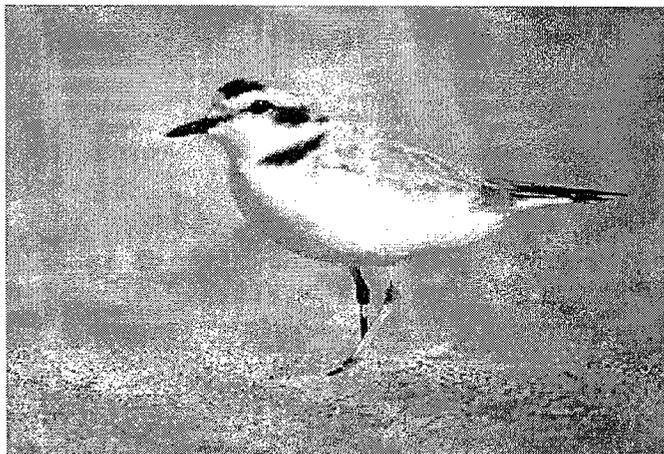


**DISTRIBUTION, PROTECTION AND REPRODUCTIVE  
SUCCESS OF SNOWY PLOVERS  
AT POINT REYES NATIONAL SEASHORE IN 2002**



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## SUMMARY

In 2002, an estimated 34 -37 Snowy Plovers (*Charadrius alexandrinus*) bred within Point Reyes National Seashore (PRNS). This number was approximately the same as in 2001 (Table 1). We located 30 Snowy Plover nests in 2002, all on Point Reyes Beach (24 between Abbott's Lagoon and North Beach parking lot, and 6 from Kehoe Beach to Abbott's Lagoon). The first clutch was initiated on April 01, 2002, 1 week later than in 2001. For the second consecutive year, Snowy Plovers nested on the shore of Abbott's Lagoon where there were three nests yielding five fledglings. As in 2001, we found no Snowy Plover nests on Limantour Spit, an area historically used by Snowy Plovers. We observed no Snowy Plovers on Drake's Spit, South Beach or Lighthouse Beach where there continues to be little, if any, suitable nesting habitat that is safe from high tides and intense human recreation.

Twenty of the nests were protected with square exclosures. Due to raptor attacks on adult plovers in exclosed nests in the 2001 breeding season, we postponed the use of exclosures around nests until the end of the raptor migration. In addition, we continued the use of crow-mesh netting as tops of exclosures to prevent access by avian predators. In total, 15 clutches hatched yielding 41 chicks and 17 fledglings. The fledge rate increased from 10 fledglings in 2001(40.0%) to 17 fledglings in 2002 (41.0%), and is within the range documented at other coastal breeding sites of 30–45% (PRBO unpubl. data).

## 1.0 INTRODUCTION

In March 1993 the Pacific coast population of the Western Snowy Plover (*Charadrius alexandrinus*) was listed as threatened by the U.S. Fish and Wildlife Service (USFWS). The population decline leading to listing was largely due to loss of habitat by encroachment of non-native vegetation, depredation pressure, and disturbance due to recreational use of beaches.

The Point Reyes Bird Observatory (PRBO) is assisting the National Park Service (NPS) to reach USFWS goals of 25 pairs of breeding birds on Point Reyes Beach (USFWS 2001) by monitoring the response of Snowy Plovers to management actions in Point Reyes National Seashore (PRNS). PRBO's past Snowy Plover research in PRNS includes intensive monitoring in 1977, 1986 to 1989, and 1995 to the present. This report documents Snowy Plover nesting success in Point Reyes National Seashore in 2002.

## 2.0 METHODS

Snowy Plovers have historically used Point Reyes Beach and Limantour Spit for nesting within Point Reyes National Seashore, Marin County, California. We separated Point Reyes Beach into four survey areas: K = Kehoe Beach entrance to Abbott's Lagoon; NP = Abbott's Lagoon to North Beach parking lot; NB = North Beach parking lot to South Beach parking lot; and SB = South Beach parking lot to Lighthouse Beach.

To prevent human disturbance to plovers, damage to pre-nesting scrapes, or attraction to nesting areas by potential predators, historical nesting territories were roped off prior to the nesting season and marked with “Area Closed Beyond This Point” signs. Incidentally, of the 30 nests found, 22 were within these fenced areas, 7 within 15 meters and 1 within 60 meters. We posted laminated signs at beach access points to explain and educate beachgoers about Snowy Plovers, beach habitat, and closures. In addition, we provided assistance for PRNS staff, Kristin Thorpe, who conducted beach patrols on weekends and holidays. We coordinated with dune restoration crews in Point Reyes to be sure work was being conducted away from nesting plovers and that future restoration would enhance and enlarge plover breeding areas.

A traffic counter was installed at the entrance to North Beach. The counter was monitored weekly and car totals were recorded every Friday afternoon for a total weekly car count, and every Monday morning to determine weekend visitation. In addition, parking lot surveys were conducted to determine the number of people per car visiting the beach. Although the number of cars counted differed dramatically between weekday and weekends, there was no noticeable difference in number of people per car on weekdays or weekends (Table 9).

We conducted 81 surveys of the two areas between Kehoe Beach and the North Beach parking lot, 4 surveys of the two areas between the North Beach parking and the Lighthouse, 30 surveys of Limantour Spit and 9 surveys of Drake's Spit to determine the current abundance and distribution of Snowy Plovers. The surveys of Point Reyes Beach required approximately 494 hours of effort. The Drake's Spit and Limantour Spit surveys required approximately 10 hours and 92 hours of effort respectively, (not including volunteer hours).

On the surveys, observers walked just below the high tide line, crossing above the line only when necessary to see the full width of the beach. Observers stopped every 50 to 100 m to scan with binoculars at least 100 m ahead for plovers. Upon locating a plover(s), observers approached close enough to determine age, sex, and color band combination if bands were present. Date, location (by sub-area and obvious landmarks), and the time of sighting were recorded. Observers then walked around the bird(s) to prevent flushing it.

We located nests using three methods: 1) systematically searching microhabitats in which plovers were likely to nest; 2) watching potential breeding adults from a concealed position; and 3) following plover footprints in fine sand. Upon finding a nest, we immediately enclosed it with a 10-foot by 10-foot square fence unless we determined that avian predators or high tide threatened the nest or the safety of nesting plovers. Nests were checked 3 - 5 times per week to verify if they were still active. Near the nest's projected hatching date, checks were made more frequently to determine the precise hatch day. We looked for the adult and chicks on subsequent visits; once found, the number of chicks and location were recorded. The chicks were monitored until 28 days after hatching, when they were considered fledged.

We continued our study of chick loss timing. We checked broods before and after every weekend and holiday, and during weekends, to determine the proportion of chicks lost on

weekdays and on weekends/holidays. The time of loss was calculated, to the nearest hour, as the midpoint between the two checks where there was a reduction in brood size.

We calculated the total number of chicks on the beach each day as the measure of “chick exposure days” (CED). The total number of CED is equal to the sum of all live chicks on the beaches each weekday, weekend day and holiday throughout the breeding season. We summed the CED for all Saturdays, Sundays and holidays and, because we last saw chicks before the weekend on Fridays, we included half of all CED Fridays in the weekend/holiday sum and half in the weekday sum. Using CED, we calculated expected losses between weekdays and weekends/holidays. We then compared the expected weekend/holiday and weekday chick losses to our observed values (Table 8).

### 3.0 RESULTS AND DISCUSSION

The first clutch of the 2002 breeding season was initiated on April 01, one week later than in 2001. Between 34 -37 Snowy Plovers bred on Point Reyes beaches (Table 2). This range suggests that the PRNS breeding population in 2002 remained at a similar level to 2001. In 2002, we found 30 nests in PRNS, 20 of which (67%) were exclosed (Tables 3 and 4). As in 2001, we limited our use of protective exclosures early in the season in an attempt to avoid possible attacks by avian predators on adults within exclosures.

All 30 nests were located on Point Reyes Beach: 24 between Abbott’s Lagoon and North Beach parking lot (NP) and 6 between Kehoe Beach entrance and Abbott’s Lagoon (K). As in 2001 no nests were found on Limantour Spit (Table 3). In 2002, 15 of 30 clutches hatched yielding 41 chicks, 17 of which fledged. Although the percentage of clutches that hatched increased 23.5% over 2001, the percentage of chicks fledged increased by only 1.0%, leaving chick loss as the major challenge for plovers breeding on Point Reyes beaches (Table 5).

There were several instances of vandalism to signs and fencing during the 2002 breeding season. The red sensitive wildlife signs, which delineate beach closures, were destroyed seven times. The laminated dogs prohibited signs needed to be replaced 13 times throughout the season. On Kehoe Beach, between May 2 and May 3 approximately 150 feet of rope fencing and 8 – 10 pieces of re bar were removed from around an active plover nest and destroyed. A similar event took place on North Beach on the night of May 30 when the fencing surrounding an area where a male was brooding his chicks was knocked down and thrown into the ocean. Most of the re bar used in this fencing was bent and unable to be reused.

Common Ravens (*Corvus Corax*) continued to be a major threat to plovers nesting at PRNS. In 2002, of 9 depredated nests, ravens took 5. Surveyors observed two distinctive pairs of ravens on North Beach, one pair at the south end near the parking lot, and a second pair, which nested on the cliffs at Abbotts Lagoon and used the north end of the beach to forage. These ravens were seen consistently in these two territories throughout the breeding season. Unlike North Beach, Kehoe Beach was most frequented by “mobs”

of ravens. In 72 full length surveys conducted on Kehoe Beach in 2002, there were only 7 where no ravens were seen. On average, 12 – 16 ravens were seen foraging together on Kehoe Beach. The highest number of ravens recorded in 2002 was 36 on June 21.

### 3.1 Nest Locations and Hatching Success

#### Limantour Spit

As in 2001, we found no nests on Limantour Spit in 2002 (Tables 3 and 6). The quality of nesting habitat on Limantour Spit continues to be limited by high tides and heavy recreational use.

#### Drake's Spit

No Snowy Plovers were observed on Drake's Spit in 2002 (Table 1). Due largely to a narrow upper beach caused by dense stands of European Beach grass, Drake's Spit continues to have little suitable nesting habitat that is safe from high tides.

#### Point Reyes Beach

##### *Summary*

The first nest of 2002 (K01) was initiated on April 01 (Fig. 2). The last nest, (NP24), was initiated on July 18, but was abandoned near hatch day for unknown reasons. As in 2001, plovers nested on the shore of Abbott's Lagoon (Fig. 1). Eight color banded plovers nested in PRNS in 2002, all on the stretch of beach between North Beach parking lot and Abbott's Lagoon (Table 4). A total of 15 clutches hatched, yielding 41 chicks and 17 fledglings.

##### *Clutch Predation*

Fifty percent of the Snowy Plover nest attempts ended in failure in 2002 (Tables 4 and 5). This is a decrease in nest failures from 2001, when 75% of all nests failed (Abbott and Peterlein 2001). Of the 15 nest failures in 2002, 9 clutches were depredated, 3 were abandoned for unknown reasons, and 3 were buried by sand during high winds (Table 4). Of the 9 depredated clutches, only one was protected by an exclosure (Table 4). Common Ravens (*Corvus Corax*) were the primary nest predator (55.5%), followed by mammalian predators (33.3%), and an unidentified raptor (11.2%). The one clutch that was lost inside an exclosure (NP22) was taken sometime between July 29 – 30. Large avian footprints and eggshell fragments were found within the exclosure. Also, a large area of whitewash was seen in and around the exclosure, which may suggest the predator perched on it to gain access. Raptors observed in this area included Red-tailed Hawks (*Buteo Jamaicensis*) and a Northern Harrier (*Circus Cyaneus*) seen attacking a Semipalmated Plover.

##### *Clutch Abandonment*

Three of the 30 (10%) nests on Point Reyes Beach were abandoned in 2002, one in the laying stage and two during incubation, all were inside exclosures (Table 4). On this same stretch of beach, 23.5% were abandoned in 2001, 20.0% in 2000 and 6.3% in 1999. The last nest of 2002 (NP24) was found and exclosed on July 18, but the pair abandoned their three eggs for unknown reasons around the day they were due to hatch. Incidentally, there were many human footprints observed in the fenced area at the time of the nest check. Three clutches were lost when high winds buried the eggs. One was a complete clutch of three eggs, and the others, with one egg each, were buried in the laying stage. Abandoned (and buried) clutches were collected in order to test for fertility and the presence of environmental contaminants.

#### *Chick Fledging*

In 2002, 17 chicks fledged from 15 clutches (Table 5). This is an increase over 2001, when 10 chicks fledged from 9 clutches (Abbott and Peterlein 2001). Weekend chick loss accounted for 66.6% of the total 24 chicks lost during 2002. The percentage of chicks lost over weekends was 28.5% higher than expected values, a similar trend to 1999 and 2000, but not 2001 (Table 8). In 2002, a traffic counter was installed at the North Beach entrance. The collection of data from this counter clearly showed that visitor use on weekends was markedly higher than on weekdays (Table 9). Of the 24 chicks lost in 2002, 50% were lost within the first 7 days of hatching. Three complete broods fledged, producing a total of eight plovers.

## **4.0 MANAGEMENT RECOMMENDATIONS**

### *Plover Monitoring Protocols to Reach Population Goals*

We recommend that PRNS continue annual monitoring of the breeding population of Snowy Plovers at Point Reyes. The Draft Recovery Plan (USFWS 2001) sets a goal of 50 adult birds on Point Reyes Beach, 10 on Limantour Spit, and 4 on Drakes Spit (32 pairs). It also recommends that to sustain the population, reproductive success should be one fledged chick per male. Continued monitoring will help to determine if these population goals are being met.

### *Predator Management*

We recommend the initiation of a predator management plan. This plan should focus on diurnal species such as Northern Harrier (*Circus Cyaneus*), Red Tailed Hawk (*Buteo Jamaicensis*), and Peregrine Falcon (*Falco Peregrinus*), as well as nocturnal predators such as Great Horned Owl (*Bubo Virginianus*), Barn Owl (*Tyto Alba*), and mammals including fox, coyote and bobcat. This plan should specifically focus on taking a population inventory of species in the area, identifying nest sites of species nesting near plover beaches as well as locating owl roosts. Because Common Ravens were found to be the cause of 55.5% of clutch depredation in the 2002 breeding season, the plan should address methods of reducing clutch predation by this species.

### *Enforcement of Habitat Closures*

To minimize disturbance, enforce beach restrictions, and promote clearer communication with the public, PRBO recommends the placement of stationary and clearly worded signs at beach access locations. These signs should clearly delineate the “open” and “closed” areas of beaches as well as provide options for alternative recreational areas. In addition, as a response to the vandalism of plover fences and signs in 2002, we recommend PRNS increase law enforcement presence in plover breeding areas.

### *Education and Outreach*

Public attitude towards beach closures could be improved with continued outreach and education about this very sensitive species. We therefore recommend increased efforts by PRNS staff to patrol beaches and educate visitors. In addition, interpretive activities and beach patrols should begin March 01, the onset of Snowy Plover nesting.

## **5.0 ACKNOWLEDGMENTS**

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Table 1. Numbers of adult Snowy Plovers on surveys of Point Reyes National Seashore in 2002.

Date	Number of Individuals by Plot <sup>1</sup>						Total
	K	NP	NB	SB	L	D	
3/13-16	-	3	-	-	54	-	57
3/19-22	27	11	-	-	47	-	85
3/26-27	24	12	0	0	20	0	56
3/30	14	18	-	-	-	-	32
4/2-4	23	8	-	-	44	-	75
4/9-13	20	15	0	0	21	0	56
4/16-18	12	10	-	-	20	-	42
4/23-27	15	14	0	0	26	0	55
5/1-2	4	14	-	-	14	-	32
5/4	2	12	-	-	-	-	14
5/6-8	2	14	-	-	5	-	21
5/9-11	4	13	-	-	2	0	19
5/14-15	6	15	-	-	0	-	21
5/18	2	12	-	-	-	-	14
5/21-22	4	13	-	-	0	-	17
5/23	3	5	-	-	-	-	8
5/24	1	12	-	-	-	-	13
5/25	1	15	-	-	-	-	16
5/26-30	4	16	0	0	0	0	20
6/4 - 7	6	17	-	-	-	-	23
6/13 - 17	11	9	-	-	0	-	32
6/29 - 30	10	3	-	-	0	-	13
7/2 - 5	4	20	-	-	0	-	24
7/13 - 16	0	8	-	-	20	-	28
7/25 - 31	5	27	-	-	13	-	45
8/-8/9	0	22	-	-	13	-	35
8/12-8/17	0	31	-	-	13	-	44
8/20-8/23	0	57	-	-	10	-	67
8/26-8/30	11	68	-	-	10	-	89

<sup>1</sup> K = Kehoe Beach to Abbott's Lagoon  
 NP = Abbott's Lagoon to North Beach parking lot  
 NB = North Beach parking lot to South Beach parking lot  
 SB = South Beach parking lot to Lighthouse Beach  
 L = Limantour Spit

Table 2. Number of Snowy Plovers nesting at Point Reyes National Seashore, 1986 to 2002.

Year	Total		
	Females	Males	Total
1986	22-23	19-21	41-44
1987	25-26	25-28	50-54
1988	21-22	19-20	40-42
1989	18-20	16-17	34-37
1995	6	6	12
1996	5-6	5	10-11
1997	12	13	25
1998	7	9	16
1999	9	11	20
2000	17-18	14-19	31-37
2001	13-19	14-17	27-36
2002	17-19	17-18	34-37

Table 3. Number of Snowy Plover nests at Point Reyes National Seashore, 1986 to 2002.

Year	Number of Nests by Plot <sup>1</sup>					
	K	NP	NB	SB	L	Total
1986	5	29	1	2	4	41
1987	9	47	6	11	1	74
1988	5	39	7	12	0	63
1989	6	41	7	6	0	60
1995	4	11	5	0	0	20
1996	0	8	0	0	1	9
1997	0	18	0	0	7	25
1998	2	10	0	0	2	14
1999	0	16	0	0	5	21
2000	10	15	0	0	3	28
2001	8	26	0	0	0	34
2002	6	24	0	0	0	30

- <sup>1</sup> **K** = Kehoe Beach to Abbott's Lagoon  
**NP** = Abbott's Lagoon to North Beach parking lot  
**NB** = North Beach parking lot to South Beach parking lot  
**SB** = South Beach parking lot to Lighthouse Beach  
**L** = Limantour Spit

Table 4. Fate of Snowy Plover nests at Point Reyes National Seashore in 2002.

Nest # & Location <sup>1</sup>	Date Found	Excused Yes/No	Female ID	Male ID	Date Hatched/Failed	# Eggs Laid	# Eggs Hatched	Outcome	Cause of Loss
NP01	4/11/02	YES	U	U	5/08/02	3	3	Hatch	Fledged 1
NP02	4/12/02	NO	PA/AP	/W	4/16/02	1	0	Fail	1 egg buried by wind
NP03	4/09/02	NO	RGR/W	U	4/17/02	3	0	Fail	Predation: Raven
NP04	4/09/02	NO	U	U	4/17/02	3	0	Fail	Predation: Raven
NP05	4/19/02	NO	U	YG/YR	4/22/02	1	0	Fail	Predation: Unknown mammal
NP06	4/22/02	NO	RGR/W	U	4/25/02	1	0	Fail	Predation: Raven
NP07	4/29/02	NO	OG/YV	YB/BY	5/01/02	1	0	Fail	Predation: Unknown mammal
NP08	4/29/02	NO	U	YG/YR	5/02/02	1	0	Fail	1 egg buried by wind
NP09	4/29/02	YES	PA/AP	/W	5/31/02	2	2	Hatch	Fledged 1
NP10	5/03/02	NO	U	U	5/06/02	1	0	Fail	Predation: Raven
NP11	5/03/02	NO	U	/B	5/09/02	2	0	Fail	Predation: Raven
NP12	5/24/02	NO	U	U	5/31/02	3	0	Fail	Predation: Fox
NP13	5/24/02	YES	U	U	6/24/02	3	3	Hatch	Fledged 1
NP14	5/24/02	YES	RB/GP	/B	6/25/02	3	3	Hatch	Fledged 3
NP15	5/29/02	YES	U	U	6/28/02	3	2	Hatch	Fledged 2
NP16	6/6/02	YES	U	U	7/05/02	3	3	Hatch	Fledged 1
NP17	6/9/02	YES	OG/YV	YB/BY	7/03/02	3	3	Hatch	Fledged 1
NP18	6/13/02	YES	U	U	7/06/02	3	3	Hatch	Fledged 0
NP19	6/17/02	YES	U	U	7/18/02	3	3	Hatch	Fledged 1
NP20	7/02/02	YES	U	U	7/22/02	3	0	Fail	Abandoned 3 eggs
NP21	7/08/02	YES	U	U	8/03/02	3	3	Hatch	Fledged 3
NP22	7/11/02	YES	U	YG/YR	7/30/02	3	0	Fail	Predation: Unidentified raptor
NP23	7/12/02	YES	U	U	8/06/02	3	3	Hatch	Fledged 2
NP24	7/18/02	YES	U	U	8/12/02	3	0	Fail	Abandoned 3 eggs
K01	4/01/02	YES	U	U	4/16/02	3	0	Fail	3 eggs buried by wind
K02	4/14/02	YES	U	U	5/17/02	3	3	Hatch	Fledged 0
K03	4/17/02	YES	U	U	4/25/02	2	0	Fail	Abandoned 2 eggs
K04	4/25/02	YES	U	U	5/29/02	2	2	Hatch	Fledged 1
K05	4/25/02	YES	U	U	5/27/02	3	2	Hatch	Fledged 0
K06	5/16/02	YES	U	U	6/15/02	3	3	Hatch	Fledged 0

<sup>1</sup> K = Kehoe Beach to Abbott's Lagoon; NP = Abbott's Lagoon to North Beach parking lot (including shore of the lagoon).

Table 5. Snowy Plover breeding success on Point Reyes Beach, Point Reyes National Seashore, 1986 to 2002.

Year	# Nests	# Eggs Laid	% Clutch Hatch	% Eggs Hatch	# Eggs Hatched	# Chicks Fledged	% Chicks Fledged	Chicks Fledged per Egg Laid
1986	34	96	29.0	29.0	28	5	18.0	0.05
1987	74	198	19.0	18.0	35	15	43.0	0.07
1988	65	161	7.7	6.8	11	5	45.5	0.03
1989	61	146	1.6	2.0	3	1	33.3	0.01
1995	20	55	10.0	9.1	5	4	80.0	0.07
1996	8	24	75.0	66.7	16	14	87.5	0.58
1997	18	44	72.2	75.0	33	20	60.6	0.45
1998	12	36	100.0	97.2	35	21	60.0	0.58
1999	16	47	87.5	80.9-85.1	38 - 40	22	55.0-57.9	0.47
2000	25	71-72	56.0	56.9-57.7	41	14	34.1	0.19-0.20
2001	34	85-87	26.5	28.7-29.4	25	10	40.0	0.11-0.12
2002	30	76	50.0	53.9	41	17	41.0	0.22

Table 6. Snowy Plover breeding success on Limantour Spit, Point Reyes National Seashore, 1986 to 2002.

Year	# Nests	# Eggs Laid	% Clutch Hatch	% Eggs Hatch	# Eggs Hatched	# Chicks Fledged	% Chicks Fledged	Chicks Fledged per Egg
1986	4	12	0.0	0.0	0	0	0.0	0.00
1987	1	3	0.0	0.0	0	0	0.0	0.00
1988	0	-	-	-	-	-	-	-
1989	0	-	-	-	-	-	-	-
1995	0	-	-	-	-	-	-	-
1996	1	3	100.0	100.0	3	1	33.3	0.33
1997	7	18	42.9	44.4	8	5	62.5	0.28
1998	2	6	50.0	33.3	2	2	100.0	0.33
1999	5	14	40.0	35.7	5	2	40.0	0.14
2000	3	9	0.0	0.0	0	0	0.0	0.00
2001	0	-	-	-	-	-	-	-
2002	0	-	-	-	-	-	-	-

Table 7. Number, dates and ages of chicks lost and possible contributing factors to mortality at Point Reyes National Seashore in 2002.

Date Lost	Weekend Loss <sup>1</sup>	Nest ID# <sup>2</sup>	Number of Chicks Lost	Chick Age <sup>3</sup> (days)	Wind Speed <sup>4</sup> Low/High (Knots)	Peak # Lighthouse Visitors <sup>5</sup>	Known Disturbance or Predators Observed in Area
8-9 May	No	NP01	1	1	7.5/10.3	350	None known
15-16 May	No	NP01	1	9	2.5/7.0	310	Northern Harrier hunting along the fore dune. Preys on Semipalmated Plover roosting on beach.
5-6 June	No	NP09	1	7	10/12	204	None known.
30 June-1 July	Yes	NP13	2	6	12/14	900	Common Raven foraging.
11-12 July	No	NP16	2	7	1.1/3.5	551	Human footprints in closed area..
21-22 July	Yes	NP17	2	18	3.3/5.7	895	11 Common Ravens foraging on dead gull.
6-8 July	Yes	NP18	3	1	8.2/12.1	1222	None Known.
21-22 July	Yes	NP19	1	3	3.3/5.7	551	11 Common Raven foraging on dead gull.
29-30 July	No	NP19	1	12	0.1/0.6	600	None known.
18-19 Aug.	Yes	NP23	1	12	No Data	500	None known.
19-20 May	Yes	K02	1	2	5.3/6.6	No data	None known.
26-27 May	Yes	K02	1	9	5.5/6.8	770	Northern Harrier hunting over dunes, Red-tailed hawk perched in dunes.
2-3 June	Yes	K02	1	17	12/15	420	Human footprints in closed area where male had been with chicks.
5-6 June	No	K04	1	8	10/12	204	14 Common Ravens foraging on beach.
1-2 June	Yes	K05	2	6	13/17	420	None known.
15-16 June	Yes	K06	1	1	6/7	1100	Dog tracks along upper beach.
18-19 June	No	K06	1	4	7.5/8.5	closed	None known.
21-22 June	Yes	K06	1	7	10/12	530	36 Common Ravens foraging on dead Common Murre.

<sup>1</sup> Weekend is defined as Friday afternoon through Sunday and holidays.

<sup>2</sup> NP = Abbott's Lagoon to North Beach parking lot; K = Abbott's Lagoon to Kehoe Beach trailhead

<sup>3</sup> Age is number of days past hatch when chick was believed to be lost and is calculated as mid-point between two brood checks when a reduction in brood size was determined.

<sup>4</sup> Weather data collected by NOAA Buoy #46013 located in Bodega Bay.

<sup>5</sup> Visitor numbers gathered from Lighthouse visitor center logbook. Numbers are not meant to represent the actual numbers of visitors to Point Reyes beaches, but rather potential visitors in the area on any given day.

Table 8. Observed and expected Snowy Plover chick loss (based on calculated chick exposure (CE) days) between 1999 and 2002.

Year	Total Chicks Hatched	Total Observed Chick Losses	Total CE days	Percent of Expected Chick Losses for Weekends/Holidays	Percent of Observed Chick Losses for Weekends/Holidays	Percent of Expected Chick Losses for Weekdays	Percent of Observed Chick Losses for Weekdays
2002	41	24	662	38.1%	66.6%	61.9%	33.4%
2001	25	15	352	33.9%	26.7%	66.1%	73.3%
2000	41	27	580	37.2%	61.5%	62.3%	38.5%
1999	38 *	18	824	37.3%	61.2%	61.3%	38.8%

\* Analysis for 1999 data does not include one nest where hatching success was not determined.

Table 9. Visitor data collected from traffic counter at the North Beach entrance.

<b>Week #</b>	<b>Date<sup>1</sup></b>	<b>Total Number of Cars for Week</b>	<b>Average # Cars/Weekday</b>	<b>Average # Cars/Weekend</b>	<b>Ratio of Weekend/Weekday</b>
1	5/26/02	954	40.40	376.0	9.3069
2	6/02/02	440	31.00	142.50	4.5968
3	6/09/02	1154	84.20	366.50	4.3527
4	6/16/02	1497	102.20	493.00	4.8239
5	6/23/02	601	52.80	168.50	3.1913
6	6/30/02	717	53.00	226.00	4.2462
7	7/07/02	1730	125.80	550.50	4.3760
8	7/14/02	1254	84.20	416.50	4.9466
9	7/21/02	1117	64.20	398.00	6.1994
10	7/28/02	915	61.60	303.50	4.9269
11	8/04/02	1488	97.20	501.00	5.1543
12	8/11/02	1547	102.40	517.50	5.0537
13	8/18/02	1556	100.20	527.50	5.2645
14	8/25/02	1523	124.40	450.50	3.6214
15	9/01/02	2084	140.40	691.00	4.9217

<sup>1</sup> Date is Sunday and reflects total number of cars per week.