Presqu'ile

Annual Report on the Management of Double-crested Cormorants for 2003

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Cover photo: Cormorants at High Bluff Island, Presqu'ile Provincial Park
Photo taken by: Ontario Parks staff

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Executive Summary

Between April 14, 2003 and July 25, 2003 Presqu'ile Provincial Park implemented a management program to reduce the population of Double-crested Cormorants in the park in order to protect the remaining western woodlands on High Bluff Island. This was in accordance with the Management Strategy for Double-crested Cormorants (Ontario Parks, 2002).

Two methods were employed to meet the objectives of the management strategy: nest removal from trees and oiling eggs in ground nests. A total of 3,980 nests were removed from trees using forestry poles. This method was partially successful for tree nesting colonies since it was time and labour-intensive and inefficient for high-level nests. Mineral oil was applied to a cumulative total of 28,648 eggs (from 4,065 ground nests). Egg oiling was an efficient means of managing ground nesting colonies as all nests could be treated and no eggs hatched after oiling. All eight species of non-target colonial waterbirds produced successful broods in 2003, demonstrating that cormorant management activities had minimal effects on non-target species.

At the end of the breeding season the number of successful cormorant nests declined substantially from the previous year (by approximately 62%). Despite this decline in nest numbers, the number of young recruited into the population was estimated to be 9,262. Thus, the Presqu'ile cormorant population still increased in 2003. To meet the objective of protecting significant park values, the management area should be expanded to the eastern woodland on High Bluff Island. Continued management in subsequent years to minimize negative effects on the woodlands, surrounding habitat and other wildlife on the islands is recommended.

Background Information

Double-crested Cormorants first colonized the Great Lakes in the early 1900s. The first known nesting colony was found in western Lake Superior in 1913. By 1945, Double-crested Cormorants (hereafter referred to as cormorants) had established colonies as far east as the St. Lawrence River in the Great Lakes Basin. Recently, cormorant populations have increased in Ontario from a low of about 120 nesting pairs in the early 1970s to 115,000 nesting pairs in 2001 (Ontario Parks, 2000). In 2002, the colony at Presqu'ile Provincial Park constituted approximately 40% of the Lake Ontario population.

Cormorants first began nesting at Presqu'ile in 1982 with a single tree nest on Gull Island. Since then, cormorant nests have spread to the adjacent High Bluff Island and numbers have risen steadily to 12,082 nests in 2002. As a result of the nesting activity of these birds, all trees on Gull Island have been killed, most super-canopy trees on High Bluff Island have been killed and the remaining mid and lower vegetation on both islands are threatened (Koh and Carr 2003).

To prevent further negative impacts on the existing ecosystem Ontario Parks implemented the 'Management Strategy for Double-crested Cormorants' (Ontario Parks, 2002). The 2003 breeding season was the first year of the program and this report summarizes the results of the management activities.

Methods

Site description

Management activities were conducted on High Bluff Island and Gull Island at Presqu'ile Provincial Park. High Bluff Island (38.16 ha) lies 2 km southwest of the Presqu'ile peninsula and is adjacent to Gull Island (7.25 ha). High Bluff Island is a low, essentially flat limestone outcrop that has a thin mantle of lacustrine sands and clays at its interior, shingle beach at its periphery, and remnant shingle beach at its interior. Gull Island is an exposed shingle and gravel bar expanding towards the peninsula.

High Bluff Island consists of two major woodlands: an 8.75 ha western woodland and a 2.88 ha eastern woodland. In the last four years, both woodlands have suffered serious degradation as a result of the cormorant population. The focus of the management program was in the western woodland due to its significant species association. In this area, most super-canopy trees have died and fallen over but the mid-canopy and lower vegetation remains relatively intact. There were no management activities in the eastern woodland.

Mature Sugar Maple (*Acer saccharum*), Red Oak (*Quercus rubra)* and Black Maple (*A. saccharum ssp. nigrum*) made up the dominant tree cover in the western woodland. The eastern woodland is dominated by White Ash (*Fraxinus americana*), White Cedar (*Thuja occidentalis*), Crack Willow (*Salix fragilis*) and White Birch (*Betula papyrifera*). Trees are scattered throughout much of the island's interior, as well as successional fields and thickets. Provincially significant species on the islands include Bushy Cinquefoil *(Potentilla paradoxa*, S3)* and Smith's Club-rush (*Schoenoplectus smithii*, S2?)* and the regionally rare Black Maple (*Acer saccharum* ssp. *nigrum*, S4?)*. The woodland on the island is considered significant due to the age of the trees, the uncommon species association, and the rarity of mature forest on Lake Ontario islands (Blaney, 1997).

Management activities

Cormorant management activities occurred from April 14 to July 25, 2003. The main objective of the management program was to protect significant vegetation in the western woodlands of High Bluff Island. Different management techniques can be used to reduce the negative effects on vegetation including: reducing the breeding population, removing tree nests to protect vegetation, oiling eggs to lower the recruitment, or a combination of these methods. Techniques used in this year's program included nest removal, to provide immediate protection to vegetation, and egg oiling, to lower the recruitment.

Nest removal. Nest removal commenced on April 28, 2003 in the western woodlands of High Bluff Island. Two techniques, fire pumps and forestry poles, were tested and used to remove nests. Fire pumps were used to spray nests with water under high pressure. Although fire pumps were capable of removing nests, they were not an ideal tool and were phased out early in the project. Fire pumps caused a high level of disturbance to non-target species, raised safety concerns for pump operators, were slow and inaccurate, and were unable to reach and destroy high-level nests.

*See Appendix for explanation of species ranking.

Forestry poles, square cross-sectioned poles in 8-foot (2.46 m) sections (normally used by arborists for pruning), were used to knock nests down from trees (Figure 1). Safety equipment included safety glasses and hard hats. Low-level nests required four or fewer sections (approximately 1 m to 10 m from the ground) and one pole-person. Mid-level nests required five to eight sections of poles (approximately 12.5 m to 20 m from the ground) and a two-person poling crew to work most efficiently. In this situation one individual operated the pole while another provided sections and recorded data. High-level nests required 8 to 12 sections of poles (approximately 22.5 m to 27.7 m from the ground) and again required two-person poling crews.

Figure 1 a: Forestry pruning poles, in sections, used for removing nests

Figure 1 b: Poles in use to remove a mid-level nest on High Bluff Island

Egg oiling. On both islands, eggs of ground nesting cormorants were treated with white mineral oil (Daedol 50 Waterbird Control Oil), approved by Health Canada. Backpack-style agricultural sprayers were used to deliver the oil (Figure 2). Each sprayer carried 12 L of oil. Hearing protection and full-face respirators with NIOSH Filters AM/CD/FM/HC/HFI(ESC.) /MA/OV/SD (part 755c) were worn by all staff. All nests were identified and marked prior to oil spray application. One person followed the oil sprayer to document the number of treated eggs, number of treated nests and number of unoccupied nests (nests without eggs). Nests containing eggs were oiled once a week on both islands.

Figure 2: Staff found it necessary to wear hearing protection and respirators while oiling eggs.

Non-target species. To minimize disturbance to the eight species of non-target colonial birds nesting on the islands, CWS was consulted to help design operations. A base camp was located in an area where non-target species were not nesting. Prior to the commencement of management activities, the location of all non-target colonial species was determined. At all times throughout the project, every reasonable effort was made to avoid disturbing these birds (e.g. people walked large perimeters around their nests). Non-target species were carefully monitored throughout the entire project. Monitoring involved daily observations and weekly counts, by telescope, of nests and nest occupants.

An area called the "Minimal Management Zone" was established where the concentration of non-target species was highest. In this area, management activities were prohibited until late May when it was apparent that non-target species were largely unaffected by activities. Even so, management activities were limited to an hour or less within each of four quadrants in this zone.

Results

Following the completion of management activities, some cormorants were able to nest successfully on High Bluff Island in the 2003 breeding season. These nests were either in the eastern woodlands, where management did not occur, or in inaccessible locations. As a result, the total number of cormorant nests in 2003 that produced young was 4,631 (3,707 in the eastern woodland and 924 in high-level trees of the western woodland). Thus, assuming that all 12,082 nests built in the previous year (2002) were successful, there was a 62% decline in the number of nests that produced young in 2003. If an average of two young per nest were produced (Weseloh et al, 1995), there were approximately 9,262 young for the 2003 breeding season.

Nest removal. 3,980 nests were removed from trees on High Bluff Island. The success of destroying a nest using forestry poles depended largely on nest height. Mid-level nests demanded the most attention due to their relative abundance and the high rate of reconstruction. Cormorant re-nesting occurred in areas where high-level nests were left behind. Cormorants appeared reluctant to return to areas that had been completely cleared of nests and to low-level nest sites (in shrubs and small trees). Removal of high-level nests was an extremely slow process and required a high degree of effort. Frequent role switching was necessary to reduce muscle fatigue and neck strain. Despite this, pole operators could only sustain five to six hours of poling per day. There were 924 high-level nests that could not be reached and removal attempts had to be abandoned by crews. The peak of nest removal activities occurred from mid-May to mid-June when nest initiation was at its peak. Nest numbers increased by 50% to 150% each week.

Egg oiling. 28,648 eggs from 4,065 ground nests were treated with oil on both islands. Egg oiling successfully inhibited almost all young from hatching. (Due to human error, 104 young hatched from ground nests in managed areas). Egg oiling was also successful at keeping adults occupied for long periods, as they would continue to incubate oiled eggs. However, predation of cormorant eggs by gull species was substantial. When predation occurred, cormorants would re-lay their eggs (in the same nests). These new broods of eggs demanded continuous oiling throughout the season, which occurred on a weekly basis. With a single backpack sprayer in operation it took an average of one day to treat eggs for High Bluff Island and a half-day for Gull Island, including travel time.

Non-target species. Negative effects of management activities on non-target species appeared minimal. All eight non-target colonial waterbird species successfully recruited young on the islands in 2003. (See Appendix 1 for a detailed summary). Great Blue Heron (*Ardea herodias,* S5)* and Black-crowned Night-Heron (*Nycticorax nycticorax,* S3)* were the most sensitive species to disturbance (i.e. most likely to flush) imposed by management activities. Despite this, 37 chicks fledged from 25 Great Blue Heron nests and at least 150 chicks fledged from 80 Black-crowned Night-Heron nests. Great Egrets (*Casmerodius albus,* S2)* were among the least sensitive species to disturbance and 10 chicks fledged from nests.

On occasion, cormorants would lay eggs in the nests of other species, specifically in nests constructed by Great Egrets and Great Blue Herons. This interspecies aggression would cause host birds to reject the eggs and abandon their nests. In cases where this was suspected the nest was examined by climbing the tree to confirm the identity and presence of cormorant eggs

*See Appendix

before nests were removed. This occurred in both the Managed and Minimal Management Zones.

Discussion

Management activities on the Presqu'ile islands in 2003 contributed to a substantial decline (of approximately 62%) in the number of cormorant nests that successfully fledged young compared to the previous year. The reduction was achieved by manipulating both ground nesting and tree nesting colonies using a combination of techniques. Egg oiling was an effective tool to reduce the ground nesting colony, as all eggs could be treated relatively quickly and the technique was successful in preventing hatching. Egg oiling also fooled adults into continuing to incubate eggs, thus occupying their time for long periods. Although nest removal by forestry poles was accomplished, the method was labour-intensive, strenuous and ineffective for high-level nests. As a result, there remained 924 high-level nests in the managed area. A more effective strategy than forestry poles is required to remove high-level nests to successfully protect the forest ecosystem. In the eastern woodland, where management activities did not occur, 3,707 nests were built, and contributed substantially to the number of young that were successfully reared in 2003. Removing all nests from both woodlands would assist in halting further degradation to the forest ecosystem.

Figure 3: aerial photo of Presqu'ile islands, 2002

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Appendix

A summary of colonial waterbirds (excluding cormorants) that have bred on High Bluff Island and Gull Island at Presqu'ile Provincial Park. Common names, 4-letter species codes, Latin names and S-ranks from the NHIC* and comments are included for each species.

Black-crowned Night-Heron (BCNH)
Nycticorax nycticorax S3
BCNH has nested at Presqu'ile since 1962 and nest numbers have ranged from 15 to 80. Nesting locations are limited due to tree mortality and loss of nesting habitat. In 2003, 80 Black-crowned Night-Heron nests were counted (26 on Gull Island and 54 on High Bluff Island) and at least 150 chicks fledged from these nests.

Caspian Tern (CATE)
Sterna caspia S3
CATE populations at Presqu'ile have gone from ten nests in the mid-1980s to 1002 nests in June 2003 (Canadian Wildlife Service). In late-June large numbers of fledged or almost fledged CATE chicks were observed. In July 2003 an additional 470 nests containing 371 eggs and 156 chicks were counted. These nests appear to have been a late brood as indicated from the abundance of unhatched eggs and newly hatched chicks when counted.

Common Tern (CMTE)
Sterna hirundo S4
CMTE was the most abundant colonial waterbird nesting at Presqu'ile during the 1960s. From a population once estimated at 10,000 pairs, it declined dramatically in the early 1970s. Annually the population establishes up to 150 nests. In July 2003, 148 nests were counted and containing 35 chicks and 198 eggs yet to hatch.

Great Blue Heron (GBHE)
Ardea herodias S5
In 1998 GBHE started nesting on the western shore of High Bluff Island (a single nest). In 2003, 25 successful GBHE nests were found on High Bluff Island and a minimum of 37 chicks fledged. In 2003 approximately 10 GBHE nests were taken over by DCCO.

Great Black-backed Gull (GBBG)
Larus marinus S2
Typically marine, the GBBG also nests at Presqu'ile. The Presqu'ile colony is one of the first known nesting locations on the Great Lakes with the first nest having been discovered in 1962. In 2003 two pair were found nesting on Gull Island and 4 chicks successfully fledged.

Great Egret (GREG)
Casmerodius albus S2
High Bluff Island is one of two Lake Ontario locations where GREG breed. The first breeding record for Presqu'ile was a single nest in May 1999 on High Bluff Island. In 2003 five active GREG nests were counted. All nests were located in shrubby vegetation (hawthorn, willow and Choke Cherry). Three times nests were taken over by cormorants, and one nest was disassembled, likely by cormorants looking for nesting material, but ten young GREG managed to successfully fledge from four nests by the end of the season.

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*NHIC: Natural Heritage Information Centre, Provincial Ranking System:
S1 Extremely rare, S2 Very rare, S3 Rare to uncommon, S4 Common, S5 Very common

Appendix, continued

Herring Gull (HEGU)
Larus argentatus S5
HEGU is the second most abundant gull species at Presqu'ile. In 1990 there were 89 pairs on the islands and in 2003 it increased to 270 pairs. Many chicks were observed on the islands in the 2003 breeding season.

Ring-billed Gull (RBGU)
Larus delarawarensis S5
RBGU is the most abundant colonial waterbird at Presqu'ile. From an initial discovery of 10 nests in 1948, the park's colonies grew to a peak population of 69,417 nests in 1990. In 1999 when the population was last tallied it consisted of 55,699 nests. Numerous chicks were seen during the management activities of 2003.