Nest Site Fidelity in Double-crested Cormorants in Sandusky Bay, Ohio

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ABSTRACT

After nearly being eliminated from the Great Lakes, the Double-crested Cormorant (Phalacrocorax auritus) *has made a remarkable comeback. This species has now created vegetation problems at nesting colonies and a potentially negative economical impact on the fisheries industry. Most state and provincial government agencies that border the Great Lakes have been implementing control methods on an ever increasing cormorant population. Data on this species, such as natal site fidelity, wintering areas, and effectiveness of control methods, are very important for its management. We analyzed band recoveries from a large cormorant colony in Sandusky Bay, Ohio, to determine their nest site fidelity. Band analysis showed a very high return rate to the natal colony and a possible preference to the specific location within the colony where the bird was hatched. The lack of encounters with banded cormorants from other colonies supports the hypothesis of strong natal site fidelity.*

INTRODUCTION

Double-crested Cormorant (*Phalacrocorax auritus*, hereafter "cormorant") populations on the Great Lakes were almost eliminated by the 1970s due to eggshell thinning (Weseloh et al. 1995). With the improvement of water quality and reduction of chemical contaminants, cormorant populations in the Great Lakes started to rapidly increase from a low of 135 pairs in 1972 to 115,000 in 2000 (Weseloh et al. 2002). The dramatic increase in cormorant populations has led to three main areas of concern from a management perspective: cormorants are perceived to be competitors with regards to sport fishing, unwanted predators among commercial aquiculture, and the source of habitat destruction at colonial nesting sites. Large cormorant colonies have detrimental effects on vegetation at the colonies (Hebert et al. 2005, Lemmon et al. 1994). While cormorant colony sizes have increased, other species that had originally nested at these sites may leave due to habitat loss. However, it is believed that cormorants return to the same nesting colony year after year (Dolbeer 1991) but few published reports document this site fidelity. Management of any species requires hard data which is critical to understand its life history.

In Sandusky Bay, Turning Point Island (41°45' N, 082°72' W) has supported cormorants nesting there since 1999 when 25 nests were found on the island. In 2012, 1,163 nests were located on the island. We wondered whether the birds at this colony exhibited site fidelity or if they dispersed from this site.

METHODS

Study Area.– The Turning Point Island is a 2.5 ha man-made island in Sandusky Bay, located near the city of Sandusky, Erie County, Ohio. The island is long and narrow with a base of organic and clay material overlaid on the sides with rip-rap and organic debris on the surface. Approximately 90% of the island is covered with 10 m tall red mulberry (*Morus rubra* L.) trees. In 1976, only Herring Gulls (*Larus argentatus*) nested on this island and the trees at this time were only 2.5 m tall (Scharf 1979). Currently at the Turning Point Island colony, Black-crowned Night Herons (*Nycticorax nycticorax*), Great Blue Herons (*Ardea herodias*), Great Egrets (*Ardea alba*), Cattle Egrets (*Bubulcus ibis*) and Herring Gulls all nest at this site.

Turning Point Island has the second largest of six cormorant colonies in Ohio. This colony is located 0.3 km from the city of Sandusky and across from a busy recreational boat launching ramp. Cormorants at this colony nest in red mulberries between 2.4 m to 10 m off the ground. Up to 12 cormorant nests have been found in a single tree. Starting in 2009, two to six nests per year have been located on the ground with young successfully raised each year. As trees die or suitable nesting sites decrease, cormorants will start to nest on the ground (Weseloh and Ewins 1994). Most cormorants nest near the top of the trees but, as their numbers increased and the canopy thinned, nest height above the ground has decreased.

The Ohio Division of Wildlife, working under U.S. Fish and Wildlife Service permits, began culling operations in 2006 in an attempt to keep cormorant populations at a manageable level and to prevent habitat destruction at this colony. Adult cormorants sitting on nests, or near a nest, were shot with high powered pellet guns at close range during the incubation period. The Ohio Division of Wildlife has culled 9,541 cormorants at the Turning Point Island since 2006.

Field Methods.– Starting in 1999, nesting cormorants were banded with butt-end, size 8 U.S. Geological Survey bands. All banding occurred on Turning Point Island during May and June during the breeding season. Nests were accessed by ladder and most young were banded at approximately four weeks of age. Banding operations would start at one end of the island and move to the opposite end. Nestlings were banded on the right leg only. Recoveries of banded cormorants were received from both the Bird Banding Lab and by checking dead birds during culling activities. Only recoveries between 15 Apr and 1 Jun were analyzed– a period which coincided with peak nesting for cormorants at this colony.

RESULTS

A total of 419 nestling cormorant were banded with 22 (5.25%) recovered as of Jun 2014. Sixteen of the 22 were encountered between 15 Apr and 1 Jun; 14 (87.5%) were of birds returning to their natal colony. Age of those cormorants recovered ranged from one to seven years old, with five being six years old. Recoveries away from the natal colony included a one-yr-old bird that was recovered 435 km southeast, entangled in fishing line near Apple Grove, West Virginia. A three-year-old bird was found dead 29 km east of its natal colony in Lake Erie. All recoveries at the colony were a direct result of culling by the Ohio Division of Wildlife. Cormorant bands recovered at this colony showed very little wear when compared with Herring Gull bands of the same age that we have recovered at this same location.

DISCUSSION

Based on the 87% recovery rate of previously banded cormorant chicks at their natal colony, it would appear that cormorants at Turning Point Island exhibit strong natal site fidelity.Other banders of cormorants in the Great Lakes (D. V. Weseloh, pers. comm.) have indicated a strong natal site fidelity in this species. Fidelity to a colony can be influenced by distance to other cormorant colonies, both man-made and natural disturbances, and nesting success (Wires and Cuthbert 2010). A study at two cormorant colonies in Vermont (Strickand et al. 2011) found that an egg-oiling and culling program that had been carried out for more than four years have caused a colony to be abandoned. However, even with over a thousand adults removed from Turning Point Island for each of the last seven years, the number of nesting pairs has remained stable. Culling takes place at Turning Point Island at least twice during the incubation period but most field personnel state that it appears that the nests are reoccupied quickly. It appears there might be a large pool of nonbreeders outside the colony waiting to occupy nest sites. Most cormorants start to breed when three years old, but a small number (17%) will breed as early as two years of age (Hatch and Weseloh 1999, Weseloh and Ewins 1994). All of the cormorant bands recovered at Turning Point Island were from breeding age birds. Except for one two-year-old bird, all others were three years old or older.

The nearest cormorant nesting site to the Turning Point Island colony is on Green Island in Lake Erie, 36 km to the northwest. Culling has produced two non-Turning Point Island band recoveries at Green Island since 1996. These recoveries included a one-year-old cormorant that was banded in northeastern Lake Erie and a two-year-old banded in the southwest end of Lake Ontario. No banding has taken place on Green Island. The two-year-old bird could have been nesting but it is unclear what a one-year-old cormorant would be doing at an active colony during the peak of the breeding season. The largest cormorant colony in Ohio, West Sister Island, is located 62 km northwest of Turning Point Island in Lake Erie. Since culling started in 2006 at West Sister Island, only three banded cormorants have been recovered between 15 Apr and 1 Jun. These birds were banded at three other colonies in the northern parts of Lake Huron and comprise a 4-, 11-, and 14-year old birds. One four-year-old cormorant was recovered on West Sister Island in August from a colony in northeastern portion of Lake Ontario in Canada. Very little banding of cormorants has occurred at West Sister because of the inaccessibility of nests high in the tree canopy (M. C. Shieldcastle, pers. comm.).

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