A Census of the Birdlife at the North Richmond Shoreline

September 2007 – August 2008

Prepared by the
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ABSTRACT
With funding from the Natural Heritage Institute and CalFed, Golden Gate Audubon conducted a census of near-shore and shoreline habitats for birdlife in the North Richmond Shoreline from August 2007 to September 2008. Observers recorded 138,155 birds comprised of 93 species using the mudflats and wetlands along the Shoreline. The most common waterfowl were scaup (with significantly more Greater Scaup than Lesser Scaup). The most common shorebirds were small sandpipers (Western and Least Sandpipers) and Willets. Western Gulls were the most common gull species. Data indicate that birds use different parts of the Shoreline during different tides and seasons, particularly waterfowl and shorebirds, indicating a need to protect and restore a diverse mosaic of habitats to be used by birds and other wildlife.

MISSION STATEMENT
Since 1917, Golden Gate Audubon has been dedicated to protecting Bay Area birds, other wildlife and their natural habitats. We conserve and restore wildlife habitat, connect people of all ages and backgrounds with the natural world, and educate and engage Bay Area residents in the protection of our shared environment.

ACKNOWLEDGEMENTS
The 2007-2008 North Richmond Shoreline Census would not have been possible without the many hours invested by volunteer census leaders and observers. We are grateful to each for the contributions made to this project. Golden Gate Audubon (www.goldengateaudubon.org) also thanks the Natural Heritage Institute (http://www.n-h-i.org), which supported this census and report with funds received through CalFed (http://calwater.ca.gov).

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TABLE OF CONTENTS

TABLE OF FIGURES

FIGURES

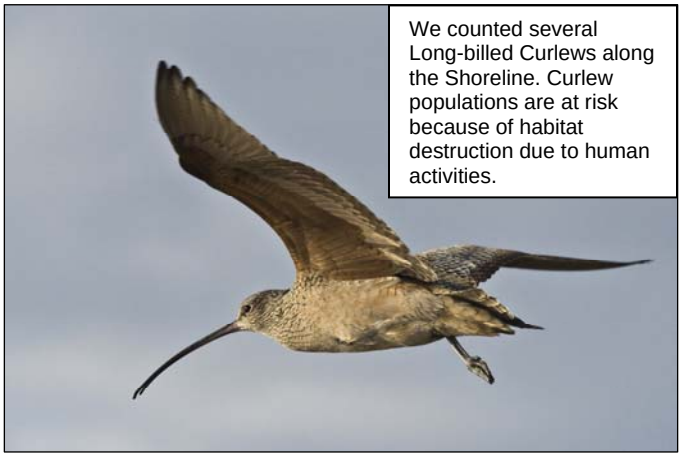
APPENDIX

EXECUTIVE SUMMARY
A Census of the Birdlife at the North Richmond Shoreline
September 2007 – August 2008

The North Richmond Shoreline provides vital habitat for hundreds of thousands of birds and other wildlife. The Shoreline's 500 acres of tidal wetlands and 800 acres of mudflats offer roosting, foraging, and nesting habitat for birds throughout the year.

To learn more about the birds of the North Richmond Shoreline, Golden Gate Audubon partnered with experienced birders and members of the local community to conduct surveys at four locations in the North Richmond Shoreline: Pt. Pinole Regional Shoreline, Wildcat Creek Park, the West County Landfill Loop trail, and the West County Wastewater Treatment Plant ponds. Our work was supported by a grant from CalFed in partnership with the Natural Heritage Institute.

Our observers recorded **138,155 birds** and **93 species** of waterbirds, shorebirds, raptors, and corvids in the North Richmond Shoreline, including 25 species of shorebirds, 22 species of waterfowl, 17 near-shore species (excluding gulls and waterfowl), 13 species of raptors, 8 species of gulls, and 6 species of marsh-associated birds (such as egrets and coots). **The Shoreline provides habitat for endangered species and several species at risk on the Audubon Watchlist.** Birds were most abundant during the winter months, but our data show that birds use the Shoreline throughout the year.



We counted several Long-billed Curlews along the Shoreline. Curlew populations are at risk because of habitat destruction due to human activities.

The most common wintering waterfowl were scaup (with much higher numbers of Greater Scaup than Lesser Scaup), Ruddy Duck, American Wigeon, and Northern Shoveler. The most common shorebirds were small shorebirds such as Western and Least Sandpipers and larger shorebirds such as Willets. Western Gulls were the most commonly observed gulls, particularly at the West County Landfill Loop trail.

Table E- 1. Counts for all birds at each site by season

Survey Site	Fall Count	Winter Count	Spring Count	Summer Count	Total (all seasons)	No. of Species Observed
Pt. Pinole	24,486	20,304	13,187	1459	59,436	81
West Co. Landfill Loop	22,413	19,023	10,094	7405	58,935	69
West Co. Wastewater Treatment Plant	2010	8812	4871	1172	16,865	56
Wildcat Creek Park	881	1314	479	245	2919	43
Totals (all sites)	**25,304**	**49,453**	**28,631**	**10,281**	**138,155**	

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A Census of the Birdlife at the North Richmond Shoreline
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We need to protect diverse sites and habitats throughout the Shoreline.

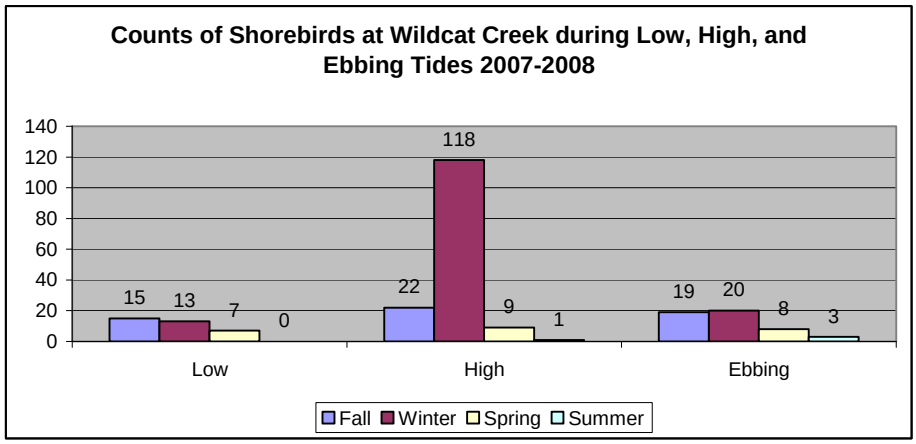
Different types of birds rely on different areas in the Shoreline at different times of the year. For example, waterfowl and near shore species were most abundant at the Pt. Pinole Regional Shoreline, while shorebirds and gulls were more abundant at the West County Landfill Loop trail.

Table E- 2. Totals by species group at each site

Survey Site	Gulls	Shorebirds	Waterfowl	Raptors	Near-shore	Marsh Birds
Pt. Pinole	4970	15,031	35,661	183	2648	884
West Co. Landfill Loop	11,276	24,652	20,425	431	924	896
West Co. Wastewater Treatment Plant	3495	5176	6771	226	64	441
Wildcat Creek Park	1391	235	565	289	43	78
Totals	**21,132**	**45,094**	**63,422**	**1129**	**3679**	**2299**

Birds need roosting and foraging areas during high tides.

We found that the number of birds at sites differed depending on whether the tides were high, low, or ebbing. For example, wintering shorebirds were much more abundant at Wildcat Creek Park during high tides than at other times (see chart to the right). Development along the Bay's shorelines has reduced much of the high tide roosting habitat and impeded roosting birds.



The North Richmond Shoreline is one of the last great stretches of tidal marsh and mudflats in the Bay. It is a great resource for wildlife and the local community. Please join us in working to protect and restore this beautiful shoreline.

The Richmond Shoreline bird census would not have been possible without months of work by our great survey leaders and members of the Richmond community. We appreciate the effort that everyone contributed and the funding assistance from the Natural Heritage Institute and CalFed. For more information, please contact Mike Lynes at (510) 843-6551 or mlynes@goldengateaudubon.org.

Greater Scaup was one of the most commonly observed species during our surveys.

I. INTRODUCTION

The North Richmond Shoreline consists of several miles of shoreline, including more than 500 acres of tidal marshlands and 800 acres of mudflats bracketed by Point San Pablo and Point Pinole in western Contra Costa County. The Shoreline's heavily urbanized watershed includes North Richmond and Parchester Village, two low-income communities wedged between industrial facilities and brownfields.[1] Despite heavy development near the Shoreline, large tracts of mudflats, tidal marsh, and upland habitat remain and provide exceptionally rich and vital habitat for birds, mammals, fish and invertebrates.

Recognized as an Audubon Important Bird Area,[2] the mudflats, tidal marshland, and adjacent uplands provide ample foraging habitat for millions of shorebirds, ducks, gulls, near-shore species, and marsh-associated species, including the endangered Clapper Rail[3] and threatened Red Knot. The Bay's largest eelgrass bed prospers just offshore, providing more than half of the eelgrass found in the Bay[4] and a submerged meadow-like habitat that supports significantly greater biodiversity than adjacent, unvegetated areas.[5]

Over the last two hundred years, the San Francisco Bay has lost at least 79% of its tidal marsh habitat and 42% reduction of tidal flat habitat.[6] The North Richmond Shoreline provides several opportunities for restoration, protection, and increasing connectivity between habitat islands that would benefit wildlife, native plants, and people who appreciate them.[7]

In 2006, the Natural Heritage Institute ("NHI") submitted its proposal for the *Forgotten Shoreline Project* to initiate the process of creating healthy and sustainable North Richmond shoreline watersheds.[8] As part of the project, NHI engaged Golden Gate Audubon (GGA) to

[1] *See* Goals Project. 1999. Baylands Ecosystem Habitat Goals. *A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project*. U.S. Environmental Protection Agency, San Francisco, Calif./S.F. Bay Regional Water Quality Control Board, Oakland, Calif. Available at http://www.sfei.org/sfbaygoals/docs/goals1999/final031799/pdf/sfbaygoals031799.pdf (accessed February 16, 2010), at 116.
[2] National Audubon Society. 2008. Important Bird Area: North Richmond Wetlands. Available at http://ca.audubon.org/maps/pdf/North_Richmond_Wetlands.pdf (accessed February 25, 2010).
[3] Liu, Leonard, J. Wood and M. Herzog. 2009. 2009 *Annual Report: California Clapper Rail (Rallus longirostris obsoletus) TE-807078-10* (PRBO Conservation Science report to the U.S. Fish & Wildlife Service). Available at http://www.prbo.org/cms/docs/wetlands/2009CLRA_USFWS%20Report_PRBO.pdf (accessed February 16, 2010).
[4] *See* Schaeffer, Korie et al. eds. (2007). *Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay*. National Oceanic and Atmospheric Administration. Available at http://swr.nmfs.noaa.gov/hcd/HCD_webContent/nocal/SHABTinSFBay.htm (accessed February 16, 2010), at p. 61.
[5] *See* Phillips, R. C. 1984. *The Ecology of Eelgrass Meadows in the Pacific Northwest: A Community Profile*. Seattle, Washington: U.S. Fish Wildlife Service Report FWS/OBS-84/24. 8; *see also* Rumrill, Steven S., D. Sowers. 2008. *Concurrent Assessment of Eelgrass Beds (Zostera marina) and Salt Marsh Communities along the Estuarine Gradient of the South Slough, Oregon*. Journal of Coastal Research, Special Issue No. 55, at 131.
[6] Goals Project (1991).
[7] Phillips, at 114-115; *see also* Section V Recommendations below.
[8] Natural Heritage Institute. 2010. *San Pablo Bay/North Richmond Shoreline*. Available at http://www.n-h-i.org/index.php?id=85 (accessed February 25, 2010).

conduct censuses of birdlife in the area to assess the breadth, geography, and seasonality of the North Richmond Shoreline bird population.

From August 2007 through September 2008, GGA conducted 48 surveys throughout the Shoreline, focusing on four representative sites: Point Pinole, Wildcat Creek, West County Waste Water Area and Landfill Loop. GGA survey teams consisted of experienced birders and assistants and were tasked with identifying and counting all waterbirds (ducks, geese, grebes, etc.), shorebirds (sandpipers, dunlin, curlews, etc.), and raptors. Each month, observers conducted four censuses: 1 high tide, 1 low tide, and 2 ebbing tide surveys. Data records were submitted to GGA for review and analysis.

During the course of its censuses, GGA counted a total of 138,155 birds (Table 1) comprised of 93 species: 25 species of shorebirds, 22 species of waterfowl, 17 near-shore species (excluding gulls and waterfowl), 13 species of raptors, 8 species of gulls, and 6 species of marsh-associated birds (such as egrets and coots and including the endangered California Clapper Rail). Audubon Watch List species observed during the census include Marbled Godwit, Clark's Grebe, Long-billed Curlew, Sanderling, Black Skimmer, and Thayer's Gull. Observed species recently delisted from the federal Endangered Species Act include the Peregrine Falcon, Bald Eagle, and Brown Pelican.

As expected, winter months provided the most abundant bird counts, with notable peaks in shorebirds and waterfowl during the winter season (Table 1).

Table 1. Counts for all birds at each site by season.

Survey Site	Fall Count	Winter Count	Spring Count	Summer Count	Total (all seasons)	No. of Species Observed
Pt. Pinole	24,486	20,304	13,187	1459	59,436	81
West Co. Landfill Loop	22,413	19,023	10,094	7405	58,935	69
West Co. Wastewater Treatment Plant	2010	8812	4871	1172	16,865	56
Wildcat Creek Park	881	1314	479	245	2919	43
Totals (all sites)	**25,304**	**49,453**	**28,631**	**10,281**	**138,155**	

The data also demonstrate the importance of a diversity of sites for different species to use throughout a landscape (*see*, *e.g.*, Table 2). For example, gulls, shorebirds and raptors were counted in higher numbers at the West County Landfill Loop site, while waterfowl were counted in higher numbers at Point Pinole Regional Park (Table 2).

Table 2. Totals by species group at each site.

Survey Site	Gulls	Shorebirds	Waterfowl	Raptors	Near-shore	Marsh Birds
Pt. Pinole	4970	15,031	35,661	183	2648	884
West Co. Landfill Loop	11,276	24,652	20,425	431	924	896
West Co. Wastewater Treatment Plant	3495	5176	6771	226	64	441
Wildcat Creek Park	1391	235	565	289	43	78
Totals	**21,132**	**45,094**	**63,422**	**1129**	**3679**	**2299**

Some areas appear to be favored during low tides while others are relied upon as high-tide roosts. For example, in the winter, gulls were counted at Pt. Pinole Regional Shoreline in much higher numbers (3195 records) than at high or ebbing tides (101 and 188 records, respectively) (Figure 5). Shorebirds were observed at Point Pinole in much higher numbers during low tide in the spring, but not the winter, summer or fall (Figure 6). Seasonal- and tide-dependent results were observed at each site, demonstrating the need for a diversity of sites and habitat characteristics that should be protected as part of a comprehensive land management plan for the Shoreline.

Golden Gate Audubon's census data support the policies set forth in the 1999 Baylands Ecosystem Habitat Goals report, which identified several habitat protection and restoration opportunities for the North Richmond Shoreline. These findings should be considered in light of other studies, such as PRBO Conservation Science's ongoing tidal marsh project, which has produced reports on the distribution of Clapper Rails and other birds associated with tidal marsh habitat throughout the Bay.[9] These add to the growing body of scientific studies and reports that demonstrate the importance of the remnant and restored tidal marsh habitat in the North Richmond Shoreline and why it should be a top priority for acquisition, protection, and sound management by public agencies and other land managers.

[9] *See* http://www.prbo.org/cms/135#reports (accessed February 16, 2010).

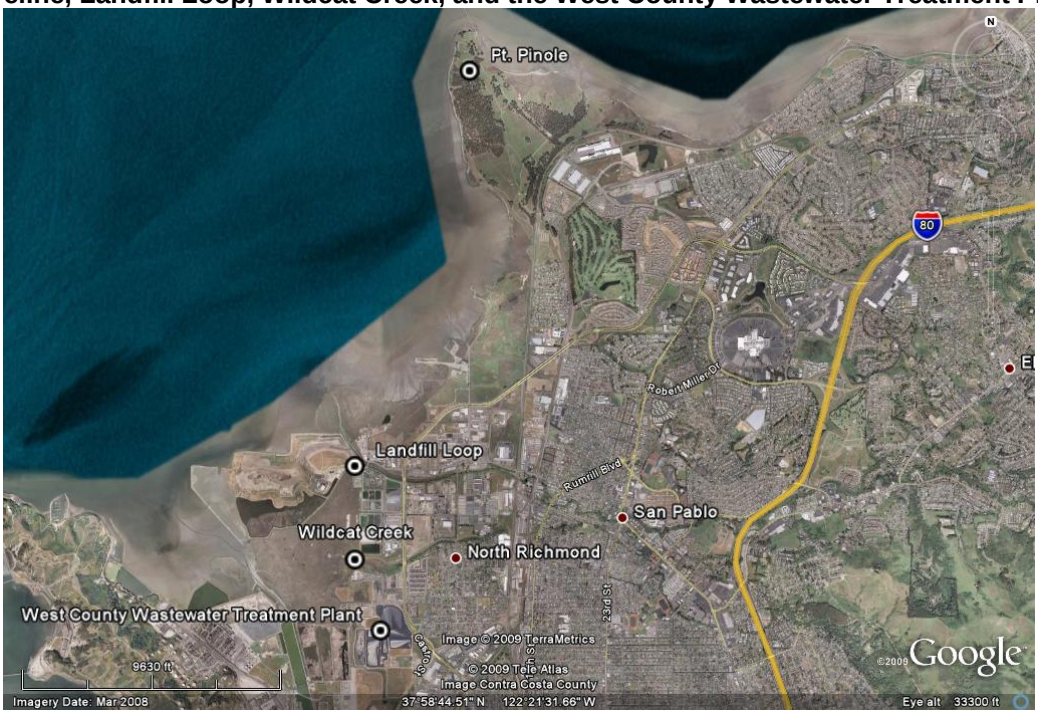
II. SURVEY AREA

The North Richmond Shoreline is located in west Contra Costa County, California between Pt. San Pablo to the south and Pt. Pinole to the north. Much of the Shoreline remains in private ownership and access to the shoreline is extremely limited. The Shoreline is surrounded by areas that have been heavily urbanized or developed for industry (Figures 1, 3).

Wildcat Creek, San Pablo Creek, and Rheem Creek comprise the three major watersheds that drain into the Shoreline. Together, the Point Pinole Regional Park and Wildcat Creek Marsh constitute one of the last contiguous stretches of riparian corridor that empties into the tidal wetlands of San Pablo Bay. However, 75% of the Shoreline does not drain into these watersheds and, instead are either tidally drained or belong to very small, but biologically significant, watersheds in the area. Because of the ecological significance of the area, the National Audubon Society and Birdlife International have designated the North Richmond Shoreline as an Important Bird Area.[10]

Survey sites were selected based on the quality of habitat at the site and accessibility. Surveys were conducted at four sites: Landfill Loop, Waste Water Area, Wildcat Creek, and Point Pinole Regional Shoreline (Figs. 1, 2, 3). Bruener Marsh, just south of Pt. Pinole, was identified as an ecologically rich area and a good potential census site, but access was unavailable.

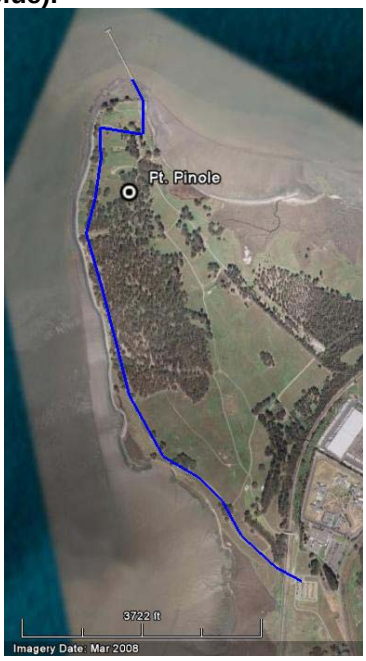
Figure 1. Figure 1 Survey Sites in the North Richmond Shoreline: Pt. Pinole Regional Shoreline, Landfill Loop, Wildcat Creek, and the West County Wastewater Treatment Plant.



[10] *See* National Audubon Society. 2008. Important Bird Areas: North Richmond Wetlands. Available at http://iba.audubon.org/iba/viewSiteProfile.do?siteId=149&navSite=state (accessed February 16, 2010)

Pinole Point: Teams began the census approaching the fishing pier and continued to survey as they moved south-southwest along the Bay View Trail back to the public parking lot. GGA considered this to be a critical census area because it provided the only clear view of the San Francisco Bay between Point Pinole and Point Molate. (Figure 2)

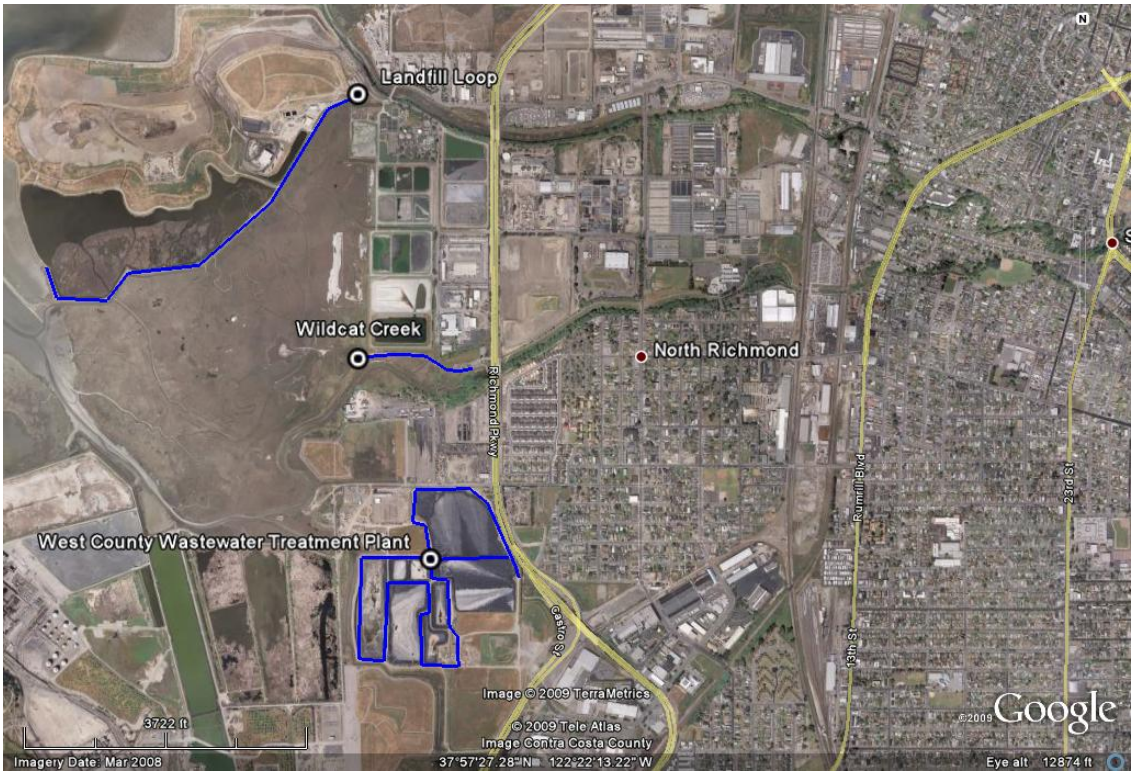
Figure 2 Figure 2. Point Pinole Regional Shoreline route (in blue).



West County Landfill Loop Trail: Teams surveyed along the completed section of the trail, counting birds in the water and flying over the area. Observers noted the area included an unusual abundance of gulls. (Figure 3)

Wildcat Creek Park & Waste Water Area: Teams split the surveys in this area into two transects, the first extending from the public parking lot along the completed portion of the Bay Trail (designated as "Wildcat Creek" in the census data) and the second consisting of the small loop around the ponds at the West County Wastewater district water treatment plant (designated as "Wastewater"). (Figure 3)

Figure 3. Routes for the Landfill Loop, Wildcat Creek, and the West County Wastewater Treatment Plant.



III. METHODS

Data Collection

Golden Gate Audubon established three census routes within the Shoreline intended to be indicative of the area and to observe the greatest concentrations of bird populations. (*See* Section II) Teams surveyed all waterbirds, shorebirds, and raptors using or flying over the Shoreline from the high water mark out to approximately 100 yards in the water and recorded their observations on standardized data forms. Corvids were recorded as part of the census. Passerines and other landbirds were noted by the observers as well, but were not included in the census. Only birds that were visually observed were counted.

GGA conducted a total of 48 censuses from September 2007 through August 2008 (12 high tide, 12 low tide, and 24 ebbing tide censuses). Census days were selected as days with relatively high tides occurring during convenient morning hours, or for ebbing tides from relatively high tides occurring during morning hours. One monthly census was done on Wednesday, one on Saturday. During the breeding season, GGA tried to census early in the day, but kept the tidal selection strategy above.

Sites were identified and selected based on an assessment of their habitat values, bird densities, and accessibility. Much of the Shoreline remains in private property and GGA was unable access many areas that have high habitat values and bird densities. Each site presented different challenges for observers. For example, the Point Pinole survey path was long relative to Wildcat Creek, which consisted of a brief walk from the parking lot to the end of a trail and a viewing area overlooking the marsh. The West County Landfill Loop trail is not yet complete, so observers left the Loop parking lot and walked to the end of the trail then returned the way they had come. For the West County Wastewater Plan, observers had to conduct the survey primarily by car. To the extent possible, observers avoided recounting birds already recorded.

Observers were trained in field identification and many were expert birders. GGA's membership includes many skilled birders that regularly conduct avian censuses and lead bird walks. GGA relied on these experienced birders to implement a survey protocol adapted from GGA's successful Eastshore State Park bird count program. Unusual birds were confirmed by review of the detailed report, or by other supporting observations.

Data were recorded on a prepared form that was submitted to GGA. Observers counted each individual bird and identified it by species, where possible. Where identification to species was not possible, observers identified it to bird type (e.g., "Gull sp.", "Shorebird sp.", "Duck sp."). GGA retrains the original data records.

Data Analysis

Data gathered by the census teams were submitted to GGA for entry into a Microsoft Access database created by Bob Lewis and Charlotte Nolan. Charlotte Nolan created a series of queries based on input from Bob Lewis and Mike Lynes to summarize the abundance and species richness of birds observed.

IV. RESULTS

Survey teams visited four sites in the North Richmond Shoreline at least 48 times from September 2007 through August 2008. Observers recorded a total of 138,155 birds using the wetland, tidal-marsh, beach and near-shore habitat (birds in adjacent uplands were not recorded). Highest bird counts occurred in winter months and the second-highest in the spring (Table 3). Pt. Pinole Regional Shoreline consistently had the highest number of birds and the highest species richness. Total counts of each species segregated by site and season are provided in tables in Appendix A.

For the purposes of summarizing our results, "Shorebirds" includes all members of the families *Charadriidae, Haematopodidae, Recurvirostridae* and *Scolopacidae* (Plovers, Oystercatchers, Stilts & Avocets and Sandpipers & Phalaropes) and "Waterfowl" include all members of the family *Anatidae* (Ducks, Geese and Swans). Gulls were classified together. "Near-shore" species includes species such as terns, grebes and cormorants, but excludes waterfowl and gulls.

Species Richness. Observers recorded 93 species of waterbirds, shorebirds, raptors, and corvids (crows and ravens) using the mudflats, wetlands, and near offshore habitat in the Survey Area.[11] GGA recorded 81 species at Pt. Pinole, 78 species at the West County Landfill Loop, 67 species at the West County Wastewater Treatment Plant, and 50 species at Wildcat Creek (Table 3, Figure 4).

Table 3. Total birds counted at each site on the North Richmond Shoreline from Sep. 2007 through Aug. 2008

Site	Fall	Winter	Spring	Summer	Total	Species
Pt. Pinole Regional Shoreline	24,486	20,304	13,187	1459	59,436	81
West County Landfill Loop	22,413	19,023	10,094	7405	58,935	78
Wastewater Treatment Plant	2010	8812	4871	1172	16,865	67
Wildcat Creek Park	881	1314	479	245	2919	50
Totals	**25,304**	**49,453**	**28,631**	**10,281**	**138,155**	**93**

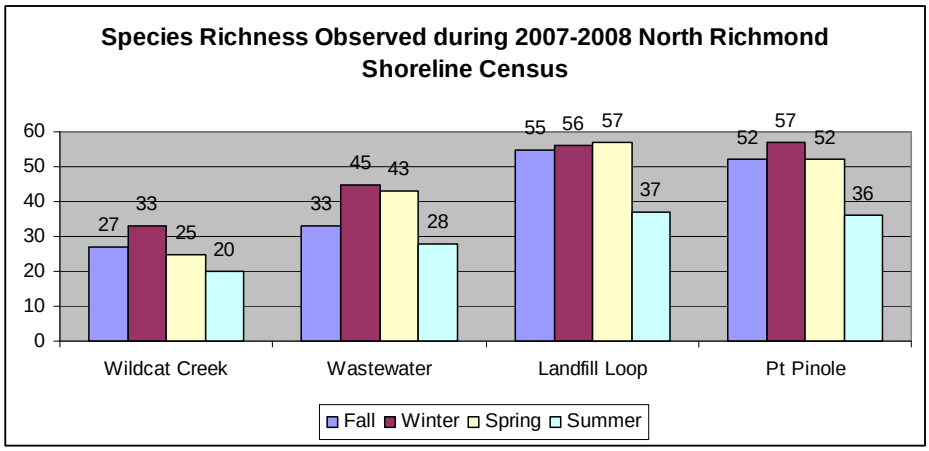
In total, GGA recorded:

- **25 species of shorebirds**, including Long-billed Curlew, Red Knot, Western Sandpiper, Sanderling, and Marbled Godwit;
- **22 species of waterfowl** (ducks and geese), including Snow Goose and Greater White-fronted Goose;
- **17 species of near-shore species** (terns, cormorants, but not waterfowl), including Clark's Grebe, Elegant Tern and Black Skimmer;
- **13 species of raptors**, including Merlin, Peregrine Falcon, and Western Burrowing Owl;

[11] Several birds could not be identified to species and were classified to group, when possible (e.g., "Scaup sp.", "Duck sp.", "Raptor sp.", etc.). Undifferentiated birds were not included in our species richness calculations, but were included in some abundance results. While observers noted several species of passerines and other landbirds using the adjacent upland habitat, these observations were not recorded as part of the census.

- **8 species of gulls**, including Thayer's Gull;
- **6 species of marsh-associated birds**, including White-faced Ibis and the endangered California Clapper Rail; and
- **2 species of corvids** (American Crow and Common Raven).

Figure 4. **Species richness observed during the North Richmond Shoreline Census (the chart includes the number of species observed at each site during each season).**



Pt. Pinole Regional Shoreline

The Pt. Pinole Regional Shoreline survey area had the highest number of birds recorded (59,436) and the highest species richness (81). Winter and fall had the highest number of bird counts at Pt. Pinole, respectively. Pt. Pinole had the second-highest counts for birds in the summer (Table 4 below). Totals of counts for each species by season are provided in Appendix A, Table A-1 below.

Shorebirds

At Pt. Pinole, observers recorded 15,031 shorebirds consisting of 16 species. Undifferentiated "small shorebirds" (primarily Sanderlings, Dunlin, and Least and Western Sandpipers, i.e., "peeps") comprised 44% (6652) of observations; undifferentiated "large shorebirds" comprised 18% (2707) of observations. For birds identified to species (i.e., excluding undifferentiated birds), Willet was by far the most abundant species, with 46% of the observations. Least Sandpiper, Dunlin, and Western Sandpiper were the next most commonly observed species at 11%, 11%, and 9%, respectively. Total counts by season and species are provided below, along with the percent of observations of each bird that was identified to species:

Table 4. Shorebird counts at Pt. Pinole Regional Shoreline (Sept. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Black-bellied Plover	91	111	60	10	272	5%
Semipalmated Plover	0	0	13	14	27	0.5%
Killdeer	34	15	15	2	66	1%
Black Oystercatcher	15	17	11	1	44	0.8%

American Avocet	28	195	160	0	383	7%
Willet	1061	792	568	91	2512	46%
Spotted Sandpiper	39	18	6	0	63	1%
Whimbrel	0	1	3	1	5	0.1%
Long-billed Curlew	8	4	1	0	13	0.2%
Marbled Godwit	98	29	59	47	233	4%
Black Turnstone	94	48	0	0	142	3%
Red Knot	0	3	0	0	3	0.05%
Sanderling	0	72	0	4	76	1%
Western Sandpiper	55	252	89	71	467	9%
Least Sandpiper	258	285	55	16	614	11%
Dunlin	2	589	4	0	595	11%
Dowitcher sp.	0	0	157	0	157	
Small shorebird	365	1734	4538	15	6652	
Large shorebird	736	1005	920	46	2707	
Total Shorebird	**2884**	**5170**	**6659**	**318**	**15031**	

Gulls

Observers recorded a total of 4970 gulls at Pt. Pinole. 72% of gulls observed were not identified to species. Of the birds identified to species, 51% were Mew Gulls, 33% were Western Gulls, 13% were Ring-billed Gulls, and 2% were California Gulls. Observers also recorded 1 Bonaparte's Gull and 3 Glaucous-winged Gulls in the fall and 2 Herring Gulls and 9 Glaucous-winged Gulls in the winter (Table 5).

Table 5. Counts of gulls at Pt. Pinole Regional Shoreline (Sept. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total counts	Percent Observations Identified to Species
Bonaparte's Gull	1	0	0	0	1	0.07%
Mew Gull	105	591	0	0	696	51%
Ring-billed Gull	164	10	1	3	178	13%
California Gull	10	7	14	0	31	2%
Herring Gull	0	2	0	0	2	0.1%
Western Gull	197	104	62	89	452	33%
Glaucous-winged Gull	3	9	4	0	16	1%
Gull sp.	660	2761	125	48	3594	
Total Gulls	**1140**	**3484**	**206**	**140**	**4970**	

Waterfowl

At Pt. Pinole, observers recorded a total of 35,661 waterfowl (ducks and geese) consisting of 18 species. The vast majority of waterfowl recorded were not differentiated, with 14,692 scaup (Greater or Lesser; 41% of all observations) and 13,435 unidentified ducks (38% of all observations). For scaup, 1454 Greater Scaup (96%) and 59 Lesser Scaup (4%) were recorded. Of ducks that were identified to species, the majority were Ruddy Duck (2717 records, 45% of identified ducks counted), American Wigeon (1400 records, or 23% of observations), Surf Scoter (1162, 19%), Bufflehead (280, 5%), and Mallard (211, 4%).

Table 6. Counts of waterfowl at the Pt. Pinole Regional Shoreline (Sept. 2007-Aug. 2008

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Geese						
Canada Goose	0	0	4	7	11	100%
Ducks						
Gadwall	0	0	4	0	4	0.07%
Eurasian Wigeon	0	2	0	0	2	0.03%
American Wigeon	328	617	455	0	1400	23%
Mallard	94	59	55	3	211	4%
Cinnamon Teal	0	0	2	0	2	0.03%
Northern Shoveler	2	0	0	0	2	0.03%
Northern Pintail	3	3	1	0	7	0.1%
Canvasback	0	2	0	0	2	0.03%
Surf Scoter	331	489	337	5	1162	19%
Black Scoter	1	0	2	0	3	0.05%
Bufflehead	71	189	20	0	280	5%
Common Goldeneye	71	116	6	0	193	3%
Common Merganser	0	0	1	0	1	0.02%
Red-breasted Merganser	10	14	0	0	24	0.4%
Ruddy Duck	29	2648	40	0	2717	45%
Duck sp.	7522	3240	2672	1	13435	NA
Scaup						
Greater Scaup	557	754	143	0	1454	96%
Lesser Scaup	53	6	0	0	59	4%
Scaup sp	10456	2734	1502	0	14692	NA
Waterfowl Total	**19528**	**10873**	**5244**	**16**	**35661**	

Marsh-associated Birds

Observers recorded 885 birds consisting of 5 species of marsh-associated birds at Pt. Pinole, including 684 American Coot (77%), 95 Great Egrets (11%), 88 Snowy Egrets (10%), and 17 Great Blue Heron (2%).

Table 7. Counts of marsh-associated species at Pt. Pinole Regional Shoreline (Sep. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Pied-billed Grebe	0	0	0	1	1	0.04%
Great Blue Heron	3	3	6	5	17	2%
Great Egret	15	6	47	27	95	11%
Snowy Egret	17	5	32	34	88	10%
American Coot	259	411	2	12	684	77%
Total Marsh	**294**	**425**	**87**	**78**	**885**	

Near-shore Species

Observers recorded 2467 near-shore species (excluding waterfowl and gulls) comprised of 14 species. Forster's Tern was the most commonly recorded (940 records, or 36%) and Double-crested Cormorant was the second most common (766 records, or 29 or 30%). Clark's Grebe comprised approximately 4% of the observations and Western Grebe comprised approximately 4%; undifferentiated Western/Clark's Grebes comprised another 7%. American White Pelican comprised 8% of records and California Brown Pelican comprised 2%.

Table 8. Counts of near-shore species at Pt. Pinole Regional Shoreline (Sep. 2007-Aug 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Common Murre	0	0	0	1	1	0.04%
Tern sp.	0	0	211	12	223	8%
Red-throated Loon	0	5	0	0	5	0.2%
Common Loon	5	4	2	0	11	0.4%
Horned Grebe	0	6	0	0	6	0.2%
Eared Grebe	6	3	0	0	9	0.3%
Western Grebe	31	45	17	0	93	4%
Clark's Grebe	10	59	23	8	100	4%
Aechmorphous/ Clark/Western Grebe	11	104	56	5	176	7%
American White Pelican	15	0	0	190	205	8%
Brown Pelican	22	7	6	8	43	2%
Double-crested Cormorant	223	63	182	298	766	30%
Pelagic Cormorant	0	8	1	1	10	0.4%
Cormorant sp	0	0	0	8	8	0.3%
Caspian Tern	0	1	12	12	25	0.9%
Elegant Tern	13	0	0	13	26	1%
Forster's Tern	225	17	401	297	940	36%
Total Near-shore	**561**	**322**	**911**	**853**	**2647**	

Raptors

Observers recorded 183 raptors consisting of 9 species. Turkey Vultures were the most commonly observed (83 observations, 46%). Osprey were the next most commonly observed (35, 20%). Observers also recorded 32 Red-tailed Hawks (18%), 10 White-tailed Kites (6%), 7 American Kestrels (4%), and 7 Red-shouldered Hawks (4%).

Table 9. Counts of raptors at the Pt. Pinole Regional Shoreline (Sep. 2007-Aug. 2008)

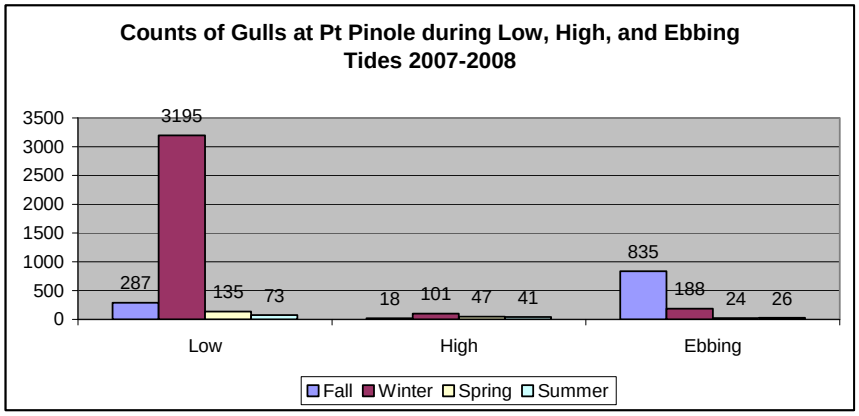
Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Turkey Vulture	32	6	22	23	83	46%
Osprey	3	4	10	18	35	20%

White-tailed Kite	4	5	0	1	10	6%
Northern Harrier	1	0	1	0	2	1%
Sharp-shinned Hawk	0	2	0	0	2	1%
Cooper's Hawk	0	0	1	0	1	0.6%
Red-shouldered Hawk	3	1	2	1	7	4%
Red-tailed Hawk	14	6	9	3	32	18%
American Kestrel	5	1	1	0	7	4%
Raptor sp.	0	1	0	3	4	
Total Raptor	**62**	**26**	**46**	**49**	**183**	

Observations of Bird Use at Pt. Pinole Regional Shoreline by Tides

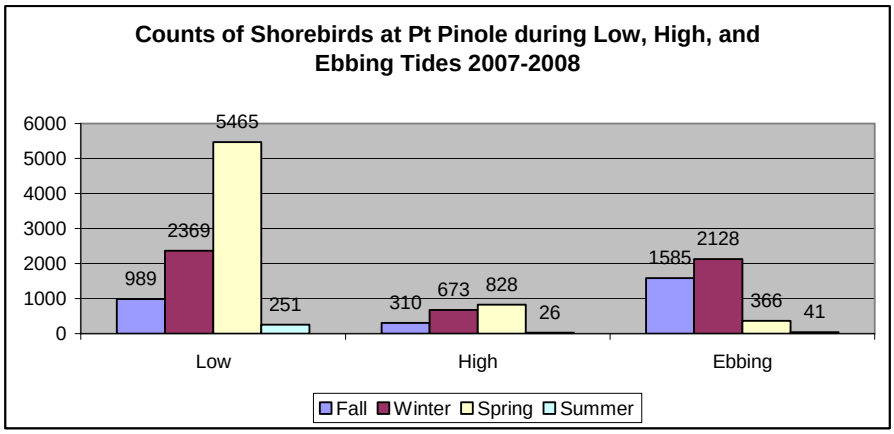
Gulls were observed in much higher numbers at low tide during the winter than at any other season or tide (Figure 5). Observers consistently recorded low counts of gulls during high tide.

Figure 5. Counts of gulls at Pt. Pinole Regional Shoreline during low, high and ebbing tides (Sep. 2007-Aug. 2008)



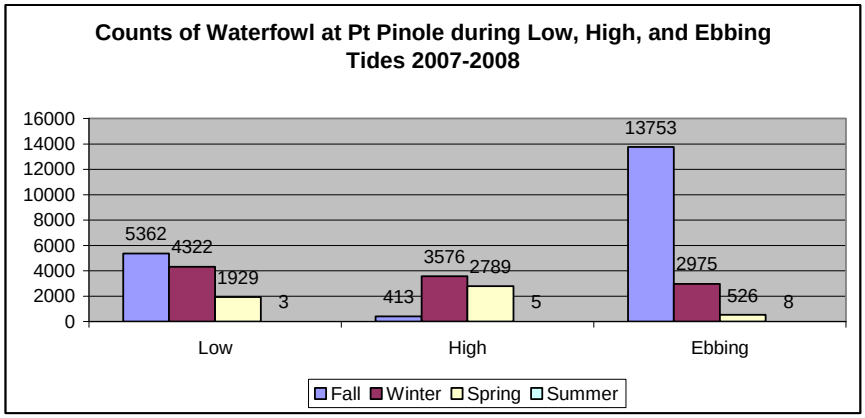
During the fall and winter, shorebirds were counted in larger numbers during ebbing and low tides than during high tide (Figure 6). During spring and summer, the largest numbers of shorebirds were counted at low tide (Figure 6).

Figure 6. Counts of shorebirds at Pt. Pinole Regional Shoreline during low, high and ebbing tides (Sep. 2007-Aug. 2008)



The largest number of waterfowl was counted during the fall at ebbing tide (Figure 7). Counts of waterfowl during the fall at low tide were slightly half ebbing tide totals. There were also noticeably fewer waterfowl during the fall at high tide.

Figure 7. Counts of waterfowl at Pt. Pinole Regional Shoreline during low, high and ebbing tides (Sep. 2007-Aug. 2008)



West County Wastewater Treatment Plant

Observers recorded 16,667 birds at the West County Wastewater Treatment Plant consisting of 56 species. Birds were most abundant at the Wastewater Treatment Plant during the winter (8812) and spring (4817). The site also had its highest species richness in the winter (45 species) and spring (43 species). Count totals for each species by season are provided in Appendix A, Table A-2.

Shorebirds

Observers recorded 5176 shorebirds comprised of 14 species at the West County Wastewater Treatment Plant. 668 shorebirds were not identified to species: 513 shorebirds were identified only as "Small Shorebird"; 8 were identified as "Large Shorebird"; 135 were identified as "Dowitcher sp."; and 12 were identified as "Yellowlegs sp." Of birds identified to species, Least Sandpiper was the most commonly observed, with 1758 observations (39%). Total counts by season and for the entire year, and the percentage of total observations by species are provided below:

Table 10. Counts of shorebirds at the West County Wastewater Treatment Plant (Sep. 07 – Aug. 08)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Killdeer	95	50	68	21	234	5%
Black-necked Stilt	145	491	158	89	883	20%
American Avocet	3	464	253	41	761	17%
Greater Yellowlegs	61	47	37	4	149	3%
Lesser Yellowlegs	4	1	0	0	5	0.11%
Willet	1	4	4	0	9	0.2%

Western Sandpiper	68	156	408	0	632	14%
Least Sandpiper	402	580	709	67	1758	39%
Dunlin	0	56	6	0	62	1%
Short-billed Dowitcher	2	0	0	0	2	0.04%
Long-billed Dowitcher	0	3	0	0	3	0.07%
Wilson's Snipe	1	2	4	0	7	0.2%
Wilson's Phalarope	0	0	0	2	2	0.04%
Red Phalarope	0	1	0	0	1	0.02%
Small Shorebird	0	359	148	6	513	11%
Large Shorebird	0	7	0	1	8	0.2%
Dowitcher sp.	82	53	0	0	135	3%
Yellowlegs sp.	9	3	0	0	12	0.3%
Shorebird Total	**873**	**2277**	**1795**	**231**	**5176**	

Waterfowl

Observers recorded 6771 waterfowl comprised of 16 species. Observers recorded 1419 geese, the majority of which were Canada Geese (1408 observations, 99%); observers also recorded 10 Greater White-fronted Geese (0.7% of goose observations), and 1 Snow Goose (in the spring). Observers recorded 5088 ducks. 47 ducks were not identified to species. For ducks identified to species, most were Mallards (2004 observations, 39%). Counts by season and for the entire year, and the percentage of total observations by species group (i.e., goose, duck, scaup) are provided below:

Table 11. Counts of waterfowl at the West County Wastewater Treatment Plan (Sep. 2007-Aug 2008

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Geese						
Greater White-fronted Goose	0	0	10	0	10	0.7%
Snow Goose	0	0	1	0	1	0.07%
Canada Goose	155	418	688	147	1408	99%
Ducks						
Gadwall	23	522	646	59	1250	25%
American Wigeon	0	7	126	0	133	3%
Mallard	191	913	784	116	2004	40%
Cinnamon Teal	0	0	20	0	20	0.4%
Northern Shoveler	274	966	137	0	1377	27%
Northern Pintail	0	5	4	0	9	0.2%
Green-winged Teal	0	28	7	0	35	0.7%
Canvasback	0	2	0	0	2	0.04%
Bufflehead	0	101	56	0	157	3%
Common Goldeneye	0	5	2	0	7	0.1%

Ruddy Duck	0	39	8	0	47	0.9%
Duck sp.	7	37	64	5	113	NA
Scaup						
Greater Scaup	0	60	19	0	79	97%
Lesser Scaup	0	2	0	0	2	3%
Scaup sp.	0	114	3	0	117	NA
Waterfowl Total	**650**	**3219**	**2575**	**327**	**6771**	

Gulls

Observers recorded 3495 gulls consisting of 7 species. 81 gulls were not identified to species (2% of all observations of gulls at the site). Of the gulls identified to species, Ring-billed Gulls and Western Gulls were the most common, with 781 (30% of observations) and 768 (30%) of all records, respectively. Total observations and percentages of observations that were identified to species are provided below:

Table 12. Counts of gulls at the West County Wastewater Treatment Plant (Sep. 2007-Aug 2008

Species	Fall	Winter	Spring	Summer	Total counts	Percent of Observations Identified to Species
Mew Gull	8	520	1	0	529	21%
Ring-billed Gull	76	693	1	11	781	30%
California Gull	3	38	4	1	46	2%
Herring Gull	5	20	0	0	25	1%
Thayer's Gull	0	1	0	0	1	0.04%
Western Gull	116	564	22	66	768	30%
Glaucous-winged Gull	8	385	22	1	416	16%
Gull sp.	81	717	79	52	929	2%
Gull Total	**297**	**2938**	**129**	**131**	**3495**	

Marsh-associated Birds

Observers recorded 441 marsh-associated birds comprised of 5 species. American Coot comprised the large majority of observations (89%).

Table 13. Counts of marsh-associated species at the West County Wastewater Treatment Plan (Sep. 2007-Aug 2008)

Species	Fall	Winter	Spring	Summer	Total counts	Percent of Observations Identified to Species
Great Blue Heron	0	5	6	2	13	3%
Great Egret	6	12	5	7	30	7%
Snowy Egret	1	0	1	2	4	1%
White-faced Ibis	0	0	0	1	1	0.2%
American Coot	6	195	172	20	393	89%
Marsh Total	**13**	**212**	**184**	**32**	**441**	

Near-shore Species

Observers recorded 64 near-shore birds (excluding gulls or waterfowl) comprised of 4 species. The large majority were American White Pelican, with 39 (61%) observations. Total counts and the percent of the total number of observations comprised of each species are provided below:

Table 14. Counts of near-shore species at West County Wastewater Treatment Plant (Sep. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
American White Pelican	26	0	0	13	39	61%
Double-crested Cormorant	0	0	3	0	3	5%
Caspian Tern	0	0	13	3	16	25%
Forster's Tern	0	0	4	0	4	6%
Tern sp.	0	2	0	0	2	NA
Near-shore Total	**26**	**2**	**20**	**16**	**64**	

Raptors

Observers recorded 226 raptors comprised of 10 species. Turkey Vultures were the most common, with 108 observations (48%). Other species included Red-tailed Hawk (57 observations, 25%), White-tailed Kite (19, 8%), Northern Harrier (10, 4%), Burrowing Owl (9, 4%), Red-shouldered Hawk (7, 3%) and American Kestrel (7, 3%). Observers also recorded 2 Cooper's Hawks and 1 Sharp-shinned Hawk.

Table 15. Counts of raptors at the West County Wastewater Treatment Plant (Sep. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Turkey Vulture	7	13	38	50	108	48%
Osprey	0	0	1	4	5	2%
White-tailed Kite	6	6	3	4	19	8%
Northern Harrier	4	3	3	0	10	4%
Sharp-shinned Hawk	0	1	0	0	1	0.4%
Cooper's Hawk	2	0	0	0	2	0.9%
Red-shouldered Hawk	4	1	0	2	7	3%
Red-tailed Hawk	21	12	19	5	57	25%
American	2	3	0	2	7	3%

Kestrel						
Burrowing Owl	0	6	3	0	9	4%
Buteo sp.	0	0	1	0	1	0.4%
Raptor Total	**46**	**45**	**68**	**67**	**226**	

Corvids

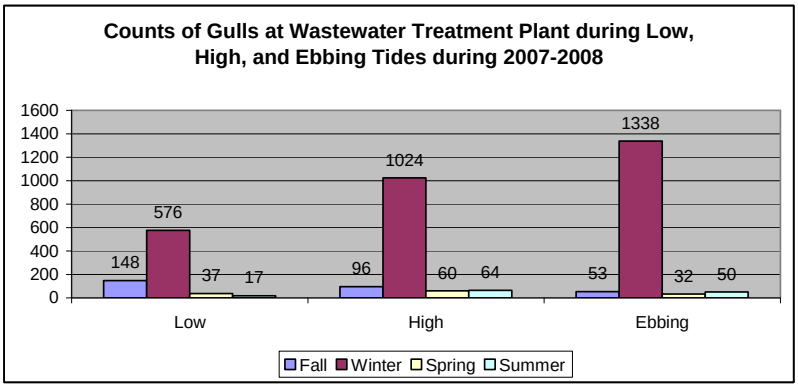
Observers recorded 647 American Crows (94% of corvids observed) and 41 Common Ravens (6%).

Observations of Bird Use at the Wastewater Treatment Plant by Tides

Gulls

Gull counts were noticeably higher in the winter at the Wastewater Treatment Plant, regardless of the tide (Table 12, Figure 8). Counts of gulls were comparably very low at all tides during every other season.

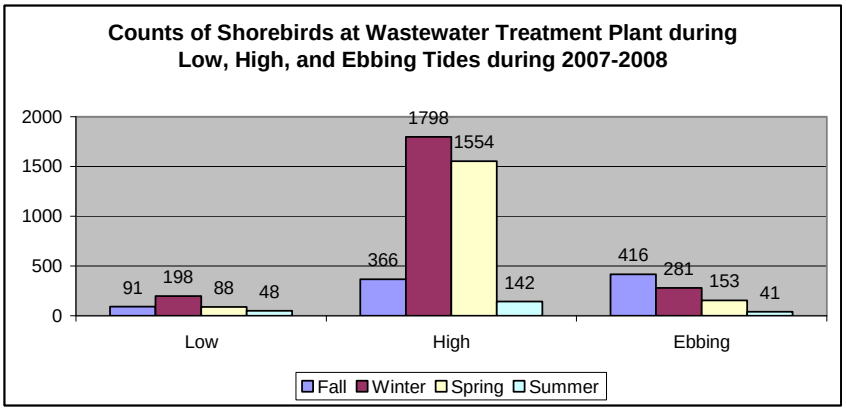
Figure 8. Counts of gulls at the West County Wastewater Treatment Plant during low, high and ebbing tides (Sep. 2007-Aug. 2008)



Shorebirds

Observers recorded the most shorebirds at the Wastewater Treatment Plant during high tide during winter and spring (Figure 9). Observers recorded slightly more shorebirds during ebbing tide in the fall than in the winter.

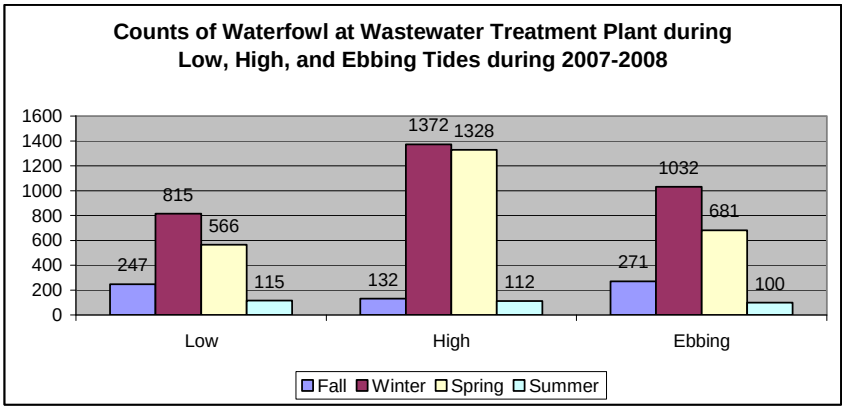
Figure 9. Counts of shorebirds at the West County Wastewater Treatment Plant during low, high and ebbing tides (Sep. 2007-Aug. 2008)



Waterfowl

Waterfowl counts were highest during high tide during the winter and spring (Figure 10). Counts were slightly higher at low tide and ebbing tide during the fall.

Figure 10. Counts of waterfowl at the West County Wastewater Treatment Plant during low, high and ebbing tides (Sep. 2007-Aug. 2008)



West County Landfill Loop

Observers counted 58,935 birds comprised of 69 species at the West County Landfill Loop trail, the second-highest abundance of birds and total species observed at the four survey sites in the North Richmond Shoreline. Fall and winter saw the highest number of birds at the Loop (22,413 and 19,023, respectively). Notably, the site had the highest number of birds in the summer (7404 birds recorded vs. 1459 at Pt. Pinole, the site with the second-highest number of birds recorded in the summer). Species richness remained consistent from the fall through the spring (55 in fall, 56 in winter, and 57 in spring). Count totals for each species by season are provided in Appendix A, Table A-3.

Shorebirds

At the Landfill Loop, observers recorded 24,652 shorebirds comprised of 19 species. Shorebirds were much more abundant in the fall and winter (8720, and 8527, respectively) than in the spring or summer (Table 16). 3414 birds were not identified to species: 2216 were classified as "small shorebird", 900 as "large shorebird", and 293 as "Dowitcher sp." Of birds identified to species, the majority were Willets (6342, 29.85%) and American Avocets (5814, 27.37%).

Table 16. Counts of shorebirds at the West County Landfill Loop (Sep. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Black-bellied Plover	94	350	31	6	481	2.26%
Killdeer	39	9	39	49	136	0.64%
Black Oystercatcher	5	0	1	0	6	0.03%
Black-necked Stilt	113	38	414	145	710	3.34%

American Avocet	2769	2353	437	255	5814	27.37%
Greater Yellowlegs	6	21	28	0	55	0.26%
Lesser Yellowlegs	0	5	4	0	9	0.04%
Willet	1880	1456	1055	1951	6342	29.85%
Spotted Sandpiper	6	7	8	3	24	0.11%
Whimbrel	1	1	0	1	3	0.01%
Long-billed Curlew	25	18	2	3	48	0.23%
Marbled Godwit	990	175	576	558	2299	10.82%
Western Sandpiper	207	1503	60	14	1784	8.40%
Least Sandpiper	592	737	270	90	1689	7.95%
Dunlin	815	809	130	0	1754	8.26%
Short-billed Dowitcher	0	0	60	0	60	0.28%
Long-billed Dowitcher	0	0	2	0	2	0.01%
Wilson's Phalarope	0	0	11	0	11	0.05%
Red-necked Phalarope	2	0	8	6	16	0.08%
small shorebird	1020	695	122	379	2216	
large shorebird	135	50	487	228	900	
Dowitcher sp.	21	30	218	24	293	
Shorebird Total	**8720**	**8257**	**3963**	**3712**	**24652**	

Gulls

Observers recorded 11,276 gulls consisting of 5 species. Gulls were much more abundant in the fall (7179) than in other months. 3680 gulls were not identified to species. Of gulls identified to species, most were Western Gulls (6073, 79.95%).

Table 17. Counts of gulls at the West County Landfill Loop (Sep. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Mew Gull	1	6	1	0	8	0.11%
Ring-billed Gull	373	33	10	11	427	5.62%
California Gull	598	52	2	255	907	11.94%
Western Gull	4323	285	669	796	6073	79.95%
Glaucous-winged Gull	121	51	9	0	181	2.38%
Gull sp.	1763	805	111	1001	3680	
Gull Total	**7179**	**1232**	**802**	**2063**	**11276**	

Waterfowl

Observers recorded 20,425 waterfowl comprised of 16 species. Waterfowl were most abundant in the winter (9139 records) and spring (5962). 6619 ducks were not identified to species and 4708 scaup were left undifferentiated. Of ducks identified to species, the most commonly observed species were Northern Shoveler (1297, 20.83%), Canvasback

(1168, 18.75%), Ruddy Duck (1136, 18.24%), and Mallard (1090, 17.5%). Uncommon species included Cinnamon Teal (3, 0.05%) and Green-winged Teal (2, 0.03%).

Table 18. Counts of waterfowl at the West County Landfill Loop

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Geese						
Snow Goose	0	1	1	0	2	0.29%
Canada Goose	156	284	190	63	693	99.71%
Ducks						
Gadwall	50	47	413	246	756	12.14%
American Wigeon	49	151	33	0	233	3.74%
Mallard	321	49	411	309	1090	17.50%
Cinnamon Teal	0	0	3	0	3	0.05%
Northern Shoveler	113	205	979	0	1297	20.83%
Northern Pintail	65	30	19	0	114	1.83%
Green-winged Teal	1	1	0	0	2	0.03%
Canvasback	124	817	227	0	1168	18.75%
Surf Scoter	43	0	15	0	58	0.93%
Bufflehead	80	151	40	0	271	4.35%
Common Goldeneye	1	95	4	0	100	1.61%
Ruddy Duck	161	592	371	12	1136	18.24%
Duck sp.	1026	5215	86	292	6619	
Scaup						
Greater Scaup	62	1086	829	2	1979	90.99%
Lesser Scaup	32	43	121	0	196	9.01%
Scaup sp.	3678	372	638	20	4708	
Waterfowl Total	**5962**	**9139**	**4380**	**944**	**20425**	

Marsh-associated Species

Observers recorded 901 birds of 7 marsh-associated species. Observers recorded the highest number of marsh-associated birds in the spring (583) and the lowest number in the fall (57). American Coot was the most common species observed (568 observations, 63.39%). The West County Landfill Loop was the only census site at which endangered California Clapper Rail was detected (5 records in fall, 1 in summer).

Table 19. Counts of marsh-associated species at the West County Landfill Loop (Sep. 2008-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Pied-billed Grebe	3	2	0	0	5	0.66%
Great Blue Heron	4	1	7	3	15	1.67%

Great Egret	17	15	45	35	112	12.50%
Snowy Egret	25	7	90	43	165	18.42%
Egret sp	0	0	0	29	29	3.24%
White-faced Ibis	0	0	1	0	1	0.11%
Clapper Rail	5	0	0	1	6	0.67%
American Coot	6	117	440	5	568	63.39%
Marsh Total	**60**	**142**	**583**	**116**	**901**	

Near-shore Birds

Observers recorded 919 near-shore birds consisting of 10 species. Observers recorded the highest number of near-shore birds in the summer (924) and the lowest in the winter (74). American White Pelican was the most commonly observed species (309, 40.66%). The next most commonly observed species were Western Grebe (141, 18.55%) and Caspian tern (102, 13.42%).

Table 20. Counts of near-shore species at the West County Landfill Loop (Sep. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Horned Grebe	0	4	0	0	4	0.53%
Eared Grebe	0	4	1	0	5	0.66%
Western Grebe	87	25	29	0	141	18.55%
Clark's Grebe	4	12	18	0	34	4.47%
American White Pelican	54	4	11	240	309	40.66%
Brown Pelican	21	3	0	7	31	4.08%
Double-crested Cormorant	28	11	38	12	89	11.71%
Black Skimmer	0	1	0	0	1	0.13%
Caspian Tern	0	0	48	54	102	13.42%
Forster's Tern	6	0	16	17	39	5.13%
Tern sp.	0	0	50	1	51	
Cormorant sp	0	0	0	10	10	
Aech/Clark/Western Grebe	71	8	24	0	103	
Near-shore Total	**274**	**74**	**235**	**341**	**924**	

Raptors

Observers recorded 431 raptors comprised of 8 species. Observers counted the highest number of raptors in the summer and fall (168, 109, respectively) and the fewest in the winter and spring (88, 66, respectively).

Table 21. Counts of raptors at the West County Landfill Loop (Sep. 2007-Aug. 2008)

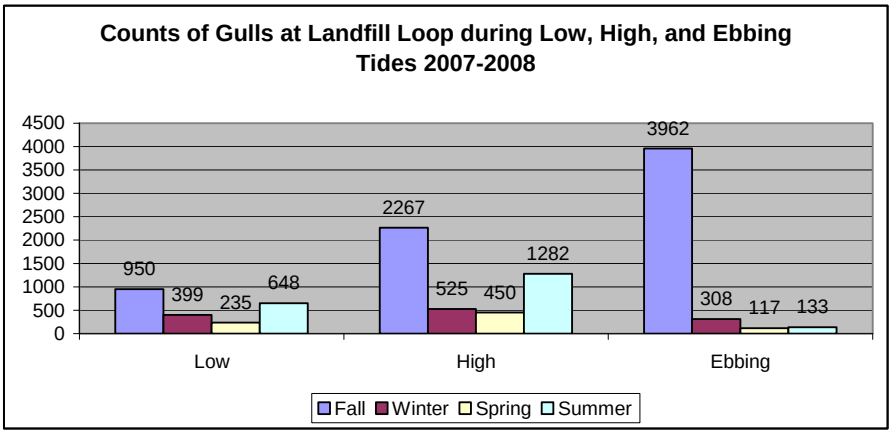
Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Turkey Vulture	37	19	34	126	216	50.23%
Osprey	6	1	6	19	32	7.44%
White-tailed Kite	4	11	1	6	22	5.12%
Northern Harrier	15	11	3	0	29	6.74%
Red-tailed Hawk	40	42	22	14	118	27.44%
American Kestrel	6	2	0	2	10	2.33%
Merlin	0	1	0	0	1	0.23%
Peregrine Falcon	1	1	0	0	2	0.47%
Accipter sp.	0	0	0	1	1	0.23%
Raptor Total	**109**	**88**	**66**	**168**	**431**	

Observations of Bird Use at Landfill Loop by Tides

Gulls

Observers counted more gulls during ebbing tide in the fall and more gulls during high tide during the summer (Figure 11).

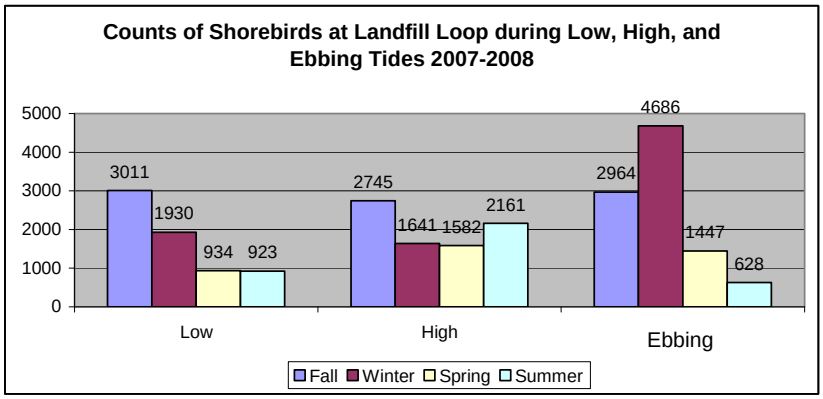
Figure 11. Counts of gulls at Landfill Loop during low, high, and ebbing tide (Sep. 2007-Aug. 2008)



Shorebirds

In the fall, shorebirds were observed at roughly equivalent numbers during low, high, and ebbing tides. However, in the winter, observers counted many more shorebirds during ebbing tide than either high or low tide. Observers also recorded a noticeably spike in shorebirds at the site during high tide in the summer (Figure 12).

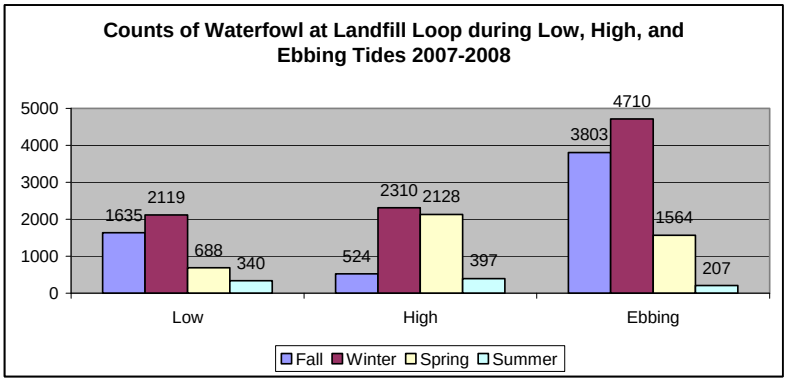
Figure 12. Counts of shorebirds at Landfill Loop during low, high, and ebbing tide (Sep. 2007-Aug. 2008)



Waterfowl

Waterfowl were counted in much larger numbers during ebbing tide in the fall and winter, but not the spring or summer (Figure 13). Observers recorded noticeably dips in counts at low tide in the spring and high tide in the fall.

Figure 13. Counts of waterfowl at Landfill Loop during low, high, and ebbing tide (Sep. 2007-Aug. 2008)



Wildcat Creek Park

Wildcat Creek Park had the lowest number of birds observed and the fewest species in all seasons. Observers counted 2919 birds comprised of 43 species. The highest number of birds were observed in winter (1314) and fall (881). Count totals by species and season are provided in Appendix A, Table A-4.

Shorebirds

Observers recorded 235 shorebirds consisting of 8 species during the surveys. Observers counted the most shorebirds in the winter (151) and the fewest in the summer (4). Most birds were identified to species, with only 6 observations being recorded as "Large Shorebird". Of birds identified to species, Willet was the most commonly observed, with 104 observations (45%). Black-necked Stilt was the next most common, with 59 (25 or 26%) observations. Observers also recorded 2 Marbled Godwits (fall and winter) and 1 Wilson's Snipe (in fall).

Table 22. Counts of shorebirds at Wildcat Creek (Sep. 2007-Aug. 2008

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Killdeer	0	8	23	0	31	14%
Black-necked Stilt	37	22	0	0	59	26%
American Avocet	0	6	0	3	9	4%
Greater Yellowlegs	13	6	1	0	20	9%
Willet	0	104	0	0	104	45%
Marbled Godwit	1	1	0	0	2	0.9%
Long-billed Dowitcher	0	3	0	0	3	1%
Wilson's Snipe	1	0	0	0	1	0.4%
Large shorebird	4	1	0	1	6	
Total	**56**	**151**	**24**	**4**	**235**	

Waterfowl

Observers recorded 565 waterfowl comprised of 11 species. Waterfowl counts were fairly consistent in the fall, winter and spring (163, 187, and 208 respectively) and very small in the summer (7). Most waterfowl were identified to species, with only 24 (4%) of ducks left undifferentiated. Canada Geese were the most commonly observed species, with 291 (51%) of all observations. Among ducks identified to species, Mallard was the most common (167 observations, 67%) with Northern Shoveler as the next most common (14, 5 or 6%). There were no scaup or scoters observed at the site.

Table 23. Counts of waterfowl at Wildcat Creek (Sep. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Geese						
Snow Goose	0	0	1	0	1	0.3%
Canada Goose	135	87	66	3	291	51%
Ducks						
Gadwall	4	19	31	1	55	22%
Mallard	19	58	87	3	167	67%
Northern Shoveler	3	11	0	0	14	5 or 6%
Northern Pintail	0	0	2	0	2	0.8%
Canvasback	0	2	0	0	2	0.8%
Common Goldeneye	0	1	0	0	1	0.4%
Hooded Merganser	0	1	2	0	3	1%
Common Merganser	0	1	0	0	1	0.4%
Red-breasted Merganser	0	4	0	0	4	2%
Duck sp.	2	3	19	0	24	
Waterfowl Total	**163**	**187**	**208**	**7**	**565**	

Gulls

Observers recorded 1391 gulls consisting of 6 species. The most gulls were observed in the winter (792) and fall (447), with far fewer in the summer (83) and spring (69). The large majority (1200 records, 86% of all records) of gulls were not identified to species. Of those identified to species, Western Gull was the most common, with 76 observations (40%). The next most commonly observed species were California Gull (58 observations, 30%), Ring-billed Gull (45, 23 or 24%), and Glaucous-winged Gull (8, 4%). Observers recorded 3 Mew Gulls in fall and 1 Herring Gull in winter.

Table 24. Counts of gulls at Wildcat Creek (Sep.2007-Aug.2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Mew Gull	3	0	0	0	3	2%
Ring-billed Gull	36	9	0	0	45	24 or 23%
California Gull	16	18	22	2	58	30%
Herring Gull	0	1	0	0	1	0.5%
Western Gull	33	9	15	19	76	40%
Glaucous-winged Gull	5	2	0	1	8	4%
Gull sp.	354	753	32	61	1200	
Gull Total	**447**	**792**	**69**	**83**	**1391**	

Near-shore Birds

Observers recorded 43 near-shore birds consisting of 3 species. Near-shore species were counted in the highest numbers in the spring (24) and none were found in the winter. Caspian Tern was the most commonly observed species, with 23 records (54%); no Caspian Terns were observed in fall or winter, with 16 observed in spring and 7 in summer. The other two species were Double-crested Cormorant (14 observations, 33%) and American White Pelican (6, 14%).

Table 25. Counts of near-shore birds at Wildcat Creek (Sep. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
American White Pelican	4	0	2	0	6	14%
Double-crested Cormorant	8	0	6	0	14	33%
Caspian Tern	0	0	16	7	23	53%
Total	**12**	**0**	**24**	**7**	**43**	

Marsh-associated Species

Observers recorded a total of 78 marsh-associated birds comprised of 4 species. Observers counted the most marsh-associated birds in the spring (29) and winter (21) and fewer in the fall and summer (both 14). In all seasons, the large majority of observations were of Great Egrets. Two observations of egrets were undifferentiated. Of birds identified to species, the large majority was Great Egret (42 observations, 55%). Other observed species were Snowy Egret (22, 29%), Great Blue Heron (11, 14 or 15%), and American Coot (1, 1%).

Table 26. Counts of marsh-associated species at Wildcat Creek (Sep. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Great Blue Heron	0	4	7	0	11	15 or 14%
Great Egret	5	12	20	5	42	55%
Snowy Egret	9	5	2	6	22	29%
American Coot	0	0	0	1	1	1%
Egret sp	0	0	0	2	2	
Total	**14**	**21**	**29**	**14**	**78**	

Raptors

Observers recorded 289 raptors consisting of 9 species. Counts of raptors were fairly consistent throughout the seasons (86 in fall, 78 in winter, 63 in spring, and 62 in summer). Observers recorded 1 undifferentiated "Accipter Sp.", 1 undifferentiated "Raptor sp.", and 4 "Buteo sp." Of raptors identified to species, Turkey Vulture was the most commonly observed species, with 86 detections (30%). The next most commonly observed species were Red-tailed Hawk (74 observations, 26%), White-tailed Kite (67, 24%), Northern Harrier (16, 6%), Red-shouldered Hawk (13, 5%), American Kestrel (12, 4%), and Cooper's Hawk (10, 4%).

Table 27. Counts of raptors at Wildcat Creek (Sep. 2007-Aug. 2008)

Species	Fall	Winter	Spring	Summer	Total Counts	Percent of Observations Identified to Species
Turkey Vulture	22	16	21	27	86	30%
Osprey	1	0	2	1	4	1%
White-tailed Kite	14	24	6	23	67	24%
Bald Eagle	0	0	0	1	1	0.4%
Northern Harrier	6	4	6	0	16	6%
Cooper's Hawk	8	2	0	0	10	4%
Red-shouldered Hawk	4	3	3	3	13	5%
Red-tailed Hawk	23	26	22	3	74	26%
American Kestrel	8	1	1	2	12	4.%
Accipter sp.	0	1	0	0	1	

Buteo sp.	0	1	2	1	4
Raptor sp.	0	0	0	1	1
Total	**86**	**78**	**63**	**62**	**289**

Corvids

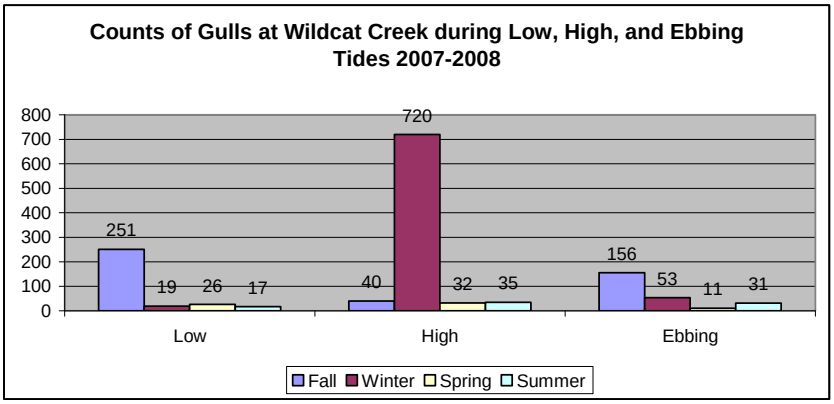
Observers recorded 273 American Crows and 41 Common Ravens. Four observations were recorded as "Corvid sp."

Observations of Bird Use at Wildcat Creek Park by Tides

Gulls

Gulls were counted in much larger numbers during high tide in the winter (Figure 14). In the fall, gulls were counted in slightly higher numbers at low and ebbing tide, with a noticeable drop off in counts during high tide.

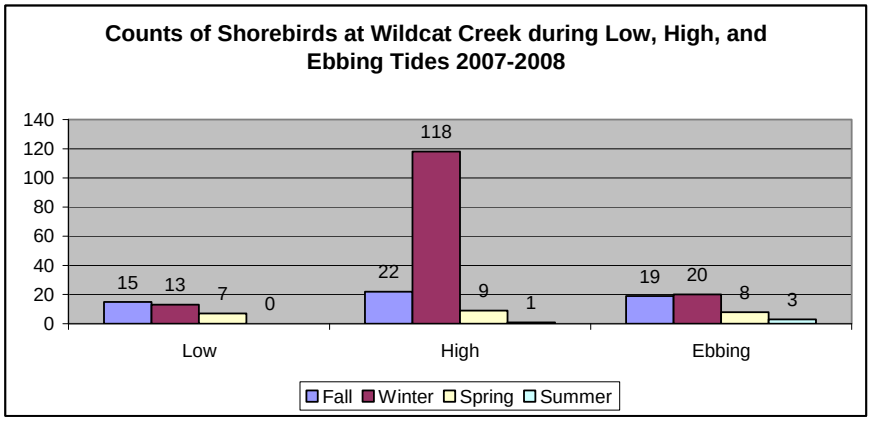
Figure 14. Counts of gulls at Wildcat Creek during low, high, and ebbing tide (Sep. 2007-Aug. 2008)



Shorebirds

Shorebirds were counted in the largest number at high tide during the winter, relative to other tides and seasons at the site (Figure 15) Shorebird counts at Wildcat Creek were generally much lower than other sites at all tides during each season (Figures 20, 21, 22).

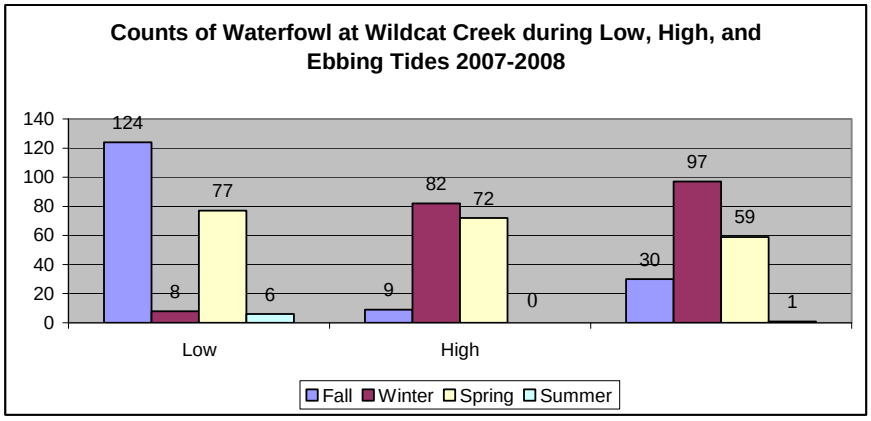
Figure 15. Counts of shorebirds at Wildcat Creek during low, high, and ebbing tide (Sep. 2007-Aug. 2008)



Waterfowl

Waterfowl were counted in the largest number during fall at low tide (Figure 16). In the winter, waterfowl were counted in much larger numbers during high and ebbing tides than during low tide. In the spring, use of the site appeared consistent regardless of the tide. Use of the site during summer was minimal.

Figure 16. Counts of shorebirds at Wildcat Creek during low, high, and ebbing tide (Sep. 2007-Aug. 2008)



Bird Use of Sites by Season and Tides

The Baylands Goals Project recognized the need for a diversity of natural areas to be used by birds and other wildlife in varying climate and seasonal conditions. The data presented above demonstrate how birds make use of each site differently during different tides (*see* Figs. 5, 6, 7 for Point Pinole; Figs. 8, 9, 10 for Wastewater; Figs. 11, 12, 13 for Landfill Loop; and Figs.14, 15, 16 for Wildcat Creek Park). The section below provides a comparison of bird counts at each site by season and tide.

Gull Observations in the North Richmond Shoreline by Season and Tides

Gulls were observed in much higher numbers during low tide at Point Pinole during the winter than at any other site (Figure 17). During high and ebbing tides, gulls were nearly absent from the site during the winter (Figs. 18, 19). Gulls appear to rely on Landfill Loop in much higher numbers during high and ebbing tides, particularly during the fall (Figures 18, 19).

Figure 17. Counts of gulls during low tide at four sites along the North Richmond Shoreline 2007-2008.

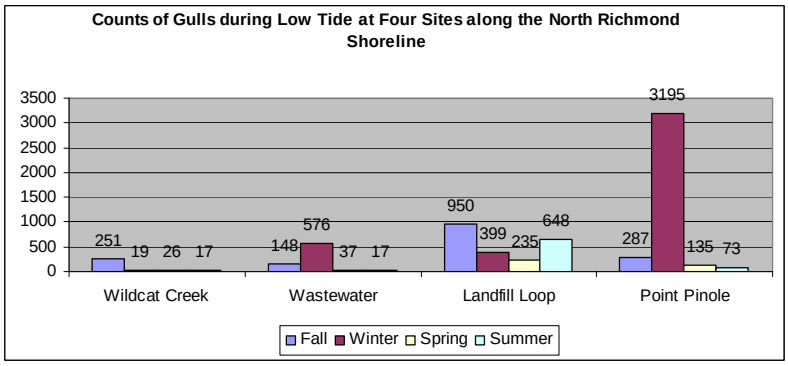


Figure 18. Counts of gulls during high tide at four sites along the North Richmond Shoreline 2007-2008.

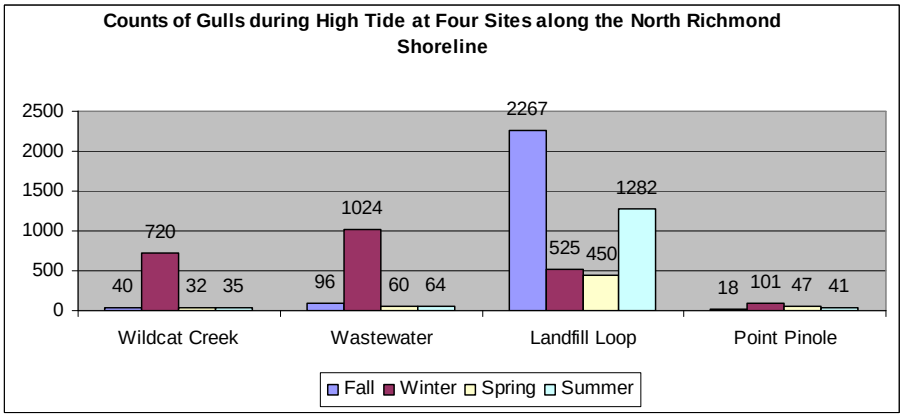
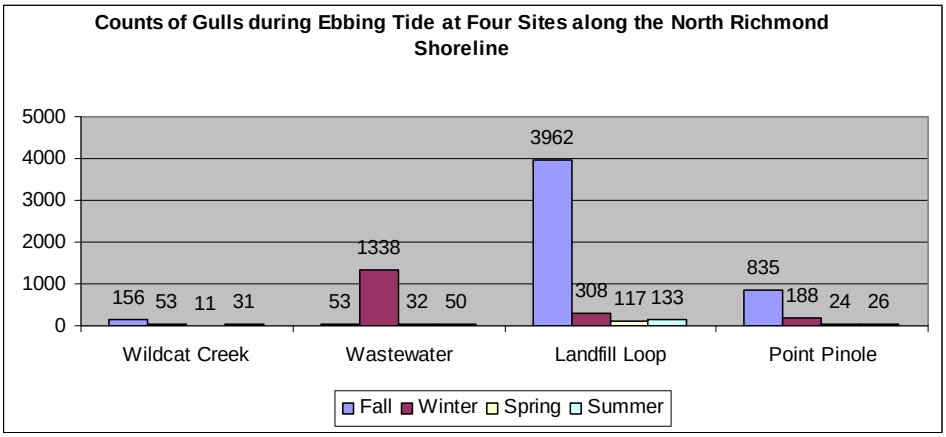


Figure 19. Counts of gulls during ebbing tide at four sites along the North Richmond Shoreline 2007-2008.



Shorebird Observations in the North Richmond Shoreline by Season and Tides

Shorebirds also shifted between the sites during different tides. For example, shorebirds aggregated in the highest observed numbers at Point Pinole during low tide in the spring (Figure 20). Shorebirds appeared in consistent numbers during low and ebbing tides in the fall and winter, and much lower numbers at high tide (Figures 20, 21, 22).

Shorebirds used Landfill Loop consistently at all tides during fall and spring. Shorebirds were counted in much higher numbers at ebbing tide during the winter than at low or high tide. Shorebirds were counted in much higher numbers during high tide in the summer (Figures 20, 21, 22).

Observed counted relatively few shorebirds at Wastewater during low and ebbing tides, but much higher numbers for all seasons during high tides, demonstrating the area's importance as a high tide roost and foraging ground (Figures 20, 21, 22).

Figure 20. Counts of shorebirds during low tide at four sites along the North Richmond Shoreline 2007-2008.

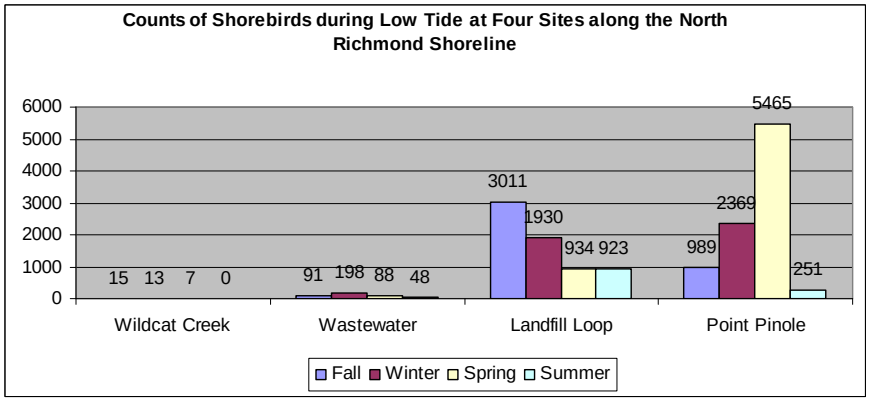


Figure 21. Counts of shorebirds during high tide at four sites along the North Richmond Shoreline (2007-20098)

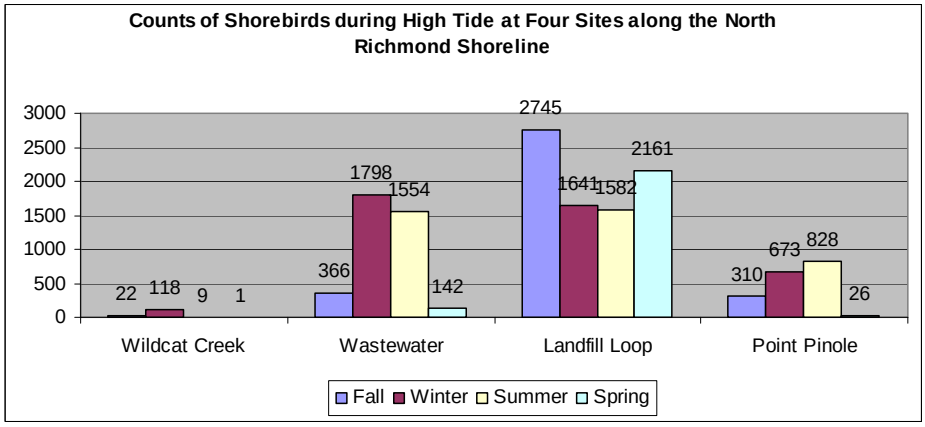
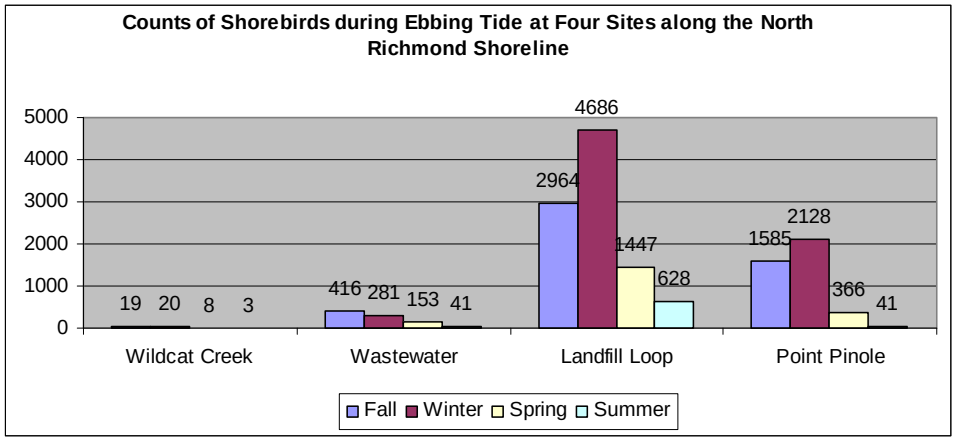


Figure 22. Counts of shorebirds during ebbing tide at four sites along the North Richmond Shoreline (2007-2008).



Waterfowl Observations in the North Richmond Shoreline by Season and Tide

Waterfowl were counted in the highest numbers at Pt. Pinole during ebbing tide in the fall (13753 observations), with a noticeable drop off during low tide (5362 observations) and high tide (413 observations) (Figures 23, 24, 25). Numbers stayed relatively consistent in the winter at all sites, regardless of the tide.

Figure 23. Counts of waterfowl during low tide at four sites along the North Richmond Shoreline (2007-2008).

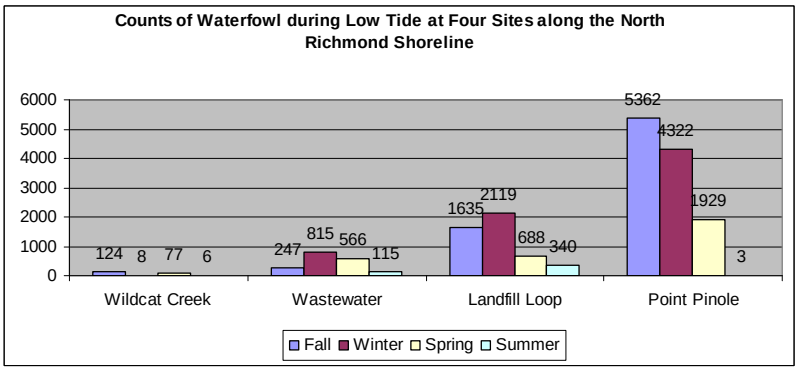


Figure 24. Counts of waterfowl during high tide at four sites along the North Richmond Shoreline (2007-2008).

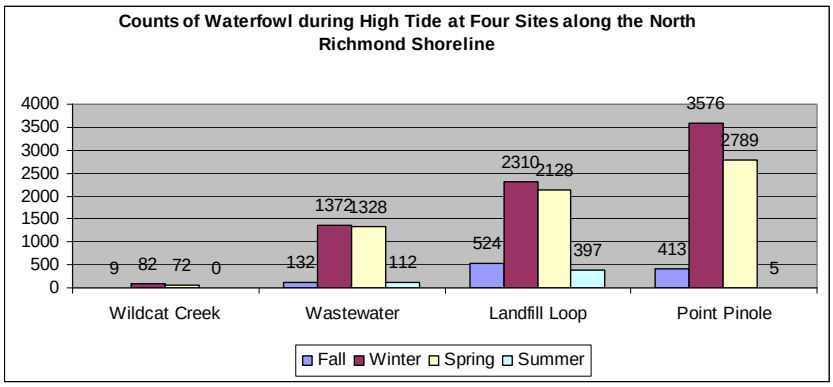
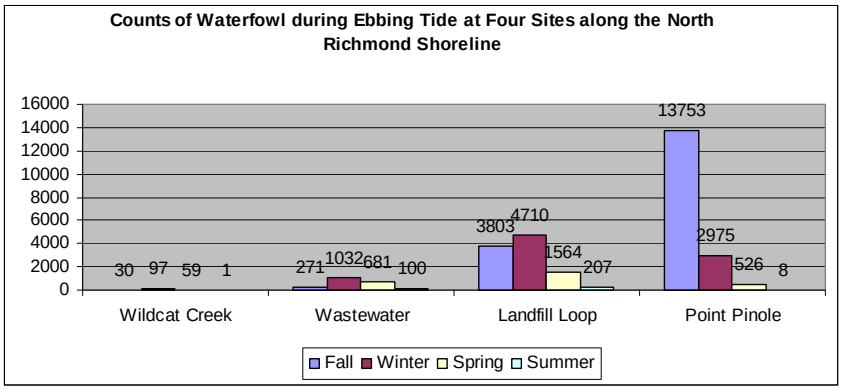


Figure 25. Counts of waterfowl during ebbing tide at four sites along the North Richmond Shoreline (2007-2008).



V. RECOMMENDATIONS

With so little habitat remaining in the San Francisco Bay Area, tracts of land such as the North Richmond Shoreline should be preserved in their entirety. The 1999 Baylands Goal Project set forth several region-wide goals that include:

- large patches of tidal marsh connected by corridors to enable the movement of small mammals and marsh-dependent birds;
- large complexes of salt ponds managed for shorebirds and waterfowl;
- extensive areas of managed seasonal ponds'
- large expanses of managed marsh;
- continuous corridors of riparian vegetation along the Bay's tributary streams;
- restored beaches, natural salt ponds, and other unique habitats; and
- intact patches of adjacent habitats, including grasslands, seasonal wetlands, and forests. [12]

Nearly all of the Bayland Goals should be applied in the North Richmond Shoreline. Within that context, Golden Gate Audubon offers the following recommendations for priorities in the North Richmond Shoreline:

1. Preserve a diversity of sites in North Richmond Shoreline

In conjunction with region-wide planning, land managers in the Shoreline should acquire, protect and restore:

- Near-shore habitat that is kept free of disturbance (from boating or pollution), including eelgrass beds;
- Large mudflats;
- High-tide roosting spots and structures;
- Tidal marsh, particularly large areas of habitat such as Breuner Marsh;
- Upland habitat, including grassland, meadows, and coastal scrub;
- Riparian corridors such as those along Wildcat and San Pablo Creeks; and
- Habitat corridors between habitat islands to facilitate wildlife movement and migration.

2. Restore native habitats

Many of the Shoreline's native habitats have been compromised by development, fill, coastline armoring, pollution, and industrial use. While the Shoreline today provides significant valuable habitat for wildlife, it could be greatly improved by additional protections and restoration efforts. We recommend that land managers implement policies to
:

- Protect and expand extant eelgrass beds;[13]

[12] Goals Project. 1999. Baylands Ecosystem Habitat Goals. *A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project*. U.S. Environmental Protection Agency, San Francisco, Calif./S.F. Bay Regional Water Quality Control Board, Oakland, Calif., at S-2.

- Restore the significant shellfish beds that once flourished along the Shoreline and once again provide spawning areas for native oysters;[14]
- Protect and restore native tidal marsh and wetlands by removing exotic plants such as invasive Spartina and replanting, where necessary, with native plants;
- Improve riparian corridors that feed the Shoreline, particularly Wildcat and San Pablo Creeks, expanding creekside habitat where possible by removing exotic plants and trash, minimizing pollution, and restoring habitat where ever possible.

3. Balance Recreational Use and Habitat Protection in the Shoreline

The North Richmond Shoreline is potentially a vast resource for open space recreation available to the residents of Richmond. Outdoor activities available long the Shoreline include walking, hiking, running, dog-walking, fishing, photography, cycling, birdwatching, picnicking, and outdoor sports. We acknowledge that a diversity of users will make different demands on the resource. However, we remind land managers that there are few areas like the North Richmond Shoreline remaining in the Bay Area. Recreational activities should be permitted to occur only in a manner that does not threaten the natural habitat values or the wildlife that depend on the area.

4. Continue Monitoring the Shoreline

The results of this census confirm the ecological importance of the North Richmond Shoreline. To better understand this ecology and plan for its protection, further monitoring of all aspects of the Shoreline's ecology is needed.[15] These should include studies that address:

- Bird population changes along the Shoreline;
- Bird use of various areas and habitats along the Shoreline;
- Threats to birds and other wildlife along the Shoreline, including risks from development, pollution, recreational use, and climate change
- The condition and potential expansion of the Shoreline's eelgrass beds and other aquatic habitat;
- Monitoring and removal of invasive Spartina and other invasive, exotic plants;
- Information gathering necessary to create climate change models applicable to the Shoreline;
- Feasibility studies for transitioning private lands on the Shoreline to public agencies for protection and restoration; and
- Information to assist in providing more outdoor recreational and education opportunities to local community members.

[13] *See* Schaeffer, Korie et al. eds. (2007). *Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay.* National Oceanic and Atmospheric Administration. Available at http://swr.nmfs.noaa.gov/hcd/HCD_webContent/nocal/SHABTinSFBay.htm (accessed February 16, 2010), at p. 60.
[14] *See id* at p. 56.
[15] Phillips, R. C. 1984. *The Ecology of Eelgrass Meadows in the Pacific Northwest: A Community Profile.* Seattle, Washington: U.S. Fish Wildlife Service Report FWS/OBS-84/24. 85. p, at 65.

VI. CONCLUSION

Golden Gate Audubon's 2007-2008 North Richmond Shoreline bird census demonstrated that hundreds of thousands of birds rely on the Shoreline's diverse habitats throughout the year. As one of the largest swaths of tidal marsh and mudflat habitat remaining in the East Bay, the Shoreline must be protected. This will be best achieved by bringing all of the Shoreline into public ownership to be managed in a manner that enhances and protects the natural resources of the area and, where appropriate, makes them available for access and enjoyment by the public.

The census would not have been possible without support from the Natural Heritage Institute, CalFed, and Golden Gate Audubon's volunteer census leaders and observers. We are grateful for their efforts and continued support.

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APPENDIX A

Table A- 1. Counts by season and species at Pt. Pinole (Sep. 2007-Aug. 2008)

Common Name	Fall Counts	Winter Counts	Spring Counts	Summer Counts	Total Counts
Canada Goose	0	0	4	7	11
Gadwall	0	0	4	0	4
Eurasian Wigeon	0	2	0	0	2
American Wigeon	328	617	455	0	1400
Mallard	94	59	55	3	211
Cinnamon Teal	0	0	2	0	2
Northern Shoveler	2	0	0	0	2
Northern Pintail	3	3	1	0	7
Canvasback	0	2	0	0	2
Greater Scaup	557	754	143	0	1454
Lesser Scaup	53	6	0	0	59
Scaup sp	10456	2734	1502	0	14692
Surf Scoter	331	489	337	5	1162
Black Scoter	1	0	2	0	3
Bufflehead	71	189	20	0	280
Common Goldeneye	71	116	6	0	193
Common Merganser	0	0	1	0	1
Red-breasted Merganser	10	14	0	0	24
Ruddy Duck	29	2648	40	0	2717
Duck sp.	7522	3240	2672	1	13435
Red-throated Loon	0	5	0	0	5
Common Loon	5	4	2	0	11
Pied-billed Grebe	0	0	0	1	1
Horned Grebe	0	6	0	0	6
Eared Grebe	6	3	0	0	9
Western Grebe	31	45	17	0	93
Clark's Grebe	10	59	23	8	100
Aech/Clark/Western Grebe	11	104	56	5	176
American White Pelican	15	0	0	190	205
Brown Pelican	22	7	6	8	43
Double-crested Cormorant	223	63	182	298	766
Pelagic Cormorant	0	8	1	1	10
Cormorant sp	0	0	0	8	8
Great Blue Heron	3	3	6	5	17
Great Egret	15	6	47	27	95
Snowy Egret	17	5	32	34	88
Turkey Vulture	32	6	22	23	83
Osprey	3	4	10	18	35
White-tailed Kite	4	5	0	1	10
Northern Harrier	1	0	1	0	2
Sharp-shinned Hawk	0	2	0	0	2

Cooper's Hawk	0	0	1	0	1
Red-shouldered Hawk	3	1	2	1	7
Red-tailed Hawk	14	6	9	3	32
American Kestrel	5	1	1	0	7
Raptor sp.	0	1	0	3	4
American Coot	259	411	2	12	684
Black-bellied Plover	91	111	60	10	272
Semipalmated Plover	0	0	13	14	27
Killdeer	34	15	15	2	66
Black Oystercatcher	15	17	11	1	44
American Avocet	28	195	160	0	383
Willet	1061	792	568	91	2512
Spotted Sandpiper	39	18	6	0	63
Whimbrel	0	1	3	1	5
Long-billed Curlew	8	4	1	0	13
Marbled Godwit	98	29	59	47	233
Black Turnstone	94	48	0	0	142
Red Knot	0	3	0	0	3
Sanderling	0	72	0	4	76
Western Sandpiper	55	252	89	71	467
Least Sandpiper	258	285	55	16	614
Dunlin	2	589	4	0	595
Dowitcher sp.	0	0	157	0	157
small shorebird	365	1734	4538	15	6652
large shorebird	736	1005	920	46	2707
Bonaparte's Gull	1	0	0	0	1
Mew Gull	105	591	0	0	696
Ring-billed Gull	164	10	1	3	178
California Gull	10	7	14	0	31
Herring Gull	0	2	0	0	2
Western Gull	197	104	62	89	452
Glaucous-winged Gull	3	9	4	0	16
Gull sp.	660	2761	125	48	3594
Caspian Tern	0	1	12	12	25
Elegant Tern	13	0	0	13	26
Forster's Tern	225	17	401	297	940
Tern sp.	0	0	211	12	223
Common Murre	0	0		1	1
American Crow	12	1	15	3	31
Common Raven	5	3	19	1	28
TOTALS	**24,486**	**20,304**	**13,187**	**1459**	**59,436**

Table A- 2. Counts of birds by species at West County Wastewater Treatment Plant (Sep. 2007-Aug. 2008)

Common Name	Fall	Winter	Spring	Summer	Total
Greater White-fronted Goose	0	0	10	0	10
Snow Goose	0	0	1	0	1
Canada Goose	155	418	688	147	1408
Gadwall	23	522	646	59	1250
American Wigeon	0	7	126	0	133
Mallard	191	913	784	116	2004
Cinnamon Teal	0	0	20	0	20
Northern Shoveler	274	966	137	0	1377
Northern Pintail	0	5	4	0	9
Green-winged Teal	0	28	7	0	35
Canvasback	0	2	0	0	2
Greater Scaup	0	60	19	0	79
Lesser Scaup	0	2	0	0	2
Scaup sp	0	114	3	0	117
Bufflehead	0	101	56	0	157
Common Goldeneye	0	5	2	0	7
Ruddy Duck	0	39	8	0	47
Duck sp.	7	37	64	5	113
American White Pelican	26	0	0	13	39
Double-crested Cormorant	0	0	3	0	3
Great Blue Heron	0	5	6	2	13
Great Egret	6	12	5	7	30
Snowy Egret	1	0	1	2	4
White-faced Ibis	0	0	0	1	1
Turkey Vulture	7	13	38	50	108
Osprey	0	0	1	4	5
White-tailed Kite	6	6	3	4	19
Northern Harrier	4	3	3	0	10
Sharp-shinned Hawk	0	1	0	0	1
Cooper's Hawk	2	0	0	0	2
Red-shouldered Hawk	4	1	0	2	7
Red-tailed Hawk	21	12	19	5	57
Buteo sp.	0	0	1	0	1
American Kestrel	2	3	0	2	7
American Coot	6	195	172	20	393
Killdeer	95	50	68	21	234
Black-necked Stilt	145	491	158	89	883
American Avocet	3	464	253	41	761
Greater Yellowlegs	61	47	37	4	149
Lesser Yellowlegs	4	1	0	0	5
Yellowlegs sp.	9	3	0	0	12
Willet	1	4	4	0	9

Western Sandpiper	68	156	408	0	632
Least Sandpiper	402	580	709	67	1758
Dunlin	0	56	6	0	62
Short-billed Dowitcher	2	0	0	0	2
Long-billed Dowitcher	0	3	0	0	3
Dowitcher sp.	82	53	0	0	135
Wilson's Snipe	1	2	4	0	7
Wilson's Phalarope	0	0	0	2	2
Red Phalarope	0	1	0	0	1
small shorebird	0	359	148	6	513
large shorebird	0	7	0	1	8
Mew Gull	8	520	1	0	529
Ring-billed Gull	76	693	1	11	781
California Gull	3	38	4	1	46
Herring Gull	5	20	0	0	25
Thayer's Gull	0	1	0	0	1
Western Gull	116	564	22	66	768
Glaucous-winged Gull	8	385	22	1	416
Gull sp.	81	717	79	52	929
Caspian Tern	0	0	13	3	16
Forster's Tern	0	0	4	0	4
Tern sp.	0	2	0	0	2
Burrowing Owl	0	6	3	0	9
American Crow	96	104	90	357	647
Common Raven	9	13	8	11	41
Corvid sp.	0	2	2	0	4
TOTALS	**2010**	**8812**	**4871**	**1172**	**16865**

Table A- 3. Counts by species at Landfill Loop (Sept. 2007-Aug. 2008)

Common Name	Fall	Winter	Spring	Summer	Total Counts
Snow Goose	0	1	1	0	2
Canada Goose	156	284	190	63	693
Gadwall	50	47	413	246	756
American Wigeon	49	151	33	0	233
Mallard	321	49	411	309	1090
Cinnamon Teal	0	0	3	0	3
Northern Shoveler	113	205	979	0	1297
Northern Pintail	65	30	19	0	114
Green-winged Teal	1	1	0	0	2
Canvasback	124	817	227	0	1168
Greater Scaup	62	1086	829	2	1979
Lesser Scaup	32	43	121	0	196
Scaup sp	3678	372	638	20	4708
Surf Scoter	43	0	15	0	58
Bufflehead	80	151	40	0	271
Common Goldeneye	1	95	4	0	100
Ruddy Duck	161	592	371	12	1136
Duck sp.	1026	5215	86	292	6619
Pied-billed Grebe	3	2	0	0	5
Horned Grebe	0	4	0	0	4
Eared Grebe	0	4	1	0	5
Western Grebe	87	25	29	0	141
Clark's Grebe	4	12	18	0	34
Aech/Clark/Western Grebe	71	8	24	0	103
American White Pelican	54	4	11	240	309
Brown Pelican	21	3	0	7	31
Double-crested Cormorant	28	11	38	12	89
Cormorant sp	0	0	0	10	10
Great Blue Heron	4	1	7	3	15
Great Egret	17	15	45	35	112
Snowy Egret	25	7	90	43	165
Egret sp	0	0	0	29	29
White-faced Ibis	0	0	1	0	1
Turkey Vulture	37	19	34	126	216
Osprey	6	1	6	19	32
White-tailed Kite	4	11	1	6	22
Northern Harrier	15	11	3	0	29
Accipter sp.	0	0	0	1	1
Red-tailed Hawk	40	42	22	14	118
American Kestrel	6	2	0	2	10
Merlin	0	1	0	0	1
Peregrine Falcon	1	1	0	0	2

Clapper Rail	5	0	0	1	6
American Coot	6	117	440	5	568
Black-bellied Plover	94	350	31	6	481
Killdeer	39	9	39	49	136
Black Oystercatcher	5	0	1	0	6
Black-necked Stilt	113	38	414	145	710
American Avocet	2769	2353	437	255	5814
Greater Yellowlegs	6	21	28	0	55
Lesser Yellowlegs	0	5	4	0	9
Willet	1880	1456	1055	1951	6342
Spotted Sandpiper	6	7	8	3	24
Whimbrel	1	1	0	1	3
Long-billed Curlew	25	18	2	3	48
Marbled Godwit	990	175	576	558	2299
Western Sandpiper	207	1503	60	14	1784
Least Sandpiper	592	737	270	90	1689
Dunlin	815	809	130	0	1754
Short-billed Dowitcher	0	0	60	0	60
Long-billed Dowitcher	0	0	2	0	2
Dowitcher sp.	21	30	218	24	293
Wilson's Phalarope	0	0	11	0	11
Red-necked Phalarope	2	0	8	6	16
small shorebird	1020	695	122	379	2216
large shorebird	135	50	487	228	900
Mew Gull	1	6	1	0	8
Ring-billed Gull	373	33	10	11	427
California Gull	598	52	2	255	907
Western Gull	4323	285	669	796	6073
Glaucous-winged Gull	121	51	9	0	181
Gull sp.	1763	805	111	1001	3680
Caspian Tern	0	0	48	54	102
Forster's Tern	6	0	16	17	39
Tern sp.	0	0	50	1	51
Black Skimmer	0	1	0	0	1
American Crow	40	23	31	38	132
Common Raven	72	70	34	23	199
TOTALS	**22413**	**19023**	**10094**	**7405**	**58935**

Table A- 4. Counts at Wildcat Creek Park

Common Name	Fall	Winter	Spring	Summer	Total Counts
Snow Goose	0	0	1	0	1
Canada Goose	135	87	66	3	291
Gadwall	4	19	31	1	55
Mallard	19	58	87	3	167
Northern Shoveler	3	11	0	0	14
Northern Pintail	0	0	2	0	2
Canvasback	0	2	0	0	2
Common Goldeneye	0	1	0	0	1
Hooded Merganser	0	1	2	0	3
Common Merganser	0	1	0	0	1
Red-breasted Merganser	0	4	0	0	4
Duck sp.	2	3	19	0	24
American White Pelican	4	0	2	0	6
Double-crested Cormorant	8	0	6	0	14
Great Blue Heron	0	4	7	0	11
Great Egret	5	12	20	5	42
Snowy Egret	9	5	2	6	22
Egret sp	0	0	0	2	2
Turkey Vulture	22	16	21	27	86
Osprey	1	0	2	1	4
White-tailed Kite	14	24	6	23	67
Bald Eagle	0	0	0	1	1
Northern Harrier	6	4	6	0	16
Cooper's Hawk	8	2	0	0	10
Accipter sp.	0	1	0	0	1
Red-shouldered Hawk	4	3	3	3	13
Red-tailed Hawk	23	26	22	3	74
Buteo sp.	0	1	2	1	4
American Kestrel	8	1	1	2	12
Raptor sp.	0	0	0	1	1
American Coot	0	0	0	1	1
Killdeer	0	8	23	0	31
Black-necked Stilt	37	22	0	0	59
American Avocet	0	6	0	3	9
Greater Yellowlegs	13	6	1	0	20
Willet	0	104	0	0	104
Marbled Godwit	1	1	0	0	2
Long-billed Dowitcher	0	3	0	0	3
Wilson's Snipe	1	0	0	0	1
large shorebird	4	1	0	1	6
Mew Gull	3	0	0	0	3
Ring-billed Gull	36	9	0	0	45

California Gull	16	18	22	2	58
Herring Gull	0	1	0	0	1
Western Gull	33	9	15	19	76
Glaucous-winged Gull	5	2	0	1	8
Gull sp.	354	753	32	61	1200
Caspian Tern	0	0	16	7	23
American Crow	90	78	53	52	273
Common Raven	13	5	7	16	41
Corvid sp.	0	2	2	0	4
TOTALS	**881**	**1314**	**479**	**245**	**2919**