest location maps) were recorded on a nest card for each nest found (Appendix 2) and entered into computer databases. Monthly population censuses were conducted to determine numbers of WSP on District beaches throughout the year. See Appendix 3 for population census data from October 2012 through September 2013. Color leg band combinations were recorded and sent to Frances Bidstrup of Point Blue Conservation Science (Point Blue, originally founded as the Point Reyes Bird Observatory Conservation Science). See Appendices 4 and 5 for a list of the band combinations observed and their histories. "Procedures for handling, injured, sick or dead WSP (including chicks and eggs)" for the District continued to be followed this year.

Thermochron iButton® brand temperature monitors (a.k.a., thermo data loggers) were placed in WSP nests at selected nests to autonomously record temperature changes. The procedure included inserting one button directly under the nest bowl and another into the sand several inches from the nest bowl as a reference point. After a nest fate had been determined, the buttons were recovered and analyzed for relative temperature fluctuations of the nest bowl compared to the reference point.

Nesting Habitat Substrate

Beginning this year, WSP monitors documented descriptive substrate variables of habitat used by WSP for nests located within the District survey area. In addition, once weekly, when feasible, WSP monitors surveying on the north Sandspit and the south Sandspit performed descriptive evaluations of substrate variables at random locations within the WSP habitat. Another WSP monitor performed an assessment at a random location on either Villa Creek Beach or Morro Strand at the randomly selected time.

When a nest was found, the substrates were recorded according to a standardized substrate data survey. First, estimates of the three most prevalent substrates and respective percentages located within a one meter radius of each nest bowl were entered. Then, if vegetation was present, individual species and height range were specified for each nest bowl. Next, the location of the nest on the beach – lower, middle, upper, or back dunes – was documented. Annotation of the topographic relief of the area within 0.76 meters (30 inches) surrounding the nest bowl as either flat– surface is overall flat; concave – surface is overall bowl formation; convex – surface is overall hill formation; or hummocks followed. Proceeding further, a range distance to the nearest active nest in feet was noted. If no other nests were known to be active, the distance was listed as greater than 100 feet. Finally, any other distinctive features or other information about the nest bowl habitat was reported. The data was collected quickly in order to limit disturbance to WSP.

WSP monitors actively surveying in-habitat were notified at a random time each week. At the physical location of each individual WSP monitor at the time of random notification, the same substrate recording procedures cited above were followed. All precautions also applied to the data gathering such that, minimum disturbance of WSP was a higher priority. Therefore, WSP monitors had the discretion to abort random point data collection in order to minimize reactive behavior. In addition, when possible, the GPS coordinates of the random location were recorded.

Determining Nest Fate

During the 2013 breeding season, the District followed USFWS Recovery Unit Five draft protocols for determining nest hatch success. In order to decrease the proportion of nests assigned an “unknown fate”, it is extremely important to determine the clutch completion date. The clutch completion date is the day the third egg is laid. After this point the parents incubate the eggs, with most clutches hatching within 28 days. The modal clutch size is three eggs, with a range of two to four. A scrape was considered a nest, if it contained at least one egg. A nest containing two or three eggs and with indication of incubating activity (WSP tracks, nest lining, adult nearby) was considered active.

There are three possible nests fates as determined by Recovery Unit Five.

- a) Hatch- Pips/chicks in the nest or indirect evidence suggesting hatch.
- b) Fail- Direct evidence of loss, predation, or eggs gone before expected hatch date.
- c) Unknown- Eggs gone and no physical sign of fate.

A “Hatch” designation is easiest, if definite evidence of hatching was observed. This includes chicks in the nest or its immediate vicinity, or pips found in an empty scrape. A nest with at least one hatched egg was considered successful. If not obvious, other indications were used in their absence, including flattened scrape, distracting adults, eggshell halves nearby, or “brooding tracks”. However, several of these indications had to be present to constitute solid evidence for a hatch. In such cases, the monitor evaluated all of the evidence and reached a reasonable conclusion of hatch or fail.

The “Fail” designation is more complicated, but if the expected hatch date is known, any interval less than 26 days was considered “Fail” unless there was physical evidence to the contrary. Nest fates were considered “Unknown”, if an incubation interval is unknown and if there was no physical evidence of its fate, or if it disappeared after 26 days of incubation. Nests were considered inactive or abandoned, if WSP tracks or adults were not noted near the nest after two weeks. A scrape containing one egg that received no additional eggs was considered failed due to abandonment. Single or “dropped” eggs not found in a recognizable scrape were not considered a potential nest. Tide losses were determined by nests missing below the high tide line or by eggs displaced from the scrape and spread on the beach by tide over wash. The nest was considered a wind loss when a nest had eggs more than half buried in the sand over the course of one day and no recent evidence of incubation.

While it is tempting to minimize the number of “Unknown Fate” nests by using the terms “Probable Hatch” and “Probable Fail,” these designations are too subjective and cannot be assigned objectively. As a result, fate designations must be considered as “Hatch” or “Fail” or “Unknown Fate”.

Current Management

Habitat Protection

By the first week of March, District beaches with WSP nesting habitat were symbolically fenced above the high tide line to demarcate the area reserved for nesting. At HSSSP, the only beach to be symbolically fenced was San Simeon Creek Beach. The fences consisted of metal eye-posts strung with polypropylene rope and/or jute rope. Signs in English and Spanish were placed at regular intervals along the length of the fencing informing the public of the closed WSP nesting habitat. Beige signs were used at Villa Creek Beach to lessen the impact on the scenic view shed. The corridors at Morro Strand and the Sandspit had yellow signs, so these access points could be clearly seen from a distance. Regulatory signs were posted at CSP beach access corridors stating that dogs are prohibited. No kite flying signs were posted at the access points to San Simeon Creek

Beach, Villa Creek Beach, Morro Strand, and the Sandspit, with the detailed posted order at the kiosks. All beaches had corridors at the main access points which allowed for continued public recreation. Maps indicating the corridors on the Sandspit were given to the local kayak concessions. Fencing for San Simeon Creek Beach was removed on August 6th. Symbolic fences were removed during the last week of September for Villa Creek Beach, Morro Strand, and the Sandspit.

Two trails previously allowing public access to Villa Creek Beach from Highway One remained closed by Superintendent's Posted Order. Both of these access trails crossed through active WSP nesting habitat and a wetland. Villa Creek Beach access is now just south of the beach from a dirt parking lot along Highway One which connects to the Bluff Trail (Appendix 1). The Bluff Trail passes along the top of the pocket beaches and enters Villa Creek Beach at its south end.

Maps displaying current location and nearby beach access corridors were placed on the bayside of the Sandspit at the accessible landing spots. Red flags were also placed on the bayside at corridor entrances so that kayakers coming from the east side of the bay could navigate toward a corridor. Additionally, maps indicating the corridor entrances were given to the local kayak concessions.

Habitat Enhancement

Symbolically fencing WSP habitat not only protects WSP nests but also allows native vegetation to expand into areas that would otherwise be trampled. Erosion of sand into areas such as the Morro Bay estuary is thus minimized, and WSP breeding areas are stabilized.

Restoration efforts to prevent the spread of non-native ice plant and European beach grass onto the foredunes and beach were continued this year at Morro Strand. This effort will provide more WSP nesting habitat. Of the 90 acres of coastal dune habitat, only three acres of European beach grass and eight acres of ice plant remain. From October 2012 through September 2013, staff hand pulled re-sprouts of previously herbicide treated invasive plants and led 177 volunteer hours to remove dead beach grass thatch. Native plant recruitment is high where non-native competition has been removed. In previously planted areas, native species are now dominant, where it once was a monoculture of invasive species.

Staff was also successful in securing a grant from the California Department of Fish and Wildlife Office of Spill Prevention and Response. The grant will finalize habitat restoration at Morro Strand over the next three years by providing for a contractor to herbicide treat the remaining non-native plants throughout the site. Although the acreage of European beach grass and ice plant is low, the sparse and discrete distribution of the remaining populations creates a labor intensive job. Staff will continue to monitor the site and treat scattered populations of invasive species

In June 2012, an ice plant control project was initiated in the Morro Dunes Natural Preserve within MDO. Approximately, 140 acres found between the Sandspit day use

parking lot and Army Road has been treated with herbicide as of October 1, 2013. This effort is part of a larger exotic plant control project targeting key invasive species throughout the Morro Dunes Natural Preserve. The bulk of the ice plant occurred in the foredunes, covering open sandy areas which could be used as WSP breeding habitat. Following herbicide treatment, the dead ice plant thatch rapidly breaks down. These areas will soon be colonized by surrounding native dune species. It is expected that more open sandy area will result from this project. This in turn will provide more WSP habitat. Herbicide treatment of the foredunes occurred from October 2012 through February 2013 to avoid the WSP breeding season. During the breeding season, herbicide treatment occurred in the back dunes, well outside the WSP habitat.

Predator Management

Monitors determined the presence of potential predators through either direct observation or by tracks. When predator control was deemed necessary, United States Department of Agriculture (USDA) Wildlife Services was contacted. USDA Wildlife Services spent 193 hours on predator removal activities within the District between April 8th and June 28th. Species removed this year were four California ground squirrels (*Spermophilus beecheyi*), eight red foxes (*Vulpes vulpes*), two Virginia opossums (*Didelphis virginiana*), six raccoons (*Procyon lotor*), and seven striped skunks (*Mephitis mephitis*).

American Crows (*Corvus brachyrhynchos*) have historically been a problem for the nesting success of WSP at Morro Strand and were the initial reason for erecting ten foot by ten foot single nest enclosures on this beach. Enclosures were constructed according to USFWS specifications again this season. Enclosures consisted of four pieces of ten foot wide no climb fencing, held together by T-posts at each corner covered by a mesh net top. All enclosures also received two wing extensions on opposite corners to deter predators from circling the enclosure. The wing extensions consisted of a five foot wide no climb fencing attached to a corner T-post at one end and another T-post at the opposite end. The top of the no climb fence was removed to create spikes to discourage avian predators from perching on the enclosure. A detailed manual for construction of a ten foot by ten foot enclosure was created in 2010. Both, the construction manual as well as hands on construction with authorized individuals were used in 2013 to train monitors.

In an effort to promote hatching success, mini-enclosures were erected at Villa Creek Beach in 2013. Mini-enclosures were constructed off site from four side panels made of no-climb fencing measuring 30 inches by 36 inches. A 30 inch by 30 inch top was made of the same fencing material. Mini-enclosure construction was finalized in situ by embedding the bottom level of the structure in sand, securing the sides with cable ties onto two metal eye-poles hammered into the sand and even with the top of the enclosure.

Another useful predator reduction method is removing trash from the beach. At the time of symbolic fencing installation and removal, CSP employees removed trash off of the beaches. This coincided with Morro Bay Beautiful trash pick-up in February. As a result, three large truckloads of trash were removed from the Sandspit. The Environmental Center of San Luis Obispo (ECOSLO) organized special Tsunami Debris Cleanups on the Sandspit on March 9th and June 8th. On March 9th, 53 volunteers

contributed 90 hours of labor while collecting 100 pounds of trash including one soap bottle with Japanese inscription. On June 8th, WSP monitors were present to provide assistance. Twenty-five volunteers gathered trash and recyclables. WSP monitors removed an additional truckload of material. On September 21st, as part of an annual statewide Coastal Cleanup, WSP monitors coordinated with ECOSLO personnel and hauled one truckload of trash from the Sandspit.

Trash accumulation was a recurrent problem at the combined Morro Bay City Beach/Morro Strand entrance at the Highway 41 Corridor. At the beginning of the winter season, there was a single, small trash receptacle on the City side of the corridor. Debris accumulated quickly and usually contained leftover food containers which attracted many omnivorous species. WSP monitors frequently noted the mess and cleaned it up. CSP contacted the City regarding this issue. In July, two additional trash containers appeared at the site. These additional units have accommodated additional trash with no overflow and reduced the spread of debris by foraging omnivores.

An updated “Predator Management Plan” for the District is currently being developed. The existing “Interim Predator Management Plan” was created in 2003.

Enforcement

CSP Ranger staff patrolled WSP areas throughout the breeding season. Seventy-eight contacts were made by Rangers for illegal activities such as dogs on beach, trespassing, and kite flying. Of those contacts, 59 were attributed to dogs on beach, which resulted in ten citations. Nine illegal trespassers were contacted; however, no citations were issued. Six kite flyers were contacted and given warnings. One person was cited for illegal camping on the beach. CSP Rangers also investigated reports of two dogs and one vehicle on the beach but were unable to locate the violating parties. Ranger vehicle activity is restricted to the wet sand area with a speed of less than ten miles per hour. In addition, WSP monitors and volunteers contacted visitors violating park regulations and if necessary, contacted the Rangers.

Information/Education

Pamphlet holders at Morro Strand and the Sandspit parking lot were stocked throughout the season with the “WSP: Sharing the Beach” brochures provided by CSP headquarters, and dog-on-leash brochures provided by Morro Coast Audubon Society (MCAS). The informational kiosk at the Morro Strand Campground also displayed WSP educational information. Each campground kiosk, as well as, the mobile sea otter educational trailer, which was stationed at Morro Rock every weekend during the summer, was provided with a WSP information binder. Additionally, six WSP interpretive panels were in place at the main access corridors at Villa Creek Beach, Morro Strand, and MDO.

This was the eighth year of displaying children’s art signs along the symbolic fencing at WSP nesting sites within the District. This MCAS sponsored project involved several beach land owners, as well as, children from the community whose artwork emphasized the WSP.

In 2009, MCAS created a brochure which indicated where dogs on leash are allowed in the Morro Bay area. This year, these brochures continued to be placed at CSP kiosks. In 2010, MCAS purchased dog leashes with "I love State Parks" printed on them. CSP monitors handed the brochures out to visitors on the beach, if they had a dog with them. They also handed out a leash, if the dog was not on a leash. In 2013, monitors recorded handing out 57 brochures and five leashes to people contacted with dogs on the beach. Brochures and leashes were sometimes given to people not in violation of regulations who were seeking information regarding regulations.

On July 4th, one volunteer and six CSP employees roamed Morro Strand from 7:00 am to 9:30 pm to inform beach users of CSP regulations and answer questions. The City held a fireworks display in Morro Bay, which was viewable from Morro Strand and the bayside portion of the Sandspit. CSP presence on Morro Strand reduced the incidents of illegal fireworks and foot traffic inside symbolically fenced habitat. The Sandspit was monitored by two CSP employees throughout the day, and Villa Creek Beach was checked periodically between 8:00 am and 4:30 pm by CSP employees. Monitors were also on the beaches from July 1st through July 7th.

Ranger, Maintenance, and Resource staff in the southern half of the District's Coastal Sector participated in a one hour training session on WSP natural history, District WSP protection and habitat management, regulations to protect WSP and their habitat, and how to operate vehicles and perform maintenance activities to minimize impacts to WSP. Campground kiosk attendants and Camp Hosts also attended a WSP training session in June.

Two WSP educational presentations were given to a total of 25 attendees at the Morro Bay Winter Bird Festival in January of 2013. At the Atascadero High School Career Fair on May 30th, a WSP monitor addressed approximately 35 students regarding CSP's WSP recovery program. On June 22nd, one CSP monitor and one volunteer staffed a WSP recovery program booth at the Summer Solstice Family Day at Morro Bay State Park. The display included a supervised family craft for creating WSP chicks, passive and interactive WSP displays, and informational WSP brochures and posters. One hundred twenty-seven family members attended the booth with 31 WSP chicks created by young artists. WSP were mentioned on approximately 35 "Adventure with Nature" interpretive walks presented on a regular basis throughout the breeding season by docents from the Morro Bay State Park Museum of Natural History.

A California Polytechnic State University biology class of 32 students came to Morro Strand to learn about dune ecosystems, land management, and to actively participant in habitat restoration. The day involved presentations on WSP and other rare species, dune ecosystems, WSP habitat recovery, land management challenges, and details of habitat restoration strategies. The day ended with the class clearing European beach grass thatch from approximately one acre of dunes.

Information regarding WSP and beach regulations is available to the public on the District website at www.slostateparks.com.

The District has been and will continue to be involved with the WSP Working Group for USFWS Recovery Unit Five through attendance at meetings and being involved with the range-wide electronic mailing list which connects all WSP interested parties together through email. The WSP Coordinator also assists Recovery Unit Five by coordinating the winter and breeding window surveys. These efforts facilitate consistent WSP management methodologies and reporting throughout the range.

Volunteer Efforts

One volunteer monitored WSP activity on Villa Creek Beach and Morro Strand throughout the year. This individual volunteered approximately 315 hours of their time towards the District WSP program. The volunteer is listed as an authorized individual on the District recovery permit. She has been with the District for nine years and is an immeasurable benefit to the program in terms of providing continuity, a positive role model, and building cohesive morale among all staff members.

In 2012, MCAS, who initiated and managed the Habitat Conservation and Plover Recovery Program in past years, transferred coordination of the program to CSP. Volunteers for this program surveyed the number and types of recreational visitors that use the District's WSP breeding sites. Two volunteers with experience and training on topics including WSP life history, how to conduct the survey without disturbing the WSP, and how to contact dispatch to report violations for Ranger response logged 25 hours performing *Recreational Use Surveys*. The purpose of the survey is to monitor type, intensity, and distribution of recreational uses. Volunteers on duty wore blue jackets signifying them as volunteers for CSP.

In February and September each year, Morro Bay Beautiful provides volunteers who collect trash on the Sandspit. Although volunteers were seen engaged in the enterprise this year, the number of volunteers and number of hours contributed were not available from the organization.

On June 22nd, one volunteer helped a WSP monitor staff a WSP recovery program booth at the Summer Solstice Family Day at Morro Bay State Park. The volunteer encouraged youngsters to craft WSP chicks, while learning about the WSP recovery program. The volunteer further directed all family members to displays, brochures, posters, and the WSP monitor for information and questions. One hundred and twenty-seven family members attended the booth with 31 WSP chicks created by young artists. The project included seven volunteer hours.

On July 4th, one volunteer was at Morro Strand for two hours answering questions and informing the public of CSP rules and regulations.

One volunteer provided help removing symbolic fencing for a total of five hours on the Sandspit and Morro Strand.

Two volunteers contributed at meetings and trainings to keep updated and coordinate efforts on the WSP recovery program for a total of 15 hours.

Volunteers from four events removed dead beach grass thatch at Morro Strand. Approximately, 70 participants provided over 177 hours of labor in an effort to restore the dunes and provide more WSP nesting habitat.

The annual statewide Coastal Cleanup was held this year on September 21st. San Simeon Creek Beach, EBSP, Morro Strand and the Sandspit were among the beaches chosen for the Coastal Cleanup Day volunteers to pick up trash. ECOSLO coordinators reported that 45 volunteers picked up trash on the Sandspit. Two WSP monitors drove the Sandspit during the 2013 California Coastal Cleanup hours, staying accessible for information seekers and assisting in the cleanup. WSP monitors hauled one truckload of trash from the Sandspit. ECOSLO recorded 175 pounds of trash and recyclables removed from the Sandspit. ECOSLO reported that across 28 beach sites throughout the county, 1,665 volunteers cleaned up approximately 4,625 pounds of trash and 1,086 pounds of recyclables. ECOSLO also coordinated two Tsunami Debris Cleanups on the Sandspit. Seventy-eight volunteers gathered trash and recyclables including one soap bottle with Japanese inscription.

RESULTS

Wintering Birds

The beaches of the District continue to provide high quality wintering habitat for WSP with approximately 260 birds wintering here. To monitor wintering numbers, population censuses were conducted on District beaches from October 2012 through February 2013 (Appendix 3). The January census was also part of the range-wide winter window survey.

Hearst San Simeon State Park

San Carpoforo

Five population censuses were conducted during the non-breeding/winter season at San Carpoforo. An average of six WSP was seen at San Carpoforo during this period. According to the censuses, numbers of WSP ranged from 0 to 27.

Point Sierra Nevada

Population censuses were conducted during the non-breeding/winter season at Point Sierra Nevada on three occasions. No WSP were seen on any of these occasions.

Arroyo de la Cruz

Five population censuses were conducted during the non-breeding/winter season at Arroyo de la Cruz. No WSP were seen on any occasion.

Sidney's Lagoon

Six population censuses were conducted during the non-breeding/winter season at Sidney's Lagoon. An average of five WSP was seen at Sidney's Lagoon during this period. According to the censuses, numbers of WSP ranged from 0 to 11.

Piedras Blancas

Four population censuses were conducted during the non-breeding/winter season at Piedras Blancas. No WSP were sighted on any occasion.

Arroyo Laguna

Five population censuses were conducted during the non-breeding/winter season at Arroyo Laguna. An average of 33 WSP was seen at Arroyo Laguna during this period. According to the censuses, numbers of WSP ranged from 0 to 68.

San Simeon Creek Beach

Six population censuses were conducted during the non-breeding/winter season at San Simeon Creek Beach. An average of 36 WSP was seen on San Simeon Creek Beach during this period. According to the censuses, numbers of WSP ranged from 10 to 89.

Villa Creek Beach

Five population censuses were conducted during the non-breeding/winter season at Villa Creek Beach. An average of 23 WSP was seen on Villa Creek Beach during this period. According to the censuses, numbers of WSP ranged from 4 to 41.

Morro Strand

Northern Unit – Old Creek:

Five population censuses were conducted during the non-breeding/winter season at Old Creek. No WSP were seen on any occasion.

Southern Unit – Morro Strand:

Five population censuses were conducted during the non-breeding/winter season. An average of 88 WSP was seen on Morro Strand during this period. According to the censuses, numbers of WSP ranged from 38 to 122.

Sandspit

Five population censuses were conducted during the non-breeding/winter season. An average of 80 WSP was seen during this period on the CSP portion of the Sandspit. Numbers of WSP ranged from 44 to 141 on the days the censuses were conducted.

Breeding Window Survey

To monitor breeding season numbers, population censuses were conducted on District beaches from March through September 2013 (Appendix 3). The May census was also part of the annual range-wide window survey count of the United States Pacific coast breeding population of WSP. While the window survey does not represent a total count of WSP, it does provide an index of population size. The results of the breeding window survey for District beaches are listed in Table 1 (*BWSI*) Graphical depiction of WSP population numbers for all District beaches are illustrated in Appendix 6.

Table 1: (*BWSI*) District WSP Breeding Window Survey Population 2002-2013.

YEAR	HSSSP Beaches	Villa Creek Beach	Morro Strand	Sandspit	District Total
2002	3	42	23	56	116
2003	0	31	24	114	167
2004	3	31	21	203	258
2005	12	33	21	181	247
2006	15	23	24	100	162
2007	4	17	17	84	122
2008	1	12	17	59	89
2009	NS	16	18	97	131
2010	1	14	16	89	120
2011	0	17	9	114	140
2012	2	13	2	113	130
2013	9	11	7	101	128
Average	5	22	17	109	151

Hearst San Simeon State Park

San Carpoforo and Arroyo Laguna are the only two HSSSP beaches with breeding numbers listed in the USFWS Recovery Plan. According to the USFWS Recovery Plan, the combined breeding bird management potential for San Carpoforo and Arroyo Laguna is 16 adults. On May 21st, the range-wide breeding window survey determined the minimum number of WSP adults seen at San Carpoforo was four, Sydney's Lagoon one, Arroyo Laguna three, and San Simeon Creek Beach one. Starting in 2002 through 2012, WSP numbers have consistently been less than five at HSSSP beaches with the exception of a marked increase into the teens in 2005-2006. In 2013, a relatively high number of adult WSP, nine, was again observed.

Villa Creek Beach

According to the USFWS Recovery Plan, the breeding bird management potential for Villa Creek Beach is 25 adults. On May 21st, the range-wide breeding window survey determined the minimum number of WSP adults was six males and five females.

Initially, WSP numbers at Villa Creek Beach were in the thirties. There was a gradual decline into the teens through 2007. WSP population numbers have held steady in the teens since. The total for 2103 is the lowest on record.

Morro Strand

According to the USFWS Recovery Plan, the breeding bird management potential on the CSP portion of Morro Strand is 30 adults. On May 21st, the range-wide breeding window survey determined the minimum number of adults was three males and four females. WSP numbers at Morro Strand held constant in the lower twenties from 2002 through 2006. The numbers dropped in 2007 to the upper teens but held steady through 2010. The population dipped below ten in 2011 and was at a record low in 2012 with only two observed during the window survey.

Sandspit

According to the USFWS Recovery Plan, the breeding bird management potential on the CSP portion of the Sandspit is 82 adults. On May 21st, during the range-wide breeding window survey 101 adults (49 males, 51 females, and one unidentified adult) were observed. Initial 2002 WSP numbers at the Sandspit was the lowest year recorded at 56; however, over the years the population has demonstrated a great fluctuation. For example, the Sandspit WSP population was at its highest at 203 only two years later in 2004. Despite the great year to year variability, the overall population seems to have remained steady. In fact, the numbers for 2009 through 2013 have been remarkably close to the yearly average of 109.

Banded Birds

Although banding is not currently performed in the District, banded WSP from other locations were often observed on District beaches. Color leg band combinations were recorded and sent to Frances Bidstrup of Point Blue. From October 2012 through September 2013, 124 banded WSP were recorded on District beaches. Fifty-one of these birds were seen between October 1, 2012 and February 28, 2013, and 104 were seen between March 1, 2013 and September 30, 2013. Twenty of the 124 banded birds were seen during both time periods. The 124 banded WSP seen this year on District beaches were banded at Oceano Dunes State Vehicular Recreation Area (ODSVRA) (36), Vandenberg Air Force Base (VAFB) (31), Salinas National Wildlife Refuge (NWR) (12), Salinas State Beach (SB) (11), Moss Landing Salt Ponds (9), Fort Ord (8), Oregon (7), Zmudowski SB (6), Guadalupe (1), Marina SB (1), Monterey Bay area (1), Moss Landing SB (1), and San Francisco (1).

Seventeen of the banded birds seen between March 1st and September 30th had the potential to breed on District beaches. These were adult WSP that were sighted on multiple occasions during the peak breeding season (May and June). These banded WSP account for 14% of the District's adult breeding population.

Forty-eight fledges from 2013 were recorded on District beaches. These WSP were banded and fledged from ODSVRA (19), VAFB (13), Salinas SB (6), Salinas NWR (3), Fort Ord (2), Oregon (2), Zmudowski SB (2), and Moss Landing SB (1).

The most observed banded birds on District beaches include P:AG (124 sightings), RR:WW (55 sightings), WP:RL (51 sightings), GA:VR (48 sightings), PV:W (42 sightings), and GG:YR (35 sightings). See Appendices 4 and 5 for a list of the band combinations observed and their histories.

Hearst San Simeon State Park

San Carpoforo

Two banded WSP, BB:BW, a 2013 fledge from ODSVRA, and rW:BR, a 2009 fledge from Zmudowski SB, were each observed once during the breeding season at San Carpoforo.

Sidney's Lagoon

One banded WSP, --:RV, a 2006 female from Salinas NWR, was seen twice during the winter at Sidney's Lagoon.

Arroyo Laguna

A total of 14 banded WSP were observed at Arroyo Laguna. Eight of these WSP were seen during the winter months, two during the breeding season, and four were seen both in the winter and breeding seasons.

A total of three fledges were seen at Arroyo Laguna this season with two from ODSVRA and one from VAFB.

San Simeon Creek Beach

A total of 15 banded WSP were observed at San Simeon Creek Beach. Nine of these WSP were seen during the winter months, three during the breeding season, and three were seen both in the winter and breeding seasons.

One fledge was seen at San Simeon Creek Beach this season from VAFB.

Villa Creek Beach

A total of 15 banded WSP were observed on Villa Creek Beach. Two of these WSP were seen during the winter months, 12 during the breeding season, and one WSP was seen both in the winter and breeding seasons.

P:AG, the female fledge from ODSVRA, has been seen consistently on District beaches since 2008, primarily staying on Villa Creek Beach. On June 19th, the pink band was observed to be missing. Of all the banded birds observed this season, P:AG, a.k.a., --:AG, was seen the most often with 124 sightings. She was seen 71 times as P:AG at Villa Creek Beach; 49 times as --:AG at Villa Creek Beach, and while the bird was still P:AG, she was also seen on Morro Strand on four occasions. This WSP was associated with

three nests at Villa Creek Beach in 2013. See the Injured/Dead Birds section for more information on P:AG.

A total of five fledges were seen at Villa Creek Beach this season with two from VAFB and one each from ODSVRA, Salinas NWR, and Salinas SB.

Morro Strand

A total of 47 banded WSP were observed on Morro Strand. Eighteen of these WSP were seen during the winter months, 21 during the breeding season, and eight were seen both in the winter and breeding seasons.

WP:RL, a 2012 female fledge banded at Salinas NWR, was the most frequently observed WSP on Morro Strand with 50 sightings. She was observed during the winter and breeding seasons at Morro Strand. She had at least one successful hatch. Subsequent to the hatch, monitors observed WP:RL multiple times brooding three young chicks and then later with three fledglings.

The 2008 male fledge from ODSVRA, PV:W, formerly PV:PW, was seen throughout the year at Morro Strand and throughout the breeding season on the Sandspit. He has been seen on District beaches consistently since 2008. PV:W was the most observed banded male at Morro Strand with 37 sightings. This male was associated with at least one nest, which hatched successfully.

Three other banded birds seen on Morro Strand during the breeding season were linked with successfully hatched nests at other District beaches in 2013.

Monitors observed 12 fledglings from 2013 on the Morro Strand from ODSVRA (5), Zmudowski SB (2), Fort Ord (1), Moss Landing SB (1), Salinas NWR (1), Salinas SB (1), and VAFB (1).

Sandspit

A total of 79 banded WSP were observed on the Sandspit this year. Of these, 14 were seen during the winter months, 75 during the breeding season, and ten were seen both in the winter and breeding seasons.

RR:WW, a 2010 male fledge from ODSVRA, was observed on the Sandspit during the winter and breeding months. RR:WW was seen paired with a female and near several fresh scrapes in late March. In late May, he was associated with a nest that successfully hatched. Six days after the hatch, monitors observed RR:WW brooding small chicks and continued to see him with one chick that finally fledged. Late in July, RR:WW was again observed with two small chicks. RR:WW was the second most frequently observed banded bird in the District with 55 sightings, and he was the most observed banded WSP on the Sandspit with 54 sightings.

GA:VR, a 2009 female fledge from ODSVRA, was associated with a nest that hatched successfully on the City portion of the Sandspit. GA:VR, a 2009 fledge from ODSVRA,

was the fourth most frequently observed WSP on District beaches. She was seen a total of 40 times on the Sandspit during the breeding months.

Six other banded birds (GG:YR, NS:RR, NY:YY, VV:GR, WR:BR, and WY:GW) had nests this year on the Sandspit. Five of these birds had successful hatches.

Monitors observed 38 fledglings from 2013 on the Sandspit from ODSVRA (13), VAFB (12), Salinas SB (6), Fort Ord (2), Oregon (2), Salinas NWR (2), and Zmudowski SB (1).

Injured/Dead Birds

Throughout the year, monitors recorded injured or dead WSP seen on the beach and notified the WSP Coordinator. In addition, banded birds known to have been injured in past seasons continued to be monitored. Depending upon each situation, intervention may or may not take place. Seven injured adults, two previously injured banded birds, two injured juveniles, and one injured WSP of an undetermined age were observed. See Appendix 7 for a summary of the injured/dead WSP on District beaches from October 2012 through September 2013.

Hearst San Simeon State Park

One previously injured adult female WSP was observed twice at Sidney's Lagoon and once at Arroyo Laguna between October 2012 and September 2013. No action was taken to intervene. --:RV was banded as BG:RV in 2006 at Salinas NWR as a chick. In 2010, the bands were removed from the left leg due to injury. No signs of the old injury were observed.

Villa Creek Beach

One unbanded injured adult WSP of unknown gender and one previously injured female WSP were observed on Villa Creek Beach between October 2012 and September 2013. No action was taken to intervene.

The unbanded injured adult was seen on September 17th. The WSP hopped about vigorously and extensively yet held its right leg aloft at all times.

The banded female, P:AG, was first seen on Villa Creek Beach in December 2008. She was most likely banded at ODSVRA in 2008. P:AG is distinct in that her left foot and one band were missing, but she had no difficulty walking or running. This year, P:AG was reliably seen at Villa Creek Beach. On June 19th, the pink band was observed to be missing. The bird was subsequently identifiable as --:AG. While the bird was still P:AG, she was also seen on Morro Strand on four occasions in March. See the Banded Bird section for more information on P:AG, a.k.a., --:AG. This WSP was associated with three nests at Villa Creek Beach in 2013. One of these nests hatched, one failed due to abandonment, and the third was depredated by an unknown predator.

Morro Strand

Five injured adult WSP, three of unknown gender, one male, and one female; one previously injured adult female WSP; one injured juvenile WSP; and one injured WSP of an undetermined age were observed on Morro Strand between October 2012 and September 2013.

A banded adult male WSP, NB:YG, a 2011 VAFB fledge who bred at VAFB in 2012 was seen with a swollen left leg and a black, shriveled foot jutting out to the side on October 17th and 18th. The bird did not place the foot on the ground. After consultation with USFWS, the injured WSP was captured on October 23rd. The dead portion of the injured leg and bands were removed. --:YG was then released on Morro Strand. On October 31st, --:YG was seen with reduced swelling on the injured leg, appeared healthy and moved about well. --:YG was reported at North VAFB on January 22nd.

Also on October 23rd, an unbanded adult WSP of unidentified gender was observed flapping its wings but did not fly. The WSP was easily captured. After consultation with USFWS, the WSP was taken to Pacific Wildlife Care for overnight care and then transported to Monterey Bay Aquarium the following day, where it was diagnosed as having a neurological problem. On November 1st, the WSP was banded YO:GR and released at Carmel Beach.

An injured juvenile WSP banded as a chick at VAFB in 2012, A:G/Y, was seen on October 29th with its right foot black, dangling, and not in use. After consultation with USFWS, the WSP was captured and taken to Bear Valley Animal Clinic. The veterinarian diagnosed the problem as a superficial skin injury with no infection and predicted it would heal without treatment. Furthermore, the injury was not likely caused by the bands but probably by being caught on something. The WSP was released back at Morro Strand. A:G/Y was seen again on both November 8th and November 20th exhibiting no limp. On July 22, 2013, A:G/Y successfully fledged three chicks at VAFB.

On January 22nd, an unbanded adult WSP of unidentified gender was observed with matted feathers on its face and upper left side possibly caused by tar. The bird walked and flew with no apparent difficulty. This WSP was not seen again.

Also on January 22nd, an unbanded adult WSP of unidentified gender was observed with an apparent growth on its right knee. Initially the bird was not using its right leg but later walked on the right leg and flew fine. This WSP was not seen again.

A banded female, P:AG, usually seen on Villa Creek Beach was observed four times at Morro Strand in March. P:AG is distinct in that her left foot and one band are missing, but she ran and foraged with no apparent problems. P:AG was seen on Villa Creek Beach in March between and after the sightings at Morro Strand. For more information on P:AG, a.k.a., --:AG see the above section concerning injured birds on Villa Creek Beach.

On four occasions between March 14th and April 3rd, an unbanded adult female WSP was observed with its left foot dangling. The bird hopped and flew well.

On three occasions between August 19th and 28th, an unbanded adult WSP of unidentified gender was observed with a black and desiccated right leg. The appendage was continuously held aloft while the WSP hopped and foraged.

Sandspit

One injured banded adult male WSP; one previously injured adult female WSP; and one injured juvenile WSP were observed between October 2012 and September 2013 on the Sandspit.

On June 18th, WR:BR, a 2008 male fledgling from Fort Ord, was observed with one older chick. The adult WSP was not using his right leg and hopped on his left leg while staying close to the chick. His leg was dangling and the right foot appeared black. On June 21st, USFWS was consulted regarding the injured bird. WR:BR was observed on five more occasions in the same condition before he was captured on July 11th. The bird's leg was swollen above the blue band and his right toes were slightly swollen and darker than those on its left foot. A piece of shell was discovered underneath the blue band. After the bands were removed, a break in the leg was visible at the point where the shell piece was embedded into the leg. WR:BR was then taken to Bear Valley Animal Clinic for further evaluation. The veterinarian determined that the WSP was not likely to survive if released with the broken leg. Therefore, WR:BR's injured leg was amputated below the joint, and he was released back on the Sandspit the following day. WR:-- immediately flew a few hundred feet and was observed 30 minutes later standing, hopping, and foraging.

On August 9th, an injured unbanded juvenile WSP was first observed on the Sandspit. The juvenile hopped amongst a flock of 25 WSP. The juvenile held its left leg high and close to its body and never extended this leg. The WSP hopped, foraged, and flew with no problem. This bird was seen a total of six times between August 9th and August 28th.

Also observed this breeding season was --:RV, originally banded BG:RV at Salinas NWR in 2006. This female WSP has been observed intermittently at various District beaches since October 2006. In August 2010, BG:RV was noticed injured and her left bands were removed due to a piece of shell being trapped under them. In 2011, --:RV appeared fully recovered and was associated with two nests on the Sandspit. This year, she was observed once in December 2012 and six times between March 18 and April 4, 2013 on the Sandspit.

Nest and Egg Numbers

Appendix 8 depicts the number of nests found by month on all District beaches. Data is included for the years 2004 through 2013 for comparison.

Tables in Appendix 8a provide a summary of nest initiation and last hatch dates for all District beaches from 2002 through 2013. The first nest in 2013 was discovered on March 21st, and the last hatch was confirmed on August 16th. For comparison to previous years, nests on District beaches have been initiated as early as March 9th, and hatches have been as late as August 28th.

Appendix 8b includes a graphic presentation of the number of active nests as of Friday of each week of the breeding season for all District beaches. Nest activity was bimodal with peaks on the weeks ending May 17th and July 5th. The weekly average of total of active nests on the District beaches from mid-April through mid-July was 32. The weekly average of total of active nests on the District beaches over the 2013 breeding season was 21.

Appendix 8c depicts the timing of nest failures on District beaches at the end of each week during the breeding season. The highest incidence of nest failures occurred in June but was nearly as high in April. A total of 90 nests failed on all District beaches in 2013.

Appendix 8d shows nest fates for all District beaches from 2001 through 2013. Overall, data from 2013 reveal an average hatch rate along with a failure due to depredation rate among the low range. Analysis by beach reveals that Villa Creek Beach continued on a marked trend of a decreasing hatch rate, as well as, an increasing rate of nest failures due to depredation. Although Morro Strand shows a higher degree of year to year variability, both Morro Strand and the Sandspit indicate no trends in hatch rate. Both beaches also show a steady rate of nest failures due to depredation. Notably in 2013, both beaches exhibited a drop in nest failures due to depredation, down from unusually high levels in 2012.

Appendix 8e provides a graph depicting the number of nests hatched each year from 2001 through 2013 on all District beaches. The number of hatches shows a clearer picture of the nest success variability than hatch rate revealed. At Villa Creek Beach, there is a clear decline in the number of successful hatches since 2001. At Morro Strand, there was a peak in 2005 with a drop to near average of about eight for several years followed by a low number of hatches over the last two years. At the Sandspit, there was a peak in 2004, followed by a rapid drop through 2007. There has been a slow but steady increase since.

Appendix 8f provides a graph depicting the number of nests hatched by month each year from 2005 through 2013 on all District beaches. Overall both Villa Creek Beach and Morro Strand tend to have more nests hatching success early in the breeding season, and the Sandspit tends to have more successful hatches later in the year.

During the 2013 nesting season, abandoned, dropped, or unhatched eggs were collected on District and City beaches for the Santa Barbara Museum of Natural History as authorized by the Ventura Fish and Wildlife Office (Appendix 8g).

Nesting Habitat Substrate: Overview

Substrate descriptions were reported for 188 of 189 nests on District beaches in 2013. The primary substrate for an overwhelming 96% of nests was sand. The primary substrate for randomly selected locations was also 96% sand. As the WSP are known to select sandy beaches for breeding, the observed selection of primary substrate which matches randomly selected sites within the breeding area is not surprising. Secondary substrates were also described for 98% of nests compared to 81% of randomly selected locations. Tertiary substrates were described for 37% of nests as opposed to 30% of randomly selected locations. There is a suggestion that the WSP have a tendency to be positively attracted to things in nest selection sites. Although the highest frequency attractants seem to be wrack and live vegetation, those are also the things that are also at random locations in the highest proportions.

Live vegetation recorded at nest sites across all beaches was predominantly sea rocket between one and 12 inches high. Also frequently observed among live vegetation at nest sites was saltbush. Dead vegetation was infrequently observed near nest sites. Sea rocket was also the most frequently observed live vegetation at randomly selected locations.

Beach locations were documented for 187 nests and 53 random locations across District beaches in 2013. WSP appeared to show a consistent preference across all beaches for upper beach followed by mid-beach locations. Random locations indicated that WSP monitors showed a search preference for the same areas; however, as opposed to the WSP, the mid-beach area was more favored than the upper beach area.

The topographic relief of the general vicinity was assessed for 185 nests and 53 random locations across District beaches in 2013. WSP seemed to prefer sites with more topographic complexity than randomly selected locations. While randomly selected locations were flat 60% of the time, nest sites were flat only 48% of the time. It is notable that topographically convex locations were selected for nests 36% of the time, while only 15% of randomly selected places were convex. It is also notable that 70% of the non-flat nest sites were convex, while only 40% of non-flat randomly selected points were convex.

The distance of newly discovered nests from other known active nests was estimated for 140 nests and 41 random locations across District beaches in 2013. It appeared that breeding WSP selected nest sites closer to other breeding WSP than random locations. Thirty-eight percent of WSP nests were discovered within 100 feet of other active WSP nest compared to only 22% of random locations. However, it is clear that this apparent social affiliation was strongly weighted by Sandspit data. There, 46% of nests were discovered within 100 feet of other active WSP nests compared to 30% of random locations. Off the Sandspit, less than 10% of newly discovered WSP nests were with 100 feet of other active nests closely matching the 14% of random locations within 100 feet of active nests.

Overall, the “typical” or modal WSP nest site across District beaches was located in sand on the upper beach, in a place with complex, preferably convex topography, proximal to things, and more than 100 feet away from other active WSP nests.

Hearst San Simeon State Park

No WSP nests were found during the breeding season at HSSSP. No WSP, scrapes, or other signs of nesting activity were observed at Point Sierra Nevada, Arroyo de la Cruz, or Piedras Blancas. See Appendix 1 for a map with area distinctions.

San Carpoforo

One scrape was seen at San Carpoforo on April 9th. A banded male, rW:BR, was sighted nearby with an unbanded female. No other signs of nesting activity were observed at San Carpoforo. During the range-wide breeding window survey on May 21st, four WSP of undetermined sex were counted at San Carpoforo.

Sidney’s Lagoon

No WSP, scrapes, or other signs of nesting activity were observed at Sidney’s Lagoon. One female WSP was counted at Sidney’s Lagoon during the range-wide breeding window survey on May 21st.

Arroyo Laguna

No WSP, scrapes, or other signs of nesting activity were observed at Arroyo Laguna. Three WSP of undetermined sex were observed at Arroyo Laguna during the range-wide breeding window survey on May 21st.

San Simeon Creek Beach

One female WSP was observed at San Simeon Creek Beach during the range-wide breeding window survey on May 21st. The area utilized for breeding in previous years was symbolically fenced, while still allowing public access to the beach; however, no nests or scrapes were found within the symbolically fenced habitat.

Villa Creek Beach

A total of 20 nests were found at Villa Creek Beach during the breeding season. The distribution of nests per month is depicted in Table 2 (VCI). The first nest was initiated on April 5th, and the last nest was found on July 26th. The first nest hatched on May 3rd. The last nest hatched on June 22nd.

Table 2: (VCI) Number of Nests Found by Month at Villa Creek Beach 2004-2013.

Month	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
March	0	0	0	0	7	2	3	2	2	3
April	4	5	7	5	13	4	7	10	14	23
May	5	10	6	7	8	3	12	15	9	21
June	5	10	4	13	7	5	5	8	12	18
July	6	6	4	1	3	2	3	3	0	1
August	0	0	0	0	0	0	0	0	0	0
Total	20	31	21	26	38	16	30	38	37	66

Fates were determined for 19 of 20 nests. A summary of nest fates for 2013 at Villa Creek Beach can be found in Table 3 (VC2). Five nests with a known fate hatched successfully for a nest hatch rate of 26%. Two nests were protected by exclosures; however, both of these nests failed due to depredation. Of the 53 eggs produced with a known nest fate, a total of 13 eggs hatched (25%).

A total of 14 nests failed. Of the failed nests, 13 were lost to depredation, and one was abandoned. Of the depredations, the highest number, eight, were lost to an undetermined predator; four were lost to striped skunk; and one to coyote (*Canis latrans*). See the Depredation section for more information. The abandoned nest was discovered at one egg on April 10th and did not reach three eggs until April 16th. The nest was active and remained at three eggs until April 29th, when one egg was taken by an unknown predator. The nest remained active until May 3rd when vegetation was observed covering the nest bowl, and sand began accumulating around the eggs. Eventually, one egg was completely buried. The two eggs were collected on May 17th.

In an effort to promote hatching success, mini-exclosures were erected around two nests at Villa Creek Beach in 2013. One nest was taken by an unknown predator, and the other was depredated by striped skunk. It was concluded that the mini-exclosures were not a deterrent to nest depredation. Also, camera and foot traffic data indicated that despite the relatively small size of the exclosures, the structures attracted undue attention to the nests by visitors to the relatively small Villa Creek Beach. See Appendix 11 for more details on camera use data, and Human Activities/Recreation section for more details on trespasses into the habitat.

Table 3: (VC2) Nest Fates and Percentages for Villa Creek Beach in 2013.

Total Nests	20	% Total		
Unknown Fate	1	5%		
Total With Known Fate	19	95%		
Hatch	5	25%		
Fail	14	70%		
Fail-		% Total	% Failed Nests	% Unexclosed Failed Nests
Without Exclosure	12	60%		
Depredated	11	55%	79%	92%
Abandoned	1	5%	7%	8%
Fail-		% Total	% Failed Nests	% Exclosed Failed Nests
With Exclosure	2	10%		
Depredated	2	10%	14%	100%

Distribution of nests and fates of nests within each beach segment in 2013 are shown in Table 4 (VC3). The table also includes percentages of nests failed and hatched. One nest on Villa Creek Beach was assigned an unknown fate. Eighteen nests were located on the main portion of Villa Creek Beach. Two nests were located on the North Pocket Beach

just south of the main beach at Villa Creek Beach. No nests occurred in the mud flats/salt pan area inland of the main beach this year.

Table 4: (VC3) Nest Distribution and Fate at Villa Creek Beach in 2013.

Area	# of Nests	% of Total Nests	Hatch	% of Hatched Nests	Fail	% of Failed Nests	Unknown Fate	% of Unknown Fate
Back Area*	0	0%	0	0%	0	0%	0	0%
Main Beach: North	10	50%	2	40%	7	50%	1	100%
Main Beach: Middle	7	35%	2	40%	5	36%	0	0%
Main Beach: South	1	5%	0	0%	1	7%	0	0%
Pocket Beaches	2	10%	1	20%	1	7%	0	0%
Total	20	100%	5	100%	14	100%	1	100%

*Area formerly known as, "South of Villa Creek."

A summary of WSP nest distribution among beach segments from 2001 through 2013 is shown in Table 5 (VC4).

Table 5: (VC4) Distribution of Nests at Estero Bluffs State Park 2001-2013.

Year	West of Villa Creek ¹	Back Area ²	Main Beach	Pocket Beaches	Cayucos Point ³	Total
2013	0	0	18	2	0	20
2012	0	0	30	1	0	31
2011	0	1	20	0	0	21
2010	0	0	24	2	0	26
2009	0	0	37	1	0	38
2008	0	0	15	1	0	16
2007	0	0	29	0	1	30
2006	0	0	34	3	1	38
2005	1	0	32	3	1	37
2004	3	2	56	3	2	66
2003	0	1	31	2	1	35
2002	2	5	33	4	0	44
2001	1	5	28	5	0	39

1 - Area formerly known as, "North of Villa Creek."

2 - Area formerly known as, "South of Villa Creek."

3 - Area formerly known as, "Estero Bluffs."

Monitoring of Villa Creek Beach began in 2001, after becoming CSP property in 2000. The majority of the WSP nests have been located on the main beach and have varied in number from 16 to 66 nests with the peak in 2004 and an arithmetic average of 34 nests. Once again in 2013 the majority of the nests, 90%, were located on the main beach.

See Appendix 1 for a map with area distinctions and Appendix 8h for nest location maps.

According to the USFWS WSP Recovery Plan, the incubation period for a WSP nest is 26 to 31 days with a mean of 27 days. The incubation period begins after the last egg in

the clutch is laid. The incubation period ends with hatching. Table 6 (VC5) provides a summary of incubation duration data for successful nests at Villa Creek Beach in 2013. The range of verified incubation periods for successfully hatching Villa Creek Beach nests was 24 to 28 days. One nest hatched outside the expected incubation range. The verified incubation period for that nest was 24 days.

Table 6: (VC5) Number of Nests by Days Incubated at Villa Creek Beach in 2013.

	Within Expected Range									
	Early	Early	Early	Average	Late	Late	Late	Late	Late	Late
Days Incubated	24	25	26	27	28	29	30	31	32	33
# of Nests Hatched	1	0	2	1	1	0	0	0	0	0

Nesting Habitat Substrate

Substrate descriptions were reported for all 20 nests on Villa Creek Beach in 2013. The primary substrate for all nests was sand. A secondary substrate was found for 19 nests. The secondary substrate was wrack for 14 nests, woody debris for three nests, live vegetation for one nest, and dead vegetation for one nest. A tertiary substrate was found for five nests. The tertiary substrate was live vegetation for three nests, wrack for one nest, and gravel for one nest.

Substrate descriptions of random locations were recorded seven times at Villa Creek Beach during the 2013 WSP breeding season. The primary substrate for all random locations was sand. A secondary substrate was found at all seven locations. The secondary substrate was wrack for four locations, live vegetation for two locations, and dead vegetation for one location. A tertiary substrate was found for only two locations. The tertiary substrate was live vegetation both times.

The live vegetation recorded at Villa Creek Beach nest sites was saltbush (*Atriplex leucophylla*) all four times. Three times the observed plants were between one and 12 inches high, and once, it was less than one inch high. The live vegetation found at four random locations included beach bur, primrose (*Camissonia cheiranthifolia*), sea rocket, and saltbush. The beach bur, sea rocket, and saltbush were between one and 12 inches high. The primrose was less than one inch high. Dead vegetation, also saltbush, was recorded at one nest site between one and 12 inches high.

Beach locations were documented for all 20 nests found at Villa Creek Beach in 2013. Twelve of the nests (60%) were located on the upper beach. There were seven discovered in the mid-beach area, and one was located on the lower beach. No nests were found in the foredunes or back dunes. For comparison, the beach location for seven randomly selected spots was also documented at Villa Creek Beach in 2013. Four random locations were on the mid-beach, two on the upper beach, and one on the foredunes.

The topographic relief of the general vicinity was assessed for each WSP nest at Villa Creek Beach in 2013. The area was described as flat in nine, almost half, of the cases. Six times it was reported as convex, hummocks four times, and convex once. For comparison, the topographical relief of seven randomly selected locations was also documented at Villa Creek Beach in 2013. Four of the random points were flat, one concave, one convex, and one hummocky.

The distance of newly discovered nests from other known active nests was estimated for all 20 nests at Villa Creek Beach in 2013. Only one nest was found within 50 feet of an active nest. Twice, nests were between 50 to 100 feet from an active nest. On the remaining 17 occasions, any active nests were at least 100 feet away. Two of the seven randomly selected locations were between 50 and 100 feet of active nests. The remaining five random spots were over 100 feet away from any active nests.

Morro Strand

A total of 12 nests were found at Morro Strand during the breeding season. The distribution of nests per month is depicted in Table 7 (*MS1*). The highest monthly number of nests, five, comprising 45% of the seasonal total, were found in April. The first nest was found on April 17th, and the last nest was found on July 24th. Evidence for another nest was recorded on August 16th, when PV:W, an adult male WSP, was observed displaying. Although no chicks were seen on that day, PV:W continued the same behavior for several more days. Young chicks were observed on August 21st confirming an additional nest and hatch. The first hatch occurred on May 27th, and the last hatch occurred on August 16th.

Table 7: (*MS1*) Number of Nests Found by Month on Morro Strand 2004-2013.

Month	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
March	0	0	2	0	2	1	0	0	0	3
April	5	6	7	6	7	14	6	7	3	15
May	2	2	4	8	8	7	5	9	10	8
June	2	3	10	9	8	8	7	11	9	6
July	2	1	2	1	1	3	1	7	5	6
August	1	0	0	0	0	0	0	0	0	0
Total	12	12	25	24	26	33	19	34	27	38

Fate was determined for all nests. A summary of nest fates for this season at Morro Strand can be found in Table 8 (*MS2*). Four nests hatched successfully, three of which were protected by exclosures. Of the 28 eggs known to have been produced, nine eggs were confirmed as hatched (32%). One dropped egg was never attributed to any active nest and was not included in the total egg or nest numbers. A total of seven nests were protected by exclosures. All of the exclosures received wing extensions this year. See Appendix 8i for a summary of nests that were exclosed. An explanation for the use of exclosures at Morro Strand is provided in the Depredation section of this report. Of the nests that were exclosed, three nests hatched and four nests failed. Two exclosed nests were abandoned after the eggs were observed partly buried nine and 12 days, after the exclosures were erected, and no further activity was noted. Two nests failed due to wind.

These nests were observed completely covered by sand seven and nine days after the exclosures were erected over the nests. There was no activity at either nest after being buried by sand.

Four of five nests not protected by exclosures failed (See Table 8 (MS2)). Three of these nests failed due to predators, and the wind was responsible for the failure of one nest. Of the three depredated nests, two were depredated by red fox, and the other was depredated by an American Crow. See the Depredation section for more information. One nest not protected by an exclosure hatched at least two eggs. This was the first nest not protected by an exclosure to have hatched since 2007.

Table 8: (MS2) Nest Fates and Percentages at Morro Strand in 2013.

Total Nests	12	% Total		
Hatch	4	33%		
Fail	8	67%		
Fail-		% Total	% Failed Nests	% Unexclosed Failed Nests
Without Exclosure	4	33%		
Depredated	3	25%	38%	75%
Wind	1	8%	13%	25%
Fail-		% Total	% Failed Nests	% Exclosed Failed Nests
With Exclosure	4	33%		
Abandoned	2	17%	25%	50%
Wind	2	17%	25%	50%

Distribution of nests and fates of nests within each beach segment in 2013 are shown in Table 9 (MS3). The table also includes percentages of nests failed and hatched. No nests on Morro Strand were assigned an unknown fate. Seventy-five percent of nests and 50% of hatches were between the Azure and Boardwalk Corridors. This year, two WSP nests were discovered on the spoils of the 2009 winter dredging operation between the Azure and Boardwalk Corridors. One nest was exclosed but failed due to wind. The other nest failed due to fox depredation prior to being exclosed. Very little WSP activity and no nests were observed in the Campground section this year. The northern-most nest of the season was found near the Hatteras Corridor.

Table 9: (MS3) Nest Distribution and Fate at Morro Strand in 2013.

Area	# of Nests	% of Total Nests	Hatch	% of Hatched Nests	Fail	% of Failed Nests	Unknown Fate	% of Unknown Fate
Campground-Hatteras	0	0%	0	0%	0	0%	0	0%
Hatteras-Azure	1	8%	1	25%	0	0%	0	0%
Azure- Boardwalk	9	75%	2	50%	7	88%	0	0%
Boardwalk-Hwy 41	2	17%	1	25%	1	13%	0	0%
Total	12	100%	4	100%	8	100%	0	0%

WSP nest distribution among beach segments from 1993 through 2013 is shown in Table 10 (*MS4*). Although the number of WSP nests on Morro Strand in 2013 is remarkably low for the second year in a row, the range and distribution is not unusual.

Table 10: (*MS4*) Distribution of Nests at Morro Strand 1993-2013.

Year	Campground- Hatteras¹	Hatteras- Azure²	Azure- Boardwalk³	Boardwalk- Hwy 41⁴	Total
2013	0	1	9	2	12
2012	0	2	7	3	12
2011	0	6	13	6	25
2010	2	1	16	5	24
2009	7	5	10	4	26
2008	12	4	15	2	33
2007	5	2	11	1	19
2006	1	5	21	7	34
2005	4	5	15	3	27
2004	3	10	20	5	38
2003	4	8	24	4	40
2002	0	0	27	10	37
2001	0	0	11	2	13
2000	0	0	9	0	9
1999	0	0	18	0	18
1998	0	0	18	2	20
1997	0	10	25	15	50
1996	0	4	30	13	47
1995	N/A	N/A	N/A	N/A	0
1994	2	13	23	8	46
1993	0	3	5	6	14

1 - Area formerly known as, "Campground."

2 - Area formerly known as, "Beach Tract."

3 - Area formerly known as, "Cloisters."

4 - Area formerly known as, "High School."

See Appendix 1 for a map with area distinctions and Appendix 8h for nest location maps.

According to the USFWS WSP Recovery Plan, the incubation period for a WSP nest is 26 to 31 days with a mean of 27 days. The incubation period begins after the last egg in the clutch is laid. The incubation period ends with hatching. Table 11 (*MS5*) provides a summary of incubation duration data for successful nests with known incubation periods at Morro Strand in 2013. The range of verified incubation periods for successfully hatching Morro Strand nests was 24 to 30 days. Two successfully hatching nests were incubated longer than the mean incubation period but were within the expected range. The incubation period of 24 days is three days shorter than average, as well as, outside the expected range.

Table 11: (MS5) Number of Nests Hatched by Days Incubated at Morro Strand in 2013.

	Within Expected Range										
	Early	Early	Early	Average	Late						
Days Incubated	24	25	26	27	28	29	30	31	32	33	34
# of Nests Hatched	1	0	0	0	1	0	1	0	0	0	0

Thermo Data Loggers

During the breeding season of 2013, thermo data loggers were placed in WSP nests to record disturbance and time of nest fates. Thermo data loggers were placed in four nest bowls at Morro Strand. One thermo data logger was placed in each nest bowl, buried, and a second thermo data logger was placed outside each nest, also buried, to act as a control. Thermo data loggers were placed at the same time as nest enclosures were constructed.

Nest MS01 was found on April 17th with three eggs and was determined to be a failed nest by abandonment on May 21st but with no activity observed since May 9th. Thermo data logger results: Nest was abandoned May 6th at 12:14 am after much absence from the nest starting two days earlier on May 4th at 8:54 pm. This length of time discounts disturbance and suggests one mate went missing. Likely the day time bird went missing, thus likely the female.

Nest MS03 was found April 5th at one egg, with the second egg observed April 7th, and the third egg observed April 9th. This nest was determined to be a fail due to wind, with the eggs last observed on Friday, April 12th. A bird was seen on the nest at approximately 10:15 am on April 15th. The nest was determined to be a fail due to wind on Tuesday, April 16th. Thermo data logger results: Data suggest the nest failed between 9:41 am and 1:01 pm on April 15th. In this case, the WSP monitors observed a bird on the nest at approximately 10:15 am on April 15th, which was apparently too short a time to register on the thermo data loggers, as temperatures continued to rise during this period. Poor insulation of the nest prior to failure suggests some insufficiency in parenting, such as first time breeders or a single parent, etc.

Nest MS04 was found April 24th at one egg, with the second egg observed April 25th, and the third egg observed on April 27th. On May 27th, two eggs were missing, and one chick was observed. The outside thermo data logger was not set. Thermo data logger results: While no outside thermo data logger was set, the data logger inside the nest still recorded a clear pattern of incubation followed by non-incubation after hatch.

Nest MS06 was found May 27th at one egg, with the second egg found May 28th. This nest was determined to be a hatch on June 25th with two chicks observed. Thermo data logger results: Nest hatch completed and chicks and adults absent June 24th at 11:23 pm.

Nesting Habitat Substrate

Substrate descriptions were reported for 11 of 12 nests on Morro Strand in 2013. The primary substrate for all nests was sand. A secondary substrate was found for nine nests.

The secondary substrate was wrack for seven nests and live vegetation for two nests. A tertiary substrate was found for only two nests. The tertiary substrate was live vegetation for one nest and gravel for one nest.

Substrate descriptions of random locations were recorded 14 times at Morro Strand during the 2013 WSP breeding season. The primary substrate for all random locations was sand. A secondary substrate was found at eight of the 14 locations. The secondary substrate was live vegetation at six locations and wrack at two locations. A tertiary substrate was found at none of the randomly selected locations.

Live vegetation recorded at Morro Strand nest sites was sea rocket at two places and saltbush at a third. All observed plants were between one and 12 inches high. The live vegetation found at six random locations included sea rocket five times and saltbush once. All plants were between one and 12 inches high.

Beach locations were documented for 11 of 12 nests found on Morro Strand in 2013. Five of the nests were located on the upper beach and another five in the mid-beach area. Only one nest was located on the foredunes. No nests were found on the lower beach or back dunes. For comparison, the beach locations for 14 randomly selected spots were also documented Morro Strand. Seven random locations were on the mid-beach, six on the upper beach, and one on the foredunes.

The topographic relief of the general vicinity was assessed for 11 of 12 WSP nests on Morro Strand in 2013. The area was described as flat in four cases. Three times it was reported as hummocky, twice as concave, and twice as and convex. For comparison, the topographical relief of 14 randomly selected locations was also documented on Morro Strand in 2013. Eleven of the random points were flat and three hummocky.

The distance of newly discovered nests from other known active nests was estimated for 11 of 12 nests on Morro Strand in 2013. All discovered nests were at least 100 feet away from any other active nests. One of 14 randomly selected locations was between 50 and 100 feet of active nests. The remaining 13 random spots were over 100 feet away from any active nests.

Sandspit

A total of 157 nests were found on the Sandspit this year. The distribution of nests per month is depicted in Table 12 (SSI). The highest monthly number of nests was 46, comprising 29% of the seasonal total, were found in June. Eighty-seven nests were found on the northern half of the Sandspit, and 70 were found on the southern half. The first nest was found on March 21st, and the last nest was found on July 29th. The first hatch occurred on April 22nd, and the last hatch occurred on August 12th.

Table 12: (SSI) Number of Nests Found by Month at the Sandspit 2004-2013.

Month	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
March	21	4	10	8	14	10	2	0	2	18
April	39	39	54	57	40	18	23	33	44	77
May	34	42	63	47	32	27	41	41	48	90
June	46	57	69	53	39	27	30	44	100	81
July	17	27	14	14	19	14	11	22	29	6
August	0	5	3	0	0	0	2	1	2	0
Total	157	174	213	179	144	96	109	141	225	272

Of the 157 nests found, fate was determined for 154 nests. A summary of nest fates for this season on the Sandspit can be found in Table 13 (SS2). Eighty-seven nests hatched successfully, none of which were protected by exclosures. Of the 424 eggs produced, a total of 239 (56%) hatched. Three dropped eggs were never attributed to any active nests and were not included in the total egg or nest numbers.

Of the 157 nests found, 30 nests were depredated (19%). An unknown avian species was responsible for the depredation of the highest number of nests (22 nests). Six nests were depredated by coyotes. One nest was a confirmed American Crow depredation. And one nest was depredated by an unidentifiable predator. See the Depredation section for more information.

Eleven nests failed due to abandonment on the Sandspit (7%). Of the 11 nests abandoned, five were three egg nests, four were abandoned at one egg, and two were abandoned at two eggs. Four of these 12 nests experienced a reduction in clutch size before abandonment. All abandoned nests were monitored for WSP tracks or other signs of activity for at least one week after the first indication of inactivity. Nesting activity was never resumed at any of these nests.

Thirteen nests failed due to high tides (8%), and high winds claimed 13 nests (8%).

Three nests were deemed as unknown fates this season. For one of these nests, all three eggs disappeared the day of its estimated hatch date (EHD). The conditions were windy, the nest bowl was slightly buried, and no evident predator tracks were observed. In addition, neither pips nor chicks were seen to confirm the fate of this nest. Another nest lost one egg two days before its EHD, and the remaining two eggs were gone the next day. The nest bowl was intact, but no predator tracks, pips or chicks were observed to confirm the fate of this nest. Finally, for the third nest, two eggs went missing one day before its EHD with no evidence of any predators, and no chicks were observed on this day. The following day the nest with its remaining egg appeared active and shell fragments were found nearby the nest, but no chicks were seen on this day. Two days later, the last egg was gone, but still no evidence of a hatch was established, and the nest was deemed as an unknown fate.

Table 13: (SS2) Nest Fates and Percentages for the Sandspit in 2013.

Total Nests	157	% Total	
Unknown Fate	3	2%	
Total With Known Fate	154	98%	
Hatch	87	55%	
Fail	67	43%	% Failed Nests
Abandoned	11	7%	16%
Depredated	30	19%	45%
Tide	13	8%	19%
Wind	13	8%	19%

In total, there were 18 instances of clutch size reductions. Eleven of the 18 instances were due to unverifiable reasons, although, avian predators are suspected. Seven of these reductions were caused by wind. And one was attributed to tide.

Ten of these 18 nests were at three eggs and reduced to two eggs. Five of the ten nests hatched, and five failed. Two nests failed due to windy conditions; one was washed by the tide; another was deemed abandoned; and one was depredated by an unknown avian predator.

Six of the 18 nests were at three eggs and reduced to one egg. Only one nest hatched its single egg successfully. The other five nests failed; two were deemed abandoned; two were depredated by an unknown avian predator; and one failed due to wind.

One of the 18 nests was reduced to one egg the day after the second egg was produced. The nest was eventually deemed abandoned.

One of the 18 nests proved to be an atypical four egg nest. Two eggs were produced but one rolled out of the nest bowl during windy conditions. The following days two more eggs were produced, and all three eggs hatched successfully.

There were ten incidents of nests moving to new locations, shifting from six inches to three feet from the original nest site. Four of these nests were accompanied with a reduction in clutch size. Six of these ten nests moved during a two day period of strong winds and high surf in early April. Of the ten nests that moved – four were lost to wind; two hatched; one was washed out by the tide; one was abandoned; one was deemed an unknown fate; and one was depredated by an unknown avian predator.

This year, two nests were found with blue eggs. For one nest, the first and third eggs of the clutch were unspeckled and blue in color. This nest was deemed as an unknown fate. For the other nest, the third egg of the clutch was unspeckled and blue. All three eggs from this nest hatched successfully.

For 2013, five nests were located in the back dunes on the Sandspit. Three of these five nests hatched, and two were determined to be abandoned. In addition, a nest depredated by coyotes was discovered in the back dunes. Eggshell fragments were discovered near the nest bowl, but it could not be determined if these fragments were from WSP or Killdeer (*Charadrius vociferous*) eggs.

Distribution of nests and fates of nests within each beach segment in 2013 are shown in Table 14 (SS3). The table also includes percentages of nests failed and hatched.

Table 14: (SS3) Nest Distribution and Fate at the Sandspit in 2013.

Area	# of Nests	% of Total Nests	Hatch	% of Hatched Nests	Fail	% of Failed Nests	Unknown Fate	% of Unknown Fate
SPB-RM6	21	13%	9	10%	12	18%	0	0%
RM6-RM5	24	15%	15	17%	9	13%	0	0%
RM5-RM4	29	18%	14	16%	13	19%	2	67%
RM4-RM3	19	12%	11	13%	7	10%	1	33%
RM3-RM2	19	12%	8	9%	11	16%	0	0%
RM2-RM1	30	19%	18	21%	12	18%	0	0%
RM1-SST	12	8%	10	11%	2	3%	0	0%
SST-HAZ	3	2%	2	2%	1	1%	0	0%
Total	157	100%	87	100%	67	100%	3	100%

WSP nest distribution among beach segments from 1994 through 2013 is shown in Table 15 (SS4). Nest numbers between the CSP boundary and Rescue Marker Six are an estimate for the years 1994 to 2004 due to a lack of demarcation of the CSP property line. Additionally, monitoring for nests was not conducted on the beach south of the Sandspit Access Trail until 2004.

Table 15: (SS4) Distribution of Nests on the Sandspit 2000-2013.

Year	SPB-RM6	RM6-RM5	RM5-RM4	RM4-RM3	RM3-RM2	RM2-RM1	RM1-SST	SST-HAZ	Total
2013	21	24	29	19	19	30	12	3	157
2012	21	25	40	19	14	21	17	9	166
2011	37	37	42	29	28	24	12	4	213
2010	20	35	29	31	26	22	14	2	179
2009	18	27	24	30	12	22	8	3	144
2008	10	19	20	16	13	10	2	6	96
2007	12	21	19	23	12	12	7	3	109
2006	12	24	26	33	15	21	7	3	141
2005	12	39	48	39	27	30	18	12	225
2004	41	55	50	47	29	34	12	4	272
2003	23	26	32	26	17	17	5	N/A	146
2002	24	16	30	16	7	7	7	N/A	107
2001	29	24	24	8	5	4	6	N/A	100
2000	19	18	25	19	11	5	2	N/A	99

See Appendix 1 for a map with area distinctions and Appendix 8h for nest location maps.

According to the USFWS WSP Recovery Plan, the incubation period for a WSP nest is 26 to 31 days with a mean of 27 days. The incubation period begins after the last egg in the clutch is laid. The range of verified incubation periods for successfully hatching Sandspit nests was 24 to 30 days. In 2013, there were 24 nests with verifiable incubation periods less than 27 days. This number is considerable higher than last season, whereas only nine nests had incubation periods less than 27 days. Twelve of these nests were outside the expected incubation range at 24 and 25 days of verified incubation periods. Table 16 (SS5) provides a summary of incubation duration data for successful nests with known clutch initiation dates on the Sandpit in 2013.

Table 16: (SS5) Number of Nests Hatched by Days Incubated at the Sandpit in 2013.

	Within Expected Range									
	Early	Early	Early	Average	Late	Late	Late	Late	Late	Late
Days Incubated	24	25	26	27	28	29	30	31	32	33
# of Nests Hatched	5	7	12	17	8	1	3	0	0	0

Nesting Habitat Substrate

Substrate descriptions were reported for all 157 nests on the Sandspit in 2013. The primary substrate for 149 nests was sand, wrack for four nests, shells for two nests, woody debris for one nest, and live vegetation for one nest. Secondary substrates were also found for all nests. The secondary substrate was wrack for 74 nests, live vegetation for 35 nests, rocks and gravel for 16 nests, shells for 11 nests, woody debris for nine

nests, dead vegetation for six nests, and sand for six nests. A tertiary substrate was found for 64 nests. The tertiary substrate was wrack for 15 nests, shells for 14 nests, live vegetation for 12 nests, woody debris for eight nests, gravel and rocks for eight nests, dead vegetation for four nests, and sand for two nests.

Substrate descriptions of random locations were recorded 33 times on the Sandspit during the 2013 WSP breeding season. The primary substrate for all but two random locations was sand. The primary substrate was live vegetation at the other two random spots. A secondary substrate was found at 29 of the 33 locations. The secondary substrate was wrack for 11 spots, live vegetation at six locations, gravel and rocks for three places, woody debris at two spots, dead vegetation at two points, shells at one location, and other material once. A tertiary substrate was found at 16 of the randomly selected locations. Woody debris was found at five locations, wrack at four places, shells at four points, live vegetation at two spots, and other material once.

Live vegetation was recorded at 47 Sandspit nest sites. Sea rocket was recorded at 26 nest sites, saltbush at 12, sand verbena at five, dune grass (*Elymus mollis*) at three, and non-specified vegetation at one nest site. With the exception of dune grass which was always higher than 12 inches, all observed plants were between one and 12 inches high. Dead vegetation was listed at a total of nine nest sites. Unspecified dead vegetation was found at four locations; dead sea rocket was found at two nest sites; dead sand verbena at one; and dead ice plant at one. All dead vegetation was listed as between one and 12 inches high. Live vegetation was found at ten random locations. In all cases, the vegetation was sea rocket. At ten of the 12 places, the sea rocket was between 1 inch and 12 inches high. Twice it was lower than one inch. Dead vegetation was found at two random locations; however, the species was not listed.

Beach locations were documented for 156 of 157 nests found on the Sandspit in 2013. Sixty of the nests were located on the upper beach, 41 on the mid-beach, 34 on the foredunes, 16 on the lower beach, and five on the back dunes. For comparison the beach locations for 32 randomly selected spots were also documented the Sandspit. Eleven random locations were on the mid-beach, seven on the upper beach, six on the lower beach, six on the foredunes, and two on the back dunes.

The topographic relief of the general vicinity was assessed for 154 of 157 WSP nests on the Sandspit in 2013. The area was described as flat in 77 cases. Fifty-eight times it was reported as convex, ten times as concave, and hummocky nine times. For comparison, the topographical relief of 31 randomly selected locations was also documented on the Sandspit in 2013. Sixteen of the random points were flat, seven convex, four concave, and four hummocky.

The distance of newly discovered nests from other known active nests was estimated for 109 of 157 nests on the Sandspit in 2013. Fifty-nine discovered nests were at least 100 feet away from any active nests. Thirty-two nests were between 50 and 100 feet of known active nests, and 18 nests were within 50 feet of any active nest. There were three occurrences of two nests being found within 30 feet of each other. On the south Sandspit,

two nests were found on the same day within 20 feet of each other. One of the nests was located in the upper dunes, while the other was positioned in the middle dunes habitat. On the north Sandspit, two nests located on the top of the foredunes were separated by approximately 30 feet. In another case, one nest was located in the middle dune habitat, while another nest was situated 30 feet away closer to the tide line. All six of these nests successfully hatched. Compared to WSP on other District beaches, the Sandspit WSP established nests closer to other actively breeding WSP. Distances were estimated for 20 randomly selected locations on the Sandspit. Fourteen random spots were over 100 feet away from any active nests. Four were between 50 and 100 feet of active nests, and two randomly selected locations were less than 50 feet from active WSP nests.

Floated Eggs

EHD were projected for nests based on the date the final egg in a clutch was laid. Nests that were discovered with already completed clutches and had no reasonable estimated initiation date were floated to provide an EHD. See Appendix 9 for float data.

Villa Creek Beach

During the 2013 breeding season, three nests were found at three eggs at Villa Creek Beach. All three of these nests were floated to project an EHD. Of the nine eggs floated, three hatched. One nest was depredated by a skunk 13 days after being floated. Another nest was lost to an unknown predator eight days after being floated.

Morro Strand

During the 2013 breeding season, three nests were found at three eggs at Morro Strand. Because nest depredation is so prevalent at Morro Strand, an active three egg nest is often exclosed before it can be floated. Two of the three nests were exclosed when found. Part of the algorithm to determine when to build an exclosure around a nest includes observation of a bird on the nest. No bird was ever seen on sitting on the third nest. Therefore, the nest was not exclosed, but the nest was depredated by a red fox before the eggs could be floated. Of the exclosed nests found at three eggs, one hatched, and the other was abandoned.

Sandspit

During the 2013 breeding season, 44 nests were found at three eggs on the Sandspit. Thirty-nine of these nests were floated to project EHD. The remaining five nests were fated before they could be floated. Three were lost to high tides, and two hatched. Of the 39 floated three egg nests, 30 hatched. Nine floated three egg nests failed. Three nests were determined to be abandoned. Of these nests, they were abandoned ten to 35 days after floating. High tides took three of these floated nests. Two nests were lost to an unknown avian predator five and 15 days after floating. One nest was depredated by a coyote five days after being floated.

This season, four nests remained at two eggs; a third egg was never produced. Two of these nests were floated and hatched successfully; one nest hatched before being floated; and one was lost to a coyote before it could be floated.

Of the 121 eggs floated, a total of 90 eggs hatched (74%) from 41 nests.

Chick/Fledgling Fate

Banding of chicks is not performed on any of the District beaches. Without a means of identifying individuals, a detailed quantitative assessment of chick and fledgling success could not be completed. Nonetheless, chicks and fledglings were observed on many occasions throughout the season as part of routine beach monitoring procedures and were documented on census counts.

Villa Creek Beach

Thirteen chicks hatched from the five successful nests at Villa Creek Beach. Chicks were observed throughout the season, beginning on May 3rd after the first hatch. Population numbers were documented during the monthly census counts. The highest number of chicks observed on one day at Villa Creek Beach was three on May 20th from a single nest hatching that day. Four WSP were confirmed to have fledged from Villa Creek Beach, so the fledge rate was at least 31%.

Morro Strand

Nine chicks hatched from four successful nests at Morro Strand. Chicks were observed throughout the season, beginning on May 27th after the first hatch. The highest number of chicks observed on one day at Morro Strand was three in one brood with a banded female, WP:RL, on seven separate dates. All three were confirmed as fledging. Two additional fledges from two different nests were seen on Morro Strand for a total of five confirmed fledges, and a fledge rate of at least 56%. On September 5th, an older chick was seen being brooded by a banded male, PV:W. Fledging was not confirmed; however, a fledgling could have been among the juveniles from other beaches arriving in late and September.

Sandspit

Two hundred thirty-nine chicks hatched from the 87 successful nests on the Sandspit. Broods with chicks of varying ages were seen throughout the season after the first hatch on April 23rd. The highest number of chicks observed in one day at the Sandspit was July 25th. On that day, 17 chicks were observed in eight separate broods.

As stated previously, confirmation of fledges in the District is compromised by absence of individual bird identification as would be possible if bird banding practices were incorporated. The high density of nests on the Sandpit exacerbates the problem. It is difficult to link specific chicks precisely to specific nests. Monitors were able to confirm three fledges on the Sandspit this year. One male banded bird, RR:WW, was observed over a three week period, first brooding small chicks and later accompanying one

fledgling. The male banded bird, WR:BR, was observed with one chick the day after a nest hatched and then 28 days later with one fledgling. The female banded bird, GG:YR, was observed twice with two small chicks and then again with two fledglings. Many more fledges were observed on the Sandspit, but without banding, the fledging location could not be confirmed as the Sandspit. The highest number of juveniles observed on one day at the Sandspit was 63 on September 18th. This number undoubtedly includes fledges from other areas. On June 18th, 12 juveniles were observed on the Sandspit. It is quite probable that these WSP all fledged from the Sandspit.

Depredation

A summary of nest depredation on District beaches from 2001-2013 is shown in Appendix 10.

Predator Sightings Across District Beaches

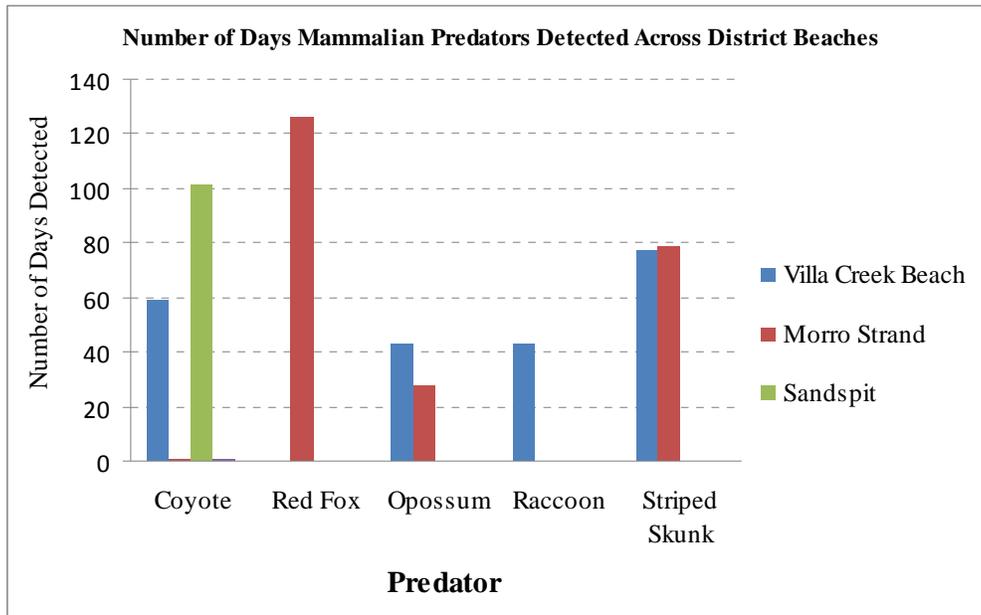
Table 17 (*Depredation 1*) lists the number of monitoring days various mammalian predators were detected on District beaches by observation or tracks during the 2013 breeding season.

Table 17: (*Depredation 1*) Number of Days Mammalian Predators Detected Across District Beaches.

Number of days coyote, fox, opossum, racoon, and skunk were detected on District beaches in the 2013 breeding season			
	Villa Creek Beach	Morro Strand	Sandspit
Coyote	59	1	101
Red Fox	0	126	0
Opossum	43	28	0
Raccoon	43	0	0
Striped Skunk	77	79	0

Figure 1 provides a graphical representation of the number of days mammalian predators were detected across District beaches in 2013.

Figure 1: Number of Days Mammalian Predators Detected Across District Beaches.



Villa Creek Beach

Predators destroyed 13 of the 19 nests with a known fate this year at Villa Creek Beach. Only one nest failed due to a reason other than depredation. Thirteen days after initiation of incubation one egg was taken from that nest. Signs of abandonment were documented four days later, and eventually, the nest failed due to abandonment. A summary of nest depredations can be found in Table 18 (VC6). Striped skunk was identified as the predator for four depredated nests. One nest was depredated by coyote. Unknown predators were responsible for eight of the depredated nests. Many of the depredated nests were surrounded by driftwood and others by dry and wind-blown sand. These conditions made it difficult for monitors to decipher predator tracks directly at the nest bowl. Therefore, definitive predators could not be assigned to many of the depredations, but skunks were suspected.

Table 18: (VC6) Nest Depredations by Predator on Villa Creek Beach in 2013.

Total Nests	20		
Predated Nests	13	% Total Fated Nests	% Predated Nests
Coyote	1	5%	8%
Striped Skunk	4	21%	31%
Unknown Predator	8	42%	62%
Unknown Fate	1		

As reported previously in this section, the percentage of nest failures at Villa Creek Beach due to depredation has been increasing since monitoring began in 2001. (See above in Nest and Egg Numbers and Appendix 8d for details.) In an effort to promote

hatching success, mini-exlosures were erected around two nests at Villa Creek Beach in 2013. Mini-exlosures were constructed off site with four side panels made of two inch by four inch no-climb fencing measuring 30 inches by 36 inches. A 30 inch by 30 inch top was made of the same fencing material. The final structure was embedded securely in the sand with the nest bowl in the geographic center. Despite the exlosures, both nests were depredated. One nest was taken by an unknown predator, and the other was depredated by a striped skunk. It was concluded that the mini-exlosures were not a deterrent to nest depredation. Also, camera and foot traffic data indicated that despite the relatively small size of the exlosures, the structures attracted undue attention to the nests by visitors to the relatively small Villa Creek Beach. See Appendix 11 for more details on camera use data and Human Activities/Recreation section for more details on trespasses into the habitat.

Very rarely are WSP monitors or predator management specialists present to observe nest depredation. As cited above predator identification may not be realized when predators leave little or no evidence behind or tracks are erased by wind-blown sand before nest fates can be investigated. In an attempt to help identify nest predators, photo infrared digital cameras with passive motion detector triggers (Reconyx PC85) were placed near a small number of nests by a staff member permitted by USFWS for this activity. During the 2013 nesting season, five WSP nests at Villa Creek Beach were selected for camera use. Two nests hatched successfully with no predators recorded near the nest. A third nest hatched successfully; however, images of gulls, coyotes, and raccoons were recorded in the vicinity of the nest bowl. The camera also recorded four dogs on the beach, one off-leash. Six trespasses into the habitat by beach visitors were also captured on camera. The two other nests selected for camera surveillance failed due to depredation. For one of the nests, the only image of a possible predator was a retinal reflection of a small animal. For the other depredated nest, a striped skunk was recorded in the vicinity of the nest bowl during the depredation window, but the depredation was not captured on camera. See Appendix 11 for details of camera use on District beaches.

Table 19 (VC7) lists the nest depredations according to predator among beach segments for Villa Creek Beach in 2013.

Table 19: (VC7) Distribution of Nest Depredations by Predator at Villa Creek Beach in 2013.

Area	Skunk	Coyote	Unknown Predator	Total Depredated	Total Nests
Back Area	0	0	0	0	0
Main Beach: North	2	1	4	7	10
Main Beach: Middle	2	0	2	4	7
Main Beach: South	0	0	1	1	1
Pocket Beaches	0	0	1	1	2
Total	4	1	8	13	20

For the protection and preservation of the WSP, USDA Wildlife Services Specialists were hired in an effort to remove WSP predators. At Villa Creek Beach trapping was used to reduce threats to WSP eggs. Predators were captured with 7"x7"x20" cage traps and 10"x12"x32" cage traps. Captured predators were immediately euthanized upon

discovery with an injection of sodium pentobarbital. All methods of euthanasia were conducted within the guidelines of the American Veterinary Medical Association. A total of six striped skunks, five raccoons, four ground squirrels, and two Virginia opossums were captured in cage traps. Eighty-six trap nights and six trap days were spent at Villa Creek Beach in an attempt to remove predators. A trap night is where one trap is set for one night. Two traps set for one night would be two trap nights. A trap day is where one trap was set for the day and removed at night.

Striped skunk tracks were identified 228 times in 2013 on Villa Creek Beach which was by far the most common type of identifiable tracks left by potential WSP predators. The first monitoring date striped skunk tracks were documented was March 13th and continued throughout the season until the last monitoring day on September 19th. Overall, striped skunk tracks were found on 77 of 138 possible sighting dates. Live striped skunks were not seen; however, images were captured on camera near one nest. See Appendix 11 on camera use for details.

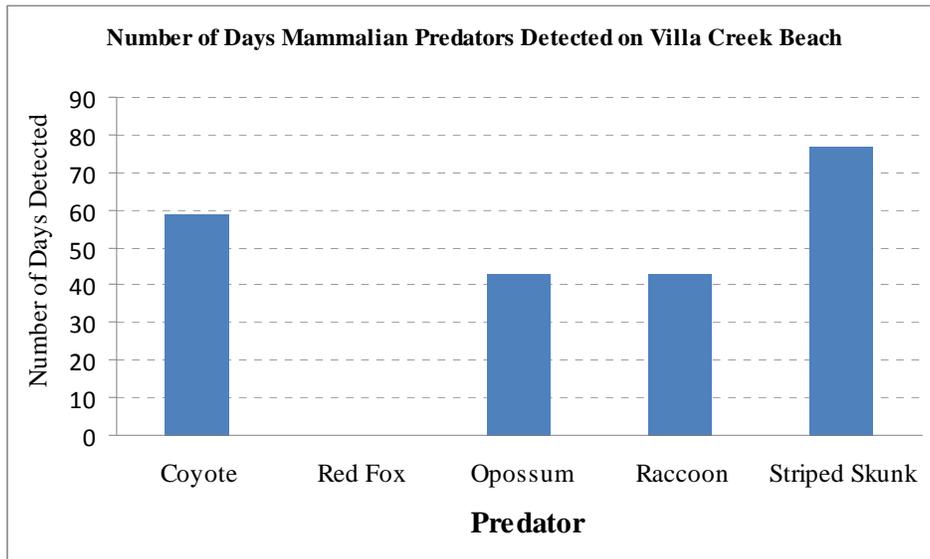
Coyote tracks were seen 96 times. The first monitoring date coyote tracks were documented was March 11th and continued throughout the season until the last monitoring day. Overall, coyote tracks were observed on 59 of 138 possible sighting dates. Live coyotes were not found; however, images were captured on camera near one nest. See Appendix 11 on camera use for details.

Raccoon tracks were seen 92 times. The first monitoring date raccoon tracks were documented was March 4th and continued throughout most of the season. Overall, raccoon tracks were found on 43 of 138 possible sighting dates. Live raccoons were not seen; however, images were captured on camera near one nest. See Appendix 11 on camera use for details.

Opossum tracks were seen 70 times. The first monitoring date opossum tracks were documented was April 1st and continued to be observed through August. Overall, opossum tracks were found on 43 of 138 possible sighting dates. Live opossums were not seen.

Figure 2 provides a graphical representation of the number of days mammalian predators were detected on Villa Creek Beach in 2013.

Figure 2: Number of Days Mammalian Predators Detected on Villa Creek Beach.



Other potential predators of WSP eggs, chicks, or adults identified on site by observation or tracks included: American Crow, common garter snake (*Thamnophis sirtalis*), domestic dog, Great Horned Owl (*Bubo virginianus*), Great Egret (*Ardea albus*), Heermann’s Gull (*Larus heermanni*), mouse, Northern Harrier (*Circus cyaneus*), Peregrine Falcon (*Falco peregrinus*), Red-shouldered Hawk (*Buteo lineatus*), Red-tailed Hawk (*Buteo jamaicensis*), Western Gull (*Larus occidentalis*), and White-tailed Kite (*Elanus leucurus*).

Morro Strand

Predators destroyed three of the 12 nests this year at Morro Strand. Red fox were responsible for two of the nest depredations. The other nest was depredated by an American Crow. A summary of nest depredations can be found in Table 20 (MS6).

Table 20: (MS6) Nest Depredations by Predator on Morro Strand in 2013.

Total Nests	12		
Predated Nests	3	% Total Nests	% Predated Nests
Red Fox	2	17%	67%
American Crow	1	8%	33%

Table 21 (MS7) lists the nest depredations according to predator among beach segments for Morro Strand in 2013.

Table 21: (MS7) Distribution of Nest Depredations by Predator at Morro Strand in 2013.

Area	Red Fox	American Crow	Total Depredated	Total Nests
Campground-Hatteras	0	0	0	0
Hatteras-Azure	0	0	0	1
Azure- Boardwalk	2	1	3	9
Boardwalk-Hwy 41	0	0	0	2
Total	2	1	3	12

Data listed in Appendix 10 reveals that historically American Crows have been responsible for a large portion of nest depredation on Morro Strand. Another predatory species of concern on Morro Strand has been the non-native red fox. In 2013, another species threatening the breeding success of WSP emerged. The striped skunk was infrequently present in past years and is now a pervasive threat.

American Crows were again observed foraging on the entire length of the Morro Strand throughout the breeding season in 2013. American Crows were seen on 93 of 138 possible occasions in murders of up to 29. American Crow tracks were seen inside the breeding habitat but were never found to saturate an area as they had in 2012. In 2012, there were murders of ten or more sighted 21 times. In 2013, there were only three murders all season of greater than ten. The average number of American Crows seen per day was less than five. Only one nest was depredated by American Crows compared to five in 2012. American Crows were documented on March 4th, the first day of monitoring, and continued to be observed until the last day of monitoring. Overall, American Crows were seen on 93 of 138 possible sighting dates.

As stated, another species of prominent concern is red fox. Red fox tracks identifiable as freshly made since the previous monitoring day were found on 126 out of 138 opportunities. Red fox tracks were observed on the first day of monitoring and continued to be observed until the last day of monitoring. Despite the presence of two wing extensions installed specifically to discourage such behavior, tracks indicated foxes circling enclosures on one occasion. Red fox were responsible for depredation of two nests.

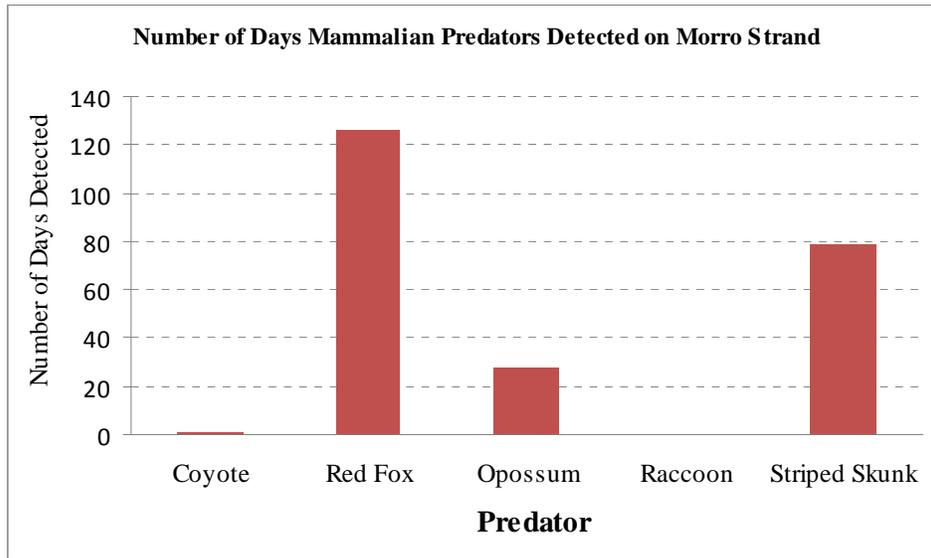
Striped skunk progressed from a species with a minor presence on Morro Strand in 2012 to a prevalent species in 2013. Sets of skunk tracks were seen a total of seven times in 2012. The number rose to 336 in 2013. The first monitoring date striped skunks tracks were documented was March 21st. Both the number and range of skunk tracks increased steadily throughout the breeding season. Overall, striped skunk tracks were found on 79 of 138 possible sighting dates. Live striped skunks were not seen. No WSP nest depredations were attributed to striped skunk; however, striped skunk tracks were frequently seen near scrapes, as well as, adjacent to nest enclosures.

Opossum tracks were seen 39 times. The first monitoring date opossum tracks were documented was March 13th and continued to be observed until the middle of August.

Overall, opossum tracks were found on 28 of 138 possible sighting dates. Live opossums were not seen.

Figure 3 provides a graphical representation of the number of days mammalian predators were detected on Morro Strand in 2013. It is perhaps noteworthy that tracks as an index of predator presence may provide an under representation on Morro Strand. Meteorological conditions, moist air, and low winds allow tracks to remain for a long time. New tracks are estimated by overlay, so identifying tracks as new became very difficult. Thus, predators may remain active without identification of added tracks.

Figure 3: Number of Days Mammalian Predators Detected on Morro Strand.



Removal of any avian species is not allowed within the City limits. In the absence of strong predator control options for American Crows, the construction of single nest enclosures was incorporated into the WSP recovery plan at Morro Strand. The initial goal was prevention of nest depredation by American Crows. Single nest enclosures are also designed to reduce nest depredation by chronically present non-native red fox, as well as, the recently incursive striped skunk. The long term goal is to enhance WSP breeding success on Morro Strand.

Once a nest reached three eggs, and an adult WSP was seen incubating the nest, a team of authorized individuals quickly and efficiently erected the ten foot by ten foot enclosure. All enclosures this year had two wing extensions. Once finished, the monitors waited for the WSP to incubate the nest again to eliminate the possibility of the enclosure as a reason for potential abandonment.

A total of seven enclosures were erected on Morro Strand during the 2013 breeding season. Three of the nests hatched successfully. Of the four failed nests within single nest enclosures, two were abandoned, and two failed because of wind.

Once the single nest enclosures are in place, there is the issue of attracting predators as well as public attention. On April 29th, a Peregrine Falcon was observed perching on top of an enclosure with an active nest. The predator was not seen atop the enclosure again, and the nest later hatched successfully. On July 4th, another Peregrine Falcon was spotted on top of an enclosure of a previously abandoned nest. On two occasions, foot traffic accompanied by dog tracks closely approached single nest enclosures. It is noteworthy that the single nest enclosures prevent accidental nest destruction by trespassers; however, they do attract additional human traffic which could disrupt nesting activities and lead to nest failure.

For the protection and preservation of the WSP, a USDA Wildlife Services Specialist was hired in an effort to remove WSP predators from Morro Strand. Predator removal activities were conducted on Morro Strand between the Azure Street parking lot and Highway 41 behind the first set of dunes. Number one and a half padded leg hold traps were set in an attempt to capture red fox, and cage traps (7"x7"x20" and 10"x12"x32") were used to capture raccoons and skunks. Captured predators were immediately euthanized upon discovery with an injection of sodium pentobarbital. All methods of euthanasia were conducted within the guidelines of the American Veterinary Medical Association. Eight red fox, one skunk, and one raccoon were captured and removed from Morro Strand. Twenty-four trap nights were spent trapping in an attempt to capture predators at Morro Strand.

Other potential predators of WSP eggs, chicks, or adults identified on site by observation or tracks included: California Gull (*Larus californicus*), California ground squirrel, coyote, domestic cat, domestic dog, Heermann's Gull, Great Blue Heron (*Ardea herodias*), mouse, owl, Red-shouldered Hawk, Red-tailed Hawk, Ring-billed Gull (*Larus delawarensis*), and Western Gull.

Sandspit

Predators destroyed 30 of the 157 nests this year on the Sandspit (Table 22 (SS6)). Avian predators were responsible for a majority (77%) of all the nest depredations. Twenty-two of the 30 nest depredations were attributed to an unknown avian species, and one nest was a confirmed crow depredation. It was determined that coyotes consumed six of the 30 depredated nests. Only one nest was listed as depredated by an unknown predator.

Table 22: (SS6) Nest Depredations by Predator on the Sandspit in 2013.

Total Nests	157		
Predated Nests	30	% Total Fated Nests	% Predated Nests
Coyote	6	4%	20%
Crow	1	1%	3%
Unknown Avian	22	14%	73%
Unknown Predator	1	1%	3%
Unknown Fate	3		

A summary of nest locations and predations can be found in Table 23 (SS7).

Table 23: (SS7) Distribution of Nest Depredations by Predator at the Sandspit in 2013.

Area	Coyote	Unknown Avian	Crow	Unknown Predator	Total Depredated	Total Nests
SPB-RM6	0	3	0	1	4	21
RM6-RM5	1	4	0	0	5	24
RM5-RM4	1	9	0	0	10	29
RM4-RM3	0	1	0	0	1	19
RM3-RM2	2	4	0	0	6	19
RM2-RM1	1	1	1	0	3	30
RM1-SST	0	0	0	0	0	12
SST-HAZ	1	0	0	0	1	3
Total	6	22	1	1	30	157

On the Sandspit, this season there was a high occurrence of avian depredations during a three week period from May 27th to June 14th. During this period, 17 nests were lost to an unknown avian predator. Fourteen of these depredations occurred on the northern half of the Sandspit. In addition, during this period, monitors witnessed an American Crow depredating a nest on the southern half of the Sandspit. The crow was first sighted on May 31st and was observed flying over the habitat and back dunes on six other occasions. The last documented crow observation was on July 13th, when a crow was photographed foraging near a three egg nest by a digital wildlife camera. The nest was left undisturbed and successfully hatched three weeks later. Unlike the other District beaches, American Crows are surprisingly uncommon on the Sandspit. There were no crow sightings last season; however, in 2011, American Crow was responsible for the depredation of 14 nests on the Sandspit.

In 2012, gulls were suspected to be the main avian predator, and 11 failed nests were confirmed gull depredations. This year, monitors observed California and Western Gulls flying low over the dunes, WSP habitat, and beach area, but nest depredation by a gull was never established. In addition, American Kestrel (*Falco sparverius*), Red-tailed Hawk, Peregrine Falcon, White-tailed Kite, and Northern Harrier were often observed perched on the dunes or Rescue Markers and seen flying over the back dunes.

On the Sandspit, a continuing predatory concern is coyotes targeting nests. Coyote tracks were observed daily in the habitat and often tracks were found within inches of a nest. This season, the six coyote depredations appeared to be indiscriminate acts and occurred randomly throughout the season. In addition to these six nests, a coyote depredated nest was discovered in the back dunes. Eggshell fragments were observed near the nest bowl,

but it could not be determined if these fragments were from WSP or Killdeer (*Charadrius vociferous*) eggs.

On May 9th, there was a very unlikely occurrence of a black bear (*Ursus americanus*) wandering at the base of Morro Rock. Monitors observed large bear tracks within the habitat traveling north from Rescue Marker One to the plateau located on the City portion of the Sandspit. The bear walked within ten inches of several nests without disturbing them.

For the protection and preservation of the WSP, a USDA Wildlife Services Specialist was hired in an effort to remove WSP predators. This season, no predators were removed from the Sandspit. Attempts were made at calling crows in for removal, but the Specialist was unsuccessful.

Very rarely are WSP monitors or predator management specialists present to observe nest depredation. As cited above predator identification may not be possible when predators leave little or no evidence behind or tracks are erased by wind-blown sand before nest fates can be investigated. In an attempt to help identify nest predators, photo infrared digital cameras with passive motion detector triggers (Reconyx PC85) were placed near nests by a staff member permitted by USFWS for this activity. During the 2013 nesting season, two WSP nests on the Sandspit were selected for camera use, but no predation events were recorded. One coyote and an American Crow were documented walking nearby one nest, which later hatched successfully. No predators were recorded at the other nest which also successfully hatched. See Appendix 11 for details of camera use on District beaches.

Other predatory species identified by observation or tracks on the Sandspit in 2013 included: Black-crowned Night Heron (*Nycticorax nycticorax*), Great Blue Heron, Great Egret, Great Horned Owl, and Heermann's Gull.

Human Activities/Recreation

For access information on these sites, see the Survey Area section of the report.

Hearst San Simeon State Park

Recreation was not routinely monitored at HSSSP beaches. While visitors were rarely seen when monitoring remote locations, visitors were usually encountered at Arroyo Laguna and San Simeon Creek Beach. The most common activities included beachcombing and surfing.

Villa Creek Beach

Recreational activity observed at Villa Creek Beach during the 2013 breeding season included beachcombing, surfing, kayaking, bird watching, and picnicking, with walking, photography, and fishing being the most prevalent activities. WSP protection measures to

eliminate pedestrian access through nesting habitat continued this year. Former trails continued to be fenced off and “Do Not Enter” signs were clearly posted.

There were 83 documented incidents of human foot traffic inside the habitat, although the actual number of people entering the habitat could be higher due to the difficulty of deciphering individual footprints.

When possible, trespassers were contacted and informed about rules and regulations regarding trail closures and educated about the WSP. Monitors witnessed seven individuals inside the WSP habitat in four separate episodes. All were contacted. Of the four occasions, all but one contact were classified as positive with trespassers leaving the habitat immediately when requested by WSP monitors.

Cameras installed to detect predators on specific nests also captured images of five trespasses at two different nest sites. Another trespass was inferred when an image of a child hanging onto the symbolic fence was disrupted by something which most likely was inside the habitat. Another image revealed beach users operating a radio-controlled plane, which is among the activities prohibited in WSP breeding habitat areas.

Fifty-one additional public contacts were noted at EBSP either with individuals or groups of up to 12 people. A total of 114 members of the public were encountered overall. WSP monitors answered questions on topics not just related to the WSP and the recovery program but additional topics including fishing, beach and tide pool access, CSP recreational opportunities, ticks, poison oak, tidal patterns, marine mammals, and other shorebirds. All 51 contacts were classified as positive.

Monitoring is more intensive surrounding the Independence Day holiday. Villa Creek Beach was monitored on all days around the Independence Day holiday, and on July 4th, one monitor patrolled in the morning and another in late afternoon. During the two week period before and after July 4th, there were 11 public contacts involving a total of 24 people, including the one non-positive trespassing incident. The other ten contacts were all outside the habitat, and all were classified as positive.

Despite a posted “No Dogs” sign at the entrance to the access trail, dog tracks were observed three times inside the habitat and eight times outside the habitat. In EBSP, people with dogs were contacted five times by monitors. In four of the contacts, the dogs were off leash. In three of those occasions, the owners complied by quickly placing the dogs on leash and left the park immediately. On the fourth occasion the dog owner mutually recognized the presence of the WSP monitor and reversed direction, leaving the park before contact could be initiated. Cameras installed to detect predators on specific nests also captured images of four dogs on Villa Creek Beach between May 26th and May 29th. Three dogs were on leash, and one dog was off leash.

On June 11th, the San Luis Obispo County Sheriff’s Search and Rescue (SLOSAR) and the City of Morro Bay Harbor Patrol conducted a sea and shore training exercise on Villa Creek Beach. Sea craft approached the shore depositing and collecting personnel in the

surf multiple times. A rescue helicopter hovered over the beach and surf line several times, dropping harness lines, as well as, dropping and picking up trainees from the surf. The helicopters landed only on the bluffs adjacent to the nearby abalone farm; there were no beach landings. The exercise inadvertently attracted trespassers into the habitat on the North Pocket Beach who were attempting to get a better view of the proceedings and ask questions about the event. The WSP monitor escorted the trespassers out of the habitat and then answered their questions. There was one known active nest on Villa Creek Beach during the training exercise, which later successfully hatched. A nest was discovered on the North Pocket Beach as the training exercise was being conducted which later failed by unknown predator.

Acts of vandalism on Villa Creek Beach were rare. One driftwood fort was built inside the habitat and another on the beach outside the habitat. Both were taken down on the day of discovery. On July 1st, a cold fire pit was found on the beach. There were a few acts of vandalism at other locations in EBSP. On March 7th, damage was discovered to two dog regulation signs. Both signs were repaired. At the beginning of July, all of the no dog signs were removed at EBSP. When the vandalism was discovered, the incident was documented by CSP Rangers, and the signs were replaced within a week.

Villa Creek Beach was patrolled by CSP Ranger staff throughout the breeding season. Three contacts were made by Rangers for entering the beach with dogs. Two dog owners were given warnings. One dog owner was given a citation.

Morro Strand

Morro Strand is easily accessible to local residents and visitors and has the highest level of recreational use of all District beaches. From March through September, volunteers counted 940 beach users (with no habitat trespassers) in 23 Recreational Survey hours. Although these surveys indicated higher rates of beach usage on weekend days, there were always substantial beach activities on weekdays, as well. Recreational activity observed included beachcombing, picnicking, jogging, illegal dog walking, horseback riding, biking, fishing, surfing, wind surfing, kite surfing, swimming, bird watching, prohibited kite flying, sunbathing, and playing baseball. Walking/running accounted for 39%, stationary activities 38%, and water activities 17% of beach activity. Combined the three classes of activities accounted for 94% of beach activities.

There were 1,005 documented incidents of human foot traffic inside the symbolically fenced habitat. Foot traffic was not evenly distributed among the sections. Most infractions occurred on the northern sections with 29% found near the Campground and 37% found between the Hatteras and Azure Corridors. The number of foot traffic infractions per month during June, July and August was approximately twice as high as the months of March, April, May, and September. The actual number of people entering the habitat could be higher due to the difficulty of deciphering individual footprints when individuals entered the habitat at the same location or in large quantities.

Trespassing was also indicated by other forms of trace evidence. Domestic dog tracks accompanied the foot traffic on at least 21 occasions. On four of these occasions, the

human and domestic dog tracks passed close to nests. There were three accounts of stroller tracks, nine sets of bicycle tracks, six drag marks from various objects, and two of radio-controlled car intrusions inside the habitat. Monitors also found residue of exploded fireworks three times and unexploded fireworks once. Elaborate sand graffiti was documented in the habitat four times.

Monitors witnessed 30 individuals trespassing in the WSP habitat. Twenty-seven of either the trespassers or supervising guardians were contacted by monitors.

There were 145 additional public contacts at Morro Strand either with individuals or groups of up to ten people. One hundred forty-four of those contacts were considered positive.

As part of the public contact WSP monitors answered questions, provided information about various aspects of the WSP recovery program, and informed beach users of beach regulations regarding parking, habitat restrictions, dogs, fires on the beach, fireworks, and also discussed various additional topics. Several times the contact was initiated in order to express appreciation of the work accomplished by CSP personnel.

A Superintendent's Posted Order was posted at the kiosks that states that no person shall operate, fly, release, or cause to be operated, flown, or released any size kite, or other device, free flying, or by remote control within or 300 feet adjacent to the symbolically fenced WSP habitat. Regulatory signs stating that kite flying is not allowed were placed at each access corridor to Morro Strand. Volunteers observed three kite flyers. WSP monitors observed five kite flyers and educated them whenever possible as to how a WSP may perceive a kite to be an avian predator.

Starting in 2009, a sandwich board with a "No Dogs on Beach" sign was placed every day at the southern CSP boundary near the high tide line. This sign established a more visible City/CSP boundary marker to lessen confusion about the change in regulations (dogs are allowed on leash on City beaches). Permanent "No Dogs on Beach" signs cannot be positioned closer to the water due to the fluctuating tides. Maps were also placed at the kiosks at the north and south ends of Morro Strand which differentiated areas of where dogs are and are not allowed. In 2011, another sandwich board sign was added near the entrance to the beach at the Highway 41 Corridor. This sign illustrates with arrows the City/CSP boundary and in which direction "dogs on leash" are allowed.

Despite posted signs, volunteers counted five dog walkers with nine dogs; four of these dogs were off leash. Monitors contacted dog owners 118 times. Overall, dog contacts involved 210 people and 145 dogs. Sixty-five of the dogs were off leash. Of 106 verbal contacts, 99 were rated as positive, six were rated as negative, and one was rated as neutral. Monitors also observed 12 sets of dog owners with a total of 18 dogs who were not contacted verbally. Usually, these dog owners would see the WSP monitor and then leave the beach immediately. Additionally, 83 sets of dog tracks were observed along the beach and 67 sets in the WSP habitat. There were eight instances of positive public contact in which dog owners inquired about dog regulations while approaching a beach

access point or while enjoying the beach without the dog. Other beach walkers reported informing dog owners of CSP's "no dogs on beach" rule. See the Information/Education section for information about the distribution of dog information brochures and leashes.

Morro Strand was frequently used by equestrians accessing the beach at the Highway 41 entrance. CSP monitors counted 92 equestrians, while the volunteers counted an additional 14. Equestrians often rode along the shore, with a few riding near or next to the symbolic fence.

Occasionally acts of vandalism occurred on Morro Strand. Signage was vandalized on ten occasions. Symbolic fencing was vandalized on five occasions. On September 19th, remains from a small fire on the back fence near the Boardwalk Corridor behind Morro Bay High School were discovered. Although the site had been cleaned up, damage included burnt vegetation and a melted "Do Not Enter WSP Habitat" sign. Rangers were notified of vandalism; fences and bent poles were repaired; and vandalized signs and property were cleaned and/or replaced.

On April 27th and 28th, the Morro Bay Kite Festival was held on the City beach. One WSP monitor patrolled the adjacent Morro Strand beach area to ensure that kite enthusiasts and spectators did not stray onto the State Beach and that all beach visitors in the area followed CSP regulations. All Morro Bay Kite Festival participants respected the beach boundaries.

The 10th Annual Miracle Miles for Kids Run from Morro Rock to Cayucos Pier was held on April 27th. One WSP monitor was present to ensure that the participants stayed on the wet sand, followed CSP regulations, and caused no disturbance to the WSP. Race officials made a public address announcement regarding both dogs and WSP. The dogs-on-beach announcement clearly and perfectly stated that dogs were prohibited on the State Beach and could not accompany race participants. The WSP announcement directed people to stay clear of WSP habitat. Event coordinators reported 2,545 registered participants. No participants entered the habitat. One interesting footnote nominally involved the WSP recovery program. Several racers participated as groups in a collective effort to fundraise. The team who raised the most money as a group called themselves the "Snowy Plovers".

The inaugural Morro Bay Bands on the Run, a fundraising event sponsored by the Morro Bay High School Music Boosters, was held in part on Morro Strand on May 25th. Small bands were stationed along the race route. At no point were the bands audible from more than a few feet away from their station. There were 97 5K runners and 73 10K runners. All runners in both races stayed low on the beach on wet sand, well away from the WSP breeding habitat. All race participants, band members, and race officials cheerfully abided by CSP regulations and co-operated helpfully with WSP monitors at every opportunity

Morro Strand was monitored most days around the July 4th holiday. On July 4th, one volunteer and six WSP monitors were on the beach from 7:00 am until after the City fireworks show. The City fireworks display was viewable from Morro Strand and the

bayside portion of the Sandspit. CSP Rangers patrolled the entire length of Morro Strand throughout the day and from the campground to the Azure Street Corridor after dark. After 8:30 pm, two WSP monitors were positioned among visitors watching fireworks displays from the Azure Street Corridor, where both formal and informal fireworks originating in Morro Bay and Cayucos could be viewed conveniently. Another WSP monitor was positioned at the Highway 41 Corridor. CSP presence on Morro Strand reduced the incidents of illegal fireworks and foot traffic inside symbolically fenced habitat. At the time of the fireworks display approximately 210 people were at the Azure Street Corridor. Rangers contacted dog owners, people with fireworks on the beach, and a group with a fire on the beach. A beach user igniting fireworks at the Azure Street Corridor was contacted by WSP monitors. Monitors encountered a total of ten dogs, eight on leash, accompanied by a total of 30 people. WSP monitors also contacted two groups of beach visitors, involving 12 people in all, trespassing inside the habitat. Fourth of July celebrants otherwise observed CSP regulations and respected WSP habitat boundaries. As of July 4th, there was one known active nest; however, a three egg nest was discovered on July 5th.

The 44th Annual Brian Waterbury Memorial Rock to Pier Fun Run and 2nd Rock 'n Around the Pier Half Marathon were held simultaneously on July 13th. The rock to pier run course was one way from Morro Rock to Cayucos Pier. The half marathon course included a return from Cayucos Pier back through Morro Strand with an exit and return to the beach via the Azure Street Corridor. Race organizers reported 1,072 registrants finished the rock to pier run and 222 registrants finished the half marathon. Two WSP monitors were present to ensure that the participants stayed on the wet sand, followed CSP regulations, and caused no disturbance to WSP. At the staging area before the race, all race participants were given an information sheet which included the wording, "PLEASE STAY ON THE HARD PACKED SAND. THE DUNES ARE HOME TO THE WESTERN SNOWY PLOVERS, AN ENDANGERED SPECIES. ANYONE RUNNING/WALKING IN THE DUNES WILL BE DISQUALIFIED!" and "NO DOGS ALLOWED ON RACE COURSE." All participants stayed low in wet, firm sand.

On August 21st, a research team from Kinnetic Laboratories Incorporated of Santa Cruz, California was allowed to gather sand for arsenic content analysis. The three person research team was accompanied by a WSP monitor. The crew conscientiously consulted with the WSP monitor and unflinchingly followed instructions and advice. WSP, as well as, all other shorebirds and beach visitors were minimally disrupted.

Morro Strand was patrolled by CSP Ranger staff throughout the breeding season. Sixty-five contacts were made by Rangers for illegal activities on Morro Strand. On 55 occasions, dogs were on the beach, and on one occasion, a dog was inside the symbolically fenced habitat. Rangers issued eight citations and gave 45 warnings for dog on the beach violations. The dog owner trespassing in the WSP breeding habitat was given a warning. Two dog owner contacts were with verified service dogs. There was one report of a loose dog on the beach. Rangers were unable to locate either the dog or the owner. Two people were contacted for trespassing inside the symbolically fenced habitat. Both were given warnings. One person was cited for illegal camping on the

beach, not in the habitat. Six contacts for illegal kite flying resulted in warnings. On July 11th, Rangers investigated a report of a vehicle on the beach but were unable to locate the vehicle.

Sandspit

Due to the lack of access points, the Sandspit experiences a lower intensity of recreational activity compared to many beaches. The types of recreational activity observed on the Sandspit include walking, beachcombing, horseback riding, jogging, picnicking, fishing, surfing, illegal dog walking, kayaking, and sand-boarding.

The highest concentration of recreational activities occurred at the south end of the Sandspit. Equestrians and pedestrians gained access to the beach from the Hazard Reef Trail, American Canyon Trail, Sandspit Trail, Rim Trail, and Army Road. The main pedestrian access point is the Sandspit Trail. This trail is popular with first time park visitors and is a regular route for surfers to access the ocean. In 2012, an additional pedestrian corridor was established one-quarter mile north of the Army Road Corridor. In the past, this section of habitat was notorious for wide spread foot traffic and pedestrian contacts within the habitat. Named, "Shark's Inlet Corridor," the access path has proved to be very successful in focusing pedestrian traffic, while minimizing negative impacts to sensitive areas.

Kayakers and boaters reached the Sandspit from various mainland launching areas. Maps were given to local kayak concessionaires, so they could inform their customers of the beach access corridors. Large red flags were placed on the bayside corridor entrances to guide kayakers to the non-restricted points of access. The flags were visible from most of the kayak launching areas on the mainland. In addition, laminated maps were attached to posts and symbolic fencing and both were placed on the bayside of the Sandspit at the most accessible landing spots. These maps informed individuals of their current location and the location of beach access corridors nearby. Patterns of foot traffic; however, indicated that people often ignored signs and continued west to the beach through WSP habitat. This season, only two kayakers were seen within the habitat, down from the 20 kayakers observed or contacted last season.

In 2013, monitors recorded 774 incidents of foot traffic within the WSP habitat with 80% of these incidents occurring on the southern half of the Sandspit. The actual number of people entering the habitat could be higher. Individual footprints are often difficult to count at locations where more than one person has entered the habitat. The decrease in pedestrian traffic through the habitat is credited to the establishment of the new Shark's Inlet Corridor in 2012.

Of the 21 people seen inside the habitat, ten were contacted by monitors. All but one of these incidents were on the south half of the Sandspit. On one occasion seven surfers were observed crossing through the habitat to the beach on the north Sandspit. The surfers were too far away for the monitor to contact. A CSP Ranger was dispatched and talked with the group of surfers near the South Jetty, but no citations were given. Upon

further investigation the following day, monitors located a bayside campsite with a sitting area around a burnt pallet.

Foot traffic was observed twice near fresh scrapes and once near an active nest which hatched successfully.

Driftwood forts were built outside the habitat on several different occasions on the southern half of the Sandspit. On five occasions, it was evident that people stepped into the habitat, and logs were dragged from the habitat for benches or fort construction. In addition, there were two recorded cases of illegal fire pits with scattered trash outside the habitat.

Monitors made 12 dog contacts. An additional two dogs and their owners were too far away to be contacted. All except one of the dog contacts and sightings were on the south half of the Sandspit. Dog tracks were observed seven times within the habitat and 12 times outside the habitat, often accompanied by human tracks. This total of 19 observed dog tracks decreased from the 27 documented in 2012.

During the breeding season, 134 equestrians were sighted by monitors. All but 11 of these equestrians were seen on the southern half of the Sandspit. The number of equestrians observed was significantly lower than the 373 riders documented in 2012. Contacts with equestrians were positive but infrequent. This season, there were no recorded incidents of horses knocking down the symbolic fence or of equestrian tracks within the habitat. However, long stretches of equestrian tracks, inches away from the symbolic fencing were observed on several occasions. There was only one incident of horses travelling where they are not allowed. This was on the Sandspit Access Trail which is reserved for pedestrian traffic only. The horse appeared to take a short cut off the pedestrian trail and took down a portion of a retaining wall.

No incidents of vandalism were recorded on the Sandspit this season.

On July 4th, two monitors were on the Sandspit for about five hours in the afternoon until the evening. Monitoring was also conducted on the days surrounding the July 4th holiday. The northern Sandspit was considered very quiet from July 3rd through July 5th. No foot traffic was recorded within the habitat and not one person was seen while the monitor was present on the beach those days. On July 4th, on the southern half of the Sandspit, the monitor made one public contact and one dog contact. No more than 15 people were observed during the five hours the monitor was on the beach. On July 5th, the monitor again made one public contact and one dog contact. In addition, eight incidents of foot traffic were counted.

During the 2013 breeding season, two instances involving law enforcement occurred on the southern portion of the Sandspit. On April 9th, the Sheriff's bomb squad detonated one box of unused Navy signal flares. The flares had washed up outside the southern end of the symbolically fenced habitat near the American Canyon Trail.

The second incident occurred on May 29th when a panga boat carrying illegal cargo beached itself on the south Sandspit. The boat landed 50 yards south of the fenced WSP habitat by the Cables Trail. During the night, suspects hauled the illegal cargo up a very steep and sandy trail to where vehicles were waiting. In the morning, authorities apprehended the suspects with cargo along Los Osos Valley Road. A WSP monitor was present when Homeland Security's contract personnel removed the 40 foot boat and debris off the beach on May 30th. Prior to the boat removal, monitors surveyed the area for WSP nests, but none were found. A large dozer, 4WD trucks, and a flatbed trailer were used to haul the boat off the beach. The event caused no environmental impacts to the sensitive area.

On July 23rd, a WSP monitor encountered a lost kayaker stranded on the southern portion of the beach about 30 yards south of the symbolically fenced habitat. The WSP monitor facilitated contact with the California Department of Forestry and Fire Protection, United States Coast Guard, and CSP Rangers who were all involved in a joint search and rescue operation.

On September 21st, concurrently with the 2013 California Coastal Cleanup (See Volunteer Efforts section for details) SLOSAR conducted a volunteer training exercise at MDO. WSP monitors encountered three trainees including a K-9 team, dog on leash, near Rescue Marker One. The point of the encounter was well outside the search area for the exercise. WSP monitors advised him that he was outside the search area. Follow-up investigation by SLOSAR revealed that the K-9 unit was indeed outside of the training exercise boundaries. SLOSAR was very thorough in the investigation of the incident and sincerely apologetic.

The Sandspit was patrolled by CSP Ranger staff throughout the breeding season. On five occasions, Rangers investigated reports of illegal activities. Two contacts were made by Rangers for dogs on the Sandspit. One violator was given a warning. The other was issued a citation. Rangers were unable to locate one reported person with a dog on the beach. And one person was given a warning for a fire on the beach.

CONCLUSIONS

In 2013, San Luis Obispo Coast District continued to work towards reaching its WSP recovery goals. The range-wide breeding window survey determined the minimum number of WSP adults on District beaches were 58 males, 62 females, and eight unidentified adults. The first nest was initiated on March 21st, and the last nest was discovered on July 29th. The first nest hatched on April 23rd, and the last nest hatched on August 16th. The WSP breeding season hatched 96 of 185 known fate clutches, for a 52% hatch rate. Four nests had unknown fates this season. The total number of nests at 189 was below the average of 223. The hatch rate was very near the average of 47%. (Appendix 8d) Two hundred twenty-six chicks hatched from the 96 successful nests. The main cause of nest failure was depredation. The main predators were varied

according to specific beaches. The most frequent depredation at Villa Creek Beach was by unknown predator. At Morro Strand, it was red fox and unknown avian at the Sandspit. (Appendix 10) Striped skunk flourished at Villa Creek Beach and Morro Strand this year. All of the depredations combined accounted for 25% of the nest fates – much lower than the average of 31% and tied for second lowest since records were kept starting in 2001. Nine percent of the nests were lost because of wind. Eight percent of the nests were abandoned. Tidal wash destroyed seven percent.

Funding for the 2013 WSP season was provided by Proposition 12 Natural Heritage Stewardship Program Bond, CSP Natural Resources Maintenance funding, and District Home Base funding. Approximately \$69,000 was spent on the WSP program this season. This amount does not include the WSP Coordinator's time.

Other than the banded WSP and salvaged eggs, the 2013 WSP annual report does not include WSP data from the City property.

Future Management

Following in non-prioritized order is what the District would like to accomplish with future WSP management efforts. These objectives may change and be prioritized depending on available funding. In order to maintain and improve nest success for future years, it is important to maintain and improve the management of the WSP program. The goal of increasing the numbers of breeding adult WSP and providing long-term protection of breeding and wintering WSP and their habitat is a priority for the District.

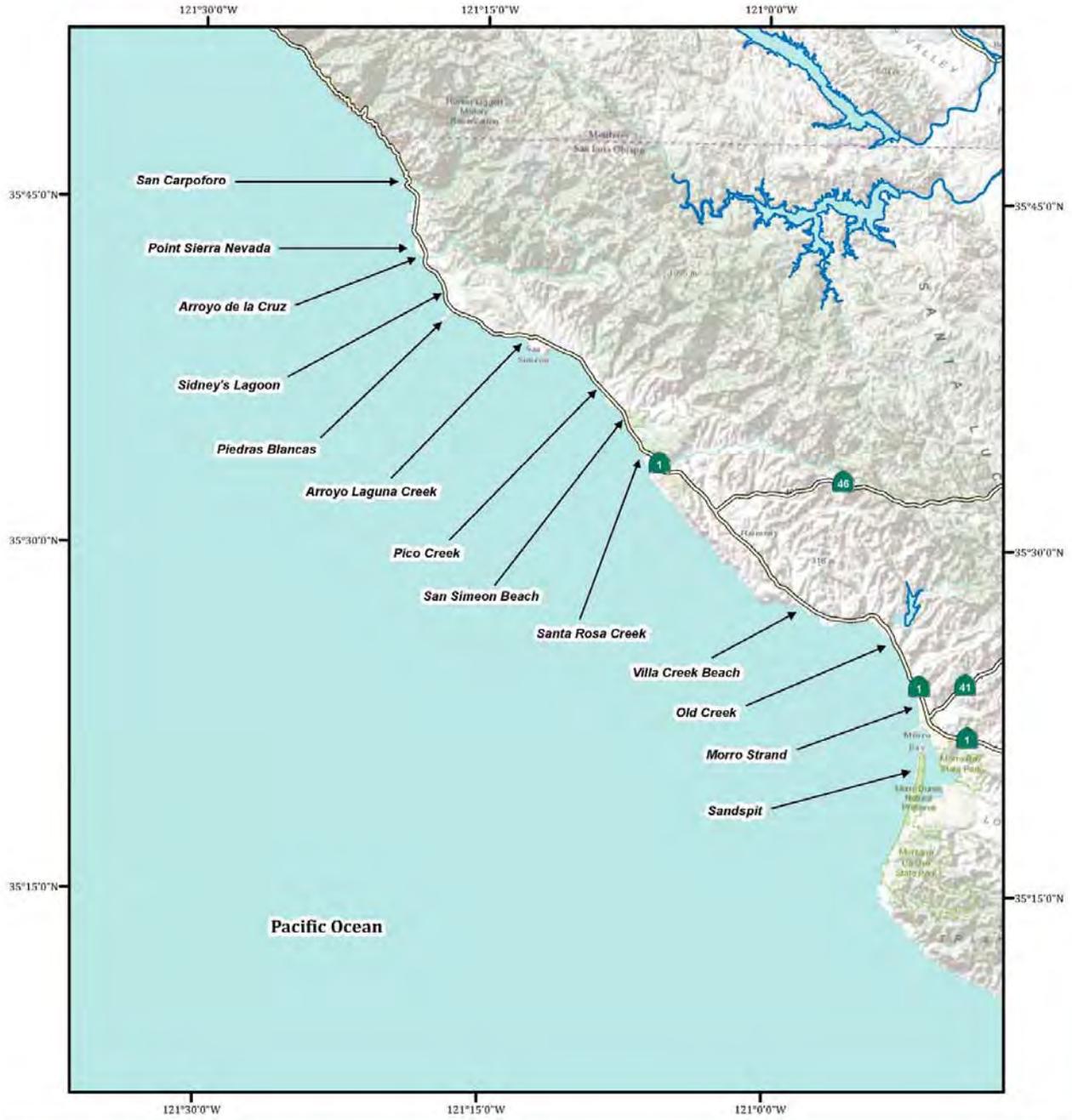
1. Continue monitoring efforts during the breeding and non-breeding seasons. Maintain a core of permitted monitors who possess field experience within the District. Continue managing for the protection of nesting and wintering habitat for WSP and other shorebirds.
2. Continue symbolic fencing and sign (both regulatory and children's) installation along WSP nesting habitat to keep recreation out of closed areas and control access points during the breeding season. Continue installing brightly colored WSP signs at the access corridors on District beaches to make the corridors more visible.
3. Continue to move towards fulfilling USFWS WSP Recovery Plan management recommendations.
4. Continue predator management control actions to remove problematic species. Continue utilizing wildlife cameras at appropriate locations to determine target species responsible for predations of nests and adult WSP.
5. Continue informational training on WSP for CSP staff and volunteers at the beginning of the WSP season and at the beginning of summer.

6. Continue cooperation with agencies and others using vehicles on the beach to keep vehicle use on wet sand and at a slow speed for the protection of breeding and wintering WSP and other shorebirds.
7. Ensure all corridors, facilities, and actions are compliant with Americans with Disabilities Act and California Environmental Quality Act guidelines.
8. Maintain involvement with range-wide and Recovery Unit Five recovery efforts for the WSP.
9. Complete Predator Management Plan for the District.
10. Continue including CSP Ranger staff in weekly WSP meetings to increase communication and coordination within the District for achieving our WSP recovery goals.
11. Continue to visit other WSP areas to learn about how other programs are managed and monitored.
12. Provide monitors with necessary training to “float eggs” so that approximate hatch dates can be determined.
13. Continue enforcement of CSP regulations throughout the year. Continue daily vehicle patrols by CSP Ranger staff to enforce rules and regulations affecting WSP habitat (i.e., dogs on beach, illegal fires, people inside closed nesting habitat, and kite flying or kite boarding). Increased patrols will give the public a sense of authoritative presence on the beach.
14. Continue exotic plant removal program to create more WSP habitat.
15. Continue to erect ten by ten single-nest enclosures as part of predator management at Morro Strand on a case by case basis. Utilize mini enclosures at Villa Creek Beach and the Sandspit, if avian predators are an issue.
16. Continue to install perch deterrents, such as spikes, to the top of ten by ten single nest enclosures, in order to prevent perching by species such as Red-tailed Hawk and Peregrine Falcon.
17. Continue to investigate remedies with the City for the removal of American Crows from Morro Strand.
18. Expand the volunteer outreach program to target beach users before they enter the beach. People are more likely to cooperate with closures, if they are informed.
19. Increase communications with Morro Bay High School regarding beach use restrictions and project objectives during the WSP nesting season.

20. Continue with increased staff and volunteers for July 4th to prevent disturbance to nesting WSP and to educate park visitors.
21. Continue having a WSP informational binder at the campground kiosks to aid in educating the campers.
22. Continue installing “no dog” signs close to the mean high tide line at the southern boundary of Morro Strand to inform dog owners walking north from the City beach that dogs are not allowed past this point. Also, maintain “no dog” signs at the northern boundary of Morro Strand at North Point.
23. Inform Coast Mounted Assistance, horse rental agencies, and any other local horse groups before the WSP season starts about the rules and regulations for equestrians on the beaches. Have WSP informational flyers available for equestrians.
24. Continue marking corridors on the east side (bayside) of the Sandspit utilizing signage, and flags marking the corridors and continue to provide accurate maps to the kayak rental businesses.
25. Continue partnership with the City in assisting them with their fence installation and removal.
26. Create permanent corridor fencing along Morro Strand similar to the one installed at the Morro Strand Campground using posts and cables.
27. Provide training to monitors on how to operate wildlife cameras near WSP nests with minimal disturbance to WSP.

Appendix 1 – Site Maps

San Luis Obispo Coast District Western Snowy Plover Habitat

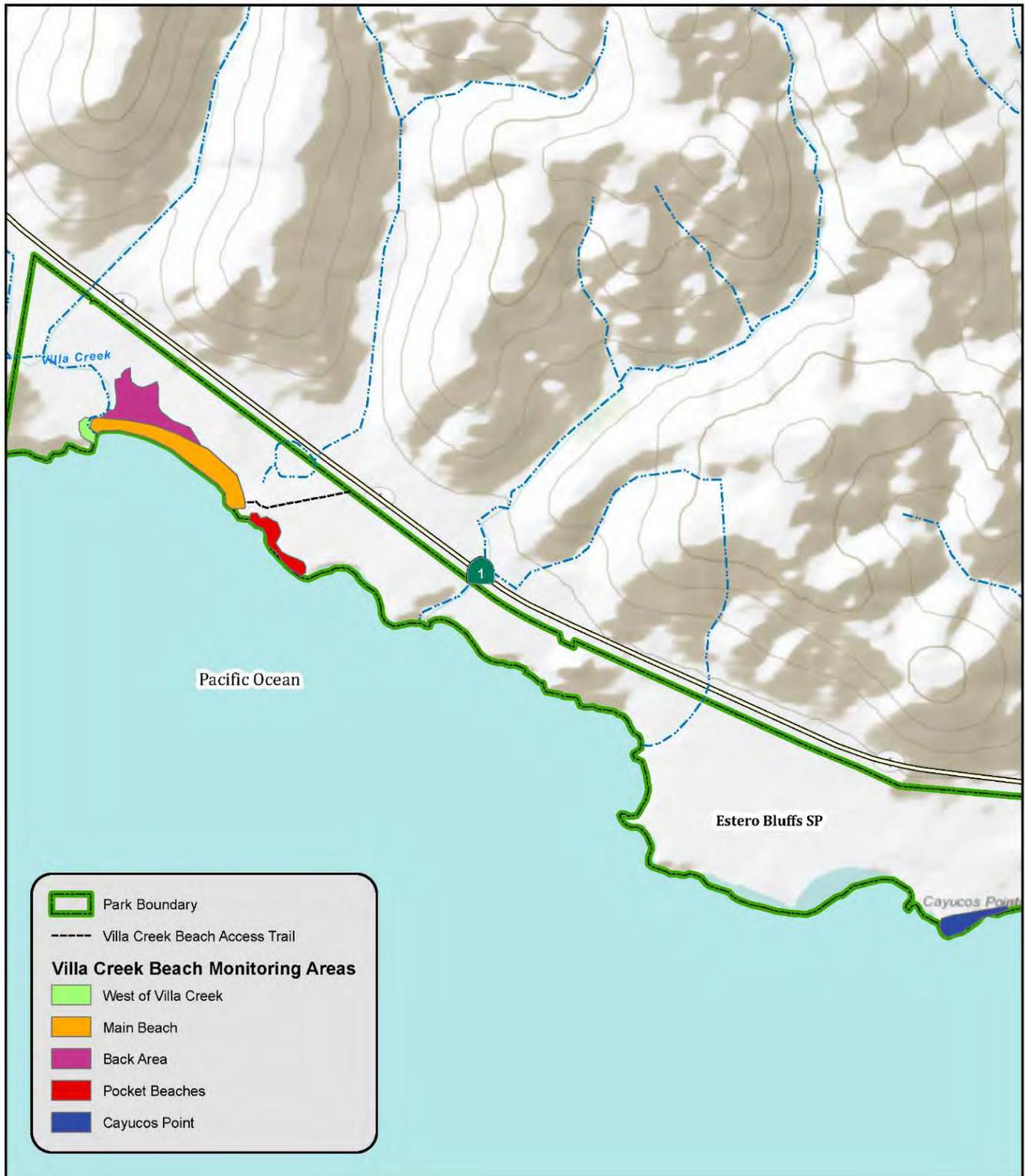


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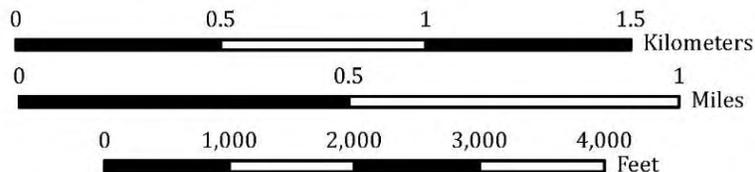
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California State Parks
Jeff Ebner
September 1, 2012

Esteros Bluffs State Park



Jeff Ebner
September 1, 2012



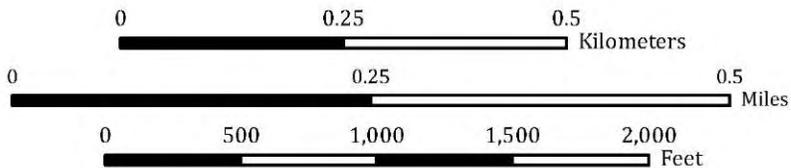
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Morro Strand State Beach Northern Unit: Old Creek



Jeff Ebner
September 1, 2012

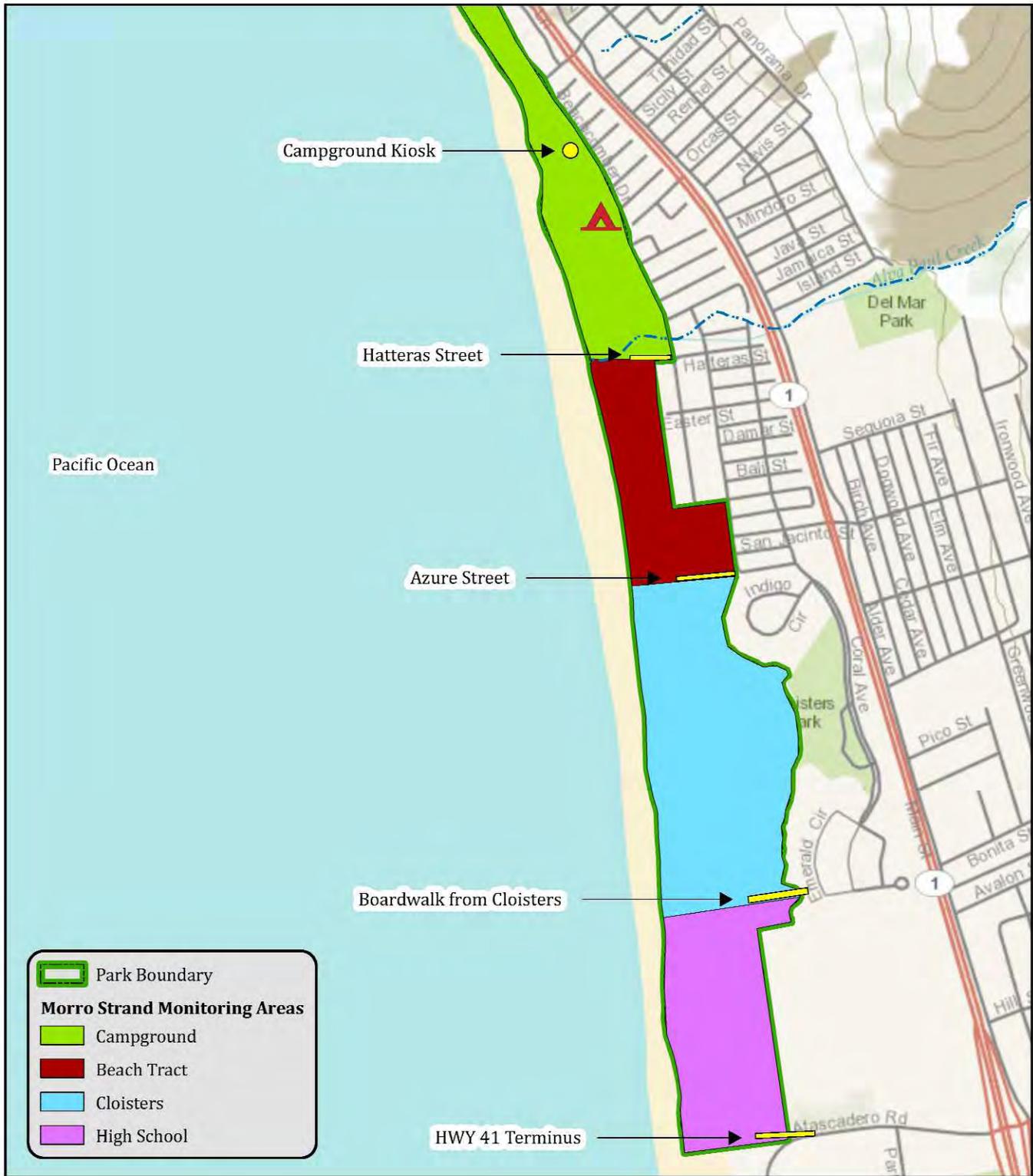


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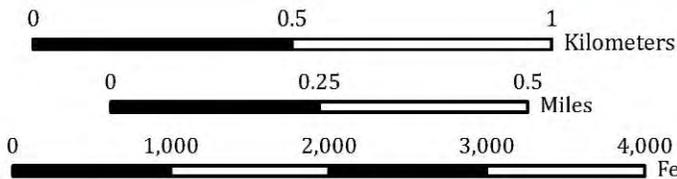


Morro Strand State Beach

Southern Unit: Morro Strand



Jeff Ebner
September 1, 2012



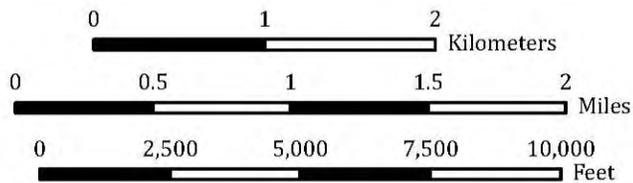
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Montaña de Oro State Park Sandspit



Jeff Ebner
September 1, 2012

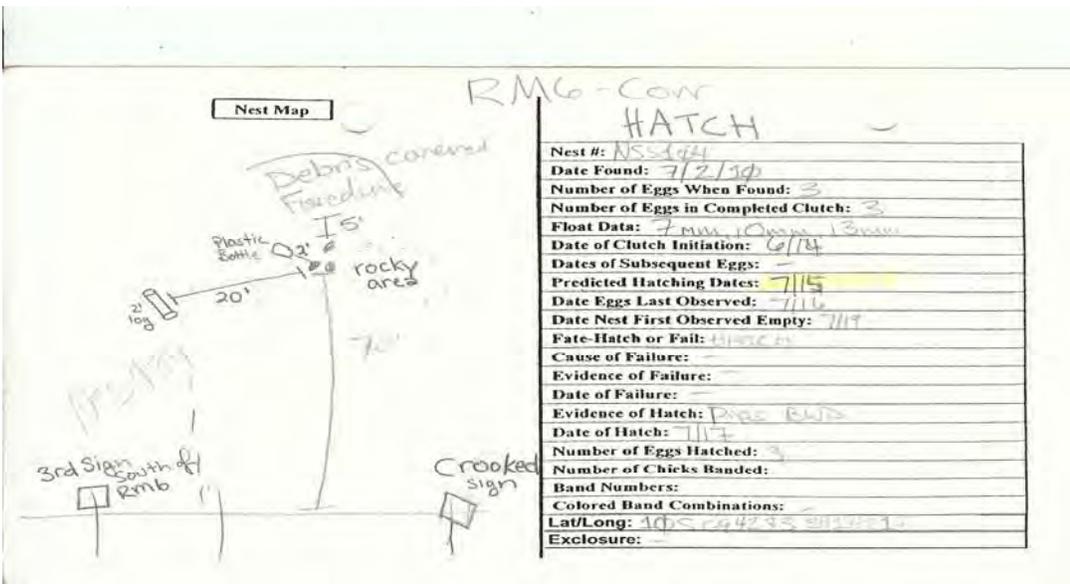
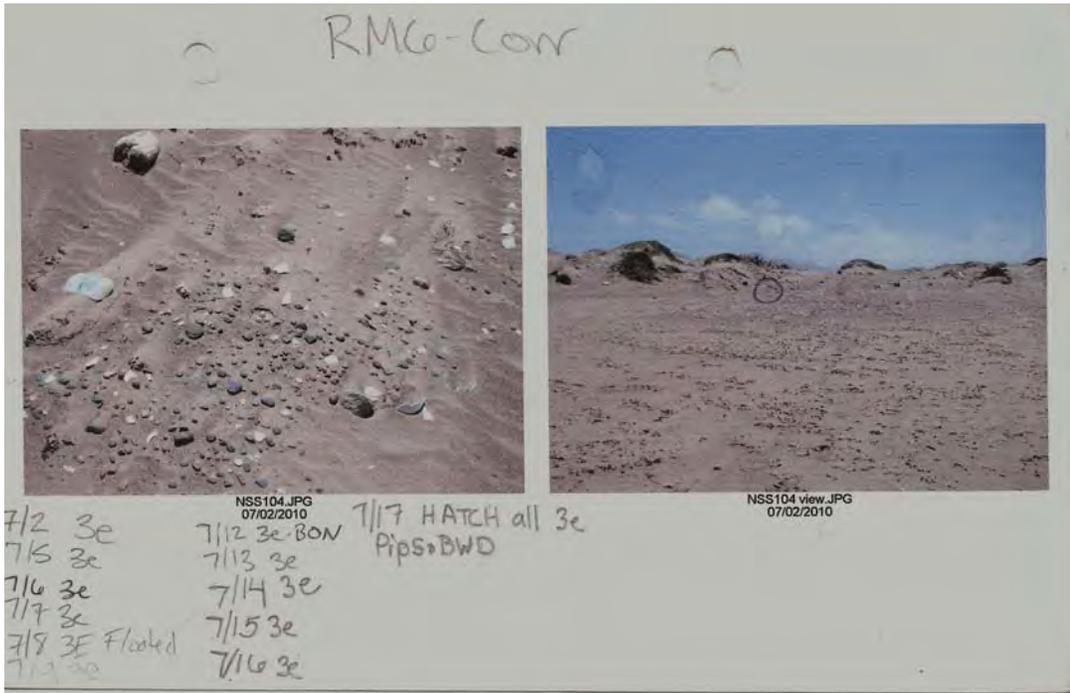


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Appendix 2 – Nest Card Example

Nest Card from nest number NSS104, found on the north half of the Sandspit between Rescue Marker Six and the CSP Corridor.



3e=3eggs; BON= Bird on nest; BWD=Broken wing display;
Pips=shell fragments found after hatch

Appendix 3 -- WSP Population Census Data on District Beaches October 2012-September 2013

Date	Hearst San Simeon State Park	San Carpofofo	Pt. Sierra Nevada	Arroyo De La Cruz	Sidney's Lagoon	Piedras Blancas	Arroyo Laguna North	Arroyo Laguna South	San Simeon Creek	Villa Creek Beach	M	F	Unknown	Juvenile	Chick	Old Creek	Morro Strand	M	F	Unknown	Juvenile	Chick	Sandspit	M	F	Unknown	Juvenile	Chick
10/17/12	78	27	-	0	7	0	-	34	10	41	-	-	41	-	-	0	118	-	-	118	-	-	103	2	-	99	2	-
11/20/12	86	0	-	0	1	0	-	68	17	25	-	-	25	-	-	0	122	-	-	122	-	-	60	-	-	60	-	-
12/17/12	63	0	0	0	11	0	-	-	52	11	-	-	11	-	-	0	38	-	-	38	-	-	141	-	-	141	-	-
12/19/12	84	-	-	-	8	-	0	63	13	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-
1/22/13*	34	1	0	-	0	-	-	0	33	33	-	-	33	-	-	0	81	-	-	81	-	-	50	-	-	50	-	-
02/14/13	0	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
02/20/13	89	0	0	0	0	0	0	0	89	4	2	2	-	-	-	0	83	-	-	83	-	-	44	-	-	44	-	-
03/26/13	-	-	-	-	-	-	-	-	-	19	6	13	-	-	-	-	85	31	36	18	-	-	57	24	26	7	-	-
04/25/13	-	-	-	-	-	-	-	-	-	12	6	6	-	-	-	-	8	6	2	-	-	-	76	31	44	1	-	2
05/21/13*	9	4	-	-	1	-	-	3	1	11	6	5	-	-	-	-	7	3	4	-	-	-	101	49	51	1	-	12
06/18/13	-	-	-	-	-	-	-	-	-	15	7	6	-	2	-	-	6	4	1	-	1	1	91	40	31	8	12	12
07/18/13	-	-	-	-	-	-	-	-	-	13	4	4	1	4	-	-	11	5	5	-	1	-	109	37	35	17	20	11
08/15/13	43	-	-	-	0	-	-	23	20	24	3	2	17	2	-	-	13	-	1	5	7	-	183	17	6	131	29	-
09/19/12	62	11	-	-	0	0	25	0	26	28	-	1	27	-	-	-	29	-	-	29	-	-	197	1	2	131	63	-
Note: Totals do not include chicks																												
Note: Sandspit data does not include City property																												
* Indicates range-wide window survey																												

Appendix 4 - Banded WSP With Known Origins Observed on District Beaches October 2012 - February 2013

Band Combination	Sex	First Seen	Last Seen	# Times Seen	History	Location	Notes
--:RV	F	10/17/12	2/20/13	6	Salinas NWR, '06	Sidney's Lagoon, Arroyo Laguna, San Simeon, Sandspit	
--:YG	U	10/23/12	10/31/12	2	VAFB, '11	Morro Strand	Formerly NB:YG
A:G/Y	J	10/17/12	11/20/12	5	VAFB, '12	Morro Strand	
AA:LW	J	11/20/12	11/20/12	1	Moss Landing Salt Ponds, '12	Arroyo Laguna	
AB:GO	U	11/20/12	11/20/12	1	Salinas NWR, '11	Arroyo Laguna	
AK:AY	J	12/15/12	12/17/12	2	San Francisco, '12	Sandspit	
AY:LL	J	10/17/12	11/1/12	5	Moss Landing Salt Ponds, '12	Morro Strand, Sandspit	
B:PR	F	10/17/12	1/26/13	7	ODSVRA, '10	Morro Strand	
BB:YB	U	11/20/12	11/20/12	1	ODSVRA, '11	Arroyo Laguna	
GA:OB	U	11/20/12	1/22/13	4	ODSVRA, '10	Villa Creek Beach	
GA:VR	F	10/17/12	2/20/13	5	ODSVRA, '09	Morro Strand	
GG:PB	J	11/20/12	2/20/13	5	ODSVRA, '12	Arroyo Laguna, San Simeon, Morro Strand	
GG:YR	J	10/17/12	1/26/13	7	ODSVRA, '12	Morro Strand	
GO:WY	J	10/17/12	12/4/12	8	Fort Ord, '12	San Simeon, Morro Strand	
GS:--	U	12/4/12	12/4/12	1	Guadalupe, '05	San Simeon	Right foot missing
LO:RO	U	11/20/12	12/19/12	3	Salinas NWR, '11	Arroyo Laguna	
NB:OW	U	12/4/12	2/20/13	2	VAFB, '11	San Simeon	Blue tape peeling off, N appears as R
NB:YG	U	10/17/12	10/23/12	3	VAFB, '11	Morro Strand	Injured, left leg removed, now --:YG
NO:AB	J	12/15/12	12/17/12	2	VAFB, '12	Sandspit	
NS:YR	U	11/20/12	12/4/12	2	VAFB	Arroyo Laguna	Year unknown with missing tape
NW:NR	J	10/31/12	11/20/12	2	VAFB, '12	Morro Strand	
NW:RR	J	11/8/12	2/20/13	3	VAFB, '12	Morro Strand, Sandspit	
NW:YR	J	12/19/12	12/19/12	1	VAFB, '12	Arroyo Laguna	
NY:OR	J	10/17/12	12/19/12	4	VAFB, '12	Arroyo Laguna	
O/Y:B	J	12/4/12	12/4/12	1	Oregon, '12	San Simeon	
OA:AA	F	11/20/12	1/22/13	4	Fort Ord Reservation Road, '10	Villa Creek Beach, Morro Strand	
OA:BW	J	10/23/12	11/2/12	2	Zmudowski SB, '12	Morro Strand	
OA:WW	U	1/19/13	1/19/13	1	Salinas NWR, '12	San Simeon	
OL:B	U	12/4/12	1/22/13	4	Salinas SB, '09	Arroyo Laguna, San Simeon	Formerly OL:BP
oO:BY	F	10/17/12	2/20/13	3	Monterey adult, '11	Sandspit	
P:AG	F	10/17/12	1/22/13	5	ODSVRA, '08	Villa Creek Beach	
PG:BR	J	11/2/12	2/26/13	5	ODSVRA, '12	Morro Strand, Sandspit	
PR:BA	U	12/17/12	12/17/12	1	Moss Landing Salt Ponds, '10	Morro Strand	

Appendix 4 - Banded WSP With Known Origins Observed on District Beaches October 2012 - February 2013

Band Combination	Sex	First Seen	Last Seen	# Times Seen	History	Location	Notes
PR:BO	U	11/2/12	1/19/13	3	Moss Landing Salt Ponds, '11	San Simeon, Morro Strand	
PR:GL	J	11/20/12	12/19/12	3	Salinas NWR, '12	Arroyo Laguna, San Simeon	
PV:W	M	10/23/12	2/20/13	4	ODSVRA, '08	Morro Strand	Formerly PV:PW
RG:YB	U	10/17/12	1/22/13	6	Oregon, '11	Morro Strand, Sandspit	
RR:WW	M	11/2/12	12/17/12	2	ODSVRA, '10	Morro Strand, Sandspit	
RR:YB	F	10/17/12	10/23/12	2	ODSVRA, '11	Morro Strand	
RR:YY	U	10/17/12	10/17/12	1	ODSVRA, '10	Sandspit	
rW:BR	M	12/4/12	1/20/13	4	Zmudowski SB, '09	San Simeon, Morro Strand	
VG:VR	U	10/29/12	11/8/12	5	ODSVRA, '11	Morro Strand	
WA:R	U	10/17/12	2/20/13	5	Bandon SB, Oregon '12	Arroyo Laguna, San Simeon	
WP:RL	J	10/23/12	1/22/13	8	Salinas NWR, '12	Morro Strand	Pink looks like white or natural
WY:GW	J	10/17/12	2/20/13	7	Moss Landing Salt Ponds, '12	Morro Strand, Sandspit	
YA:OY	F	10/17/12	2/25/13	4	Salinas SB, '10	Sandspit	
yG:OY	U	11/20/12	11/20/12	1	Salinas NWR, '10	Sandspit	
YP:WO	U	10/22/12	1/22/13	7	Salinas SB, '11	Morro Strand	
YY:OA	F	11/1/12	12/17/12	2	Moss Landing Salt Ponds, '10	Morro Strand, Sandspit	

Appendix 5 - Banded WSP With Known Origins Observed on District Beaches March - September 2013

Band Combination	Sex	First Seen	Last Seen	# Times Seen	History	Location	Notes
:AG	F	6/20/13	9/26/13	49	ODSVRA, '08	Villa Creek Beach	Formerly P:AG; three nests; one hatched
--:RV	F	3/18/13	4/4/13	6	Salinas NWR, '06	Sandspit	
AA:LW	U	8/15/13	8/15/13	1	Moss Landing Salt Ponds, '12	Arroyo Laguna	
AA:OG	J	8/21/13	8/21/13	1	Salinas NWR, '13	Villa Creek Beach	
AA:WG	J	8/23/13	9/12/13	2	Salinas NWR, '13	Sandspit	
AK:AY	F	3/4/13	3/31/13	9	San Francisco, '12	Sandspit	
AR:OY	J	7/30/13	8/8/13	3	Fort Ord, '13	Sandspit	
AR:YG	J	8/15/13	9/30/13	10	Salinas SB, '13	Villa Creek Beach, Morro Strand, Sandspit	
B:PR	F	3/7/13	9/19/13	6	ODSVRA, '10	Morro Strand, Sandspit	
B/A/B:Y	J	9/20/13	9/20/13	1	Oregon, '13	Sandspit	
BB:AY	U	9/20/13	9/20/13	1	ODSVRA, '11	Sandspit	
BB:BW	J	9/17/13	9/17/13	1	ODSVRA, '13	San Carpoforo	
BB:BY	J	8/26/13	8/26/13	1	ODSVRA, '13	Sandspit	
BB:YB	J	7/23/13	7/27/13	3	ODSVRA, '13	Morro Strand	
BO:GG	F	4/11/13	4/11/13	1	Salinas NWR, '12	Sandspit	
BW:WR	U	9/5/13	9/10/13	2	Salinas NWR, '12	Morro Strand, Sandspit	
GA:AG	J	9/3/13	9/19/13	4	ODSVRA, '13	Villa Creek Beach, Sandspit	
GA:BB	J	8/15/13	8/15/13	1	ODSVRA, '13	Sandspit	
GA:BW	J	8/8/13	8/21/13	4	ODSVRA, '13	Sandspit	
GA:GG	J	8/26/13	8/26/13	1	ODSVRA, '13	Villa Creek Beach	
GA:GW	J	8/1/13	8/15/13	3	ODSVRA, '13	Arroyo Laguna, Sandspit	
GA:VB	J	8/19/13	9/10/13	3	ODSVRA, '13	Morro Strand, Sandspit	
GA:VR	F	3/7/13	9/19/13	43	ODSVRA, '09	Morro Strand, Sandspit	One nest on City owned portion of Sandspit hatched
GA:YW	J	9/12/13	9/12/13	1	ODSVRA, '13	Sandspit	
GB:AY	J	7/30/13	7/30/13	1	Salinas SB, '13	Sandspit	
GG:AW	J	9/3/13	9/17/13	4	ODSVRA, '13	Sandspit	
GG:BR	J	8/28/13	9/19/13	3	ODSVRA, '13	Morro Strand	
GG:GR	J	9/19/13	9/20/13	2	ODSVRA, '13	Sandspit	
GG:OW	M	8/28/13	8/30/13	2	ODSVRA, '09	Sandspit	

Appendix 5 - Banded WSP With Known Origins Observed on District Beaches March - September 2013

Band Combination	Sex	First Seen	Last Seen	# Times Seen	History	Location	Notes
GG:PB	J	9/17/13	9/17/13	1	ODSVRA, '13	Arroyo Laguna	
GG:VW	J	9/3/13	9/3/13	1	ODSVRA, '13	Sandspit	
GG:WB	J	8/9/13	9/3/13	6	ODSVRA, '13	Sandspit	
GG:YR	F	3/11/13	8/30/13	28	ODSVRA, '12	Villa Creek Beach, Morro Strand, Sandspit	Two nests hatched on Sandspit
L:O/G	J	9/20/13	9/20/13	1	VAFB, '13	Sandspit	
LO:RO	M	3/7/13	3/7/13	1	Salinas NWR, '11	San Simeon	
LW:W	M	3/19/13	3/19/13	1	Oregon, '10	Morro Strand	
NO:AB	M	3/4/13	9/20/13	19	VAFB, '12	Villa Creek Beach, Sandspit	
NO:AR	J	8/21/13	8/23/13	2	VAFB, '13	Villa Creek Beach	
NO:AW	J	9/12/13	9/12/13	1	VAFB, '13	Sandspit	
NO:BY	J	9/5/13	9/12/13	3	VAFB, '13	Morro Strand, Sandspit	
NO:NY	J	9/12/13	9/19/13	2	VAFB, '13	Sandspit	
NO:WY	J	9/10/13	9/20/13	5	VAFB, '13	Sandspit	
NR:GR	J	7/18/13	7/18/13	1	VAFB, '13	Sandspit	
NR:NR	J	7/3/13	7/4/13	2	VAFB, '13	Sandspit	
NR:NY	J	7/3/13	9/17/13	4	VAFB, '13	Arroyo Laguna, San Simeon, Villa Creek Beach, Sandspit	
NR:RG	J	6/26/13	6/26/13	1	VAFB, '13	Sandspit	
NR:YR	J	6/26/13	7/5/13	3	VAFB, '13	Sandspit	
NS:RR	F	3/19/13	9/19/13	20	VAFB, '12	Sandspit	Missing tape; most likely NW:RR; two nests; one hatched
NW:OB	U	8/15/13	9/17/13	3	VAFB, '05	San Simeon, Sandspit	L:GWG reband
NW:YR	F	3/7/13	3/7/13	1	VAFB, '12	Sandspit	N appears as faded O; W tape peeling appearing as N
NW:YY	U	8/15/13	9/12/13	5	VAFB, '05	Morro Strand, Sandspit	Reband of G:WRW
NY:--	F	6/27/13	8/15/13	13	VAFB, '08	Morro Strand	
NY:NG	F	6/27/13	6/27/13	1	VAFB, '12	Villa Creek Beach	
NY:OR	F	4/9/13	4/9/13	1	VAFB, '12	Arroyo Laguna	
NY:PB	M	5/21/13	7/27/13	13	VAFB, '12	Morro Strand, Sandspit	
NY:YY	F	3/19/13	7/15/13	20	VAFB, '12	Sandspit	Two nests; one hatched
OA:AA	F	3/7/13	3/22/13	5	Fort Ord, '10	Morro Strand	
OA:YG	U	8/15/13	8/16/13	2	Moss Landing Salt Ponds, '11	Morro Strand	Another banded with same combination at Zmudowski SB, '11

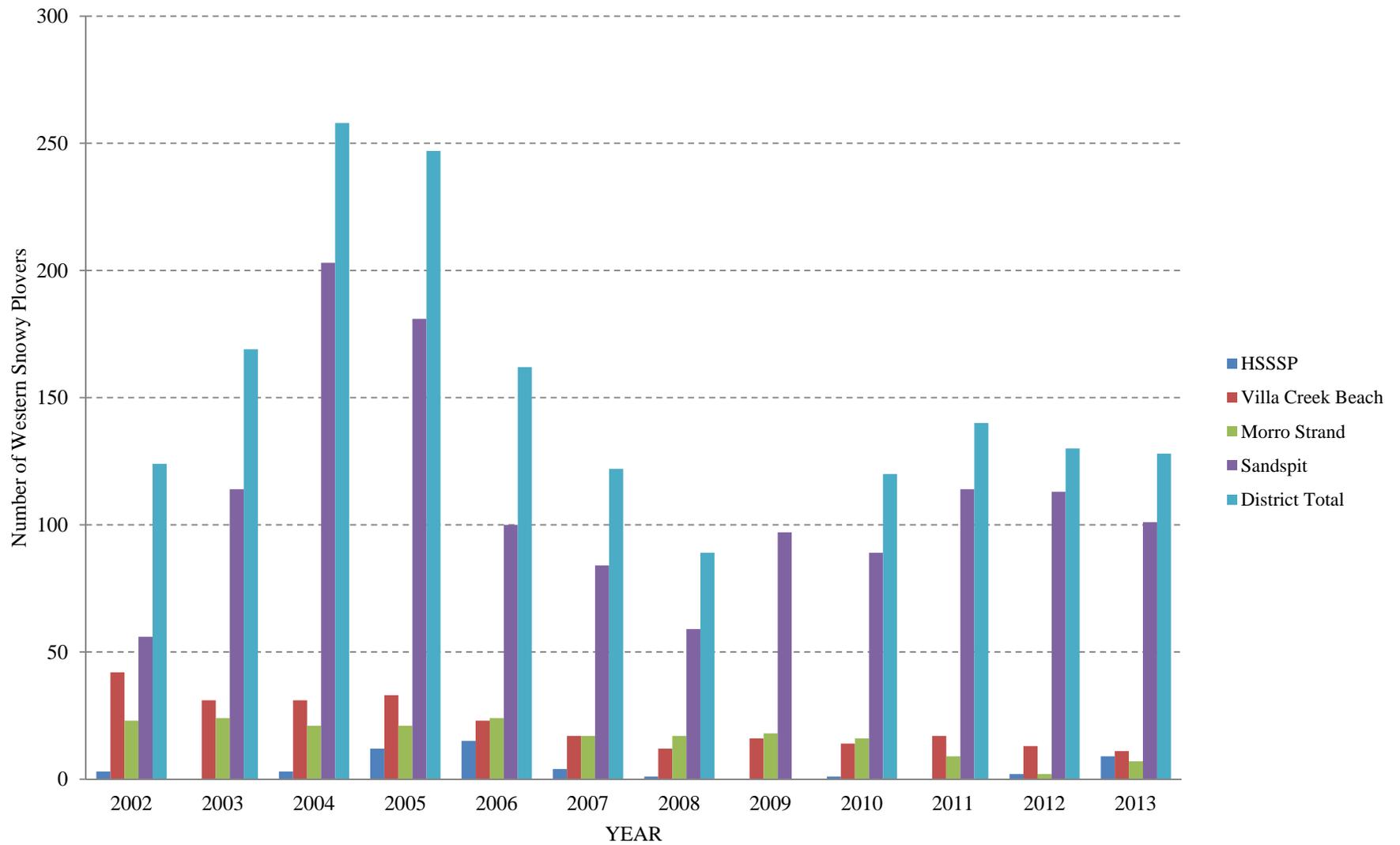
Appendix 5 - Banded WSP With Known Origins Observed on District Beaches March - September 2013

Band Combination	Sex	First Seen	Last Seen	# Times Seen	History	Location	Notes
OA:YR	U	8/23/13	8/23/13	2	Salinas SB, '11	Sandspit	
OB:AG	J	9/5/13	9/5/13	1	Zmudowski SB, '13	Morro Strand	
OG:WW	J	9/12/13	9/19/13	2	Salinas SB, '13	Sandspit	
OG:YR	U	3/19/13	3/19/13	1	Moss Landing Salt Ponds, '10	Morro Strand	
OL:B	M	4/9/13	4/9/13	1	Salinas SB, '09	Arroyo Laguna	Formerly OL:BP
oO:BY	M	7/25/13	9/17/13	15	Monterey, '11	Sandspit	
OO:WY	J	8/23/13	9/3/13	3	Salinas SB, '13	Sandspit	
P:AG	F	3/7/13	6/19/13	70	ODSVRA, '08	Villa Creek Beach, Morro Strand	Three nests at Villa Creek Beach; one hatched
P:Y/G	U	5/20/13	9/20/13	13	VAFB, '12	Sandspit	
PB:LL	M	3/30/13	7/8/13	8	Moss Landing Salt Ponds, '12	Morro Strand, Sandspit	
PG:BR	F	3/12/13	4/3/13	10	ODSVRA, '12	Villa Creek Beach, Morro Strand	
PR:BO	F	3/7/13	3/7/13	1	Moss Landing Salt Ponds, '11	San Simeon	
PR:GL	F	3/7/13	3/7/13	1	Salinas NWR, '12	San Simeon	
PV:W	M	3/7/13	9/5/13	38	ODSVRA, '08	Morro Strand, Sandspit	Formerly PV:PW; one successful nest at Morro Strand
R:W/R/W	J	8/26/13	8/26/13	1	VAFB, '13	Sandspit	
RA:AG	J	8/5/13	8/5/13	1	Fort Ord, '13	Sandspit	
RG:YB	F	3/6/13	9/19/13	15	Oregon, '11	Morro Strand, Sandspit	
RR:VB	U	3/12/13	3/12/13	1	ODSVRA, '10	Morro Strand	
RR:WW	M	3/7/13	9/19/13	53	ODSVRA, '10	Sandspit	One nest hatched
RR:YB	U	8/21/13	8/21/13	1	ODSVRA, '11	Sandspit	
RR:YR	F	6/7/13	8/12/13	2	ODSVRA, '10	Sandspit	
RW:BO	M	4/18/13	4/18/13	1	Marina SB, '11	Villa Creek Beach	
rW:BR	M	4/9/13	4/9/13	1	Zmudowski SB, '09	San Carpoforo	Part of a pair
S:--	M	3/22/13	6/26/13	5	Oregon	Sandspit	Several banded this way over the years; part of a pair
VG:BY	J	9/19/13	9/20/13	2	ODSVRA, '13	Sandspit	
VG:VR	F	8/23/13	9/19/13	9	ODSVRA, '11	Sandspit	
VV:GR	F	4/30/13	7/15/13	14	ODSVRA, '12	Sandspit	Possible nest
VV:OB	J	9/10/13	9/19/13	2	ODSVRA, '13	Morro Strand, Sandspit	
VV:OW	U	9/3/13	9/3/13	1	ODSVRA, '09	Sandspit	
VV:WB	J	9/3/13	9/5/13	2	ODSVRA, '13	Morro Strand	

Appendix 5 - Banded WSP With Known Origins Observed on District Beaches March - September 2013

Band Combination	Sex	First Seen	Last Seen	# Times Seen	History	Location	Notes
WA:AY	F	3/4/13	3/4/13	1	Zmudowski SB, '10	Sandspit	
WA:R	U	8/15/13	9/17/13	2	Oregon, '12	San Simeon	
WB:RL	F	4/11/13	9/19/13	22	Fort Ord, '12	Sandspit	
WO:WR	J	8/28/13	9/30/13	7	Salinas NWR, '13	Morro Strand, Sandspit	
WP:RL	F	3/19/13	9/17/13	43	Salinas NWR, '12	Morro Strand, Sandspit	One nest hatched at Morro Strand
WR:--	M	7/12/13	7/12/13	1	Fort Ord, '08	Sandspit	Formerly WR:BR
WR:BR	M	3/11/13	7/11/13	23	Fort Ord, '08	Sandspit	One nest hatched; injured right leg -- see Appendix 8
W/R:Y	J	9/19/13	9/19/13	1	Oregon, '13	Sandspit	
WY:GW	F	3/6/13	4/1/13	10	Moss Landing Salt Ponds, '12	Sandspit	Part of a pair; near a nest which was depredated
WY:RG	J	7/30/13	9/30/13	7	Zmudowski SB, '13	Morro Strand, Sandspit	
Y:Y/G	J	9/17/13	9/20/13	3	VAFB, '13	Sandspit	
YA:OY	F	3/26/13	9/19/13	17	Salinas SB, '10	Sandspit	
YA:RW	J	9/30/13	9/30/13	1	Moss Landing SB, '13	Morro Strand	
YA:WR	J	7/12/13	7/12/13	1	Salinas SB, '13	Sandspit	
YB:RR	J	8/3/13	8/3/13	1	Salinas SB, '13	Sandspit	
yB:WY	F	3/26/13	3/26/13	1	Salinas NWR, '12	Villa Creek Beach	Part of a pair
yG:OW	F	6/26/13	9/17/13	14	Salinas SB, '05	Sandspit	
YY:AR	J	7/26/13	8/23/13	2	Fort Ord, '13	Morro Strand, Sandspit	

Appendix 6 - Breeding Window Survey Census 2002 - 2013



Appendix 7 -- Injured WSP on District Beaches October 2012-September 2013

Date	Location	Sex	Age	Band Combo	Nest	Description of Injury	Actions taken	Comments
10/17/12	Villa Creek Beach	F	Adult	P:AG	Yes	Missing left foot	None	First observed in 2008 with missing foot; seen 71 times this year at Villa Creek Beach and four times at Morro Strand as P:AG between 10/17/12 and 6/18/13; seen 49 times at Villa Creek Beach as -:AG; one hatch and two failed nests at Villa Creek Beach in 2013
10/17/12	Sidney's Lagoon	F	Adult	--:RV		Bands removed in 2010 due to injury	None	Formerly BG:RV; originally banded in 2006
10/17/12	Morro Strand	M	Adult	NB:YG		Left leg swollen; black, shriveled foot juts out to side; did not place foot on ground	Emailed Doug George	Hopped away when approached; 2011 VAFB fledgling and bred at VAFB in 2012
10/18/12	Morro Strand	M	Adult	NB:YG		Same as above	Called Robert McMorran	Hopped and flew away when approached
10/23/12	Morro Strand	M	Adult	NB:YG		Same as above	Called Doug George and Robert McMorran; after consultation, Doug George captured and removed dead portion of left leg and left bands and released at Morro Strand	Hopped away and foraged after release; now -:YG
10/23/12	Morro Strand	U	U	YO:GR		Flapped wings but did not fly; stumbled around; did not run when approached; easily captured	Doug George captured; after consultation with Robert McMorran, took to Pacific Wildlife Care for overnight care and then to Monterey Bay Aquarium the next day	Appeared to have some type of neurological problem; 11/1/12 released at Carmel Beach with band combination YO:GR
10/29/12	Morro Strand	U	J	A:G/Y		Right foot black and dangling; did not use	Emailed Doug George and Robert McMorran	Banded as a chick in 2012 at VAFB
10/31/12	Morro Strand	M	Adult	--:YG		Left leg swollen but did not appear to be as swollen as last week	Emailed Doug George and Robert McMorran	Formerly NB:YG; appeared healthy; foraged and moved around fine
11/01/12	Morro Strand	U	J	A:G/Y		Did not walk on right foot but would stand on; in hand, had skin injury above right band	Doug George captured; after consultation with Robert McMorran, took to Bear Valley Animal Clinic, then released back at Morro Strand	Dr. Choy said it was a superficial skin injury with no infection and should heal on its own; not caused by bands; probably leg was caught on something

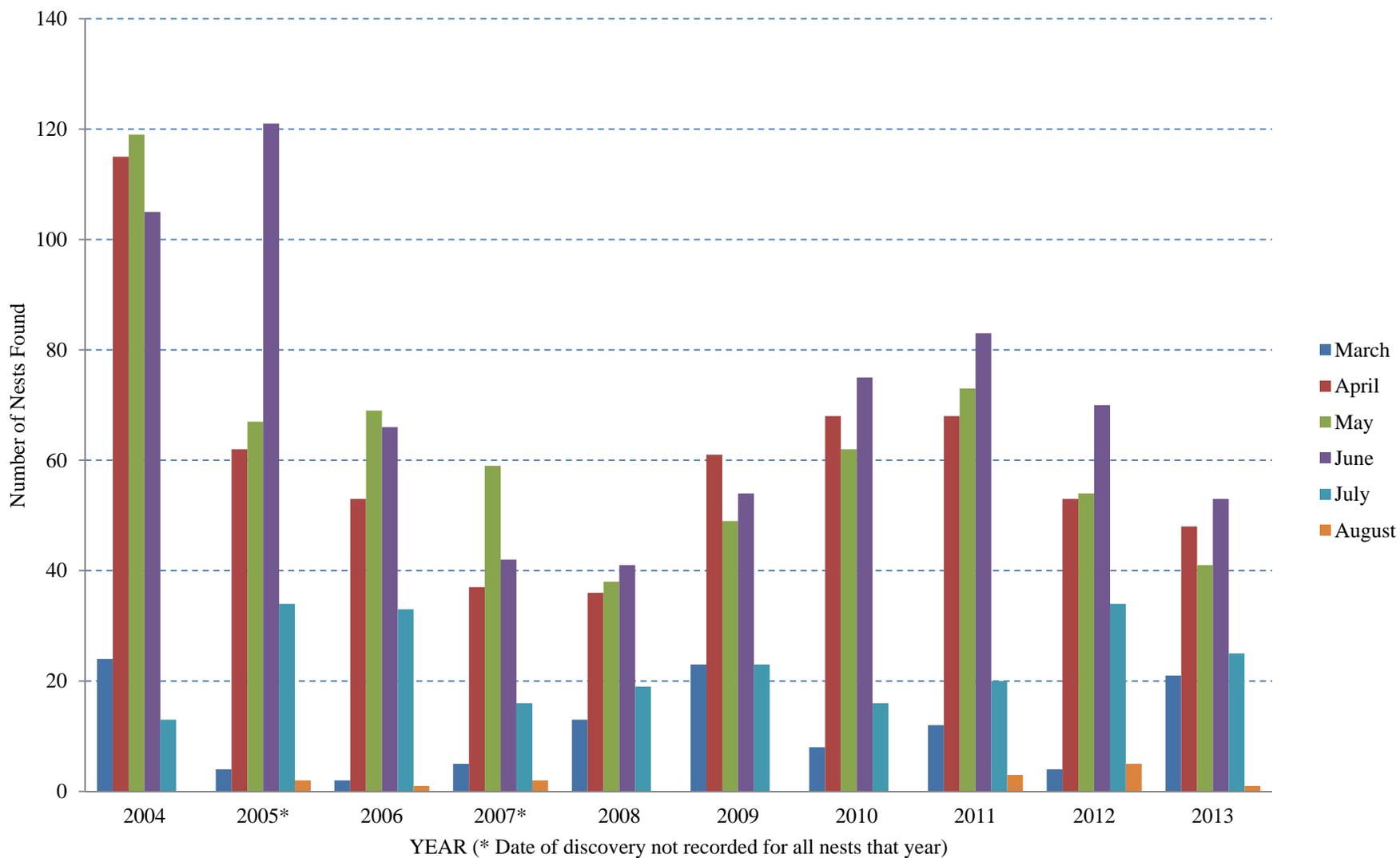
Appendix 7 -- Injured WSP on District Beaches October 2012-September 2013

Date	Location	Sex	Age	Band Combo	Nest	Description of Injury	Actions taken	Comments
11/08/12	Morro Strand	U	J	A:G/Y		No limp	Emailed Doug George and Robert McMorran	
11/20/12	Morro Strand	U	J	A:G/Y		No limp	None	
11/20/12	Arroyo Laguna	F	Adult	--:RV		Bands removed in 2010 due to injury	None	Formerly BG:RV -- originally banded in 2006
12/17/12	Sandspit	F	Adult	--:RV		Same as above	None	Formerly BG:RV
12/19/12	Sidney's Lagoon	F	Adult	--:RV		Same as above	None	Formerly BG:RV
12/20/12	San Simeon	F	Adult	--:RV		Same as above	None	Formerly BG:RV
01/22/13	Morro Strand	U	Adult			Matted facial feathers; possibly tar also on upper left side	None	No problems walking or flying
01/22/13	Morro Strand	U	Adult			Apparent growth on right knee	None	Initially was not using right leg but later walked on right leg and flew fine
01/22/13	North VAFB	M	Adult	--:YG		Missing left foot	Emailed Doug George and Robert McMorran	Formerly NB:YG
03/07/13	Morro Strand	F	Adult	P:AG		Missing left foot; Well healed stump; ran and foraged fine; a little off balance when scratching with stump; kept scratching like the stump could not reach the itch	None	First observed in 2008 with missing foot; seen 71 times this year at Villa Creek Beach as P:AG; seen four times at Morro Strand as P:AG between 3/17/13 and 3/22/13; seen 49 times at Villa Creek Beach as --:AG; one hatch and two failed nests at Villa Creek Beach in 2013
03/14/13	Morro Strand	F	Adult			Left leg dangling	None	Hopped and foraged fine; flew well; most likely the same bird was seen four times between 3/14/13 and 4/3/13 at Morro Strand
03/18/13	Sandspit	F	Adult	--:RV		Bands removed in 2010 due to injury	None	Formerly BG:RV; originally banded in 2006; seen six times on the Sandspit between 3/18/13 and 4/4/13
06/18/13	Sandspit	M	Adult	WR:BR	w/large chick	Did not use right leg any	None	Hopped and stayed with chick; originally banded as a chick in 2008 at Fort Ord

Appendix 7 -- Injured WSP on District Beaches October 2012-September 2013

Date	Location	Sex	Age	Band Combo	Nest	Description of Injury	Actions taken	Comments
06/19/13	Villa Creek Beach	F	Adult	--:AG		Missing left foot; leg might be swollen	None	P:AG has apparently lost P band; moved around fine; seen 49 times at Villa Creek Beach as --:AG; one hatch and two failed nests at Villa Creek Beach in 2013
06/21/13	Sandspit	M	Adult	WR:BR		Did not use right leg any	Emailed Robert McMorran and Doug George	
06/26/13	Sandspit	M	Adult	WR:BR		Did not use right leg any	Emailed Robert McMorran, Doug George and Gary Page	
06/28/13	Sandspit	M	Adult	WR:BR		Dangling black leg; bands do not appear to move freely	None	Hopped and flew fine
07/04/13	Sandspit	M	Adult	WR:BR		Dangling black leg; bands do not appear to move freely	None	With a small flock
07/09/13	Sandspit	M	Adult	WR:BR		Dangling black leg; bands do not appear to move freely	Emailed Robert McMorran and Doug George	With a small flock
07/11/13	Sandspit	M	Adult	WR:BR		Piece of shell under B band; leg broken under B band	Doug George captured; took to Bear Valley Animal Clinic; Dr. Choy amputated leg below joint	
07/12/13	Sandspit	M	Adult	WR:--		Amputated right leg below joint; former WR:BR	Released on Sandspit; emailed Robert McMorran and Doug George	Immediately flew upon release; seen again 30 minutes later foraging, hopping, and standing
07/22/13	VAFB	M	Adult	A:G/Y	Yes	Healed skin injury	None	Fledged three chicks at VAFB
08/09/13	Sandspit	U	J			Held its left leg close to its body and never extended it; foot looked darker, almost black; never lowered the injured leg	None	Hopped and foraged quite well; most likely the same bird was spotted six times between 8/9/13 and 8/28/13
08/19/13	Morro Strand	U	Adult			Did not use right leg which appeared black and desiccated	None	Hopped and foraged fine; most likely the same bird was seen two more times on 8/20/13 and 8/28/13
09/17/13	Villa Creek Beach	U	Adult			The right leg was held aloft at all times; barely visible	None	Bird hopped well

Appendix 8 – Number of Nests Found by Month on District Beaches 2004-2013



Appendix 8a -- Nest Initiation and Last Hatch Dates Summary for District Beaches

Hearst San Simeon State Park		
Year	First Nest Initiation	Last Nest Hatched
2013	-	-
2012	6-May*	5-Jun
2011	-	-
2010	-	-
2009	10-Apr	-
2008	-	-
2007	-	-
2006	26-Apr	11-Aug
2005	21-Apr	15-Jul
2004	-	-
2002	29-Apr	26-May*

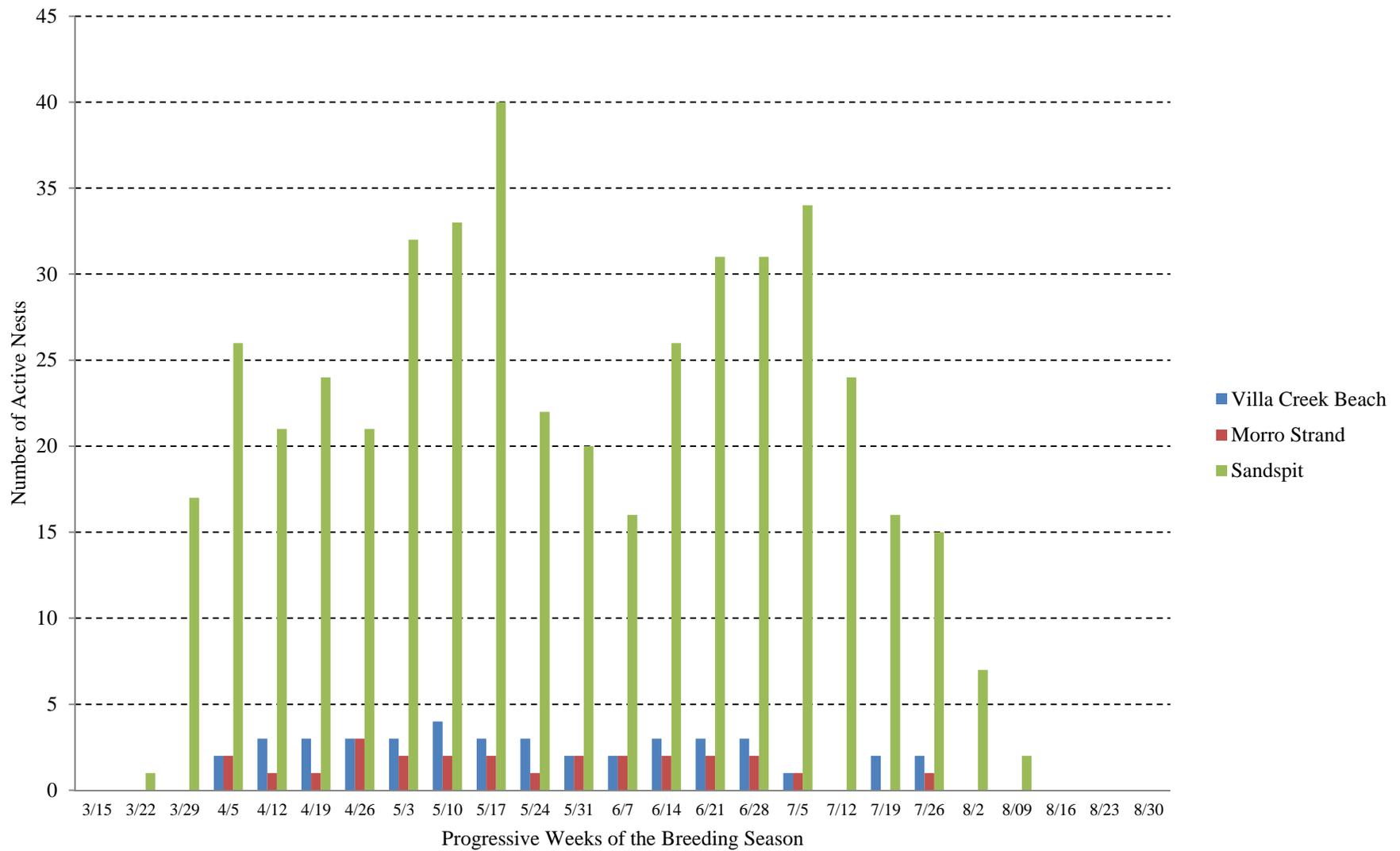
Villa Creek Beach		
Year	First Nest Initiation	Last Nest Hatched
2013	5-Apr	22-Jun
2012	9-Apr	14-Aug
2011	5-Apr	29-Jul
2010	31-Mar*	28-Jul
2009	9-Mar	29-Jun
2008	17-Mar	5-Aug
2007	9-Mar	1-Aug
2006	24-Mar	26-Jul
2005	30-Mar	22-Jul
2004	18-Mar	6-Aug
2003	21-Mar	31-Jul
2002	27-Mar	28-Aug
2001	28-Mar	30-Jul

Morro Strand		
Year	First Nest Initiation	Last Nest Hatched
2013	17-Apr	16-Aug*
2012	18-Apr	7-Aug
2011	16-Mar	15-Aug
2010	9-Apr	16-Aug*
2009	20-Mar	3-Aug
2008	24-Mar	25-Jul
2007	6-Apr	16-Aug
2006	7-Apr	11-Aug
2005	25-Apr	20-Aug*
2004	18-Mar	18-Aug
2003	21-Mar	14-Aug*
2002	27-Mar	15-Jul
2001	3-Apr*	13-Aug
2000	28-Mar	3-Jun
1997	13-Apr	20-Aug

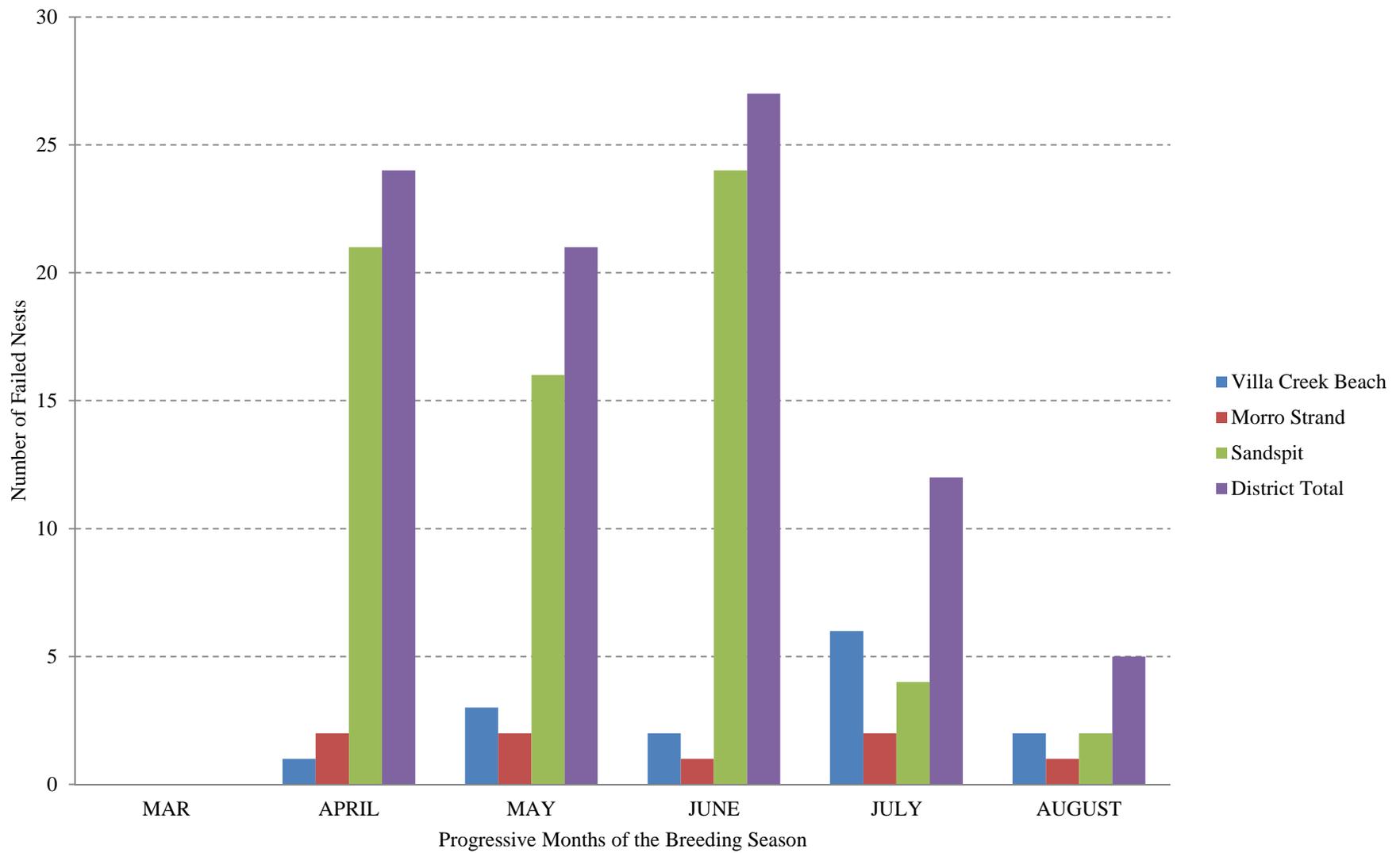
Sandspit		
Year	First Nest Initiation	Last Nest Hatched
2013	21-Mar	12-Aug
2012	14-Mar	18-Aug
2011	15-Mar	23-Aug
2010	19-Mar	8-Aug
2009	9-Mar	17-Aug
2008	18-Mar	18-Aug
2007	21-Mar	20-Aug
2006	7-Apr	15-Aug
2005	24-Mar	17-Aug
2004	15-Mar	5-Aug
2003	16-Apr	11-Aug
2002	28-Mar	8-Aug
2001	17-Mar	14-Aug
2000	18-Mar	18-Aug
1987	29-Mar	8-Aug*

*Approximate date

Appendix 8b --Number of Active Nests Through Progressive Weeks of the 2013 Breeding Season



Appendix 8c -- Number of Failed Nests Through Progressive Months of the 2013 Breeding Season



Appendix 8d -- Summary of Nest Fates at District Beaches 2001-2013

	2013		2012		2011		2010		2009		2008		2007		2006		2005		2004*		2003*		2002*		2001*			
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%		
Hearst San Simeon State Park																												
Total # of nests	0		3		0		0		2		2		6		11		5		0		1		1				NA	
# nests hatched	0		1	33%	0		0		0		2	100%	5	83%	7	64%	5	100%	0		0		1	100%	0			
Failed predator	0		0		0		0		1	50%	0		0		0		0		0		1	100%	0					
Failed wind	0		0		0		0		1	50%	0		0		0		0		0		0		0					
Failed aband.	0		2	67%	0		0		0		0		0		0		0		0		0		0					
Failed tide	0		0		0		0		0		0		1	17%	0		0		0		0		0					
Failed human	0		0		0		0		0		0		0		0		0		0		0		0					
Failed other	0		0		0		0		0		0		0		0		0		0		0		0					
Failed unk.	0		0		0		0		0		0		0		4	36%	0		0		0		0					
Unk. Fate	0		0		0		0		0		0		0		0		0		0		0		0					
Villa Creek Beach																												
Total # of nests	20		31		21		26		38		16		30		40		37		66		35		44		39			
# nests hatched	5	26%	5	16%	7	35%	6	23%	6	17%	8	57%	8	29%	14	36%	16	43%	16	24%	18	51%	25	57%	27	69%		
Failed predator	13	68%	24	77%	10	50%	13	50%	25	69%	3	21%	16	57%	21	54%	14	38%	29	44%	13	37%	8	18%	6	15%		
Failed wind	0		0		0		1	4%	1	3%	0		1	4%	0		0		0		0		0		0			
Failed aband.	1	5%	1	3%	1	5%	4	15%	1	3%	1	7%	2	7%	2	5%	3	8%	4	6%	0		5	11%	1	3%		
Failed tide	0		0		2	10%	2	8%	2	6%	2	14%	1	4%	2	5%	4	11%	11	17%	0		2	5%	1	3%		
Failed human**	0		1	3%	0		0		1	3%	0		0		0		0		1	2%	0		0		3	8%		
Failed other	0		0		0		0		0		0		0		0		0		0		0		1	2%	0			
Failed unk.	0		0		0		0		0		0		0		0		0		5	8%	4	11%	3	7%	1	3%		
Unk. Fate	1	5%	0		1	5%	0		2	5%	2	13%	2	7%	1	3%	0		0		0		0		0			

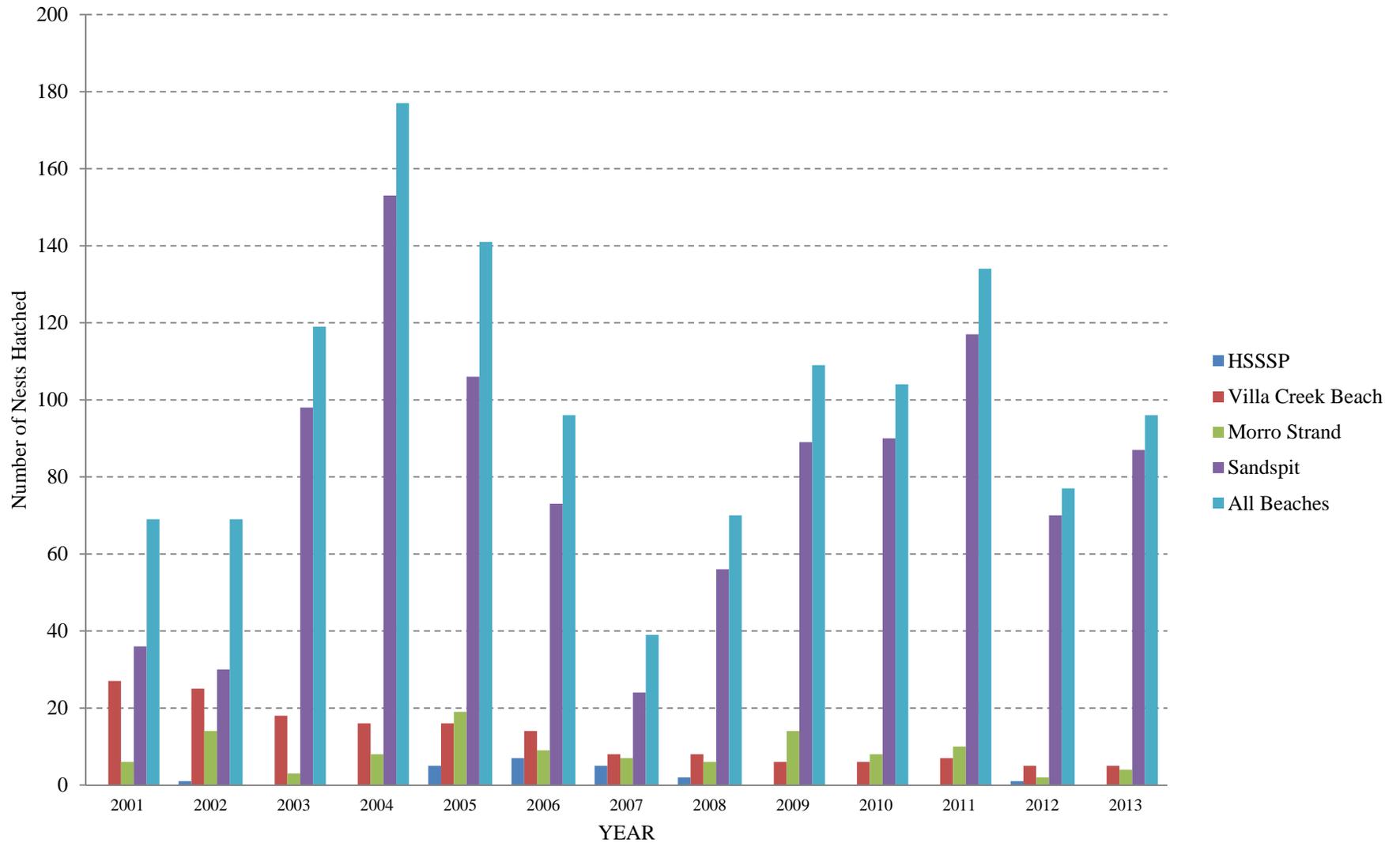
* Numbers for 2001-02 include Sandspit City property. HSSSP was not monitored in 2001 and 2002-04 numbers only include San Simeon Beach **Includes take by equestrians

Appendix 8d -- Summary of Nest Fates at District Beaches 2001-2013

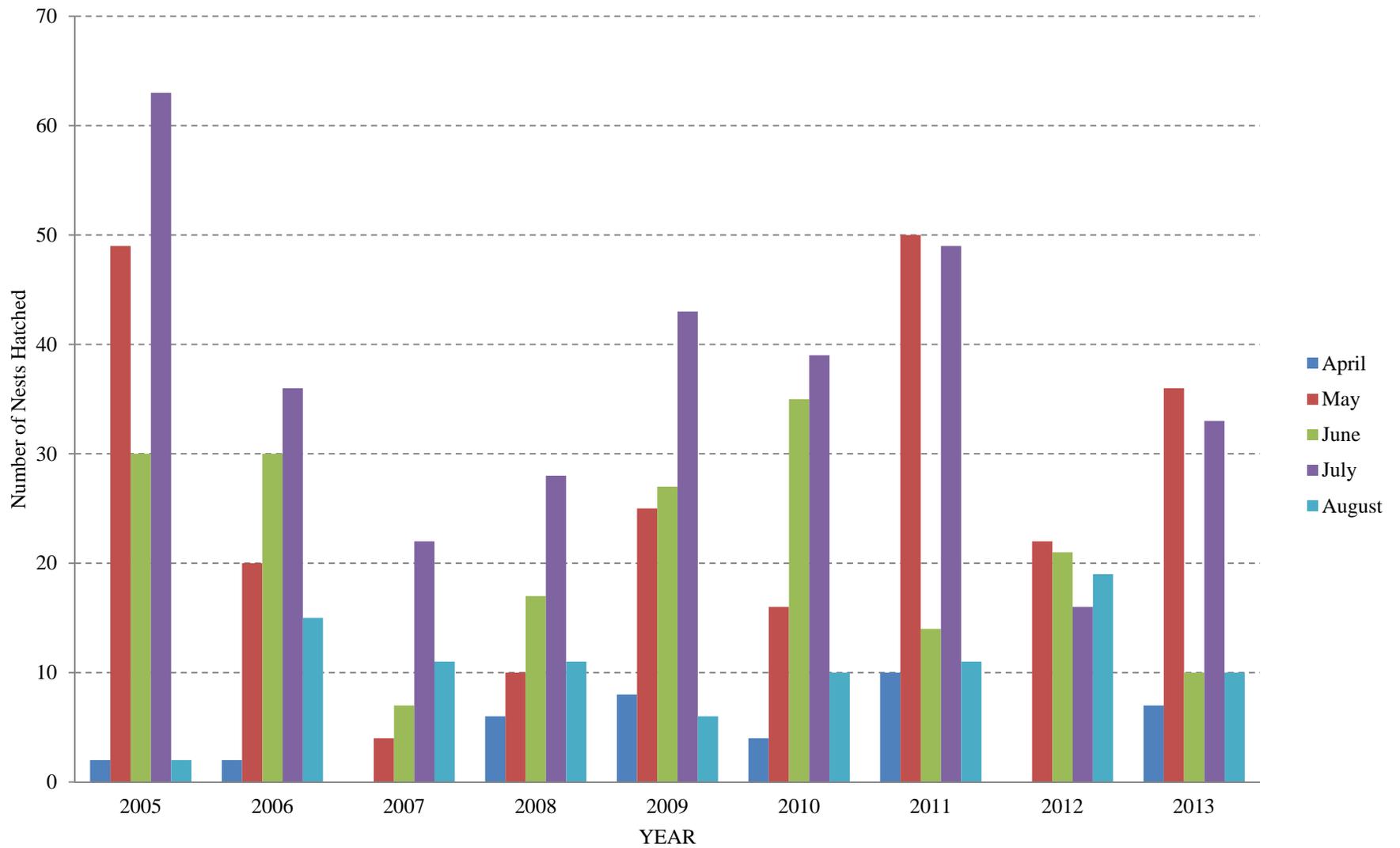
	2013		2012		2011		2010		2009		2008		2007		2006		2005		2004*		2003*		2002*		2001*			
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%		
Morro Strand																												
Total # of nests	12		12		25		24		26		33		19		34		27		38		45		37		14			
# nests hatched	4	33%	2	17%	10	40%	8	35%	14	54%	6	19%	7	37%	9	27%	19	70%	8	21%	3	7%	14	38%	6	43%		
Failed predator	3	25%	6	50%	9	36%	6	26%	6	23%	8	26%	5	26%	2	6%	3	11%	14	37%	33	73%	8	22%	4	29%		
Failed wind	2	17%	2	17%	3	12%	2	9%	1	4%	6	19%	1	5%	0		1	4%	3	8%	0		0		0			
Failed aband.	3	25%	2	17%	2	8%	5	22%	3	12%	6	19%	6	32%	21	64%	3	11%	6	16%	1	2%	5	14%	0			
Failed tide	0		0		1	4%	2	9%	1	4%	4	13%	0		0		1	4%	2	5%	6	13%	1	3%	2	14%		
Failed human	0		0		0		0		0		0		0		1	3%	0		1	3%	0		0		0			
Failed other	0		0		0		0		0		0		0		0		0		2	5%	0		0		0			
Failed unk.	0		0		0		0		1	4%	1	3%	0		0		0		2	5%	2	4%	9	24%	2	14%		
Unk. Fate	0		0		0		1	4%	0		2	6%	0		1	3%	0		0		0		0		0			
Sandspit																												
Total # of nests	157		174		213		179		144		96		109		141		225		272		146		109		109			
# nests hatched	87	56%	70	41%	117	56%	90	51%	89	63%	56	59%	24	22%	73	54%	106	49%	153	56%	98	73%	30	40%	38	36%		
Failed predator	30	19%	74	44%	51	24%	35	20%	23	16%	20	21%	59	54%	46	34%	69	32%	48	18%	9	7%	29	39%	50	47%		
Failed wind	13	8%	5	3%	5	2%	12	7%	10	7%	6	6%	13	12%	1	1%	4	2%	20	7%	10	7%	0		0			
Failed aband.	11	7%	13	8%	26	12%	13	7%	6	4%	2	2%	8	7%	5	4%	11	5%	7	3%	5	4%	9	12%	7	7%		
Failed tide	13	8%	7	4%	7	3%	23	13%	11	8%	10	11%	5	5%	5	4%	21	10%	28	10%	10	7%	5	7%	8	7%		
Failed human**	0		0		1	0%	0		0		0		0		0		0		0		0		2	3%	4	4%		
Failed other	0		0		0		0		0		0		0		0		0		0		0		0		0			
Failed unk.	0		0		3	1%	4	2%	3	2%	1	1%	0		6	4%	7	3%	16	6%	2	1%	0		0			
Unk. Fate	3	2%	5	3%	3	1%	2	1%	2	1%	1	1%	0		5	4%	7	3%	0		12	8%	34	31%	2	2%		
Total # of Nests- ALL BEACHES	189		220		259		229		210		147		164		226		294		376		227		191		162			
# Nests Hatched- ALL BEACHES	96	52%	78	36%	134	53%	104	46%	109	53%	72	51%	44	27%	103	47%	146	51%	177	47%	119	55%	70	45%	71	44%		

* Numbers for 2001-02 include Sandspit City property. HSSSP was not monitored in 2001 and 2002-04 numbers only include San Simeon Beach **Includes take by equestrians

Appendix 8e – Total Nests Hatched on District Beaches 2001-2013



Appendix 8f – Nests Hatched per Month on District Beaches 2005-2013



Appendix 8g - 2013 Salvaged WSP and Eggs

Deposited at:
Santa Barbara Museum of Natural History
Vertebrate Zoology Department
Paul Collins, Curator
2559 Puesta del Sol Road
Santa Barbara, CA 93105

By:
California State Parks
Nicholas Franco, District Superintendent
750 Hearst Castle Road
San Simeon, CA 93452
Recovery Permit #TE082237-4.3

1. Western Snowy Plover eggs (4)
Collected by: Regena Orr
Location: Villa Creek Beach, Estero Bluffs State Park, San Luis Obispo County, CA
Two eggs collected from an abandoned nest.
Two unhatched eggs collected from two nests after other eggs successfully hatched.
2. Western Snowy Plover eggs (7)
Collected by: Regena Orr
Location: Morro Strand State Beach, San Luis Obispo County, CA
Six eggs collected from three abandoned nests.
One dropped egg.
3. Western Snowy Plover eggs (52)
Collected by: Regena Orr
Location: Montana de Oro State Park Sandspit, San Luis Obispo County, CA
Seventeen eggs collected from eleven abandoned nests.
Fourteen eggs collected from six nests washed over by high tide.
Twelve unhatched eggs collected from ten nests after other eggs successfully hatched.
Six eggs collected from five wind-blown nests.
Three dropped eggs.
4. Western Snowy Plover eggs (5)
Collected by: Regena Orr
Location: City of Morro Bay property on the Sandspit, San Luis Obispo County, CA
Two eggs collected from one abandoned nests.
Two unhatched eggs collected from two nests after other eggs successfully hatched.
One dropped egg.

Appendix 8g - 2013 Salvaged WSP and Eggs

5. Western Snowy Plover Chick (1)
Collected by: Jennifer Rafferty
Location: Jetty Beach, City of Morro Bay property on the Sandspit,
San Luis Obispo County, CA
Date Found: July 8, 2013
Visitor's (Jennifer Rafferty) son found chick "alone" on beach. The family
took the chick to Pacific Wildlife Care where it died overnight. US Fish and
Wildlife Service was contacted regarding the incident.

Estero Bluffs State Park

Villa Creek Beach
San Luis Obispo County, CA

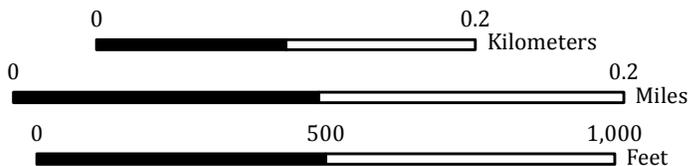


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2010 NAIP Aerial Imagery



Jeff Ebner
October 1, 2013



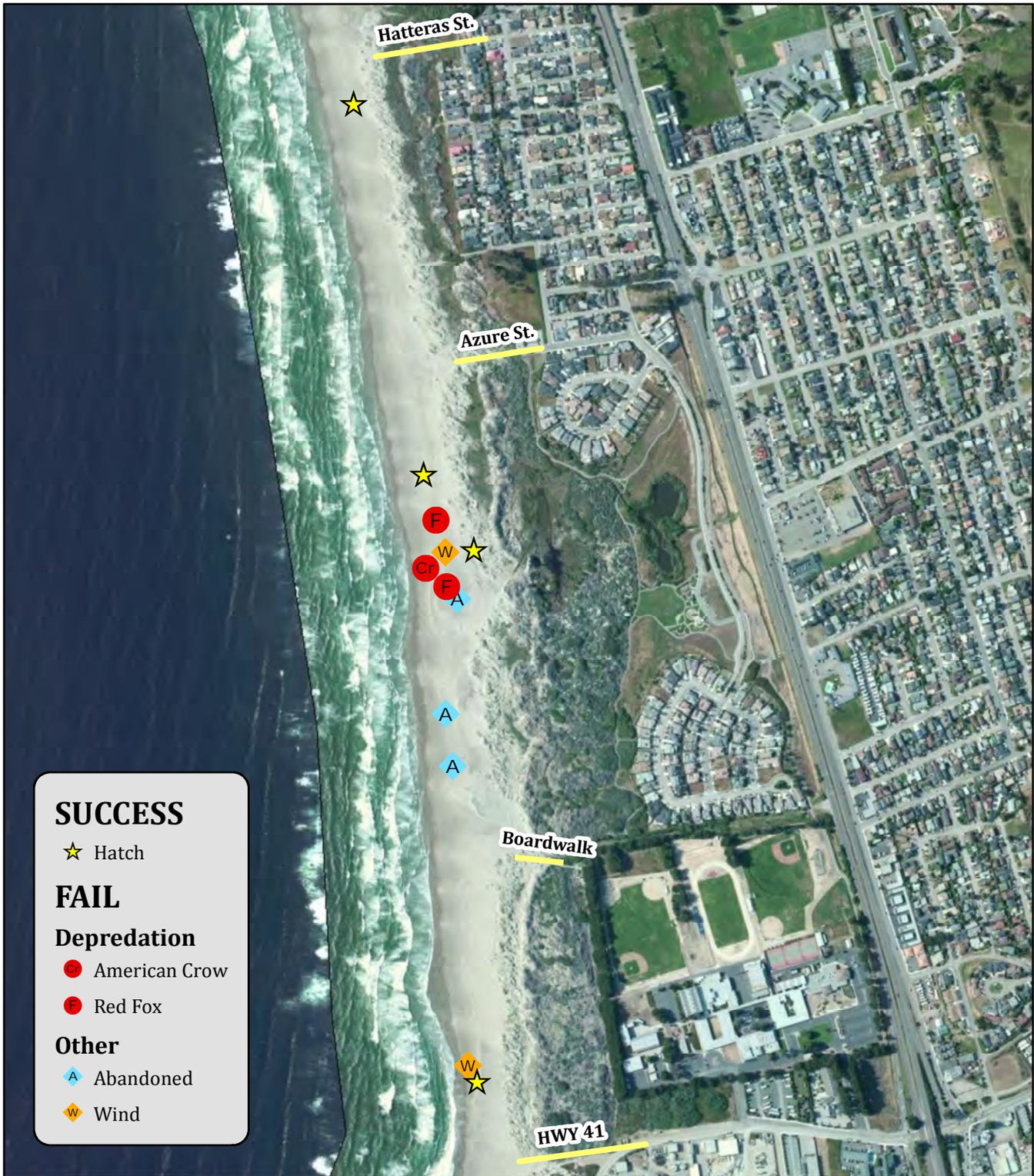
Western Snowy Plover
(*Charadrius nivosus*)
Nest Fates for 2013



Morro Strand State Beach

Southern Unit: Morro Strand

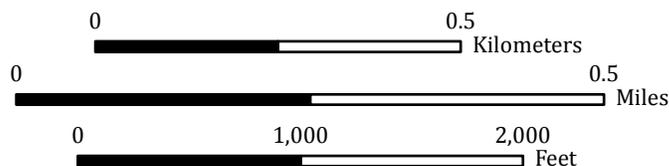
San Luis Obispo County, CA



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2010 NAIP Aerial Imagery



Jeff Ebner
October 1, 2013



Western Snowy Plover
(*Charadrius nivosus*)
Nest Fates for 2013



Montaña de Oro State Park

Sandspit

San Luis Obispo County, CA



Nest Fate

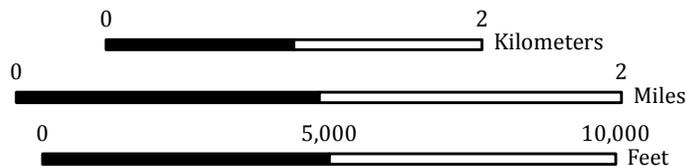
- Hatch
- Fail
- Unknown

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2010 NAIP Aerial Imagery



Jeff Ebner
October 1, 2013



Western Snowy Plover
(*Charadrius nivosus*)

Nest Fates for 2013



Appendix 8i - Exclosed vs. Unexclosed Nest Fate on Morro Strand 2003-2013

	2013		2012		2011		2010		2009		2008		2007 ⁽²⁾		2006 ⁽³⁾		2005 ⁽⁴⁾		2004 ⁽⁵⁾		2003	
Exclosure Type: Large; > 10 ft. diam.																						
# of nests exclosed, % of total nests	7	58%	5	42%	14	56%	14	58%	16	62%	11	33%	7	37%	31	91%	25	93%	22	58%	0	0%
Nests hatched ⁽¹⁾	3		2		10		8		14		6		2		7		19		8			
Nests depredated	0		0		0		1		0		0		0		1		1		3			
Failed, adult mortality	0		0		0		0		0		0		0		3		0		0			
Failed, abandoned	2		2		2		2		2		3		5		18		3		6			
Failed, other causes	2		1		2		2		0		2		0		1		2		5			
Unknown fate	0		0		0		1		0		0		0		1		0		0			
Number adults depredated in/near nest	0		0		0		0		0		0		0		3		1		0			
Number adults entangled in net top	0		0		0		0		0		0		0		0		1		2			
Exclosure Type: None.																						
# of nests unexclosed, % of total nests:	5	42%	7	58%	11	44%	10	42%	10	38%	22	67%	12	63%	3	9%	2	7%	16	42%	45	100%
Nests hatched ⁽¹⁾	1		0		0		0		0		0		5		2		0		0		3	
Nests depredated	3		6		9		5		6		8		5		1		2		11		33	
Failed, abandoned	1		0		0		3		1		3		1		0		0		0		1	
Failed, other causes	0		1		2		2		3		9		1		0		0		5		8	
Unknown fate	0		0		0		0		0		2		0		0		0		0		0	
NOTES																						
1. Nests hatching at least one chick.																						
2. Red fox circling exclosures. Began adding "wings" and "spikes" to some exclosures.																						
3. Red-tailed Hawk perching on exclosures & changed net top to 1"x1".																						
4. Great-horned Owl found inside exclosure.																						
5. Three crows found inside exclosures & red fox tracks often seen around exclosures.																						

Appendix 9 -- 2013 Floated Egg Data for District Beaches

Nest #	Float Data	Float Date	Estimated # of Days Before Hatching	Estimated Hatch Date	Actual # of Days Before Hatching	Actual Hatch Date	Fate of Failed Nests	Date Failure	# of Days Before Failing
Villa Creek Beach									
VC05	0°, 20°, 20°	05/02/13	27	05/29/13			Skunk	5/15/2013	13
VC06	16 mm, 16 mm, 18 mm	05/17/13	7	05/24/13	3	05/20/13			
VC16	0°, 10°, 30°	07/04/13	27	07/31/13			Unknown Predator	7/12/2013	8
North Sandspit									
NSS017	13 mm, 13 mm, 14 mm	04/23/13	8	05/01/13	6	04/29/13			
NSS020	45°, 45°, 11 mm	04/23/13	22	05/15/13	27	05/20/13			
NSS030	10°, 10°, 20°	04/30/13	27	05/27/13	27	05/27/13			
NSS032	14 mm, 15 mm, 16 mm	05/15/13	8	05/23/13			Coyote	5/20/2013	5
NSS034	11 mm, 12 mm, 14 mm	05/15/13	11	05/26/13	12	05/27/13			
NSS037	20°, 20°, 30°	05/15/13	23	06/07/13	22	06/06/13			
NSS039	14 mm, 15 mm, 15 mm	05/15/13	8	05/23/13	5	05/20/13			
NSS040	45°, 45°, 60°	05/15/13	22	06/06/13			Unknown Avian	5/30/13	15
NSS041	11 mm, 13 mm, 15 mm	05/15/13	10	05/25/13	6	05/21/13			
NSS062*	12 mm, 14 mm, 14 mm	06/18/13	8	06/26/13	11	06/29/13			
NSS073	20°, 20°, 30°	06/18/13	25	07/13/13	23	07/11/13			
NSS077*	90°, 15 mm, 15 mm	07/01/13	11	07/12/13	18	07/19/13			
NSS078	13 mm, 14 mm, 15 mm	07/01/13	9	07/10/13	7	07/08/13			
NSS079	90°, 11 mm, 12 mm	07/01/13	12	07/13/13			Tide	7/9/2013	8
NSS084	60°, 80°	07/15/13	21	08/05/13	21	08/05/13			
NSS086	10 mm, 13 mm, 14 mm	08/01/13	10	08/11/13	11	08/12/13			
South Sandspit									
SSS001*	0°, 10°, 15°	03/25/13	28	04/22/13	28	04/22/13			
SSS002	10°, 20°, 45°	03/25/13	27	04/21/13			Abandoned	04/25/13	31
SSS007*	20°, 20°, 45°	04/04/13	26	04/30/13	20	04/24/13			
SSS010*	20°, 50°, 80°	04/04/13	23	04/27/13			Tide	04/09/13	5
SSS012*	10°, 10°, 25°	04/04/13	27	05/01/13	27	05/01/13			
SSS015*	70°, 85°, 85°	04/10/13	21	05/01/13	21	05/01/13			
SSS017*	10 mm, 10 mm	04/23/13	11	05/04/13	14	05/07/13			
SSS018*	12 mm, 13 mm, 14 mm	04/23/13	8	05/01/13	13	05/06/13			
SSS023	90°, 7 mm, 10 mm	04/30/13	15	05/15/13	20	05/20/13			
SSS026	45°, 45°, 60°	04/30/13	23	05/23/13	23	05/23/13			
SSS027	8 mm, 9 mm, 10 mm	04/30/13	13	05/13/13			Abandoned	05/10/13	10
SSS030*	10 mm, 12 mm, 12 mm	05/15/13	11	05/26/13			Tide	05/23/13	8
SSS031	8 mm, 12 mm, 14 mm	05/15/13	13	05/28/13	12	05/27/13			
SSS033*	15 mm, 15 mm, 16 mm	05/15/13	8	05/23/13	9	05/24/13			

Appendix 9 -- 2013 Floated Egg Data for District Beaches

Nest #	Float Data	Float Date	Estimated # of Days Before Hatching	Estimated Hatch Date	Actual # of Days Before Hatching	Actual Hatch Date	Fate of Failed Nests	Date Failure	# of Days Before Failing
SSS034*	8 mm, 10 mm, 12 mm	05/15/13	13	05/28/13	8	05/23/13			
SSS042	45°, 60°, 80°	06/04/13	23	06/27/13	21	06/25/13			
SSS044	0°, 10°, 20°	06/04/13	27	07/01/13			Unknown Avian	06/09/13	5
SSS053	70°, 80°, 90°	06/20/13	19	07/09/13	18	07/08/13			
SSS060*	13 mm, 14 mm, 15 mm	07/01/13	10	07/11/13	7	07/08/13			
SSS066*	85°, 90°, 90°	07/10/13	17	07/27/13	16	07/26/13			
SSS067*	45°, 80°, 90°	07/10/13	19	07/29/13	19	07/29/13			
SSS068*	85°, 90°, 90°	07/10/13	17	07/27/13	19	07/29/13			
SSS069**	75°, 80°, 85°	07/10/13	21	07/31/13			Abandoned	08/14/13	35
SSS070*	30°, 40°, 13 mm	07/15/13	21	08/05/13	23	08/07/13			
SSS071	13 mm, 16mm, 17mm	08/01/13	3	08/04/13	5	08/06/13			

Value with degree symbol (°) indicates angle at which egg floats, given Horizontal = 0° and Vertical = 90°

Value with millimeter symbol (mm) indicates diameter of egg visible above the surface of water

VC = Villa Creek Beach, NSS = North Sandspit, SSS = South Sandspit

and ** by Allen Potthoff under the supervision of Regena Orr

Appendix 10 - Summary of WSP Nest Depredations on District Beaches 2001-2013

	2013		2012		2011		2010		2009		2008		2007		2006		2005		2004		2003		2002		2001			
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%		
Hearst San Simeon State Park*																												
Total # of nests	0		3		0		0		2		2		6		11		5		0		1		1				N/A	
Total Depredated	0		0		0		0		1	50%	0		0		0		0		0		1	100%	0					
Coyote	0		0		0		0		0		0		0		0		0		0		0		0					
Red Fox	0		0		0		0		0		0		0		0		0		0		0		0					
Dom. Dog	0		0		0		0		0		0		0		0		0		0		0		0					
Striped Skunk	0		0		0		0		0		0		0		0		0		0		0		0					
American Crow	0		0		0		0		0		0		0		0		0		0		1	100%	0					
Raccoon	0		0		0		0		0		0		0		0		0		0		0		0					
Gull Species	0		0		0		0		0		0		0		0		0		0		0		0					
Unk. Mammal	0		0		0		0		0		0		0		0		0		0		0		0					
Unk. Avian	0		0		0		0		0		0		0		0		0		0		0		0					
Unk. Predator	0		0		0		0		1	50%	0		0		0		0		0		0		0					
Other	0		0		0		0		0		0		0		0		0		0		0		0					
Fail Unk.	0		0		0		0		0		0		0		4	36%	0		0		0		0					
Unk. Fate	0		0		0		0		0		0		0		0		0		0		0		0					
Villa Creek Beach																												
Total # of nests	20		31		21		26		38		16		30		40		37		66		35		44		39			
Total Depredated	13	68%	24	77%	10	50%	13	50%	25	69%	3	21%	16	57%	21	54%	14	38%	29	44%	13	37%	8	18%	6	15%		
Coyote	1	5%	0		0		3	12%	0		0		3	11%	0		0		1	2%	6	17%	0		1	3%		
Red Fox	0		0		0		0		0		0		0		0		0		0		0		0		0			
Dom. Dog	0		0		0		0		0		0		0		0		0		0		0		0		0			
Unk. Canid	0		0		0		0		0		0		0		0		0		0		0		2	5%	0			
Striped Skunk	4	21%	1	3%	0		0		2	6%	1	7%	0		0		6	16%	7	11%	0		1	2%	0			
American Crow	0		0		0		0		0		0		0		0		0		1	2%	0		0		0			
Raccoon	0		0		0		1	4%	2	6%	0		0		0		0		0		0		2	5%	0			
Gull Species	0		6	19%	0		2	8%	4	11%	2	14%	3	11%	7	18%	2	5%	2	3%	0		2	5%	2	5%		
Ground Squirrel	0		2	6%	0		0		0		0		2	7%	0		0		0		0		0		0			
Unk. Mammal	0		0		0		0		0		0		0		0		0		0		2	6%	0		3	8%		
Unk. Avian	0		1	3%	0		0		0		0		0		0		0		0		0		0		0			
Unk. Predator	8	42%	14	45%	10	50%	7	27%	17	47%	0		8	29%	14	36%	0		18	27%	4	11%	1	2%	0			
Other	0		0		0		0		0		0		0		0		6	16%	0		1	3%	0		0			
Fail Unk.	0		0		0		0		0		0		0		0		0		5	8%	4	11%	3	7%	1	3%		
Unk. Fate	1	5%	0		1	5%	0		2	6%	2	14%	2	7%	1	3%	0		0		0		0		0			

Appendix 10 - Summary of WSP Nest Depredations on District Beaches 2001-2013

	2013		2012		2011		2010		2009		2008		2007		2006		2005		2004		2003		2002		2001	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Morro Strand																										
Total # of nests	12		12		25		24		26		33		19		34		27		38		45		37		14	
Total Depredated	3	25%	6	50%	9	36%	6	26%	6	23%	8	26%	5	26%	2	6%	3	11%	14	37%	33	73%	8	22%	4	29%
Coyote	0		0		0		0		0		0		0		0		0		0		0		0		0	
Red Fox	2	17%	0		0		0		0		2	6%	0		1	3%	2	7%	0		3	7%	1	3%	3	21%
Dom. Dog	0		0		0		0		0		0		0		0		0		0		0		0		0	
Striped Skunk	0		0		0		0		0		0		0		0		0		0		0		0		0	
American Crow	1	8%	5	42%	4	16%	3	13%	5	19%	3	10%	2	11%	1	3%	0		11	29%	30	67%	6	16%	0	
Raccoon	0		0		0		0		0		0		0		0		0		0		0		0		1	7%
Gull Species	0		0		0		0		0		0		0		0		0		1	3%	0		1	3%	0	
Unk. Mammal	0		0		0		0		0		0		0		0		0		0		0		0		0	
Unk. Avian	0		0		0		0		0		1	3%	0		0		0		0		0		0		0	
Unk. Predator	0		1	8%	5	20%	3	13%	1	4%	2	6%	3	16%	0		1	4%	1	3%	0		0		0	
Other	0		0		0		0		0		0		0		0		0		1	3%	0		0		0	
Fail Unk.	0		0		0		0		1	4%	1	3%	0		0		0		2	5%	2	4%	9	24%	2	14%
Unk. Fate	0		0		0		1	4%	0		2	6%	0		1	3%	0		0		0		0		0	
Sandspit																										
Total # of nests	157		174		213		179		144		96		109		141		225		272		146		109		109	
Total Depredated	30	19%	74	44%	51	24%	35	20%	23	16%	20	21%	59	54%	46	34%	69	32%	48	18%	9	7%	29	39%	50	47%
Coyote	6	4%	16	9%	10	5%	27	15%	22	15%	17	18%	9	8%	33	24%	28	13%	13	5%	0		0		0	
Red Fox	0		0		0		0		0		0		0		0		0		0		0		0		1	1%
Dom. Dog	0		0		0		0		0		0		0		0		0		0		0		0		1	1%
Striped Skunk	0		0		0		0		0		0		0		0		0		30	11%	7	5%	27	36%	43	40%
American Crow	1	1%	0		15	7%	0		1	1%	0		0		0		5	2%	0		0		0		0	
Raccoon	0		0		0		0		0		0		0		0		0		0		0		0		0	
Gull Species	0		11	7%	0		0		0		0		0		0		10	5%	0		0		0		0	
Unk. Mammal	0		0		0		0		0		0		0		0		0		1	0%	0		1	1%	2	2%
Unk. Avian	22	14%	24	14%	5	2%	2	1%	0		0		45	41%	6	4%	11	5%	0		1	1%	0		0	
Unk. Predator	1	1%	23	14%	20	10%	6	3%	0		3	3%	5	5%	7	5%	15	7%	2	1%	1	1%	0		3	3%
Other	0		0		1	0%	0		0		0		0		0		0		1	0%	0		1	1%	0	
Fail Unk.	0		0		3	1%	4	2%	3	2%	1	1%	0		6	4%	7	3%	16	6%	0		0		0	
Unk. Fate	3	2%	5	3%	3	1%	2	1%	2	1%	1	1%	0		5	4%	7	3%	0		12	9%	34	45%	2	2%
Total # of Nests- ALL BEACHES	189		220		259		229		210		147		164		226		294		376		227		191		162	
# Nests Depredated- ALL BEACHES	46	25%	104	48%	70	27%	54	24%	55	27%	31	22%	80	49%	69	32%	86	30%	91	24%	56	26%	45	29%	60	38%

Appendix 11 -- 2013 Camera Use on WSP Nests

Nest #	Camera Installed	Camera Removed	Fate	Set By	Removed By	Notes
Villa Creek Beach						
VC02	4/25/2013	5/6/2013	Hatch	A. Potthoff*	A. Potthoff	No images of predators recorded.
VC06	5/17/2013	5/21/2013	Hatch	A. Potthoff*	A. Potthoff	No images of predators recorded.
VC07	5/17/2013	6/14/2013	Hatch	A. Potthoff*	A. Potthoff	Raccoons, gulls & coyotes recorded in general vicinity of nest.
VC08	5/21/2013	6/4/2013	Fail	A. Potthoff*	A. Potthoff	Only had eye shine from a potential predator -- something small
VC18	7/18/2013	7/31/2013	Fail	A. Potthoff*	A. Potthoff	Skunk identified near enclosure during depredation window but depredation was not recorded on camera.
North Sandspit						
NSS012	4/10/2013	5/15/2013	Hatch	V. Brown*	V. Brown	1 egg went missing on 4/17 most likely due to wind -- nothing recorded on camera
NSS083	7/10/2013	8/6/2013	Hatch	A. Potthoff*	V. Brown	Images of crow and coyote recorded near nest

*Camera set under supervision of R. Orr