

CALIFORNIA BROWN PELICAN NESTING ON ISLA ALCATRAZ, SONORA, MEXICO

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Numbers of the California Brown Pelican (*Pelecanus occidentalis californicus*) off southern California declined precipitously during the 1960s (Schreiber and Delong 1969, Gress and Anderson 1983). With the decline in dichlorodiphenyldichloroethane (DDT) in the marine food chain along with efforts to preserve key habitat, Brown Pelican populations in southern California have increased (Shields 2002). Although patterns of attendance at each colony vary greatly from year to year, breeding populations farther south along the west coast of Baja California and in the Gulf of California have remained fairly stable (Everett and Anderson 1991, D. W. Anderson pers. comm.). In 2004 Brown Pelicans formed a small nesting colony on Isla Alcatraz, a small island located 1.4 km off the coastal town of Bahía de Kino Viejo in Sonora, México (28° 49' N, 111° 55' W). I monitored this colony throughout the 2006 breeding season to determine if it had expanded or declined in comparison to previous estimates of numbers of active nests. I also tried to determine the fledgling success of the colony by monitoring 40 focal nests from early in the season in January to when nests were abandoned in May. Given its small size, short distance from a major human settlement, and high biodiversity, Isla Alcatraz should be considered an important site for research and conservation.

Most previous research on Isla Alcatraz has been undertaken by Prescott College A.C. (PC), a biological field station in the nearby town of Kino Nuevo. The island has an area of 1.44 km² and comprises four basic habitats: sandy beach, rocky beach, salt flats, and rocky cliffs. Halophytic vegetation, mostly Iodine Bush (*Allenrolfea occidentalis*) and Desert Wolfberry (*Lycium* spp.), grows on the salt flats, while Cardón cacti (*Pachycereus pringlei*) can be found in the flats and at higher elevations (PC unpubl. data). A large colony of Double-crested Cormorants (*Phalacrocorax auritus*) nests on the island from September to March/April, representing an estimated 28–43% of this species' population in the Gulf of California and 5–8% of the population on the entire Pacific coast (Pfister et al. 2005). Eight species of wading birds and the Yellow-footed Gull (*Larus livens*), endemic to the Gulf of California, also nest on the island. While Brown Pelicans have always used Isla Alcatraz as a roosting site, no nesting was recorded there until 2004, when 115 nests were active (PC unpubl. data). No data on reproductive success are available for 2004 or 2005.

The colony was active from December 2005 through May 2006 and was located on the lower elevations of the rocky cliff zone and on a small part of the salt flats closest to the base of the cliffs. Nests were constructed of sticks and branches and placed either on the ground or in a shrub.

I counted all active nests, and recorded activity at 38 focal nests, once a week or once every two weeks from January through May 2006. So as not to disturb the birds, I maintained a distance of 70 m from the colony, surveying it through 8.5 × 44 binoculars mounted on a tripod. I defined active nests as nests with chicks or adults sitting or crouching in them. A basic nest structure had to be visible for a crouching or sitting pelican to be counted as a nest, as many individuals simply sat or crouched in bushes. I identified and reidentified focal nests by using digital photographs of the colony to locate individual nests. I considered a nest to be successful if I saw chicks in the nest at least once and on the visit prior to nest abandonment the chicks were large and covered fully with white down or white down and emerging feathers. I considered a nest to be a failure if no chicks were ever seen in the nest or if on the visit prior to nest abandonment chicks were too small to have survived without parents.

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I made 11 counts of the colony from January to May 2006. On my first visit on 31 January 129 nests were active. The number of active nests reached its maximum of 317 on 21 and 29 March. Numbers of active nests between February 22 and April 9 were similar, indicating that the colony increased rapidly from December to February with the arrival of breeding pairs, stabilized when most pairs had nests and were incubating eggs or rearing chicks, then decreased rapidly from late April through late May as chicks fledged and nests were abandoned (Figure 1). Of the 38 focal nests I tracked, 18 (47%) fledged two chicks, 8 (21%) fledged three chicks, 2 (5%) fledged one chick, and 10 (27%) failed to fledge any chicks. This yields an average of 1.63 young per nesting attempt and 2.28 young per successful nesting attempt.

Thus the Brown Pelican colony on Isla Alcatraz increased from 2004 to 2006 by a factor of 2.75. The colony has grown not only in terms of breeding pairs but in area occupied. In 2004 pelicans were nesting only on the eastern and southern sides of the interior low-elevation cliff zone (PC unpubl. data). In 2006, 25–30% of the nests were placed on the eastern and northern sides of the interior cliff saddle among a large stand of Cardones.

Focal nests consisted of nearly 25% of the Brown Pelican colony on Alcatraz when I first selected them on 8 February and about 12.5% of the colony when I recorded the highest numbers of active nests in late March. If it is assumed that 317 pairs of Brown Pelicans nested on Alcatraz this season, and that the reproductive success of the focal nests can be extrapolated to the entire colony, the colony's reproductive output in 2006 was 400–500 fledglings.

Continued monitoring on Alcatraz is needed to follow changes in the size and density of the Brown Pelican colony. It would be interesting to determine if individuals hatched on Alcatraz return to the island to breed or disperse to other locations, although this would entail banding. It would also be interesting to determine egg-to-chick hatching success to clarify where in the nesting cycle young suffer the highest mortal-

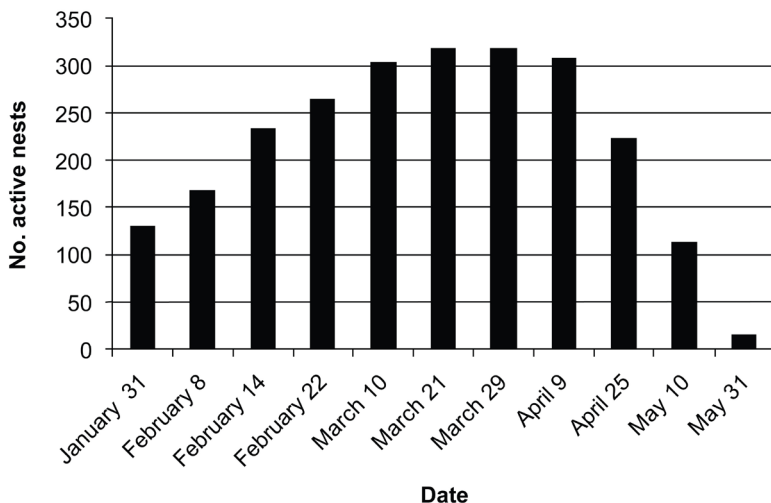


Figure 1. Numbers of active Brown Pelican nests counted from January to May 2006 on Isla Alcatraz, Sonora, México.

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ity. Future research on Isla Alcatraz can provide valuable insights into the ecology of this small yet important island and the ecology of the Gulf of California as a whole.

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