



**Compilation of Existing Shorebird Monitoring Programs across California and  
the California Landscape Conservation Cooperative**

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*Submitted by*

Matthew E. Reiter

PRBO Conservation Science, TomKat Ranch Field Station, PO Box 747, Pescadero, California

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## **BACKGROUND**

PRBO Conservation Science (PRBO) is developing a broad-scale international program to detect trends and quantify habitat associations for Pacific Flyway shorebird populations, the Pacific Flyway Shorebird Survey (PFSS; [www.prbp.org/pfss/](http://www.prbp.org/pfss/)). The PFSS has the primary goals of: (1) developing an efficient, sustainable yet statistically robust sampling design and monitoring protocol for the Pacific Flyway; (2) establishing a framework to capture, manage, share, and analyze these monitoring data; and (3) understanding critical associations between habitat management and habitat change on the abundance of shorebirds in order to inform conservation and management actions.

To accomplish our goals for the PFSS within the California Landscape Conservation Cooperative (CA LCC), one of our objectives in Phase II of this project is to integrate existing shorebird data collection from the southern CA LCC through the new online shorebird data portal. To do this, we identified existing monitoring programs within our region of interest and determined if those programs could, based on their protocol willingness to partner contribute data to the much broader scale PFSS.

## **METHODS**

We sent out questionnaires (see Appendix I) to query state and federal agencies, NGOs, consulting firms, universities, and citizen scientists about existing and historic shorebird monitoring programs. We compiled this information to guide the development and implementation of the Pacific Flyway Shorebird Survey throughout the California LCC. Herein, we summarize general information obtained about existing surveys, organized in a spatial hierarchy and then by the organization coordinating the surveys. Complete data for all sites are in Appendix II (there are 3 worksheets in the attached excel file). We prioritized our engagement with these existing programs using historic data; the details of this prioritization will be available in our monitoring design product (end of January). We also indicate the current state of cooperation with each program, as it pertains to the PFSS, in this compilation.

## **RESULTS**

We identified 19 existing interior (i.e. Central Valley) surveys (Table 1) and 20 coastal surveys (Table 2) that had potentially compatible protocols and could contribute to the PFSS. Most existing programs were collecting data quite regularly throughout the year (see “Survey Frequency” in Table 1 and Table 2). The contribution to the PFSS would be from a single survey during the annual survey window (15 November – 15 December). All existing programs indicated they would contribute to the PFSS and we are working with these programs to integrate their ongoing data collection. In 2011, we will coordinate with 16 existing programs throughout the Central Valley of California and 12 existing programs in coastal regions from Humboldt Bay to Upper Newport Bay. We will also launch surveys at five important sites in southern California and northern Baja, Mexico that currently do not have regular monitoring (Mission Bay, San Diego Bay, Tijuana River Estuary, Estero de Punta Banda, and Bahia de San Quintin). Data from partner programs will be centralized through the new online shorebird data entry portal in the California Avian Data Center and linked to the online data summary tools. Both the portal and the summary tools are products of Phase I of this CA LCC supported project.

## **SUMMARY**

The large number of existing shorebird monitoring programs in the CA LCC that are willing to contribute to the PFSS was impressive and encouraging to our efforts to develop this ambitious monitoring program. Coordinating with these existing efforts in a way in which local scale data (e.g. single estuary) can be put into the context of shorebird populations in the broader CA LCC and the Pacific Flyway will contribute greatly to our ability to manage shorebird populations, and increase the

efficiency of the long-term monitoring program. We also think this will increase the value of all surveys and keep volunteers engaged. This compilation provides the baseline for rapid progress on the PFSS in 2011 and 2012.

We also discovered that there were some very important regions (i.e. all of the Western Hemisphere Shorebird Network sites in California except Elkhorn Slough; [www.whsrn.org](http://www.whsrn.org)) that did not have annual surveys. In the interior, the Sacramento Valley rice lands and the private wetlands of the Grasslands Ecological Area in the San Joaquin Valley had no regular surveys. On the coast, Humboldt Bay, San Francisco Bay, and San Diego Bay have only very intermittent surveys. However beginning in 2011, in addition to coordinating with existing monitoring efforts, all of these very important regions will be part of the PFSS through new coordinated monitoring programs. These compilation data on existing programs presented here helped identify these critical gaps in the shorebird monitoring.

To date, we have not been able to coordinate will all programs identified in this survey that collect compatible data. We prioritized our contacts based on the individual site's importance, measured as the percentage of California-wide wintering shorebirds counted at that site based on data from the Pacific Flyway Project (Page et al. 1999). We also have focused our efforts on the design and implementation of new monitoring in key regions that have no annual surveys (e.g. San Francisco Bay). We hope to integrate all sites collecting compatible data throughout California and the CA LCC, over the next 2 years, so that we have a sample of wintering shorebirds which includes the full variation of bird use and habitat availability.

Coordination with and integration of existing monitoring programs across a broad landscape is a cost-effective way to increase our understanding of wildlife populations. This is becoming easier and more feasible with the advent and increasing sophistication of online data entry portals and data management systems (e.g. eBird). The PFSS will maximize these capabilities in order to maintain an efficient, sustainable, but still effective monitoring program. Linking these existing monitoring programs across the CA LCC is an essential step to understanding the potential impacts of climate change and helping to develop adaptation strategies for Pacific Flyway shorebirds.

#### **ACKNOWLEDGMENTS**

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#### **LITERATURE CITED**

Page, G. W., L. E. Stenzel, and J. E. Kjelson. 1999. Overview of shorebird abundance and distribution in wetlands of the Pacific coast of the contiguous United States. *Condor* 101:461-471.

**Table 1:** Summary of existing shorebird monitoring programs in the Central Valley of California. Continued across on next page →

Region	Survey ID/Location	Stratum	Habitat
Interior	1 - Sacramento NWR	Sacramento Valley	wetlands
	2 - Delevan NWR	Sacramento Valley	wetlands
	3 - Colusa NWR	Sacramento Valley	wetlands
	4 - Sutter NWR	Sacramento Valley	wetlands
	5 - Butte Sink WMA (Butte Sink Unit)	Sacramento Valley	wetlands
	6 - North Central Valley WMA (Llano Seco Unit)	Sacramento Valley	wetlands
	7 - Sacramento Regional County Sanitation Bufferlands	Sacramento Valley	wetlands, ponds
	8 - Los Banos Wildlife Area (including Mud Slough Unit)	San Joaquin Valley	wetlands
	9 - Volta WA	San Joaquin Valley	wetlands
	10 - N Grasslands WA (Salt Slough Unit and China Island Unit)	San Joaquin Valley	wetlands
	11 - Mendota Wildlife Management Area	San Joaquin Valley	wetlands
	12 - Cosumnes River Preserve Waterbird Counts	San Joaquin Valley	wetlands, flooded rice
	13 - San Luis NWR	San Joaquin Valley	wetlands
	14 - Merced NWR	San Joaquin Valley	wetlands
	15 - Stone Lakes NWR	San Joaquin Valley	wetlands
	16 - Westlake Farms	Tulare Basin	evaporation ponds
	17 - Lost Hills Water District	Tulare Basin	evaporation ponds
	18 - Tulare Lake Drainage District (TLDD) Evap Ponds	Tulare Basin	evaporation ponds
	19 - Kern NWR Shorebird Survey	Tulare Basin	wetlands

• → Table 1 – continued

ID	Organization	First Year	Survey Frequency	Status*	Region
1	U.S. Fish & Wildlife Service	1994	1 - 2x/mo	S, D	<b>Interior</b>
2	U.S. Fish & Wildlife Service	1994	1 - 2x/mo	S, D	
3	U.S. Fish & Wildlife Service	1994	1 - 2x/mo	S, D	
4	U.S. Fish & Wildlife Service	1994	1 - 2x/mo	S, D	
5	U.S. Fish & Wildlife Service	1994	1 - 2x/mo	S, D	
6	U.S. Fish & Wildlife Service	1994	1 - 2x/mo	S, D	
7	Sacramento Regional County Sanitation District	1994	1x/wk (winter)	S, D	
8	California Department of Fish & Game	1993	2x/mo	A	
9	California Department of Fish & Game	1993	2x/mo	A	
10	California Department of Fish & Game	1993	1x/mo	None	
11	California Department of Fish & Game	1992	1x mo (Jan & Apr)	S, D	
12	Bureau of Land Management/The Nature Conservancy	1994	2x/mo (Aug - Mar)	A, D	
13	U.S. Fish & Wildlife Service	2007	2x/mo (Sept-May)	S, D	
14	U.S. Fish & Wildlife Service	2007	2x/mo (Sept-May)	S, D	
15	U.S. Fish & Wildlife Service	2002	-	S, D	
16	Private Consultant	1993	2x/mo	None	
17	Private Consultant	1996	2x/mo	None	
18	TLDD	2003	2x/mo	S, D	
19	U.S. Fish & Wildlife Service	2005	1 - 2x/mo	S, D	

	*Status = status of partnership and contribution to program
	S = conduct surveys D = provide data A = grant access to conduct surveys None = no current engagement

**Table 2:** Summary of existing shorebird monitoring programs in coastal California. Continued across on next page →

Region	Survey ID/Location	Stratum	Habitat
Coastal	1 - Humboldt Bay	North Coast	estuary/bay
	2 - Bodega Harbor Shorebird Survey	North Coast	estuary/bay
	3 - Tomales Bay Shorebird Project	North Coast	estuary/bay
	4 - Bolinas Lagoon Waterbird Survey	North Coast	estuary/bay
	5 - South Bay Salt Pond Surveys of Cargill Managed Ponds	Central Coast	salt ponds
	6 - San Francisco Bay Shorebird Survey	Central Coast	estuary/bay
	7 - Elkhorn Slough quarterly waterbird survey	Central Coast	estuary/bay
	8 - Morro Bay Shorebird Survey – Volunteer Monitoring Program	Central Coast	estuary/bay
	9 - Lower Santa Ynez River Estuary	South Coast	estuary
	10 - Mugu Lagoon Waterbird Survey	South Coast	estuary/salt marsh
	11 - Ballona Creek	South Coast	estuary
	12 - Upper Newport Bay Monthly Survey	South Coast	estuary/bay
	13 - Buena Vista Lagoon Monthly Bird Count	South Coast	estuary/bay
	14 - Aqua Hedionda Lagoon	South Coast	estuary/bay
	15 - North San Diego County Beaches	South Coast	beach
	16 - Torrey Pines Monthly Bird Survey	South Coast	mixed habitat
	17 - Silver Strand State Beach	South Coast	beach
	18 - San Dieguito Lagoon	South Coast	estuary/bay
	19 - San Elijo Monthly Bird Count	South Coast	estuary/bay
	20 - San Diego Bay	South Coast	estuary/bay

→ Table 2 - continued

ID	Organization	First Year	Survey Frequency	*Status	Region
1	Humboldt State University (Dept. of Wildlife)	2010	1x /yr	S, D	Coastal
2	Bodega Marine Reserve -- UC Davis	1984	3x/yr	S, D	
3	Audubon Canyon Ranch	1989	8x/yr	S, D	
4	PRBO	1971	6x/yr (winter)	S, D	
5	San Francisco Bay Bird Observatory (SFBBO)	2005	1x/month	S, D	
6	PRBO, SFBBO, USGS, Audubon California	2010	1x/yr	S, D	
7	Elkhorn Slough National Estuarine Research Reserve	2003	4x/yr (quarterly)	S, D	
8	Audubon CA, Morro Coast Audubon , Morro Bay National Estuary Program	1988	1x/yr	S, D	
9	PRBO, Audubon California, Purisima Audubon Chapter	2009	4x/yr (quarterly)	S, D	
10	Naval Base Ventura County	2001	1x/mo	S, D	
11	Cooper Ecological Monitoring, Inc.	2009	2x/mo	None	
12	Sea and Sage Audubon	2000	1x/mo	S, D	
13	Buena Vista Audubon Society	-	1x/mo	None	
14	Aqua Hedionda Lagoon Foundation	-	-	None	
15	California Department of Parks and Recreation	2002	1x/wk	None	
16	Torrey Pines Docents	2000	1x/mo	None	
17	California Department of Parks and Recreation	2000	1x/wk	None	
18	Friends of the San Dieguito River Valley	-	-	None	
19	San Diego County Parks Dept & San Elijo Lagoon Conservancy	2002	1x/mo	None	
20	U.S. Navy, U.S. Fish and Wildlife Service; Port of San Diego; TierraData	2006	1x/mo every 3 years	A, S, D	

*Status = status of partnership and contribution to program
S = conduct surveys
D = provide data
A = grant access to conduct surveys
None = no current engagement