Tommy Thompson Park Double-crested Cormorant Management Report 2022

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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); this designation was upgraded to Key Biodiversity Area in 2022.

FIGURE 1. TOMMY THOMPSON PARK/LESLIE STREET SPIT

Six species of colonial waterbirds breed regularly at Tommy Thompson Park. 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*). 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.

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).

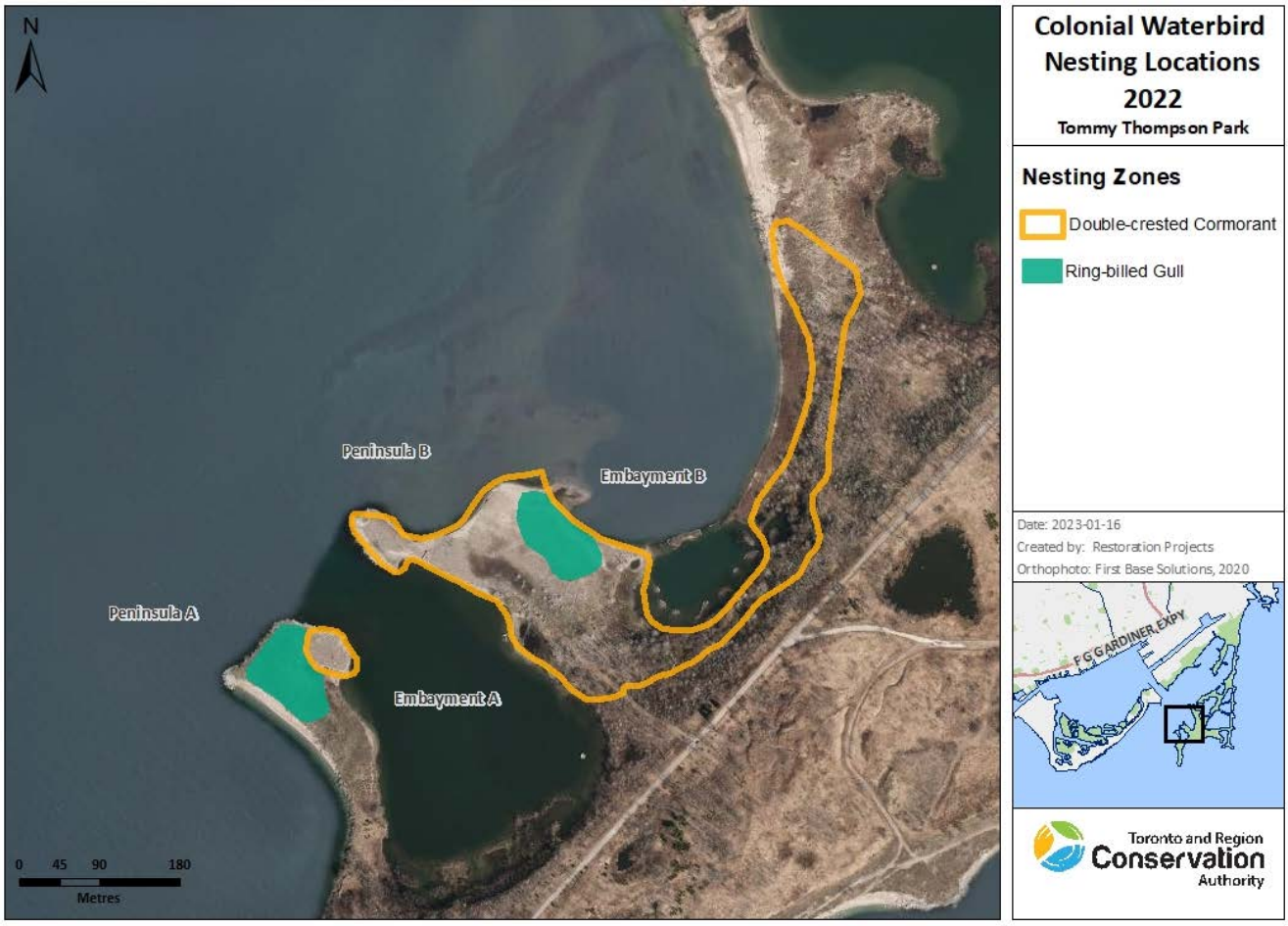

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FIGURE 2. COLONIAL WATERBIRD NESTING LOCATIONS, TOMMY THOMPSON PARK, 2022

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 (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. TRCA takes precautions to ensure management efforts do not adversely impact non-target species within the Deterrent Areas. Peninsula D is the only remaining forested peninsula in the park, and is not occupied by nesting colonial waterbirds, however, cormorants attempted nesting and were effectively deterred on the peninsula in May 2022.

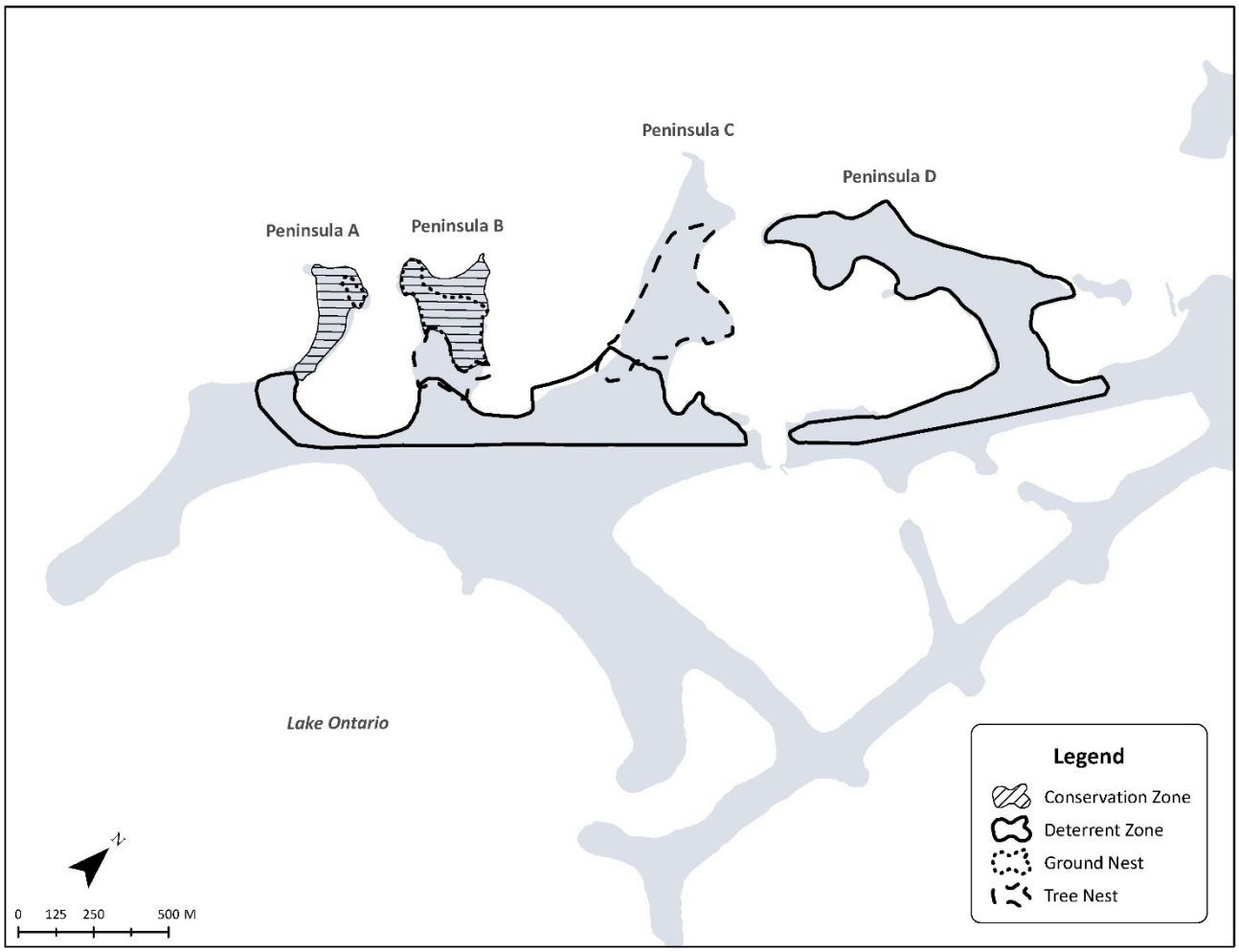

FIGURE 3. CORMORANT MANAGEMENT ZONES AT TOMMY THOMPSON PARK

2022 Population Data

Breeding Census

First of season cormorants were observed at TTP on 22 March 2022. The peak-season breeding cormorant population decreased by 17% with 8,860 nests counted in late-June (Table 1, Figure 4). 88% of the was ground nesting on Peninsulas A and B (Figure 5); the total number of tree-nests decreased on all peninsulas.

TABLE 1. TOMMY THOMPSON PARK CORMORANT NEST COUNT 2012 TO 2022

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Pen A	13	5	14	14	4	0	0	53	474	20	0
Pen A Ground	-	-	10	541	1525	1821	1445	2354	741	590	372
Pen B	982	1310	1316	1184	1007	2474	1815	1962	1215	568	96
Pen B Ground	5812	6986	7799	7608	8555	5836	9061	6327	5982	7820	7410
Pen C	4934	3689	3270	2561	2184	2710	2194	2918	3034	1739	982
Total	**11741**	**11990**	**12409**	**11908**	**13275**	**12841**	**14515**	**13614**	**11446**	**10737**	**8860**

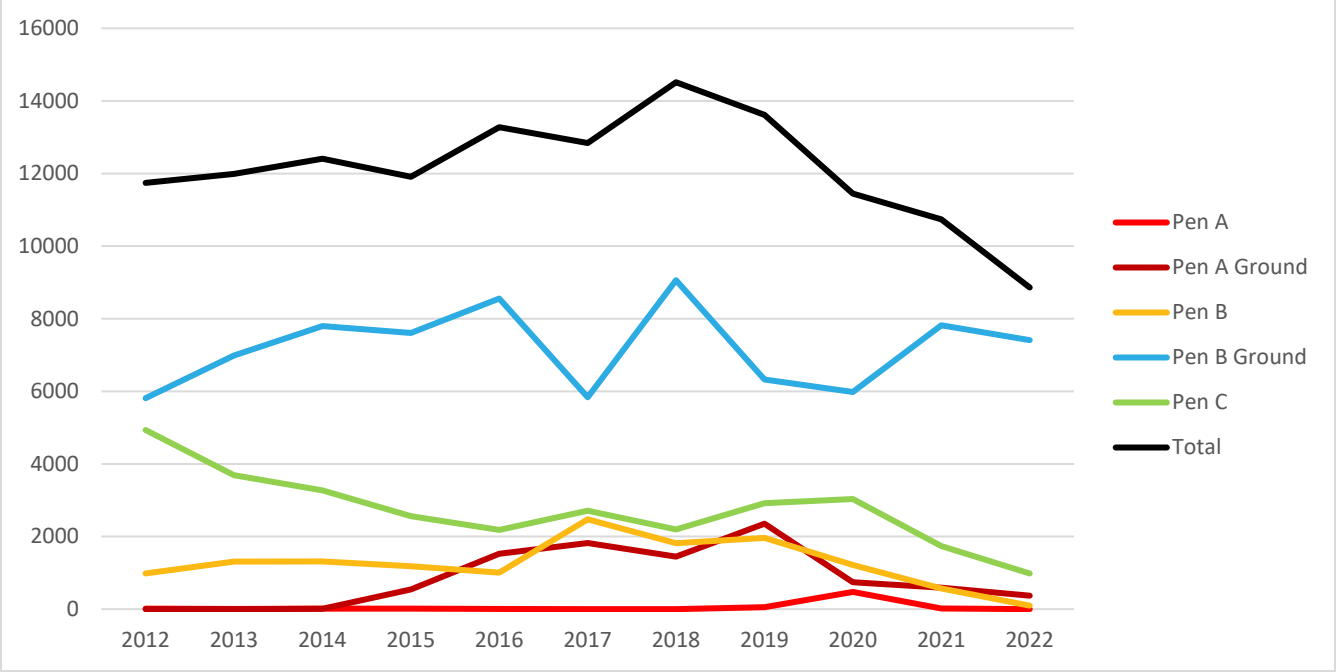

FIGURE 4. CORMORANT NEST COUNT AT TOMMY THOMPSON PARK 2012 TO 2022

FIGURE 5. 2022 CORMORANT GROUND-NEST COLONIES ON PENINSULAS A AND B

Chick Banding

TRCA has a Scientific Permit to Capture and Band Migratory Birds from Environmental Canada (#10716) and a MNRF permit (#1057623). A banding team led by Dr. G. S. Fraser of York University and TRCA volunteers Rae Xamin and Paul Xamin captured and banded 31 cormorant chicks from the Peninsula B ground-nest colony after sunset on 7 July 2022. Accessing the ground-nest colony after dark minimizes disturbance to the birds and reduces risk of chick predation.

2022 Management Review

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

TABLE 2. 2022 STRATEGIC APPROACH MATRIX

	Peninsula A	Peninsula B	Peninsula C	Peninsula D
Inactive Nest Removal (post 2022 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. Staff engaged park visitors in informal interpretation as part of the weekend nature interpretation program, and the management strategy was presented to post-secondary academic groups and conference participants throughout the year. Furthermore, the TTP Cormorant Management Strategy was highlighted in two news articles:

- The Narwhal, 21 June 2022: The birds are back in town: lost habitat is being restored in Toronto's accidental wilderness
- CBC, 21 July 2022: They're Toronto Islands' newest visitors, but residents hope cormorants don't stay long

Inactive Nest Removal

Inactive nest removal took place in December 2022 and 308 nests were removed from Deterrent Areas on Peninsulas B and C. Nests were removed using the same methods as previous years – trained staff used arborist poles to safely poke nests from the trees, and professional arborists climbed heathy trees to remove nests too high in the canopy to poke from the ground.

Enhanced Ground Nesting

Ground nesting enhancements were undertaken on Peninsula B early in the breeding season. Logs from felled Black Locust (*Robinia pseudoacacia*) trees in TTP were strategically placed adjacent to the existing ground nesting colony to encourage expansion. The area was selected because it was previously occupied by ground nesting cormorants, but all materials were washed away after the flood events of 2017 and 2019.

Pre-nesting and Active Deterrents

Deterrents began with human presence, waving of arms, clapping, and shouting. Techniques quickly escalated to shaking trees with rope, shaking a tarp, flying a tarp in the tree canopy, and using screamers and bangers (Figure 6). Unlike previous years, the screamers and bangers were mostly ineffective at deterring cormorants, but there was intermittent success throughout the season. A blue tarp either being shaken from the ground or suspended by ropes in trees was the most successful tool this season in deterring cormorants from loafing and nesting in trees.

Pre-nesting deterrents commenced on 18 April 2022 and were used primarily on Peninsulas B and C, and to a lesser extent on Peninsula A, throughout the active breeding season. During peak nesting season, from 9 May to 4 June, deterrents were implemented 6-days a week, from dawn to dusk. Management at TTP ended a week earlier than usual as the team was re-assigned to manage a new cormorant nesting colony at Toronto Island Park.

Cormorant nesting effort was moderate through April and May. Many existing nests were occupied by cormorants when pre-nesting deterring began on Peninsulas B and C. Cormorants were quickly desensitized to the progressing level of deterrent techniques and actively attempted to expand their nesting area. As expected, nesting attempts slowly increased from mid-May through early June when attempts subsided.

All existing cormorant nests had been removed from the Peninsula A tree nesting area before the breeding season (in December 2021), and no cormorant nesting attempts were observed until mid-May. Fortunately, they responded well to deterrents and abandoned the area. Loafing had been observed before the nesting attempts. Cormorants began loafing and attempting to nest on Peninsula D in early May, but were successfully deterred within a couple days.

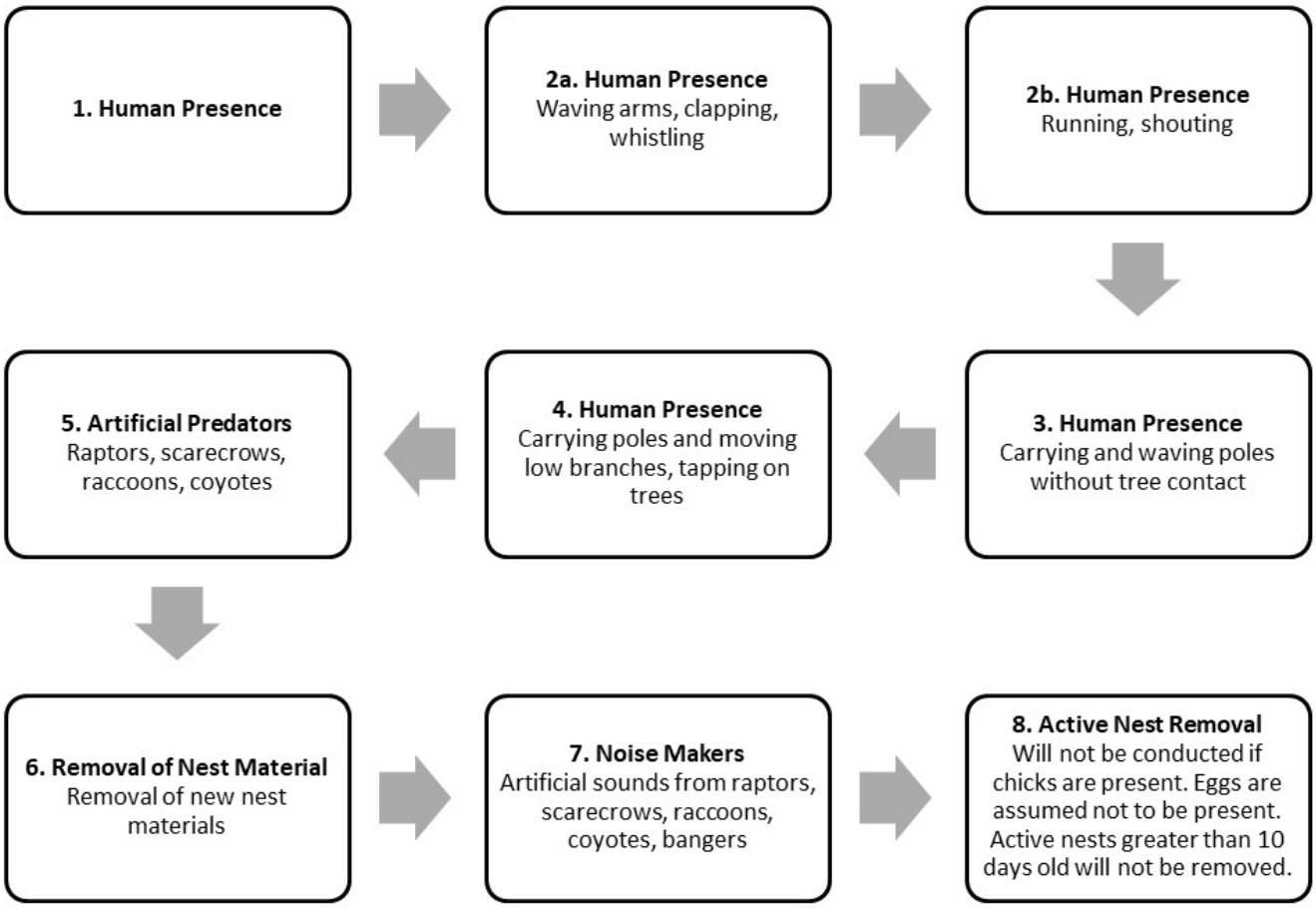

FIGURE 6. CORMORANT DETERRENT ESCALATION SCALE

Active Nest Removal

Active nest removals were carried out in strategic areas of Peninsulas A, B, C and D to prevent nesting in Deterrent Areas. Nests were carefully monitored to track the age of any eggs present, and a 10-day threshold was maintained to ensure any removed eggs were immature. The conservative 10-day threshold is based on current scientific literature of embryo development in altrical waterbirds (Humane Society of United States, 2009, Powell et al, 1998). If eggs older than 10 days were discovered, or a nest was known to be older than 10 days, deterrent activities on that nest were ceased (Figure 7).

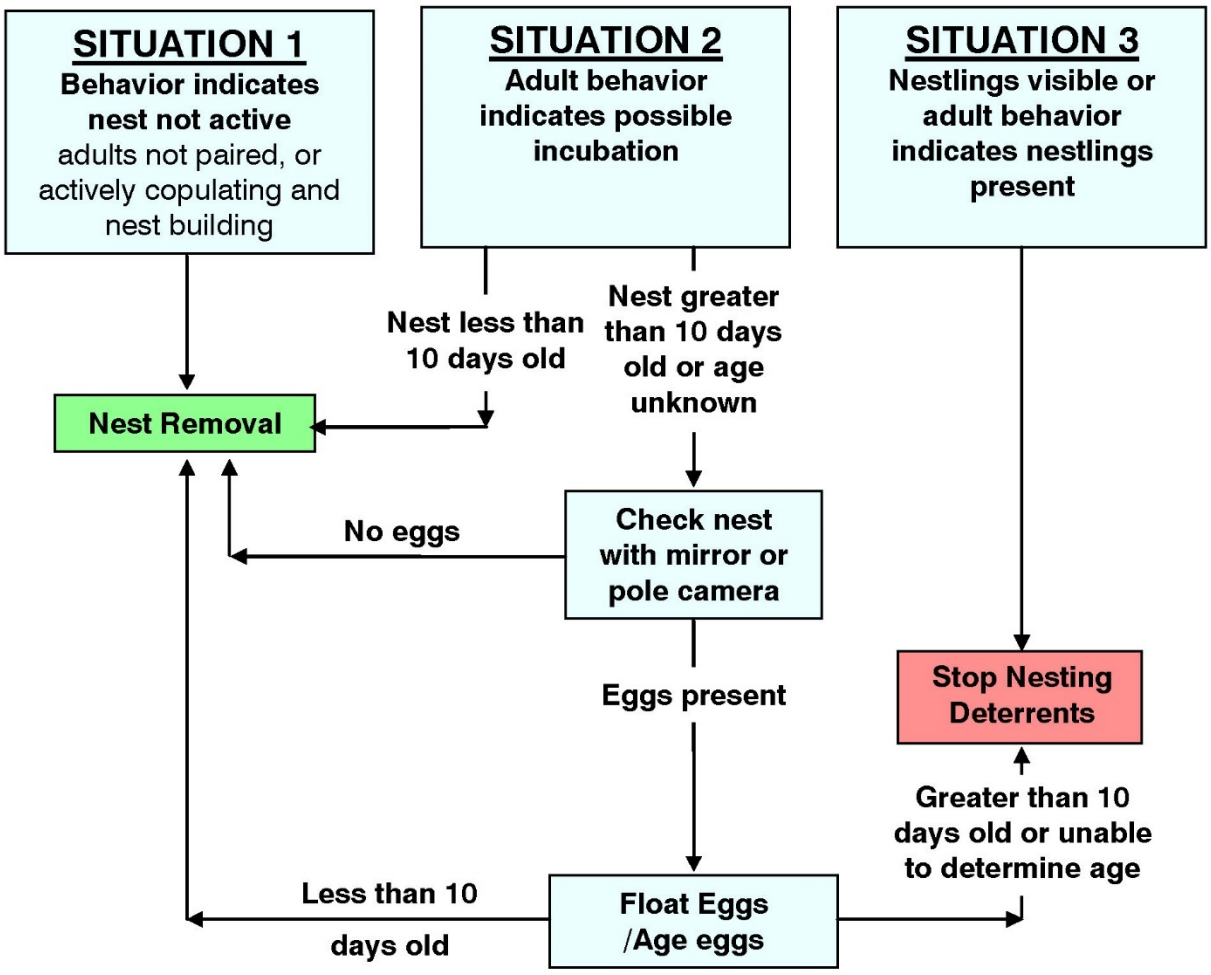

FIGURE 7. ACTIVE NEST REMOVAL DECISION MATRIX.

A total of 810 active nests and 730 eggs were removed. Of those, 25 nest and 11 eggs were removed from Peninsula A; 84 nests and 42 eggs were removed from Peninsula B; 696 nests and 677 eggs were removed from Peninsula C; and 5 nests 0 eggs were removed from Peninsula D. Active nest removal began on 19 April and continued until 6 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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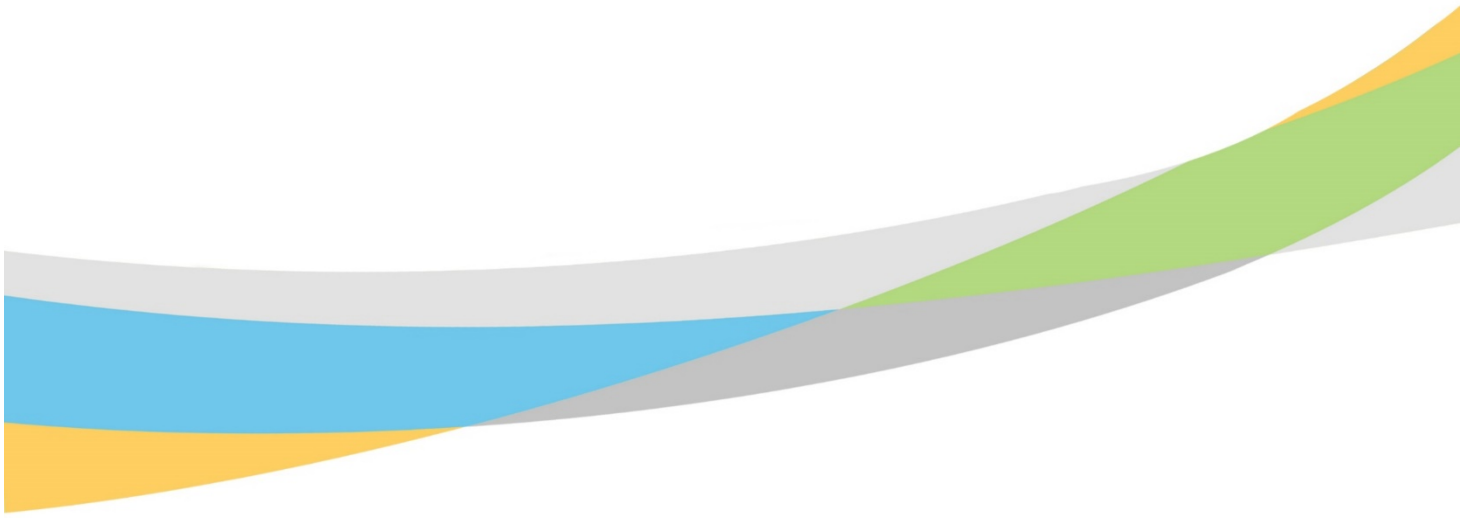

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