
2008 Final Report on the Western Snowy Plovers

Coal Oil Point Reserve
University of California
Santa Barbara, CA

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.

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ABSTRACT

In 2008 we continued with the management of the WSP population at Coal Oil Point Reserve as in previous years. We were able to estimate chicks until fledged age. We experimented with replacing plover eggs with wood eggs and then returning the hatching egg to the plover nest. This was a successful way to improve hatchability during a high skunk predation time but it was very laborious.

INTRODUCTION

Sands beach at Coal Oil Point Reserve (COPR) has a wintering and a breeding population 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. Presently, all of the potential breeding habitat is protected during the breeding season and the beach east of the slough mouth is protected during the wintering months. Although Sands beach is relatively small, it has a large population of wintering plovers.

METHODS AND RESULTS

The 2001-2004 report (Sandoval, 2004) describes the management actions taken to protect the wintering and breeding populations of WSP at the reserve since 2001. Figure 1 shows the location of the plover habitat and the permanent and seasonal fences to protect them.

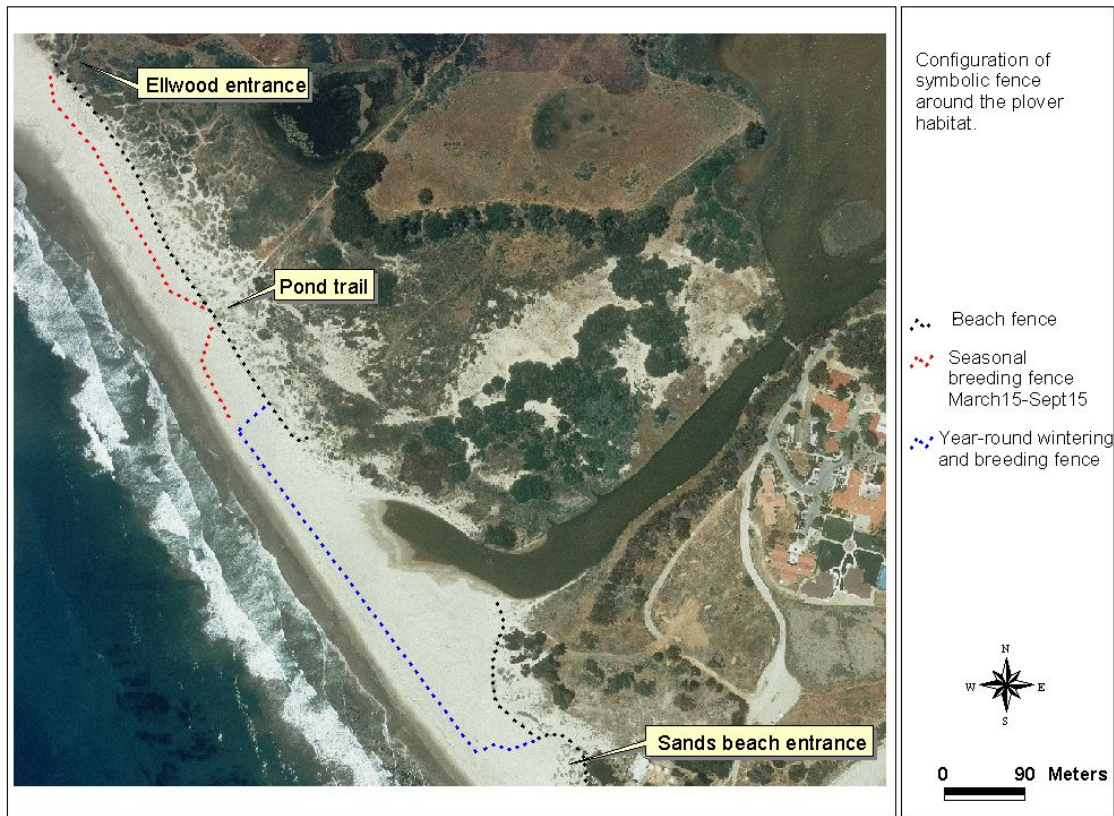


Figure 1. Location of the habitat protected for the Western Snowy Plovers on Sands beach at Coal Oil Point Reserve.

WINTERING POPULATION

When we counted, we walked along the wet sand from the eastern boundary of Sands beach to the western boundary of the Reserve (Figure 2) spotting and counting plovers with a binocular.

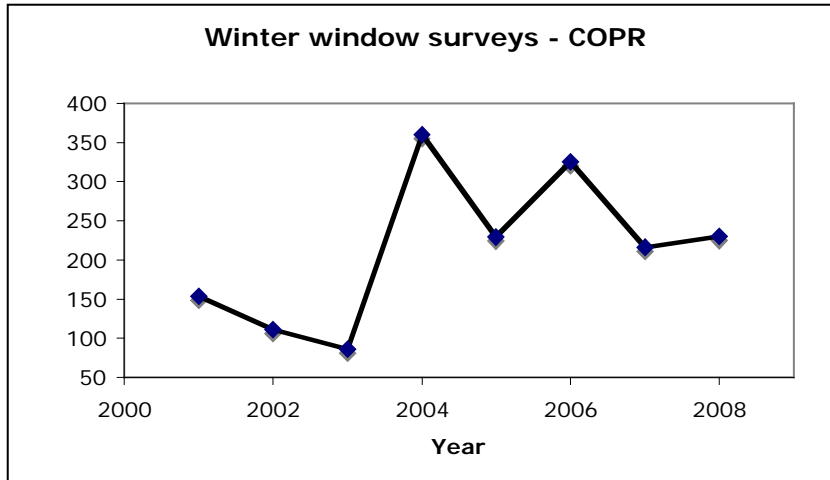


Figure 2. Winter window surveys of snowy plovers at Coal Oil Point Reserve.

BREEDING POPULATION

Nesting

In 2008, the number and location of adult plovers, nests, and chicks was counted 3 times per week by Cristina Sandoval, Pat Walker, and Jen Stroh (Table 1).

Table 1. Changes in breeding at Coal Oil Point since 2001. The number of fledged chicks is estimated based on the number of males in the window survey. Because males can move around within a season, this number may be overestimated.

Year	Breeding survey #	Nests	Nests Hatched (Nests hatched/#nests)	Chicks Fledged (Fledged/male)
1970- 2000	few	~2-4/30yr	none	none
2001	1	1	1 (100%)	1 (1)
2002	8	9	6 (67%)	14 (2.8)
2003	26	24	16 (67%)	40 (3.3)
2004	30	51	20 (39%)	27 (1.9)
2005	26	64	16 (25%)	30 + 17 (2.3)
2006	39	43	24 (56%)	48 + 11 (2.5)
2007	39	66	20 (30%)	?
2008	25	57	22 (38%)	39 (2.8)

The breeding window surveys show an increase in the number of adults since 2001 and possible maximum capacity of about 35 adults (Figure 3). The nests have been placed closed to each other around the preferred areas around the slough mouth. Although there is more breeding habitat west of the slough, the plovers nest there at much lower density.

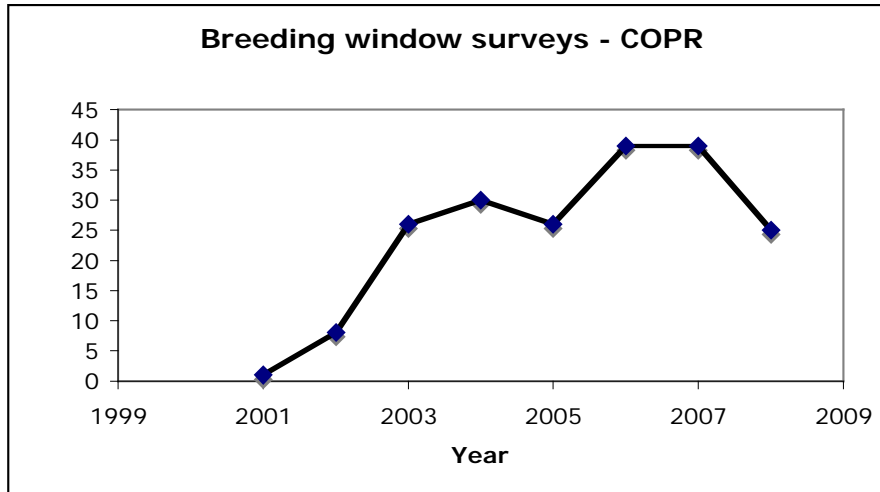


Figure 3. Counts of adult snowy plovers at Coal Oil Point Reserve in the breeding window surveys.

The total number of nests that successfully hatched seems to have reached a stable level since 2001 (Figure 4). This total is a result of the nest failure and re-nesting so it is good indicator of nesting success. The total number of chicks fledged also seems to have reached a stable level around 35 (Figure 5).

The number of chicks that have fledged in a year closely correlates with the number of nests that hatched (Figure 6). If this trend continues, we can start using the number of nests hatched as a measure of nesting success at the reserve, instead of attempting to count chicks.

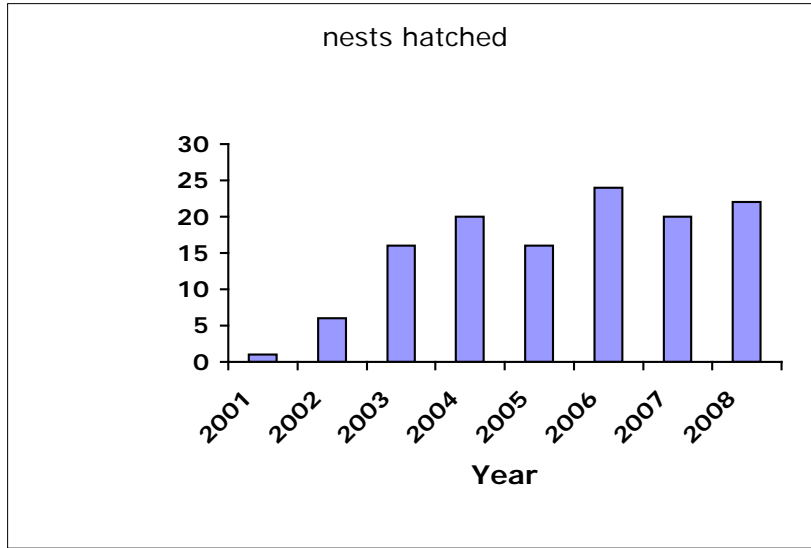


Figure 4. Total number of nests that hatched at Coal Oil Point Reserve.

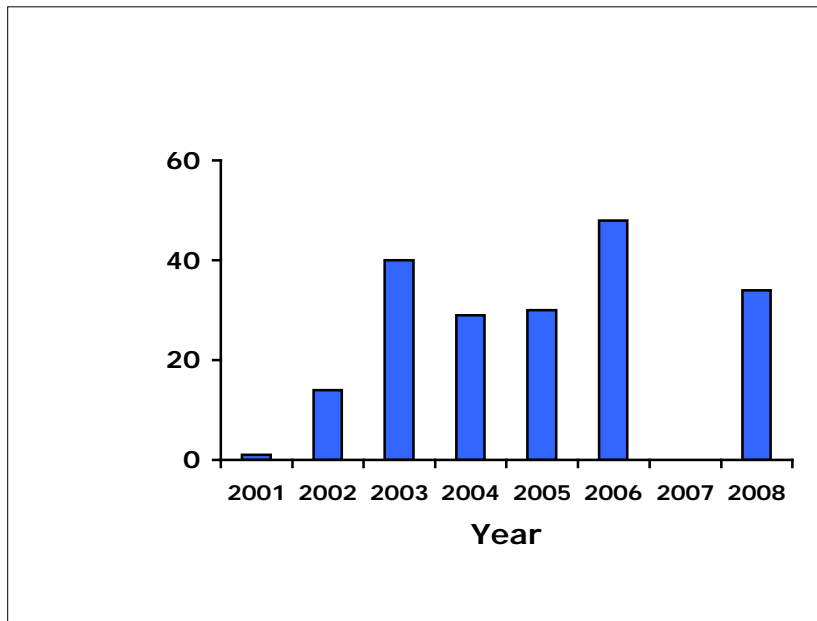


Figure 5. Number of chicks fledged at Cola Oil Point Reserve.

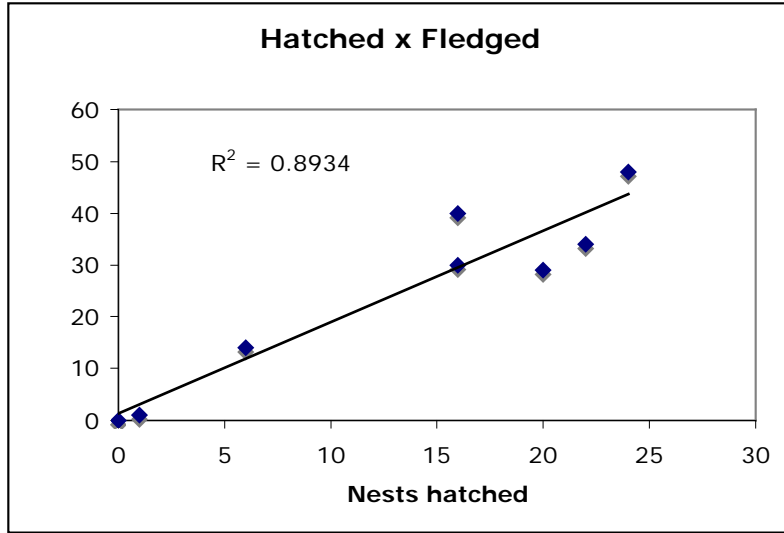


Figure 6. Regression of the number of chicks fledged each year and the number of nests that hatched.

Predation

Skunks were the main cause of nest failure in 2008 (Figure 7, Table 2) and this also a problem in previous years (Figure 8). Several skunks were seen each night foraging in the nesting area. Following the skunk footprints, we think that the skunks arrive at the beach and first eat beach hoppers and then move towards the plover nests. A meshed fence was used to help prevent skunks from moving from inland to the beach. This fence helped focus the skunk access to the beach to a few entrances but it did not stop them from reaching the beach.

From June 24 2008 to August 19 2008, USDA Wildlife Services was contracted to trap skunks and raccoons because the nest predation was nearly 90%. The traps used were Victor #1½ padded jaw traps and Tomahawk cage traps. Wildlife Services spent 92.5 hours on predator removal activities, carcass disposal, and associated administrative duties at Coal Oil Point Reserve during the 2008 season. A total of two hundred fifty padded leg-hold trap nights and sixty three cage trap nights were spent trapping and removing predators.

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A total of eleven skunks and six raccoons were captured in padded leg-hold traps and euthanized. A total of four skunks were captured in cage traps and euthanized as well.

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The Shorelines & Watersheds, a 501 (c)(3) nonprofit organization based in Goleta, California, developed a “Skunk Awareness Program” to educate residents of the Devereux Watershed about the threats that skunks have on ground nesting shorebirds. In March 2008, Shorelines & Watersheds implemented this program as following:

- Distributed flyers in neighborhoods surrounding Coal Oil Point Reserve (total distributed: ~1000).
- Placed flyers every other month in 20-30 locations (i.e. coffee shops, libraries) around Santa Barbara.
- Submitted articles to the Goleta Valley Voice and other local newspapers.
- Distributed information to relevant environmental organizations.
- Initial efforts have been made to collaborate with Isla Vista Parks and Recreation on this issue.

Table 2. Number of nests lost by fate in 2008 and previous years.

	2002	2003	2004	2005	2006	2007	2008	Total nests
Total nests	9	24	51	64	43	66	57	314
Hatched	6	17	20	16	25	30	22	136
Skunk	0	0	10	18	2	19	18	67
Crow	2	4	8	3	0	0	0	17
Wind	1	3	2	6	1	1	2	16
Tide	0	0	5	5	2	0	7	19
Abandoned	0	0	0	9	3	0	0	12
Abandoned Owl	0	0	0	0	6	0	0	6
Flooded	0	0	0	3	0	0	0	3
Raccoon	0	0	2	1	0	0	0	3
Whimbrel	0	0	1	0	0	0	0	1
Gull	0	0	0	0	1	0	0	1
Opossum	0	0	0	1	0	0	0	1
Unknown cause	0	0	0	1	3	11	0	15
Unk pred	0	0	0	1	1	1	0	3
Unk fate	0	0	0	0	0	4	4	8
Total lost	3	7	28	48	19	36	31	

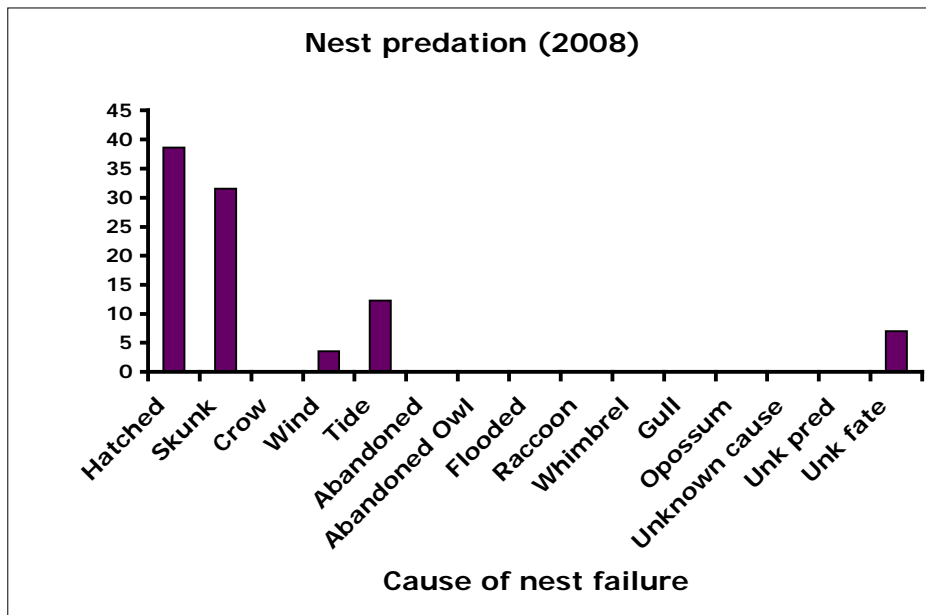


Figure 7. Nest predation in 2008.

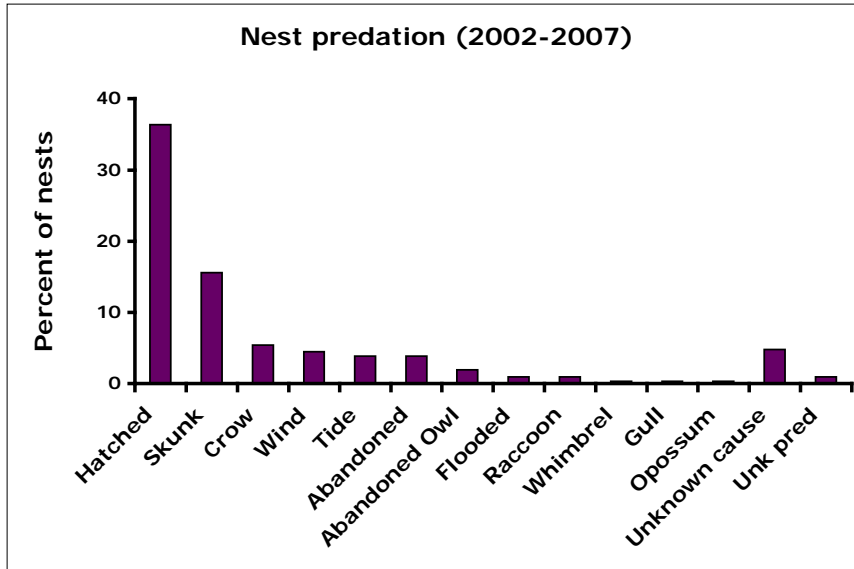


Figure 8. Percent of nests destroyed by various causes between 2002 and 2007

Egg replacement experiment

Because of the intense predation by skunks, we attempted to save the last nesting attempt by replacing the real eggs with wood eggs during the incubation period. The real eggs were then returned to the nests when we heard piping and a chick was beginning to hatch. All 10 nests that we conducted the replacement hatched (Table 3).

Although the egg replacement was an effective way to improve hatching success, it was a very time consuming strategy. The reason for it is that the incubator and the eggs need to be checked several times a day for signs of piping so the eggs can be returned to their nests before the chick is walking.

Table 3. Fate of nests where real eggs were replaced with fake eggs versus nests that where the real eggs were left on the beach during incubation

		Hatched	Failed	Total
Replaced	2007	10	1	11
	2008	10	0	10
Total Replaced		20	1	21
Not replaced	2007	18	33	51
	2008	10	29	39
Total not replaced		28	62	90

Hand-raised chicks

In 2008, there was a large number of eggs that failed to hatch in captivity at a late stage in development. We believe that this was because there was 1 dead egg that spread a bacterial infection to the other eggs. To solve this problem, we purchased a second incubator to separate the eggs that were viable from the eggs that might be dead.

Eight nests and 4 dumped eggs were recovered from the beach because they were abandoned or destroyed by wind or tide (Table 4). Tide was the most common cause of nests being rescued. However of the 10 eggs rescued after being washed away by tides, only 1 egg fledged a chick. One of the eggs that were in the incubator was decomposing and exploded, possibly causing bacterial contamination to the other eggs that were viable. This may explain the large number of eggs with dead embryos. Some of those, failed at the piping stage. After we separated the viable eggs to a second incubator (eggs from the replacement experiment), the hatching success improved to almost 100%.

Table 4. Cause and fate of the 2008 nests that were rescued to be raised in captivity.

Nest	Cause	#Eggs	Hatched	infertile	dead embryo	fledged	chick death
274	wind	3	0	0	3	0	0
275	tide	2	0	0	2	0	0
276	wind	3	0	2	1	0	0
277	tide	2	1	1	0	0	0
281	tide	2	2	0	0	0	2
287	tide	1	1	0	0	1	0
294	unknown	1	0	1	0	0	0
A1	unknown	1	0	0	1	0	0
A2		1	1	0	0	1	0
302	tide tar	2	0	1	1	0	0
A3	tide	1	0	0	1	0	0
A4	chick abandoned	0	0	0	0	1	0
Total		19	5	5	9	3	2

Enforcement

We still have not started an enforcement plan. This is expected to start in March 1st of 2009.

Location of nests

The location of nests was again not recorded in 2008. The beach was narrower than in previous years. This made the tracking of broods more difficult because the chicks would hide behind the dunes when disturbed.

Docent program

The docent program continues at the same level as in 2006. The docents have been very instrumental in reducing the impact of beach users to the Snowy Plovers. The docents main duties include showing and educating people about the plovers, requesting compliance to the leash law, requesting people to stay away from the symbolic fence, requesting people to move around the plover flock, and scaring away crows.

APPENDIX 1. Band sightings banding at the reserve

Banding

We did not band the nursery chicks in 2008 as we were not able to find an available bander.

Sightings

No banded plover nested in the reserve in 2008

CONCLUSION

The plover breeding and wintering populations at COPR appear to have increased since 2001 and become stable relative to other populations along the coast. Skunk has become a 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 were pleased to find out that the number of chicks fledged in a year correlates with the number of nests that hatched. This allows us to focus on nest success rather than tracking chicks, which are not banded at the reserve.

RECOMMENDATIONS

- The skunk problem returned and we need to implement a predator control program for the next year. Several attempts to trap skunks and to reduce their presence on the beach with fencing of the dune area failed.
- The chick nursery. We need to obtain a banding permit for a local biologist because it was not feasible to "borrow" plover banders from other locations as their were busy during the breeding season.

ACKNOWLEDGEMENTS

We are very thankful to the following individuals who went the extra length to make the program work. Pat Walker and Jen Stroh helped count plovers . Jennifer Stroh, the docent coordinator, also managed the docent program. Steve Ferry and Pat Walker continued to assist with fence maintenance. The docents, too many to count, showed that people care and are willing to work from their hearts to save the plovers.

CALIFORNIA LEAST TERNS

1 pair nested in the reserve in 2008 and this nest were destroyed by skunks before the second egg was laid (Table 5).

Table 5. Nesting of California Least Terns at Coal Oil Point Reserve.

Year	# pairs	# nests	# nests hatched	# chicks fledged	Observations
2006	5	4	4	7	Skunks ate 5 nests. Red Tail Hawk
2007	4	6	1	0	ate chicks
2008	2	1	0	0	Skunk ate 1 nest

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>