



SAN FRANCISCO BAY
BIRD OBSERVATORY

Colonial Waterbird Nesting Summary for San Francisco Bay, 2010



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INTRODUCTION AND METHODS

San Francisco Bay Bird Observatory (SFBBO) staff biologists and volunteers monitored active waterbird nesting sites in the San Francisco Bay during the 2010 nesting season. For this report, we include data from the South San Francisco Bay, and several colonies in the Central and North San Francisco Bay and inland locations in Contra Costa County. For more information on herons and egrets in the North San Francisco Bay, see Kelly et al. (2006) or the Audubon Canyon Ranch website at www.egret.org.

We focused principally on colonies of California Gull (*Larus californicus*), Forster's Tern (*Sterna forsteri*), Caspian Tern (*Hydroprogne caspia*), California Least Tern (*S. antillarum browni*), Great Blue Heron (*Ardea herodias*), Great Egret (*A. alba*), Snowy Egret (*Egretta thula*), and Double-crested Cormorant (*Phalacrocorax auritus*). Additionally, we counted American Avocets (*Recurvirostra americana*), Black-necked Stilts (*Himantopus mexicanus*), Black Skimmers (*Rynchops niger*) and Black-crowned Night Herons (*Nycticorax nycticorax*) when nesting with other species of interest. SFBBO monitored Western Snowy Plover (*Charadrius alexandrinus nivosus*) nests (see Robinson-Nilsen et al. 2010 for methods), and here we include the total number of known nests in each salt pond for this species.

SFBBO biologists and volunteers monitored colonies using binoculars and scopes during set three day periods over the course of the breeding season. We counted all adults, nests, and chicks at the colony site. We monitored all heron species seven times between 6 March and 21 July 2010, cormorants eight times between March 6 and August 9 2010, and gulls and terns six times between 1 May and 9 August 2010. SFBBO also performed one walk-through of each California Gull colony between 14 and 25 May 2010 to count all existing nests, eggs and chicks. Here, we report the peak number of nests in all colonies monitored by SFBBO.

Additionally, we include information on colonies provided by the U.S. Geological Survey (USGS; J. Ackerman), Oregon State University (OSU; D. Roby and D. Battaglia), and East Bay Regional Park District (EBRPD; D. Riensche and D. Bell). USGS, OSU and EBRPD data represent the total number of nests counted throughout the season, rather than the peak number of nests observed. In 2008 and 2010, we used USGS data to determine colony size for certain Forster's Tern colonies, however, in 2009, we used SFBBO volunteer data for all Forster's Tern colonies.

SFBBO has been monitoring nesting colonial waterbirds as a citizen science project in the San Francisco Bay since 1982. The methods have remained the same throughout the duration of this project. While we do not have the ability to monitor every nest of every species in the South Bay, this data set is useful for looking at long-term trends in these species. This report summarizes the 2010 colonial waterbird breeding results.

RESULTS AND DISCUSSION

***Anhingidae*: Cormorants**

Double-crested Cormorants.--- Double-crested Cormorants nesting in the South Bay increased by 35% over 2009 number, and is the first increase in five years (Table 1). Two new colonies were monitored this year, one in the PG&E towers adjacent to the Dumbarton bridge and one on pond A18 in Alviso. In 2010, most colonies increased slightly from their numbers in 2009 with the exception of Lakeshore Park in Newark, where adults were regularly seen but did not nest. The largest Double-crested Cormorant colonies were Steinberger Slough in Redwood City (162 nests) and northern Lake Merced in San Francisco (88 nests; Table 1). From 2009, the colony in southern Lake Merced in San Francisco remained stable, the colony at Lake Merced Mesa increased by 35% and the colony in northern Lake Merced increased by 53%. Birds were reported nesting and feeding more frequently in the northern portion of the lake, possibly due to increased fish availability in these areas.

***Ardeidae*: Herons and Egrets**

Great Blue Herons.--- The Great Blue Heron population in the South Bay has remained stable since 2008 and has increased slightly from 2005 (Table 1). The largest colony in 2010 was in Portola Valley, with 25 active nests. The new colony that formed in 2008 on an island in Almaden Lake was inactive this year, and it was estimated by volunteers that approximately 30% of the nesting vegetation in this colony has been destroyed or cut down during the non-breeding season since 2009. The island is vegetated with non-native species and City of San Jose Parks Department is planning on replanting the island with native vegetation. The Great Blue Heron colonies at Eden Landing Ecological Reserve in Hayward remained stable from 2009 to 2010 but are expected to continue to decline as the duck blinds they nest on deteriorate. The “heron house” on pond E6B hosted 4 nests. Surveys were not performed at the Greco Island colony site in 2010 (6 nests in 2009).

Great Egrets.--- The number of Great Egret nests monitored by SFBBO remained stable from 2009 to 2010. Since 2005, the number of Great Egrets nesting within the study area has remained fairly stable, ranging from 115 to 139 nests (Table 1). In 2010, the largest Great Egret colony was at Ruus Park in Hayward, and hosted 41 nests. In small breeding colonies, numbers of nests increased slightly, while numbers within the larger colonies decreased slightly. The Lake Elizabeth colony, which was inactive in 2009, hosted 5 nests this year. Surveys were not performed at the Bair Island colony site in 2010 (3 nests in 2009).

Snowy Egrets.--- Snowy Egret nest numbers in the South Bay are declining, following a continuing trend seen over the past six years from 272 nests in 2005 to 64 nests in 2010 (Table 1). Hayward Regional Shoreline Park in Hayward, which has previously been one of the larger nesting colonies (107 nests in 2007), was not active this year. The Steinberger Slough colony in San Mateo declined by 89% from 46 nests in 2009 to 5 nests in 2010. The Redwood Shores colony in San Mateo, independent of Steinberger Slough, had a peak of 5 nests, but was

abandoned twice in 2010 possibly due to heavy demolition performed in close proximity to nesting trees. The largest colony this year was on Bay Farm Island in Alameda, which grew slightly from 13 nests in 2009 to 15 nests in 2010.

Laridae: Terns

Forster's Terns.--- Forster's Terns nesting in the South Bay increased by 10% in 2010. We based the number of nests on the peak number of nests observed by SFBBO volunteers as well as the total number of nests counted the USGS, and EBRPD (Table 2). The number of Forster's Tern nests in the study area has varied since 2005 and ranges from 771 in 2005 to 1214 nests in 2006 (Table 2). The largest colony in 2010 was on Hayward Shoreline which hosted 614 total nests, nearly twice the amount of nests hosted here in 2009 (Mark Taylor, East Bay Regional Park District, pers. comm.) The colony on pond B1 in Mountain View increased by 89% to 37 nests but is still smaller than in 2008, and the colony on pond B2 decreased by 94% to 10 nests, a sharp decline from 181 nests in 2009. Nesting on pond A16 in Alviso continued to decline from 87 nests in 2009 to 8 nests in 2010, these birds may have moved to the neighboring colony at New Chicago Marsh, which was inactive in 2009, but had 40 nests this year.

Caspian Terns.--- In 2010, SFBBO volunteers monitored 3 Caspian Tern nests in the South Bay, all at Agua Vista Park in San Francisco. Researchers at OSU recorded two Caspian Tern nests at Eden Landing on pond E10. The annual numbers at E10 have fluctuated from 22 nests in 2007 to 147 nests in 2009 (Table 2). Adult terns were seen by SFBBO volunteers at the colony on the Moffett pond B2 in Mountain View, but no terns were observed nesting there this year (64 pairs in 2009; Table 2). The South Bay's Caspian Tern numbers were lower than previous years. They may have nested in areas that we were not monitoring or have relocated outside of the South Bay.

Least Terns.--- California Least Tern is a federally endangered species. The numbers nesting in the South Bay decreased from 81 nests in 2009 to 53 nests in 2010 (Table 2). The largest colony in the South Bay was at Hayward Regional Shoreline Park in Hayward, which has increased dramatically from the 8 nests there in 2005 (Table 2). In 2004, EBRPD built a nesting island at Hayward Regional Shoreline Park specifically for nesting waterbirds and employed decoys and call playback to attract California Least Terns to the site (D. Riensche, pers. comm.). Nest success was low in 2005 and 2006 due to depredation, but in recent years, nest success has improved due to implementation of a predator management program. This year however, nesting space was limited due to an increase in vegetation coverage, which may account for the decrease in nest numbers. Despite this, in 2010, the colony fledged over 72 chicks (D. Riensche pers. comm.). The colony on pond E8A in Eden Landing Ecological Reserve in Hayward (established with six nests in 2007) did not have any nests this year due to changes in water level management for construction related to the South Bay Salt Pond Restoration Project (Table 2).

Laridae: Gulls

California Gulls.--- There were more California Gulls breeding in the South San Francisco Bay in 2010 than in any previous year. From 2005 to 2008, California Gull nests increased annually by an average of 15%. In 2009, numbers declined by 5%, and in 2010 numbers increased by 6% (Table 2). The gull abatement program at Newby Island Landfill in Milpitas is continuing to significantly reduce the number of gulls using the landfills as a food source (Robinson-Nilsen and Demers 2010).

In 2010, several South Bay colonies increased in size ,with the exception of the Mowry M1/M2 colony, which decreased by roughly 1,400 nests this year. The Coyote Hills N6/N7 colony, which was discovered last year and monitored for the first time in 2010, held 1253 nests and may have contributed to the rise in nest numbers this year. The largest California Gulls colony was located on pond A6 in the Alviso salt pond complex. A6 held just over 50% of the total nests in the South Bay in 2010. This pond was restored to tidal action in December 2010 as part of the South Bay Salt Pond Restoration Project, likely displacing thousands of nesting gulls.

California Gulls initiated two new colonies in 2010. One pair of California Gulls nested at Eden Landing which is breeding habitat for the majority of the Western Snowy Plovers in the Bay. California Gulls also bred for the first time this year in the Central Valley at the City of Davis Wastewater Treatment Plant ponds in Yolo County, where 76 nests were found (E. Whisler, pers. comm.).

Charadriidae: Plovers

Western Snowy Plovers.--- Western Snowy Plover is a federally threatened species. SFBBO monitored 243 Snowy Plover nests on 23 former salt ponds in the South Bay and two former salt ponds in the North Bay (Table 3). Plovers also nested on levees at the Napa Cargill Plant Site (K. Taylor, pers. comm.). For more information on Snowy Plovers in the San Francisco Bay, see Robinson-Nilsen et al. (2010).

RECOMMENDATIONS:

1. Regulatory agencies, such as U.S. Fish and Wildlife Service and California Department of Fish and Game, should work with private land owners to protect colonies on privately owned land. Kelly et al. (2006) suggest that the conservation of heron and egret colonies should focus on the protection of colony sites with more than 100 nests, however, herons and egrets in the South Bay are much more likely to be found in smaller colonies of 5 – 50 nests. These smaller colonies may be more sensitive to disturbance and more likely to be abandoned than larger sites (Kelly et al. 2006).
2. The U.S. Army Corps of Engineers plans to relocate 2500 pairs of Caspian Terns to the San Francisco Bay from the Columbia River in Oregon as a method to protect endangered Columbia River salmonids (USFWS 2005). To reduce possible nest encroachment or predation upon nests or chicks of endangered and threatened species,

we recommend careful placement of the Caspian Tern nesting islands so they are not in close proximity to California Least Tern and Western Snowy Plover nesting habitat.

3. The South Bay Salt Pond Restoration Project will displace California Gulls from the largest colony at pond A6 due to restoring the pond to tidal action in December of 2010. Studies should be conducted to investigate the where these displaced gulls will nest during the 2011 breeding season.
4. Displaced California Gulls from the A6 colony also have the potential to outcompete other waterbirds for nesting habitat. California Gulls initiate nests before many other nesting waterbirds, and may exclude them from historical nesting habitat (Strong et al. 2004). Therefore, measures should be taken to deter displaced gulls from the A6 colony from nesting at current waterbird colony sites. Managers should make necessary management plans in the event that California Gulls begin to nest in sensitive habitat, such as Western Snowy Plover nesting ponds, or the newly created islands at pond SF2. Management plans could include hazing gulls away from certain areas before they initiate their nests or oiling eggs to limit nest success.
5. California Gulls are opportunist feeders and are known to depredate American Avocet, Black-necked Stilt and Forster's Tern nests and chicks (Ackerman et al 2006 and Ackerman unpublished data) as well as the federally threatened Western Snowy Plover nests and chicks (Robinson-Nilsen et al. 2010). Further studies are needed to investigate the impacts of nest and chick depredation by California Gulls on nesting waterbirds in the San Francisco Bay.
6. It is unknown if the population growth of California Gulls in San Francisco Bay is due to local breeding success or is being supported by emigration of California Gulls from colonies outside of the Bay Area. Further study is needed to assess California Gull nest survival rates and chick growth and survival rates.
7. The number of California Gulls using Newby Island Landfill has decreased significantly since the landfill began an abatement program in 2008 (Robinson-Nilsen and Demers 2010). The change in available food resources due to the abatement may contribute to where future colonies arise the South Bay. Newby Island Landfill should continue their gull abatement program as one measure to reduce the number of nesting California Gulls in the San Francisco Bay.
8. Continued monitoring of the South Bay waterbird species over the next few years will be crucial as the South Bay Salt Pond Restoration Project continues its Phase One actions, including construction near or at waterbird colony sites and conversion of habitats currently supporting breeding waterbirds to tidal marsh. Land managers should plan to provide alternative habitat for nesting birds during construction in nesting ponds, and study where the displaced birds nest.

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Geological Survey, Davis Field Station; Roger Harris at Corte Madera Ecological Reserve; Daniel Battaglia and Dan Roby at Oregon State University; Mark Taylor, David Riensche and Doug Bell of East Bay Regional Park District; and Ed Whisler at Yolo County Audubon Society.

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Table 1. Numbers of nests within heron, egret, and cormorant colonies in the South San Francisco Bay, CA, 2010. Counts are based on peak numbers of active nests observed by SFBBO staff and volunteers.

Site Location	Land owner/operator	Pond # or tower location	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Method
Eden Landing	CDFG	E9/E14/E6B/E8A		6				SFBBO
Eden Landing	CDFG	Heron House		4				volunteer
Alviso	DESFBNWR	A18	32					SFBBO
Alviso	DESFBNWR	A9/A10	0 ^A					SFBBO
Bair Island ^B	DESFBNWR	n/a						SFBBO
Moffett	DESFBNWR	Towers by A2W	18					volunteer
Moffett	DESFBNWR	Towers by A3W	18					volunteer
Almaden Lake	other	n/a		0	16	5	2	volunteer
Bay Farm Island - Alameda	other	n/a			17	15		volunteer
Calaveras Reservoir	other	n/a		0 ^A				volunteer
Coyote Parkway Lakes	other	n/a		1				volunteer
Crocker Lake	other	n/a		0 ^A				volunteer
Don Castro	other	n/a		7				volunteer
Dumbarton	DESFBNWR	PG&E towers	49 ^C					SFBBO
Grant Lake	other	n/a		1				volunteer
Greco Island ^B		NW Tower						SFBBO
Hayward Shoreline	other	n/a				0	0	volunteer
Lake Chabot	other	n/a		7				volunteer
Lake Cunningham ^D	other	n/a					24 ^C	volunteer
Lake Del Valle Park	other	n/a		0 ^A				volunteer
Lake Elizabeth	other	n/a			5		2	volunteer
Lake Merced - MESA	other	n/a	23	4				volunteer
Lake Merced - NORTH	other	n/a	88	5				volunteer
Lake Merced - SOUTH	other	n/a	42	2				volunteer
Lake Merritt	other	n/a	83					volunteer
Lakeshore Park, Newark	other	n/a	0			12	14	volunteer
Lexington Reservoir	other	n/a						volunteer
Morgan Hill, Llagas Creek	other	n/a		5	10			volunteer
Ovation court	other	n/a		18				volunteer

Table 1 (cont).

Site Location	Land owner/operator	Pond # or tower location	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Method
Oyster Cove Pier	other	n/a		0 ^A				volunteer
Palo Alto Baylands	other	n/a				4	18	volunteer
Portola Valley	other	n/a		25				
Redwood Shores/Steinberger Slough	other	n/a	162	3	0	5	18	volunteer
Ruus Park	other	n/a			41	12		volunteer
Shadow Cliffs	other	n/a	17	11	8			volunteer
Shorebird way	other	n/a			36	9		volunteer
Stow Lake	other	n/a		7				volunteer
Vasona County Park	other	n/a		6				volunteer
Vasona Reservoir	other	n/a				2 ^C	2 ^C	volunteer
Veterans Park, Livermore	other	n/a		3				volunteer
2010 TOTALS			532	115	133	64	80	
2009 TOTALS			347	116	130	87	79	
2008 TOTALS			608	117	115	106	74	
2007 TOTALS			701	127	139	138	133	
2006 TOTALS			769	106	133	168	112	
2005 TOTALS			662	102	123	272	59	

^AColony is abandoned

^BNot surveyed

^CNumbers may be underestimates due to poor visibility or visual obstructions

^D1 GRHE nest at colony site

Table 2. Numbers of nests within shorebird, tern and gull colonies in the South San Francisco Bay, CA, 2010. Counts are based on peak numbers of active nests either observed by volunteers during the breeding season from levees or areas adjacent to colonies, calculated from a single walkthrough of the colony. Numbers provided by an outside agency are total numbers of nests monitored during the season.

Site location	Land owner/operator	Pond / tower	American Avocet	Black-Necked Stilt	California Gull	Caspian Tern	Forster's Tern	Least Tern	Black Skimmer	Method
Alviso	DESFBNWR	A7	5				67			volunteer
Alviso	DESFBNWR	A5			87					SFBBO
Alviso	DESFBNWR	A9/A10			0 ^A					SFBBO
Alviso	DESFBNWR	A6			11554					walkthrough
Alviso	DESFBNWR	A5/A7			358					volunteer
Alviso	DESFBNWR	A8	38	1			31		0	volunteer
Alviso	DESFBNWR	A16	0	0			8		0	volunteer
Alviso	DESFBNWR	A12	0							volunteer
Coyote Hills	DESFBNWR	N6/N7			1253					SFBBO/USGS
Coyote Hills	DESFBNWR	N2A/N3A/N4AB			3297					walkthrough
Dumbarton	DESFBNWR	N1					0			USGS
Dumbarton	DESFBNWR	N2					0			USGS
Dumbarton	DESFBNWR	N3					0			USGS
Moffett	DESFBNWR	A2W	4	2			47		0	USGS
Moffett	DESFBNWR	B1	6				37		2	volunteer
Moffett	DESFBNWR	B2	4		10	0	10		0	walkthrough/ volunteer
Mountain View	DESFBNWR	A1 SE Island	0				24			volunteer
Mountain View	DESFBNWR	A1 NW Island			214					walkthrough / volunteer
Mowry	DESFBNWR	M1/M2			3010					walkthrough
Mowry	DESFBNWR	M4/M5			2390					walkthrough
New Chicago Marsh	DESFBNWR	n/a	11	2			40			volunteer
Newark	DESFBNWR	N4A					2			USGS
Ravenswood	DESFBNWR	R1								volunteer
Eden Landing	CDFG	E10				2				Dan Roby, OSU
Eden Landing	CDFG	all			1		19			USGS

Table 2 (cont).

Site location	Land owner/ operator	Pond / tower	American Avocet	Black-Necked Stilt	California Gull	Caspian Tern	Forster's Tern	Least Tern	Black Skimmer	Method
Eden Landing	CDFG	E8A						0		SFBBO
Agua Vista ^B	other	n/a				3				volunteer
Belmont Slough ^A	other	n/a	0	0			0			volunteer
Charleston Slough	other	n/a	1				31			volunteer
Hayward Shoreline	other	n/a	21	6			614 ^C	53 ^C	6	volunteer/EBRPD
Palo Alto Flood Control Basin	other	n/a			852					walkthrough
Redwood Shores	other	n/a				0	0			volunteer
2010 TOTALS			90	11	23026	5	930	53	8	
2009 TOTALS			237	20	21672	147	841	81	11	
2008 TOTALS			308	27	22718	82	874	64	5	
2007 TOTALS			1304	266	18452	22	766	11	3	
2006 TOTALS			448	345	16475	84	1214	15	5	
2005 TOTALS			437	144	13800	72	771	8	5	

^AColony is abandoned

^B3 WEGU nests at colony site

^CTotal nest numbers reported by EBRPD

Table 3. Western Snowy Plover nesting sites and numbers of nests in South San Francisco Bay, CA, 2010 (see Robinson-Nilsen et al. 2010).

Location	Total nests
Alviso	
A6	1
New Chicago Marsh	1
Eden Landing	
E6A	1
E6B	29
E8	35
E8A	10
E12	21
E14	3
E16B	20
E11	7
E6	13
E3C	3
Ravenswood	
R1	4
R2	1
R3	7
R4	16
R5	11
RSF2	33
Warm Springs	
A22	19
A23	4
Hayward Shoreline	
Hayward	3
OBN-14	1
Total South Bay	243
Napa Plant Site	6
7/7A	3
RU3 Total	252