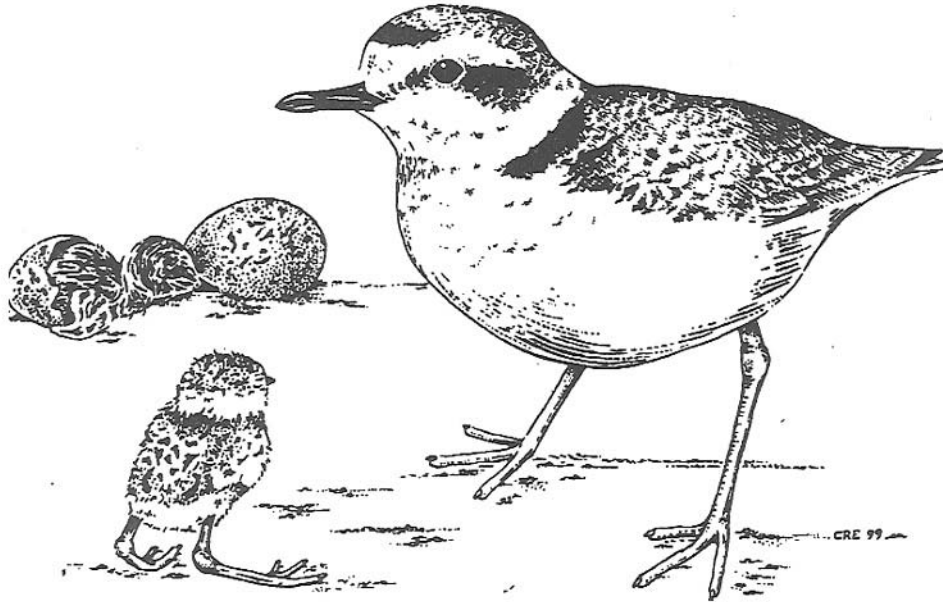


**California State Parks**  
**North Coast Redwoods District**



**Western Snowy Plover**  
**Annual Report**  
**2006**

Report Prepared by  
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December 12, 2006

## INTRODUCTION

The Department of Parks and Recreation (DPR) manages nearly 25 percent of the state's coastline. Many of these coastal lands provide important habitat for the western snowy plover (*Charadrius alexandrinus nivosus*), a shorebird listed as "threatened" by the federal government and a "species of special concern" by the State of California. As these coastal lands are also popular recreation areas for millions of people, strategic management of DPR lands is essential to meeting state and federal goals to stop the decline of this species and restore sustainable populations (CDPR 2002). Consequently, in March of 2002, DPR released the *Western Snowy Plover Systemwide Management Guidelines* to facilitate stewardship efforts to protect the western snowy plover (WSP or plover) and manage coastal habitat. The guidelines present an integrated approach to assessing WSP use of State Park System (SPS) lands, planning for the species' conservation, implementing management actions, and monitoring progress toward recovery (CDPR 2002). A major component of the Department's approach to WSP stewardship relies on thorough documentation of management efforts and adaptive responses at the unit or district level (CDPR 2002).

Regular evaluation of habitat management, visitor management, law enforcement, public education and interpretative efforts is needed to continuously improve stewardship results. As such, this report assesses the effectiveness of efforts taken by DPR, North Coast Redwoods District (NCRD) to protect and restore WSP populations in light of management activities and monitoring results of 2006. This report will contribute to a systemwide annual report produced by DPR, Natural Resources Division to assess WSP management throughout SPS lands. In addition, as many activities associated with research, monitoring, or management of WSP require an endangered species permit under Section 10(a)(1)(A) of the Endangered Species Act, this report will meet the requirements of the NCRD's 10(a)(1)(A) permit (TE004234-1).

## **BACKGROUND**

The coastal population of the western snowy plover was listed as threatened under the Endangered Species Act in 1993 (USFWS 1993) as a distinct population segment. The listing included populations nesting along the coast in Washington, Oregon and California. A significant population decline and a reduction in the number of active breeding areas prompted the federal listing. The United States Fish and Wildlife Service (USFWS) designated critical habitat for the WSP in 1999. This designation was amended in 2004 following a lawsuit over the failure to analyze the economic impacts of the critical habitat (Colwell et al. 2006). In 2001, the USFWS released a draft recovery plan. The primary objective of the plan was to ensure the long-term viability of the U.S. Pacific coast WSP population by: (1) achieving well distributed increases in numbers and productivity of breeding adult birds, and (2) providing for long-term protection of breeding and wintering WSP and their habitat (USFWS 2001). According to the recovery plan, the population will be considered for delisting when a number of recovery criteria related to productivity and habitat protection are met within the six designated recovery units throughout the range (USFWS 2001). Earlier this year the USFWS denied a proposal to de-list the plover, but did propose a new 4(d) rule, which would allow counties to relax management activities should they exceed the total number of breeding plovers in the county as identified in the recovery plan (Colwell et al. 2006).

The NCRD is located within Recovery Unit 2, which includes Del Norte, Humboldt, and Mendocino counties. Recent surveys indicate that most plovers in Recovery Unit 2 breed and winter in Humboldt County along ocean beaches and gravel bars of the Eel River (Colwell et al. 2006). For Recovery Unit 2, the draft recovery plan listed the following recovery criteria: (1) maintain 150 adults for 10 years; (2) maintain a 5-year average productivity of at least one fledged chick per male; and (3) have in place participation plans among cooperators to insure protection and management of breeding, wintering and migration areas to maintain the subpopulation sizes and average productivity listed above.

Since 1998, Recovery Unit 2 Working Group has been active in monitoring suitable WSP habitat with a coordinated effort between federal, state, and local agencies as well as parties who have an interest in WSP conservation. Much of the WSP recovery effort is expected to be organized and facilitated by the working group, as members include conservation experts (e.g. Humboldt State University and Mad River Biologists) as well as resource managers (e.g.

DPR, Bureau of Land Management, California Department of Fish and Game) with responsibility for on-the-ground actions (CDPR 2002). In 2001 biologists of Humboldt State University (HSU) and Mad River Biologists (MRB) began collaborating in what has become a multi-year effort to answer questions critical to effective management and recovery of the WSP in Recovery Unit 2. Consequently, the HSU/MRB WSP annual report has served as the Recovery Unit 2 annual report since 2001. Much of this report is based on those results.

The NCRD - WSP program objectives for 2006 were to:

- 1) Continue monthly monitoring efforts of suitable habitat throughout the District.
- 2) Continue restoration of beach and dune habitat within the District.
- 3) Identify and avoid human activities (Park operations or visitor use) that may pose impacts to the species.
- 4) Continue to use nest enclosures and symbolic fencing to protect nests from predators when appropriate.
- 5) Continue to increase law enforcement presence on beaches during the breeding season, especially during holiday weekends.
- 6) Increase DPR staff experience and knowledge.
- 7) Increase public outreach with signage and presentations.
- 8) Continue to work and coordinate with the Recovery Unit 2 working group and subcommittees.

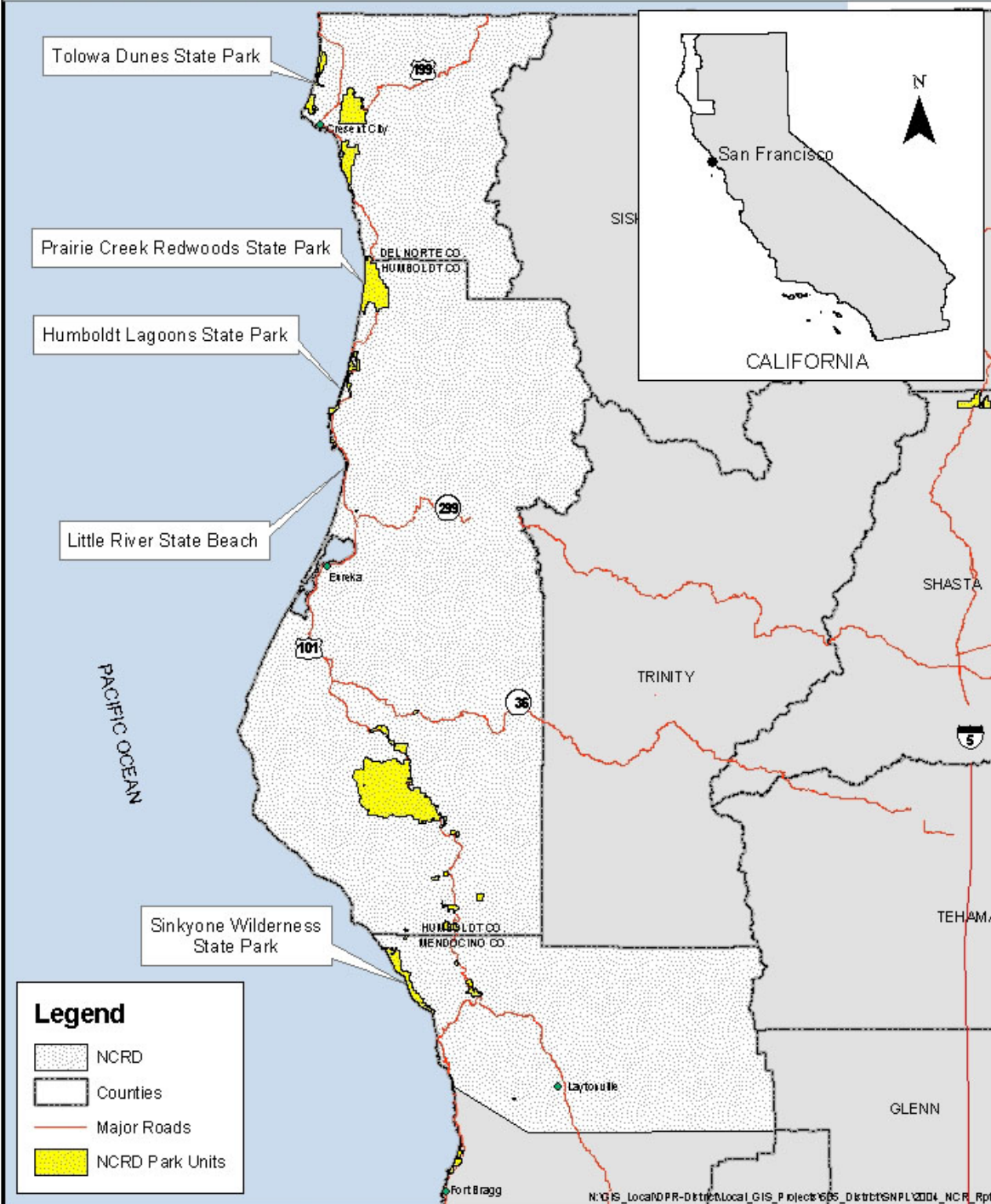
## **STUDY AREA**

Department of Parks and Recreation, Redwood National and State Parks (RNSP), U.S. Fish and Wildlife Service (USFWS), MRB, and HSU biologists surveyed 7 State Park beaches within the NCRD that have been identified as suitable WSP habitat (Figure 1). These beaches are (1) Tolowa Dunes State Park (TDSP); (2) Gold Bluffs Beach, Prairie Creek Redwoods State Park (PCRSP); (3) Stone Lagoon Beach, Humboldt Lagoons State Park (HLSP); (4) Dry Lagoon Beach, HLSP; (5) Big Lagoon Beach, HLSP; (6) Little River State Beach (LRSB) and (7) Usal Beach, Sinkyone Wilderness State Park (SWSP).



# California State Parks

## North Coast Redwood District



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**FIGURE 1**  
General Location Map

## **METHODS**

Management activities were conducted under USFWS permit TE-004234-1 and USFWS banding permit #22971. Suitable habitat within the NCRD was surveyed bi-monthly during the breeding season (April-August) and monthly during the non-breeding season (September-March) with the exception of TDSP and Usal Beach. Tolowa Dunes State Park and Usal Beach was surveyed less frequently due to financial constraints. Intensive monitoring (every 3 days) was conducted by NCRD Resource Management staff, MRB, and HSU biologists at LRSB where breeding activity was documented.

### *Abundance and Distribution*

Annual abundance and distribution of WSP was estimated based on mid-month ( $\pm 4$  days) surveys, by covering identified stretches of beach and stopping at 50-100 meter intervals to scan with binoculars and/or spotting scopes. Western snowy plover numbers, sex, age, and color band combinations were recorded whenever possible.

### *Reproductive Monitoring*

We searched for nests (at least bi-monthly) beginning 15 March and continuing until 31 August, some sites were surveyed more often. Nests were located by observing suggestive behavior of adult plovers and watching them return to the nest to incubate, following tracks, spotting incubating adults on the nest or by accidental discovery. Each nest location was recorded using a global positioning system (GPS) and the number of eggs (1-3) was noted. When nests were discovered after clutch completion, initiation dates were estimated using egg floatation data (Westerkov 1950, Alberico 1995). Efforts were made to minimize disturbances around nests thereby reducing the likelihood of attracting predators or promoting abandonment. If an adult WSP was observed incubating or nearby (e.g., performing a distraction display), the bird's sex and color band combination was recorded and used to determine nest ownership. Clutches at LRSB were protected from predation by erecting exclosures near the time of clutch completion. Nests were not exclosed prior to April 15 owing to risks of predation of adult plovers by migrating merlins (*Falco columbarius*). In early June 2006 exclosure methodologies were modified resulting from the discovery of an incubating adult's remains near its exclosed nest. This discovery, together with the concurrent disappearance of eight other incubating adults, prompted the removal of existing exclosures and the decision to abandon exclosure use as a predator management tool at LRSB and Clam Beach County Park.

Nests were monitored regularly (3 day interval) to determine status and whether a clutch had failed or not. In the event of a clutch failure, probable cause was determined. Possible causes included 1) predation (eggs disappear prior to predicted hatch date and predator footprints occurred at a nest or egg shell fragments/yolk at nest); 2) drifting sand (coincident with strong winds, eggs partially or completely buried by sand); 3) high tide inundation (eggs displaced or absent from nest and recent high tide line situated above nest elevation); 4) human-caused (vehicle tracks or footprints pass directly over nest and eggs gone or egg remnants in nest cup); 5) dog-caused (tracks leading to nest cup and eggs gone); and 6) unknown (Colwell et al. 2006). Upon hatch, NCRD Resource Management staff and/or HSU/MRB monitored movements and survival of chicks along with parental care behavior for 28 days. When possible, broods were relocated every three days and the number of chicks and tending adults were noted.

#### *Banding*

Nesting birds were captured and banded with a unique combination of plastic bands and colored tape wrapped around USFWS metal bands (Colwell et al. 2006). At hatch, each chick was banded on the right leg with a single metal band wrapped with brood-specific colored tape to enhance knowledge of brood survival rates (Colwell et al. 2006).

#### *Data Summary and Analysis*

Data was collected separately for the seven State Park beaches being monitored using standardized datasheets designed for the Recovery Unit 2 and submitted to MRB and USFWS in Arcata. Hatching success is defined as the number of nests that successfully hatched at least one chick divided by the total number of nests. Fledging success is defined as the number of chicks that survived to 28 days divided by the total number that hatched.

#### *Habitat Restoration and Plover Use*

During abundance and distribution surveys, general habitat conditions were recorded. Nesting and brooding activity occurring in restoration areas was noted to determine if habitat characteristics influence nesting/fledging success.

#### *Human Activity and Management*

Data on human use was collected during WSP abundance and distribution surveys; however, only the data gathered at Gold Bluff Beach, Stone Lagoon, Dry Lagoon, and Big Lagoon were analyzed for this report. At LRSB, TDSP, and Usal Beach human use data was collected intermittently and was therefore not considered for analysis. Total number of humans

observed and their associated activities were recorded and tallied. This included people within the parking area, surfers, both in and out of the water, and fisherpersons either on the beach or lagoon shore. Fisherpersons, kayakers, and boaters within the lagoons or ocean were not tallied. Concurrently with the human use data, dog use was also collected. Dogs were tallied and identified as either being on or off-lease. Evidence of human, dog, and vehicle sign was recorded, however as this information is considered anecdotal it is only referenced in the discussion section as an indicator to the severity of illegal use.

#### *Predator Activity and Management*

We collected data on potential plover predators to assess the threat of predation between sites and over different temporal scales. It was anticipated that this data might help evaluate relationships between relative abundance of potential predators and SNPL nesting success. Presence or absence of various predator sign was recorded for each survey. To assess the threat of avian predators, area-constrained (500 m radius) point counts at 20 minute intervals were conducted and the number of corvids and raptors recorded. We also noted the total number of these events observed during the entire survey. Point count data was summarized by averaging values for multiple observations conducted during each visit to a site, and then averaging all observations for each study site.

#### *Enforcement and Regulatory Signage*

Since the initiation of the Department's Snowy Plover Management and Protection Program, ranger staff have been instructed to increase enforcement activities in plover habitat areas. Enforcement data were not maintained for the 2006 season, however estimations were provided for the number of beach patrols and the number of enforcement actions (both warning & violations) conducted at sites within the study area.

#### *Education and Outreach*

To assess the effectiveness of our education and outreach efforts, volunteer and outreach hours were tallied by beach and event.



## RESULTS and DISCUSSION

### *Abundance and Distribution*

Five of the seven suitable habitat sites were surveyed at least monthly for the 2005-2006 plover season. Due to financial constraints Tolowa Dunes State Park and Usal beach were only surveyed during the winter and breeding window surveys, however, several anecdotal observations yielded results beyond the winter surveys. Three of the seven sites surveyed during the winter season produced plover observations (Figure 2). During the 2006 breeding season, WSP were observed at four of seven surveyed NCRD beaches: Little River State Beach, Dry Lagoon Beach (HLSP), Gold Bluffs Beach (PCRSP) and TDSP. The observation of birds in March and April at Gold Bluffs Beach and Dry Lagoon, were likely late wintering birds or migrants. Little River State Beach was the only active nesting location this year, compared to last year when Gold Bluffs Beach and Big Lagoon had nesting plovers present.

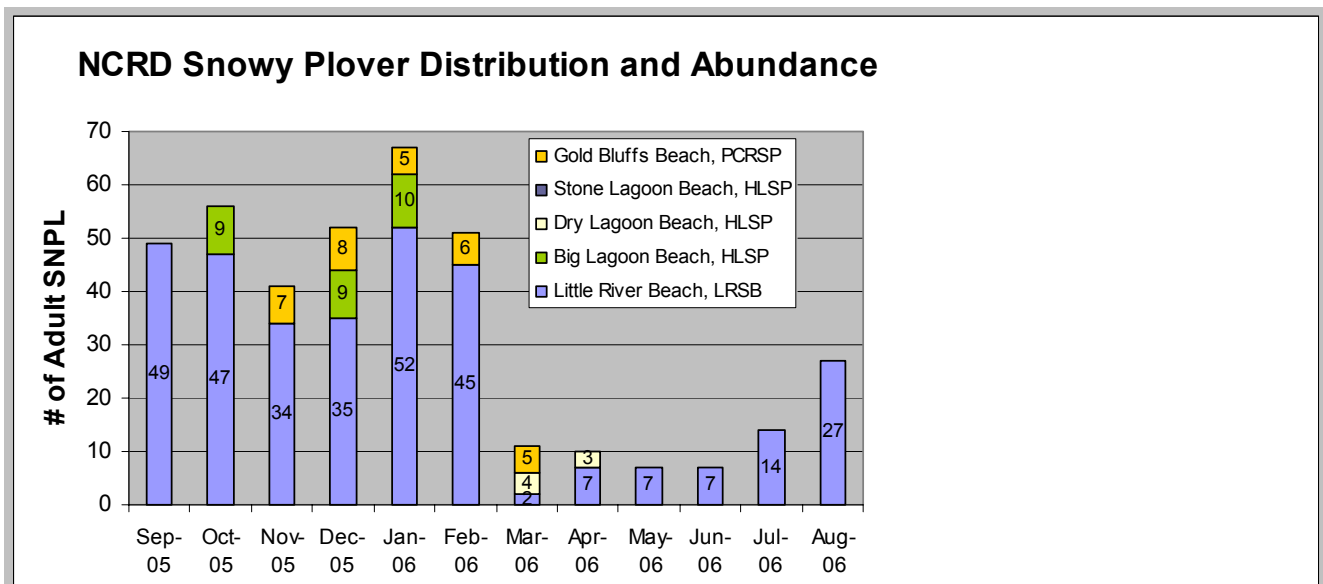


Figure 2. Western Snowy Plover Distribution and Abundance within the North Coast Redwoods District.

\* Gold Bluffs Beach was not surveyed during October 2005.

Since intensive surveys began in 2001, LRSB as consistently had the highest number (52) of wintering plovers in Recovery Unit 2. The number of plovers detected in the NCRD during the breeding season was down from 2005; a trend that was seen for the entire Recovery Unit (Colwell et al. 2006).

### *Reproductive Success*

In the NCRD, 4 breeding plovers initiated 2 nests, which produced 3 chicks and 0 fledged juveniles in 2006 (Table 1). Both initiated nests were at LRSB (Figure 3). Hatching success



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**FIGURE 3**  
**LRSB Snowy Plover Nests**

(3 of 6) was 50% and fledging success (0 of 3) was 0%. Snowy plover reproductive success in the NCRD was lower compared to the 2004 and 2005 breeding season with males in the NCRD producing no fledglings. Snowy plover productivity was the lowest recorded since 2001 for the entire Recovery Unit (Colwell et al. 2006).

| <i>Unit</i>              | <i>Females<sup>a</sup></i> | <i>Males<sup>a</sup></i> | <i># of Nests</i> | <i># Exclosed</i> | <i>% Hatched</i> | <i># Chicks Hatched</i> | <i># Chicks Fledged</i> |
|--------------------------|----------------------------|--------------------------|-------------------|-------------------|------------------|-------------------------|-------------------------|
| Tolowa Lake, TDSP        | 0                          | 0                        | 0                 | 0                 | 0.00%            | 0                       | 0                       |
| Gold Bluffs Beach, PCRSP | 0                          | 0                        | 0                 | 0                 | 0.00%            | 0                       | 0                       |
| Stone Lagoon, HLSP       | 0                          | 0                        | 0                 | 0                 | 0.00%            | 0                       | 0                       |
| Dry Lagoon, HLSP         | 0                          | 0                        | 0                 | 0                 | 0.00%            | 0                       | 0                       |
| Big Lagoon, HLSP         | 0                          | 0                        | 0                 | 0                 | 0.00%            | 0                       | 0                       |
| Little River State Beach | 2                          | 2                        | 2                 | 2                 | 50%              | 3                       | 0%                      |
| Totals 2006              | 2                          | 2                        | 2                 | 2 <sub>b</sub>    | 50%              | 3                       | 0(0%)                   |
| 2005                     | 6                          | 5                        | 6                 | 3                 | 83%              | 14                      | 3(21%)                  |
| 2004                     | 2                          | 2                        | 2                 | 1                 | 100%             | 4                       | 3(75%)                  |

*a* Based on histories of marked birds known to nest in the NCRD. Birds were assigned to a site where they spent the most time.

*b* The exclosure of one nest was removed late in the incubation phase, due to potential adult predation. This nest subsequently failed.

### *Habitat Restoration and Plover Use*

To further protect WSP and the beach and dune ecosystem, the NCRD continues to restore degraded beach and dune habitat in State Park holdings. The following summarizes beach and dune restoration activities for the 2006 season and associated plover monitoring results.

#### **TOLOWA DUNES STATE PARK**

The restoration of small pockets of native beach and dunes by hand continued at TDSP. No new restoration sites have been initiated.

#### **PRAIRIE CREEK REDWOODS STATE PARK**

Additional funding through the Natural Heritage Stewardship Program was secured to continue dune restoration at Carruther's Cove (north end of Gold Bluffs Beach) within PCRSP. Over the last two years, approximately 10 acres of beach and dunes have been treated for *Ammophila arenaria* removal in the Carruther's Cove area. In addition to the Carruther's Project, small pockets of beach and dunes are being restored by hand at Gold Bluffs Beach under the Category H program.

**HUMBOLDT LAGOONS STATE PARK**

The restoration efforts at HLSP began in the spring of 2002 and initial treatment of the entire dune system was completed in March of 2005. Restoration efforts at the beaches at HLSP are currently at a maintenance level and are being funded by the Category H program. In 2005, two nests were initiated in restored habitat at Big Lagoon Beach, the first breeding activity at Big Lagoon since 1983. This year no nests were detected at Big Lagoon, however plovers were observed for the first time at Dry Lagoon Beach in the Spring of 2006.

**LITTLE RIVER STATE BEACH**

With the Little River State Beach Pilot Habitat Restoration Project completed, approximate 10 acres of habitat has been treated with heavy equipment and retreated multiple times throughout 2006. Two nests initiated at LRSB were in restored habitat (Figure 3), both occurring within a grade treatment plot. The grade method uses a dozer to remove exotic vegetation while also producing a slope of approximately 2-3 percent.

*Human Activity and Management*

Data was collected at Gold Bluffs Beach, Stone Lagoon, Dry Lagoon, and Big Lagoon every month with the exception of October, November, and February at Gold Bluffs Beach and in November at Stone, Dry, and Big lagoons. Human activity was generally highest at all beaches in June, July, and August (Figure 4).

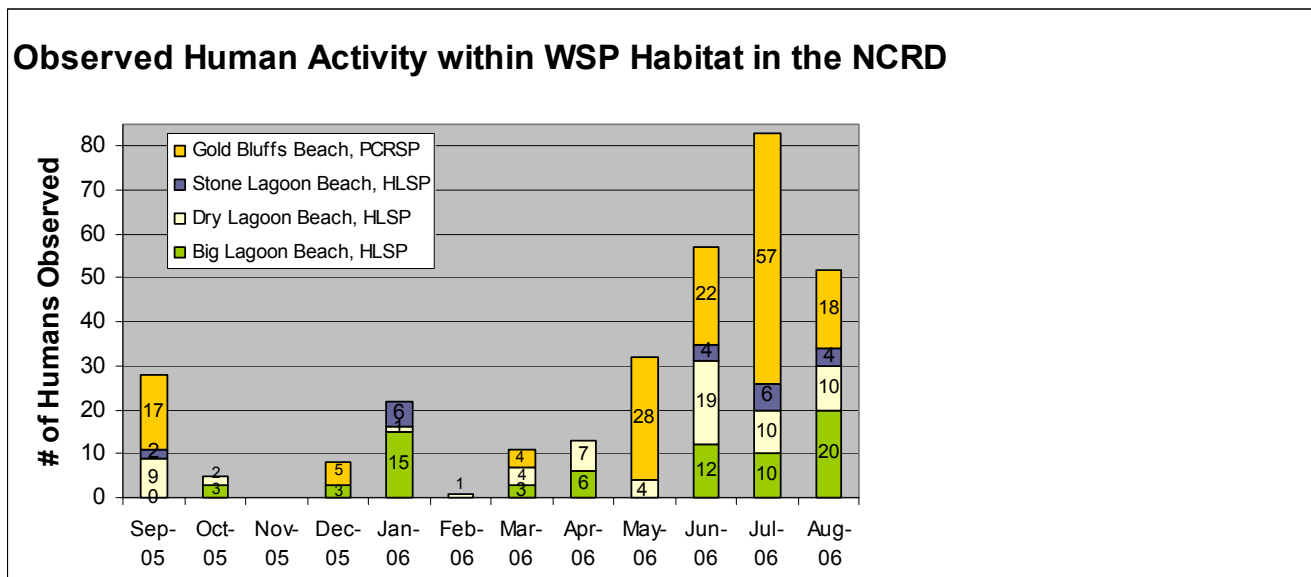


Figure 4. Total number of humans observed on beaches while conducting abundance and distribution surveys.

### *Predator Activity and Management*

In 2006 NCRD continued using predator exclosures, anti-predator perching devices and predator proof trash cans to manage predator concentrations in plover breeding areas. Two nests initiated at LRSB were exclosed and symbolically fenced; however, after several adult plovers disappeared one exclosure was removed and the nest failed. It's believed that a predatory bird clued in on the fencing and was taking breeding adult WSP as they left the fenced area. To avoid further loss of adults, all nest exclosures at the Clam Beach County Park and Little River State Beach were taken down in June.

Predator data was collected at Gold Bluffs Beach, Stone Lagoon, Dry Lagoon, and Big Lagoon every month with the exception of October, November, and February at Gold Bluffs Beach and in November at Stone, Dry, and Big lagoons. However, this data has yet to be analyzed.

### *Enforcement and Regulatory Signage*

In 2006, individual rangers reported varying numbers of interpretive contacts and verbal warnings to visitors with dogs off leash and vehicle play. At Big, Dry, and Stone Lagoon beaches, the illegal activity observed was primarily dogs on the beach and in the dunes. The lagoons are well signed, however illegal dog use is observed on the beach and in the dunes, primarily near campground and day use areas. No citations were issued this year for noncompliance in or near plover habitat during the breeding season, but around 200 educational contacts were made. Approximately 80 sand patrols and 250 frontage road patrols were made at LRSB. Humboldt Lagoons state park was patrolled 400 times, of which 6 involved driving on the sand.

### *Education and Outreach*

The 2006 "Share the Beach" docent program (organized by Recovery Unit 2's outreach subcommittee) began in March with two educational workshops, consisting of a 2-3 hour classroom session, followed by a 2-3 hour field trip. A small group of volunteers became docents and we were able to have 2 volunteer docents on the beach, for a few hours, every other weekend. In addition, the subcommittee had WSP educational displays showing at the Humboldt County Fair (August 11-21) and at the local annual bird watching festival "Godwit Days" (April 21-23). For the second year the subcommittee hosted an art exhibit at the Ink People Gallery in Eureka where key messages about WSP were interwoven into the space.

Finally, four WSP related campfire programs were given at Patrick's Point State Park; six WSP programs were given in 2005. An average of 25 visitors attended each campfire program.

In 2006 District Resource Management staff provided WSP training to State Park and National Park staff. Seasonal staff had not been brought on at the time of the training and therefore were not included.

## **CONCLUSION**

In 2006 the NCRD Resource Management Program continued monitoring WSP within the District with the help of HSU/MRB (Little River State Beach), RNSP (Gold Bluffs Beach), and the USFWS (TDSP). Wintering numbers (67 plovers) for the NCRD were the highest recorded since regular surveys began in 2002. The number of breeding adult plovers (4; 2 males and 2 females) was similar to that of 2004, the lowest number recorded since intensive monitoring began in 2002. Of the two nests occurring within the NCRD, only 1 hatched and the brood failed (hatching success 50% and 0% fledging success) before the chicks fledged resulting in the lowest productivity ever recorded for the NCRD. Similarly, Colwell et al. reported the 2006 Recovery Unit 2 breeding season to host the smallest population size (57; 29 males and 28 females) and the lowest productivity (36% fledged, 20/56 chicks) since collaborative efforts began in 2001. Population estimates based on adult survival and fledging success suggest that the plover population in Recovery Unit 2 is sustained by immigration from other recovery units along the Pacific Coast (Colwell 2006).

To facilitate management of snowy plovers within the NCRD we draw upon results presented in the Recovery Unit 2 annual report (Colwell et al. 2004, 2005, 2006) as it relates to habitat degradation, human disturbance, and predation. These three factors have been reported to compromise reproductive success and hence, limit populations of the snowy plover along the Pacific coast (Colwell et al. 2006).

### *Habitat Degradation and Management*

Over the past couple of years plovers have nested and reared chicks in recently-restored dune habitats without prior breeding experience in these areas. This suggests that the plovers are responding to landscape changes due to invasive exotic removal, rather than simply returning to a familiar breeding area (Colwell 2005). Since the completion of two NCRD restoration projects (HLSP iceplant removal project and LRSB pilot restoration project)

in 2005, all but one nest (6/7 total nests) has occurred in treated habitat. Sixty-six percent of the nests found in treated habitat, occurred within the graded treatment plots of the LRSB Pilot Restoration Project. Colwell et al. 2006 points out that though plovers continue to use restored habitats, the relationship of habitat restoration to population recovery remains unclear.

NCRD Resource Management Staff have been preparing the Little River State Beach and Clam Beach County Park Restoration and Enhancement Plan. The USFWS Coastal Grant Program provided \$25,000 to help fund the preparation of this plan. The District is currently seeking additional funding to complete this plan and to complete the environmental compliance.

#### *Human Disturbance and Management*

Plover productivity continues to be compromised by human activity. On Recovery Unit 2 beaches, Colwell et al. (2006) reported that humans have vandalized exclosures and nests, stepped on eggs, disturbed incubating adults causing nest abandonment, and caused the death of newly hatched chicks owing to hypothermia. These observations suggest a need for further education and outreach as well as increased enforcement presence and action.

Enforcement is a critical component to minimize human impacts to WSP and its habitat. In 2006, no citations were issued for noncompliance of dog presence or vehicle regulations in or near plover habitat. Visitors engaged in illegal activities were commonly observed, so this lack of citations is not a result of increased compliance by the public. The biggest deterrent to sand patrols is the poor performance of vehicles in the beach environment. North Coast Redwoods District will be evaluating its practices regarding enforcement of beach and dune regulations and will continue to make improvements. In addition to law enforcement presence, proper regulatory and interpretive signage is vital to snowy plover protection. Even with the presence of signs, there is continued illegal activity from vehicles, dogs, and horses. Increased signage and replacement of vandalized signs may help to minimize human disturbance in the study area. Symbolic fencing at LRSB pilot treatment area has proven to be a successful tool to manage human activity near breeding plovers, as such these areas will continue to be symbolically fenced.

To encourage protection of the beach and dune ecosystem and educate the public about sharing the beach with all species, the NCRD has been active in the WSP Recovery Unit 2

Outreach subcommittee and the “Share the Beach” docent program at LRSB and adjoining Clam Beach County Park (CBCP).

#### *Predation and Management*

Colwell et al. (2006) reported that though it is difficult to attribute Recovery Unit 2’s low productivity to any one cause, based on observations of egg and chick predation by corvids (*Corvus brachyrhynchos* and *C. corax*), as well as the presence of corvid sign near failed nests and broods, they conclude that corvids continue to be the most significant cause of low productivity on beaches.

Predator exclosures used to increase hatching success have been the primary management tool to control predators within NCRD, however, exclosures do not protect chicks once they hatch. As a result, although predator exclosures have been effective at increasing hatching success in Recovery Unit 2, fledging success remains low. The use of exclosures may have unintended risks, such as increased risk to predation by incubating adults or attracting adults to breed in potentially low quality habitat (Colwell et al. 2006). Both of these examples seem to apply to LRSB.

#### *Co-operation*

Since 1999 the NCRD has been an active member in the Recovery Unit 2 working group and has been monitoring suitable habitat within the NCRD. Monitoring has included cooperation between state and federal agencies, educational institutions, and private consulting firms. The NCRD Resource Management staff continues to be involved with the Predator Control, Education Outreach, and the Habitat Restoration subcommittees. In addition to participating in Recovery Unit 2 subcommittees, District Resource Management staff maintained their participation in the Humboldt Coastal Dunes Cooperative and to a lesser extent, the Dunes Forum. The Humboldt Coastal Dunes Cooperative facilitates coordinated ecosystem management of coastal dune environments, through collaboration among stakeholders, which are comprised of local, tribal, state, and federal coastal dune land managers.

#### **WSP Management Objectives for 2007**

In 2007 the North Coast Redwoods District plans to:

- Increase coordination between groups collecting WSP data in the NCRD.
- Initiate electronic WSP data gathering using PDA’s with GPS units and/or GPS dataloggers within NCRD.



- Continue monitoring efforts throughout the NCRD and participation in the Recovery Unit 2 demographic study.
- Re-establish abundance and distribution surveys within suitable habitat at Tolowa Dunes State Park and Usal Beach, Sinkyone Wilderness State Park.
- Continue to work and coordinate with the Recovery Unit 2 working group and subcommittees, and the Humboldt Coastal Dunes Cooperative.
- Continue habitat restoration within suitable habitat.
- Continue to use symbolic fencing to protect nests when appropriate.
- Develop a database for the rangers to document beach and dune patrols, violations, citations, and contacts.
- Continue to increase law enforcement presence at occupied State Park beaches during the WSP breeding season, especially during holiday weekends.
- Continue to use nests exclosures where appropriate.
- Increase public outreach with signage and working within the Recovery Unit 2 Outreach Subcommittee.

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# Appendix A

## Western Snowy Plover Field Survey Sheets

Page \_\_\_ of \_\_\_

### Western Snowy Plover Field Survey Form

Survey Location \_\_\_\_\_ Month \_\_\_\_\_ Day \_\_\_\_\_ Year 2003

Observer(s) Name: \_\_\_\_\_ Initials: \_\_\_\_\_ Affiliation: \_\_\_\_\_ Phone: (\_\_\_\_) \_\_\_\_\_

Start Time \_\_\_\_\_ Stop Time \_\_\_\_\_ Total Time \_\_\_\_\_ Start Time \_\_\_\_\_ Stop Time \_\_\_\_\_ Total Time \_\_\_\_\_

Weather conditions: \_\_\_\_\_ Temperature: \_\_\_\_\_

Cloud Cover: \_\_\_\_\_ Precipitation: \_\_\_\_\_ Wind: (mph) \_\_\_\_\_ (direction) \_\_\_\_\_ Tides: \_\_\_\_\_

Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%

Precipitation: N = None, R = Rain, F = Fog, D = Drizzle

General habitat conditions of survey area (beachgrass, driftwood, disturbance – vehicles, people, dogs): \_\_\_\_\_

Other species detected (especially potential predators): \_\_\_\_\_

| CORVID POINT COUNT DATA |        |        |       |          |      |
|-------------------------|--------|--------|-------|----------|------|
| Time                    | Point# | #Raven | #Crow | #BlkCrvd | Rpt? |
|                         | 1      |        |       |          |      |
|                         | 2      |        |       |          |      |
|                         | 3      |        |       |          |      |
|                         | 4      |        |       |          |      |
|                         | 5      |        |       |          |      |
|                         | 6      |        |       |          |      |
|                         | 7      |        |       |          |      |
|                         | 8      |        |       |          |      |
|                         | 9      |        |       |          |      |
|                         | 10     |        |       |          |      |
|                         | 11     |        |       |          |      |
|                         | 12     |        |       |          |      |
|                         | 13     |        |       |          |      |

#### SUMMARY OF ALL SNOWY PLOVERS OBSERVED

| ADULTS |         |             | YOUNG     |        | Age Unknown | Total SNPLs | # Banded | NESTS            |                         |
|--------|---------|-------------|-----------|--------|-------------|-------------|----------|------------------|-------------------------|
| Males  | Females | Sex Unknown | Juveniles | Chicks |             |             |          | Previously found | New (attach nest sheet) |
|        |         |             |           |        |             |             |          |                  |                         |

Sighting # \_\_\_\_\_ Location: \_\_\_\_\_ Time: \_\_\_\_\_

| Color Combo | Sex   | Age   | Color Combo | Sex   | Age   | Color Combo | Sex   | Age   |
|-------------|-------|-------|-------------|-------|-------|-------------|-------|-------|
| 1. _____    | _____ | _____ | 6. _____    | _____ | _____ | 11. _____   | _____ | _____ |
| 2. _____    | _____ | _____ | 7. _____    | _____ | _____ | 12. _____   | _____ | _____ |
| 3. _____    | _____ | _____ | 8. _____    | _____ | _____ | 13. _____   | _____ | _____ |
| 4. _____    | _____ | _____ | 9. _____    | _____ | _____ | 14. _____   | _____ | _____ |
| 5. _____    | _____ | _____ | 10. _____   | _____ | _____ | 15. _____   | _____ | _____ |

**Nests Observed:** New Nests (Y/N) \_\_\_\_\_ # \_\_\_\_\_ if yes, fill out and attach nest sheet(s)  
**Previously known nests:** (Record 6 digit Nest ID if known; location description; sex, band combo, and behavior of associated birds.)

**Other Behaviors Observed:** (Displays, disturbance, paired birds etc.) \_\_\_\_\_

**Recording band combos:** Record colors for the bird's left leg first, right leg second. Separate the colors on the left leg and right leg with a colon (:). Record colors from the top to bottom for each leg. Read T ↓ B, R ← L if the bird is facing you.  
 Underlined letter is code for color: Aqua Blue Green BlacK Lime Orange Pink Red Silver Violet White Yellow. \* Record un-banded birds as X:X.  
*Examples:* A bird that has no bands on its left leg and one yellow band on its right leg is X:Y. A bird with a left band on top (orange) left bottom (red) and a right band on top (green) right bottom (red) would be OR:GR. A bird with only one band (red) on the left and one band (white) on the right would be R:W.  
**Sex:** Male, Female, Unknown      **Age:** Addult, Juvenile (Young capable of flight), Chick (incapable of flight), Unknown

### Western Snowy Plover Field Survey Form

Sighting # \_\_\_\_\_ Location: \_\_\_\_\_ Time: \_\_\_\_\_

|    | Color Combo   | Sex   | Age   |     | Color Combo   | Sex   | Age   |     | Color Combo   | Sex   | Age   |
|----|---------------|-------|-------|-----|---------------|-------|-------|-----|---------------|-------|-------|
| 1. | _____ : _____ | _____ | _____ | 6.  | _____ : _____ | _____ | _____ | 11. | _____ : _____ | _____ | _____ |
| 2. | _____ : _____ | _____ | _____ | 7.  | _____ : _____ | _____ | _____ | 12. | _____ : _____ | _____ | _____ |
| 3. | _____ : _____ | _____ | _____ | 8.  | _____ : _____ | _____ | _____ | 13. | _____ : _____ | _____ | _____ |
| 4. | _____ : _____ | _____ | _____ | 9.  | _____ : _____ | _____ | _____ | 14. | _____ : _____ | _____ | _____ |
| 5. | _____ : _____ | _____ | _____ | 10. | _____ : _____ | _____ | _____ | 15. | _____ : _____ | _____ | _____ |

Nests Observed: New Nests (Y/N) \_\_\_\_\_ # \_\_\_\_\_ if yes, fill out and attach nest sheet(s)

Previously known nests: (Record 6 digit Nest ID if known; location description; sex, band combo, and behavior of associated bird)

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Other Behaviors Observed: (Displays, disturbance, paired birds etc.) \_\_\_\_\_

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Sighting # \_\_\_\_\_ Location: \_\_\_\_\_ Time: \_\_\_\_\_

|    | Color Combo   | Sex   | Age   |     | Color Combo   | Sex   | Age   |     | Color Combo   | Sex   | Age   |
|----|---------------|-------|-------|-----|---------------|-------|-------|-----|---------------|-------|-------|
| 1. | _____ : _____ | _____ | _____ | 6.  | _____ : _____ | _____ | _____ | 11. | _____ : _____ | _____ | _____ |
| 2. | _____ : _____ | _____ | _____ | 7.  | _____ : _____ | _____ | _____ | 12. | _____ : _____ | _____ | _____ |
| 3. | _____ : _____ | _____ | _____ | 8.  | _____ : _____ | _____ | _____ | 13. | _____ : _____ | _____ | _____ |
| 4. | _____ : _____ | _____ | _____ | 9.  | _____ : _____ | _____ | _____ | 14. | _____ : _____ | _____ | _____ |
| 5. | _____ : _____ | _____ | _____ | 10. | _____ : _____ | _____ | _____ | 15. | _____ : _____ | _____ | _____ |

Nests Observed: New Nests (Y/N) \_\_\_\_\_ # \_\_\_\_\_ if yes, fill out and attach nest sheet(s)

Previously known nests: (Record 6 digit Nest ID if known; location description; sex, band combo, and behavior of associated birds)

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Other Behaviors Observed: (Displays, disturbance, paired birds etc.) \_\_\_\_\_

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**Recording band combos:** Record colors for the bird's left leg first, right leg second. Separate the colors on the left leg and right leg with a colon (:).

Record colors from the top to bottom for each leg. Read T ↓ B, R ← L if the bird is facing you.

Underlined letter is code for color: Aqua Blue Green Black Lime Orange Pink Red Silver Violet White Yellow. \* Record un-banded birds as X:X.

*Examples:* A bird that has no bands on its left leg and one yellow band on its right leg is X:Y. A bird with a left band on top (orange) left bottom (red) and a right band on top (green) right bottom (red) would be OR:GR. A bird with only one band (red) on the left and one band (white) on the right would be R:W.

Sex: Male, Female, Unknown

Age: Addult, Juvenile (Young capable of flight), Chick (incapable of flight), Unknown

## Appendix B. NCRD Western Snowy Plover Breeding Summary 2006

| Location                 | Nest Number   | Initiation Date | Northing | Easting | Date Nest Exclosed | Female       | Male                  | Number Hatched | Date Hatched or Failed | Number Fledged | Date Fledged | Comments                                |
|--------------------------|---------------|-----------------|----------|---------|--------------------|--------------|-----------------------|----------------|------------------------|----------------|--------------|---|
| Little River State Beach | <b>06CN05</b> | 04/18/06        | 4540842  | 406424  | 04/18/06           | <b>GV:RG</b> | <b>RY:WB</b>          | 3              | 05/24/06               | 0              | NA           |   |
| Little River State Beach | <b>06CN12</b> | 5/27/06         | 4540845  | 406435  | 05/27/06-06/28/06  | <b>OO:BO</b> | <b>OR:OB or OO:GY</b> | 0              | 06/12/06               | 0              | NA           | Exclosure removed 06/28 prior to hatch. |

\* UTM - North American Datum 1983