**CORMORANT ADVISORY GROUP MEETING #8**
Thursday December 9, 2010
6:30 p.m. to 9:00 p.m.
Metro Hall, Room 304, 55 John Street, Toronto

**FINAL MEETING NOTES**

Attendees:
Ralph Toninger, TRCA
Karen McDonald, TRCA
Andrea Chreston, TRCA
Gail Fraser, York University
Ilona Feldmann, York University
Jim Quinn, McMaster University
Janette Harvey, City of Toronto
Bernie Taylor, City of Toronto
Paul Scott, Aquatic Park Sailing Club
Cathryn MacFarlane, Aquatic Park Sailing Club
Liz White, Animal Alliance of Canada*
Ainslie Willock, Canadians for Snow Geese*
John Carley, Friends of the Spit
Don Barnett, Toronto Ornithological Club
*Barry Kent MacKay, Observer**
(*Denotes member of Cormorant Defenders International)

*These notes reflect the general nature of the meeting discussion. If there are errors or omissions, please contact A. Chreston at achreston@trca.on.ca or 416-661-6600 ext. 5772.*

*Comments contained herein reflect the opinion of the individual and do not necessarily reflect the position of the organization they represent.*

**1. Welcome and Introduction**
R. Toninger welcomed everyone to the meeting and gave a brief overview of the advisory group process for new attendees. Everyone then introduced themselves and R. Toninger introduced B. MacKay who attended the meeting as an observer. B. MacKay has been a long-time visitor of the Spit and was actively involved in the process to preserve the Spit as an urban wilderness. B. MacKay is also a local expert on colonial waterbirds; he was originally invited to participate in the DCCO Advisory Group, however, was unable to commit at the time for personal reasons. C. Weseloh and D. Moore of Canadian Wildlife Service (CWS) as well as P. Hubert and J. Almond of the Ministry of Natural Resources all sent regrets.

The purpose of this meeting was to review the 2010 season. The Advisory Group process began November 2007 and the goal and objectives have remained constant ever since. The

goal of the management plan is to limit the loss of forest canopy at Tommy Thompson Park (TTP) [R.Toninger used the word goal; however he was not referring to the overall strategy, but rather the objective of limiting forest canopy loss. The overall goal remains the same, to achieve a balance between the continued existence of a healthy, thriving cormorant colony and the other ecological, educational, scientific and recreational values of Tommy Thompson Park.]

**2. Review of 2010 Season**

R. Toninger presented a review of the 2010 season. Since the last meeting in February 2010, the 2010 Strategic Approach was taken to the TRCA Authority Board where it was approved as part of Resolution #A23/10. R. Toninger also noted that the letters of support and those representatives who attended the Board meeting were greatly appreciated. Significant outreach and education about DCCO at TTP was undertaken throughout 2010. Unfortunately the colony tours scheduled as part of the Spring Bird Festival in May were cancelled due to poor weather; however, many group tours and presentations at meetings were fulfilled over the year.

Colonial waterbird peak nest numbers for 2010 were reviewed. Although a large scale nest failure of BCNH occurred in 2009, the colony rebounded with 434 nests in 2010, with all but 3 of these nests on Peninsula C. The GREG population was recorded at 5 nests on Peninsula C, but at least one pair produced a double clutch. The RBGU population nest estimates remained constant at approximately 30,000 nests on Peninsulas A and B. The HEGU population remained low at less than 20 nests observed and TRCA continued to support CWS on the HEGU contaminates study. The peak COTE nest numbers were difficult to estimate in 2010 because of weather events and predation, but the minimum estimate was 231 nests. The DCCO population experienced a significant increase of 1870 nests during the 2010 breeding season, for a total of 9434 nests. The majority of the nest number increase was supported by ground nests, increasing by 1353 nests. The 2010 ground nesting population numbered 3310 nests, representing 35 per cent of the total TTP colony. Tree nests on Peninsula A increased by 17 nests with all nesting occurring in the two remaining trees. Peninsula C increased by 636 nests, and tree nest numbers on Peninsula B continued to decrease, a trend observed since 2005. Overall there were fewer trees nested in, although the number of tree nests on Peninsula C increased.

R. Toninger briefly reviewed DCCO and BCNH colonization of TTP. It has recently been observed that the DCCO arriving in early March occupy the ground nests at the same rate as the remaining tree nests, whereas in the past the ground nest colony was a secondary location. The colony population increase over the last several years has largely been sustained through the expansion of the ground nest colony. L. White asked if the 1300 new ground nesters in 2010 were new to TTP or if they moved from the trees. R. Toninger replied that this is unknown; the only way to quantify this would be a mark-recapture study. TRCA and York University currently colour leg band DCCO chicks that hatch in the ground nesting colony, but adult colour leg banding may yield more immediate results. Banding DCCO that tree nest is almost impossible, but techniques are being developed to band adult ground nesting DCCO away from the nest to avoid disturbance.

R. Toninger reviewed tree health, which continues to decline. C. MacFarlane commented that based on the presentation it appears as if there is growth in 2009 that was not shown in 2006. K. McDonald replied that trees are only mapped once they have been nested in, so the appearance of “new” trees in 2010 is because they were not previously nested in. R. Toninger

added that when trees are first nested in and mapped they are generally healthy; therefore increase the average health rating of the nest trees. P. Scott asked about the satellite BCNH colony from 2009 and if it had been nested in during 2010 as the tree health was not illustrated on the 2010 map. K. McDonald replied it had not been nested in and therefore not surveyed.

The Peninsula A DCCO Conservation Zone is located on the tip of Peninsula A where the two remaining trees are located and ground nest enhancements have been undertaken including the York University study plots. The researcher access tunnel was relocated to the west side of the peninsula and a gate was added (later destroyed by a storm) to reduce the number of predators using it. Tires, stakes, straw nesting materials and DCCO decoys were added to Peninsula A to encourage nesting. The Peninsula B Conservation Zone includes the natural ground nesting subcolony and the ground nest enhancement area toward the east side of the peninsula. Ground nest enhancements included fallen trees and nests, as well as decoys on the east side of the peninsula within eyesight of the loafing sandbar. The existing ground nest colony has been moving outwards over the years. This year the direction of the movement was towards the past canopy.

G. Fraser commented that the date on the signage to keep people out of the colonies should be extended; September 1 is too soon as one of the last nests on Peninsula B to fledge was September 12. Additionally if you don't want people to disturb loafing birds the date should be changed. G. Fraser thought September 30 would be late enough. R. Toninger added that we would love to have people stationed by the signs to keep people out since many people ignore the signs. L. White commented that she has seen people following the signs. K. McDonald commented that adding the federal offence sign to the existing sign has helped reduce the number of violations. R. Toninger said that TRCA wants to better delineate the colony and the public use area. Other ideas include installing a temporary viewing blind for people to observe the colony without disturbing it or informational signage about the colonies, but interpretive signage at TTP is controversial.

Pre-nesting deterrents were not conducted on Peninsula B due to the presence of BCNH nests, or on Peninsula D as no nesting attempts were observed. TTPBRS researchers observed roosting or loafing cormorants several times early in the season and they flushed with the arrival of the researchers.

Inactive nest removal on Peninsula C was carried out for the first time since 2004. A total of 32 inactive nests were removed. Pre-nesting deterrents in the Primary Deterrent Area on Peninsula C began on April 8, when active nest building was observed. The Primary Deterrent Area was divided into a grid to help keep track of the trees; a total of 83 trees were tracked. A variety of deterrent techniques were used and implemented based on the escalation scale. Deterrents escalated quickly as DCCO become habituated to human presence very rapidly. Active nest removal of known age nests and partial nest removal began on April 21. A total of 72 active and partial nests were removed. P. Scott asked what the difference is between the number of nests removed using inactive and active nest removal. R. Toninger replied that inactive nest removal occurred during the non-breeding season (winter) and involved the complete removal of nests from the previous year, while active nest removal occurs during the breeding season. Active nest removal is quite difficult at TTP because the nests in the deterrent area are older, therefore large and well attached to the branches and extremely high and very hard to reach. Utility fiberglass and aluminum firefighter poles were used with some

success; however the flexibility, weight and breakage of the poles are limiting factors. Ropes were also used to shake the target trees and keep the birds out for short periods of time.

Post-breeding deterrents were not required as DCCO were not observed loafing in trees. However, there were many birds loafing on the peninsula's sandbars, which is what we want to encourage as it does not impact trees.

Restoration activities implemented during 2010 in and around the colony areas included buffer plantings and shoreline stabilization. The goal of the restoration is to decrease erosion; increase habitat; and establish a more defined boundary between nesting and non-nesting areas. Plantings have been quite successful on Peninsulas A and C where they are located just outside the nesting areas, but not on Peninsula B where planting has occurred both within and outside the nesting area. Plant material within the nest area appears to have been broken off, likely by DCCO to use as nest materials.

**3. Update on the DCCO Conspecific Attraction Experiment**

I. Feldmann presented her findings from the DCCO conspecific attraction study at TTP on Peninsula A. The goal was to attract DCCO to nest on the ground on Peninsula A. The access tunnel to Peninsula A was moved to the west side of the peninsula to improve the sightlines around the ground nest area, following a recommendation from the 2009 study. The study design was similar to 2009, having four plots with three treatments: high (12 decoys), low (3 decoys) and control (0 decoys). There were 36 available nest sites, of which 16 were tires and 16 were stakes. Observations from the blind were taken three times a week to monitor DCCO visits and behaviors in the study area. Audio of DCCO calls was played, however the speakers were a bit too far away from the colony and should be moved closer in the future. J. Quinn asked what kind of vocalization was used. G. Fraser replied that it was the audio from the Columbia River attraction study and consists of one call on a loop. The audio was not as close to the colony as it was in 2009, but the DCCO could still hear it. J. Quinn suggested getting in touch with the Cornell Lab of Ornithology to get better audio.

The results from 2010 were promising in comparison to 2009. In 2009 there were 3 loafers, in 2010 there were 59. In 2009 there was 1 DCCO sitting near the nests in the study plot and in 2010 there were 8. Additionally, in 2010 there were 13 cases of nest building, 6 RBGU nest takeovers, 3 courtship displays and 3 DCCO that returned multiple times to the same location. There were many DCCO loafing on the shoreline this year and an increase in activity in the ground nesting enhancement area, with many DCCO coming into the area from the shoreline. Prospectors will be the ones to initiate the new colony. The visitation rate increase in 2010, up to 1.10 visits per hour from 0.63 per hour in 2009.

I. Feldmann also looked at nest preference and found that 70 per cent of DCCO preferred the tires that resembled nests and/or straw, while only 30 per cent preferred the stakes. A problem with the stakes was that they lost the straw early in the season due to wind and collection by DCCO and gulls. Plots with low decoy density were preferred over plots with high decoy density. She noted that the decoys were covered in RBGU guano early in the season. R. Toninger speculated that guano covering the decoys might be a deterrent. J. Quinn added that some people will use RBGU carcasses to deter gulls from the area, so dead DCCO (i.e. a toppled over decoy) may not help attract birds.

In 2010 I. Feldmann also measured temperature, wind, sightlines and distance to water at the Peninsula A study area and the Peninsula B ground nesting area. The temperature was the same across the peninsulas, however, Peninsula A was windier. There were more visible obstructions on Peninsula A which may affect site selection. The distance to the water from the nesting areas are the same.

Other observations of I. Feldmann included DCCO picking up and tossing RBGU eggs. J. Quinn asked if the eggs ever broke. I. Feldmann replied that she didn't see any break, but her view was partially obstructed. She also noted that there was raccoon activity on Peninsula A that seemed to peak at the time of RBGU fledging and the DCCO nests in the Siberian elm were depredated.

**4. Update on Other York University Studies**

G. Fraser undertook six additional studies at TTP during 2010. The following four pertain to DCCO and BCNH.

*Raccoon Impact on Tree Nesting Waterbirds*

In the fourth year of this study G. Fraser doubled the number of nests being followed – 215 nests in 45 trees. One of three treatments were applied to each study tree: foil; single predator guard with foil above; and double predator guard with foil above, all applied at or above breast height. BCNH nest productivity was 0.37 for foil trees, 0.47 for single predator guard trees and 0.31 for double predator guard trees. Double predator guards help deter raccoons, but are not 100 per cent effective due to the double guards not being completely flush with the tree. Also, some of the nest failures in trees with double predator guards were related to a windstorm in May. Overall nest productivity in 2010 was similar to past years, with the exception of 2009. The average nest initiation date in 2010 was later than in previous years with BCNH arriving and leaving repeatedly before finally staying.

Foil wrapped trees were checked weekly and a claw mark index was applied. Foil on DCCO trees had a 25 per cent index while foil on BCNH had 20 per cent. Based on the claw mark index it cannot be said that BCNH nest contents are preferred by raccoons. DCCO nests were predated only early in the season. K. McDonald asked if this is because the BCNH arrived later. G. Fraser replied that could be one reason.

*Raccoon Occupancy*

G. Fraser installed three trail cameras on Peninsula C and two in the forest on Peninsula B to help quantify raccoon population and activity. Based on tail markings, individual raccoons were identified, which allowed for a population estimate. The camera study has limitations so the population estimate is very conservative at 11 individuals in spring and 6 in fall. Population density was calculated at 50 raccoons per square kilometer in spring and 31 per square kilometer in the fall, compared to 40 raccoons per square kilometer in the city (based on a previous study). G. Fraser restated that there are limitations with this estimate, but it provides a general idea. There was found to be 100 per cent occupancy on Peninsulas B and C in the spring and 60 per cent in the fall. J. Quinn asked if the 100 per cent occupancy is based on the observation of individuals - are you confident you're identifying all the raccoons in the area. G. Fraser replied that the occupancy is not based on individuals. Some cameras picked up more photos of raccoons than others. G. Fraser will continue with this study and will refine the methodology for future seasons.

*Carryover effects of deterring activities on non-target cormorants and cormorant productivity and tree health*
This study followed a selection of DCCO nests and looked at tree health as an important feature of nest site quality and the effects of deterrent activities on the nest settlement pattern.

The literature suggests that DCCO prefer dead and dying trees over healthy. Data was collected from 58 tree nests on Peninsula B and the results showed that trees with a health rating equal to or greater than 4 were the first to be occupied, with a 1.8 week difference in establishment. The study did not consider the nesting history of the tree, although trees with a rating of 1-3 did not contain old nests, while trees with a rating of 4-5 did contain old nests.

The second component of the study examined if deterrents have an effect on non-target birds and if it impacts settlement. Peninsula B was used as the control site as no deterrents took place. Transects were established on each Peninsula and the transects on Peninsula C were conducted adjacent to the Primary Deterrent Area. Data on nest height and settlement patterns were collected. 64 nests were followed on Peninsula C. The mean nest height of early nesters at the control site was significantly lower than nest height adjacent to the deterrent area. Late nesters at the control site had a significantly lower mean relative nest height compared to late nesters adjacent to the deterrent area. There was no significant difference in the chronology of nest activity between the control site and adjacent to the deterrent area. There was no significant difference in the number of active or failed nests between the control site and adjacent of the deterrent area. Although dead standing trees were occupied first, nest density peaked in healthier trees on Peninsula B. Deterring appeared to shift peak nest density on Peninsula C further away from the deterrents and in healthier trees, but did not appear to influence nest chronology or overall number of failed or active nests.

L. White commented that the deterrents seem to shift DCCO higher in trees and closer to the road on Peninsula C. G. Fraser replied that it seems that way, but there was also less nesting habitat available adjacent to the deterrent area as the trees are unhealthy with fewer limbs. L. White commented that DCCO may prefer dead and dying but that the trees cannot support them. J. Quinn commented that in his experience DCCO will return to existing nest trees and even when the trees fell they still stayed in the area and nested on the ground. L. White asked how we know DCCO prefer ground nesting. R. Toninger replied we don't know. G. Fraser added it could be individual preference, for example if DCCO were hatched on the ground they may prefer that nest location. J. Quinn said that it may also be related to predators. L. White asked if raccoons are going to the ground nest site. G. Fraser didn't think that the ground nests are a high priority for raccoons, the colony is well buffered by RBGU nests. There was a shift in nest density away from the Primary Deterrent Area, which is not biologically significant, but is important for tree management. G. Fraser also commented that DCCO are not responding to some of the deterrents, including the bangers, because they are not biologically relevant. She recommends using biological cues to mimic predation threats, like a robotic eagle.

*DCCO Productivity and Usurpation Rates*
To ensure the least amount of disturbance possible, G. Fraser kayaked out to the tip of Peninsula B and accessed her viewing blind of the ground nest colony through a tunnel. Additionally, all activities taking place within the ground nest colony took place at night. G. Fraser believes that the ground nest colony growth can be attributed in part to the decrease in daytime disturbances to the colony.

45 ground nests were followed and 95.5 per cent successfully fledged chicks. Average number of chicks fledged per nest was 2.8.

As with 2009, the Peninsula B ground nests were much more synchronous than Peninsula C. Synchronous behavior is important for colonial birds as it helps buffer predation when all the chicks are of similar age. I. Feldmann asked if there is greater predation after the RBGU chicks around the ground colony fledge. G. Fraser replied she did not observe this.

175 tree nests were followed on Peninsula B; 129 nests failed and nest productivity was 26 per cent producing an average of 2.2 chicks fledged per nest. 170 tree nests were followed on Peninsula C; 62 nests failed and nest productivity was 65 percent producing an average of 2.2 chicks fledged per nest. 15 additional nests were followed on Peninsula C in the mixed species area where BCNH also nest. Here productivity was lower at 0.33. G. Fraser hypothesizes that nest failures in the mixed species area are likely due to inexperienced birds.

215 BCNH nests were followed to determine DCCO usurpation of BCNH nests. Nine nests or 4.1 per cent were usurped by DCCO or GREG, a similar rate observed as in previous years. J. Quinn commented that it is interesting in Hamilton where almost all BCNH usurped by DCCO. G. Fraser replied that it is relatively constant at TTP. L. White commented that usurpation must be common. J. Quinn replied that it is likely common with DCCO and RBGU and HEGU. L. White said that usurpation by DCCO on GBHE nests and GBHE on DCCO nests has been observed at other sites. G. Fraser noted that temporary takeovers were observed at TTP.

**5. Summary and Wrap-up**

Overall, 2010 was successful as we continue to work towards the original objectives and there was a dramatic increase in ground nesting on Peninsula B. The limit of disturbance to the ground nest colony seems to be significant factors in attracting DCCO to nest on the ground, although philopatry and nest site fidelity may also be significant factors. The increased DCCO visitations in the York University study area are promising and TRCA will continue to work towards the objective of attracting DCCO to nest on the ground.

Plans for the 2011 Strategic Approach will be presented at the next Advisory Group meeting in February. We will use the insights gained from the York University studies to refine and adapt the strategy. The 2011 Strategic Approach will be similar to 2010, although the deterrent areas may be expanded so that healthy trees can be protected. G. Fraser said that it is important to remove nests when DCCO move into new areas, as DCCO are targeting existing nests. Early deterrents are key so that early DCCO arrivals see the ground nest colony as a safe and attractive nest site. Other objectives for 2011 are to obtain a unique colour leg band for the TTP DCCO colony and develop a method for safely capturing adult birds away from their nests.