

1993 HERON AND EGRET MONITORING RESULTS AT WEST MARIN ISLAND

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INTRODUCTION

The sizes of nesting colonies of Great Egrets, Snowy Egrets, Black-crowned Night-Herons, and occasionally, Great Blue Herons on West Marin Island have been monitored annually by the Marin Audubon Society since 1981 (Pratt 1993, p. 99 *in* Shuford 1993, *The Marin County Breeding Bird Atlas*, Bushtit Books, Bolinas, CA, and unpubl. data). However, the nest counts have been conducted by boat and provide rough estimates at best of colony sizes because of the difficulty of observing hidden nests. Recent land-based counts on West Marin Island (Roger Hothem, USFWS, per. comm.) have generated some concerns over possible disturbance to the colonies. In 1993, as part of a regional study of heron and egret colonies in the northern San Francisco Bay area (Kelly *et al.* 1993, *Colonial Waterbirds* 16(1):18-27; Kelly 1994, ACR Project Report 90-3-4, Audubon Canyon Ranch, Stinson Beach, CA), Audubon Canyon Ranch gathered data on reproductive success of Great Egrets on West Marin Island by monitoring focal nests from observation points on East Marin Island. In this report, we present the results of 1993 monitoring efforts, and make recommendations about future monitoring of colony sizes and reproductive success of herons and egrets at West Marin Island.

METHODS

Ninety-six Great Egret nests were mapped and numbered on nesting panoramas (from photographs) and monitored with telescopes on three visits to East Marin Island and 15 observation days from the mainland. Reproductive success of Snowy Egret and Black-crowned Night-Heron nests was not monitored because of time limitations and difficulty in observing the contents of hidden nests from remote positions. Focal Great Egret nests were selected by mapping all visible nests in four main areas of the island: (1) Middle North Side, observed from the mainland; (2) Upper and (3) Lower East End of the North Side, observed from the slope above the East Marin Island landing; and (4) Upper East End, observed from the west end of East Marin Island. To allow efficient monitoring and accurate identification of numbered nests, all focal nests observed in the four main areas were mapped in contiguous blocks; therefore, results reflect the fates of nests found in the four main areas of the island, but may not accurately represent more isolated nests or nests in other areas of the island.

On each visit, the active status, nest contents, and nesting (behavioral) stage of each focal nest were recorded. The five nesting stages used to evaluate nesting chronology in the ACR's regional monitoring program are described in Table 1.

Field observers monitoring reproductive success were Binny Fischer, John P. Kelly, Helen Pratt. Transportation to East Marin Island was provided by Keith Fraser and Audubon Canyon Ranch. A

census of all active nests on West Marin Island was conducted on 1 June (see attached report). Field observers on the census were Ros Day, Binny Fischer, Helen Pratt, Barbara Salzman, and Jean Starkweather. The census boat was provided by Keith Fraser who also acted as skipper.

Table 1. Behavioral stages used to classify nests in analysis of differences in intraseasonal reproductive timing.

NESTING STAGE

- 1 Egg-laying or incubation; adult lying down in nest for long periods, standing to turn eggs, defecate, or if mate arrives
- 2 Hatching; small (downy) chicks, or feeding observed low in the nest (Watch carefully when adults stand or move.)
- 3 Chicks (usually) standing; most or all of down replaced by juvenal plumage; parent(s) continuously at the nest
- 4 Adults not continuously at nest (but may be present for some time after feeding!); chicks (usually) on nest platform
- 5 Young often off the nest, on nearby branches

Observation Days:

16 April 1993	East Marin Island reconnaissance, mapping and monitoring of focal Great Egret nests on West Marin Island
17 May 1993	Monitoring focal Great Egret nests on West Marin Island from East Marin Island
1 June 1993	West Marin Island heron and egret census by boat
7 June 1993	Monitoring focal Great Egret nests on West Marin Island from East Marin Island
3 March - 5 June 1993	15 additional observation days to monitor focal Great Egret nests visible from the mainland with a telescope

Methods are describe in detail on the attached "1993 Instructions for Field Observers," in the summary report on the 1993 heron and egret breeding season in the northern San Francisco Bay area (Kelly 1994), and in Kelly *et al.* (1993).

DISCUSSION AND RESULTS

We estimated that 98 Snowy Egret nests were active on 1 June 1993. This was the smallest number of active nests observed since 1981 (Table 2 and Pratt 1993). However, the decrease may reflect a regional decline in the northern San Francisco Bay area, from an estimated 291 nests in 1991 to 247 in 1992, to 182 in 1993 (Kelly 1994). In 1993, there was also shift in the distribution of active Snow egret nests away from West Marin Island to other colonies in the region (Table 3). The cause of the shift is not known, but repeated harassment by a Red-tailed Hawk, causing fly-ups of most of the Snowy Egrets on West Marin Island when they were in the early stages of establishing nest sites (observed on several occasions between 16 April and 14 May), may have contributed. Continued monitoring is needed to understand the dynamics of regional populations, including normal levels of annual colony size variability

Table 2. Estimated number of active nests on West Marin Island on 1 June 1993.

Area	Great Egret	Snowy Egret	Black-crowned Night-Heron
West End	1	2	11
South End	7	0	6
East End	0	9	8
North Side	112	87	16
Total	120	98	41

Table 3. Sizes of Snowy Egret colonies in 1991, 1992, and 1993, in the northern San Francisco Bay area.

Colony Site	1991	1992	1993
Brooks Island	7	5	26
Napa State Hospital	0	6	15
Picher Canyon, ACR	5	3	11
Penngrove	2	7	13
Peterson Lane	0	1	9
Red Rock	0	5	20
West Marin Island	277	220	98
Total	291	247	182

and levels of change that would indicate unusual local shifts or sources of population change.

We estimated that the pre fledging brood size of successful Great Egret nests was 1.91 (SE = 0.07, n = 54) young per nest. The probability of Great Egret nest mortality, based on 96 focal nests, was 0.08; this is lower than the estimated regional level of 0.13 (281 nests) for Great Egrets in 1993 (Kelly 1994). The overall mean productivity, based on nests with all possible outcomes was therefore approximately 1.75 young per nest. Mean stage of nesting (Table 1) among Great Egret nests was 1.05 (SE = 0.02, n = 87) on 16 April, 2.75 (SE = 0.19, n = 80) on 17 May, and 3.66 (SE = 0.10, n = 76) on 7 June.

The Black-crowned Night-Heron count increased from 30 in 1992 to 41 in 1993. However, the nest count conducted by boat provides a poor indication of colony size for Black-crowned Night-Herons because their nests are well-concealed in the vegetation. Counts conducted by boat in 1991 and 1992 were between 15% and 22% of the USFWS counts conducted on the island in those years (Roger Hothem, pers. communication). However, the boat counts may serve as a rough index of colony size. According to boat counts conducted since 1981, the number of nesting Black-crowned's appears to be holding steady (Helen Pratt 1993).

Great Blue herons did not nest on West Marin Island in 1993, although 2 nests were observed in 1991 and one nest in 1992 (John Kelly, unpubl. data). One active Black Oystercatcher nest with one adult (incubating or brooding) was observed on 2 June 1993. We searched for Pigeon Guillemots following a report of one observed in the water near the island, but none were found.

RECOMMENDATIONS FOR HERON AND EGRET MONITORING ON MARIN ISLAND

Audubon Canyon Ranch would like to continue monitoring herons and egrets on West Marin Island. We suggest a similar approach as was used in 1993, with additional effort to follow focal Snowy Egret nests, if possible. This requires a program of 4-5 visits annually to East Marin Island to monitor reproductive success, and an overall census conducted by boat during each nesting season. An additional trip to East Marin Island early in the season may be needed to obtain current photographs of the vegetation for making focal-nest panoramas.

Observations from a boat cannot provide accurate counts of nesting Black-crowned Night-Herons and Snowy Egrets because these species often conceal their nests in the vegetation. In 1990, 1991, and 1992, counts of Black-crowned Night-Heron nests conducted by boat provided colony size estimates that were only 12%, 15%, and 22%, respectively, of land-based counts (Roger Hothem, USFWS, pers. comm.). However, counts conducted by boat may provide an adequate index of colony size if the visibility bias is constant, i.e., if vegetation structure does not change significantly among years. Therefore, in 1994 we would also like to (1) conduct four independent counts from a boat during the nesting season to test the precision of annual nest counts, with estimates of variability among observers and among count days; (2) to begin an annual photomonitoring effort (from East Marin Island) to detect any changes in vegetation on West Marin Island that could influence nest counts conducted by boat; and (3) to approach the shoreline of West Marin Island by boat, without landing, to investigate the possibility of monitoring focal Black-crowned Night-Heron and Snowy Egret nests without disturbing the colonies. If feasible, we would then monitor focal Snowy Egret and Black-crowned Night-Heron nests by boat immediately before or after each visit to East Marin Island; if the potential for any nestling loss is observed, attempts to monitor focal nests by boat would be discontinued.