

Tommy Thompson Park Double-crested Cormorant Management Report 2019

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Background

Tommy Thompson Park (TTP) is located on the Leslie Street Spit, a manmade peninsula that extends five kilometres into Lake Ontario in Toronto, Ontario (Figure 1). Originally intended for port-related infrastructure, construction of the peninsula began in the 1950s, but through natural succession and habitat enhancement efforts by Toronto and Region Conservation Authority (TRCA), it has become the largest area of natural habitat on the Toronto waterfront. The final size of the Spit is complete at approximately 500 hectares, including the associated water lots.



FIGURE 1. TOMMY THOMPSON PARK/LESLIE STREET SPIT

The Spit was designated as an Important Bird Area (IBA) in 2000 based on the globally significant numbers of colonial waterbirds under the general congregatory threshold, and nationally significant numbers of waterfowl during spring and fall migration as well as during winter depending on ice conditions (Wilson & Cheskey, 2001). Six species of colonial waterbirds breed regularly at Tommy Thompson Park (Figure 2). Two species are predominately tree-nesters: Black-crowned Night-Heron (*Nycticorax nycticorax*) and Great Egret (*Ardea alba*); and four species are ground-nesters: Double-crested Cormorant (*Phalacrocorax auritus*, hereafter cormorant), Ring-billed Gull (*Larus delawarensis*), Herring Gull (*Larus argentatus*) and Common Tern (*Sterna hirundo*) (not

shown in the figure, but nested on a raft in Embayment D and one nest was identified in the Cell 2 wetland). Caspian Terns (*Hydroprogne caspia*) historically nested at TTP, disappeared from 2004 to 2011, then attempted ground-nesting with varying success from 2012 to 2016. Until 2012, cormorants were predominantly a tree-nesting species at TTP, however, since 2013 the majority of nests have been on the ground.

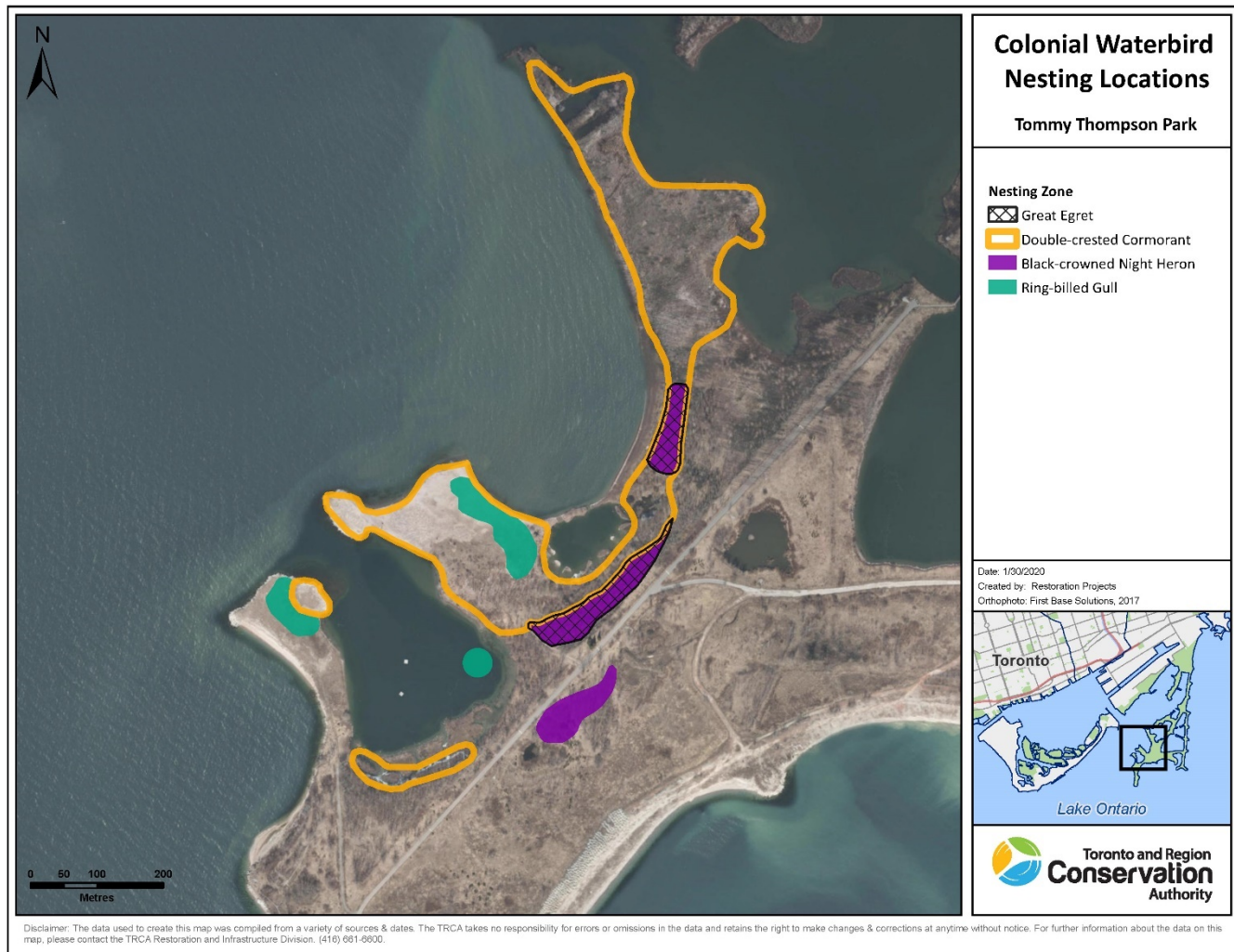


FIGURE 2. COLONIAL WATERBIRD NESTING LOCATIONS, TOMMY THOMPSON PARK, 2019

Cormorants began nesting on Peninsula B in 1990 (Wilson & Cheskey, 2001) and expanded to Peninsula A the following year. The population steadily increased and expanded onto Peninsula C in 2000, followed by ground-nesting on Peninsula B in 2002, likely in response to fallen trees (due to the negative health implications of their tree-nesting behavior) as well as an increase in the overall Great Lakes population (Weseloh, et al., 1995). Today, cormorants nest on three of the four peninsulas at the park, Peninsulas A, B and C (Figure 2).

Cormorant Management Strategy

In 2008, TRCA developed the Tommy Thompson Park Double-crested Cormorant Management Strategy in response to the significant decline and public concern for the loss of forest habitat on the peninsulas (Toronto and Region Conservation Authority, 2008, 2009, 2010, 2012, 2013, 2014, 2016, 2018). The development of the strategy involved founding a Cormorant Advisory Group of stakeholders and experts, including conservationists,

academics and interest groups from across the spectrum to provide advice and input on the management plan. The inaugural meeting was in late 2007 and the group continued to meet annually to review management results and provide input on proposed management scenarios until 2016 (Toronto and Region Conservation Authority, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2016).

The overall goal of the Double-crested Cormorant Management Strategy, as established by the Cormorant Advisory Group in 2008, is to achieve a balance between the continued existence of a healthy, thriving cormorant colony and the other ecological, educational, scientific and recreational values of TTP. The objectives of the Strategic Approach are to:

1. Increase public knowledge, awareness, and appreciation of colonial waterbirds;
2. Deter cormorant expansion to Peninsula D;
3. Limit further loss of tree canopy on Peninsulas A, B and C; and
4. Continue research on colonial waterbirds in an urban wilderness context (Toronto and Region Conservation Authority, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2016, 2018).

To achieve the goals and objectives of the Double-crested Cormorant Management Strategy, TRCA employed a suite of management techniques between 2009 and 2011 which included inactive nest removals, pre-nesting deterrents, active nest removals, habitat enhancements and post-nesting deterrents. Results from annual population counts during this time showed an increase in the ground-nesting colony and a leveling off in the tree-nesting colonies. These data suggested that the techniques had been successful in changing the nesting behaviour of cormorants. In 2012, TRCA slightly modified the strategy to reduce pre-nesting deterrents to assess whether a reduced level of intensity would be effective. Results from the 2012 season confirmed reduced pre-nesting deterrents remained as effective. However; since 2014 there has been an annual increase in the pre-nesting deterrents required to prevent cormorants from expanding their tree nesting range into new areas.

Current Status

The TTP cormorant colony currently comprises three sub-colonies: Peninsula A (tree- and ground-nesting), Peninsula B (tree- and ground-nesting) and Peninsula C (tree-nesting). The ground-nesting colonies are classified as Cormorant Conservation Zones (Figure 3), where cormorant nesting and roosting is encouraged and enhanced. The tree-nesting colonies are classified as Deterrent Areas, where cormorant nesting is discouraged through management activities. Management in the Deterrent Areas is complicated by the presence of non-target species, Black-crowned Night Herons and Great Egrets. At the time of the IBA designation, the night-heron colony was estimated as one of the largest in Canada, representing 30 percent of the national breeding population (Wilson & Cheskey, 2001). TRCA takes precautions to ensure management efforts do not adversely impact non-target species. Peninsula D is the only remaining forested peninsula in the park, and is not occupied by nesting colonial waterbirds.

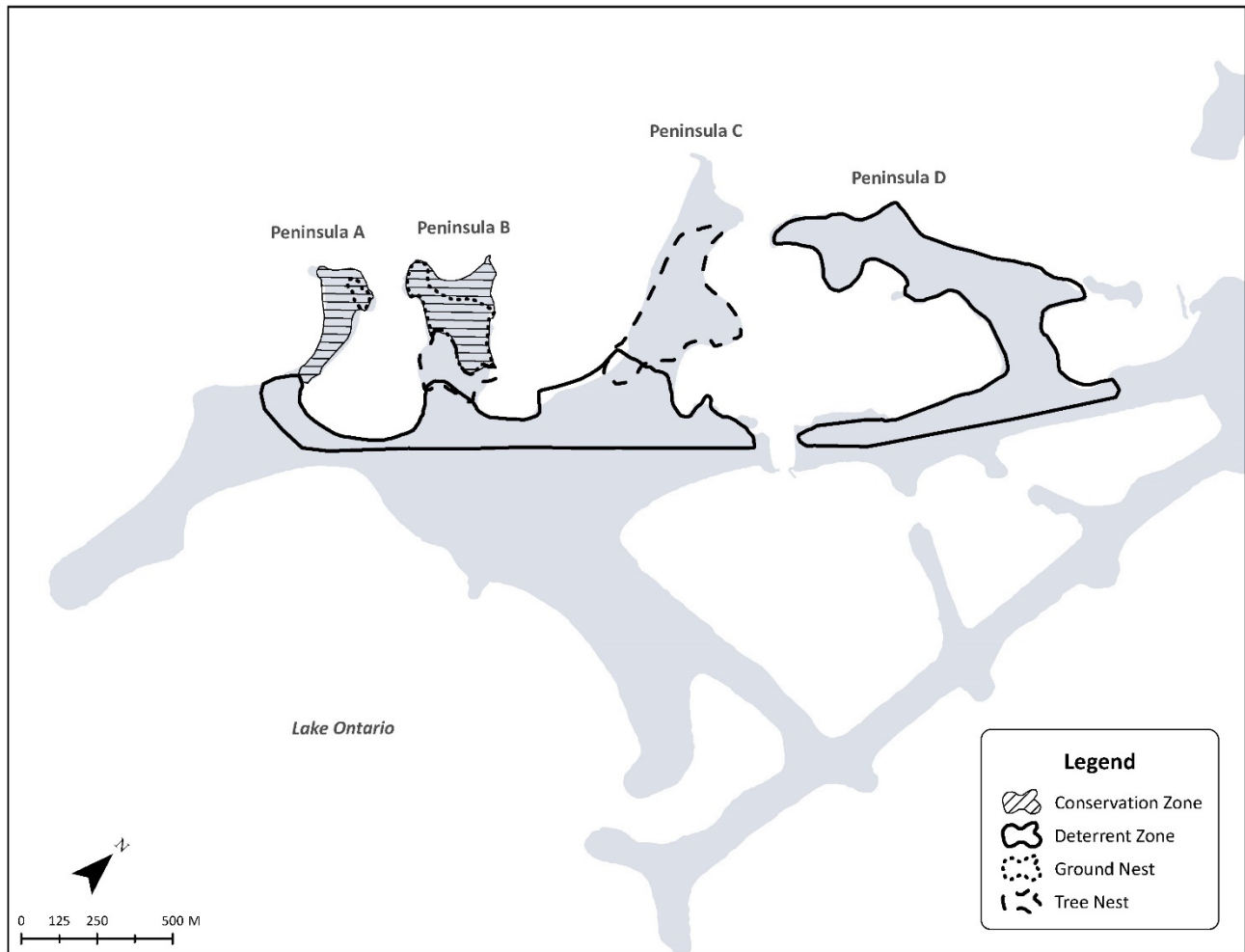


FIGURE 3. CORMORANT MANAGEMENT ZONES AT TOMMY THOMPSON PARK

2019 Population and Tree Health

Breeding Census

Cormorants began to arrive at TTP from their wintering grounds on 21 March 2019. The breeding cormorant population at TTP decreased in 2019 with 13,614 nests counted at the peak period in mid-June (Table 1, Figure 4). The percent of the overall colony represented by ground-nesting decreased to 64% compared to 72% in 2018, as a result of record high Lake Ontario water levels flooding a large area of the traditional ground nest area on Peninsula B. Tree-nests increased by 147 on Peninsula B and 724 on Peninsula C, bringing the average number of nests per tree to 8.68 and 6.71 respectively, which is a decrease in density from 2018.

TABLE 1. TOMMY THOMPSON PARK CORMORANT NEST COUNT 2008 TO 2019

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Pen A	49	22	39	19	13	5	14	14	4	0	0	53
Pen A Ground	-	-	-	-	-	-	10	541	1525	1821	1445	2354
Pen B	1050	917	781	1262	982	1310	1316	1184	1007	2474	1815	1962
Pen B Ground	1009	1957	3310	4547	5812	6986	7799	7608	8555	5836	9061	6327
Pen C	4609	4668	5304	5546	4934	3689	3270	2561	2184	2710	2194	2918
Total	6717	7564	9434	11374	11741	11990	12409	11908	13275	12841	14515	13614

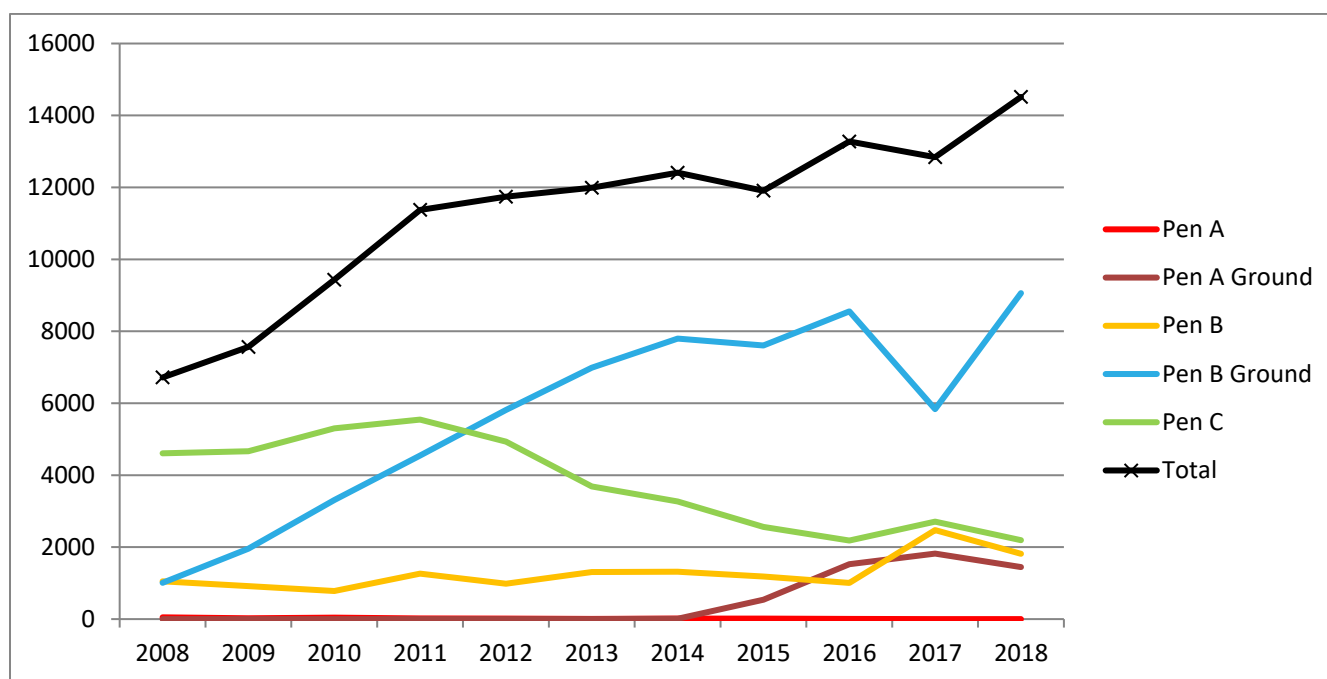


FIGURE 4. CORMORANT NEST COUNT AT TOMMY THOMPSON PARK 2008 TO 2019

Chick Banding

TRCA has a Scientific Permit to Capture and Band Migratory Birds from Environmental Canada (#10716) and an MNRF permit (#1057623). A banding team led by Dr. G. S. Fraser of York University and including Jennifer Smith (TRCA), Diego Corrales (TRCA volunteer) and Andrew Gavloski (York University student), captured and banded 20 cormorant chicks from the Peninsula B ground-nest colony after sunset on the evening of 18 July 2019, and 27 chicks on the evening of 25 July 2019. Accessing the ground-nest colony after dark minimizes disturbance to the birds and reduces risk of chick predation.

Tree Health

The health of trees in the nest areas is evaluated annually through a qualitative ranking system that scores the tree based on the degree of impact, with 1 being no impact and 5 being a severely damaged or standing dead tree (Figure 5). This survey has been completed in late August to early September since the 1990s. With over 20 years of data

showing a clear decline in forest health due to cormorant nesting, tree health surveys were modified in 2012 to randomly sample the target deterrent areas on Peninsulas C and B, as well as the control area on Peninsula D.

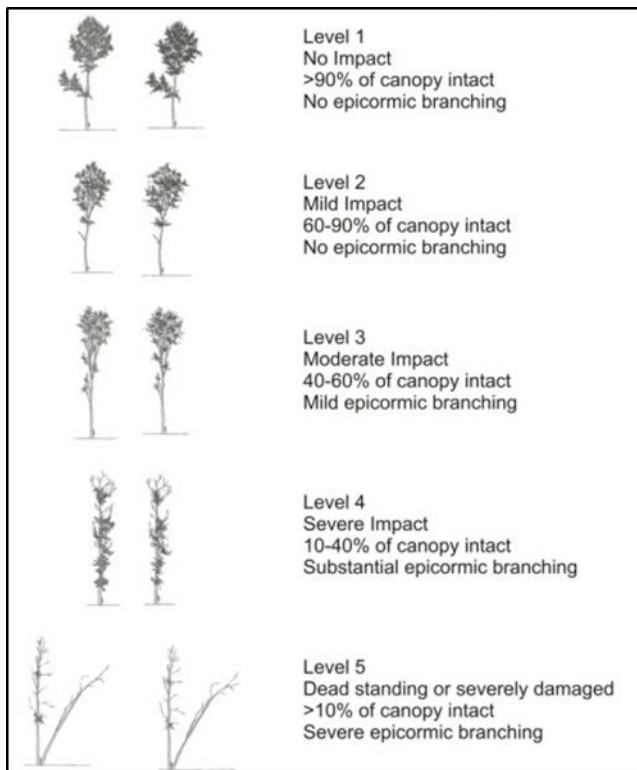


FIGURE 5. COTTONWOOD TREE HEALTH RANKING SCHEME

Tree health surveys were not completed in 2019. As of 2017, tree health on the Peninsulas at Tommy Thompson Park is also influenced by prolonged periods of standing water, as a result of the record high Lake Ontario water levels in 2017 and 2019. All low-lying areas in the park, which includes most of Peninsulas B and C were under a metre of water for approximately 8 weeks, from mid-May to mid-July in both years.

2019 Management Review

Cormorant management in 2019 followed the adaptive Strategic Approach for 2019 (Table 2). This Strategic Approach included inactive nest removals, pre-nesting deterrents, active nest removals, habitat enhancements and post-nesting deterrents, all to be implemented as required within target areas in the cormorant colonies.

TABLE 2. 2019 STRATEGIC APPROACH MATRIX

	Peninsula A	Peninsula B	Peninsula C	Peninsula D
Inactive Nest Removal (prior to 2019 breeding season)		*	*	
Enhanced Ground Nesting	*	*		
Pre-Nesting Deterrents	*	*	*	*
Post-Breeding Deterrents	*	*	*	*

Increasing Public Knowledge, Awareness and Appreciation

Increasing public knowledge and fostering an appreciation for cormorants is an important aspect of the management plan at Tommy Thompson Park. As in previous years, a viewing blind was installed at the edge of the colony on Peninsula C to provide visitors the opportunity for good views of the tree-nesting areas without disturbing the birds. The colony was highlighted at the Spring Bird Festival on 11 May 2019 with a well attended walk focused on colonial waterbirds, and three park-wide bike tours. Participants enjoyed views and learned about the colony from various lookouts. TRCA staff interpreted the colony for numerous corporate, academic and naturalist groups throughout the year.

Inactive Nest Removal

Inactive nest removal took place on one day in November 2018, with 22 nests removed on Peninsulas B and C. An additional 100 nests were removed from Peninsula B in early April 2019. These nests were targeted as they were located within the deterrent areas, and had not been successfully removed during the active deterrent phase in 2018. Discouraging nesting in healthy trees is important to maintain overall forest health. The method used to remove the cormorant nests was the same as previous years. Trained staff used arborist poles to safely poke nests off of the branches.

Enhanced Ground Nesting

Ground nesting enhancements were not applied in 2019, however, the ground-nest population on Peninsula A increased by 909 compared to the previous year. In contrast, the ground-nests on Peninsula B decreased by 2,734, but it was significantly impacted by the high-water levels of 2019.

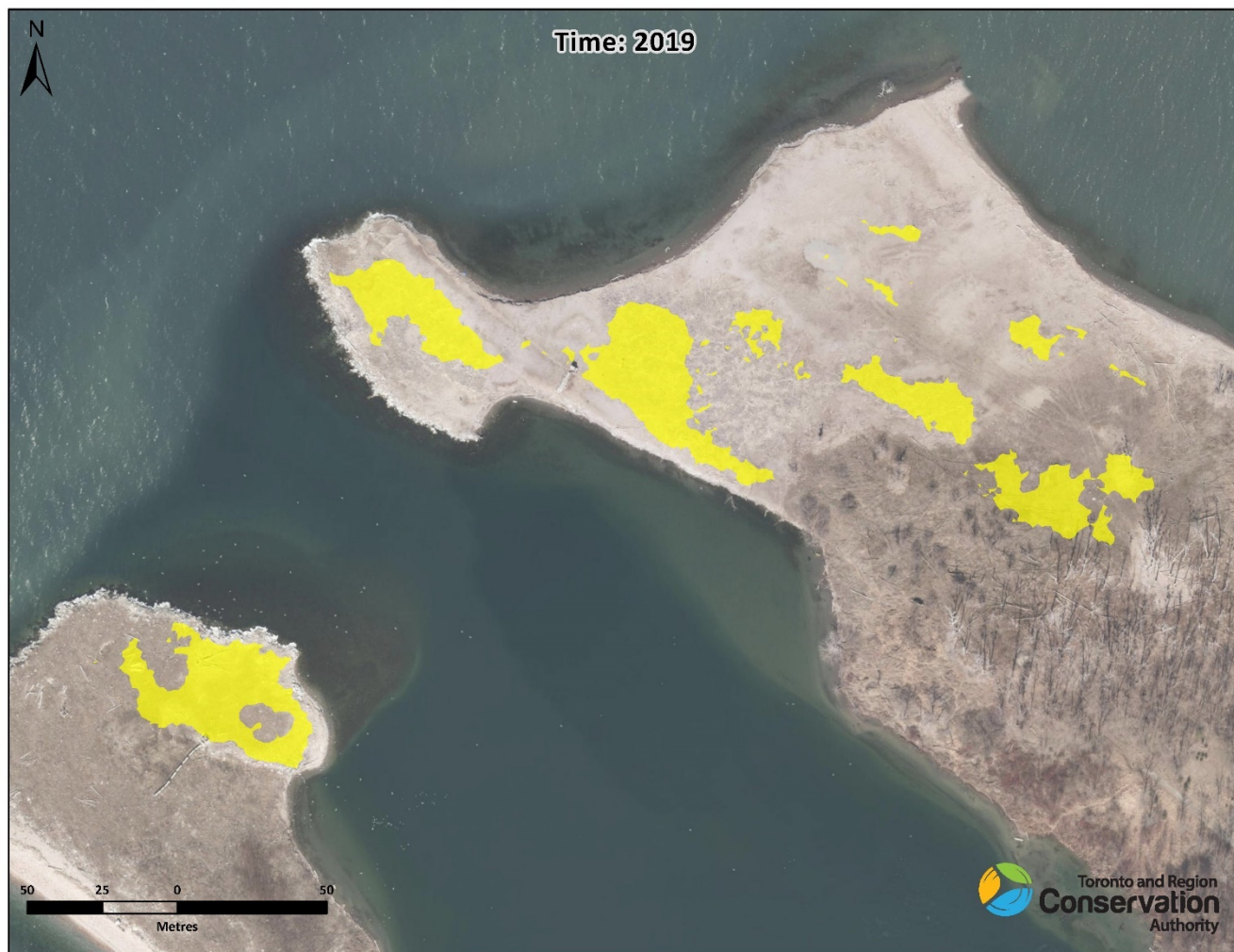


FIGURE 6. 2019 CORMORANT GROUND-NEST COLONIES ON PENINSULAS A AND B

Pre-nesting and Active Deterrents

Pre-nesting deterrents commenced on 10 April 2019 and were utilized primarily on Peninsulas B and C and at the base of Peninsula A near the peak of breeding season. Cormorant nesting attempts in deterrent areas was slow through April and the beginning of May, however attempts increased at an accelerated pace in mid-May and continued through the end of June. During this period, cormorants quickly became desensitized to the progressing level of deterrents and were aggressively attempting to expand their nesting range. Deterrents included human presence, use of long forestry poles, ropes attached to trees, flashlights, noise bangers and nest removal. Cormorants responded well to bangers and screamers, however, they were so determined to nest at the end of the season that eventually these techniques did not frighten all individuals from their nests. From late April to mid-June deterrents were undertaken from dawn to dusk, achieving management throughout all periods of the day when cormorants were most actively scouting nest locations and nest building. From 25 April to 8 June 2019, management was performed 6 days a week.

Cormorants started nesting attempts in trees at the base of Peninsula A (new in 2019) in conjunction with a high surge in lake levels during a storm event on May 29. They were also observed roosting in trees on Peninsula D following this event. Increased staff presence in the last week of May/first week of June to assist with deterring on

Peninsulas A and D. Cormorants roosted on Peninsula D for 6 days but did not return after June 3. There was reduced human presence on Peninsula D as many of the trails and access points were flooded.

Flooding was significant on the peninsulas, with some trees in over a metre of water. This added to the challenge of nest removals and deterrents as staff had to wade slowly through the deep water, keeping close watch for submerged tipping hazards (logs, branches, rocks, etc) and floating debris (logs).

Active Nest Removal

Active nest removals were carried out in strategic areas of Peninsulas A, B and C to prevent the expansion of nesting cormorants into previously nest-free areas. Depending on the location within the colony, either individual trees or large areas were monitored and managed using active nest removal. Nests were closely monitored to keep track of the age of eggs. No nests greater than 10-days old were removed, to prevent destruction of mature eggs; the 10-day incubation threshold followed is a conservative estimate based on current scientific literature on embryo development for altricial waterbirds (Humane Society of United States). In the event that eggs older than 10 days or nestlings were discovered, or a nest was known to be at least 10 days old, deterrent activities focusing on that nest ceased (Figure 7). A total of 2,483 active nests and 2,588 eggs were removed. Of those, 166 nests and 123 eggs were removed from Peninsula A; 1,591 nests and 1,666 eggs were removed from Peninsula B; and 726 nests and 797 eggs were removed from Peninsula C. When possible, undamaged eggs were collected and float tested to confirm the incubation stage. These efforts began on 11 April and continued until 26 June 2019.

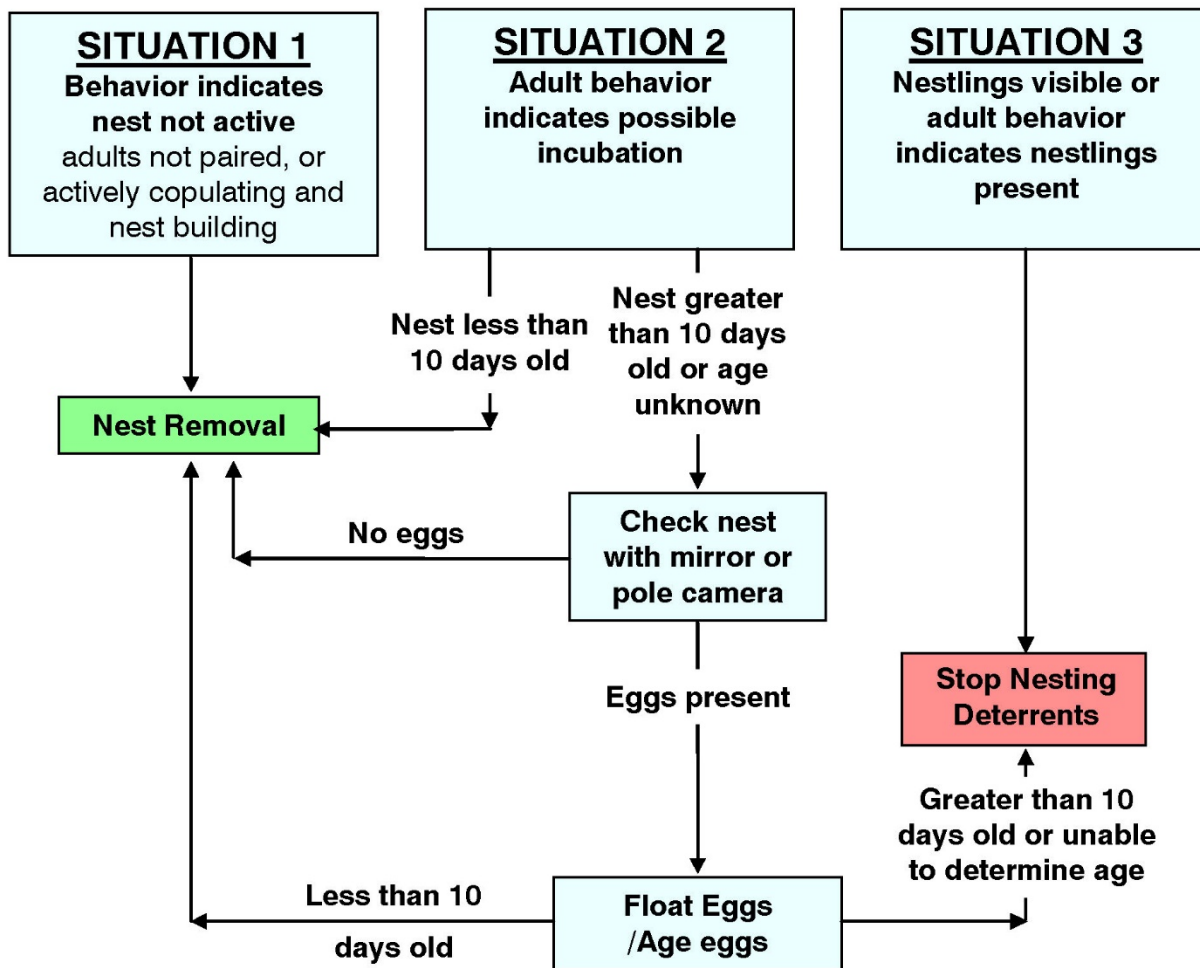


FIGURE 7. ACTIVE NEST REMOVAL DECISION CHART

Post Breeding Deterrents

Post breeding deterrents were identified for Peninsulas A, B, C and D but were not required as cormorants did not roost in the trees.

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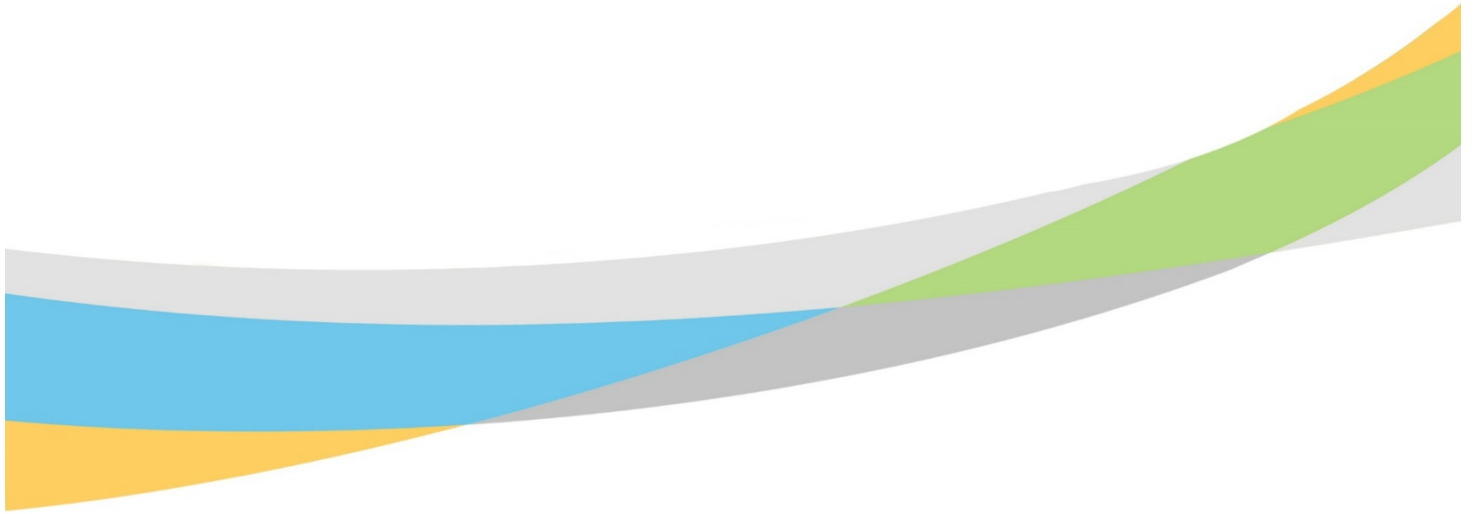
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