

# **Tommy Thompson Park Double-crested Cormorant Management Report 2018**

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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). Construction of the peninsula began in the 1950s for port-related facilities, but through natural succession and habitat enhancement efforts by the 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 ha, including the associated water lots.

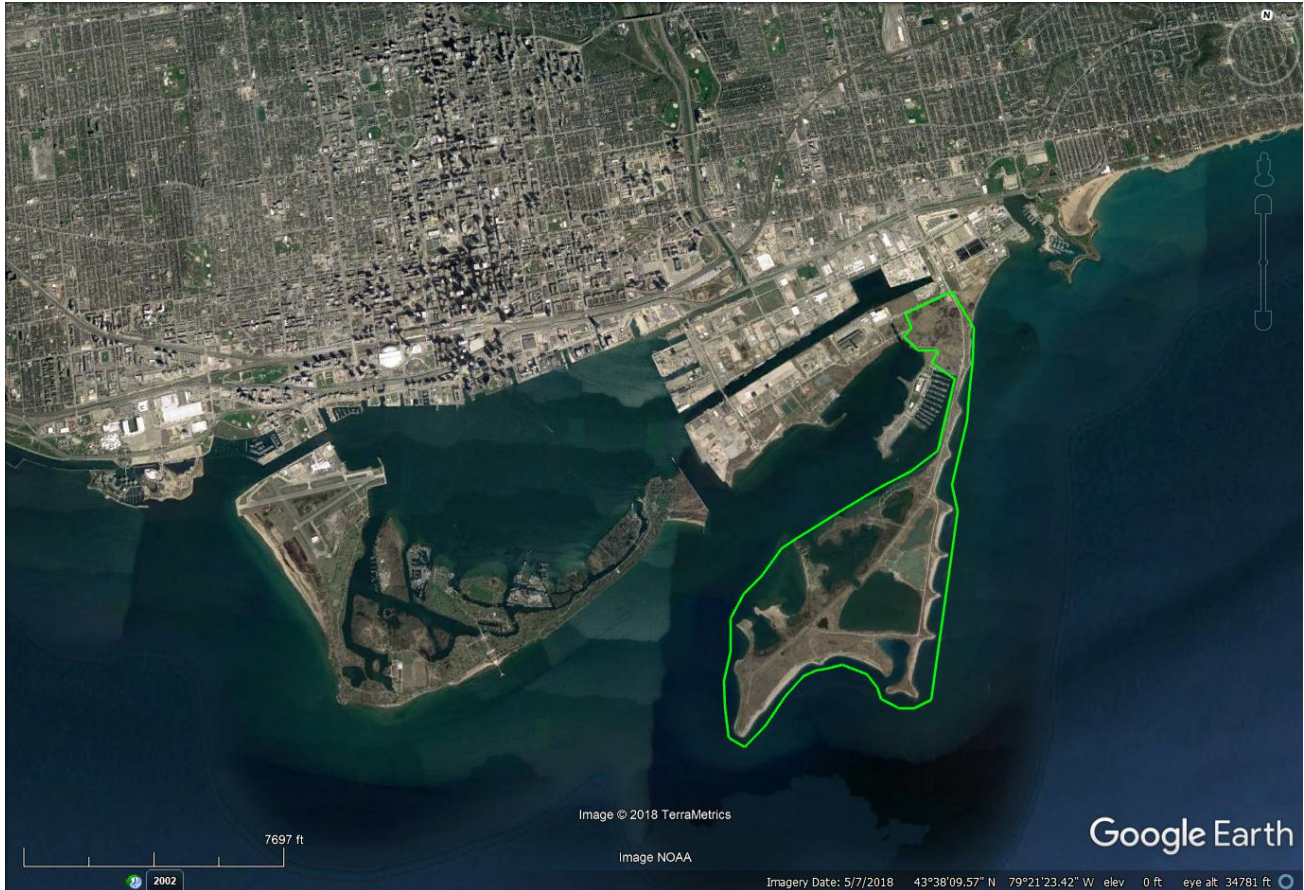


FIGURE 1. TOMMY THOMPSON PARK/LESLIE STREET SPIT (GOOGLE, 2018)

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*). Historically, cormorants were predominantly a tree-nesting species at TTP, however, since 2013 the majority of nests have been on the ground. Although there was no nesting from 2004 to 2011, Caspian Terns (*Hydroprogne caspia*) attempted ground-nesting with varying success from 2012 to 2016.

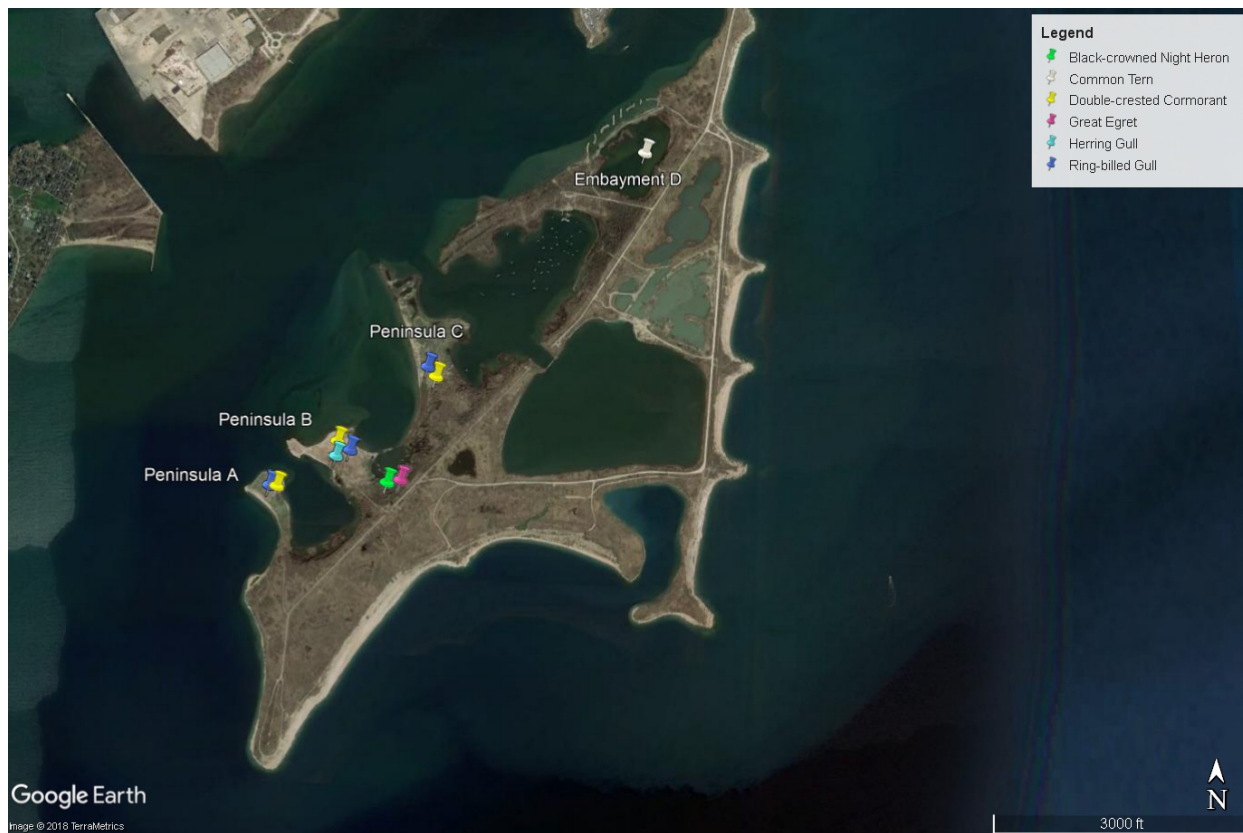


FIGURE 2. COLONIAL WATERBIRD NESTING LOCATIONS, TOMMY THOMPSON PARK, 2018

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 timeframe 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 (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.



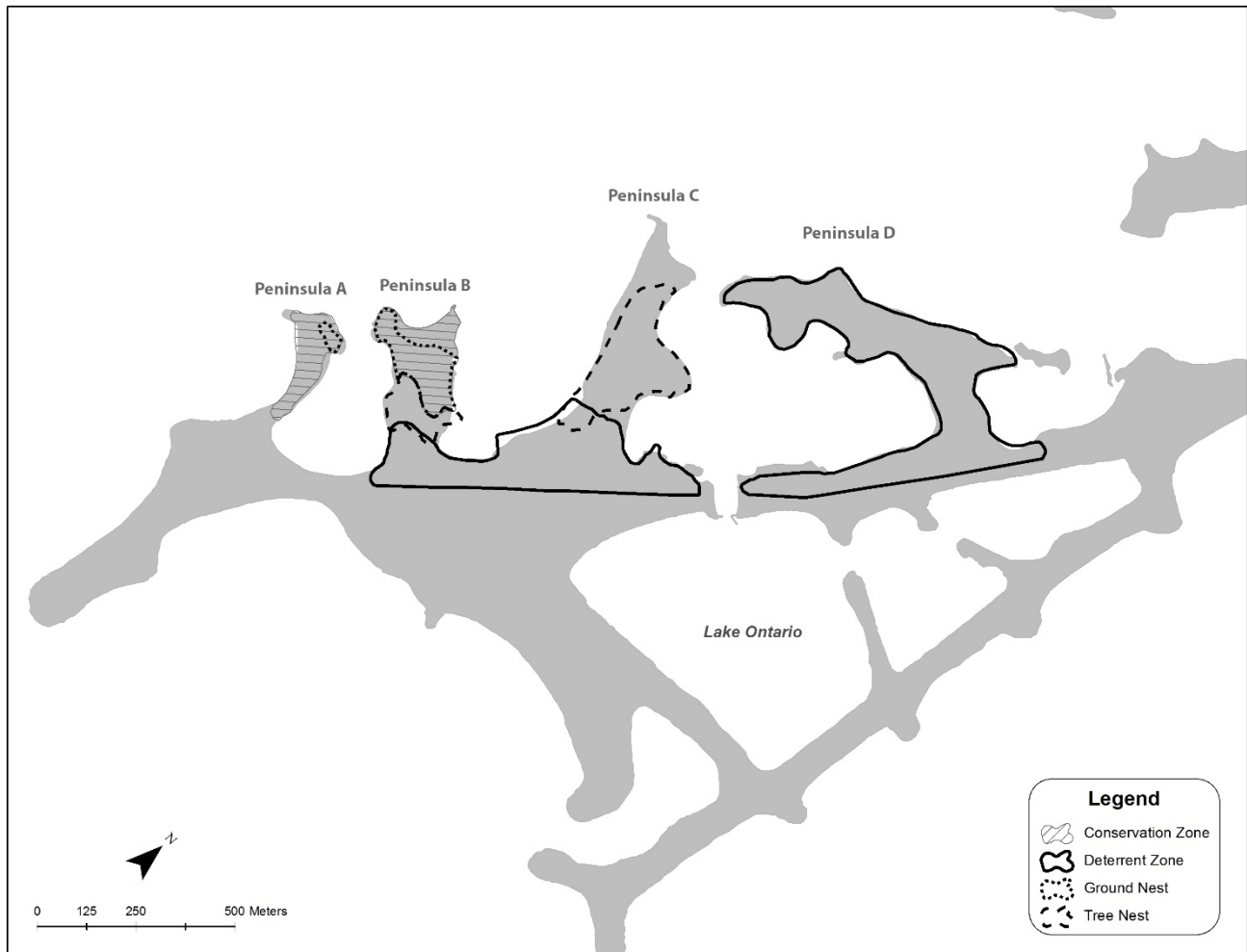


FIGURE 3. CORMORANT MANAGEMENT ZONES AT TOMMY THOMPSON PARK

## 2018 Population and Tree Health

### Breeding Census

Cormorants began to arrive at TTP from their wintering grounds on 22 March 2018. The breeding cormorant population at TTP increased in 2018 with 14,515 nests counted at the peak period in mid-June (Table 1, Figure 4). The percent of the overall colony represented by ground-nesting increased to 72% compared to 60% in 2017. Tree-nests decreased by 659 on Peninsula B and 516 on Peninsula C, bringing the average number of nests per tree to 10.1 and 8.5 respectively.

TABLE 1. TOMMY THOMPSON PARK CORMORANT NEST COUNT 2008 TO 2018

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

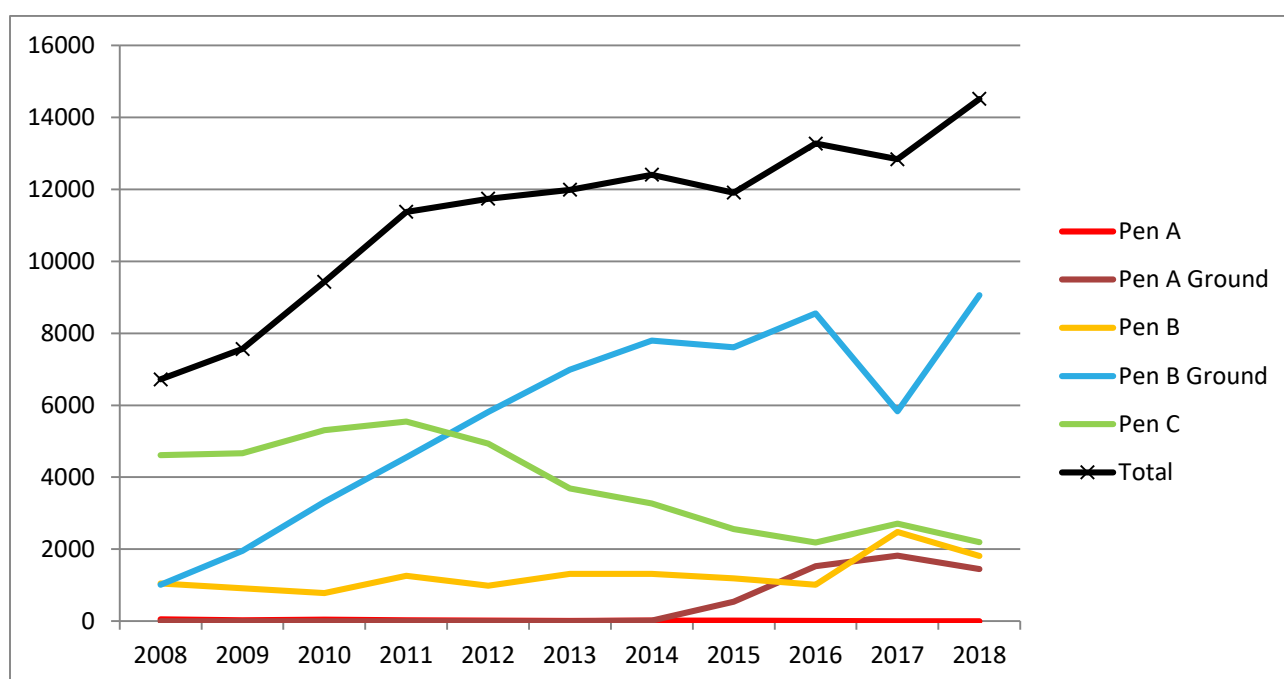


FIGURE 4. CORMORANT NEST COUNT AT TOMMY THOMPSON PARK 2008 TO 2018

### 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 comprised of TRCA staff and volunteers, captured and banded 32 cormorant chicks from the Peninsula B ground-nest colony after sunset on the evening of 12 July 2018. 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.

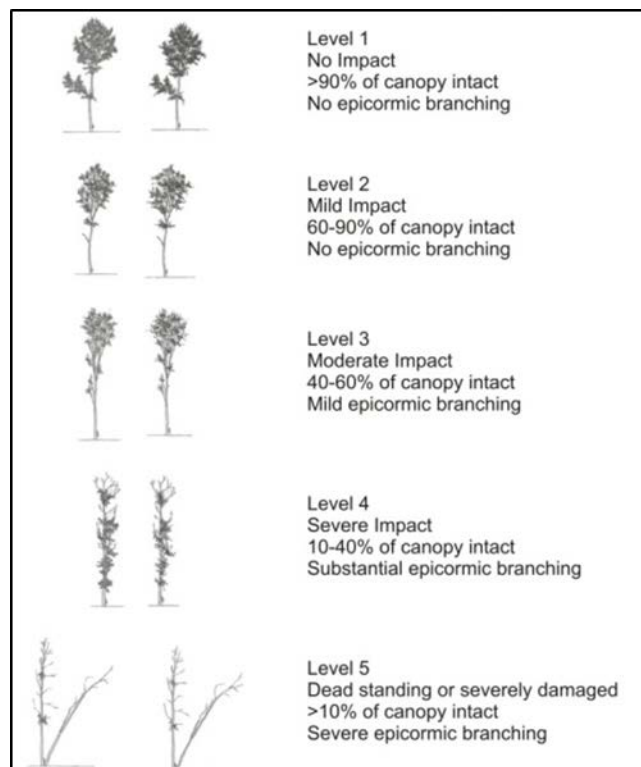


FIGURE 5. COTTONWOOD TREE HEALTH RANKING SCHEME

Results from these surveys indicate that tree health in the deterrent areas on Peninsula C (n=20) has an average rating of 4.5 and a mode of 5. The control plot of non-nest trees established on Peninsula D (n=11) has a rating of 1.5 and a mode of 1. The areas where the colony of Black-crowned Night Herons nest trees were located, at the base of Peninsula C (n=20) has an average rating of 2.6 and a mode of 2.

## 2018 Management Review

Cormorant management in 2018 followed the adaptive Strategic Approach for 2018 (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. 2018 STRATEGIC APPROACH MATRIX

	Peninsula A	Peninsula B	Peninsula C	Peninsula D
Inactive Nest Removal (prior to 2018 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 12 May 2018 with two well attended hikes focused on colonial waterbirds, and again at the Butterfly Festival on 18 August 2018 on a park-wide bike tour. 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.

In a joint collaboration between TRCA and York University, a paper was published in the June 2018 volume of the scientific journal *Waterbirds* on the unique management strategy adopted by the park.

- McDonald, K., R. Toninger, A. Chreston, I. R. Fledmann and G. S. Fraser. 2018. Living with Double-crested Cormorants (*Phalacrocorax auritus*): a Spatial Approach for Non-lethal Management in Toronto, Canada. *Waterbirds* 41: 208-220.

The management strategy was also presented by TRCA staff at the June 2018 International Association of Great Lakes Research (IAGLR) conference in Toronto.

The colony was the focus of print media attention in late August 2018 when a number of juvenile birds were infected with, and displayed symptoms of Newcastle Disease Virus. TRCA received questions at the park, on social media, and on the phone from concerned citizens. TRCA staff were subsequently interviewed on the subject for articles published online for CBC and Toronto.com.

- CBC News, August 24 2018 – Researchers closing in on mystery illness killing Toronto’s most controversial birds  
<https://www.cbc.ca/news/canada/toronto/cormorants-toronto-disease-1.4795873>
- Toronto.com, August 30 2018 – What’s killing cormorant birds in Toronto?  
[https://www.toronto.com/news-story/8865390-what-s-killing-cormorant-birds-in-toronto-/](https://www.toronto.com/news-story/8865390-what-s-killing-cormorant-birds-in-toronto/)

## Inactive Nest Removal

Inactive nest removal took place in the months of January, February and April 2018 on Peninsulas B and C. A total of 728 inactive cormorant nests were removed. Nests were targeted based on the height and accessibility of the nests in the trees, as well as their location in relation to the Black-crowned Night Heron and Great Egret nesting sites. Trees that were not entirely dead were also targeted. 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 nest enhancements in 2018 took place on Peninsulas A and B. Straw bales and wood material from fallen trees were placed in these areas to provide nesting material and structure to replace that which was lost during the 2017 flood. The ground-nest population on Peninsula A decreased by 376 compared to the previous year. In contrast, the ground-nests on Peninsula B increased by 3,225; this area was significantly impacted by the high water levels of 2017 so this seemingly significant increase is mostly explained as re-establishment.



FIGURE 6. 2018 CORMORANT GROUND-NEST COLONIES ON PENINSULAS A AND B

### Pre-nesting and Active Deterrents

Pre-nesting deterrents commenced on 4 April 2018 and were utilized on Peninsulas B and C. 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, flashlights, noise bangers and nest removal. 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 23 April to 9 June 2018, management was performed 6 days a week. This increased presence and use of deterrent techniques throughout the whole day showed positive results, allowing the active nest removal to keep up with the nest building attempts by the cormorants.

Pre-nesting and active deterrents were not required on Peninsula D as human presence from the Aquatic Park Sailing Club, the Tommy Thompson Park Bird Research Station staff and volunteers and park visitors was sufficient to prevent cormorants from scouting and nesting.

### Active Nest Removal

Active nest removals were carried out in strategic areas of Peninsula B and Peninsula 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 1,222 active nests and 1,335 eggs were removed. Of those, 542 nests and 536 eggs

were removed from Peninsula B; and 680 nests and 799 eggs were removed from Peninsula C. When possible, undamaged eggs were collected and float tested to confirm the incubation stage. These efforts began on 23 April and continued until 9 June 2018.

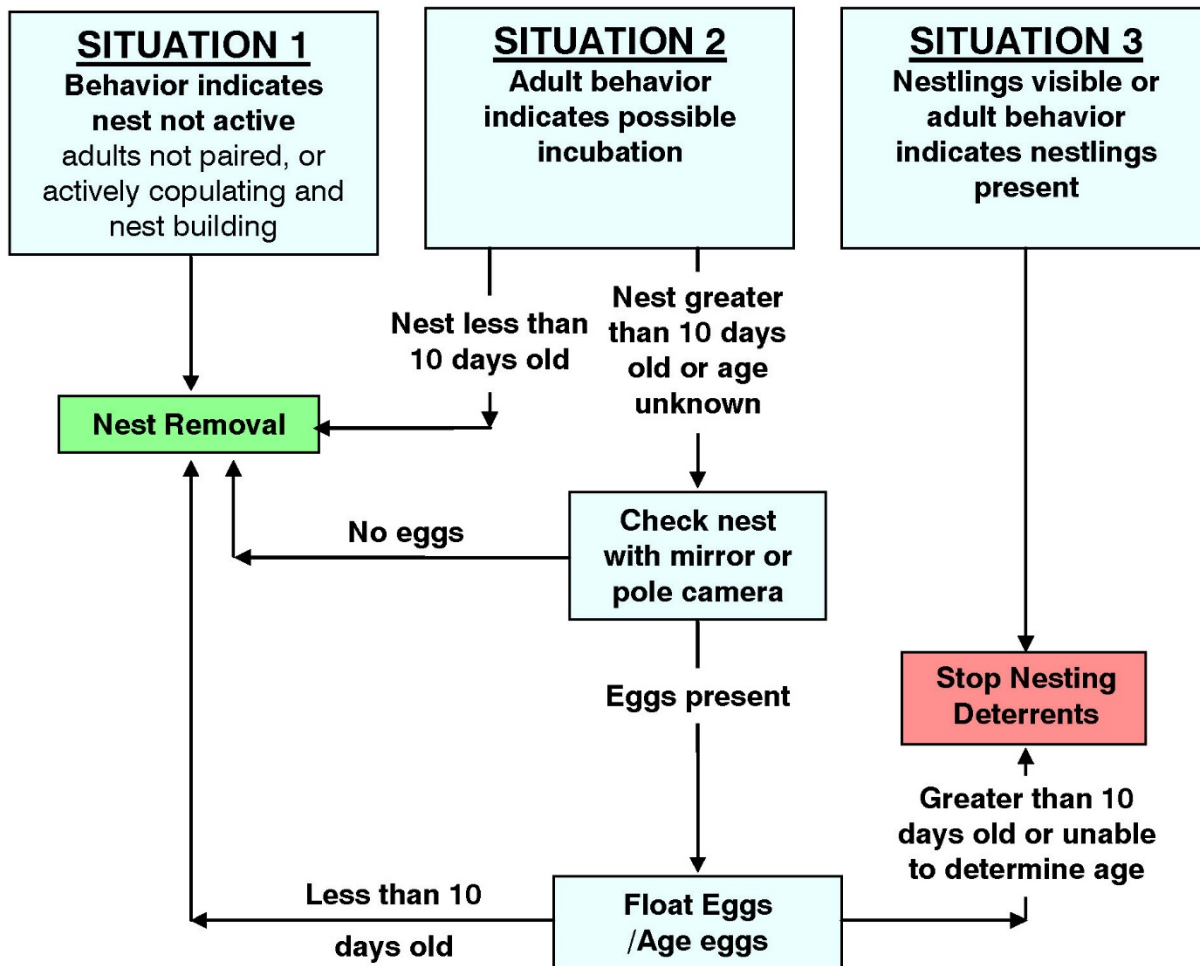


FIGURE 7. ACTIVE NEST REMOVAL DECISION CHART

### 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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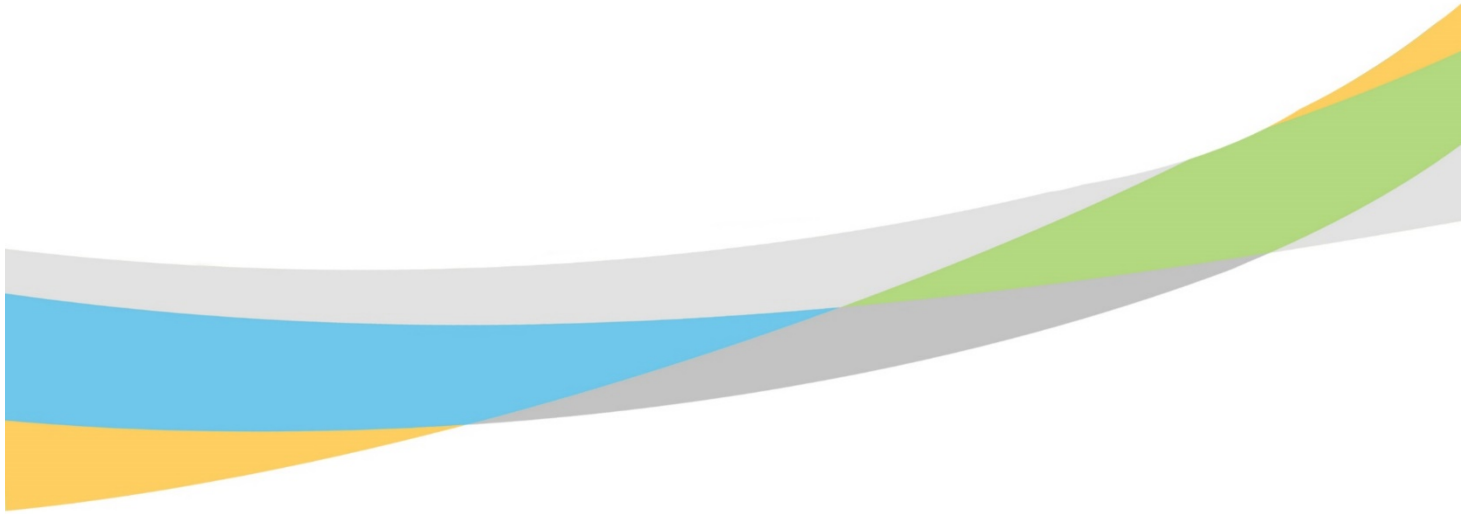
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