

2016 MONITORING RESULTS FROM THE DESILVA ISLAND HERONRY

A report to the DeSilva Island Home Owners' Association



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INTRODUCTION

The Great Blue Heron nesting colony at DeSilva Island, in Marin County, California, is one of many colony sites that are monitored by Audubon Canyon Ranch (ACR) as part of its Heron and Egret Project. The Project was initiated in 1990 and reflects an ongoing effort to monitor the status of colonially nesting herons and egrets throughout five counties in the northern San Francisco Bay region. The primary goal of the Heron and Egret Project is to develop and apply current and historical information on status of herons and egrets to wetland conservation concerns in the San Francisco Bay area. Specifically, the project focuses on monitoring local and regional trends in nesting abundance and reproductive performance (Kelly et al. 2006, 2007). A brief summary of colony site locations and results is posted online at <http://www.egret.org/googleearthheronries>.

The heronry at DeSilva Island is one of several colony sites in Marin County and is known to have supported nesting herons and egrets since 1979 (Pratt 1983, Kelly et al. 2006). The trees used for nesting are blue gum eucalyptus (*Eucalyptus globulus*) and are located along the southern waterfront of the DeSilva Island town homes complex.

METHODS

ACR staff and trained volunteers use binoculars and spotting scopes to monitor nesting activities from vantage points along Seminary Drive south of the colony site and from locations on DeSilva Island near the nesting trees. Each year, a colony map or “panorama” is created to document the locations of individual nests. The data recorded include: (1) the number of active nests, (2) reproductive success (nest survival rates and the number of chicks fledged from

successful nests), (3) the nesting stage (a measure of seasonal timing), and (4) any observed disturbances or potential predators observed or inferred in the vicinity of the nesting site.

Reproductive success in heronries includes outcomes that reflect two different sets of ecological effects (Kelly et al. 2007). First, nest survivorship (percent of nests that fledge at least one young) is primarily related to disturbance and nest predation. Second, the number of young fledged in successful nests is primarily related to the availability of food in surrounding feeding areas, which is needed to provision nestlings. The number of successful nests in the colony is estimated as the number of Great Blue Heron nests with one or more young that reach the minimum fledging age of eight weeks. The number of young fledged in successful nests is estimated from the “prefledging brood size,” based on nests with young at least five-to-eight weeks of age post-hatch.

We do not attempt to measure the timing of initial occupation of the heronry at the onset of the nesting season. However, to evaluate the intraseasonal timing of nesting activity, we measure the proportions of nests in the parental guardian period (egg laying, incubation, or young generally less than three-to-four weeks of age) and post-guardian period (nests not continuously guarded by parents, young generally greater than three-to-four weeks of age). A detailed account of the monitoring methods is available in Kelly et al. (2006, 2007). Results are reported as means or percentages \pm standard errors (SE).

RESULTS AND DISCUSSION

Nest locations

In 2016, we monitored Great Blue Heron nesting activity at the DeSilva Island Heronry approximately weekly from 22 January through 29 June (29 visits, for a total of 36.25 volunteer hours in the field). The locations of nest sites active in 2016 were documented on panoramic photographs of the colony site (Figure 1). The spatial extent of nesting activity remains limited to nesting trees along the southern shore of DeSilva Island. No Great Egrets nested at DeSilva in 2016. The only record of nesting Great Egrets at DeSilva occurred in 1995 when there were three recorded nest attempts.

Active nests

In 2016, herons were first observed occupying nest sites in the colony on 22 January and the first active nest was observed on 8 February. Peak colony size at the DeSilva Island Heronry was 12 active Great Blue Heron nests, recorded on 14 March. This represents a slight increase in the peak number of active nests since 2015 (Figure 2, Table 1). Nest numbers at DeSilva Island have been

relatively stable over the last several years, though at a lower level than in the first years of monitoring. The long-term average colony size for this site is 12.37 ± 0.40 nests ($n = 27$ years). The number of active nests in heron and egret colonies is normally dynamic among years as environmental conditions and regional population sizes fluctuate (Kelly et al. 2007). However, the relatively stable size of the DeSilva colony throughout our monitoring effort suggests that the suitability of environmental conditions at the colony site and in the surrounding wetlands have also remained stable.

Reproductive success

In 2016, all but one nest were observed early enough to track nest survivorship. Observations of these focal nests indicated that $91 \pm 8.67\%$ ($n = 11$) of nests survived to fledge at least one young. This is the same as observed in 2015 (Figure 3, Table 1). The single nest that failed apparently did so in late-March. Nesting failures in heronries often reflect the impacts of predation or disturbance (such as caused by weather events or human activity). Although Common Ravens were seen in the colony trees in 2016, no interactions between avian predators and herons were noted by observers.

The number of young fledged from successful heron and egret nests is sensitive to the availability of food in surrounding feeding areas (Kelly et al, 2007). In 2016, 2.09 ± 0.16 ($n = 11$) young were produced, on average, in successful nests, based on clearly observed broods. This average is slightly lower than that observed in 2015 (Figure 4, Table 1) and the long term average of 2.3 ± 0.07 ($n = 27$).

Seasonal timing

On 2 May, 2016, $81.82 \pm 11.63\%$ of nests sampled ($n = 11$) in the colony had reached the postguardian stage, meaning most of the nests had chicks mature enough to be left unattended by both parents for short periods. The timing of nesting was very close to that observed in 2015, even though the first observed nest attempt in 2016 occurred about a month later than the first observed attempt in 2015. However, in both 2015 and 2016 nesting phenology had progressed further by early May than predicted by the long term average for this index of timing ($38.4 \pm 6.4\%$; $n = 25$). Historically, the timing of nesting varies considerably and is likely related to weather patterns or other factors that affect not only the conditions in the nesting colony, but also the availability of food in surrounding wetlands. The relatively early progression of nesting in 2015 and 2016 when compared to some years (e.g. 2014) may be related to the lack of any substantial rainfall in winter and spring.

Disturbance

We found no evidence of colony site disturbances by predators in 2016, though Common Ravens were observed near the nest trees, and observers indicated a pair was nesting within 100 m of the herons' nest trees. No predation or other interactions between other avian predators and herons was observed in 2016.

Early in February of 2016, Double-crested Cormorants were observed roosting in the heron nest trees and occupying nest platforms. Although all nest sites were eventually claimed by Great Blue Herons, cormorants continued to roost in the trees throughout the season. As a result, the amount and type of guano present at the heronry has changed. There were no indications that this disturbed the nesting Great Blue Herons.

Conclusions

This was a relatively successful nesting year at the DeSilva Island heronry. We found no direct evidence of disturbance by potential nest predators or humans. The timing of nesting was very similar to the previous year, though the colony was very slightly larger. The nesting herons exhibited no change in nest survival, and showed only a slight decline in average number of young produced in successful nests compared to nesting activity in 2015.

ACKNOWLEDGEMENTS

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ABOUT AUDUBON CANYON RANCH

Audubon Canyon Ranch is a non-profit scientific research, environmental education, and land preservation organization. Audubon Canyon Ranch properties include the Cypress Grove Research Center on Tomales Bay, the 535-acre Bouverie Preserve in Sonoma, 3,000 acres of protected lands at the Modini Mayacamas preserves in northern Sonoma County, and the 1,000-acre Martin Griffin Preserve in Stinson Beach, which was home to one of the San Francisco Bay Area's most significant and most studied Great Egret and Great Blue Heron nesting sites.

Audubon Canyon Ranch's mission is to protect the natural resources of its sanctuaries while fostering an understanding and appreciation of these environments. We conduct research and restoration that advances conservation science, educates adults and children, and promotes ecological literacy that is grounded in direct experience. ACR's vision is for all adults and children to feel a strong connection with the wonder and beauty of the natural world. We are working to support the development of a region-wide community of people who share a commitment to restore and preserve the natural environment.

Table 1. Annual Great Blue Heron colony size (peak number of active nests), percent nest survivorship (percent of nests that fledged at least one young), prefledging brood size, and percent of nests that reached the post-guardian period in early May (on or near 29 April – 1 May) at the DeSilva Island Heronry, Marin County, California (SE = standard error; n = sample size; * indicates data were not available).

Year	Colony Size	Percent nest survivorship \pm SE (n)	Prefledging brood size \pm SE (n)	Percent nests in post-guardian period \pm SE (n)
1990	8	*	2.2 \pm 0.15 (6)	*
1991	9	89 \pm 10.5 (9)	2.1 \pm 0.31 (7)	*
1992	12	75 \pm 12.5 (12)	2.8 \pm 0.24 (7)	0 \pm 0.0 (9)
1993	13	77 \pm 11.7 (13)	2.3 \pm 0.29 (8)	67 \pm 15.7 (9)
1994	15	100 \pm 0.0 (15)	2.0 \pm 0.26 (11)	57 \pm 13.2 (14)
1995	16	81 \pm 9.8 (16)	1.9 \pm 0.26 (10)	0 \pm 0.0 (14)
1996	15	73 \pm 11.4 (15)	2.4 \pm 0.14 (12)	31 \pm 12.8 (13)
1997	13	92 \pm 7.4 (13)	2.5 \pm 0.19 (12)	23 \pm 11.7 (13)
1998	15	93 \pm 6.9 (15)	2.1 \pm 0.2 (13)	0 \pm 0.0 (15)
1999	13	92 \pm 7.4 (13)	2.9 \pm 0.14 (12)	0 \pm 0.0 (11)
2000	13	69 \pm 12.8 (13)	2.3 \pm 0.23 (11)	23 \pm 11.7 (13)
2001	12	67 \pm 13.6 (12)	3.3 \pm 0.34 (8)	27 \pm 13.4 (11)
2002	13	77 \pm 11.7 (13)	2.7 \pm 0.16 (14)	42 \pm 14.2 (12)
2003	14	71 \pm 12.1 (14)	2.0 \pm 0.22 (9)	45 \pm 15.0 (11)
2004	13	83 \pm 10.8 (13)	2.8 \pm 0.14 (9)	90 \pm 9.5 (10)
2005	16	73 \pm 11.4 (16)	2.4 \pm 0.19 (14)	93 \pm 6.9 (14)
2006	14	29 \pm 12.1 (14)	2.2 \pm 0.14 (9)	0 \pm 0.0 (8)
2007	12	83 \pm 10.8 (12)	2.5 \pm 0.16 (10)	18 \pm 11.6 (11)
2008	11	73 \pm 13.4 (11)	1.9 \pm 0.28 (8)	11 \pm 10.5 (9)
2009	10	67 \pm 15.7 (10)	2.1 \pm 0.13 (7)	0 \pm 0.0 (8)
2010	10	70 \pm 14.5 (10)	2.2 \pm 0.14 (9)	75 \pm 15.3 (8)
2011	13	62 \pm 13.5 (13)	1.9 \pm 0.19 (9)	22 \pm 13.9 (9)
2012	11	64 \pm 14.5 (11)	1.6 \pm 0.22 (5)	43 \pm 18.7 (7)
2013	10	80 \pm 12.65 (10)	2.4 \pm 0.21 (10)	90 \pm 9.49 (10)
2014	10	90 \pm 9.49 (10)	2.6 \pm 0.15 (10)	80 \pm 12.6 (10)
2015	11	91 \pm 8.67 (11)	2.7 \pm 0.14 (10)	80 \pm 12.7 (10)
2016	12	91 \pm 8.67 (11)	2.1 \pm 0.16 (11)	82 \pm 11.6 (11)



Figure 1. Photographic panoramas showing locations of active nest sites at the DeSilva Island Heronry, Marin County, California, 2016.

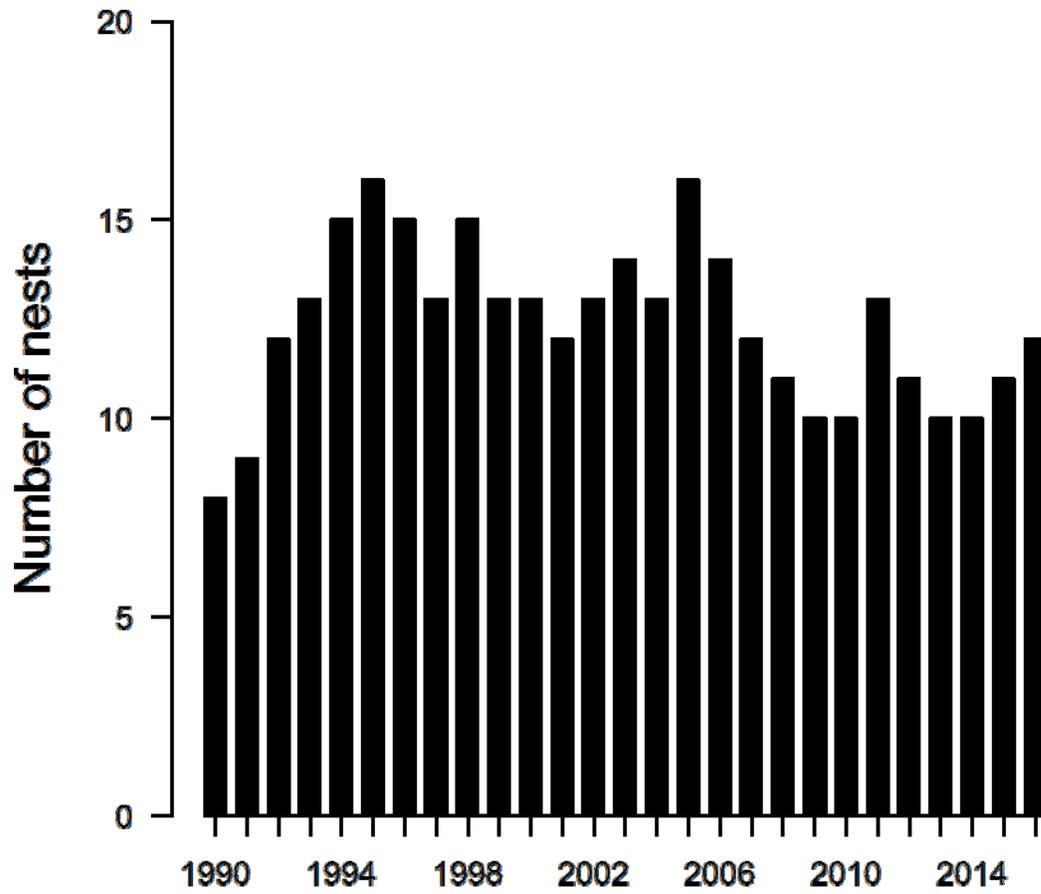


Figure 2. Annual Great Blue Heron colony size (peak number of active nests) at the DeSilva Island Heronry, Marin County, California.

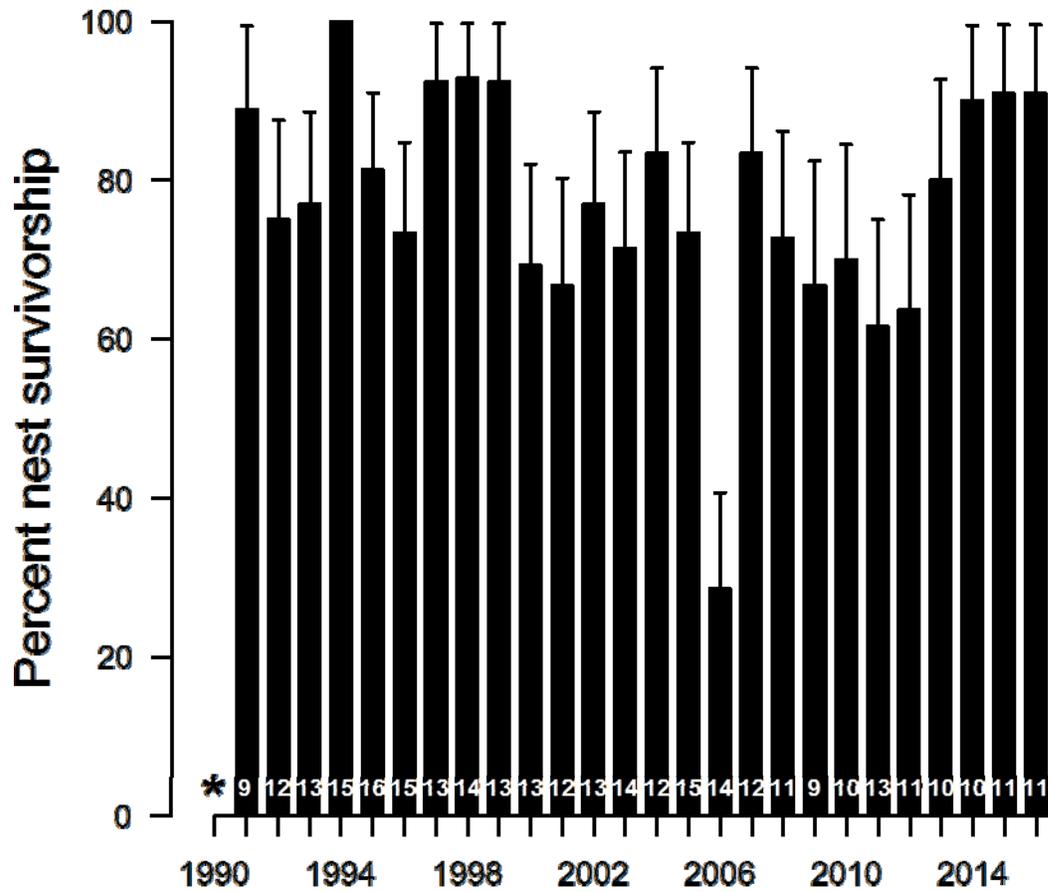


Figure 3. Annual percent nest survivorship \pm standard error of Great Blue Herons at the DeSilva Island Heronry, Marin County, California (labels on bars indicate sample size; * indicates nest survivorship data were not available).

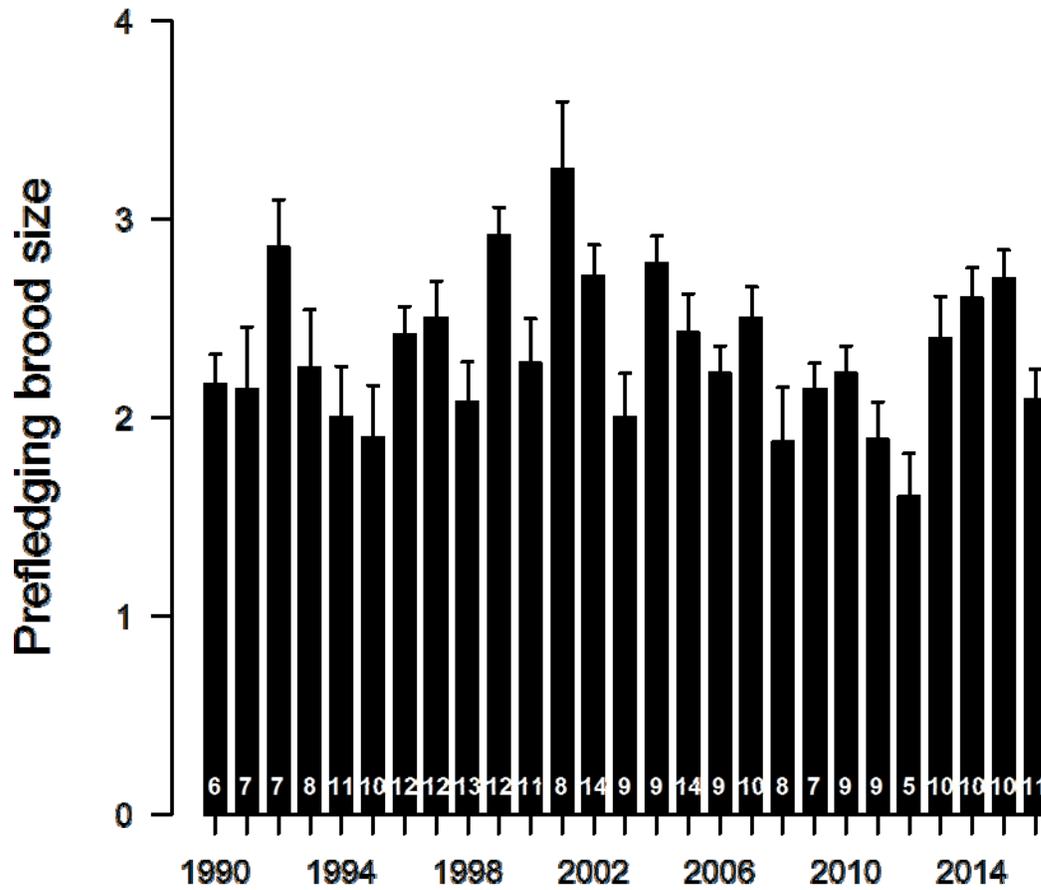


Figure 4. Annual prefledging brood size \pm standard error of Great Blue Herons at the DeSilva Island Heronry, Marin County, California (labels on bars indicate sample size).

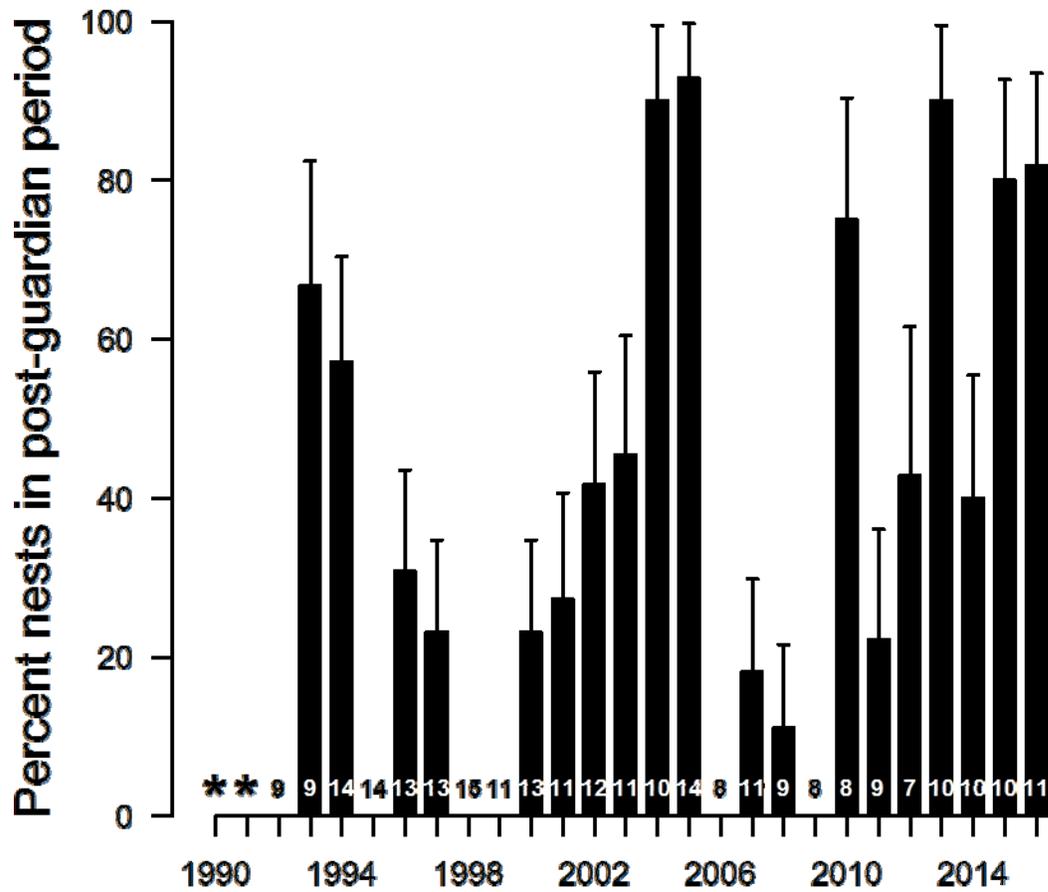


Figure 5. Annual percent of Great Blue Heron nests \pm standard error that reached the post-guardian period in early May (on or near 6-8 May) at the DeSilva Island Heronry, Marin County, California (labels on bars indicate sample size; * indicates stage data were not available).