2013 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 North Bay 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 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.

Our estimates of reproductive performance at DeSilva Island are highly precise because most or all of the nests are closely monitored each year (Table 1). The level of certainty achieved in our observations is actually higher than suggested by the standard errors in this report, which account for the possibility of different results if different individuals from the regional population had chosen to nest at DeSilva Island. We consider this approach to be more appropriate for detecting significant differences in nesting performance across years.

We do not attempt to measure the intraseasonal timing of the 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, 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 ± standard errors (SE).

RESULTS AND DISCUSSION

Nest locations

In 2013, we monitored Great Blue Heron nesting activity at the DeSilva Island Heronry approximately weekly from 19 January through 21 July (35 visits, for a total of 71.25 volunteer hours in the field). The locations of nest sites active in 2013 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

2013. The only record of nesting Great Egrets at DeSilva occurred in 1995 when there were three recorded nest attempts.

Active nests

The number of active nests in heron and egret colonies is normally dynamic among years, sometimes revealing large year-to-year changes in nesting abundance (Kelly et al. 2007). In 2013, peak colony size at the DeSilva Island Heronry was 10 active Great Blue Heron nests, recorded on 29 January. This peak was earlier than in 2012 (which occurred in March) and represents a slight decrease in the peak number of active nests since 2012 (Figure 2, Table 1).

Reproductive success

In 2013, all nests were in locations that were visible enough to track nest survivorship. Observations of these nests indicated that 80 ± 12.65% (n = 10, all nests sampled) of nests survived to fledge at least one young. This represents an increase from what we observed 2012 (Figure 3, Table 1). Nesting failures in heronries often reflect the impacts of predation or disturbance (such as caused by weather events or human activity). Although Common Ravens and other nest predators were seen in the colony trees, no interactions between avian predators and herons were observed. However, two nest failures were recorded that may have been associated with damage related to high winds (see Disturbance).

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 2013, 2.4 ± 0.21 (n = 10) young were produced, on average, in successful nests, based on clearly observed broods. This rate represents an increase in brood size since the dip in 2012 (Figure 4, Table 1).

Intraseasonal timing

On 3 May, 2013, 90 ± 9.49% of nests sampled (n = 10) in the colony had reached the postguardian stage. Therefore, nesting occurred earlier in the season, on average, in 2013 than in 2012 (Figure 5). 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. Therefore, the relatively early nesting in 2013 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 2013, though Common Ravens and a Red Shouldered Hawk were both observed near the nest trees. No predation or other

interactions between avian predators and herons was observed in 2013. Observers did document two nest failures after a wind storm. Each of these nest failures was associated with an apparently damaged nest platform, and the birds at these locations were repeatedly observed nest building after the wind storm. Therefore it seems reasonable that the two nest failures observed in 2013 may have been caused by wind disturbance.

Conclusions

Although nest numbers were slightly lower in 2013 than in 2011 or 2012, 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, and the nesting herons exhibited increases in nest survival and the number of young produced in successful nests.

ACKNOWLEDGEMENTS

We would like to thank Madelon Halpern, a dedicated volunteer observer who spends many hours each year documenting activity at the DeSilva Island heronry. In 2013 she was assisted by Ann Taylor and Ron Mallory whom we also thank for their efforts.

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ABOUT AUDUBON CANYON RANCH

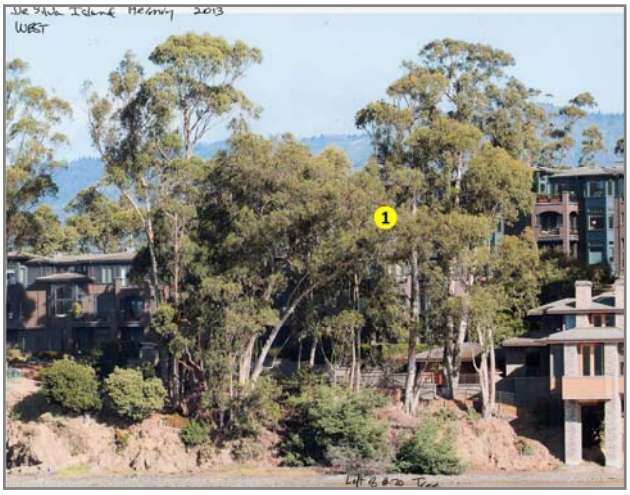
Audubon Canyon Ranch is a non-profit scientific research, environmental education, and land preservation organization. Audubon Canyon Ranch properties include the Cypress Grove Research Center on Tomales Bay, the 535-acre Bouverie Preserve in Sonoma and the 1,000-acre

Martin Griffin Preserve in Stinson Beach, which is home to one of the San Francisco Bay Area's most significant and most studied Great Egret and Great Blue Heron nesting sites.

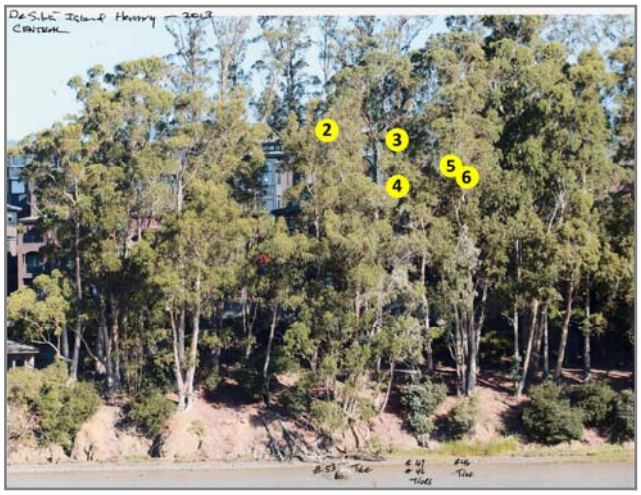
Audubon Canyon Ranch’s mission is to protect the natural resources of its sanctuaries while fostering an understanding and appreciation of these environments. We conduct research and restoration that advances conservation science, educates adults and children, and promotes ecological literacy that is 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 6-8 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 ± SE (*n*)	Prefledging brood size± SE (*n*)	Percent nests in post-guardian period ± SE (*n*)
1990	8	*	2.2 ± 0.15 (6)	*
1991	9	89 ± 10.5 (9)	2.1 ± 0.31 (7)	*
1992	12	75 ± 12.5 (12)	2.8 ± 0.24 (7)	0 ± 0.0 (9)
1993	13	77 ± 11.7 (13)	2.3 ± 0.29 (8)	67 ± 15.7 (9)
1994	15	100 ± 0.0 (15)	2.0 ± 0.26 (11)	57 ± 13.2 (14)
1995	16	81 ± 9.8 (16)	1.9 ± 0.26 (10)	0 ± 0.0 (14)
1996	15	73 ± 11.4 (15)	2.4 ± 0.14 (12)	31 ± 12.8 (13)
1997	13	92 ± 7.4 (13)	2.5 ± 0.19 (12)	23 ± 11.7 (13)
1998	15	93 ± 6.9 (15)	2.1 ± 0.2 (13)	0 ± 0.0 (15)
1999	13	92 ± 7.4 (13)	2.9 ± 0.14 (12)	0 ± 0.0 (11)
2000	13	69 ± 12.8 (13)	2.3 ± 0.23 (11)	23 ± 11.7 (13)
2001	12	67 ± 13.6 (12)	3.3 ± 0.34 (8)	27 ± 13.4 (11)
2002	13	77± 11.7 (13)	2.7 ± 0.16 (14)	42 ± 14.2 (12)
2003	14	71 ± 12.1 (14)	2.0 ± 0.22 (9)	45 ± 15.0 (11)
2004	13	83 ± 10.8 (13)	2.8 ± 0.14 (9)	90 ± 9.5 (10)
2005	16	73 ± 11.4 (16)	2.4 ± 0.19 (14)	93 ± 6.9 (14)
2006	14	29 ± 12.1 (14)	2.2 ± 0.14 (9)	0 ± 0.0 (8)
2007	12	83 ± 10.8 (12)	2.5 ± 0.16 (10)	18 ± 11.6 (11)
2008	11	73 ± 13.4 (11)	1.9 ± 0.28 (8)	11 ± 10.5 (9)
2009	10	67 ± 15.7 (10)	2.1 ± 0.13 (7)	0 ± 0.0 (8)
2010	10	70 ± 14.5 (10)	2.2 ± 0.14 (9)	75 ± 15.3 (8)
2011	13	62 ± 13.5 (13)	1.9 ± 0.19 (9)	22 ± 13.9 (9)
2012	11	64 ± 14.5 (11)	1.6 ± 0.22 (5)	43 ± 18.7 (7)
2013	10	80 ±12.65 (10)	2.4 ± 0.21 (10)	90 ± 9.49 (10)



West end of colony



Colony center

East end of colony

Figure 1. A photographic panoramas showing locations of active nest sites at the DeSilva Island Heronry, Marin County, California, 2013.

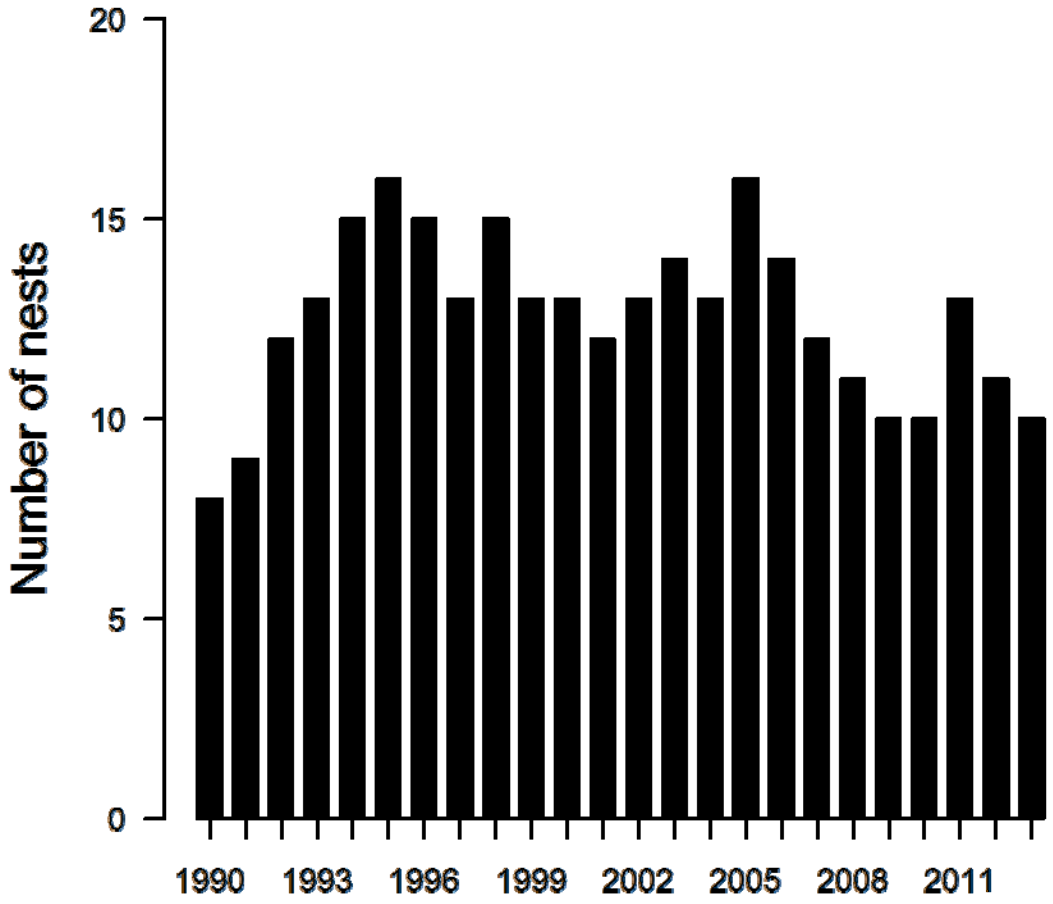


Figure 2. Annual Great Blue Heron colony size (peak number of active nests) at the DeSilva Island Heronry, Marin County, California.

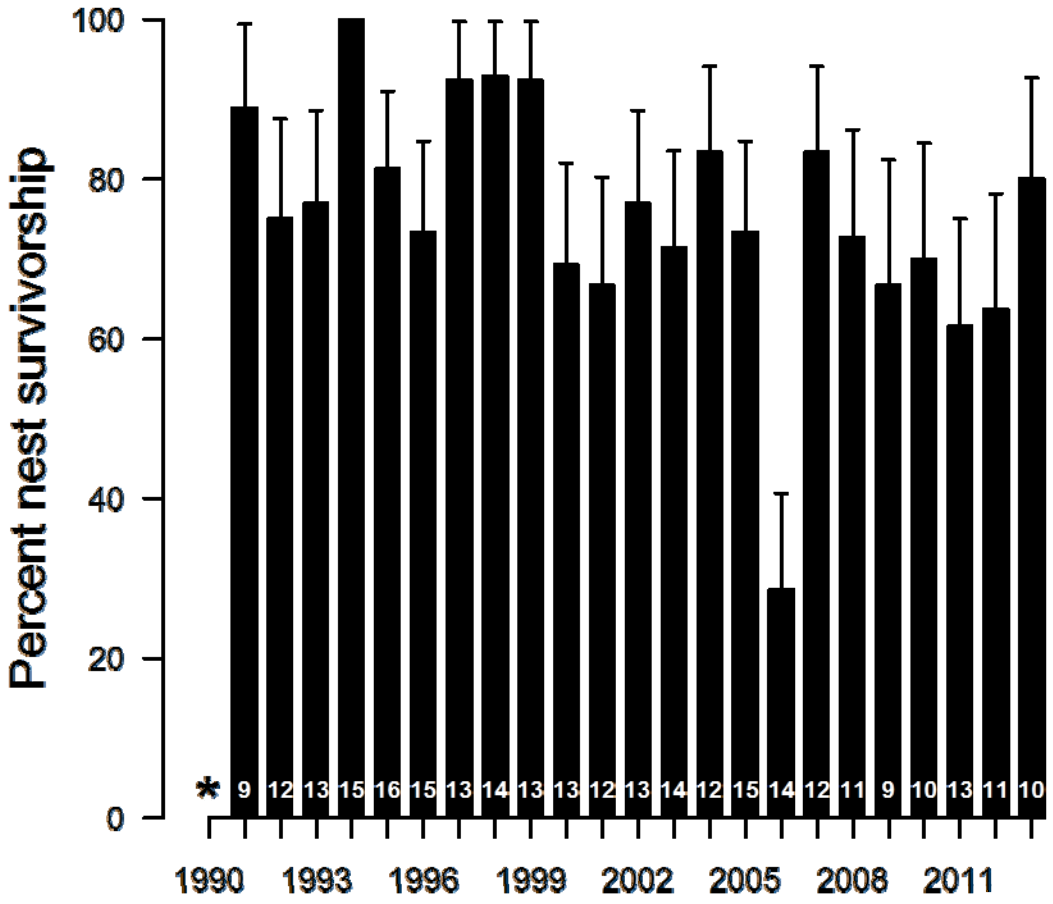


Figure 3. Annual percent nest survivorship ± standard error of Great Blue Herons at the DeSilva Island Heronry, Marin County, California (labels on bars indicate sample size; * indicates nest survivorship data were not available).

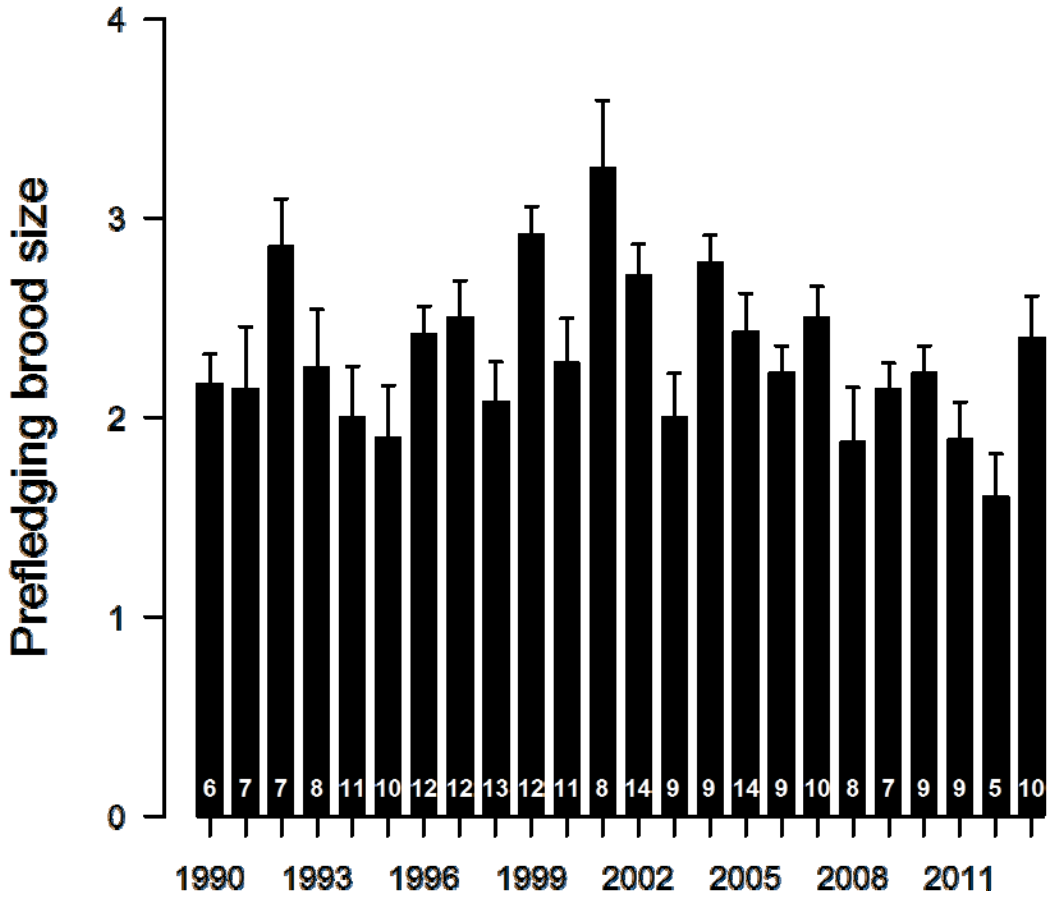


Figure 4. Annual prefledging brood size ± standard error of Great Blue Herons at the DeSilva Island Heronry, Marin County, California (labels on bars indicate sample size).

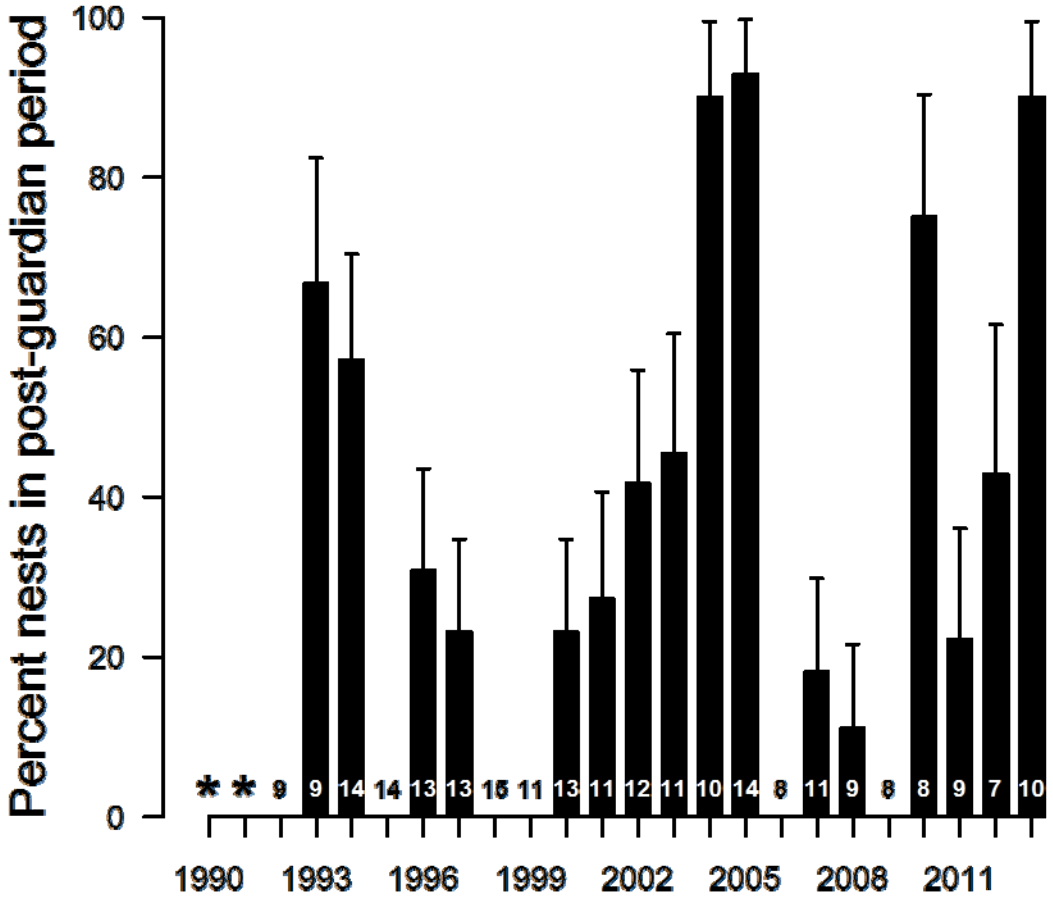


Figure 5. Annual percent of Great Blue Heron nests ± standard error that reached the post-guardian period in early May (on or near 6-8 May) at the DeSilva Island Heronry, Marin County, California (labels on bars indicate sample size; * indicates stage data were not available).