



SAN FRANCISCO BAY  
BIRD OBSERVATORY

## **Snowy Plover Habitat Enhancement Pilot Project**

RLF grant #2008-0328

Grant Period:

October 2008 – December 2010

### **Interim Report**

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The South Bay Salt Pond Restoration Project (the Restoration Project) has committed to support 125 pairs of breeding Western Snowy Plovers within the project area. As the Restoration Project restores the South Bay salt ponds to tidal action, the amount of Snowy Plover nesting habitat available will be reduced. In 2006, the California Department of Fish and Game (CDFG) began managing water levels in their salt ponds for nesting Snowy Plovers with the hopes of increasing nest density. In 2008, the Don Edwards San Francisco Bay National Wildlife Refuge (the Refuge) managed water level in one pond for nesting shorebirds and Snowy Plovers. Despite the increased water management, Snowy Plover nest success has decreased in the South San Francisco Bay (South Bay) over the past 5 years. In November 2008, the San Francisco Bay Bird Observatory (SFBBO) and the Refuge began working with CDFG at their Eden Landing Ecological Reserve property to study if certain habitat enhancements increase Snowy Plover nest success. In this report, we describe the progress we have made towards our habitat enhancement goals and our next steps to completing our objectives.

In November and December 2008, the California Conservation Corps (CCC) worked for two weeks removing predator perches and vegetation encroaching on Snowy Plover nesting habitat at Eden Landing. During that time, the CCC removed enough posts to fill a 30 cubic yard dumpster and removed over two hectares of vegetation. This was the first time we have partnered with the CCC and their staff was very skilled and efficient at the tasks.

The CCC also helped SFBBO staff and volunteers create 13 experimental plots on five salt ponds. Each plot was randomly placed within the pond. Each plot contained three one hectare blocks, which were randomly selected to receive either shells, footprints, or no

treatment. In the shell blocks, we spread approximately five to eight shells in each square meter, adding up to over three tons of shell. Drakes Bay Family Farm donated all of the shells saving the project thousands of dollars. The spreading of the shells took place from 24 November until 9 December 2008 and from 8 September to 31 December 2009. We will spread the remaining shell plots in January and February 2010, weather permitting.

SFBBO began our Snowy Plover monitoring program on 2 March 2008 and we hired two field assistants and two interns to conduct the surveys. We continued monitoring ponds through 30 September 2009. This year we monitored 163 Snowy Plover nests in the South Bay and determined that 96 (59%) hatched. Through the monitoring program we also studied plover use of the oyster shell plots. We recorded the highest nest density (6 nests/ha) for the San Francisco Bay in one of the shell plots. Nest success rate in the shell plots was 66%, whereas the nest success rate at Eden Landing outside of the shell plots was 50%. Nests in the shell plots hatched at higher than expected rates compared to all other areas at Eden Landing ( $\chi^2=4.98$ ,  $df=1$ ,  $P=0.026$ ). Eight percent of the shell plot nests were depredated compared to 44% of nests at Eden Landing outside of the shell plots. The high nest density in the shell plots and high nest success of the nests within the plots show that spreading oyster shells may prove to be a valuable technique if the SBSRP is to reach its goal of 125 pairs of breeding plovers in the South Bay.

The Snowy Plover chick banding program was successful this season in banding 113 chicks. Through our re-sighting surveys, we have determined that 28 of the banded chicks fledged. The chicks from nests in shell plots had similar fledging success as those from non-shell

plot nests. Snowy Plover chicks are precocial and leave the nest within a few hours of hatching. The males lead the chicks to foraging areas, which may be outside shell plots.

Scott Demers from H.T. Harvey and Associates assisted SFBBO in setting up the nest camera portion of the habitat enhancement study. We built 5 nest cameras and deployed them to continually monitor Snowy Plover nests, without disturbance impacts. We monitored 24 nests throughout the season and captured eight depredation events. All the nest predators were avian and included Red-Tailed Hawks, Northern Harriers, a Common Raven and a California Gull. We also captured footage of a California Gull depredating newly hatched Snowy Plover chicks. We were able to set up one camera on both a Snowy Plover nest and an endangered California Least Tern nest when they nested within 10 m of each other. Both nests hatched successfully but the Least Tern chicks were depredated within a few hours of hatching by a Northern Harrier. Video clips of all the depredation events are online at:

<http://vimeo.com/4362181>

SFBBO and U.S. Department of Agriculture, APHIS - Wildlife Services office signed a cooperative service agreement on 12 December 2008 to conduct wildlife management activities at Eden Landing Ecological Reserve during the 2009 breeding season. A Wildlife Services staff member worked part time at Eden Landing to reduce the number of predators that may impact Snowy Plover nest success. SFBBO and the Refuge worked closely with the Wildlife Services crew to determine which predators were impacting plovers. The video footage of predators depredating nests was very useful to help Wildlife Services focus their predator management activities.

The data collected this year has been invaluable for the understanding and management of Snowy Plovers in the South Bay salt ponds. We look forward to continuing this study in 2010.

**South Bay Salt Pond Western Snowy Plover  
Nesting Habitat Enhancement  
Project Outcomes**

Objective	Progress/Process	Conservation Outcomes
Enhance Snowy Plover nesting habitat by removing predator perches, removing vegetation and spread 15 hectares of oyster shells.	Worked with the CCC to remove potential predator perches and encroaching vegetation. Spread oyster shells over 13 hectares of salt ponds. We will spread 2 remaining plots in 2010.	Increase Snowy Plover nest success and fledging success.
Manage predators in Snowy Plover nesting areas.	Contracted with USDA APHIS-Wildlife Services to have one part-time staff member managing predators in Snowy Plover nesting areas in 2009.	Reduce the number of Snowy Plover nest and chick depredation events.
Monitor breeding Snowy Plovers and determine nest success.	Started monitoring ponds 2 March 2009 and continued through 30 September 2009.	Determine effectiveness of habitat enhancement projects on nest success and the overall success of the 2009 breeding season.
Determine Snowy Plover nest predators with digital camera systems.	Constructed 5 nest cameras and recorded eight depredation events in 2009. We will continue camera study in 2010.	Identify nest predators and assess the effect of habitat enhancement techniques on the types of nest predators present.
Determine Snowy Plover fledging success.	Banded 113 chicks in the 2009 breeding season and determined that 28 fledged.	Determine effectiveness of habitat enhancement projects on fledging success.

## South Bay Salt Pond Western Snowy Plover Nesting Habitat Enhancement

Task	Original Budget	Spent to date (as of 15 December 09*)	Remaining Funds	Notes
Post/vegetation removal (CCC)	\$30,000	\$26,112.00	\$3,888.00	We have extended our contract with the CCC and will use the remaining funds in 2010
Predator Management (USDA APHIS – Wildlife Services)	\$40,000	\$38,038.69	\$1,961.31	We are waiting for final invoice
Plover Monitoring	\$50,000	\$58,735.15	(\$8,735.15)	
Enhancement (shells)	\$20,580.64	\$12,719.70	\$7,860.94	Includes report time and expenses
Nest Cameras (proposed in addendum)	\$38,225.00	\$37,064.42	\$1,160.58	
Plover Chick Banding (proposed in addendum)	\$31,803.13	\$15,815.18	\$15,987.95	
<b>Total</b>	<b>\$210,609</b>	<b>\$188,485</b>	<b>\$22,124</b>	

\* Funds spent up to 12/31/09 will be available on January 4, 2010.