

Hamilton Harbour Colonial Waterbird Management Report - Spring/Summer 2016

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In the spring of 2016, we monitored colonial waterbird colonies at various sites on the Hamilton waterfront: Pier 27, the man-made islands of Windermere Basin, and the man-made islands north of the Canadian Centre for Inland Waters (CCIW). In May, we conducted a harbour-wide (including Windermere Basin and Cootes Paradise) census of “active” nests (nests containing eggs or chicks) for the following six species: double-crested cormorants (DCCO; *Phalacrocorax auritus*), ring-billed gulls (RBGU; *Larus delawarensis*), herring gulls (HEGU; *Larus argentatus*), common terns (COTE; *Sterna hirundo*), Caspian terns (CATE; *Hydroprogne caspia*) and black-crowned night herons (BCNH; *Nycticorax nycticorax*).

Colonial waterbird populations in Hamilton Harbour have been monitored since 1997. The McMaster-based management/monitoring program was started in 2007, with the intention of encouraging maintenance of a diverse waterbird community in the Harbour. In addition to monitoring, this program manages the sites listed above in an attempt to preserve nesting space for the less populous or ecologically compromised COTE, CATE, HEGU and BCNH. The two more populous species, RBGU and DCCO, arrive early or aggressively occupy/take over available space, making it difficult for individuals of the more vulnerable populations to nest. This has been a particular problem on the artificial islands north of the CCIW (Fig. 1). When the habitat was designed in 1996, it was hoped that barren regions on North Island and the northern two thirds of Centre Island would attract COTE, while shrubs and trees on South Island and the southern third of North Island would attract BCNH (Quinn et al, 1996). DCCO would be allowed to nest in the middle of Centre Island, but would otherwise be discouraged (largely through nest removal) from occupying space on the artificial islands (Quinn et al, 1996). However, DCCO numbers have risen steadily over the last twenty years, and their aggressive colonization of the artificial islands has necessitated regular nest removal on South, North, and Neare during the nesting season.

Similar issues arise in Windermere Basin, where four artificial islands have been built to provide a habitat for CATE and COTE. Without intervention, these islands would be rapidly colonized by RBGU in the early spring, before CATE and COTE have arrived in the area. To discourage RBGU colonization, Predator Bird Services Inc. was hired to provide tethered raptors, which were perched in the Basin daily until CATE and COTE arrived and began seeking nest sites.

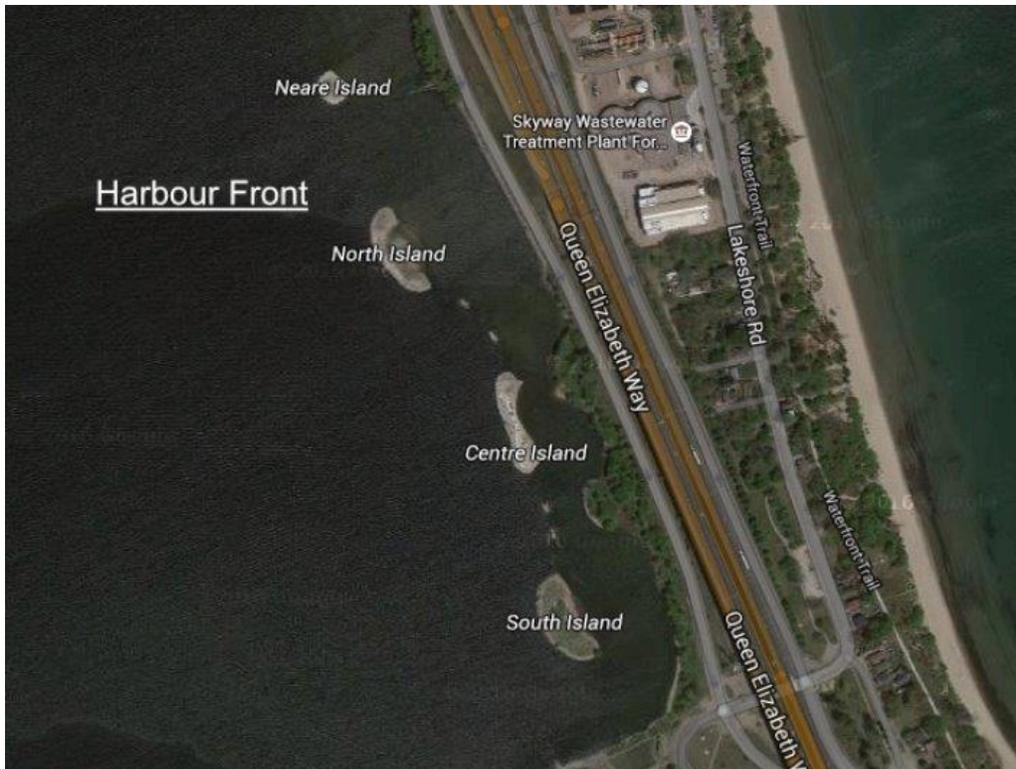


Figure 1: The artificial islands in Hamilton Harbour (Google Earth, 2016).

SOUTH ISLAND

Ring-billed and Herring Gulls

When we began monitoring in early May, RBGU nested primarily on the southern half of South Island, as DCCO had colonized the northern end. By mid-May, DCCO had been displaced from the northern end, allowing RBGU to occupy all available ground space for the duration of the summer. By mid June, the water level in the harbour had receded, exposing mud flats on the eastern side of the island where fledgling chicks began to roost. Drought-like conditions and/or water level control of Lake Ontario in early July caused the water to recede further, and evaporated a large puddle where fledglings had been wont to swim.

RBGU nesting was well underway when we first visited the island on May 2nd. We counted 2524 active RBGU nests on South Island on May 17th, a substantial decrease from last year's count of 3464. It's possible that this drop was a result of higher water levels this spring; last year, the mud flats were available for nesting as early as April. We continued to observe new active nests as late as July.

There was a single HEGU nest on South Island as of May 17th. However, we did not observe any HEGU chicks on South Island over the course of the summer.

Black-Crowned Night Herons

We observed several BCNH nests in Tree 2 (Fig. 2) on South Island on May 2nd. However, DCCO had displaced BCNH from the tree by mid-May, taking over existing nests and constructing new nests of their own. When we conducted our census on May 17th, there were only two active BCNH nests on the island. These were located in a small shrub on the western shore. Over time, our efforts to displace DCCO from South Island allowed BCNH to colonize evergreen shrubs at the centre of the island, as well as the lower boughs of Tree 6. An unofficial census conducted on June 29th counted 15 active nests.

In July, the cessation of cormorant nesting meant that we visited South Island much less frequently than we had in previous months. We returned to the island on July 11th, after an absence of 10 days, and discovered that 12 of the 15 active BCNH nests no longer contained eggs. All of the empty nests were intact, and no chicks or eggshells were found.



Figure 2: The trees on South Island, Tree 12 being the northernmost tree and Tree 1 being the southernmost tree.

Double Crested Cormorants

There was very little foliage on the island at the beginning of May 2016 when compared to 2015 (Fig. 3), possibly due to a combination of early, persistent DCCO nesting this year and a cool spring. However, as DCCO nesting declined, foliage on the island improved considerably.

When monitoring began on May 2nd, DCCO colonies were well established on South Island. On the first day of nest removal, we removed 69 nests from the trees and 100 from the ground on the northern end of the island. For the next six weeks, we visited the island 2-3 times per week, using extendable aluminum poles to dislodge tree nests and a pitchfork to toss ground nests into the water. The number of nests we removed on each visit rose steadily in the first week, peaking at 412 on May 9th (Fig. 4). The peak occurred much earlier and was much higher than both 2015, when 205 nests were removed on June 8th, and 2014, when 150 nests were removed on June 3rd. However, much like in previous years, the number of nests removed per visit steadily dropped after peaking. By the end of June, DCCO had stopped nesting on South Island and removal was no longer necessary. DCCO continued to roost on South Island, but in smaller numbers. We allowed a single active nest to remain in one of the island's shrubs, as it had escaped detection until the chicks had hatched and we could no longer remove it.

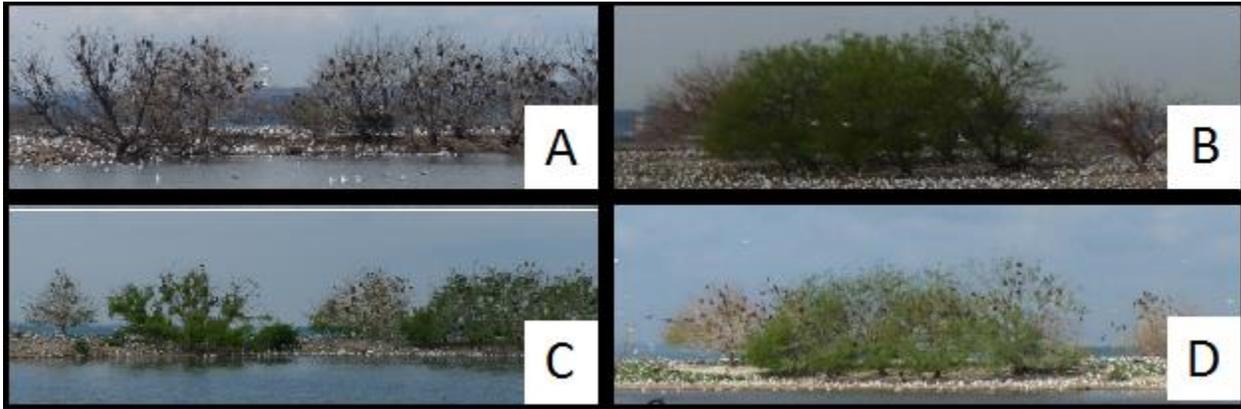


Figure 3: South Island on May 4th, 2016 (A) vs. May 5th, 2015 (B). South Island on June 20th, 2016 (C) vs. May 27th, 2015 (D).

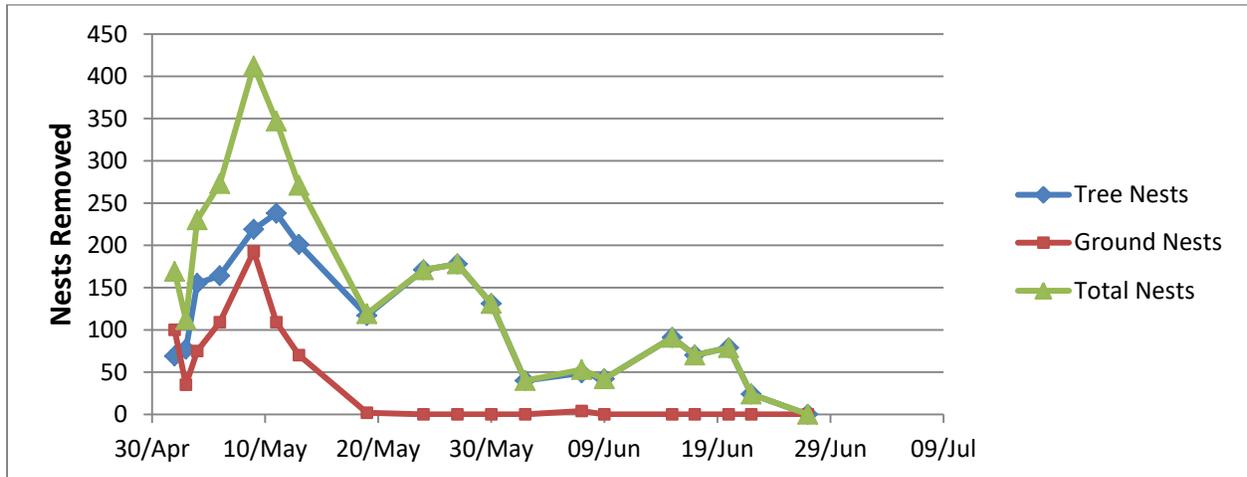


Figure 4: The number of nests removed from South Island on each visit.

DCCO nesting on South Island peaked in early May, declining over the course of May and June. By May 24th, DCCO had stopped nesting on the ground. By June 27th, DCCO had abandoned South Island entirely. DCCO nesting in 2016 peaked earlier and persisted over a longer period than in 2015 (Fig. 5).

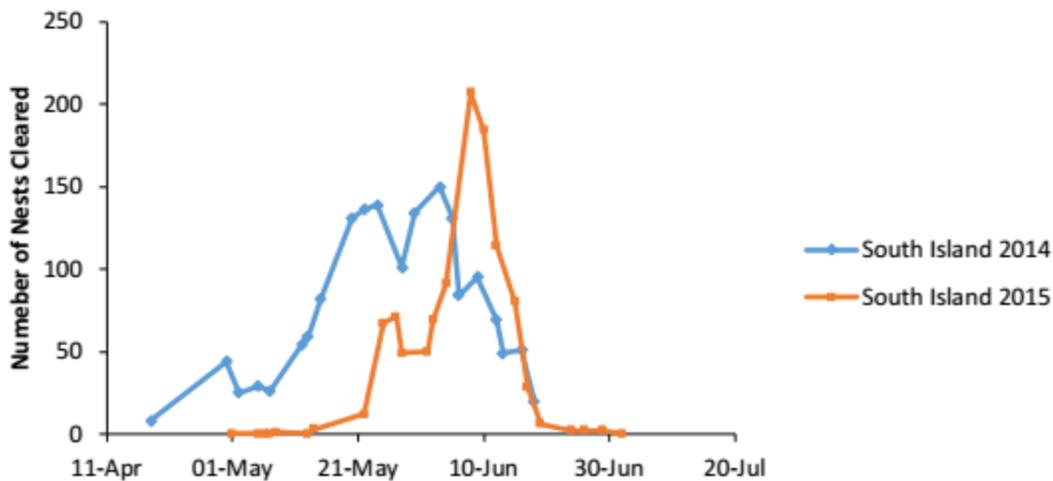


Figure 5: Total nests removed from South Island in 2015 and 2014.

DCCO favoured the larger trees in the centre of the island. Tree 4 consistently had the highest number of nests, while the smaller trees on the northern shore had no nests after the first few weeks. Our official census, conducted on May 26th, counted 187 active DCCO nests on South Island. This is an increase from last year’s count of 49 nests.

This year, we tested two new tactics for discouraging nesting on South Island. On May 11th, after removing 70 ground nests, Muhammed Aydin buried all the available nesting material (twigs, roots, and vegetation) on the northern end of the island. The result was a barren patch of land broken by several large mounds of earth. After the mounds were built, DCCO abandoned the ground and nested only in the island’s trees. We also tried stringing reflective bird-repellent tape along the branches of Tree 8. Unfortunately, this had little effect. DCCO continued to nest in Tree 8, in some cases directly beside the reflective tape.

CENTRE ISLAND

Caspian Terns

As in previous years, steps were taken to preserve nesting space for CATE on the north end of the island (Fig. 6). In April, Dr. James Quinn, Dr. Dave Moore, and student volunteers covered a large area on the northern side of the island with plastic sheeting to deter RBGU nesting. We removed the sheeting with Dr. Quinn and Dr. Moore on May 2nd to allow CATE colonization. We visited Centre Island just once more after removing the sheeting, when we counted 227 active CATE nests on June 1st. This is almost double the 2015 count of 127, and higher than the 2014 count of 213.



Figure 6: The CATE colony on the northern end of Centre Island, where plastic sheeting was used to preserve nesting space.

Double Crested Cormorants

We allowed DCCO to colonize the majority of Centre Island without interference (Fig. 7). They nested both on the ground, in small trees, and on the wooden poles at the centre of the island. Our May 26th census counted 1472 nests, an increase from the 2015 count of 1064.



Figure 7: The DCCO colony occupied the majority of Centre Island.

We removed 12 DCCO nests from Centre Island on the date of our census, as they were beginning to encroach on the CATE colony.

Herring Gulls and Ring-billed Gulls

RBGU surrounded the CATE colony, nesting in areas that had not been covered by plastic. It is possible that this had a negative impact on CATE, as we observed RBGU attempting to steal eggs when CATE were disturbed. Our census counted 195 active RBGU nests, a sharp decrease from last year's count of 422.

Three active HEGU nests were also counted on Centre Island, a slight decrease from last year's count of 4.

NORTH ISLAND

Double Crested Cormorants

DCCO activity on North Island was similar to that on South Island, albeit on a smaller scale. As North Island is an important nesting site for HEGU populations, we removed DCCO nests from the ground and the island's two trees regularly (usually 3 times per week). DCCO nesting on North Island was persistent, but occurred in much lower numbers than on South Island (Fig. 8). The highest number of nests removed in a single visit was 32. Our census counted 25 active nests on May 26th, an increase from last year's count of 0 nests.

DCCO nesting on North Island peaked in mid-May before steadily declining. By June 27th, DCCO had stopped nesting on North Island.

Herring Gulls

North Island is home to the largest HEGU colony in the harbour. Our census counted 52 active nests, a decrease from last year's count of 63. HEGU nested mainly on the raised northern and southern ends of the island, and were occasionally aggressive in protecting their territory. In June, the hatchlings often swam in near the shore on the leeward, eastern side of the island. Future management teams should be careful to avoid disturbing these hatchlings, as they may swim far from shore and become lost if startled.

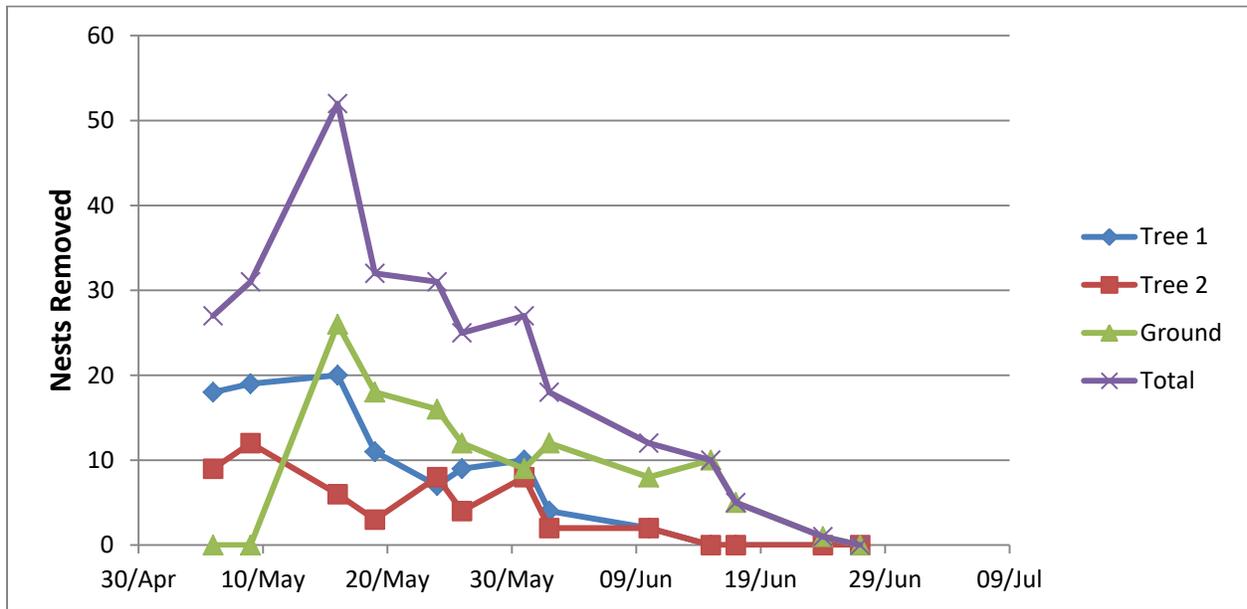


Figure 8: DCCO nest removal on North Island in 2016. There are only two trees on North Island; Tree 1 is the southernmost, while Tree 2 is the northernmost.

NEARE ISLAND

Double Crested Cormorants

Last year, Santa Claus mannequins were placed on Neare Island by the management team, and successfully deterred DCCO nesting in the summer of 2015. This year, mannequins were placed on Neare before DCCO nesting had begun. However, DCCO had grown accustomed to the mannequins' presence, and colonized the western side of the island. We made regular trips to the island to dispose of ground nests and preserve space for HEGU nesting. In late June, we attempted to discourage DCCO nesting by building large stone piles on the western side of the island covering cormorant nesting materials. DCCO nesting dropped sharply once the piles were in place.

DCCO nesting on Neare Island peaked later in the year than it did on South Island and North Island. It's possible that our activities on South drove DCCO to nest on Neare. Future teams should visit Neare Island as frequently as possible to ensure that DCCO who have been pushed off of South do not move in.

DCCO nesting on Neare Island peaked in mid-May, and was relatively persistent until mid-June. It sharply declined after June 15th, and DCCO stopped nesting on Neare by June 27th (Fig. 9).

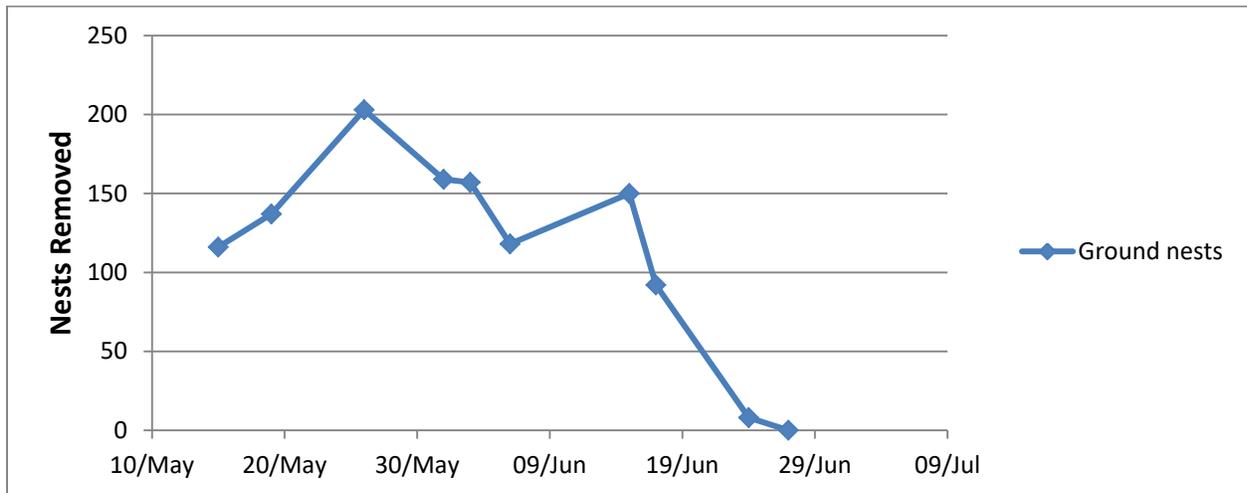


Figure 9: DCCO nests removed from the ground on Neare Island.

We counted 200 active DCCO nests on Neare Island during our May 28th census. Once DCCO had been displaced, HEGU began roosting on the stone piles on the western side of the island.

Herring Gulls

HEGU nested on the eastern side of Neare Island for the duration of the summer. We counted 43 active nests during our census, a slight drop from the 2015 count of 50 active nests. This decrease may be a result of increased DCCO activity on Neare Island this year. Initially, DCCO occupied much of the western side of the island. Once DCCO had been displaced, HEGU began roosting on the stone piles on the western side of the island. Close monitoring of Neare Island is likely to be essential in the future, as it is one of the primary sites for HEGU nesting in the harbour.

HEGU would often raid DCCO nests when the cormorants had been startled by our approach. However, this predation did not seem to deter DCCO from nesting on Neare Island. HEGU chicks are also easily startled, and often flee to the water when disturbed. We did our best to avoid frightening them, lest they should swim out too far and not be able to return to shore.

WINDERMERE BASIN

Ring-Billed Gulls

RBGU arrive in Windermere Basin much earlier than CATE and COTE, and could easily occupy all available nesting space on the basin’s four islands. To discourage RBGU nesting, Predator

Bird Services Inc. placed tethered raptors on Island 2 and Island 3 (Fig. 10). The raptors were removed on May 12th, when CATE and COTE had arrived and were showing interest in nesting in the basin.

When the raptors were removed, RBGU began to nest on the slopes of the islands in Windermere Basin. On June 1st we counted 31, 25, and 45 active RBGU nests on Islands 1, 2, and 3, respectively. RBGU did not nest on the Spur Dyke. On June 16th, we observed RBGU nesting on the shores of the Basin.

The total number of active RBGU nests in the Basin was 101, a decrease from last year's count of 144.



Figure 10: The islands of Windermere Basin (Google Earth, 2016).

Caspian Terns and Common Terns

CATE and COTE both arrived in the basin in late April, and began nesting in mid-May. The tethered raptors appear to have been successful in preserving nesting space for CATE on the plateaus at the tops of the islands. In our June 1st census, we counted 244 active CATE nests on Island 1 and 264 active CATE nests on Island 2. COTE nested mainly on the slopes of Islands 1 and 2, likely because the tops of the islands had been occupied by the larger CATE.

There were 234 active COTE nests on Island 1, and 244 on Island 2. COTE also nested on top of Island 3 and on the Spur Dyke, where CATE were absent. We counted 120 COTE nests on Island 3, and 85 on the Spur Dyke.

In total, there were 508 CATE nests in the Basin, an increase from last year's count of 389. There were a total of 683 COTE nests in the Basin, a slight decrease from last year's count of 706.

It was hoped that the available space on Centre Island (discussed above), and the threat of the tethered raptors, would entice CATE away from Windermere Basin and into the harbour. CATE numbers on Centre Island did increase this year relative to 2015, but CATE still occupied much of the available space in the Basin.

PIER 27

Double-Crested Cormorants

Pier 27 is a home to a confined disposal facility, a rectangular body of water whose walls are formed by the pier itself, the shoreline of Eastport Drive, and two berms that stretch out into the open water to form a corner (Fig. 11). DCCO colonized the entire length of the northern berm, nesting on large mounds of earth along the berm's outer edge. They also nested on the eastern end of the northern berm, and in the trees where the northern berm meets Eastport Drive (Fig. 11).

On May 26th, our census counted 2553 active DCCO nests at Pier 27. This was the largest DCCO colony in Hamilton Harbour this year, and represents a sizeable increase from last year's count of 1982 nests. We also continued a project from last year in which regurgitations from DCCO chicks were obtained for a study investigating the fish species that DCCO on Pier 27 feed to their young. We palpated the abdomens of the chicks to stimulate regurgitation. We then identified the fish species, recorded the weight of the chick, and returned it to the nest. Over the course of several weeks, we collected a total of 75 individual fish samples from 60 DCCO nests. 69 of the samples contained alewife (*Alosa pseudoharengus*), 5 samples contained round goby (*Neogobius melanostomus*), and 1 sample contained both alewife and round goby.



Figure 11: Pier 27 in Hamilton Harbour, just west of Eastport Drive.

Black-Crowned Night Herons

BCNH nested along the shore line on the outer edge of both the north and east berms. Our May 26th census counted 72 active nests, a slight decrease from the 2015 count of 74 nests. When we returned to Pier 27 in July, many chicks had hatched and roamed along the rocks at the shoreline.

Ring-Billed Gulls and Herring Gulls.

RBGU nested along the centre and inner edge of both berms, along the shoreline of Eastport Drive, and under the trees where the northern berm meets Eastport. In July, we often observed RBGU among the DCCO colony, retrieving dropped fish when the adult cormorants had been disturbed by our presence. HEGU nested along the centre of both berms, and were observed prowling the edges of the DCCO colony in search of newly hatched chicks to prey on.

On May 17th, we counted 4651 active RBGU nests at Pier 27, a sharp drop from last year's count of 6752. The decrease may be a result of increased numbers of DCCO forcing RBGU relocations to other nesting sites in the harbour including the Max Acher North America (MANA) industrial site, which saw an increase of almost 3000 RBGU nests this year. However, it should be noted that the 2015 management team were unable to do a direct RBGU count at the MANA

site, and instead recorded an estimate. Consequently, the increase may not be as large as it appears.

Our census also counted 29 HEGU nests on Pier 27, a decrease from last year's count of 37.

On May 30th, we observed two men tossing RBGU eggs from nests along Eastport Drive, at the eastern edge of the confined disposal facility. Dr. Quinn contacted the Hamilton Port Authority, and was told that this activity was sanctioned by environmental manager Marilyn Baxter. The reasoning behind the egg destruction is unclear.

Concluding Remarks

This year, our wildlife management strategies produced mixed results. Repeated nest removal eventually led DCCO to abandon South Island, but not before BCNH had been driven away. The number of active BCNH nests in the harbour dropped sharply this year. The DCCO populations was slightly larger this year and began nesting earlier; the colony on South Island was very well established when monitoring began in 2016. Similarly, DCCO eventually abandoned North Island and Neare Island, but their persistence may have impacted the HEGU population, which saw its fourth straight year of decline. In the future, it may be necessary to start nest removal earlier to preserve space for HEGU and BCNH.

Results in Windermere Basin were also mixed. Although many CATE were drawn to the preserved nesting space on Centre Island, many continued to nest in the Basin. CATE took up much of the available nesting space on Islands 1 and 2, outcompeting COTE. The number of active CATE nests was the highest on record, while COTE saw a slight decline. In the future, removing plastic sheeting from Centre Island immediately upon arrival of CATE, and keeping raptors in Windermere Basin, may grow the Centre Island CATE colony and take individuals away from Windermere.

Finally, this report focuses on waterbird colonies at sites that we actively managed, and does not provide a complete picture of the waterbird populations in the Harbour as a whole. Harbour-wide census data from the last 19 years is provided in the appendix below.

Acknowledgements

We would like to acknowledge the generous donations of funding from the City of Hamilton, the City of Burlington, and the Hamilton Port Authority. In kind support was provided by McMaster University in the form of volunteer helpers and time spent on this work by Dr. James S. Quinn.

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Image Sources

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APPENDIX: Hamilton Harbour Waterbird Nest Counts 1997-2016

Ring-billed Gulls

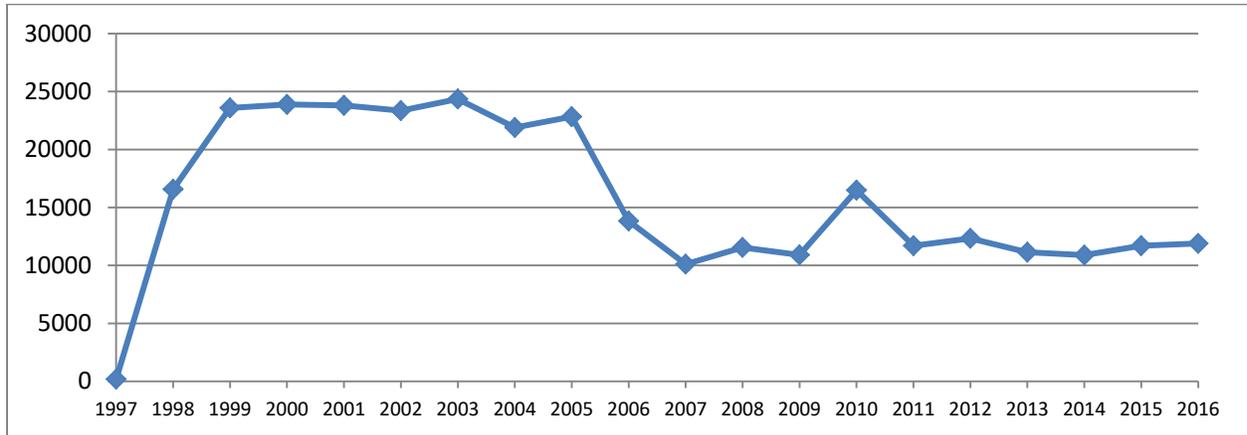


Figure A1: Census counts of active ring-billed gull nests throughout Hamilton Harbour and Cootes Paradise marsh.

Herring Gulls

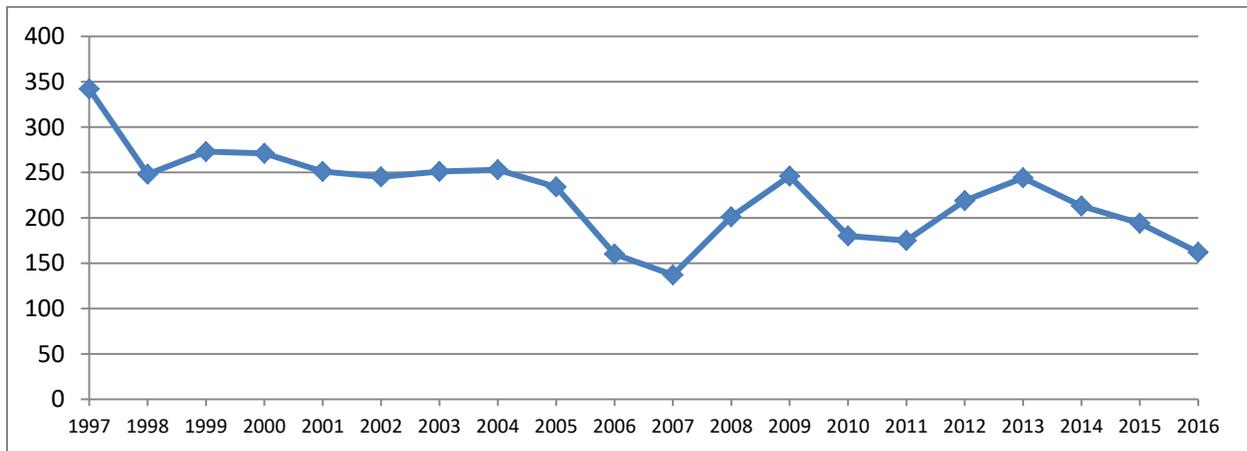


Figure A2: Census counts of active herring gull nests throughout Hamilton Harbour and Cootes Paradise Marsh.

Double-Crested Cormorants

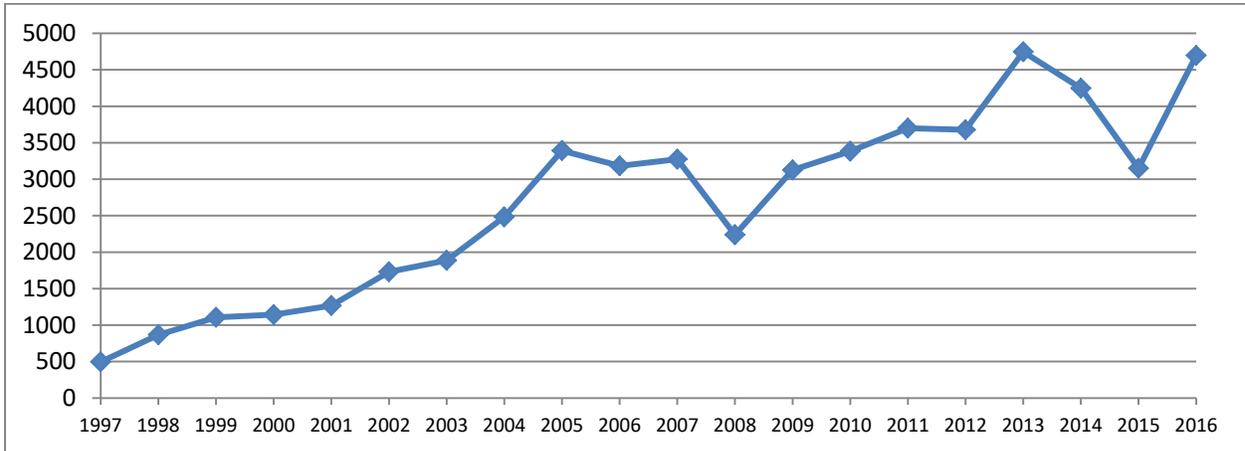


Figure A3: Census counts of active double-crested cormorant nests throughout Hamilton Harbour and Cootes Paradise marsh.

Common Terns

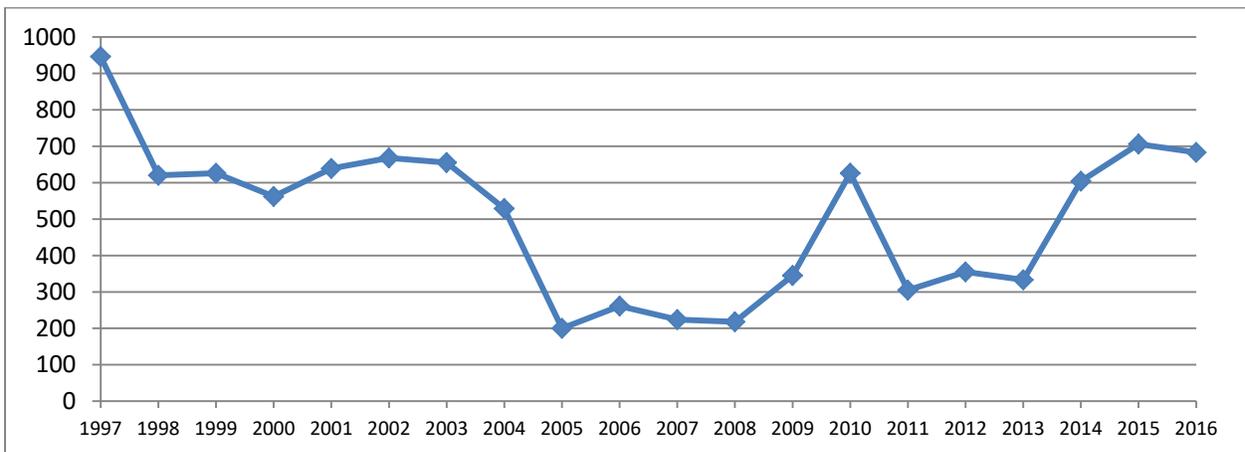


Figure A4: Census counts of active common tern nests throughout Hamilton Harbour and Cootes Paradise marsh.

Caspian Terns

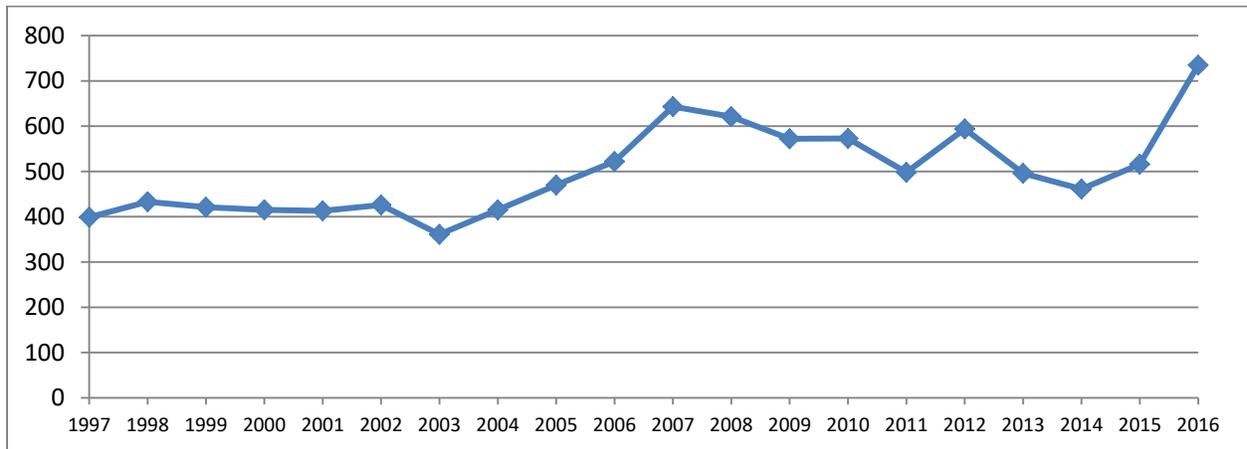


Figure A5: Census counts of active Caspian tern nests throughout Hamilton Harbour and Cootes Paradise marsh.

Black-Crowned Night Herons

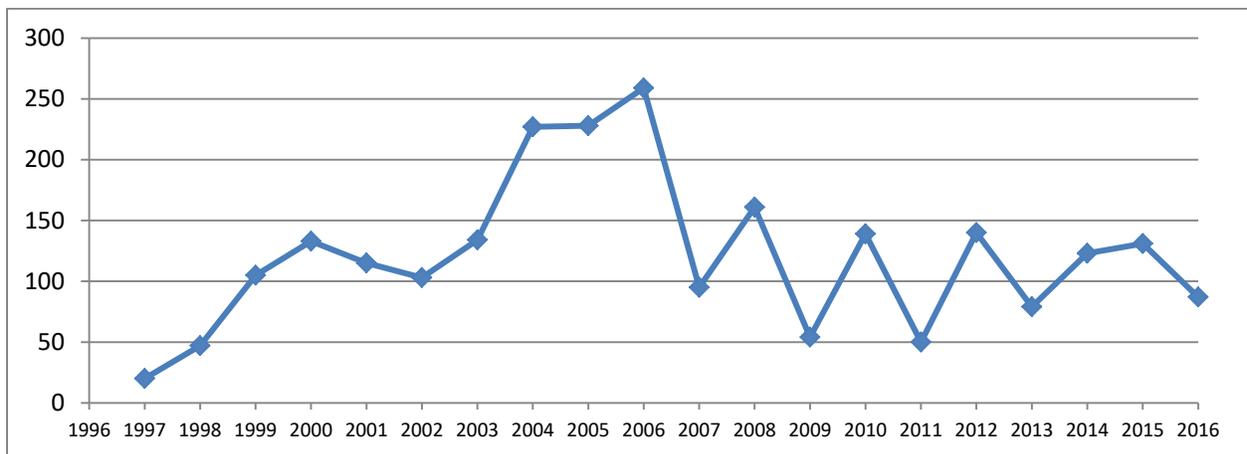


Figure A6: Census counts of active black-crowned night heron nests throughout Hamilton Harbour and Cootes paradise marsh.