

## Beyond the Bay Area

# Mapping Heronries in Coastal California

by Emiko Condeso and John Sterling

At the end of the nesting season, as packet after packet of carefully summarized observations of heron and egret behavior begin to fill the Cypress Grove Research Center mailbox, it is easy to assume that the San Francisco Bay Area is the center of the wading bird universe. Every spring, approximately 70 volunteers monitor about 60 nesting colony sites in the northern San Francisco Bay Area. A concurrent effort, coordinated by the San Francisco Bay Bird Observatory (SFBBO), gathers a similarly sized data set from the Bay Area counties south of the Golden Gate Bridge. Together, these data contribute to the Heron and Egret Project—a regional, long-term effort to monitor the distribution, abundance, and productivity of nesting herons and egrets. Data from this project form a powerful basis for conservation—to protect both our nesting wading birds and the wetlands upon which they depend.

Inventory and monitoring projects such as this one, that document population status and identify trends, are widely recognized as essential for conservation and management of natural resources. Before any threats to wildlife can be assessed, or management decisions made, the current state of the population must be known. Although the Bay Area is well established as an important area for nesting herons and egrets,

relatively little is known about heron and egret breeding distribution beyond the Bay Area to support decision-making at a larger scale. No comprehensive statewide survey or monitoring effort exists, even though it is widely recognized that many parts of California provide important habitat for wading birds.

In response to this lack of statewide data, and evidence that some colonial waterbird populations are declining (potentially at risk) while others may be increasing and causing management concerns (Cattle Egrets and Black-crowned Night-Herons prey on the nests of Tricolored Blackbirds, a top-priority Species of Special Concern in California), the United States Fish and Wildlife Service (USFWS) has initiated a survey of colonial waterbirds in 11 western states (Table 1). When complete, this effort will provide a record of active and historical (currently inactive, but previ-

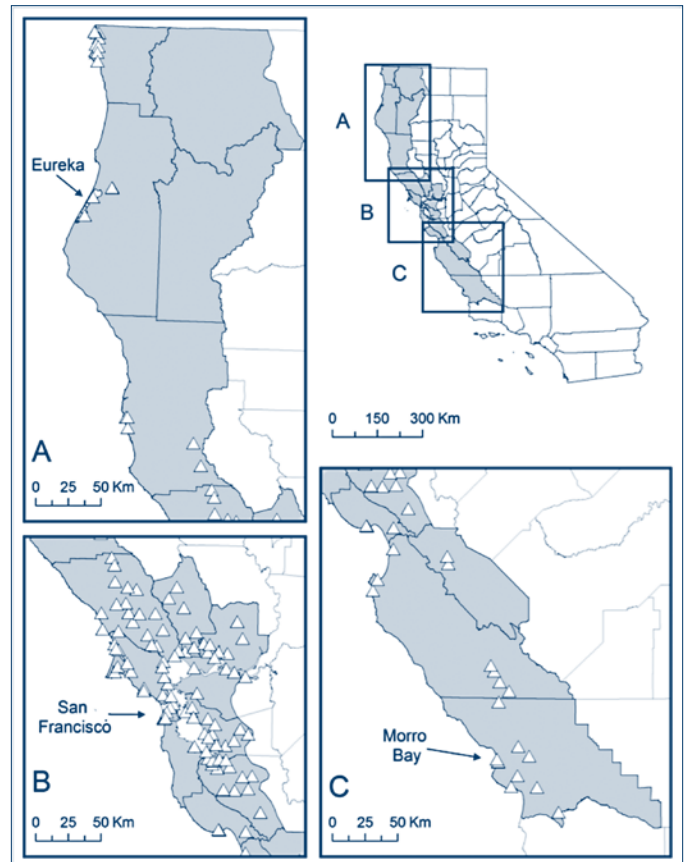
ously documented) colonies in one all-inclusive document: Coordinated Colonial Waterbird Inventory and Monitoring in the Western United States: Comprehensive Breeding Season Surveys.

The results of the colonial waterbird inventory will provide important baseline data and a basis for future monitoring to track changes in population size and distribution of colonial waterbirds in the western United States. Audubon Canyon Ranch, in collaboration with PRBO Conservation Science (PRBO), participated in this effort

**Table 1.** Focal species for the coordinated colonial waterbird inventory and monitoring in the western United States (excerpted from the United States Fish and Wildlife Service Western Colonial Waterbird Survey Protocols, 2008).

Island nesters	Tree nesters	Marsh nesters
American White Pelican	Black-crowned Night Heron	Black Tern
Double-crested Cormorant <sup>a</sup>	Great Blue Heron	Forster's Tern
Common Tern	Snowy Egret	White-faced Ibis
Caspian Tern	Great Egret	Franklin's Gull
Ring-billed Gull	Cattle Egret	
California Gull	Neotropic Cormorant	
Western Grebe		
Clark's Grebe		
Eared Grebe		

<sup>a</sup>Double-crested Cormorants are also tree nesters.



**Figure 1.** Preliminary map of active colony sites identified in the coastal survey area (shaded area) in 2011, including the northern coastal counties of Del Norte, western Siskiyou, Humboldt, Trinity, and Mendocino (inset A), the Heron and Egret Project study area (inset B), and the north-central coastal counties of Santa Cruz, Monterey, San Benito, and San Luis Obispo (inset C).

by organizing a survey focusing on Great Blue Herons, Great Egrets, Snowy Egrets, Cattle Egrets, Black-crowned Night-Herons, and Double-crested Cormorants in northern and central California. The area surveyed includes all coastal counties north of Santa Barbara County, including the San Francisco Bay Area, as well as the interior counties of the Central Valley north of Stanislaus County, excluding the Great Basin and Sierran regions of northeastern California. We report here on the results of the survey of the coastal counties, which was coordinated by ACR (Figure 1).

The surveys of nesting colonies along the northern California coast were carried out primarily by highly skilled volunteer birders under the direction of several county coordinators. We timed the surveys to coincide with the peak of breeding activity (April and May), when nest sites were most detectable. Where access was available, colonies were surveyed from land using spotting scopes and binoculars; inaccessible areas were surveyed by boat or aircraft. We excluded Double-crested Cormorant colonies on offshore rocks and on bridges from the survey, because those sites were previously documented by other studies. Volunteers prioritized search areas by first visiting previously documented sites, then searching the nearby surroundings for new sites. When active sites were identified, the observers counted and mapped the nests of each species. When nests could not be seen, observers counted the number of adult birds that were present. We compiled historical colony records from local birders, breeding bird atlases, government agencies, PRBO, and the California Natural Diversity Database. We also identified additional priority survey areas by their proximity to assumed high-quality foraging areas, such as the riparian corridors of the Eel, Russian, and Salinas rivers.

### Importance of the Bay Area

The results of this survey are preliminary at the time of this writing, as data compilation is still underway. However, so far we have identified 171 active nesting sites in the coastal survey area (Figure 1). The majority of these sites (127) were located in the San Francisco Bay Area, and all of these were already being monitored monthly by ACR and SFBBO. Outside of the San Francisco Bay Area, we detected 44 sites across eight counties. The majority of these sites were previously known or strongly suspected to exist prior to the survey.



Great Egret twig presentation during nest building.

As in the Bay Area, most of the heron and egret colonies in the northern and southern coastal areas were found in either blue gum eucalyptus (*Eucalyptus globules*) or Monterey cypress (*Cupressus macrocarpa*) trees, although in the riparian areas along the Salinas River Valley, valley oak (*Quercus lobata*) and western sycamore (*Platanus racemosa*) were common nest substrates. On coastal Prince Island near the Oregon border, birds nested in large elderberry “trees” (*Sambucus* sp.). Very few sites were found in low-growing marsh vegetation such as rushes and sedges. Throughout the coastal survey area (including the Bay Area counties), Great Blue Heron colonies were found in both riparian and estuarine areas, where birds are likely foraging in both salt marshes and freshwater wetlands. Great Egret, Snowy Egret, and Black-crowned Night-Heron colonies tended to be located near estuaries; however, several important sites were also found in inland, freshwater-influenced areas such as the Laguna de Santa Rosa in Sonoma County.

Great Blue Herons nested in all of the counties surveyed except for Trinity County, and they were most abundant in Sonoma, Solano, Marin, Napa, and Monterey counties (Table 2). Throughout the survey area, Great Blue Herons tended to nest in small colonies of fewer than 10 nests. Notable exceptions were large colonies of 28 (Contra Costa), 26 (Monterey), 23 (Sonoma), and 21 (San Mateo) nests.

We found Great Blue Heron colonies in all of the counties surveyed except for Trinity County. Unlike Great Blue Herons,

most Great Egrets nested in colonies that were larger than 10 nests, with the largest Great Egret colonies numbering 197, 110, and 108 nests each (Solano County). Snowy Egrets and Black-crowned Night-Herons were distributed similarly to Great Egrets, although they nested in fewer counties (absent from Contra Costa, Sacramento, and Santa Cruz counties). Additionally, nesting Snowy Egrets were not found in Monterey County. Notably, large Black-crowned Night-Heron and Snowy Egret colonies were found in Solano, Sonoma, Marin, Monterey, Napa, Alameda, and San Francisco counties. Cattle Egrets were found nesting only at two sites in the survey area, one in Sonoma and one in Solano County.

Double-crested Cormorants were found nesting in all counties except Contra Costa, Sacramento, Humboldt, Trinity, San Benito, and Monterey. However, cormorants that may have been nesting on offshore rocks and bridges throughout the survey area were not censused.

Preliminary results suggest that relatively few herons and egrets nest in the coastal counties north of Mendocino, compared to the rest of the survey area. However, we suspect that our estimates of nest abundance in these counties are lower than the actual number of nests, given that many potentially suitable nesting areas were difficult to access. The steep, wooded terrain in Trinity and Siskiyou counties, in particular, made surveys difficult. In addition, large amounts of late spring/early summer rainfall interfered with the survey effort, reducing the detectability of nesting birds

**Table 2.** Preliminary numbers of nesting pairs in the coastal California survey area in 2011, by county. Western Siskiyou County was not surveyed due to weather constraints.

County	Great Blue Heron	Great Egret	Snowy Egret	Cattle Egret	Black-crowned Night-Heron	Double-crested Cormorant <sup>c</sup>
<b>SF Bay Area</b>						
Sonoma	109	146	111	40	197	31
Napa	69	70	95	0	90	43
Solano	78	521	276	145	111	263
Marin	78	200	89	0	48	548
Contra Costa	28	16	0	0	0	0
Alameda	56	75	186 <sup>a</sup>	0	24 <sup>a</sup>	110
San Francisco	16	0	83	0	50	129
San Mateo	24	0	0	0	0	187
Santa Clara	31	66	27	0	44	179
Sacramento <sup>b</sup>	14	1	0	0	0	0
<b>North Coast</b>						
Del Norte	18	8	30 <sup>a</sup>	0	30	4
W. Siskiyou	–	–	–	–	–	–
Humboldt	17	111	2	0	30	0
Trinity	0	0	0	0	0	0
Mendocino	24	0	0	0	0	12
<b>South Coast</b>						
Santa Cruz	10	11	0	0	0	208
San Benito	13	0	0	0	0	0
Monterey <sup>a</sup>	72	23	0	0	92	0
San Luis Obispo	47	8	18	0	37	263

<sup>a</sup> Counts of nestlings were used to estimate number of nesting pairs at some colonies.

<sup>b</sup> Only a small fraction of Sacramento County was included in the survey.

<sup>c</sup> Double-crested Cormorants on offshore rocks and bridges were not counted.

and colonies throughout the survey area. Western Siskiyou County, in particular, was not surveyed due to constraints imposed by weather.

Colonial waterbirds, by definition, concentrate in particular places during the nesting season, and this behavior makes them vulnerable to chance events involving weather, pollution, or other disturbances, and to changes in human land use (Kushlan et al. 2002). Because of this vulnerability, information on the size and distribution of the breeding populations is critical for effective management. Like ACR's Heron and Egret Project, the USFWS Colonial Waterbird Survey will help to identify important nesting habitat for a number of species in California and help guide decisions made by land managers and conservation planners.

Future objectives of the USFWS survey include development of a monitoring program that will provide repeated estimates of breeding population size and distribution.

Such effort is important because colony sizes and locations can change dramatically between years (Kelly et al. 2007). The unseasonably wet spring of 2011, combined with the large geographic area, also made colony detection difficult, and subsequent surveys will be required to determine if the results are accurate or stable. For example, future surveys are needed to confirm whether the higher nesting densities in the nine-county Bay Area contrast as strongly with lower nesting densities along the rest of the northern California Coast as the survey results suggest.

Future work by ACR will help to elucidate regional differences in heron and egret nesting abundance, by comparing foraging habitat associations among coastal areas or between heron and egret "hotspots" such as the Sacramento Valley and San Francisco Bay (Kelly et al. 2008). With this landscape perspective on the needs of nesting herons and egrets, ACR is expanding the focus of colonial waterbird conservation from

protecting individual colonies to protecting wetlands, one of the most endangered habitats in California.

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