Tommy Thompson Park Double-crested Cormorant Management Report 2021

Prepared by Liam Graham

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Background

Tommy Thompson Park (TTP) is located on the Leslie Street Spit, a constructed landform 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 central Toronto waterfront. The final size of the Spit is approximately 500 hectares, including the associated water lots. The Spit was designated as an Important Bird Area (IBA) in 2000 based on the globally significant populations of nesting colonial waterbirds, the continentally significant numbers of overwintering waterfowl, and nationally significant numbers of migratory birds (Wilson & Cheskey, 2001).

FIGURE 1. TOMMY THOMPSON PARK/LESLIE STREET SPIT

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 and again in 2021. Until 2012, cormorants were predominantly a tree-nesting species at TTP, however, since 2013 most nests have been on the ground.

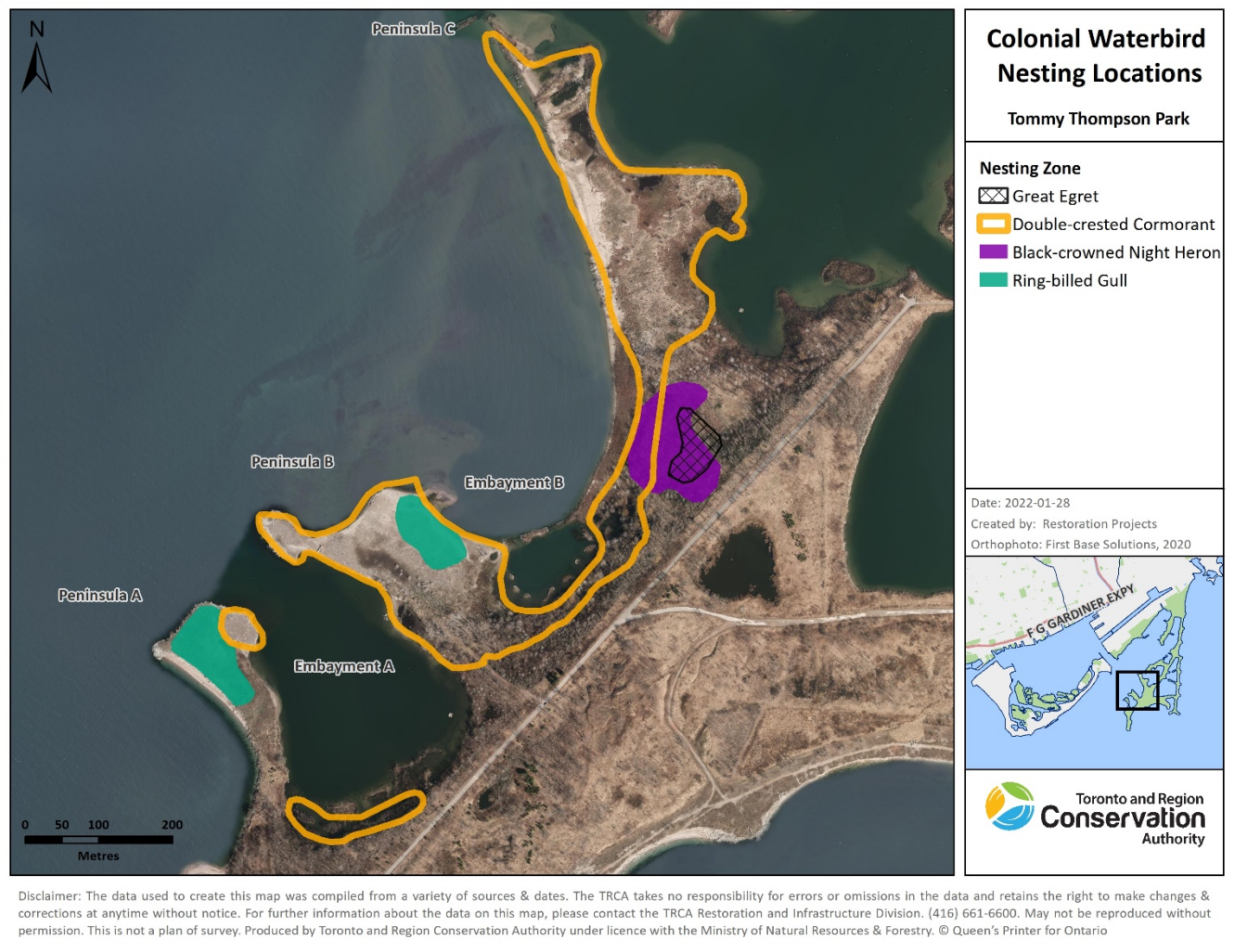

FIGURE 2. COLONIAL WATERBIRD NESTING LOCATIONS, TOMMY THOMPSON PARK, 2021

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, 2020). 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, 2020).

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.

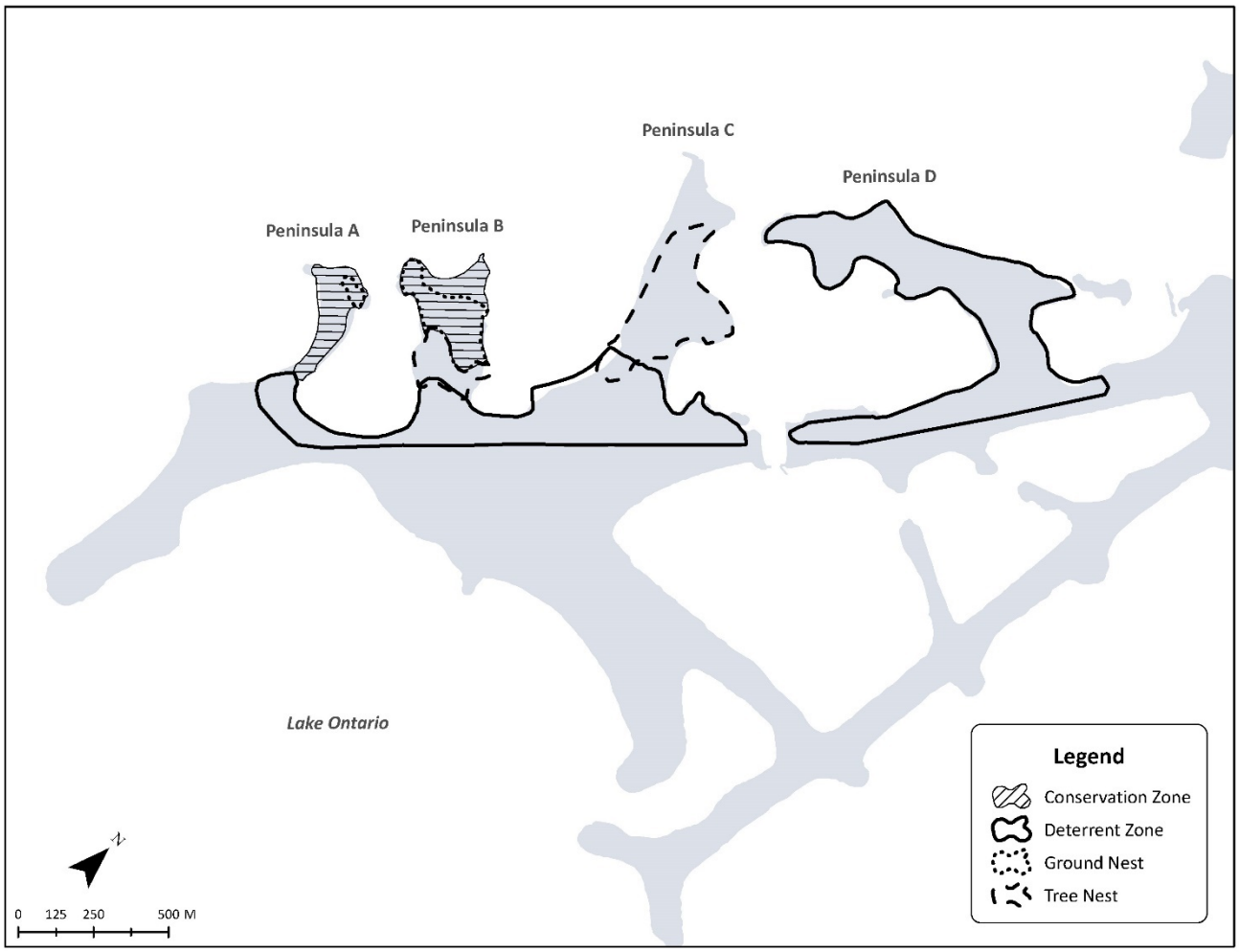

FIGURE 3. CORMORANT MANAGEMENT ZONES AT TOMMY THOMPSON PARK

2021 Population Data

Breeding Census

Cormorants began to arrive at TTP from their wintering grounds on 17 March 2021, with two individuals observed on Peninsula B. The breeding cormorant population at TTP decreased in 2021 with 10,737 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 78% compared to 59% in 2020 with our most successful nest removal season to date. The total number of tree-nests decreased on all peninsulas.

TABLE 1. TOMMY THOMPSON PARK CORMORANT NEST COUNT 2011 TO 2021

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Pen A	19	13	5	14	14	4	0	0	53	474	20
Pen A Ground	-	-	-	10	541	1525	1821	1445	2354	741	590
Pen B	1262	982	1310	1316	1184	1007	2474	1815	1962	1215	568
Pen B Ground	4547	5812	6986	7799	7608	8555	5836	9061	6327	5982	7820
Pen C	5546	4934	3689	3270	2561	2184	2710	2194	2918	3034	1739
Total	**11374**	**11741**	**11990**	**12409**	**11908**	**13275**	**12841**	**14515**	**13614**	**11446**	**10737**

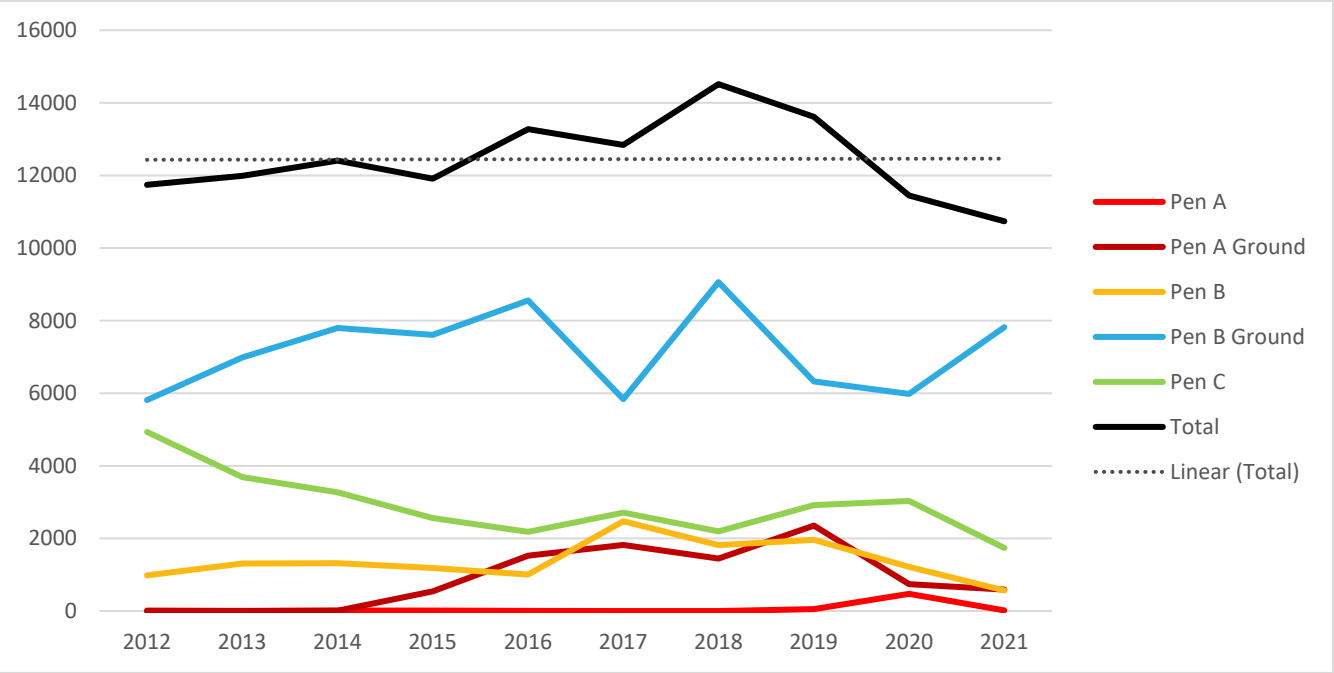

FIGURE 4. CORMORANT NEST COUNT AT TOMMY THOMPSON PARK 2012 TO 2021

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 TRCA volunteers Jim Mackiewicz, Lynda Mackiewicz, Rae Hutchinson, Paul Xamin, and Liam Graham captured and banded 35 cormorant chicks from the Peninsula B ground-nest colony after sunset on the evening of 14 July 2021, and 32 chicks on the evening of 19 July 2021. Accessing the ground-nest colony after dark minimizes disturbance to the birds and reduces risk of chick predation.

2021 Management Review

Cormorant management in 2021 followed the adaptive Strategic Approach for 2021 (Table 2). The 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. 2021 STRATEGIC APPROACH MATRIX

	Peninsula A	Peninsula B	Peninsula C	Peninsula D
Inactive Nest Removal (post 2021 breeding season)	*	*	*	
Enhanced Ground Nesting	*	*		
Pre-Nesting Deterrents	*	*	*	*
Active Nest Removals	*	*	*	
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. Interpretation opportunities were limited in 2021 due to the ongoing COVID-19 pandemic. However, Tommy Thompson Park staff engaged visitors in informal interpretation and the management strategy was presented to a university environmental planning class.

Inactive Nest Removal

Inactive nest removal took place in November and December 2021, after the breeding season was complete. 655 nests were removed on all three peninsulas. Nests were removed following the same method as previous years. Trained staff used arborist poles to safely poke nests from the trees. Many nests were located too high in the canopy to poke from the ground. Professionally trained arborists assisted by climbing healthy trees to remove these nests, which leaves the colony is a good position for spring 2022.

Enhanced Ground Nesting

Ground nesting enhancements were not applied in 2021. Figure 5 illustrates the cormorant ground nesting areas on Peninsulas A and B.

FIGURE 5. 2020 CORMORANT GROUND-NEST COLONIES ON PENINSULAS A AND B

Pre-nesting and Active Deterrents

Pre-nesting deterrents commenced on 15 April 2021 and were utilized primarily on Peninsulas B and C, and on Peninsula A to a lesser extent, throughout the season. Cormorant nesting effort was moderate through April and May. Many nests from 2020 were already occupied by cormorants when pre-nesting deterring began on Peninsulas B and C. Nesting attempts increased from mid-May until the end of June, and cormorants were quickly desensitized to the progressing level of deterrents and were repeatedly attempting to expand their range. Cormorants returned to nests from the previous year at the base of Peninsula A and continued to try and extend their range throughout the peninsula until early June. Cormorants began loafing on Peninsula D near the end of May.

Deterrents began with human presence, waving of arms, clapping, and shouting, and quickly turned to shaking trees with rope and the use of screamers and bangers (Figure 6). Initially the screamers and bangers were effective at deterring cormorants, but the effect did not last long. Throughout the following weeks, many cormorants were no longer frightened by the sounds made by the screamers and bangers, even within proximity to their detonation.

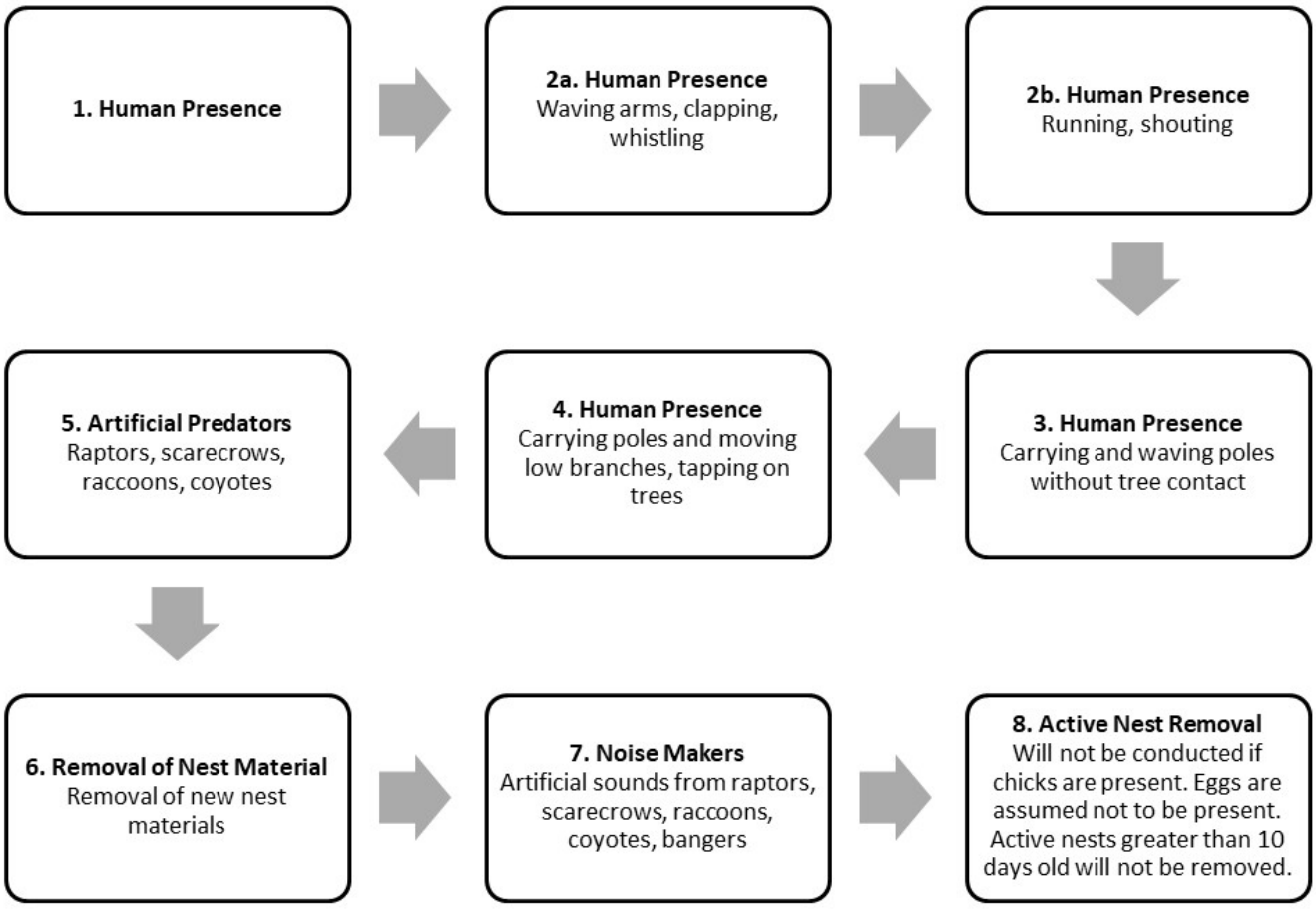

FIGURE 6. CORMORANT DETERRENT ESCALATION SCALE

From April until late June deterrents were implemented from dawn until dusk, except for a 9-day period between 22 April and 30 April, wherein the crew was not on site due to COVID-19. From 3 May to 5 June, management was performed 6 days a week.

Active Nest Removal

Active nest removals were carried out in strategic areas of Peninsulas A, B and C to prevent expansion into previously nest-free areas. Nests were carefully monitored to track the age of any eggs present. Due to the high number of nests remaining from the previous season and unusually asynchronous nesting behaviours, nests up 14 days old were removed. This was an increase from the conservative 10-day threshold followed in previous seasons and was based on current scientific literature of embryo development in altrical waterbirds (Humane Society of United States, 2009, Powell et al, 1998). Increasing the window by four days allowed the team a greater window to protect the trees during the peak nest-building stage. If eggs older than 14 days or nestlings were discovered, or a nest was known to be older than 14 days, deterrent activities on that nest were ceased (Figure 7).

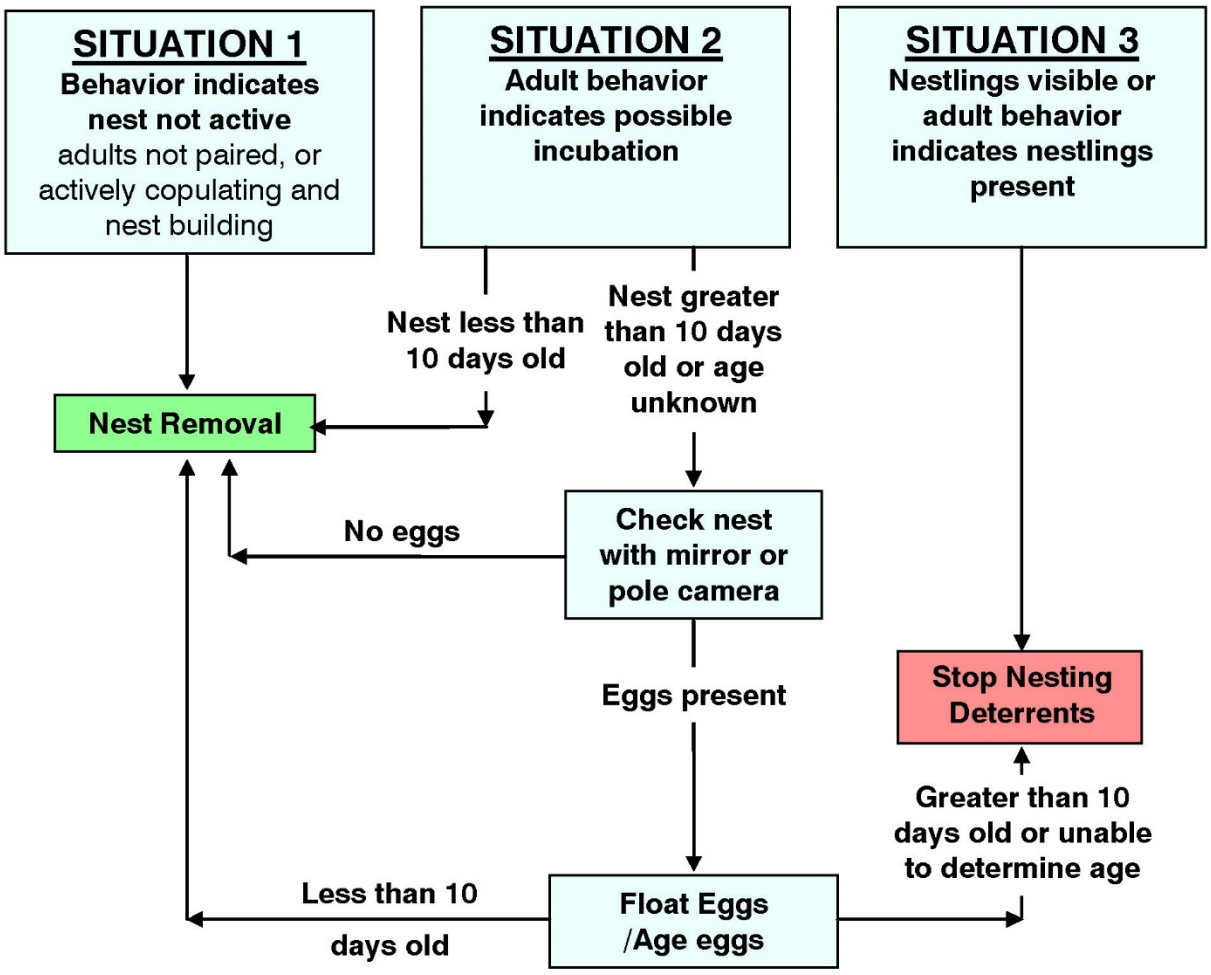

FIGURE 7. ACTIVE NEST REMOVAL DECISION MATRIX. CONSERVATIVE 10-DAY THRESHOLD INCREASED TO 14-DAYS FOR 2021 BREEDING SEASON.

A total of 1,719 active nests and 1,017 eggs were removed. Of those, 23 nest and 4 eggs were removed from Peninsula A; 310 nests and 110 eggs were removed from Peninsula B; and 1,386 nests and 903 eggs were removed from Peninsula C. Active nest removal began on 15 April and continued until 23 June.

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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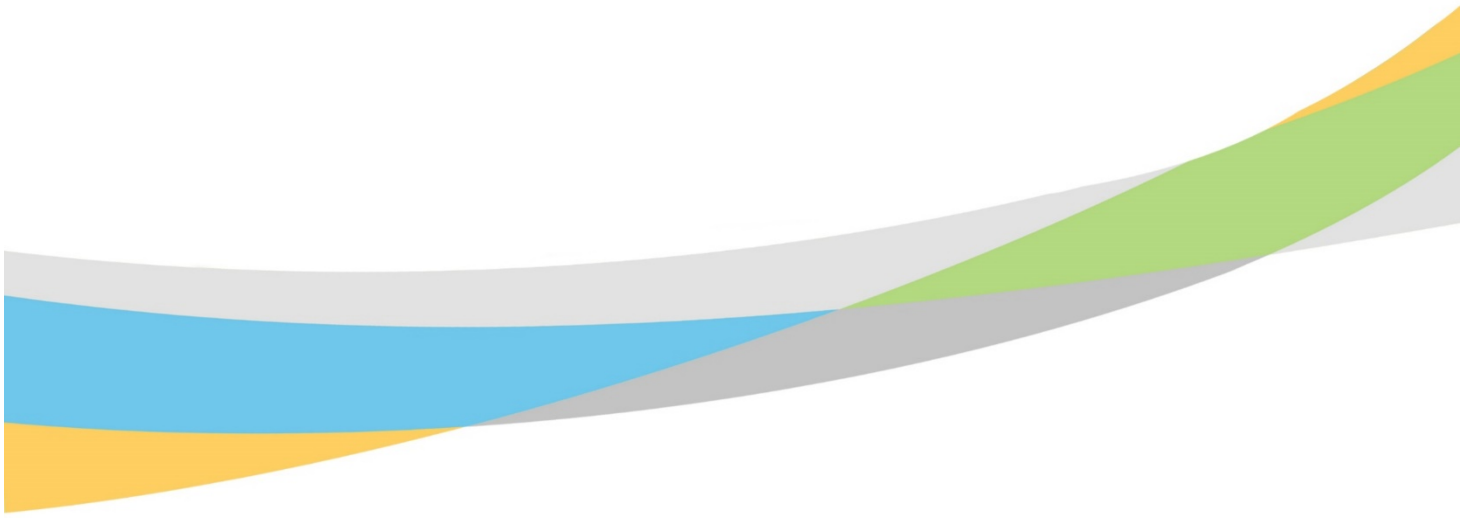

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