2014 Final Report on the Western Snowy Plovers

Coal Oil Point Reserve
University of California
Santa Barbara, CA

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Site: Sand's Beach, Coal Oil Point Reserve (COPR)

Location: RU5, Santa Barbara, CA

Lat-Long: 34 25 00 N, 119 52 30 W

USGS maps: Goleta 7.5, Dos Pueblos Canyon 7.5, Goleta 15

Jurisdiction: Owned and managed by the University of California Santa Barbara.

Climate: Avg precp 14-21 in/year, avg min temp 42 F, avg max temp 75 F

Total linear beach length: 1,200 m

Protected linear beach length: 300-400 m during Winter and fall and 800 m during the breeding season

Protected area during breeding season: 30,700 sq meters or 7.6 acres

Docent program? Yes, all year, most daylight hours

Interpretive and regulatory signs? Yes, at beach entrances and fences

Management Plan? Yes

Enforcement? Docents request compliance with leash law and restricted areas. Officers are called when problem is not solved.

Monitoring: Yes, weekly in the winter and Fall and daily in the spring and Summer.

Predator management: harassment of crows, fencing to prevent skunk, predator control.

INDEX

ABSTRACT

In 2014 we continued with the monitoring of the WSP population at Coal Oil Point Reserve as in previous years. We had predator control during most of the breeding season, but nest predation by mammalian predators was high. However, chick fledge rates were higher than average. Nesting on the mud flats was also the highest on record.

INTRODUCTION

Sands beach at Coal Oil Point Reserve (COPR) has a wintering populations of about 250 individuals and a breeding population of about 20 pairs of the Western Snowy Plover. The beach is open to the public all year, but a portion of the dry sandy beach, which is the plover habitat, has been protected since Spring 2001.

METHODS AND RESULTS

In 2014, we continued with the same management practices established in 2004 (Sandoval, 2004). Figure 1 shows the location of the plover habitat and the symbolic fences. The exact location of the fences varies based on tides and season, and whether the slough mouth is open. When the slough mouth is open, a portion of the fencing is removed to prevent it from being washed away.

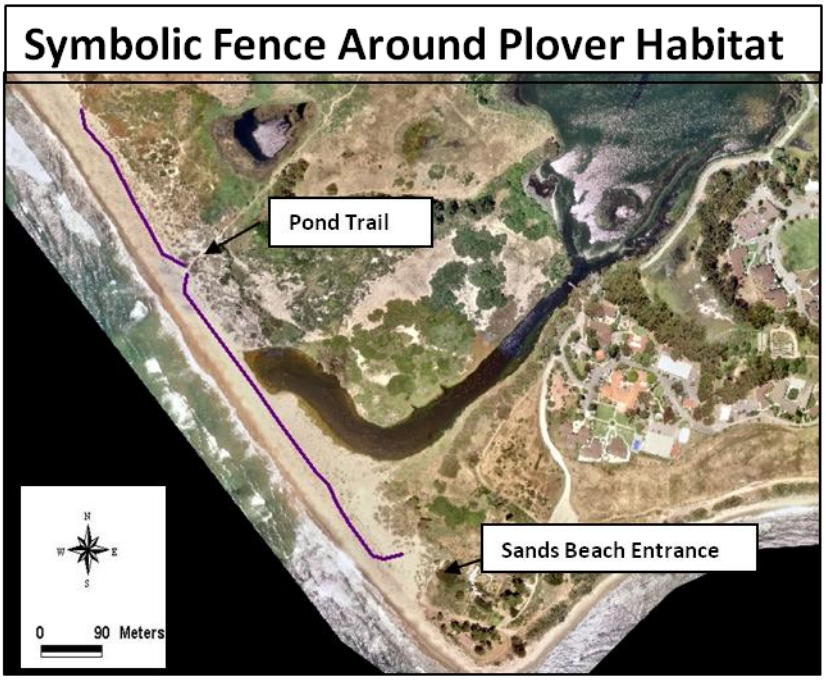

Figure 1. Location of the habitat protected for the Western Snowy Plovers (year round) on Sands beach at Coal Oil Point Reserve. The mudflats not shown in this photo area also protected. The fence is shown in purple.

WINTERING POPULATION

To count individuals of the WSP, we walked along the wet sand from the eastern boundary of Sands beach to the western boundary of the Reserve and observed all individuals with binoculars. On the way back, we stopped at groups of individuals to look for color bands on the legs.
The number of wintering plovers at the reserve has been lower than average for the last 5 years (Figure 2). We do not know what accounts for this trend.

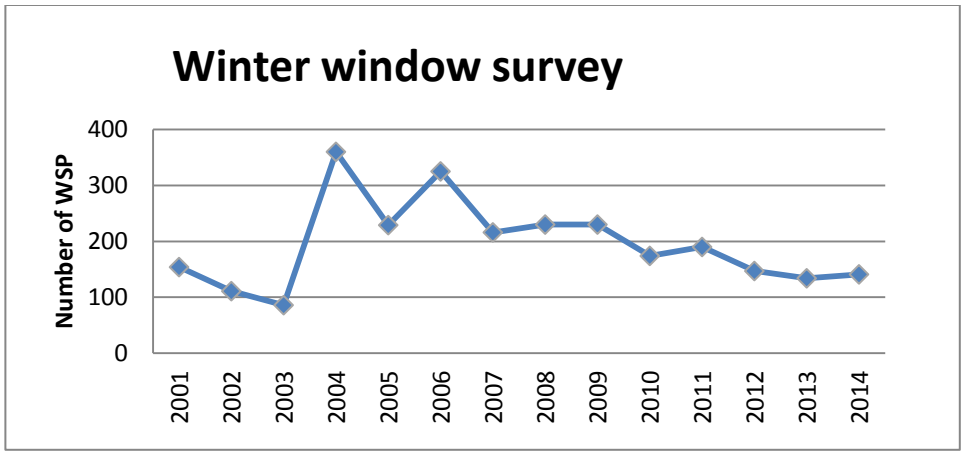

Figure 2. Winter window surveys of snowy plovers at Coal Oil Point Reserve.

BREEDING POPULATION

We counted the breeding population in the same way as the wintering population. We counted 33 WSP during the 2014 breeding window survey. Figure 3, below, shows the breeding population window surveys between 2001 and 2014. The graph also shows that the number of adults increased right after the implementation of the management plan in 2001 and reached a mean of about 32 adults after 2003.

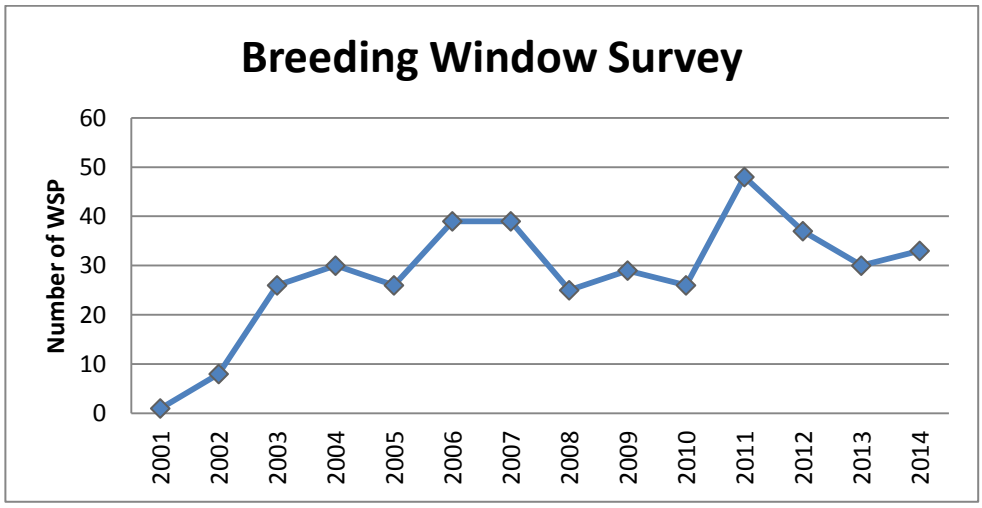

Figure 4. Counts of adult snowy plovers at Coal Oil Point Reserve during the breeding window surveys.

Nesting

During the nesting season in 2014, the numbers and locations of adult plovers, nests, and chicks were counted 3 times per week by April Price and Pat Walker. Table 1, below, summarizes the results of these

observations. The number of males for the estimation of fledged chicks/male is calculated based on half of the adult number counted in the breeding window survey. Because males can move around within a season, the number of males may be underestimated.

Detailed discussion of nest and chick fate follow below.

Year	Breeding survey #	Nests	Nests Hatched (Nests hatched/#nests)	Chicks Fledged (Fledged/male)	Fledgling Rate Nests that fledged at least one chick/nests that hatched at least one chick
1970-2000	few	~2-4/30yr	none	none	none
2001	1	1	1 (100%)	1 (1)	1.0
2002	8	9	6 (67%)	14 (2.8)	2.3
2003	26	24	16 (67%)	40 (3.3)	2.5
2004	30	51	20 (39%)	27 (1.9)	1.5
2005	26	64	16 (25%)	30 + 17 (2.3)	1.9
2006	39	43	24 (56%)	48 + 11 (2.5)	2.0
2007	39	66	20 (30%)	?	0.9
2008	25	57	22 (38%)	39 (2.8)	1.5
2009	29	64	39 (60%)	61 (+3)	1.6
2010	26	74	42 (57%)	19 (1.5)	0.5
2011	48	84	35 (42%)	9 (0.4)	0.3
2012	37	73	34 (47%)	22 (1.2)	0.6
2013	30	65	36 (55%)	30 (2.0)	0.9
2014	33	77	21 (27%)	26 (1.6)	1.2

Table 1. Changes in breeding variables at Coal Oil Point since 2001.

Nest Fate and Predation

In 2014, there were 77 nests laid at COPR and 21 (27%) of the nests hatched. Figure 5 shows the number of nests laid and the number of nests hatched between 2001-2014.

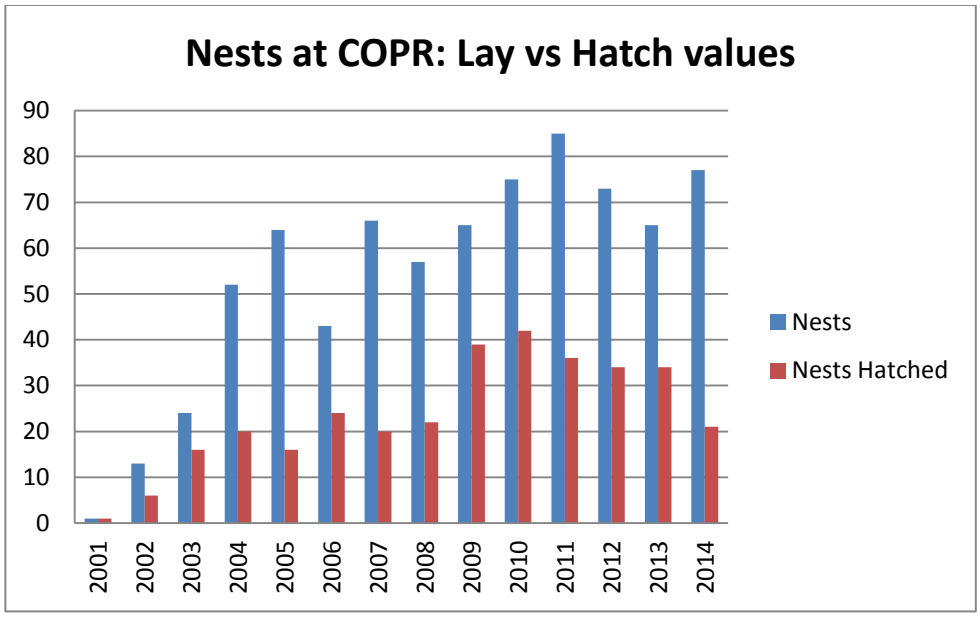

Figure 5. Total number of nests that had at least one egg and that hatched at least one chick at Coal Oil Point Reserve.

Figure 5 shows an increase in nest survival (nests hatched) between 2008 and 2009, which coincides with the initiation of our predator control program.

Historically, skunks and crows have been the most significant nest predators at COPR. In 2009, skunk predation levels dropped significantly after the initiation of a USDA predator control program(Figure 6). In 2014, there were ten documented nest failures due to skunk predation; the highest number since the initiation of predator control program. USDA predator control captured and euthanized a total of 18 skunks and 15 raccoons were trapped and euthanized in 2014 (USDA appendix).

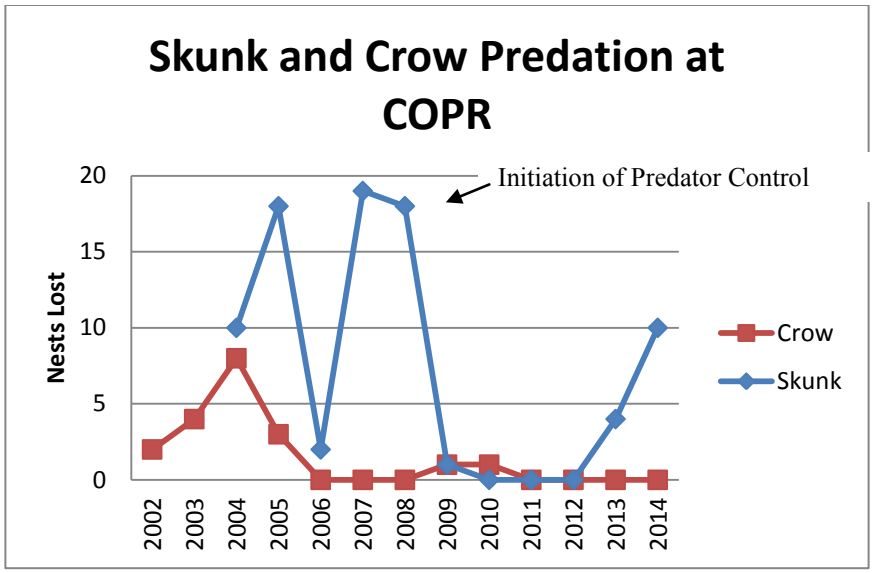

Figure 6. Crow and Skunk predation between 2002 and 2014.

Figure 7 below summarizes the nest fate in 2014.

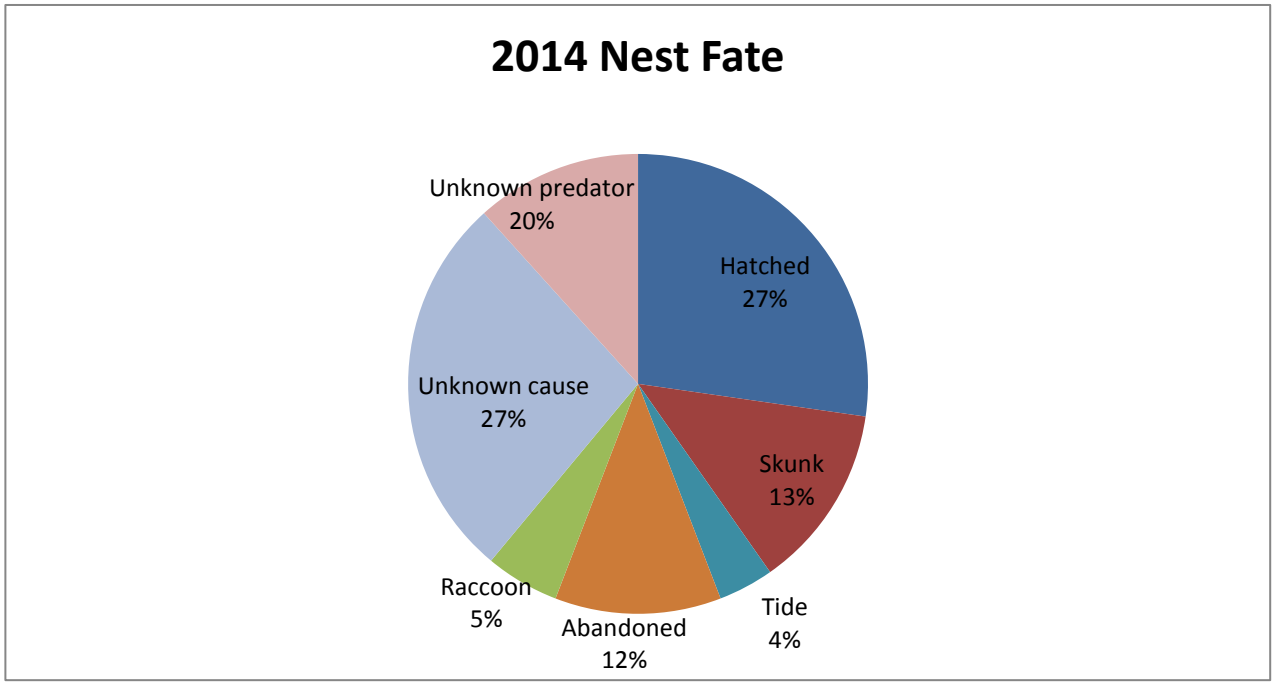

Figure 7. Nest fate at COPR in 2014.

In 2014, we observed 9 abandoned nests at COPR (12 percent of total nests). We have not had such a high number of abandoned nests since 2006, when six nests were abandoned due to owl activity and 3 nests were abandoned for other reasons (Table 2). Most of the nest abandonment occurred early in the

nesting season; 7 of the (14) nests laid in March were abandoned. Although we did not observe any adult predation events, the high level of nest abandonment events may indicate high WSP adult predation levels in March, perhaps from one successful individual predator.

Table 2, below, shows a complete representation of nest fate over the years.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total nests	**9**	**24**	**51**	**64**	**43**	**66**	**57**	**64**	**74**	**84**	**73**	**65**	**77**
Hatched	**6**	**17**	**20**	**16**	**25**	**30**	**22**	**39**	**42**	**35**	**34**	**34**	**21**
Skunk			10	18	2	19	18	10	0	0	0	4	10
Crow	2	4	8	3	0	0	0	1	1	0	0	0	0
Wind	1	3	2	6	1	1	2	5	2	10	2	0	0
Tide			5	5	2		7	1	5	12	16	6	3
Abandoned			0	9	3		0	1	3	5	3	4	9
Abandoned Owl	0	0	0	0	6		0		0		0	0	0
Flooded			0	3	0		0		4	3	0	0	0
Raccoon			2	1	0		0	1	0	0	2	2	4
Whimbrel			1	0	0		0		0	1	0	0	0
Gull	0	0	0	0	1		0		0	0	0	0	0
Opossum				1	0		0		0	0	0	0	0
Unknown cause			0	1	3	11		k a	15	8	11		21
Unk pred				1	1	1		4	0	10	5	15	9
Unk fate						4	4	2	0	0	0	0	0

Table 2. Number of nests lost by fate in 2014 and previous years.

In 2014, thirty percent of the nests at COPR were lost to an unknown cause or an unknown predator (Figure 7). In an attempt to identify the predators, we placed 4 Moultrie Game Spy I-35 cameras about 8 feet from nests on the mudflats. We were able to identify one nest fate with the cameras; a racoon was captured eating the eggs of one of the nests. The other three nests with cameras hatched. The cameras were a useful tool on the dried mudflats, where animal tracks are difficult to find. However, the cameras did not capture the movement of chicks, or most movements of adult WSP.

In the future we may invest in more sensitive camera equipment to track avian predation, but we will need to weigh the costs and benefits of using expensive equipment that may be stolen, as occurred with one of our cameras in 2013.

Chick survival

The average number of WSP chicks fledged each year at COPR since 2001 is 27. The fledge numbers have varied between one individual in 2001 (beginning of the WSP management program) and 61 in 2009 (Figure 8). In 2014, 26 WSP chicks fledged at COPR.

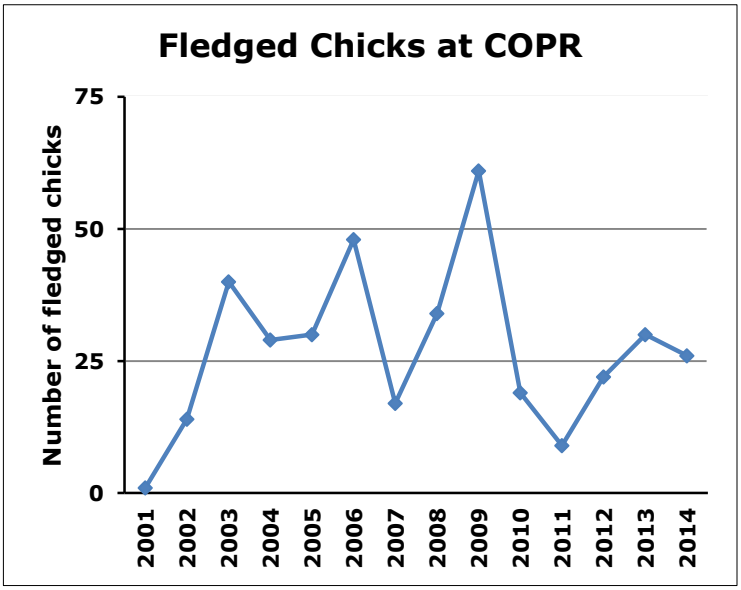

Figure 8. Number of chicks fledged at Coal Oil Point Reserve.

In 2014, we had 1.6 chicks fledged per male (Table 1). The fledging rate (nests that fledged at least one chick/total nests that hatched at least one chick) was 66%, the highest that it has been since 2009 (Figure 9).

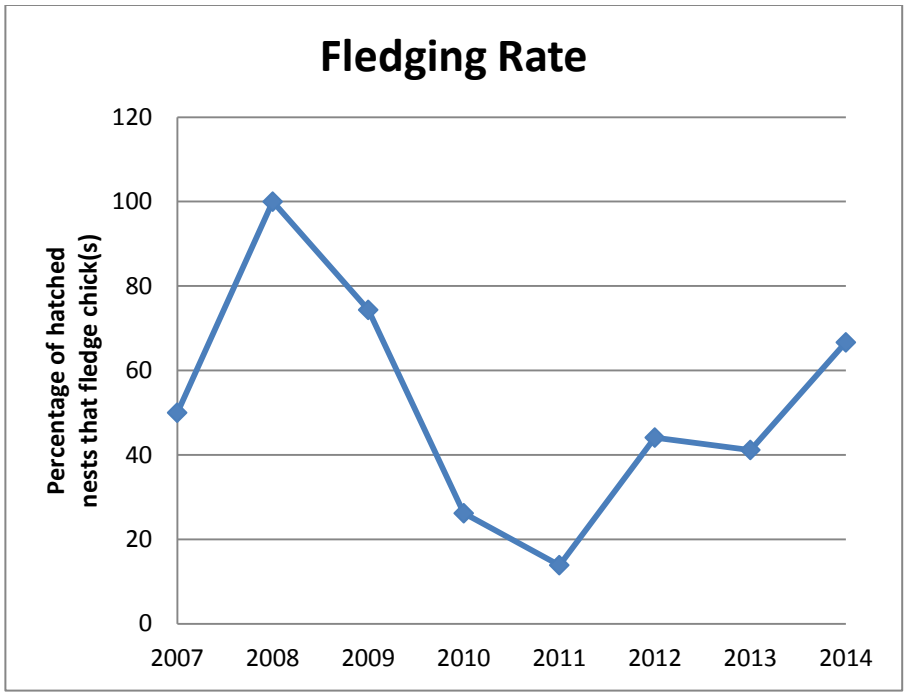

Figure 9. Fledging Rate: Percentage of hatched nests that fledged at least one chick.

Rehabilitation

Chick from McGrath State Beach

On August 4th, 2014, Alexis Frangis, state park employee, rescued an abandoned WSP chick from San Buenaventura State Beach. Frangis brought the rescued chick to Coal Oil Point Reserve on the same day.

The chick was kept in an open- top plastic terrarium with a heat lamp. We provided the chick with beach hoppers, collected from the wrack at COPR. When the chick was 5 days old, we transferred it to the Wildlife Care Network. Special care was taken to keep the bird from imprinting on humans; curtains were placed around the terrarium at most times. On September 11th, plover biologist Doug George, from PRBO, banded the chick as pa:Bw.

On September 23rd, we released the chick in front of the slough mouth at Coal Oil Point Reserve, next to a large flock of WSP. As soon as we released him, he took off flying, but after a quick flight, he came

right back to the beach, and flew into the flock of WSP. April Price and Cristina Sandoval watched the pa:Bw and the flock for 20 minutes following the release and did not observe any unusual behaviors.

Since his release, we have looked for pa:Bw three times a week. He has not been seen since his release day.

Enforcement

Officers enforce the leash law and other pertinent ordinances at COPR when they are called by the docents .

Location of nests

In 2014, We took the GPS coordinates of all of the WSP nests. For monitoring purposes, the nest locations were estimated using the numbered posts along the beach. For the nests on the mudflats, we used detailed descriptions to identify location for monitoring purposes.

On March 1st, 2014 a major storm event washed away all of the plover fencing, and cut away the dune system where the plovers had nested in previous years. As a result of the beach morphology change, the WSP changed their nesting locations. In previous years, the WSP largely nested on the ocean side of the dunes, with the nest locations easily visible from the fence line. In 2014, the WSP beach nests were concentrated in the wide slough mouth, or equally far from the shore in the dune system (Figure 11).

In 2014, we observed a high level of nesting activity on the mud flats. Figure 10, below, shows the nesting activity on the delta and beach over the past seven years. In 2014, 45%of the nests were laid on the delta, as compared to an average of 17 % between 2007 and 2013. The high nesting rate on the delta may have something to do with the change in beach morphology, but may also be correlated to the low rain fall in 2014. Because of the dry year, the mudflats were available for nesting early in the season, and were not inundated by water throughout the nesting season.

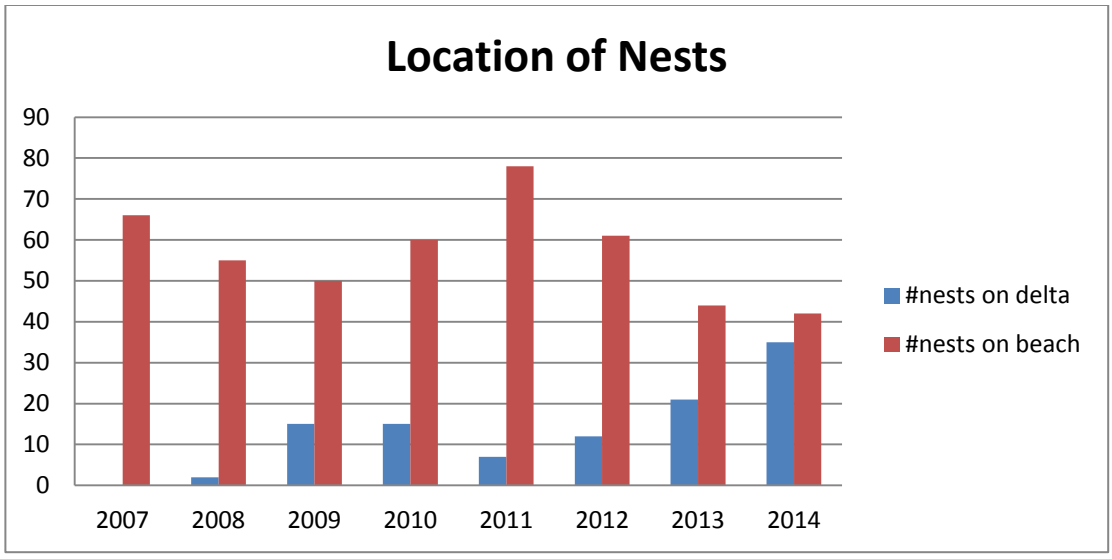

Figure 10: Nesting on the beach and delta between 2007-2014

We tracked the location of nests using a hand held Garmin GPS device. We used this data to look for spatial patterns in hatching and fledging success. The map of nest location on the beach is shown below (Figure 11) and the maps of nest location on the mudflats follows (Figure 12).

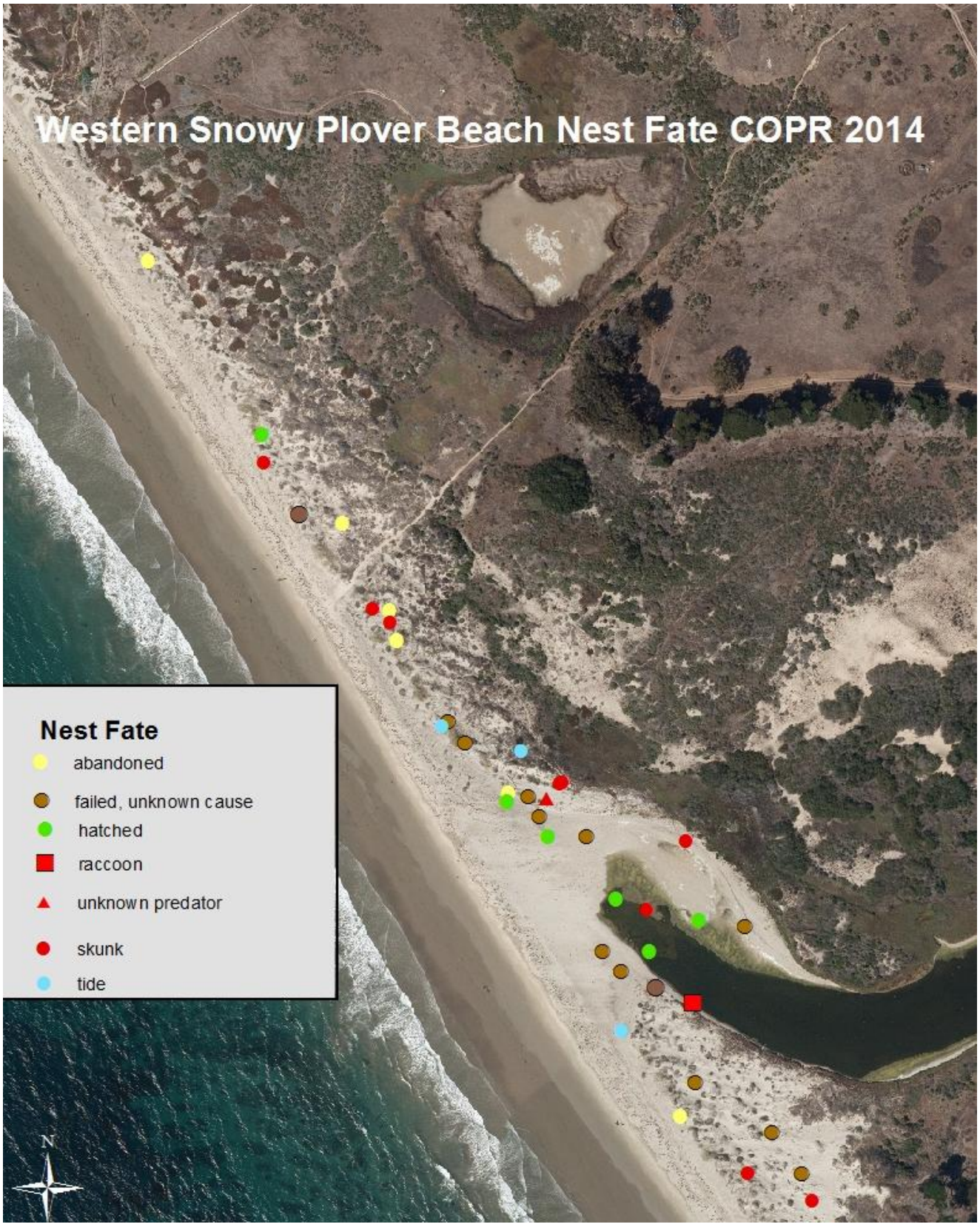

Figure 11: Nest Map on the beach

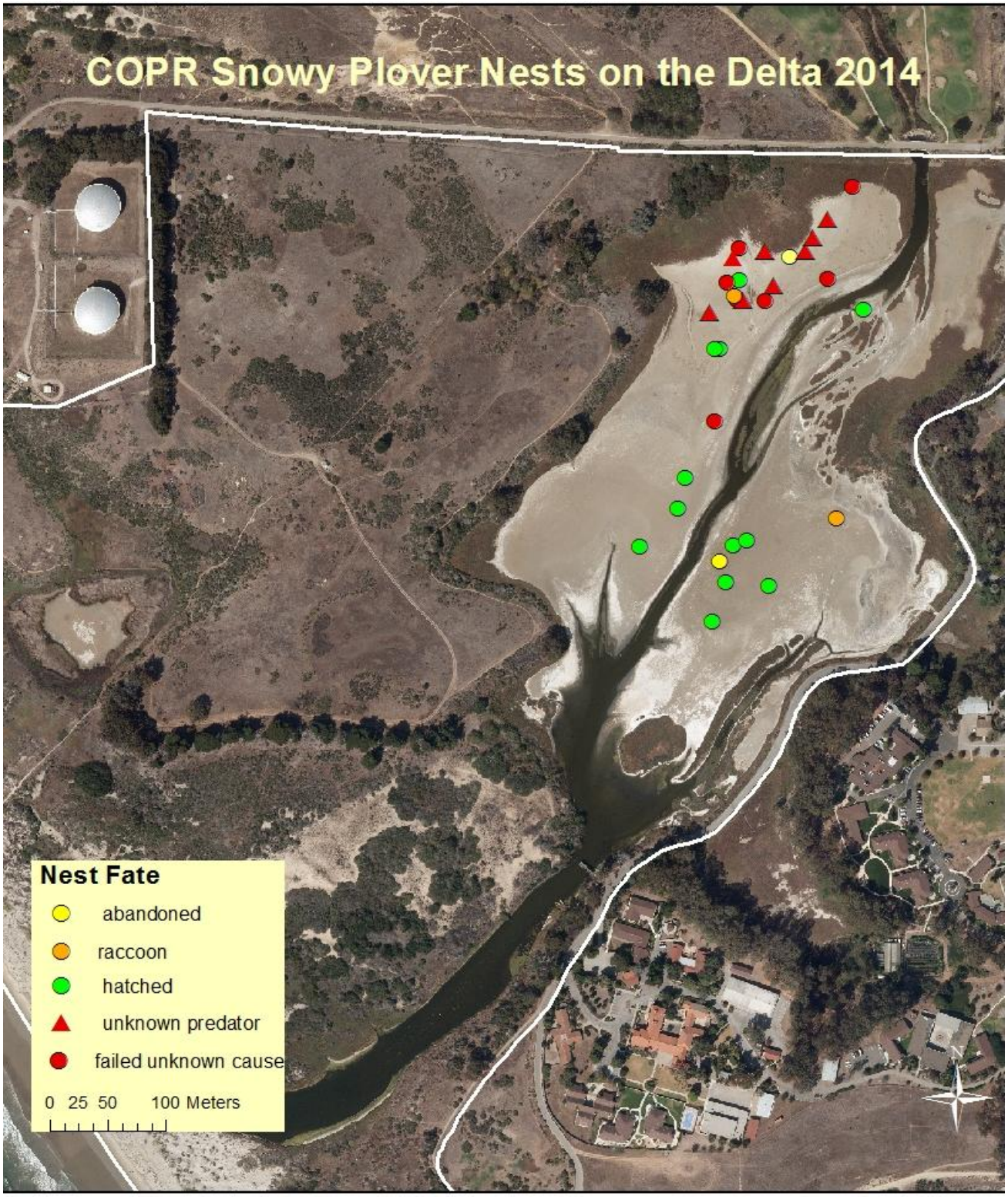

Figure 12: Nest Map on the mudflats

Docent program

The docent program continues at the same level as in 2013. The docents have been instrumental in reducing the impact of beach users to the Snowy Plovers. The docents main duties include educating people about the plovers, requesting compliance to the leash law, requesting people stay away from the symbolic fence, requesting people to move around the plover flock, and scaring away crows.

CONCLUSION

The plover breeding and population at COPR appear to have recovered since the implementation of a management plan in 2001. The control of skunks has become a management priority to improve hatching success. Because the density of nests is relatively high compared to other beaches, a nest predator can cause a large impact in a single night. We concluded that we cannot used the hatching success as a predictor of fledgling success, thus we will continue to count the number of chicks until fledgling age. The wintering population at the reserve is in a downward trend and we do not have an explanation. The docent program continues to be an effective way to reduce human impact on the plovers.

RECOMMENDATIONS

- The USDA trapping program worked well and should be continued.
- The mud flats should be included as part of the plover nesting habitat and be regularly monitored.
- Predator monitoring should be increased during the breeding season. Docents should watch for predators, both from the beach and potentially from blinds.

ACKNOWLEDGEMENTS

We are very thankful to Pat Walker who helped count plovers, locate nests and determine their fate and constructed and maintained the fences. April Price, the docent coordinator, managed the docent program. Steve Ferry also continued to assist with fence maintenance. The docents, too many to count, kept a presence at the beach every day of the year.

California Least Terns

No pairs were observed at COPR in 2013.

Bibliography of other Snowy Plover studies at COPR:

Lafferty, K.D. 2000. **Status, trends and conservation of the western snowy plover with a focus on the Devereux Slough population at Coal Oil Point Reserve, Santa Barbara County, CA**, Museum of Systematics and Ecology, University of California, Santa Barbara, Santa Barbara, CA.

Lafferty, K.D. 2001a. **Birds at a southern California beach: seasonality, habitat use and disturbance by human activity**. Biodiversity and Conservation 10: 1-14.

Lafferty, K.D. 2001b. **Disturbance to wintering western snowy plovers**. Biological Conservation 101: 315-325.

Kevin D. Lafferty, Darcie Goodman and Cristina P. Sandoval 2005. **Restoration of breeding by snowy plovers following protection from disturbance**. Biodiversity and Conservation. Online at: http://www.kluweronline.com/issn/0960-3115

APPENDIX 1. Band sightings banding at the reserve

Band Sightings				
9-Aug-14	VV:AW	VG:BR	AV:GY	GG:GG
13-Jul-14	GG:GW			

APPENDIX 2. USDA Report from 2014

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Cristina Sandoval
Director, Coal Oil Point Reserve
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23 September 2014

Report of Predator removal for Coal Oil Point Reserve:

Predator management activities were conducted on the Coal Oil Point Reserve in an effort to protect the threatened Western Snowy Plover against predation by mammalian predators during the 2014 nesting season. Predator removal began on 4 April 2014 and ended 22 August 2014.

Striped skunks and raccoons were the target predators during the 2014 snowy plover nesting season. Trapping was the method used to remove the predators. Traps used to capture mammalian predators were Victor #1½ padded jaw traps and 10" X 12" X 32" Tomahawk cage traps. All target mammals captured in traps were given an injection of sodium pentobarbital as a means of euthanasia with the exception of three raccoons that were euthanized off site by a single shot to the head with a 22 caliber cartridge. A total of 16 striped skunks and 11 raccoons were captured in padded leg-hold traps and euthanized. A total of two striped skunks and four raccoons were captured in cage traps and euthanized as well. All euthanasia of wildlife conducted by Wildlife Services is done in accordance with the American Veterinary Medical Association's Guidelines for the Euthanasia of Animals: 2013 Edition. These guidelines can be found at https://www.avma.org/KB/Policies/Documents/euthanasia.pdf.

Wildlife Services spent 130 hours on predator removal activities, carcass disposal, and associated administrative duties at Coal Oil Point Reserve during the 2014 season. A total of one thousand one hundred ninety five padded leg-hold trap nights and three hundred thirty cage trap nights were spent trapping and removing predators. A trap night is where one trap is set for one night. Two traps set for one night would be two trap nights, etc.

Wildlife Services recommends beginning predator removal activities prior to pairing and breeding season in 2015. Each year the cost of conducting predator removal increases.

United States Department of Agriculture

Animal and Plant Health Inspection Service

Wildlife Services

San Luis District

P.O. Box 957, Taft, CA 93268-0957

Coal Oil Point Reserve should consider this and secure sufficient funding to conduct the desired amount of predator removal.

Spotlight and scent station surveys should be conducted during the non-nesting season to identify predator species that inhabit the nesting area.

Predator management should be continued each year to help ensure fledging success of the threatened Western Snowy Plover.

Feel free to contact Kevin or myself if you have any questions.

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