SAN FRANCISCO BAY
BIRD OBSERVATORY

Colonial Waterbird Nesting Summary for the South San Francisco Bay, 2008

Including the Don Edwards San Francisco Bay National Wildlife Refuge and Eden Landing Ecological Reserve

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INTRODUCTION and METHODS

As part of the San Francisco Bay Bird Observatory's (SFBBO) Waterbird Program, staff biologists and volunteers monitored active waterbird nesting sites in the South San Francisco Bay during the 2008 nesting season. We focused principally on colonies of California Gull (*Larus californicus*), Forster's Tern (*Sterna forsteri*), Caspian Tern (*Hydroprogne caspia*), Least Tern (*S. antillarum*), 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*) nesting for a separate project (Robinson et al. 2008), and we include the total number of nests in each salt pond in this report.

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 8 March and 7 July 2008, cormorants eight times between March 8 and August 11 2008, and gulls and terns six times between 3 May and 11 August 2008. SFBBO also performed one "walk-through" of each California Gull colony to count all existing nests, eggs and chicks. Here, we report the numbers of nests in all colonies monitored by SFBBO. Additionally, we include information on colonies provided by the U.S. Geological Survey (J. Ackerman), Oregon State University (D. Battaglia), and Corte Madera Ecological Reserve (R. Harris).

RESULTS

***Anhingidae*: cormorants**

Double-crested Cormorants.--- Double-crested Cormorants in the South Bay have declined from the numbers reported in 2007, with approximately 10 percent fewer nests reported this year (Table 1). This decline persists even when taking into account the lack of monitoring at the Bair Island colony this year (15 nests in 2007). Cormorants once again nested in substantial numbers at the power towers along Steinberger Slough and the power towers at pond A2W in the Moffett area. They also colonized a second set of towers in the adjacent pond A3W. Cormorants continued to nest at Lake Merced in relatively consistent numbers, but have spread out to use the north side of the lake (which was abandoned in 2007) as well as the south side and Lake Merced Mesa. All other colonies have declined 15 – 37% since 2007.

Until 2006, Double-crested Cormorants nested in conjunction with a small California Gull colony along the A9/A10 levee in the Alviso complex. However, this colony did not successfully nest in 2007, probably due to predation. In 2008, this colony was still inactive, with no evidence of new nest construction or use of last year's nests.

***Ardeidae*: herons and egrets**

Great Blue Herons.--- The Great Blue Heron population in the South Bay remained stable between 2007 and 2008. SFBBO monitored fewer nests in 2008 compared to 2007 (Table 1), but this difference can be accounted for by the San Pablo Reservoir colony which we included last year, but was monitored by the Audubon Society this year. Some colonies (such as Lake Merced, Ovation Court and Portola Valley) have increased, and a new colony was established at Almaden Lake. The Great Blue Heron colonies at Eden Landing Ecological

Preserve ponds E9 and E8A continue to be the only bayland nesting sites, and the colonies have decreased to less than half of 2007 numbers (Table 1). At this site, all of the nests are constructed on dilapidated duck blinds that are in the process of collapsing. Without efforts to maintain these structures, this colony will likely decline further. The colony on pond E8A is located in Western Snowy Plover nesting habitat, and although the herons do not appear to impact the plovers, they have been observed depredating American Avocet eggs and chicks in that pond (Caitlin Robinson, personal communication).

Great Egrets.--- In 2008, Great Egret nested in similar numbers in the South Bay as in 2007. We did not monitor two colonies included in last year's surveys (Bair Island and San Pablo Reservoir: 8 nests each in 2007), and we were unable to obtain data for the Bay Farm Island colony (14 nests in 2007) at the time of publication. However, removing those numbers from last year's data, the Great Egret population increased slightly in 2008. Much of this increase is due to a new colony (10 nests) established at Steinberger Slough. The pair that initiated nesting at Lake Cunningham in 2007 did not return this year.

Snowy Egrets.--- Nesting Snowy Egrets decreased 16% from 2007, and this decrease persists when colonies we did not monitor this year (Bair Island, Bay Farm Island, and Vasona Reservoir Island) are removed from the 2007 data. Although nesting increased dramatically at Steinberger Slough (43 nests in 2008 compared to two in 2007), this has not compensated for large decreases at Hayward Shoreline (57% decrease) and the Palo Alto Baylands (79% decrease). One pair of Snowy Egrets nested for the first time this year at the Great Egret colony on Shorebird Way.

***Laridae*: Terns**

Forster's Terns.--- The numbers of Forster's Tern nesting in the South Bay increased in 2008 from 2007 levels, but numbers continue to be well below the 2006 nesting population. In 2007, many Forster's Tern colonies were abandoned, including a large colony (650 nests) at pond N6/7 in Coyote Hills, and smaller colonies at pond E8A at Eden Landing Ecological Reserve and pond A8 in Alviso. Most of these colonies remained inactive in 2008, although Forster's Terns once again nested at pond A8 in Alviso and at a smaller colony at pond N3 in Coyote Hills (Table 2). Colonies at ponds E4 and E7 at Eden Landing Ecological Preserve that were re-established in 2007 after being abandoned in 2006 were not used this year. Despite the overall increase in nesting Forster's Terns, several large colonies decreased between 2007 and 2008: Charleston Slough decreased by 44%, A1 decreased by 56%, and A16 decreased by 60%. Predation by California Gulls and erosion of breeding colonies may have played a role in these declines. However, declines at these colonies were mitigated by large increases in Forster's Terns nesting at the Moffett salt ponds (B1, B2 and A2W), Hayward Shoreline, and Alviso pond A12 (Table 2).

Since 2003, Forster's Terns have made several nesting attempts at Corte Madera in Marin County, but all were abandoned without any apparent cause, except in 2007, when the colony had 35 nests. In 2008, rangers observed six nests, but all were abandoned in May, possibly due to predation by an unleashed pet dog.

Caspian Terns.--- The number of Caspian Tern nests increased from 22 nests in 2007 to 89 nests in 2008, similar to numbers reported in 2005 and 2006. This increase is largely due to the re-establishment of the E10 colony in Eden Landing Ecological Preserve (48 nests; Table 2).

The E10 colony was abandoned during the 2004 breeding season after fox predation, and had remained abandoned until this year. Additionally, the Moffett pond B2 colony (Table 2) increased from 12 nests in 2007 to 27 nests in 2008, after being completely abandoned in 2006. We observed no attempt at nesting at Coyote Hills pond N2A/N3A levee in 2008 (Table 2). Caspian Terns abandoned this colony, which was located in middle of large California Gull colony (Table 2) in 2007, despite being the largest South Bay colony in 2006. It is possible that attempted nesting efforts in 2007 and 2008 were interrupted due to gull predation. The A5/A7 levee colony in Alviso was abandoned in 2007 and remained inactive in 2008.

Least Terns.--- The numbers of nesting California Least Terns increased from 11 nests in 2007 to 64 nests in 2008. The colony on pond E8A in Eden Landing Ecological Preserve (established with six nests in 2007) had only two nests this year (Table 2), and both were depredated. In contrast, the colony at Hayward Shoreline Park increased dramatically (Table 2). In 2004, East Bay Parks, with the help of many volunteers, built a new island in the park specifically for nesting waterbirds. In 2005 and 2006, the nests were depredated by gulls, but in recent years success has improved due to implementation of a predator management program. Also, East Bay Park employed decoys and call playback to attract Least Terns to the site (David Riensche, , personal communication). In 2008, the colony fledged over 70 chicks. This island was also used successfully by a pair of Western Snowy Plovers (Table 3).

***Laridae*: gulls**

California Gulls.--- We counted 22,718 California Gull nests in the South Bay in 2008, an increase of 23% from 2007 (Table 2). Pond A6 in Alviso (the Knapp property), a dry salt pond with 12,491 nests, continues to be the largest gull colony (Table 2). Colony numbers remained

fairly stable at Coyote Hills 2A/3A/4Ab levee and Mowry pond M1/M2 levee (Table 2). A new colony established at the Palo Alto Flood Control basin in 2007 tripled in size in 2008, and the nearby colony on former salt pond A1 increased 665% from 2007. The only colony to decline was the Moffett B2 colony, which suffered heavy raptor predation in 2007 and was almost entirely abandoned in 2008, with only two unsuccessful nests (Table 2).

***Charadridae*: plovers**

Western Snowy Plovers.--- Western Snowy Plovers nest on dry salt ponds in the South San Francisco Bay. SFBBO and Refuge biologists monitored 118 Snowy Plover nests on 17 ponds in the South Bay (Table 3), and, of these nests, 64 were successful, 44 were depredated, five were lost at hatch, three were flooded, one abandoned and one nest had an unknown fate. In addition to monitoring ponds in the South Bay, in 2008 we monitored two salt ponds at the Napa-Sonoma Marsh Wildlife Area, which are owned and operated by California Department of Fish and Game. We observed broods with chicks in the Napa ponds but never located a nest. For more information on Snowy Plovers in South Bay, see Robinson et al. (2008).

DISCUSSION and RECOMMENDATIONS:

Overall, Great Blue Heron and Great Egret breeding populations in the South Bay are doing well. However, the only Great Blue Heron colony located on the South Bay is located on dilapidated hunting blinds and the stability of this colony is in question if these structures are not maintained. Snowy Egret numbers have declined, especially at Hayward Shoreline Park and Palo Alto Baylands. Additionally, Double-crested Cormorants declined nearly 10% since 2007. Large cormorants colonies decreased, and numbers are the lowest recorded in recent years.

Black-crowned Night Heron numbers are probably under-represented here, due to their relatively secretive and stealthy nature.

While herons and egrets colonies at Hayward Shoreline Park and the Palo Alto Baylands have undergone some of the largest declines, tern populations at these sites have been very successful. Likewise, tern populations breeding the South Bay increased since last year. Forster's Terns have likely been affected by California Gull encroachment on nesting habitat and the deterioration of several nesting sites, such as A1 and A16. These island colonies are eroding on their windward side and also subject to waves and drifting foam if the water level is high. We suggest managers reinforce these islands and manage water levels to reduce wave action. The increase in Forster's Terns is like due to their ability to colonize new areas, such as pond A12. The water level in this pond was drained in 2008 to create new island habitat for shorebird nesting, and has been very successful, attracting Forster's Terns, Black Skimmers, Snowy Plovers, and hundreds of American Avocets. Pond A12, however, is very close to the California Gull colony at pond A6, and gulls may have depredated many of the A12 nests towards the end of the breeding season (J. Demers, personal observation). This could threatened the success of A12 and other ponds managed for breeding waterbirds, especially once pond A6, the largest California Gull colony, is breached as part of the Salt Pond Restoration Project in 2010. California Gull numbers continue to rise at an exponential rate, increasing by 12 – 23% each year since 2005. Gull populations will likely continue to increase if local landfills remain a food source, and the effect of nesting habitat loss (via the A6 breach) remains unknown. Displaced gulls encroach upon the levees and islands near A6, forcing the smaller and later-nesting terns and shorebirds elsewhere. While Hayward Shoreline Park has

successfully encouraged Least Tern and Snowy Plover nesting with a combination of habitat creation and predator management by volunteers, this strategy may not be as effective over the large areas involved with Salt Pond Restoration Project.

With the changes occurring in the South San Francisco Bay over the next few years, continued monitoring is essential to evaluate the effects of restoration efforts and assess trends in breeding waterbird populations. Most waterbird colonies in the South Bay are located on federal, state, or locally owned lands, which are generally protected; therefore conservation of colony sites via land acquisition is not needed. Although Kelly et al. (2006) suggest that the conservation of heron and egret colonies focus on the protection of colony sites with more than 100 nests, 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), therefore, to maintain populations of herons and egrets in the South Bay, managers should minimize disturbance by limiting public access to colonies and controlling predator access. Furthermore, managing water levels in wetlands (where applicable) to provide safe nesting and chick-rearing habitat that limits predator access and human interfere may benefit terns and shorebirds nesting in the South Bay.

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Table 1. Numbers of nests within heron, egret, and cormorant colonies in the South San Francisco Bay, CA, 2008. 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	E8A, E9		9				SFBBO
Alviso	DESFBNWR	A9/A10	0					SFBBO
Moffett	DESFBNWR	Towers by A2W	27					volunteer
Moffett	DESFBNWR	Towers by A3W[b]	38[a]					volunteer
Almaden Lake	other	n/a		6[a]	12	10	?	volunteer
Bay Farm Island - Alameda	other	n/a			?[c]	?[c]		volunteer
Calaveras Reservoir	other	n/a		2				volunteer
Coyote Parkway Lakes	other	n/a		2				volunteer
Crocker Lake	other	n/a		1[d]				volunteer
Don Castro	other	n/a		4				volunteer
Grant Lake	other	n/a		1				volunteer
Hayward Shoreline	other	n/a				46	4	volunteer
Lake Chabot	other	n/a		4[e]				volunteer
Lake Cunningham[f]	other	n/a					9	volunteer
Lake Elizabeth	other	n/a			?[g]		?[g]	volunteer
Lake Merced -MESA	other	n/a	28	5				volunteer
Lake Merced -NORTH	other	n/a	58[a]	7				volunteer
Lake Merced -SOUTH	other	n/a	140	2				volunteer
Lake Merritt	other	n/a	93					volunteer
Morgan Hill, Llagas Creek	other	n/a		9	5			volunteer
Ovation court	other	n/a		18				SFBBO
Oyster Cove Pier	other	n/a		0				volunteer
Palo Alto Baylands	other	n/a			2	6	28	volunteer
Portola Valley	other	n/a		20				volunteer
Redwood Shores/Steinberger Slough	other	n/a	205	3	10[a]	43	33[d]	volunteer
Ruus Park	other	n/a			34			volunteer
Shadow Cliffs	other	n/a	19	10	5			volunteer
Shorebird way	other	n/a			47	1[a]		volunteer
Stow Lake	other	n/a		5				volunteer
Vasona County Park	other	n/a		6				volunteer
Veterans Park, Livermore	other	n/a		3				volunteer
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	

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Table 1 (cont).

[a]New colony in 2008

[b]Green Herons also nesting, nests not visible

[c]New colony in 2007, data not available in 2008

[d]Nests failed

[e]Unlikely young fledged (GBHE)

[f]Two Green Heron nests

[g]Colony nested in dense foliage. "Beak" numbers only, no accurate number of nests.

Table 2. Number of nests within shorebird, tern and gull colonies in the South San Francisco Bay, CA, 2008. Counts are based on peak numbers of active nests (unless otherwise noted) either observed by volunteers during the breeding season from levees or areas adjacent to colonies, calculated from a single walkthrough of the colony, or provided by an outside agency.

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	4				68			volunteer
Alviso	DESFBNWR	A5			15+[a]					SFBBO
Alviso	DESFBNWR	A9/A10			0					SFBBO
Alviso	DESFBNWR	A6			12491					walkthrough
Alviso	DESFBNWR	A5/A7				0				volunteer
Alviso	DESFBNWR	A8	27				40[b]			volunteer
Alviso	DESFBNWR	A16	92	1			101			volunteer
Alviso	DESFBNWR	A12[c]	131	3			30		1	volunteer
Coyote Hills	DESFBNWR	N6/N7					0			SFBBO/USGS
Coyote Hills	DESFBNWR	2A/3A/ 4Ab			2476					walkthrough
Dumbarton	DESFBNWR	N1					8[d]			volunteer
Dumbarton	DESFBNWR	N3					7[e]			volunteer
Moffett	DESFBNWR	A2W	many				14			USGS
Moffett	DESFBNWR	B1	3				250		1	volunteer
Moffett	DESFBNWR	B2	4	2	2	27	104			volunteer
Mountain View	DESFBNWR	A1			308		81			walkthrough / volunteer
Mowry	DESFBNWR	M1/M2			4112					walkthrough
Mowry	DESFBNWR	M4/M5			2967					walkthrough
New Chicago Marsh	DESFBNWR	n/a								volunteer
Eden Landing	CDFG	E10				48				OSU
Eden Landing	CDFG	E8A						2		SFBBO
Agua Vista	other	n/a			2[f]	7				volunteer
Belmont Slough	other	n/a	6[g]	15[g]						volunteer
Charleston Slough	other	n/a	8				55			volunteer
Corte Madera	other	n/a					6[h]			Corte Madera
Hayward Shoreline[i]	other	n/a	31	6			65	62	2	volunteer
Mountain View Slough Island	other	n/a	2				34		1[j]	volunteer
Palo Alto Flood Control Basin	other	n/a			345					walkthrough
Redwood Shores	other	n/a					11k			volunteer
2008 TOTALS			308	27	22718[i]	82	874	64	5[i]	
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	

Table 2 (cont).

[a]Subcolony near main California gull colony on A6 (CAGU)

[b]New Forster's Tern colony in 2008

[c]Pond drained drained in 2008 to create more island habitat for waterbird nesting; new colonies of American Avocets , Forster's Terns, and Black Skimmers

[d]Bad visibility, no accurate nest counts

[e]New Forster's Tern colony in 2008

[f]New California gull nesting site in 2008; also 2 Western Gull nests, abandoned by early July

[g]Abandoned by all species by late June

[h]All nests abandoned May 31 2008 (FOTE)

[i]Also nesting Killdeer, numbers unknown

[j]Black Skimmer nest abandoned by late June

[k]Possibly only nests, no chicks

[l]Number of nests only obtained by walkthrough, not peak count

Table 3. Western Snowy Plover nesting sites and numbers of nests in South San Francisco Bay, CA, 2008 (also, see Robinson et al. 2008).

Location	Nests
Alviso	
A8	3
A12	1
Impoundment	2
Eden Landing	
E6B	1
E8	7
E8A	45
E8X	1
E12	13
E14	13
E16B	8
E6	2
Ravenswood	
R1	13
R3	1
R4	1
RSF2	2
Warm Springs	
A23	4
Hayward	
Hayward	1
Total South Bay	**118**