State of California
The Resources Agency
Department of Fish and Game
Wildlife Branch

Western Snowy Plover Breeding Survey
Ormond Beach, California

2010 Season

by
Cynthia Hartley
Permit# TE-181713-0

South Coast Region, 2008-02

Report

To

State of California
Department of Fish and Game
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123

Western Snowy Plover Survey
Ormond Beach, California

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Cynthia Hartley
Ventura, CA

Prepared 28 September 2010

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Executive Summary

The abundance and productivity of the threatened western snowy plover (WSP) (*Charadrius alexandrinus nivosus*) was monitored at Ormond Beach located in Oxnard, Ventura County, California from March 15, 2010 to September 15, 2010.

An average of 34 adult WSP were recorded weekly during the survey period. There were a total of 24 breeding individuals, which includes 12 males and 12 females. Twenty seven WSP nests were located, of which 70% successfully hatched (19 nests), 22% failed (6 nests) and 2 had an undetermined outcome. For the first time in 3 years WSPs established five nests in a third area, the salt panne inland from the east end or Ormond Beach.

The biggest threat to nesting success in 2010 was nest predators. Nests were predated by ground squirrels and ravens. The use of mini-exclosures was initiated on the east end of Ormond Beach due to the high predation rate early in the season and the increase in ground squirrels and their dens in that area. The success rate with the exclosures was 100%. Unlike last year in 2009, no humans vandalized nests inside exclosures. Human trespassing was much less than in the previous year. However, trash left by humans continues to be a problem and a source of attraction to nest predators. The number of dog visits to the beach decreased again in 2010 (116 documented dog visits compared to 263 in 2009 and 468 in 2008 during the same period).

INTRODUCTION

The western snowy plover (WSP) (*Charadrius alexandrinus nivosus*) breeds along the coast of the Pacific Ocean in California, Oregon, and Washington and at alkaline lakes in the interior of the western United States (Page et al. 1991). Loss of habitat, predation pressures, and disturbance have caused the decline of the coastal population of WSP and led to the listing of the Pacific Coast Population of WSP as federally-threatened on March 5, 1993 (Federal Register 1993).

Ormond Beach is located between Naval Base Ventura County, Pt. Mugu (Arnold Road) and the City of Port Hueneme (J Street drain). The beach is approximately 2 miles long. From west to east, the sandy beach is backed by Perkins Street, a pickleweed wetland, the Reliant Energy power plant, and another pickleweed wetland. The west end is owned by the City of Oxnard, the center and eastern portion are owned by the California Coastal Conservancy. The survey area is bounded by the Point Mugu boundary fence on the southeast, to Port Hueneme Beach on the northwest, and includes the Ormond Beach Salt Pannes directly inland from the northeast end of Ormond Beach. Figure 1 shows an aerial view of the nesting areas.

Figure 1. Ormond Beach survey area

Plovers utilize dune backed beaches for nesting and digging scrapes, which they line with shells and other bits of material. They lay three camouflaged eggs and incubate for approximately 28 days. Chicks are precocial and typically are attended to by the male, which guards the surviving chicks and leads them to forage. Chicks fledge approximately four weeks after hatching. On Ormond Beach, plovers utilize two distinct areas for nesting, which are located on the southeastern and northwestern ends of the beach. There is an approximately 0.5 mile stretch of beach in front of the Reliant Energy power plant where no nests are found. Over the past years, various types and configurations of protective fencing have been put up in the spring and taken down in the fall. As in past years the protective fencing completely enclosed the breeding area on the northwest end of the beach. The breeding area on the southeast end of the beach was enclosed for the first time on all four sides (Figure 1). The beach is not cleaned or groomed, so driftwood and wrack collect on the seaward edge and provide forage for nesting birds.

Efforts to protect plover nesting have been ongoing for approximately 20 years by various non-governmental organizations including the Ventura Audubon Society, the Conejo Valley Audubon Society, the Nature Conservancy, and the Sierra Club. These private efforts have had the support of the California Department of Fish and Game and the U. S. Fish and Wildlife Service.

The objective of this work was to monitor all nests, eggs and young of the plover and estimate reproductive success. The number of adults and chicks observed each week was recorded, nests were located and tracked until completion, and nest outcome was determined where possible. Threats to nesting success were determined and documented.

METHODS

Population Abundance and Nest Fate

Monitoring of Ormond Beach was conducted by walking wandering transects a minimum of once per week over the entire length of the beach in each direction from the boundary fence of Navy Base Ventura County, Pt. Mugu to Port Hueneme Beach. The Ormond Beach Salt Pannes were also included in the survey area. All plovers observed were recorded by age and gender. All nests located were recorded by date found, GPS coordinates, and number of eggs. Nests were marked with a colored tongue depressor placed approximately three to five feet inland. Each nest was followed until hatching or date lost prior to hatching. Once a nest no longer contained eggs, a 2 meter area around the nest was examined for eggshell fragments, egg yolk, tracks of birds or possible predators or any other disturbance. Next, the nest scrape was carefully examined for shell fragments. Nest hatching was determined by locating a pip shell (1-4 mm) within the hatched nest, by observing displaying behaviors of adults and locating chicks when possible. Failed nests were determined based on eggshell evidence such as large shell fragments, fragments with egg membrane still attached and/or egg contents within 2 meters of the nest scrape (Mabee 1997). In addition signs of predator tracks, nest disturbance, observations of predators in the nest vicinity and eyewitness reports were used as evidence of failed nests. If no eggshell pip, fragment or egg content could be located, and no signs of nest disturbance as well as no adult defending behavior or chick presence observed, the nest outcome was recorded as unknown.

Nest Initiation

Nest initiation was calculated for nests confirmed to have hatched by subtracting 28 days from the first observed survey date in which no eggs remained in the nest. For nests determined to have failed or with unknown outcome, nest initiation was taken to be the first date the nest was observed with eggs.

Breeding Adults
The number of breeding adults was estimated. This number was calculated by adding the number of active nests and the number of active broods sighted on the same survey date. The survey with the highest combined number of nests and broods was used to calculate the number of breeding adults representative of the season. One breeding male and female were attributed to each active nest and one breeding male was attributed to each active brood.

Dogs
The number of dogs entering the beach via the Arnold Road parking lot access was recorded by a volunteer docent, Walter Fuller. Observations were made between the hours of 6:30 am and 1:30 pm Monday through Saturday throughout the breeding season.

RESULTS and DISCUSSION

Population Abundance
Throughout the survey period the average number of adult WSP observed was 34. The monthly averages are shown in Figure 2. The greatest number of birds were observed in the months of March and April with average counts of 48 and 58. During these months there continued to be gatherings of WSP on the outer beach. During May, June and July the population counts dropped to monthly averages of 33, 41 and 25, respectively. Fewer birds were observed on the beach and the majority of birds were seen in the fore or back dune area of the breeding areas or in the salt panne. In August, the numbers of WSP dropped to an average of 9 birds per survey. This corresponded to the end of the breeding season and birds were only observed foraging in the high tide area. In September, WSP were again observed in flocks corresponding to winter gatherings on the outer beach and the average number increased to 38. Detailed population data gathered during each survey is included in Attachment 1.

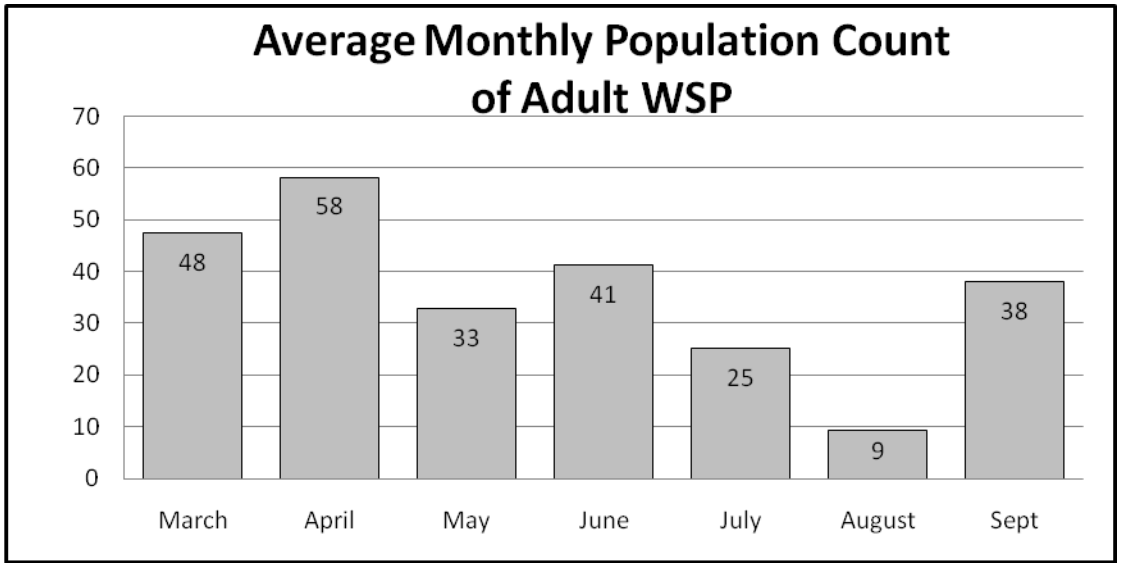

Figure 2. Average monthly number of adult plovers observed during the 2010 survey period.

Breeding Adults

The estimated number of breeding adults is calculated to be a total of 24 individuals, with 12 males and 12 females. This is based on the survey with the greatest number of active nests (n = 12). Nest numbers and chick observations are detailed in Attachment 2.

Banded Birds

Banded WSP observed during the survey period were recorded and the data was sent to Frances Bidstrup, with Point Reyes Bird Observatory. Banded birds observed included two that had fledged from Camp Pendelton, two from Oceano and one bird from Salinas National Wildlife Refuge (NWR). A male WSP banded S:K/P was observed on March 30th and April 3 foraging on the northwest end of Ormond Beach. It had been banded at Camp Pendleton sometime since 2004. A female banded S:K/V was observed on June 5th roosting on the outer beach near the northwest breeding area. It also had been banded at Camp Pendleton during the same time period. On May 31 another female banded bird GG:VG was observed displaying defending behavior in the salt panne. It fledged from and had been banded at Oceano in 2008. This bird was not re-sighted. A male WSP with the bands GP:RP was observed foraging in the high tide line in front of the Reliant Energy power plant on June 27. It fledged from the southern end of Salinas NWR in 2009. Finally, a bird with the band pattern RR:OY was observed foraging with a flock on the outer beach near Arnold Rd. on September 7. It was a hatch year bird and had just been banded at Oceano on July 22 of this year. A detailed record of banded bird sightings is included in Attachment 3.

Nest Activity

Spatial Dispersal of Plover Nests

WSP utilized three distinct areas for nesting in 2010. Consistent with previous years since at least 2003, nests were established on the northwest and southwestern or northeastern ends of the Ormond Beach. There is an approximately 0.5 mile length of beach in front of the Reliant Energy power plant bounded by the east and west nesting areas where no nests are found. This year nests were also found in the salt panne near Arnold Rd. (Figure 1). Nests have been observed in this location only in 2006 and 2007. Ten nests were established on the northwest end of Ormond Beach, 12 nests were on the southeast side, and 5 nests were found in the salt panne.

Nest Initiation
The first nest was located on April 3, 2010 and the final nest on August 4, 2010. A total of 27 WSP nests were located during the 2010 breeding season. No nests were initiated in March, although pairs were observed performing courtship behaviors (scrape construction and copulation). Nesting began in April when 6 nests were established. In May, nest initiation peaked with 13 new nests and in June, only 7 were found. In July there was only one new nest. No nests were found in August or September. Figure 3 summarizes nest initiation by month. For a detailed account of recorded nest observations see Attachments 4 and 5.

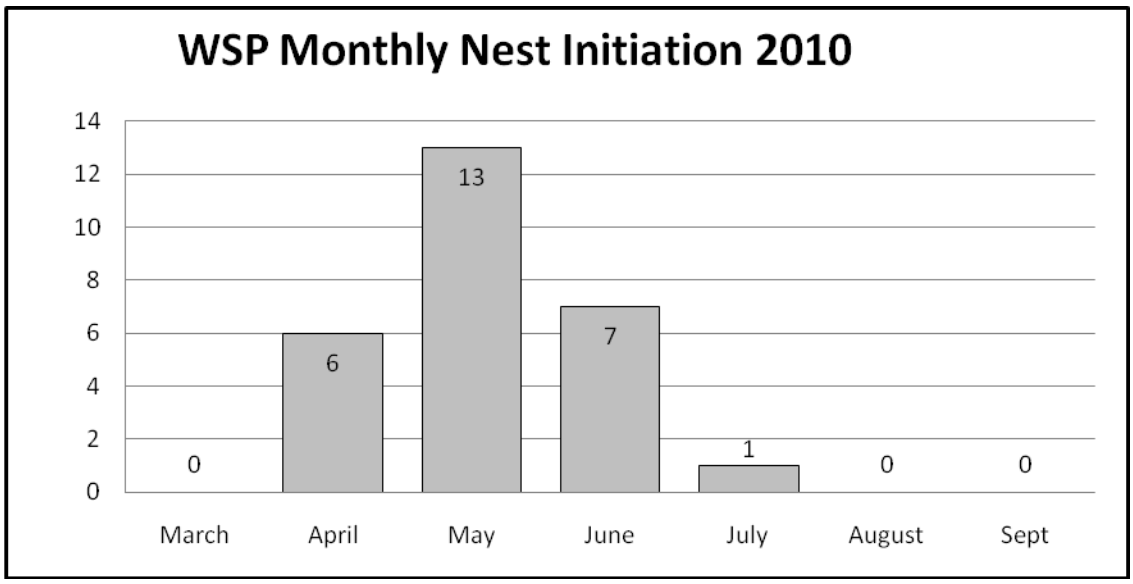

Figure 3. Total number of plover nests initiated each month

Nesting Outcome
Nineteen out of the 27 nests located during the season were determined to have hatched (70%). Six nests were determined to have failed due to predation (22%) and two nests had an unknown outcome (7%). No nests were determined to have been abandoned. All nests had three eggs and of the nests that hatched, all but two hatched each of the three eggs. One nest hatched two and one nest hatched 1 egg. See Attachments 4 and 5 for complete hatch details.

Outcome	Number	Percent
Hatch	19	70%
Predated	6	22%
Undetermined	2	7%
Abandoned	0	0%
Total	27	

Nest Failures
The 6 failed nests were the first nests of the season. All of these nests were located on the eastern end of Ormond Beach (Figure 4). Predation was confirmed in five of the failed nests. Two nests were predated by squirrels and 3 nests were predated by corvids. The sixth nest was either predated or destroyed by high winds two weeks after it was discovered. All nest evidence was blown away before it could be examined. Two undetermined nests had no signs of hatching and no signs of predation so the outcome is unknown.

The east end of Ormond Beach was heavily infested with ground squirrels all season, a trend that began in 2009 and became worse in 2010. Because of the loss of the first nests to predation, mini-exclosures were used on all subsequent nests on the east end. The success rate with exclosures was 100%.

Figure 4. Spatial arrangement and nest outcome of WSP nests during the 2010 breeding season at Ormond Beach.

Dogs

Between May 1 and September 1 a total of 116 dogs were recorded entering the beach from the Arnold Road parking lot. Observations were made between the hours of 6:30 am and 1:30 pm Monday through Saturday each week. This data does not account for any dogs that entered Ormond Beach via Hueneme Beach. Compared to data collected in 2008 and 2009, there has been a downward trend each year in dog visits to the beach (Figure 5). For the same time period in 2008 there were 468 dogs entering the beach and in 2009 there was 263. In early 2009, Oxnard City Animal Control started ticketing dog owners with off-leash dogs and has continued the practice in 2010.

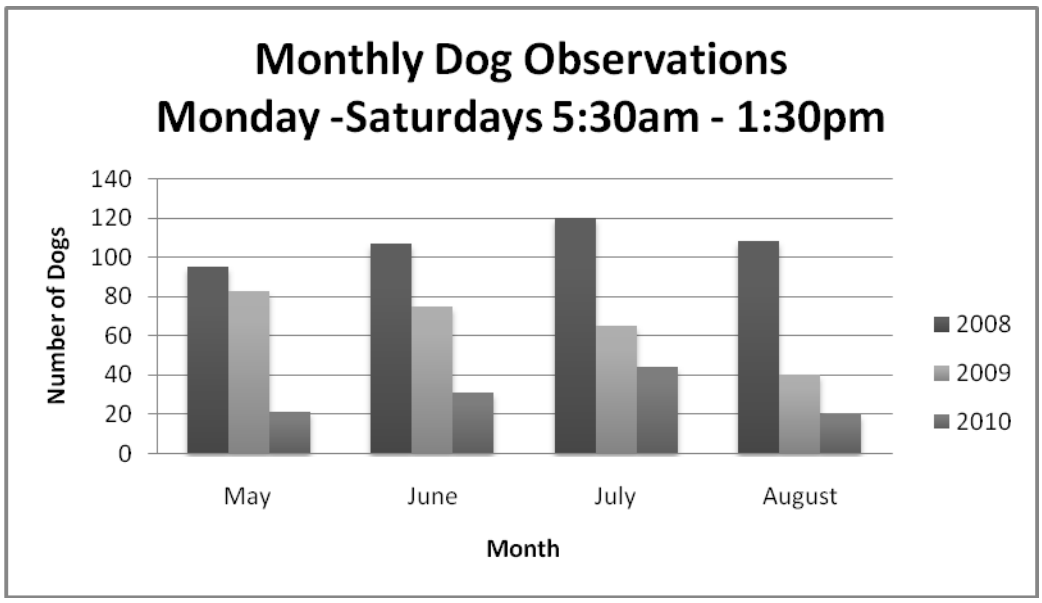

Figure 5. Average number of dogs visits recorded between 06:30 and 13:30 hours Monday through Saturday.

Threats to Nesting Success

During the 2010 WSP breeding season, the greatest threat to nesting success were predators. Ground squirrels were the biggest problem. Corvids also predated 3 nests early in the season. Another issue was strong winds which occurred from March until late May. Winds typically had sustained speeds of 15-25 mph and gusted up to 40 mph. In some cases winds persisted for a week at a time and on two occasions high winds caused the cancellation of the nest survey. Although WSP succeeded in establishing nests during this time, it is possible one nest was lost to the wind.

Natural Predators

Ground squirrels were seen on almost every survey in the southeastern breeding area. Squirrel dens are located inside and inland of all breeding areas and are especially numerous on the southeast end of the beach. On July 15, a squirrel was observed predating a California least tern (CLT) nest in the southeastern breeding area (personal observation). An adult tern and two adult WSP were attempting to distract the squirrel. All existing CLT nests were lost that day. A WSP nest was also in the area, but had a mini-exclosure on it. Without mini-exclosures it is likely that most WSP nests would have been lost to squirrel predation as what occurred in the 2009 breeding season. Crows and ravens were also observed on most surveys throughout the season at Ormond Beach and were responsible for 3 nest failures. Other predators observed in the area were a peregrine falcon that was seen on the Reliant Energy power plant and on the Pt. Mugu tower east of Arnold Rd. A long-tailed weasel and a coyote were observed in the salt panne area (pers. communication, Walter Fuller).

Humans

The biggest issue with human activity on Ormond Beach in 2010 was trash left on the beach. This attracts predators and contributes to the predation problem. Problems with transients were much less of a problem than in past years. No homeless people lived in the dunes by the nesting area as they did in 2009. Homeless encampments were confined to cypress trees behind the southeast nesting area and did not pose a problem to nesting birds. Human trespassers in the breeding grounds were also much less of a problem in 2010 compared to 2009. A large fort that attracted human trespassers into the breeding ground on the northwest end of the beach was removing in a pre-season beach cleanup on March 5, 2010. No new forts were established during the year. A large sturdy chain link fence with a gate was also installed at a common crossing point. Additional factors that helped were the use of a more durable fencing that was able to withstand high winds, the enclosure of the southeast breeding area was fenced on all four sides, and better signage.

Recommendations

There are several areas of improvement that could be implemented to increase breeding success of the WSP at Ormond Beach. Development of a management plan is critical to improving the fledgling success of the WSP at Ormond Beach. The management plan should address the following issues:

1) Continue to strictly enforce the dog leash law at all times. Ideally, dogs should be banned from the breeding areas during the breeding season with leash law enforcement during non-breeding times.
2) Add signage at the entrance to the beach showing which areas are opened and closed to the public. Include educational information on endangered breeding birds.
3) Initiate a predator control program to remove ground squirrels from breeding areas.
4) Repair the gate before the Arnold Road parking lot and close the parking lot from dawn to dusk.
5) Move the protective fencing further towards the high tide line on the southeast end since WSP establish nests on the fence line.
6) Do not allow scientific monitoring or educational field trips inside the breeding areas without the presence of a nest monitor.
7) Oppose any development of lands south of Hueneme Road as this would increase human use of the beach and result in degradation of the wetland and beach habitats on Ormond Beach.
8) Public events should not be scheduled on Ormond Beach during the nesting season (i.e. grunion runs, beach cleanups). Educational trips should stay 50 feet away from the protective fencing or the fencing boundaries should be extended.
9) Collect the three portions of the beach that are used by WSP under a single owner. Alternatively, ensure endorsement and active support of the management plan by all three property owners (the California Coastal Conservancy, Reliant Energy, and the City of Oxnard).

Acknowledgements

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Attachment 1. WSP population abundance per survey.

Date	Total: adults	Total: all ages	Females	Males	Unknown	Chicks	Hatch Year
3/20/2010	65	65	22	43	0	0	0
3/27/2010	30	30	7	19	4	0	0
4/3/2010	84	84	24	60	0	0	0
4/10/2010	54	54	10	44	0	0	0
4/17/2010	66	66	13	50	3	0	0
4/24/2010	29	29	5	24	0	0	0
5/1/2010	42	42	8	34	0	0	0
5/8/2010	aborted survey due to high winds						
5/15/2010	18	18	4	14	0	0	0
5/18/2010	27	0	0	0	0	0	0
5/22/2010	aborted survey due to high winds						
5/31/2010	44	44	10	34	0	0	0
6/5/2010	35	37	10	25	0	2	0
6/12/2010	36	36	6	25	5	0	0
6/19/2010	43	50	16	24	3	7	0
6/27/2010	51	66	17	34	0	12	3
7/7/2010	32	42	11	19	2	6	4
7/15/2010	28	32	12	14	2	2	2
7/24/2010	27	32	11	14	2	3	2
7/29/2010	14	17	7	5	2	3	0
8/4/2010	13	13	1	12	0	0	0
8/9/2010	8	11	4	3	1	3	0
8/16/2010	6	6	0	4	2	0	0
8/22/2010	13	15	5	4	4	0	2
8/29/2010	6	6	1	3	2	0	0
9/7/2010	23	23	0	0	23	0	0
9/11/2010	53	53	0	0	53	0	0
Average	**34**						

Attachment 2. Total number of active nests and brood observations. The maximum number of clutches occurred on May 31 with the occurrence of 12 active nests.

Date	# Chicks	Hatch Year	Calculated Active Nests	# broods with chicks	# breeding adults	Notes - chick detail/breeding behavior
3/20/2010	0	0	0	0	0	
3/27/2010	0	0	0	0	0	
4/3/2010	0	0	1	0	2	
4/10/2010	0	0	3	0	6	
4/17/2010	0	0	2	0	4	
4/24/2010	0	0	1	0	2	
5/1/2010	0	0	2	0	4	
5/8/2010				0		winds prevented survey
5/15/2010	0	0	6	0	12	
5/18/2010	0	0	7	0	14	
5/22/2010				0		winds prevented survey
5/31/2010	0	0	12	0	**24**	
6/5/2010	2	0	11	1	23	
6/12/2010	0	0	10	0	20	
6/19/2010	7	0	8	3	19	3 clutches of chicks(3@1wk old, 2@1wk, 2@2wks)
6/27/2010	12	3	6	5	17	5 clutches; banded bird GP:RP male
7/7/2010	6	4	5	2	12	2 clutches(3@<1wk old, 3@2wks)
7/15/2010	2	2	5	1	11	1 clutch of 2 chicks(1wk old)
7/24/2010	3	2	3	1	7	1 clutch of 3 chicks (days old)
7/29/2010	3	0	0	1	1	1 clutch of 3 chicks(1 week old)
8/4/2010	0	0	0	0	0	
8/9/2010	3	0	0	1	1	1 clutch of three 2-week old chicks crossing to the Mugu side *Last chick sigthing of the year*

Attachment 3. Banded WSP detail

Date	Band Combo	Sex	Band Details	Behavior	Additional Info
3/20/2010	S:K/P	male	Banded Camp Pendelton, any year since 2004	foraging	by J-St. Estuary
4/3/2010	S:K/P	male	Banded Camp Pendelton, any year since 2004	foraging	Arnold Rd.
5/31/2010	GG:VG	female	Banded 2008 Oceano	defending	Wetlands/salt panne
6/5/2010	S:K/V	female	Banded Camp Pendelton, any year since 2004	roosting	J St. Estuary
6/27/2010	GP:RP	male	Banded 2009 southern end of Salinas NWR "between the signs"	foraging	High tide line in front of Reliant Energy power plant
9/7/2010	RR:OY	HY	Banded on 7/22/2010 at Oceano	roosting	Arnold Rd. flock

Attachment 4. WSP nest details for nest numbers 1-14

Nest #	Location	Date Found	Survey date eggs gone	Eggs Laid	Eggs Hatched	Exclosure	Outcome	Fate	Comments
10OB01	east	4/1/2010	4/17/2010	3	0	no	Fail	predated/corvid	corvid tracks, broken eggs
10OB02	east	4/10/2010	4/17/2010	3	0	no	Fail	predated/squirrel	eggs gone, squirrel tracks
10OB03	east	4/8/2010	4/17/2010	3	0	no	Fail	predated/squirrel	eggs gone, squirrel tracks
10OB04	east	4/17/2010	4/23/2010	1	0	no	Fail	predated/corvid	corvid tracks, broken eggs
10OB05	east	4/17/2010	5/1/2010	3	0	no	Fail	unknown/wind	no eggs or sign of nest scrape
10OB06	east	5/1/2010	5/8/2010	3	0	no	Fail	predated/corvid	corvid tracks, broken eggs
10OB07	salt panne	5/3/2010	5/27/2010	3	3	yes	Hatch	succeed	chick observed near nest on 5/27/10, pips
10OB08	east	5/15/2010	6/5/2010	2	2	yes	Hatch	succeed	2 chicks observed near nest, pips
10OB09	east	5/31/2010	6/23/2010	3	3	yes	Hatch	succeed	2 chicks just hatched, 1 egg
10OB10	east	5/31/2010	7/2/2010	3	3	yes	Hatch	succeed	pips, exclosure
10OB11	west	5/31/2010	6/12/2010	3	3	yes	Hatch	succeed	pips found
10OB12	west	5/31/2010	6/27/2010	3	3	yes	Hatch	succeed	2 just hatch chicks in nest on 6/27/10; no eggs left on 7/2/10
10OB13	west	5/31/2010	6/19/2010	3	?	no	unknown	unknown	1 egg left, no pips
10OB14	west	6/2/2010	6/19/2010	3	3	no	Hatch	n/a	pips, chicks spotted in area on 6/16/10

Attachment 5. WSP nest details for nest numbers 15-27

Nest #	Location	Date Found	Date eggs gone	Eggs Laid	Eggs Hatched	Exclosure	Outcome	Fate	Comments
10OB15	east	6/5/2010	6/10/2010	3	3	yes	hatch	succeed	exclosure, no signs of disruption, female nearby distracting, chick sighted on 6/11/10
10OB16	west	6/9/2010	6/27/2010	3	3	no	hatch	succeed	pips found
10OB17	salt panne	6/10/2010	only chicks obs.	2	2	no	hatch	n/a	2 chicks, day old observed 6/10/10
10OB18	salt panne	6/10/2010	6/19/2010	3	3	no	hatch	n/a	3 chicks nearby ~ 1 wk old. No pips in nest, but no signs of disturbance.
10OB19	salt panne	6/19/2010	6/27/2010	3	?	no	no pips	unknown	no signs of predation, but no pips or chicks
10OB20	west	6/23/2010	7/24/2010	3	2	no	hatch	n/a	pips found
10OB21	west	6/23/2010	7/7/2010	3	3	no	hatch	n/a	1 egg left on 7/7/10
10OB22	west	6/23/2010	6/23/2010	3	3	no	hatch	n/a	3 chick newly hatched chicks in nest scrape
10OB23	east	7/2/2010	7/29/2010	3	3	yes	hatch	n/a	adult female sighted with v. young chick nearby 7/28/10; no eggs 7/29/10
10OB24	west	7/2/2010	7/24/2010	3	3	no	hatch	n/a	pips found
10OB25	salt panne	7/7/2010	only chicks obs.	3	3	no	hatch	n/a	3 chicks, <1 week old with adult male nearby, No documented nest in area with matching hatch date.
10OB26	west	7/7/2010	7/24/2010	3	3	no	hatch	n/a	pips found
10OB27	east	8/4/2010	8/5/2010	3	1	no	hatch	n/a	male next to nest, brooding new chick