

Breeding Double-Crested Cormorants and Wading Birds on Isla Alcatraz, Sonora, México¹

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Introduction

Isla Alcatraz is a small volcanic island in the Eastern Midriff Island region of the Gulf of California, approximately 1.4 km from the fishing community of Bahía de Kino, Sonora, México. The island falls under the protection of the Gulf Island Reserve system for wildlife and migratory birds. Isla Alcatraz is home to one of the largest Double-crested Cormorant (*Phalacrocorax auritus albociliatus*) breeding colonies in western North America (Anderson et al. 1976; Carter et al. 1995). A survey in 1975 estimated a total of approximately 1,500 pairs of breeding Double-crested Cormorants on the island (Anderson in Carter et al. 1995). Except for this initial survey, virtually nothing is known about the Alcatraz population of cormorants. The island is also an important breeding area for Yellow-footed Gull (*Larus occidentalis*) and at least eight species of wading birds, including the threatened Reddish Egret (*Egretta rufescens*). There are over forty other species of birds that roost and forage on or near the island, including Blue-footed Booby (*Sula nebouxii*), Brown Pelican (*Pelecanus occidentalis*), and Peregrine Falcon (*Falco peregrinus*). A number of conservation issues presently and potentially affect the island, including human disturbance, organic and non-organic trash, and the introduction of exotic species. The close proximity of the island to Bahía de Kino increases the potential for human impact. It also, however, increases the potential for community involvement in research, education, and conservation.

For the last two years Prescott College has been monitoring the Double-crested Cormorant and wading bird colonies on the island. The following is a summary of the results of these projects to date.

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Methods

The cormorant colony is located on the rocky slopes of the island, where peaks rise approximately 130 m above sea level. Nests are generally located on the ground among the rocks. We conducted our surveys over a two-year period, from October 2000 through April 2001 and from September 2001 to March 2002. During the first year, we conducted weekly surveys throughout the fall, while monthly surveys took place in the spring. During the second year, we conducted weekly surveys throughout the breeding season.

For ease in counting, we divided the colony into eight sections, two of which were surveyed by boat. A minimum of two observers conducted each survey and counted all active nests in each section. A nest was designated "active" if it had one or more birds standing or sitting on it. In each section, observers made independent counts, and then compared their numbers. Final numbers of section counts were averaged to come up with the total for each, and these numbers were summed to obtain a count of total numbers of active nests in the colony.

The wading bird colony is located along the base of the island's northeasterly slope. We divided the colony into four sections based on naturally occurring breaks in vegetation. We monitored the colony on 19 days between 15 February and 19 April 2001, observing the birds from a distance through binoculars and counting all individuals of each species present in each section of the colony. In order to minimize human disturbance, observations were made from a distance of at least 100 m.

Results

Figure 1 shows summary results of cormorant surveys in both years. During the first year, cormorants were already nesting by 2 October 2000, when we counted 353 active nests. The count increased steadily through mid-November and then jumped dramatically in late November. The count peaked on 2 January 2001 (1,225 active nests) and declined throughout the early spring. Between March and April the number of active nests dropped precipitously, plummeting from 496 pairs on 3 February 2001 to only 61 pairs on 7 April 2001.

In the second year, we began the study on 12 September 2001, and counted 324 active nests. This number initially increased during September and October to a high count of 1,091, but toward the end of the month numbers decreased significantly to only 513 active nests on 7 November 2001. After this, numbers again increased, reaching a season maximum of 1,093 active nests on 29 November 2001. Numbers dipped again in December but remained relatively stable throughout January (average = 1,036 active nests) until February, when they again began to decline. In March 2002 we counted 391 active nests, indicating the breeding season was drawing to an end.

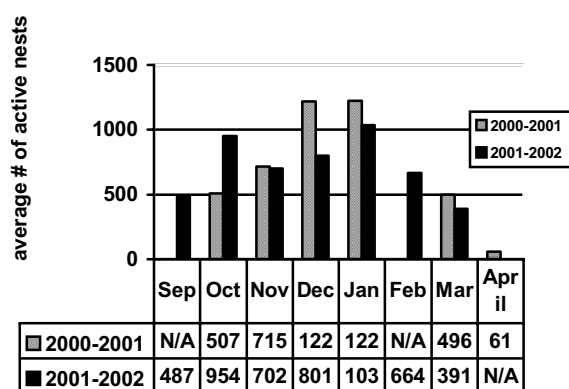


Figure 1— Average Double-crested Cormorant counts by month, Isla Alcatraz, Bahia de Kino, Sonora. N/A indicates that no data were available for the given period

We observed eight species of wading birds nesting on Isla Alcatraz over a period of three and a half months: Yellow-crowned Night-Heron (*Nyctanassa violacea*), Black-crowned Night-Heron (*Nycticorax nycticorax*), Tricolored Heron (*Egretta tricolor*), Reddish Egret, Cattle Egret (*Bubulcus ibis*), Snowy Egret (*Egretta thula*), Great Blue Heron (*Ardea herodias*), and White Ibis (*Eudocimus albus*) (table 1).

Table 1— Peak counts of nesting wading birds in 2000, Isla Alcatraz, Bahia de Kino, Sonora, México

| Species | Peak Count |
|----------------------------|------------|
| Yellow-crowned Night-Heron | 149 |
| Black-crowned Night-Heron | 34 |
| Tricolored Heron | 9 |
| Reddish Egret | 41 |
| Cattle Egret | 16 |
| Snowy Egret | 87 |
| Great Blue Heron | 23 |
| White Ibis | 26 |
| Total: | 385 |

Our maximum count was 385 individuals of all species. In addition to nesting on the island, we also observed five wading bird species foraging around the island (Yellow-crowned Night-Heron, Tricolored Heron, Reddish Egret, Snowy Egret, and Great Blue Heron).

Discussion

Although cormorant counts in the second year were conducted with a greater intensity than in year one, monthly average numbers of active nests were lower in the second year (fig. 1). Reasons for this are unclear, but may be weather related. During the fall and early spring, island vegetation is normally minimal, but heavy rainfall in late fall of 2001 produced increased plant growth, temporarily obscuring views of many nests located on the ground. When we compared average numbers of active nests over the length of the breeding season for both years, we found similar numbers (704 in year one versus 719 in year two). Based on data from these two years, the Alcatraz population appears to be relatively stable.

From 1973 to 1991, an estimated 7,150 Double-crested Cormorants nested in the Mexican states of Sonora and Sinaloa, making up approximately 15 percent of the Pacific coast marine population of this species (Carter et al. 1995). Based on these population estimates, approximately 32 percent of the coastal nesting population of the cormorants in the Gulf of California nested on Isla Alcatraz during the 2000-2002 breeding seasons. This represents 5 percent of the overall Pacific coast marine population. Although little is known about the Alcatraz cormorant population in the years between Anderson’s initial 1975 survey and this study, it is clear that the island’s colony is extremely active and is a vital part of the cormorant population on the Pacific coast.

The unusually high diversity of the Isla Alcatraz breeding wading-bird population emphasizes the biological richness of the island. The island’s Reddish Egret population is of particular interest to conservation, as this species is designated “threatened” on the Gulf of California islands. At the peak of the wading bird study, Reddish Egret was the third most abundant species in the colony. Further studies of the Alcatraz population will help conservation efforts for this species in other areas.

Many of the wading birds that nest on Isla Alcatraz appear to forage in the nearby estuaries of Santa Rosa and La Cruz, located on the mainland north and south of Isla Alcatraz, respectively. In addition to these two important areas, the island itself is also a foraging site for wading birds. Having this food source close to the

nesting grounds reduces time spent away from the nest and could decrease nest depredation.

Presently, the major threats to breeding cormorants and wading birds on Isla Alcatraz are human disturbance and exotic species introduction. Human disturbance of the island's shoreline and interior poses a threat to both the breeding and foraging grounds, and further study is needed to determine the impact of these intrusions. Repeated disturbance of the island may cause birds to abandon nesting efforts, or may lower nest success (Kushlan and Hafner 2001). Another potential threat is the introduction of predators such as rats or cats to Isla Alcatraz. At present, although we have documented house mouse (*Mus musculus*) on the island, no predators that could seriously threaten ground-nesting birds have been found. However, the frequent use of the island by people makes future introductions a very real possibility.

Conclusions

The cormorant and wading bird colonies on Isla Alcatraz highlight the biological importance of this small, near-shore island. To ensure the continued success of these colonies, local, state, and federal agencies and institutions must work together to create and implement management strategies for the island. Prescott College is working in collaboration with the Gulf Island Reserve, the community of Bahía de Kino, and other conservation organizations in the region to develop and implement a community-supported management plan for Isla Alcatraz. Involving community members in identifying threats to Isla Alcatraz and developing and implementing management strategies

are vital parts in promoting community stewardship of and pride in the island and encouraging island visitors to take responsibility for their actions.

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