

Double-crested Cormorants and VHF Telemetry on Lake Ontario, 2000

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Double-crested Cormorant (*Phalacrocorax auritus*) nesting sites and pairs have increased dramatically over the past decade on Lake Ontario (Weseloh and Pekarik 1999). With that population and range expansion has come concerns about the impacts Double-crested Cormorants have on sport fish populations, other colonial waterbird species, private property and unique ecological sites. In order to address these concerns and better understand the breeding biology of this species, the New York State Department of Environmental Conservation (NYSDEC) began several studies relating to Cormorant diet and management control in the eastern basin of Lake Ontario.

Examination of Cormorant diet began on Little Galloo Island in 1992 and has been ongoing. Management activities have included; nest removal on Gull, Bass and Calf Islands since 1994 and egg oiling on Little Galloo Island which began in 1999 (Farquhar and Mazzocchi 2000). All these islands are located in Jefferson County, New York. It is anticipated that these activities will continue in 2001.

Nesting sites on Lake Ontario can be found in both the United States (US) and Canadian waters, often in close proximity. Until recently, Little Galloo Island has had the highest number of nesting pairs on Lake Ontario since the late 1970's. However, in both 1999 and 2000, the highest number of nesting pairs on Lake Ontario was on High Bluff Island, Ontario, approximately 100 km west of Little Galloo Island (Weseloh et al. 2000). It is not clear whether this shift of breeding activity is in response to recent management activities on Little Galloo Island. In 2000, NYSDEC initiated a two year satellite and VHF radio telemetry study. This paper will discuss the preliminary results of the VHF radio telemetry study. The objectives of this study were to determine: (1) foraging behavior of birds nesting on Pigeon and Snake Islands in respect to N.Y. and Canadian waters (2) nest site fidelity within the breeding season (3) movement of birds between Lake

Ontario, Oneida Lake and nearby waters. The work was conducted under permit from the Ontario Ministry of Natural Resources and in collaboration with the United States Department of Agriculture (USDA) and Canadian Wildlife Services.

Study Areas

Pigeon Island

Located on Lake Ontario, Province of Ontario, Canada, this island is approximately 18 km (11 mi) Southwest of the mainland (Figure 1). Owned by the Provincial Government of Ontario, Canada this island is approximately 6 km (4 mi) from US waters and is approximately one hectare in size. In 2000, 1,431 Double-crested Cormorants nested on this island.

Snake Island

Also located on Lake Ontario, Province of Ontario, Canada, this island is approximately 3 km (2 mi) from the mainland (Figure 1). This island is privately owned and is less than one hectare in size. In 2000, 1,344 Double-crested Cormorants nested on this island.

Methods

In May 2000, 25 birds were captured on Pigeon and 23 on Snake Islands and fitted with VHF transmitters using a backpack harness design (adapted from Dunstan 1972; King et al., 2000). Birds were captured with modified leg hold traps set on or near active nests (King et al. 1998, 2000). Transmitters were made by Advanced Telemetry Systems (ATS) and John Kenty (NYSDEC) and were in the 170, 172, and 173 MHz frequency ranges. Transmitters weighed approximately 28 gms and 17 gms for the ATS and NYSDEC transmitters, respectively. The expected longevity (battery life) of these transmitters was approximately one year for the ATS and five months for the NYSDEC. Birds were also

marked with United States Fish and Wildlife Service aluminum bands and white color plastic bands with black lettering. Culmen, tarsus, and wing cord measurements were taken prior to releasing the birds.

From mid May through 8 August, weekly field visits via boat or airplane were made to the two breeding colonies to collect VHF data. Two flights were made from the Watertown airport and covered Pigeon and Snake Islands, and the Canadian and US sides of the St. Lawrence River downstream to Grindstone Island on the first flight and Chippewa Bay on the second flight. In addition, three stationary receivers (data loggers) were placed near the mouth of the Saint Lawrence River in the town of Cape Vincent, New York approximately 15 km (10 mi) from the breeding sites (Figure 1). Data loggers were set up from 7 July through December 2000. Receivers scanned at two second intervals, twenty-four hours per day. Birds could be detected within 2.5 km (1.5 mi) of the receivers (Figure 1). If a signal was received and registered the correct frequency and pulse rate, it was logged as a "hit". Any hits not within the correct beats per minute were discarded. For analysis purposes, data logger information was sorted by frequency, date of hit, and time of hit in 1 hr increments.

Data collected was analyzed to determine if birds showed site fidelity during the chick rearing period (30 May-31 July). Prior to 30 May was considered pre-chick and after 31 July was considered post chick time periods.

Results

Of the 48 transmitted birds; one was found dead in a commercial trap net within days of being tagged and two birds were never picked up either by hand tracking or the data loggers. Of the remaining 45 birds, thirty-two birds (18 Pigeon, 14 Snake) were present on their respective islands at least three times during the chick rearing period and were considered to show site fidelity within the breeding season. Ten birds were not detected enough to make any inferences and three birds moved among several locations.

On Lake Ontario, eight birds were located by hand tracking only and 37 were recorded by both hand tracking and data loggers. Total number of data logger hits per bird ranged from 1-157 with a mean of 20. The number of days that hits were recorded ranged from 1-

55 per bird. Twenty-one birds were detected by data loggers on five or more days. The majority of hits occurred between 05:00 and 19:00 with the peak number of hits per hour occurring at 06:00 (Figure 2).

The first Lake Ontario flight was made on 20 July with 20 transmitted birds located. Eighteen of those were on either Snake or Pigeon Islands and the remaining two were on Howe Island just downstream of Kingston, Ontario. No nests were confirmed on Howe Island so the birds were assumed to be feeding or loafing. The second flight was made on 29 August and 10 birds were located as follows; six on Snake Island, one on Pigeon Island, one bird near Grindstone Island, and one in Chippewa Bay. The bird located on Grindstone Island exhibited movement between Snake, Pigeon and Howe Islands during the course of the summer.

During the field work conducted on Little Galloo Island from 16 May through 8 August, attempts were made to detect all Pigeon and Snake Island transmitted birds. No Pigeon or Snake Island birds were ever detected on Little Galloo Island on any of those visits.

On Oneida Lake, data loggers were set up and scanned the 172 and 173 MHZ frequencies of the Lake Ontario birds from 8 August through 23 September 2000 (J. Coleman pers. comm.). In addition, four flights were made as part of a hazing project, one on 31 August before the hazing began and three in September. All Lake Ontario frequencies were capable of being picked up during those flights. Preliminary findings from the Oneida Lake study, indicate that 15 Lake Ontario transmitted birds were detected on Oneida Lake during August and/or September. Three of those birds were detected on Onondaga Lake after the start of the hazing project and one was detected back on Lake Ontario.

Discussion

Over the last six years, management of Double-crested Cormorants has been an issue not only on the eastern basin of Lake Ontario, but throughout the Great Lakes and much of eastern North America. Having a better understanding of behavior and movements of this species will allow for practical and effective management decisions.

An initial concern of this study was that too much disturbance during the trapping efforts might cause the Cormorants to abandon their nesting sites. One month

after being trapped, 83% of the transmitted Cormorants were detected on their respective islands and 66% showed site fidelity during the breeding period. There did not appear to be any movement of Snake or Pigeon birds to Little Galloo Island. However, over 75% (n=37) were detected at least once and 40% (n=19) on at least five days by the data loggers, indicating that birds nesting on Snake and Pigeon Islands were potentially feeding in NY waters. This suggests that managing Cormorants on NY islands to protect the local fishery may need to be re-evaluated if birds are feeding across international waters.

If the preliminary data from Oneida Lake is accurate then it is apparent that a percentage of Lake Ontario birds do utilize Oneida Lake as a stop over before fall migration. Cormorant movements between Lake Ontario and Oneida Lake may occur more frequently than we thought.

In 2001, we plan to tag 25 birds each on Snake, Pigeon and Little Galloo Islands with VHF transmitters which will give us more information regarding Cormorant behavior and local movements. This information in combination with the satellite study will be beneficial when making management decisions. To date, Cormorant management has been site specific, but it is evident that there is a need to manage more on a regional or even international scale if there is going to be any impact on reducing Cormorant numbers. Cormorant movements between Lake Ontario, Oneida and Onondaga Lakes reinforces the idea that management practices need to be considered on a larger scale.

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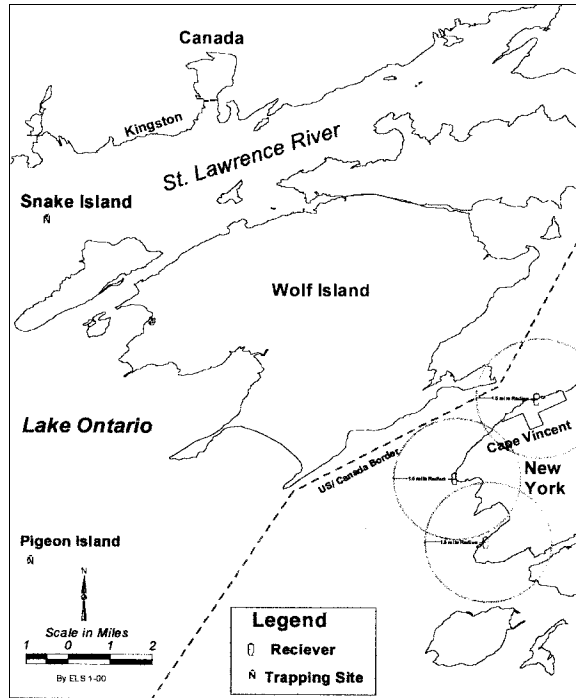


Figure 1. Double-crested Cormorant trapping sites and receiver locations, 2000.

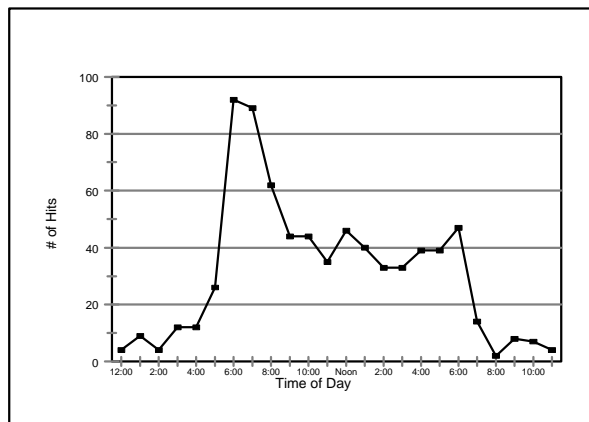


Figure 2. Double-crested Cormorant data logger hits by time of day, 2000.