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Reports

Title

2001-2004 Final Report on the Western Snowy Plovers

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Author

Sandoval, Cristina

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Report on the Western Snowy Plovers Coal Oil Point Reserve 2001-2004

Contact for this report:
Cristina Sandoval
Marine Science Institute
University of California
Santa Barbara, CA 93106
Sandoval@lifesci.ucsb.edu
<http://coaloilpoint.ucnrs.org>

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 precip 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: 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 along protected areas

Management Plan? Yes (see attached)

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? Some, harassment of crows.

ABSTRACT

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. The population of wintering plovers increased and a growing breeding population has been established. Although Sands beach is relatively small, it has the largest population of wintering plovers in US. We believe that the high abundance of kelp wrack all year provides abundant food and contributes to the high quality habitat for plovers.

Lafferty et al (2005) show the positive effects of beach management on the numbers of plovers at COPR. This report provides additional detailed information about the breeding population of plovers on Sands beach.

MANAGEMENT DESCRIPTION

Signs

We installed a 36" x 42" interpretive sign on the bluff top at each entrance to the beach to help educate the public about the threatened status of the plovers. To inform the public about the regulations and enforcement, we installed "Dogs must be on leash" signs at each entrance, on the beach. To help delineate the protected area and reduce trespassing, we installed we installed signs along the fence line. These signs were made of PVC and were installed using an Australian auger (used for beach umbrellas). These signs have a picture of the plover and say "Plover Habitat, No trespassing".

Fences

A symbolic fence is used to separate people from plovers. (Figure 1). The fence is symbolic because it clearly delineates the protected area but it is not a substantial physical barrier. It would be impossible to build a barrier that would prevent trespass in to the plover area. Instead, we have constructed a minimal fence that defines the boundaries of the protected area. Using signs and docents, we request that the public respect the boundary and help us protect the plovers.

The fence is comprised of several 20 meter sections (using sections facilitates installation and reduces fence maintenance). We use 5/8" diameter, 5' long metal anchor rods as posts. These posts have a ring on the top through which we passed the rope. A post is installed every 5 meters. Each post is labeled to facilitate mapping the location of nests on the beach. The fence is easy to install; it takes three people working about three hours to install 400 m of fence.

The fence is stationary between the end of Spring and the mid Fall. Occasionally we lifted posts that were partially buried as the sand accumulated on the beach. However, during the winter, the storms eroded the beach and we had to move the fence higher up on the shore.

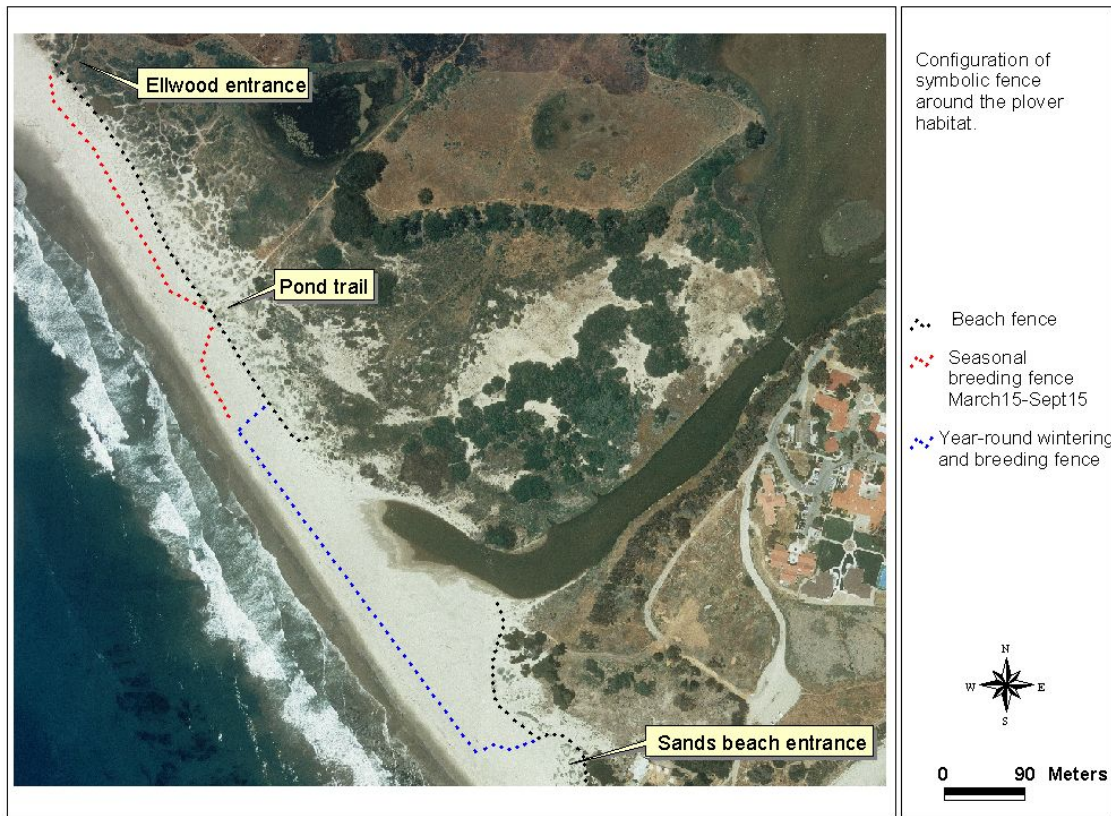


Figure 1. Location of the habitat protected for the Western Snowy Plovers on Sands beach at Coal Oil Point Reserve.

Docent program

The docent program was implemented to increase awareness of the public, increase compliance with beach regulations and involve community members to work directly with the plover conservation program. The docents provide a strong political support for the program.

A part time docent coordinator was employed to recruit, train, and schedule docents. During the breeding season there were approximately 50 docents, most volunteers, covering 100 hours per week. This meant that there was a docent monitoring the protected area all daylight hours. A paid staff worked from 5:30 AM to 8:00 AM each day because this was a difficult time to schedule volunteers. In the non-breeding season,

docents monitored the protected area for about 50 hours per week. In the winter, the docents were scheduled to work when the beach was busiest, from 11:00 Am to 4:00 PM.

Recruitment of docents involved a variety of mediums. Students from UCSB responded to announcements in their classrooms and visited a docent-staffed table in front of the University Center. Community members heard about the program from radio and newspaper ads, fliers posted at food stores, field trips at the Reserve, and personal contact with other docents.

We trained new docents once a month. The docents were trained for 2 hours in the classroom and another 2 hours on the beach. In the classroom, they watched a video (Life on the Water's Edge from La Purisima Audubon) and a slide show given by the docent coordinator. Some docents received additional training in Non-Violent Communication (CNCV.org) to help them deal effectively with uncooperative visitors to the beach.

Each day, the docents checked in and out at a small building located at the bluff overlooking the plover area. This room is dedicated to the docent program and provides a shelter during bad weather. On the beach, docents were stationed at the eastern corner of the plover area, near the main entrance to the beach, because most visitors enter Sands beach through this access point. When crows were present, docents walked up and down the beach, scaring them away.

The docents were responsible for informing beach goers about Reserve rules and about the need to protect plovers. At COPR, chicks could be viewed on a scope without being disturbed. They used a spotting scope to show plovers and chicks to the public. Chick viewing was an effective outreach tool to demonstrate the fragility of the plovers to human impact.

The docents met twice a year to receive updates about the plover status and socialize. A smaller group of veteran docents met with the Reserve Director approximately 5 times

per year to discuss how to improve the program. Some docents also assisted the Reserve director in installing and maintaining the fences and signs. The docents started a new 503-C organization called Friends of Coal Oil Point Reserve, with the mission to support the Reserve and the plover program.

MONITORING

I - WINTERING POPULATION

Plovers were counted weekly by Melissa Kelly. She walked along the wet sand from the eastern boundary of Sands beach to the western boundary of the Reserve (Figure 1) spotting and counting plovers with a binocular. All plovers, including those feeding near the shore, were counted. Color bands were also recorded.

The number of plovers on the beach during the winter season increased each year reaching a maximum of 406 in 2003 Lafferty et al (2005). This number is higher than seen in most other wintering areas, perhaps due to quality habitat and food supply.

Wintering plovers preferred to rest near the eastern margin of the Devereux slough. This aggregation shifted east when the beach eroded perhaps because plovers sought higher and drier sections of the dunes during storms.

Several banded plovers were observed during winter and one banded plover bred at COPR. A list of the individuals sighted and the dates are listed in Appendix 2.

II - BREEDING POPULATION

The number and location of adult plovers, nests, and chicks was counted daily by Cristina Sandoval, during the breeding season.

a) Breeding success

Since the plover habitat has been protected with a symbolic fence and docents monitoring the area, the number of plover pairs has increased each year (Table 1).

Table 1. Changes in breeding at Coal Oil Point following protection from recreational disturbance. All values represent totals for the year except the pairs column, which represents the peak number of nests at one point in time. The relative hatching and fledgling success) for each year are shown in parenthesis.

| Year | Pairs | Nests | Eggs Laid (Eggs hatched/laid) | Eggs Hatched | Chicks Fledged (Fledged/eggs hatched) |
|----------------------------|-------|---------------|-------------------------------------|-----------------|---|
| 1970- 2000 | few | ~2- 4/30yr | ~7-8/30yr | none | none |
| 2001 | 1 | 1 | 2-3 | 2-3 | 1 |
| 2002 | 5 | 9 | 21 (0.76) | 16 | 14 (0.87) |
| 2003 | 12 | 24 | 63 (0.71) | 45 | 40 (0.89) |
| 2004 | 26 | 92 | 141 (0.40) | 56 | 27 (0.48) |
| Total during protection | 44 | 126 | 267 | 119 | 72 |

A comparison of the breeding success between the 30 years before the initiation of protective measures that excluded humans and the 4 years following protection shows the impact of human recreation on the plovers. Plovers did not breed successfully when the roosting area was not protected but quickly recovered once a symbolic fence was installed and a docent program started. The impact of unmanaged beach recreation can be estimated to have caused the loss of breeding potential of 810 fledged chicks over the last 30 years (27 fledged chicks per year -mean of 2002-2004). Lafferty (2001b) has shown that, when the beach is partitioned by a fence into areas for public recreation and areas dedicated to plovers, without human intrusion, the rate of disturbance that cause a plover to run or to fly is greatly reduced. Plover nests are cryptic on the sand and, when unprotected, can be destroyed by trampling which may crush eggs and chicks. For

breeding birds, the impact is also from nest trampling. The only 2 nests observed in the 30 years pre-management were trampled within days of discovery.

Nest density was high relative to other protected beaches, suggesting that Sands beach is a high quality habitat for plovers. Throughout the year, the kelp wrack supports large numbers of kelp flies and beach hoppers, which are the main food items for plovers at Sands beach.

The presence of a docent monitoring the protected area was instrumental to obtain compliance from users and dog owners. A docent was able to effectively monitor a beach section of approximately 400m maximum. As the breeding population of plovers at COPR grows and expands to the west, a second docent will be needed to patrol the expanded area and to talk to visitors entering the beach from the west end of the Reserve.

b) Breeding phenology

Nest initiation peaked in April, May and June (Figure 2).

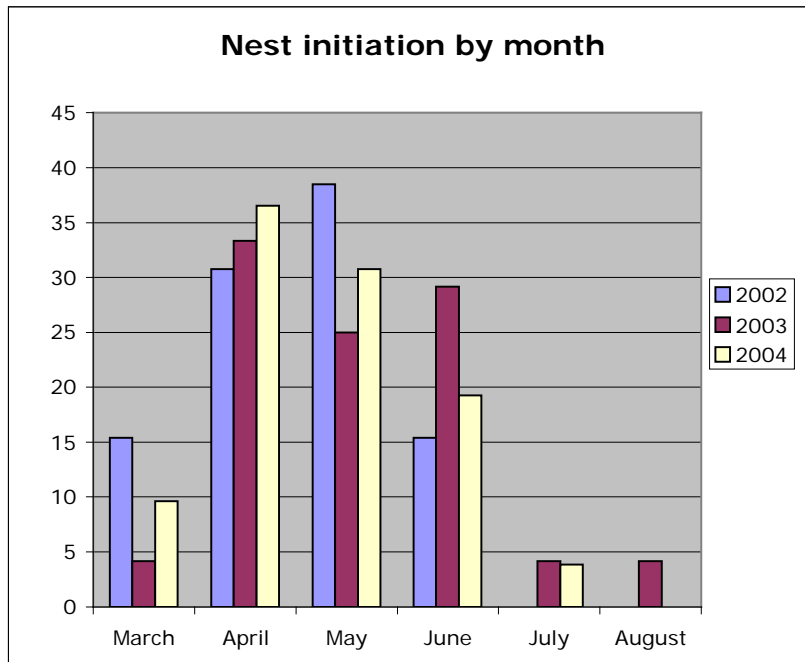


Figure 2. Percent of new nests started each month.

c) Predation

Once human impact was greatly reduced, predators were the main cause of mortality to plover eggs and chicks. Predation on chicks and nests was most intense in April and June (Figure 3 and 4). This is not solely because of a larger number of nests in these months since a large number of nests were initiated in May as well (Figure 2). We do not yet understand the reason for this temporal pattern in predation.

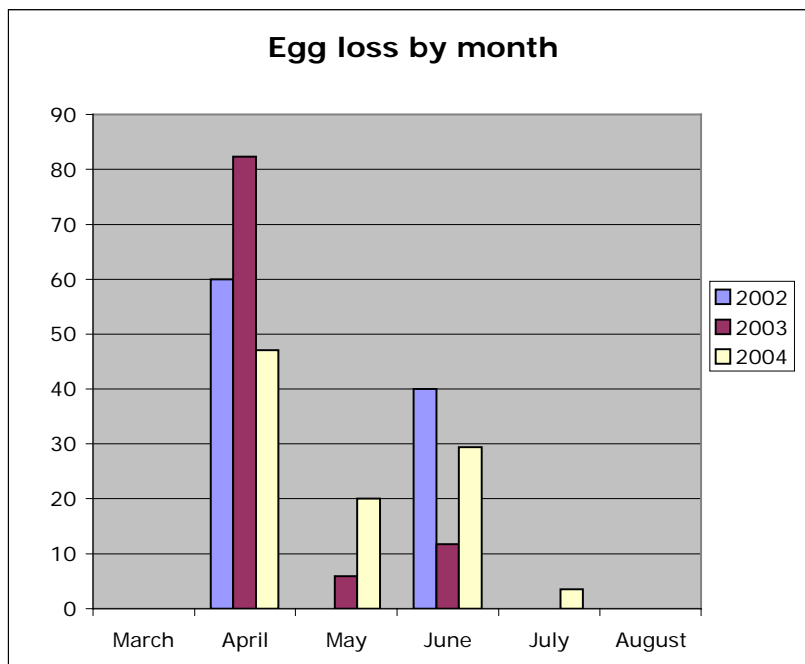


Figure 3. Percent of eggs lost each month.

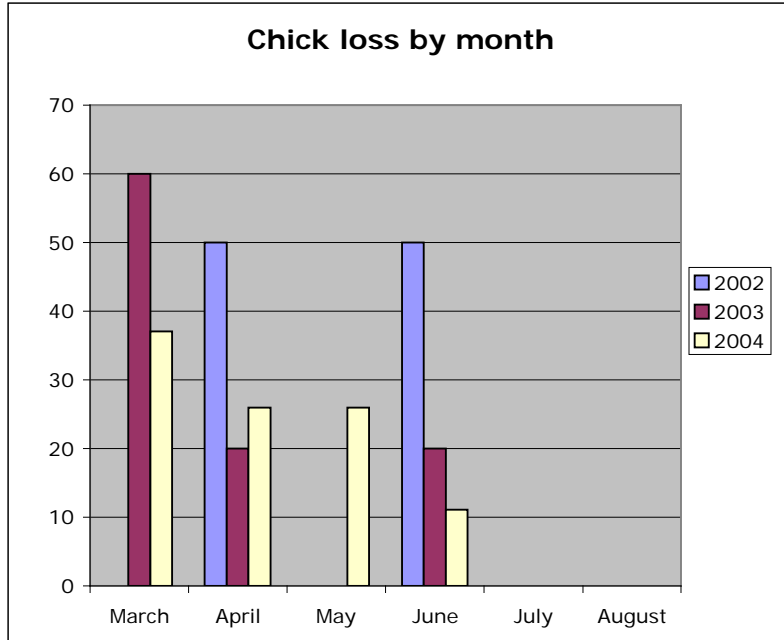


Figure 4. Percent of chicks lost each month.

In the plover area protected from human disturbance, crows and skunks were the largest cause of mortality of eggs, followed by non-biological events such as high tides and wind (Figure 5 and 6). Skunks were only present in 2004 while crows were present each year from 2001 to 2004. One 3 week-old chick died after being attacked by an unleashed dog. The dog and the owner were walking along the ocean, outside of the protected area, where the chick was feeding. The docent intercepted the owner to request that she put a leash on her dog but the dog attacked the chick while they were talking. After this incident, we asked the docents to hold an unleashed dog if he/she things they are near a chick.

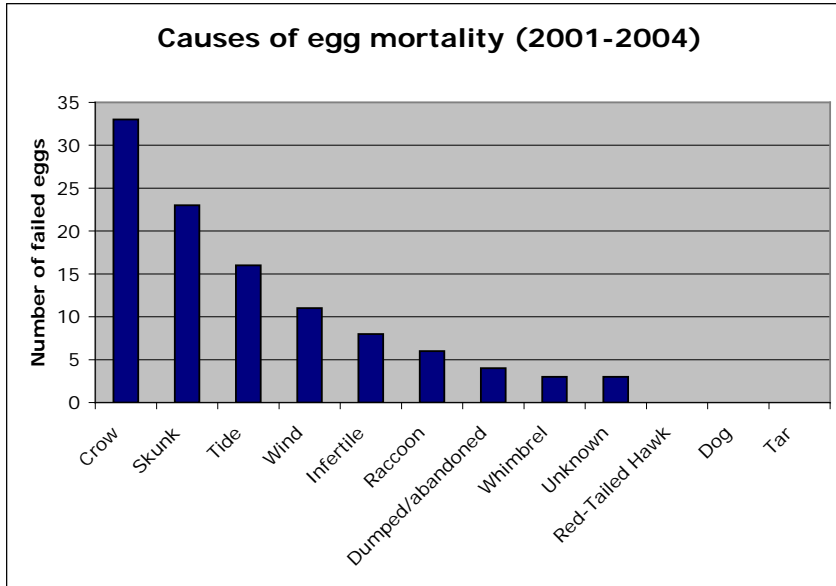


Figure 5. Percent of eggs eaten or killed by the various agents.

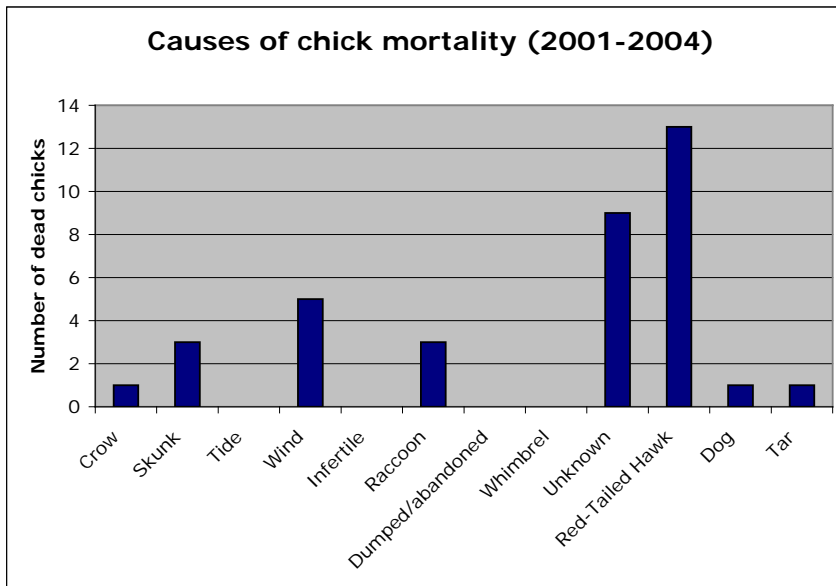


Figure 6. Percent of chicks eaten or killed by various agents.

d) Enforcement

The UCSB Police department has law enforcement jurisdiction at the Reserve. At present, docents are instructed to phone Campus Police if beach users refuse to cooperate with requests to follow regulations. Citations to owners of unleashed dogs are at the

discretion of each officer. Due to a need for increased enforcement, the Reserve will continue to request regular police patrols of Sand's Beach during the day and at night and will push for a no-tolerance policy for unleashed dogs.

e) Location of nests

The location of each nest was mapped and the fate of eggs and chicks was monitored throughout the breeding season. The plovers clearly preferred to nest on the flat beach near the slough mouth but also used the narrower beach backed by dunes east and west of the slough (Figure 7a).

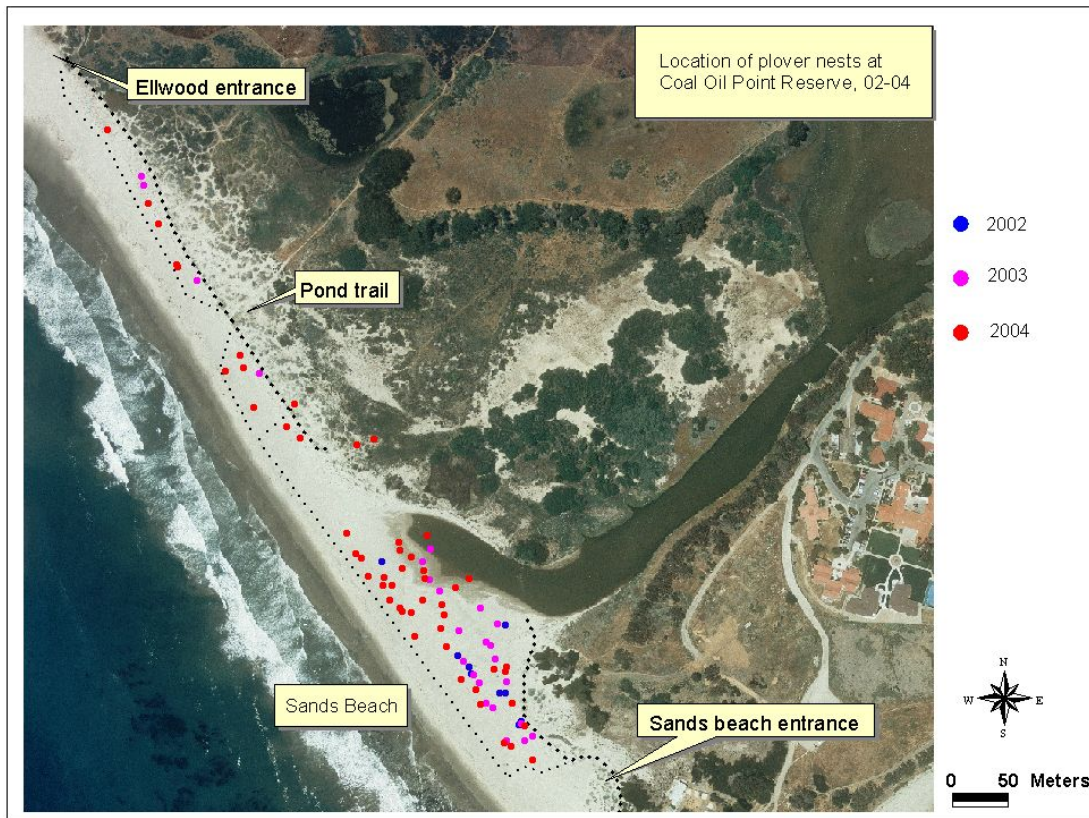


Figure 7a. Location of all plover nests in 2002, 2003 and 2004. The location of the one nest in 2001 is not known. The slough mouth was north and west from where it is shown in this aerial photo.



Figure 7b. Location of failed and hatched nests in 2004.

CONCLUSION

Protecting the plovers from human disturbance appears to have had a large and positive effect on plover abundance and reproductive success. This project shows that plovers can respond quickly to active management that reduces disturbance by humans, pets, and predators. This response, particularly successful breeding, can exceed expectations.

To realize a continued growth in fledgling success, measures to reduce mortality by predators will need to be implemented in the future. Crows and Red-tail hawk predation can be eliminated with exclosures. Skunk predation will be more challenging to control, because juvenile skunks can pass through the 4 x 2 inch mesh of the exclosure. If skunk predation continues to be high, we may need to be trap and remove them from the area.

In summary, the management strategies we have employed at Sands beach dramatically benefit plovers without greatly inconveniencing beach users. We believe that management strategies must be site-specific and flexible. For example, our management plan balancing public recreation and protection has been effective at COPR because a large number of docents monitor a small area during most daylight hours. In contrast many other beaches with plover habitat are larger and away from a good source of docents, making it impossible to intensively monitor beach recreation. Our model could be best adapted to other small beaches that have had historical breeding and wintering populations.

The strategies must be flexible (adaptive management) to respond quickly to the information gathered by monitoring. For example, when we discovered plovers nesting on the west side of the Reserve, we added a fence in that area during the breeding season. The type of predators seemed to vary from year to year. New predators may require novel strategies to avoid excessive predation.

ACKNOWLEDGEMENTS

We are very thankful to the following individuals who went the extra length to make the program work. Melissa Kelly worked as a dedicated staff and volunteer to count plovers every Sunday morning. Jennifer Stroh, the docent coordinator, ensured that the docents were well prepared and happy. Darcie Goodman and Kevin Lafferty conducted much of the research needed to support this management plan. Steve Ferry and Bob Henson were not just model docents but also used their creative minds to improve the sign and fence system. Ed Easton started the Friends of the Coal Oil Point Reserve. Him and the board members have fund raised for the Reserve and plover program. Roger Millikan created a website that facilitated public outreach and the administrative services. Callie Bowdish recorded the beauty of the plovers and their natural history through photography. Her photos are kindly available at her website (<http://homepage.mac.com/cjbowdish/COPP/>). The USFWS staff and plover managers provided support, information and ideas, and

most importantly, shared enthusiasm for the recovery of the WSP. The docents, too many to count, showed that people care and are willing to work from their hearts to save the plovers.

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 (in press). **Restoration of breeding by snowy plovers following protection from disturbance**. Biodiversity and Conservation. Online at:
<http://www.kluweronline.com/issn/0960-3115>

APPENDIX 1

Table 2. Causes of mortality of eggs and chicks by year.

| | 2001 | | 2002 | | 2003 | | 2004 | | Total eggs | Total chicks | Total eggs and chick |
|----------------------|------|--------|------|--------|------|--------|------|--------|------------|--------------|----------------------|
| | Eggs | Chicks | Eggs | Chicks | Eggs | Chicks | Eggs | Chicks | | | |
| Total produced | 2 | 2 | 21 | 16 | 63 | 45 | 141 | 56 | 227 | 119 | 346 |
| Crow | 0 | 1 | 4 | 0 | 7 | | 22 | 0 | 33 | 1 | 34 |
| Skunk | | | | | | | 23 | 3 | 23 | 3 | 26 |
| Tide | | | | | | | 16 | 0 | 16 | 0 | 16 |
| Wind | | | 1 | 0 | 7 | 1 | 3 | 4 | 11 | 5 | 16 |
| Infertile | | | | | 1 | | 7 | 0 | 8 | 0 | 8 |
| Raccoon | | | | | | | 6 | 3 | 6 | 3 | 9 |
| Dumped/ abandoned | | | | | 1 | | 3 | 0 | 4 | 0 | 4 |
| Whimbrel | | | | | | | 3 | 0 | 3 | 0 | 3 |
| Unknown | | | | 1 | 1 | 2 | 2 | 6 | 3 | 9 | 12 |
| Red-Tailed Hawk | | | | | | | 0 | 13 | 0 | 13 | 13 |
| Dog | | | | | | | 1 | | 0 | 1 | 1 |
| Tar | | | | | | | 1 | | 0 | 1 | 1 |
| Total lost | 0 | 1 | 5 | 1 | 17 | 5 | 85 | 29 | 107 | 36 | 143 |
| % loss | 0 | 50 | 24 | 6 | 27 | 11 | 60 | 52 | | | |

APPENDIX 2. Sightings of banded plovers at COPR (prepared by Melissa Kelly and Cris Sandoval).