

# Western Snowy Plover Monitoring

at the

Crissy Field Wildlife Protection Area of  
The Presidio of San Francisco

2009/2010



Golden Gate Audubon Society  
San Francisco Conservation Committee

Prepared by

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### **Abstract**

In 2009-2010, Golden Gate Audubon volunteers continued monitoring wintering western snowy plovers at the Crissy Field Wildlife Protection Area in the Presidio, San Francisco CA. Data collected indicate that the number of plovers using the WPA continues to decline from 4.11 plovers observed per survey hour in 2005-2006 to 1.55 plovers per survey hour in 2009-2010. Compliance with the dog leash requirements remains approximately 34%, unchanged from 2008-2009, meaning that approximately 2/3 of dog owners visiting the area are failing to comply with the requirement to leash their dogs. Protection of the plovers would be enhanced by increased outreach and education, enforcement of leash requirements, and other measures to decrease disturbances of the plovers and other wildlife that rely on the WPA.

### **Acknowledgements**

Thanks to the staff of the Golden Gate National Recreation Area for their cooperation in this monitoring project.

### **Observers**

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### **Recommended Citation**

Zlatunich, M. and M. Lynes. 2010. *Western Snowy Plover Monitoring at the Crissy Field Wildlife Protection Area of the Presidio, San Francisco, California*. Available at <http://www.goldengateaudubon.org>

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## **I. Introduction**

The bayside beach within the Wildlife Protection Area (WPA) at Crissy Field in the Presidio is of an ecological composition found nowhere else in San Francisco. From its shallow bay waters to its open, intertidal beach to its vegetated dunes, this area supports a variety of birds and other wildlife including members of the Pacific coast population of the western snowy plover (*Charadrius alexandrinus nivosus*).

The Pacific coast western snowy plover is a small shorebird, with an estimated population of 2600 individuals, which has been listed as threatened under the Federal Endangered Species Act since 1993 (USFW, 2007). The WPA is a regular wintering site for the western snowy plover, and as a result it has been included in the U.S. Fish & Wildlife Service's recovery plan for the species (USFW, 2007).

Since 2005, a Golden Gate Audubon volunteer monitoring program has established that while the WPA is important for western snowy plovers, impacts and disturbances from recreational users reduces the quality of the habitat for the plovers. According to the National Park Service, "[a]nalyzes of plover monitoring data have shown that while the leash requirement reduced the number of off-leash dogs, there are still too many unleashed dogs in these areas to adequately protect the western snowy plover." (National Park Service (2008) Western Snowy Plover Monitoring at Ocean Beach and Crissy Field)

Monitoring has also identified conflicts between recreational use of the WPA and the western snowy plover recovery effort. By identifying and understanding the impacts of recreational use on western snowy plovers and their habitat, recommendations can be developed and provided to the staff of the Golden Gate National Recreation Area (GGNRA) to assist in the development of sustainable management policies and practices.

This report contains the results of 20 surveys carried out from November 2, 2009 through February 15, 2010, as well as active searches during the pre-survey and post-survey periods.

## **II. Survey Area**

The survey area includes the bayside beach and dunes within the WPA from the Coast Guard Pier eastward to the shoreline rip-rap (east boundary fence after December 31, 2009) and extending 100 meters offshore. A map of the survey area is provided in Appendix A.

## **III. Methods**

Observers followed the same protocol as in previous years of the survey (see Appendix B). Active searches were made of the area, from July 15 to October 31, 2009 and from March 1 to March 31, 2010, to detect the presence of western snowy plovers, making note of the number of individuals and leg band combinations.

One hour static surveys were conducted, from November 1, 2009 to February 28, 2010, from the wooden observation platform using binoculars and spotting scope. Survey times included mornings, afternoons, weekdays, weekends, high and low tides. All bird and mammal species were recorded as well as all wildlife disturbances both natural and human induced.

**Survey Dates.** Active searches were conducted from July 15 to Oct. 31 and after Feb. 28. Twenty static surveys were conducted between Nov. 1 and Feb. 28. Static surveys occurred on

November 2, 7, 10, 13, 27, 29; December 2, 18, 19, 22, 27; January 10, 11, 14, 26, 27, 31; and February 2, 11, 15.

## **IV. Current Conditions at the Crissy Field WPA**

### ***Access points***

In November and December of 2009, additional fencing and gates with signage were installed at all of the promenade access points as well as along the east boundary of the WPA. There are currently five access points to the portion of the WPA that is the study area. Access can be made from either end of the beach along the waters edge, from a gate in the east boundary fence, from a gate at the boardwalk viewing platform, and from a gate adjacent to the Gulf of the Farallones visitor center.

### ***Signage***

Signage is currently in place at entry points to the WPA alerting the public that this area is habitat for the Western Snowy Plover, that disturbance from humans and dogs can impact snowy plover survival, and to walk near the waterline to avoid areas used by plovers. The signage also indicates that off-leash dogs, disturbing wildlife and disturbing threatened species are violations of the law.

### ***Habitat Maintenance/Enhancement***

Beach clean-ups are conducted in July and several times during the overwintering season by volunteers. Dune vegetation and beach structure are not currently managed.

A storm drain outlet located within the WPA has been problematic during rainy conditions and has required mechanical clearing after any rain event. This work requires bringing a backhoe into the WPA. The National Park Service has provided training to equipment operators to minimize impacts to plovers.

### ***Outreach/Education***

In February of 2008, the National Park Service initiated a volunteer outreach program and began recruiting and training volunteers to educate park visitors within the plover habitats at Ocean Beach and Crissy Field. A Yahoo Groups internet site has been established as a docent communication tool.

On site tabling is conducted on several occasions throughout the season including July 4<sup>th</sup> weekend and on Coastal Cleanup Day.

### ***Temporary Closures***

To protect against anticipated heavy recreational use, the National Park Service closes the WPA to all recreation on several occasions throughout the wintering season, including the Fourth of July Weekend and Fleet Week.

### ***Recreational Use & Disturbance***

The WPA is currently open to a variety of recreational activities. Observed activities during past survey years include: walking, jogging, dog walking, kite flying, fishing, boating, swimming, picnicking, golfing, ball playing, disc golf, photography and wildlife viewing. Recent

improvements in signage, trail configuration, and public education are anticipated to reduce the occurrence of incompatible recreational activity.

Previous survey data have shown that the greatest disturbance impact to wildlife within the WPA is caused by dogs, joggers and walkers.

### ***Law Enforcement***

US Park Police and NPS rangers have been issuing warnings and citations, as well as developing a dog walker database.

### ***Pet Restrictions***

In September of 2008 the National Park Service adopted a final interim leash rule that requires all dogs to be on-leash within the WPA from July 1 to the following May 15 of every year. A park-wide dog management plan is currently being developed.

### ***Species Richness***

The following is a cumulative list of bird species that have been observed using the shoreline and dunes of the study area during the course of the surveys from 2005 to the present. Species of concern are listed in **bold** lettering (from Audubon Watch List and American Bird Conservancy Green List.)

Great Blue Heron	Ring-billed Gull	Cliff Swallow
Black-bellied Plover	California Gull	Barn Swallow
Semipalmated Plover	Herring Gull	European Starling
<b>Western Snowy Plover</b>	Western Gull	American Pipit
Killdeer	<b>Heermann's Gull</b>	Yellow-rumped Warbler
Greater Yellowlegs	Rock Pigeon	Savannah Sparrow
Willet	Anna's Hummingbird	White-crowned Sparrow
Whimbrel	Belted Kingfisher	Song Sparrow
<b>Long-billed Curlew</b>	Black Phoebe	Western Meadowlark
<b>Marbled Godwit</b>	Say's Phoebe	Brewer's Blackbird
<b>Sanderling</b>	Common Raven	House Finch
<b>Western Sandpiper</b>	American Crow	Lesser Goldfinch
Least Sandpiper	Horned Lark	American Goldfinch

The following mammal species have been observed within the study area since 2005.

Southern Sea Otter  
California Sea Lion  
Northern Elephant Seal  
Harbor Seal

## V. Western Snowy Plover History at the WPA (2005-2010)

**Table 1. Western snowy plovers observed 2005 through present.**

Letter codes indicate color band combinations. "Unb" indicates unbanded birds. Residents are birds that are observed regularly throughout the wintering season (Nov 1 – Feb 29).

Status	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
Resident	OG:YO PG:BY	OG:YO PG:BY	OG:YO PG:BY	OG:YO PG:BY LW:YY LW:BR LW:WB	PG:BY LW:YY LW:BR	LW:YY LW:BR
	unb	unb	unb	unb	unb	unb
	unb	unb	unb		unb	unb
		unb	unb			unb
		unb	unb			unb
Migrant		WW:RY	BY:WV		AA:RL	
Total	4	7	7	6	6	5

**Table 2. Banded Bird Roster**

Observers recorded color band combinations of western snowy plovers observed at the Crissy Field WPA and consulted with PRBO to determine their original history.

BAND ID.	SEX	HATCH YR.	BANDING LOCATION
OG:YO	F	2003	Monterey Bay Aquarium
PG:BY	M	2004	Pismo Beach
WW:RY	F	2000	Humboldt Co.
BY:WV	F	2006	Salinas NWR
LW:WB *	?	?	Local
LW:YY *	?	?	Crissy Field
LW:BR *	?	?	Crissy Field
AA:RL	?	2008	Zmudowski SB

\* Banded subsequent to Cosco Busan oil spill of 2007.

## VI. 2010 RESULTS

### *Western Snowy Plovers Observed*

There were, at minimum, five western snowy plovers observed in the WPA throughout the wintering season, with the first seasonal observation occurring on 9/11/2009 (Lynn Strandberg) and the last occurring on 1/14/2010 (Lynn Strandberg). Two banded birds that had been observed in the previous season were resident in the WPA throughout the fall and winter; LW:YY, and LW:BR, both banded locally subsequent to the oil spill of 2007.

All of the winter resident banded birds were observed at Ocean Beach on several occasions, indicating that some birds use both sites throughout the winter season.

## Result Tables

**Table 3. Western Snowy Plover observation data 2009/2010.**

Inclusive of active searches from date of first arrival, static surveys, and incidental observations.

Plover sightings Sep - Oct				
	LW:YY	LW:BR	unb	unk
9/11 ls			1	
9/14 mz				
9/21 mz				
9/24 ls				
9/30 mz				
9/30 pf	x			
10/5 mz				
10/8 ls				
10/12 mz	x		2	
10/21 mz	x		1	
10/28 mz	x	x	2	

Plover sightings Nov - Feb				
	LW:YY	LW:BR	unb	unk
11/2 mz				
11/7 rh				2
11/10 mz			1	
11/13 ls	x		3	
11/27 ls	x	x	3	
11/29 rh	x	x	3	
12/2 mz	x	x	3	
12/18 ls	x		1	
12/19 rh	x			
12/22 mz	x	x	2	
12/27 rh				2
12/30 mz*	x	x	1	
1/2 mz*				
1/6 mz*				
1/8 mz*				
1/10 rh				
1/11 mz				
1/13 mz*	x			
1/14 ls	x			
1/26 mz				
1/27 ls				
1/31 rh				
2/2 mz				
2/11 ls				
2/15 mz				

Plover sightings March				
no sightings				

pf = Patrick Furtado  
rh = Richard Horrigan  
ls = Lynn Strandberg  
mz = Matt Zlatunich  
\* = non-survey observation  
unb = unbanded  
unk = unknown

**Table 4. Recreational use data 2009/2010.**

Data is for static survey period, Nov. 1 – Feb. 28.

DATE	DAY	TIME	WALKERS		JOGGERS		ON-LEASH DOGS		OFF-LEASH DOGS	
			shore / dunes	shore / dunes	shore / dunes	shore / dunes	shore / dunes	shore / dunes		
11/2/2009	M	10:10-11:10a	6	6	0	0	1	0	0	0
11/7/2009	Sa	3:45-4:45p	14	9	2	0	1	0	0	2
11/10/2009	Tu	2:35-3:35p	5	6	1	0	0	0	1	3
11/13/2009	F	1:50-2:50p	12	0	0	0	0	0	0	0
11/27/2009	F	10:00-11:00a	2	0	1	0	0	0	0	0
11/29/2009	Su	2:36-3:36p	111	48	7	0	1	2	7	5
12/2/2009	W	11:40-12:40a	0	2	1	0	0	0	1	0
12/18/2009	F	10:30-11:30a	2	1	0	0	0	1	0	0
12/19/2009	Sa	11:53-12:53p	2	14	1	0	0	0	0	5
12/22/2009	Tu	9:35-10:35a	0	1	4	0	0	0	0	1



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DATE	DAY	TIME	WALKERS		JOGGERS		ON-LEASH DOGS		OFF-LEASH DOGS	
			shore / dunes	shore / dunes	shore / dunes	shore / dunes	shore / dunes	shore / dunes		
12/27/2009	Su	2:52-3:52p	30	18	0	0	5	5	5	10
1/10/2010	Su	11:48-12:48p	21	5	3	0	4	0	7	3
1/11/2010	M	1:05-2:05p	5	4	1	0	0	0	0	1
1/14/2010	Th	10:50-11:50a	4	0	0	0	3	0	0	0
1/26/2010	Tu	1:15-2:15p	7	1	0	0	0	0	1	0
1/27/2010	W	1:45-2:45p	18	0	0	0	1	0	5	1
1/31/2010	Su	12:33-1:33p	9	18	0	2	0	2	0	5
2/2/2010	Tu	9:25-10:25a	2	0	2	0	1	0	0	0
2/11/2010	Th	2:30-3:30p	9	1	0	0	2	0	1	0
2/15/2010	M	3:30-4:30p	29	8	6	0	4	0	1	0
SUB-TOTAL			288	142	29	2	23	10	29	36
<b>TOTAL</b>			<b>430</b>		<b>31</b>		<b>33</b>		<b>65</b>	

**Table 5. Surveys with plovers present 2009/2010.**

DATE	DAY	TIME	WALKERS		JOGGERS		ON-LEASH DOGS		OFF-LEASH DOGS	
			shore / dunes	shore / dunes	shore / dunes	shore / dunes	shore / dunes	shore / dunes		
11/7/2009	Sa	3:45-4:45p	14	9	2	0	1	0	0	2
11/10/2009	Tu	2:35-3:35p	5	6	1	0	0	0	1	3
11/13/2009	F	1:50-2:50p	12	0	0	0	0	0	0	0
11/27/2009	F	10:00-11:00a	2	0	1	0	0	0	0	0
11/29/2009	Su	2:36-3:36p	111	48	7	0	1	2	7	5
12/2/2009	W	11:40-12:40a	0	2	1	0	0	0	1	0
12/18/2009	F	10:30-11:30a	2	1	0	0	0	1	0	0
12/19/2009	Sa	11:53-12:53p	2	14	1	0	0	0	0	5
12/22/2009	Tu	9:35-10:35a	0	1	4	0	0	0	0	1
12/27/2009	Su	2:52-3:52p	30	18	0	0	5	5	5	10
1/14/2010	Th	10:50-11:50a	4	0	0	0	3	0	0	0
SUB-TOTAL			182	99	17	0	10	8	14	26
<b>TOTAL</b>			<b>281</b>		<b>17</b>		<b>18</b>		<b>40</b>	

**Table 6. Plover disturbance data 2009/2010.**

Indicating plovers observed at the shoreline (s) and on the dunes (d), the number of disturbances (DIST.) recorded, and the source of disturbance; walker (w), jogger (j), leashed dog (LD), and off-leash dog (OLD).

DATE	DAY	TIME	PLOVERS	DIST.	W	J	LD	OLD
11/2/2009	M	10:10-11:10a	0					
11/7/2009	Sa	3:45-4:45p	2d					
11/10/2009	Tu	2:35-3:35p	1d					
11/13/2009	F	1:50-2:50p	3d	1	1			
11/27/2009	F	10:00-11:00a	5d					
11/29/2009	Su	2:36-3:36p	5d	7	7			
12/2/2009	W	11:40-12:40a	5sd	1		1		
12/18/2009	F	10:30-11:30a	2d					
12/19/2009	Sa	11:53-12:53p	1d	1	1			
12/22/2009	Tu	9:35-10:35	4d					

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DATE	DAY	TIME	PLOVERS	DIST.	W	J	LD	OLD
12/27/2009	Su	2:52-3:52p	2d	1				1
1/10/2010	Su	11:48-12:48p	0					
1/11/2010	M	1:05-2:05p	0					
1/14/2010	Th	10:50-11:50a	1s	3	1		2	
1/26/2010	Tu	1:15-2:15p	0					
1/27/2010	W	1:45-2:45p	0					
1/31/2010	Su	12:33-1:33p	0					
2/2/2010	Tu	9:25-10:25a	0					
2/11/2010	Th	2:30-3:30p	0					
2/15/2010	M	3:30-4:30p	0					
<b>TOTAL</b>		<b>20 HOURS</b>	<b>31</b>	<b>14</b>	<b>10</b>	<b>1</b>	<b>2</b>	<b>1</b>

**Table 7. Plover disturbance rate 2009/2010 (11 surveys).**

	TOTAL	SHORE	DUNES	SNPL DIST.	DIST. RATE
Walkers	281	182	99	10	3.60%
Joggers	17	17	0	1	5.90%
On-Leash Dogs	18	10	8	2	11.10%
Off-Leash Dogs	40	14	26	1	2.50%
<b>Combined Total</b>	<b>356</b>	<b>223</b>	<b>133</b>	<b>14</b>	<b>3.90%</b>

### Data Analysis

**Table 8. Plover presence.**

Indicating early and late detection dates and number of surveys in which plovers were detected.

	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
Early Date	n/a	25-Jul	1-Aug	26-Jul	11-Sep
Late Date	n/a	28-Mar	19-Mar	5-Mar	14-Jan
# of Surveys	18	26	15	20	20
<b>Plovers Detected</b>	<b>17</b>	<b>24</b>	<b>14</b>	<b>13</b>	<b>11</b>

**Table 9. Plover counts per survey hour.**

Showing use of the WPA by plovers and distinguishing use of shore and dunes.

	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
Shore	1.22	0.15	0.2	0.65	0.175
Dunes	2.89	3.54	2.67	1.5	1.375
<b>Total Individuals</b>	<b>4.11</b>	<b>3.69</b>	<b>2.87</b>	<b>2.15</b>	<b>1.55</b>

**Table 10. Plover counts by visit during each month (2005-2010).**

Monitoring visits occurred from two to seven times per month during each of the five survey seasons. The table below provides total number of plovers observed during each visit.

Survey Periods	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	
Nov	1		4		0	
	2	6	3		2	
	3	5	3	4	0	1
	4	5	4		4	3
	5	5	3	3	0	5
	6	5	4		4	5
	7		4		2	
Dec	1					
	2	5	4	1	1	5
	3	5	4	4	5	2
	4		4	4	4	1
	5	4	3	3	4	4
	6	4	4	3	5	2
	7					
Jan	1		4			
	2	4	5		5	0
	3	4	6	3	4	0
	4	2	6		2	1
	5	4	2	3	0	0
	6	4	6		0	0
	7		4			0
Feb	1		4	5		
	2	4	5	0	0	0
	3		0	4		
	4	0	0	3	3	0
	5		1	1	0	
	6	3	2	2	0	0
	7		2			

**Table 11. Recreational use rate per survey hour.**

	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
Walkers	n/a	11.39	17.8	33.65	21.5
Joggers	n/a	0.92	0.87	2.7	1.55
On-Leash Dogs	n/a	1.31	1.6	3.5	1.65
Off-Leash Dogs	n/a	3.15	4.4	6.85	3.25
<b>Total Per Hour</b>	<b>n/a</b>	<b>16.77</b>	<b>24.67</b>	<b>46.7</b>	<b>27.95</b>

**Table 12. Percentage of recreational traffic through dunes.**

	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
Walkers	n/a	n/a	n/a	36%	33%
Joggers	n/a	n/a	n/a	28%	6.50%
On-Leash Dogs	n/a	n/a	n/a	47%	30%
Off-Leash Dogs	n/a	n/a	n/a	62%	55%
<b>Total Per Hour</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>40%</b>	<b>34%</b>

**Table 13. Pet rule compliance rate.**

Indicating the percentage of pet owners who are compliant with the current pet rule as it pertains to the survey area.

	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
Total Dogs	n/a	116	90	207	98
On-Leash	n/a	34	24	70	33
Off-Leash	n/a	82	66	137	65
<b>Compliance Rate</b>	<b>n/a</b>	<b>29%</b>	<b>27%</b>	<b>34%</b>	<b>34%</b>

## VII. Conclusions

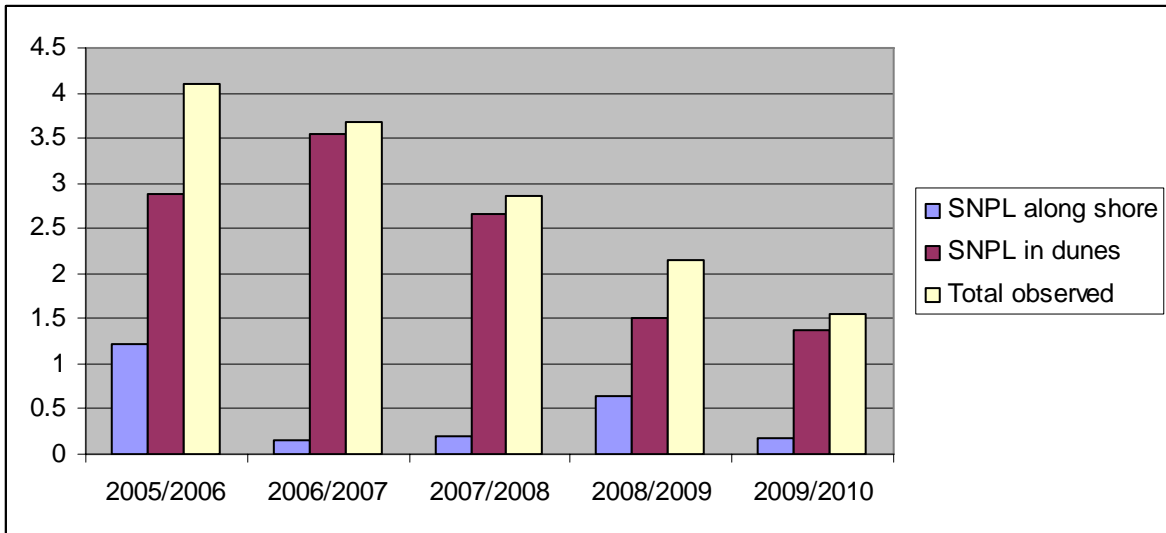
### *Plover Presence, Abundance, and Density*

Tables 8, 9 & 10 and Chart 1 (see below) indicate that western snowy plover presence within the WPA has been declining over the past several seasons. This trend seems to have continued throughout the 2009/2010 wintering season, with plovers arriving at the WPA later than in previous seasons, and being detected on only 11 of the twenty static surveys (Table 6). Plovers also departed the WPA much earlier than in previous years, the last detection being in mid-January (Table 6).

The construction of a fence along the east boundary of the WPA in late December may have contributed to the early departure of the plovers from the WPA, as the fence bisected part of the plover's usable habitat and off-leash dog play commenced directly adjacent to the remaining plover habitat. Only one plover was detected on only one survey after installation of the fence (Table 6).

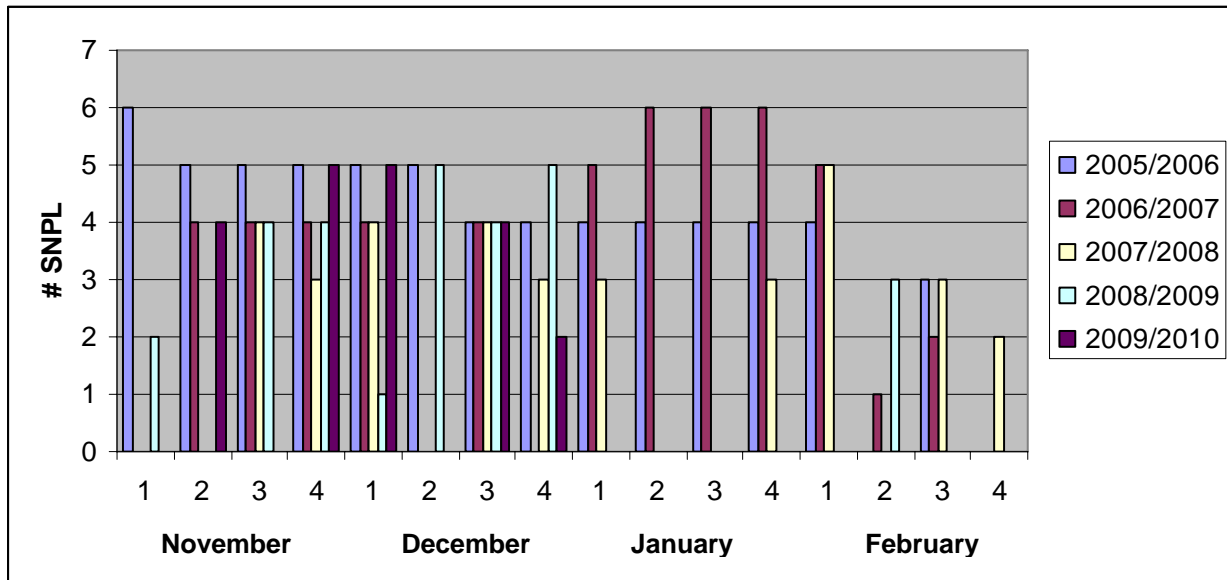
**Chart 1. Plover counts per survey hour (2005/2006 – 2009/2010)**

Counts of plovers were divided by survey hour, divided into counts of plovers along the shore, in dunes, and total counts. Counts have decreased in each year of monitoring, from 4.11 total plovers/survey hour in 2005-2006 to 1.55 plovers/survey hour in 2009-2010

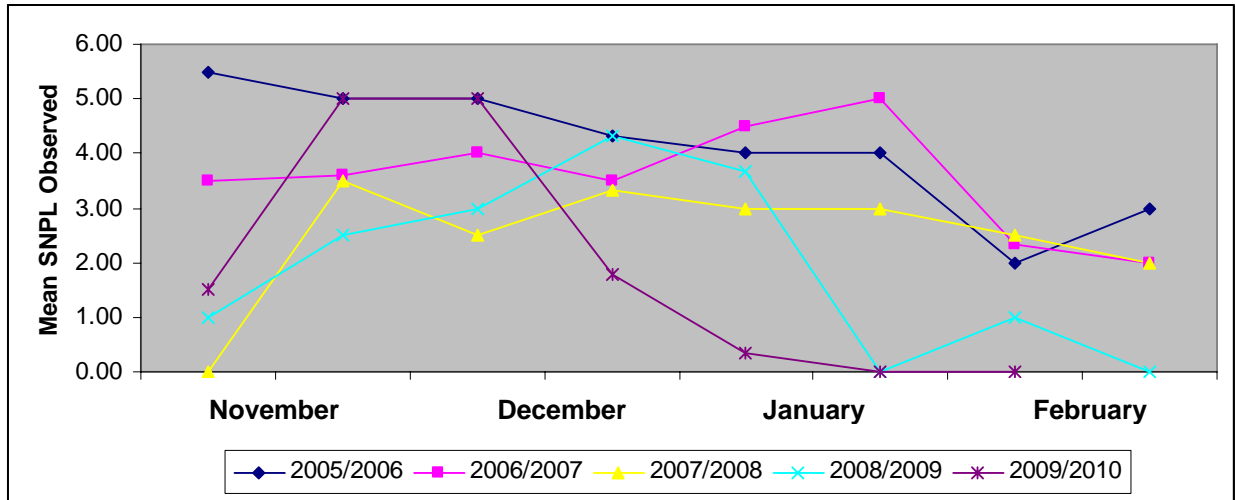


**Chart 2. Plover counts by survey period (4/month).**

Surveys from 2005-2006 to 2009-2010 were grouped into four survey periods per month (approximately 8-day periods).



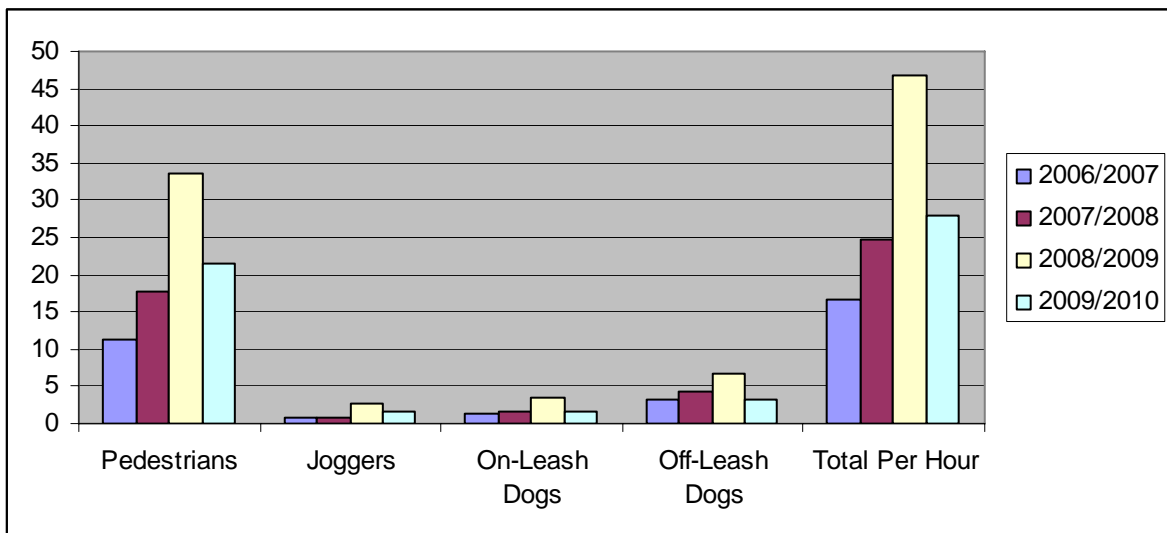
**Chart 3. Number of western snowy plovers observed per survey hour, grouped in 14-day survey periods.**



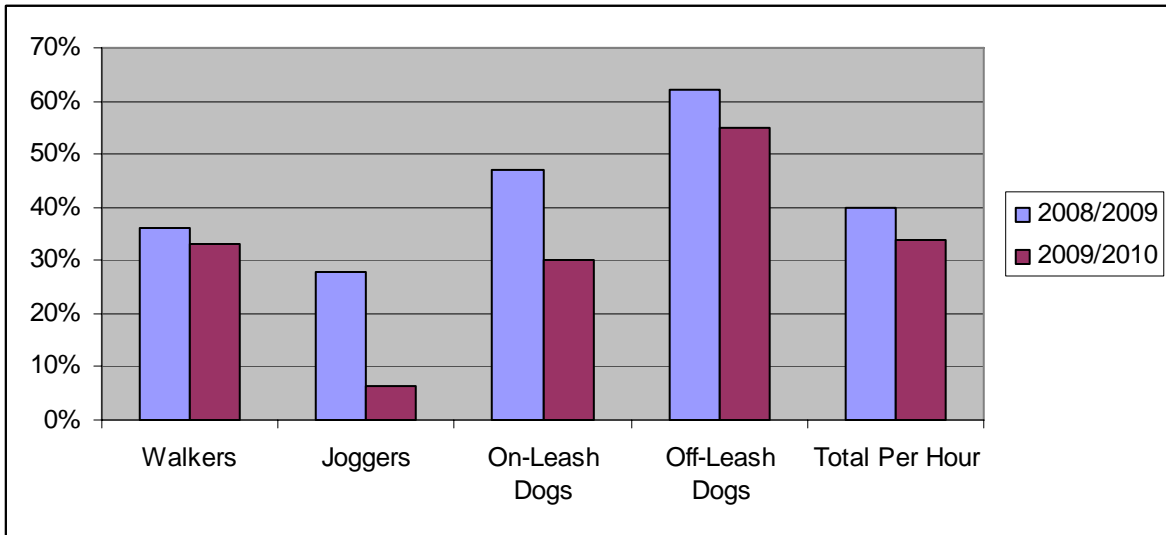
**Recreational Use and Pedestrian Traffic**

Tables 11 & 12 indicate that recreational use and pedestrian traffic through the WPA were significantly lower than in the 2008/2009 season, but still higher than in previous survey seasons. The installation of protective fencing and signage has likely been contributory to the control and reduction of recreational use of the eastern WPA, directing park visitors to the shoreline and reducing the amount of foot traffic through the dunes. However, several observations were made of park visitors crossing the dunes from the shoreline in an attempt to access the locked gate at the boardwalk observation platform.

**Chart 4. Occurrences of recreational use per survey hour, by use type.**



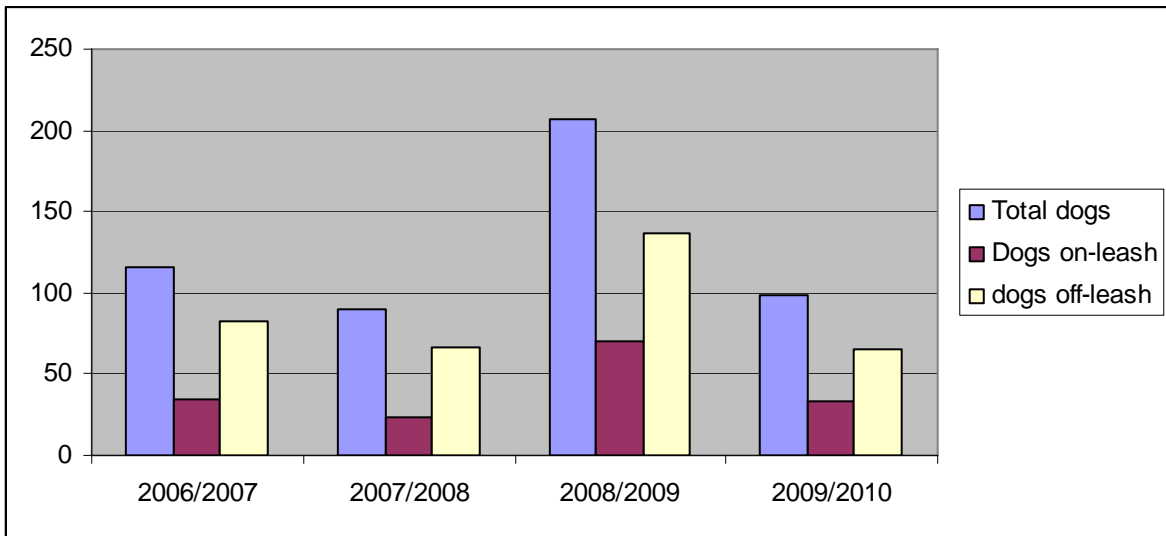
**Chart 5. Percentage of recreational traffic through dunes, by use type.**



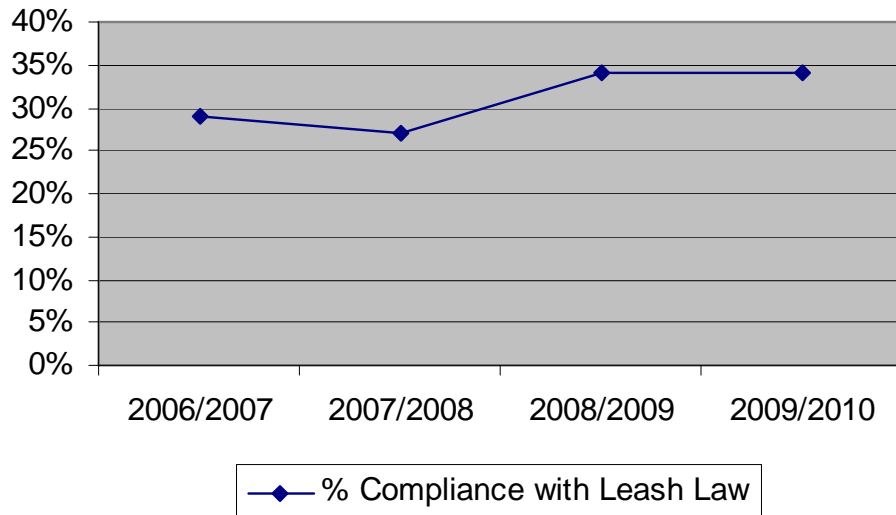
***Pet Rule Compliance***

Table 13 and Charts 4 and 5 indicate that, although the number of dogs observed in the study area was significantly lower this survey season than in the 2008/2009 season, compliance with the leash requirement remains unchanged since the 2008-2009 season at 34% compliance.

**Chart 6. Dogs in the Wildlife Protection Area (total, on-leash, off-leash).**



**Chart 7. Percent compliance with leash law requirement**



## VIII. Recommendations

In response to the results of this study the following actions are recommended. All recommendations are based on protection actions as described in the USFWS Western Snowy Plover Recovery Plan.

### ***Access/Fencing***

During the course of the survey, several park visitors were observed crossing the dunes, from the shoreline to the wooden observation platform, in an attempt to exit the WPA via the locked gate. So as to eliminate confusion and unnecessary dune traffic, it is recommended that the gate at the wooden observation platform be eliminated and replaced with solid fencing.

Installation of a fence along the east boundary of the WPA has reduced the amount of usable plover habitat and has exposed remaining habitat to directly adjacent off-leash dog activity. It is recommended that repositioning or elimination of the east boundary fence should be considered as a means of expanding usable plover habitat and maintaining an adequate buffer zone.

### ***Signage***

Despite the installation of informative and interpretive signage, survey data indicate a rate of approximately 66% non-compliance with leash requirements by park visitors. Data also indicate that many visitors continue to disturb the plovers. As applicable park rules and conditions change in the future, signage should be re-evaluated and modified to maximize effectiveness.

### ***Habitat Maintenance/Enhancement***

Development and implementation of volunteer beach clean-up activities should be continued and further coordinated. Dune vegetation and driftwood presence should be evaluated and necessarily modified to maximize habitat value.



### ***Outreach/Education***

It is likely that improved outreach and educational efforts aimed at recreational users of the Crissy Field area will contribute toward general compliance with park rules, reductions in disturbances to western snowy plovers, and significant increases in the habitat value of the WPA. It is recommended that the GGNRA continue to develop and expand the outreach program toward maximization of its educational potential.

### ***Temporary Closures***

Heavy recreational use days, including Fleet Week, Coastal Clean-up Day and fair weather weekends, can result in significant disturbances to western snowy plovers and other shorebirds. It is recommended that the GGNRA continue to identify potential high-disturbance days for temporary closure of the WPA. Closures should be supplemented with outreach/education.

### ***Recreational Use & Disturbance***

Monitoring and data collection provide important information about recreational uses and subsequent disturbances of snowy plovers and other shorebirds. It is recommended that the GGNRA continue to support monitoring, to evaluate the relationships between recreational activities and disturbances to wildlife, and to eliminate or ameliorate adverse recreational impacts within the WPA.

### ***Law Enforcement***

Despite the issuance of warnings and citations by US Park Police and NPS rangers, as well as the development of a dog walker database, compliance with the park leash rule remains relatively low. Consistently low compliance indicates that the GGNRA's law enforcement program is not adequately protecting the western snowy plovers in the WPA. It is recommended that the GGNRA evaluate the effectiveness of law enforcement, set compliance and enforcement goals, and implement necessary modifications to achieve those goals.

### ***Pet Restrictions***

The USFWS Recovery Plan, Recovery Action 2.3.2 states, "Pets should be prohibited on beaches and other western snowy plover habitats if, based on observations and experience, pet owners fail to keep pets leashed and under full control." Observations reported in Table 13 and Chart 4 demonstrate that pet owners "fail to keep pets leashed and under full control" within the WPA and it is therefore recommended that all pets should be prohibited from entering the WPA.

## **REFERENCES**

- U.S. Fish and Wildlife Service. 2007. Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (*Charadrius alexandrinus nivosus*). In 2 volumes. Sacramento, California. xiv + 751 pages.
- Zlatunich, M. 2007. Western Snowy Plover Monitoring at the Crissy Field Wildlife Protection Area of The Presidio of San Francisco and the Relative Impact of Human Disturbance 2006/2007. Golden Gate Audubon, San Francisco, CA. 12pp.
- Zlatunich, M. 2008. Western Snowy Plover Monitoring at the Crissy Field Wildlife Protection Area of The Presidio of San Francisco and the Effectiveness of the Seasonal Use Restriction 2007/2008. Golden Gate Audubon, San Francisco, CA. 10pp.
- Zlatunich, M. 2009. Western Snowy Plover Monitoring at the Crissy Field Wildlife Protection Area of The Presidio of San Francisco and the Relative Recreational Use Patterns 2008/2009. Golden Gate Audubon, San Francisco, CA. 15pp.

## **APPENDIX A – Map of Survey Area**

Figure A-1.

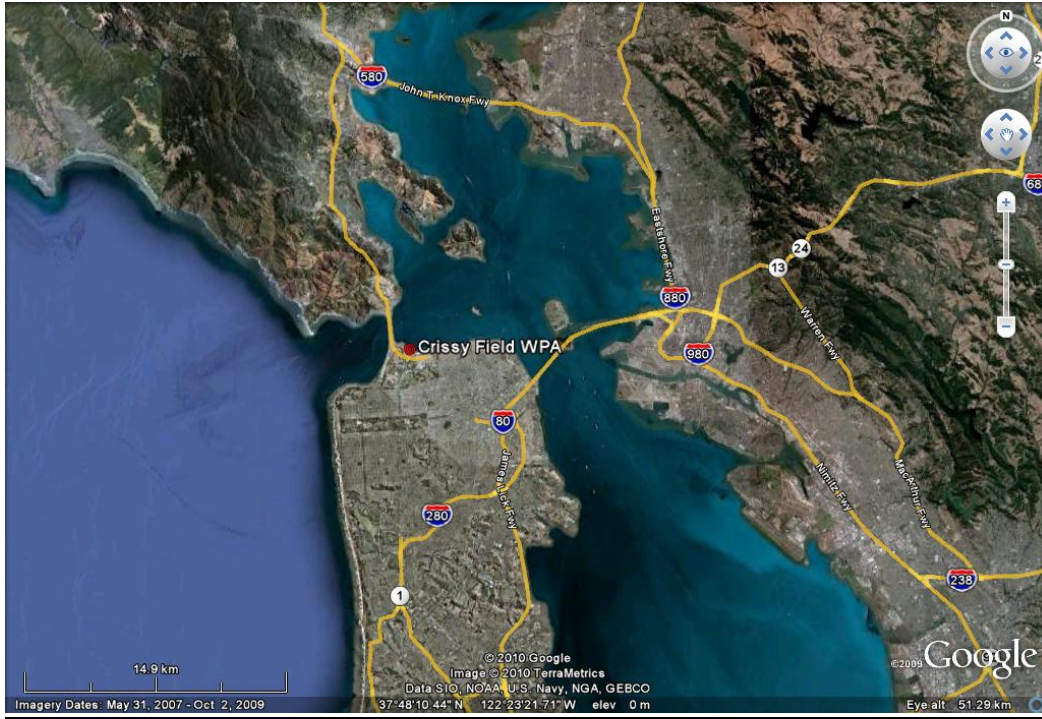
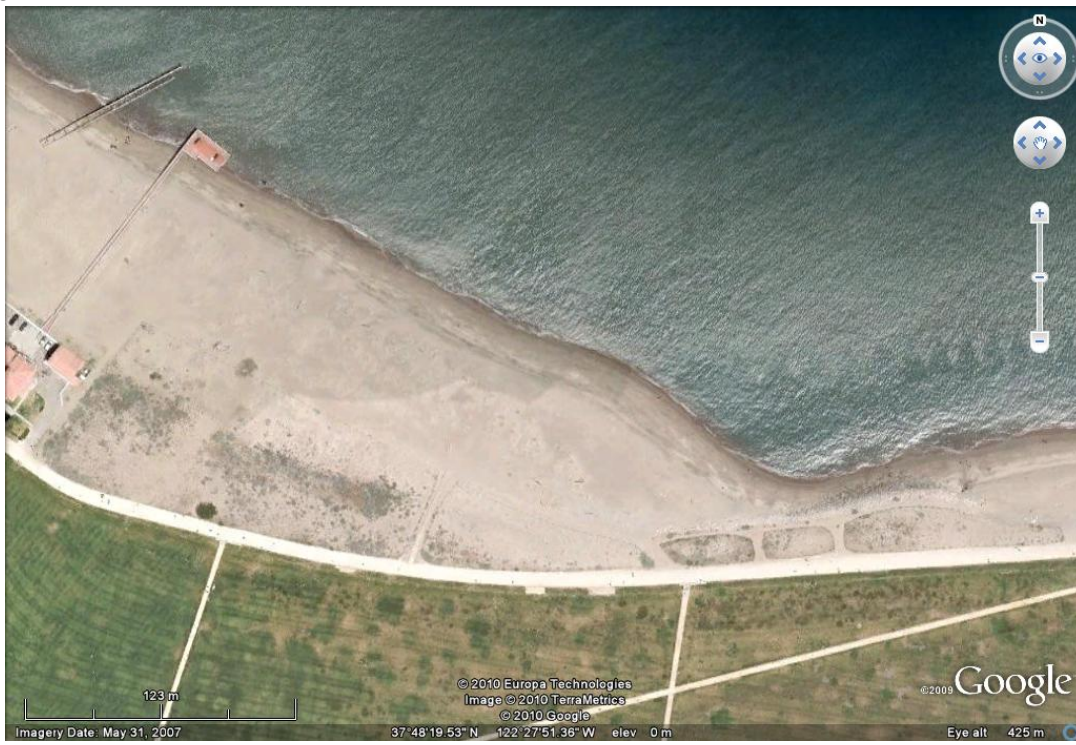


Figure A-2



## **APPENDIX B – Survey Protocol**

# Crissy Field Wildlife Protection Area Static Survey Protocol

Revised 1/2009

## Survey Objectives

The objective of this survey is to gather data on western snowy plover use and to understand the types and frequencies of disturbances, both human induced and natural, so that recommendations can be made for management policies that will best protect the natural resources of the Wildlife Protection Area.

## Survey Area

The survey area includes the bayside beach and dunes within the Wildlife Protection Area from the Coast Guard Pier eastward to the east boundary fence and extending 100m offshore.

## Survey Technique

One hour surveys are to be conducted by observing the survey area from the wooden platform that is accessed via the boardwalk from the Crissy Promenade. Surveyors will use binoculars and spotting scope to view survey area. Surveyors will record all data on the provided data sheet.

In the event that no snowy plovers have been observed during the entire one hour survey and activity was light enough that the potential for the plovers to be undetected on the beach is reasonable, the surveyor shall walk the beach to determine with certainty whether plovers are present or not. If plovers are detected at this time they are to be added to the survey count.

## Supplies Needed

Binoculars  
Spotting Scope  
Clip Board  
Data Sheet  
Pen  
Time Piece

## Data Recording

**Location** – Enter location where survey is being done (Crissy WPA).

**Day/Date** – Enter the day of the week and the date when the survey is being done.

**Time** – Enter the start and stop time of the survey. Surveys may have any start time and the stop time will be one hour later.

**Weather** – Select the proper descriptors from the Weather and Tide Descriptors box and make entries for temperature, sky and wind. For each category choose the one descriptor that best describes the condition during the survey time.

**Tide** – Tidal information can be entered after the survey is done and will require consultation of tide tables. If the time of the high or low tide occurred during the survey hour then the appropriate descriptor (either “high” or “low”) should be used and the time and height of the tide should be entered. If the high or low tide occurred outside of the survey hour then the appropriate descriptor, outgoing or incoming, should be used and the closest time and height, as indicated on the tide tables, should be entered.

**Observer(s)** – Enter the name(s) of the observer(s).

**Human Use** – The number of walkers, joggers, leashed dogs, off-leash dogs, and other human activity categories should be recorded by tally in the provided box and category; **S** for shoreline, **D** for dunes. Users should be counted each time they enter the survey area. If a user crosses both shoreline and dunes they shall be tallied under the dune category.

**Species** – Surveyors will record information using descriptors and codes as described on the data sheet.

All species seen within the survey area, and determined by their behavior to be relating to the survey area, will be recorded using standard four letter code. If identification is made only to family and not to species then the first two letters shall be XX and the last two letters shall indicate the family. An example of this would be an unknown gull species recorded as XXGU.

Behavior and habitat codes can be used in all applicable combinations. Each species should be recorded as to all behaviors and habitats observed during the survey hour. As an example, Western Gulls seen foraging at the shoreline, resting on the water and flying over the dunes would be recorded as; F/S, R/W, A/D.

Additional comments such as plover band colors, unusual behaviors, injured animals, or anything out of the ordinary should be recorded in the comment section.

**Disturbances** – All shorebird disturbances, natural and human induced, shall be recorded on the data sheet.

*Disturbance sources* are what cause the disturbance. Identify only one source per disturbance. If the source is a multiple, such as a jogger with an off-leash dog, only the closest source shall be recorded. Disturbance sources include but are not limited to:

Jogger	American Crow
Off-leash dog	Boater
On-leash dog	Swimmer
Walker	Angler
Common Raven	Helicopter

*Magnitude* of disturbances shall be recorded on the data sheet as minor, moderate or major. Criteria is that a **minor** disturbance will cause a resting bird to stand, a **moderate** disturbance will cause a standing bird to walk or run and a **major** disturbance will cause a bird to flush.

A brief *description* of the disturbance shall be given.

**Dog Free Time** – During the survey the amount of time when there are no dogs on the beach shall be recorded and the sum shall be entered on the survey form.

## Unusual Occurrences

If the observer witnesses a blatant violation of the law, such as a dog owner knowingly and without regard allowing his dog to harass wildlife, the observer shall make note on the comment sheet and shall, upon completion of the survey, file a wildlife harassment report at the park police station (include incident number on survey sheet). Emergency situations can be reported to GGNRA Dispatch at 561-5505.

## Survey Schedule

Surveys shall be scheduled so that all daily use time frames are duly represented including weekday mornings, weekday afternoons, weekend mornings and weekend afternoons.