

**HERON AND EGRET MONITORING RESULTS
AT MARIN ISLANDS NATIONAL WILDLIFE REFUGE:
2020 and 2021 NESTING SEASONS**

A Report to the San Pablo Bay National Wildlife Refuge



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INTRODUCTION

Audubon Canyon Ranch (ACR) has been monitoring the number of nesting herons and egrets at Marin Islands since 1979, and the annual reproductive success of Great Egrets and Great Blue Herons there since 1993. The Marin Islands supported large numbers of nesting herons and egrets from at least as early as 1979 through 2015 (Table 1). In 2015, all the nesting Snowy Egrets and Black-crowned Night-Herons abandoned the site before completing the nesting cycle and there were substantially reduced numbers of Great Egrets and Great Blue Herons (Kelly and Fischer 2018). Since the 2016 season, West Marin Island has supported zero nesting herons or egrets. East Marin Island supported only small numbers of nesting Great Blue Herons between 2016-2019. Here I present my detailed observations of heron and egret nesting activity on the Marin Islands in 2020 and 2021.

METHODS

Detailed methods for monitoring the numbers of heron and egret nests and estimating reproductive success of Great Egrets and Great Blue Herons are described in Kelly et al. (2006, 2007). In 2020, I made only a single visit to Marin Islands before the COVID-19 pandemic restricted field work. In 2021 I made three visits to East Marin Island in 2019 (30 March, 5 May and 21 May). On each visit I circled the islands by boat (18-foot Boston Whaler or 13-foot kayak), using 10x binoculars to search all trees and shrubs for evidence of nesting herons and egrets. On each visit (except 21 May 2021) I also landed on East Marin Island to conduct further searches. I followed biosecurity protocols for every landing on East Marin Island, using the provided spray bottle and boot brush at the dock to clean footwear and telescope tripod feet. I also searched all appropriate habitat for nesting Black Oystercatchers and counted the number of nesting Western Gulls (almost exclusively on West Marin Is.) from the boat and while on East Marin Island.

RESULTS AND DISCUSSION

In both 2020 and 2021, there were no observed nesting attempts by herons and egrets on West Marin Island. On East Marin Island on the single visit in 2020 (10 March), I observed Great Blue Herons occupying two nest platforms but did not observe evidence of active nesting. Another three Great Blue Herons were roosting in trees. From the information I was able to gather, it is unclear whether Great Blue Herons actively nested on East Marin Island in 2020. In 2021, I did not observe any Ardeid species on East Marin Island while I was ashore. However, as I was departing the island on 30 March two Great Blue Herons arrived from the southwest and landed in trees that had active nests in previous years. To avoid potential disturbance during the nest initiation period, I did not return to Marin Islands until May. On both May visits I observed no evidence of Ardeid nesting activity, although a Great Blue Heron was observed foraging along the shore of East Marin Island on 4 May and a Black-crowned Night-heron was observed in the low vegetation near shore on the north side of East Marin Island on 21 May.

Table 1. Annual number of active heron and egret nests on East and West Marin Islands based on early-June counts conducted by boat and from East Marin Island, 1979-2019.

Year	Great Egret	Snowy Egret	Black-crowned Night-heron	Great Blue Heron
1979	58	262	98	0
1981	75	325	109	0
1982	187	500	80	0
1983	190	345	89	0
1984	139	347	54	0
1985	84	161	79	0
1986	160	126	40	0
1987	89	239	41	0
1988	77	212	35	0
1989	79	245	61	0
1990	119	300	37	1
1991	90	277	45	2
1992	189	220	30	1
1993	120	98	41	0
1994	163	8	32	2
1995	172	16	18	2
1996	148	36	22	3
1997	167	119	24	5
1998	155	117	53	7
1999	101	84	47	8
2000	134	156	50	9
2001	94	217	26	7

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2002	121	204	64	7
2003	81	103	51	10
2004	83	59	29	12
2005	161	91	44	12
2006	126	116	41	9
2007	60	43	21	10
2008	52	132	40	6
2009	64	175	63	9
2010	64	102	31	8
2011	61	89	48	10
2012	53	121	26	8
2013	42	59	11	10
2014	36	94	26	6
2015	26	0	0	5
2016	0	0	0	1
2017	0	0	0	4
2018	0	0	0	8
2019	0	0	0	4
2020*	Unk	Unk	Unk	Unk
2021	0	0	0	0

* Incomplete surveys in 2020 prevented confirmation of nesting activity.

Disturbance and Colony abandonment

As in previous years, I suspect but could not confirm that pair of Common Ravens was nesting on East Marin Island in 2021. As noted in previous reports (e.g. Kelly and Fischer 2018), the occasional, opportunistic predation of heron and egret nests by ravens is unlikely the primary cause of the widespread nest failure and abandonment observed in 2016. In 2021 I observed no evidence that ravens disturbed Great Blue Heron nesting attempts.

Also as noted in previous reports e.g., Jennings 2020), there appears to be regular human presence near and perhaps on both islands. I observe recreational boaters, including people fishing, within 200 m of the islands in 2020 and 2021, though I have yet to directly observe anyone land on either island.

I lack conclusive evidence suggesting a cause for Great Blue Herons to cease nesting at East Marin Island. Many factors are known to impact colony occupancy by herons and egrets, including changes in habitat quality and disturbances at multiple scales (Kelly et al. 2018). However, without direct observation it remains difficult to conclude the reason a particular colony was abandoned. It is known that herons and egrets, along with other colonial nesting birds, display variable dynamics in colony occupancy at landscape scales, with colonies in a region “blinking in and out” through time as resources and ecological conditions fluctuate (e.g.,

Martínez-Abraín et al. 2003, Mashiko and Toquenaga 2018). On 21 May 2021 our survey of known and likely colony locations throughout the central San Francisco Bay revealed evidence of Great Blue Heron nesting in 2 locations that had not been used for nesting for at least 5 years. It could be that these were birds that had nested at East Marin Island in recent years but moved in either 2020 or 2021.

Other bird species

While monitoring the heron and egret colonies at the Marin Islands, I opportunistically observed the presence of other bird species, on or within 100 m of the Marin Islands (Table 2). The main difference in the East Marin Island avifauna community in 2021 from previous years was an increase in the number of Canada Geese on the island. On 4 May I observed 20 Canada Geese on or within 200 feet of the island and observed evidence of at least 4 active nests.

I detected no evidence of Black Oystercatcher nesting on West or East Marin Island in 2020 or 2021, however the timing of my visits may have missed such activity. Although the timing of my surveys may have missed Western Gull nesting activity, there appeared to be $< \frac{1}{2}$ the active nests (≤ 10) along the grassy south- and west-facing slopes of West Marin Island as I have observed in prior years. Among passerines, I observed direct or indirect evidence that Anna's Hummingbird, Rufous/Allen's Hummingbird, House Finch, Song Sparrow, Bushtit and Bewick's Wren were nesting on East Marin Island in 2021.

Table 2. Bird species observed on or within 100 m of the Marin Islands in 2021.

Species	30 Mar	4 May
Canada Goose	x	x
Mallard	x	x
Greater/Lesser Scaup	x	x
Bufflehead	x	
Mourning Dove	x	
Anna's Hummingbird	x	x
Rufous/Allen's Hummingbird	x	
Black Oystercatcher	x	x
Western Gull	x	x
Common Raven	x	x
Violet-green Swallow	x	x
House Finch	x	x
Golden-crowned Sparrow	x	
Song Sparrow	x	x
Greater Scaup		x
Common Goldeneye		x
Allen's Hummingbird		x
Spotted Sandpiper		x
Caspian Tern		x
Great Egret		x
Snowy Egret		x
Bushtit		x
Bewick's Wren		x
gull sp.		x
Double-crested Cormorant		x
American Crow		x

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