Common Terns *Photo: Saul Bocian*

Colonial Waterbird Populations

at the Leslie Street Spit/Tommy Thompson Park

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TOMMY THOMPSON PARK (TTP) is located on the Leslie Street Spit, a 5 km long human-made peninsula in 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 its owner, the Toronto and Region Conservation Authority (TRCA), it has become the largest area of natural habitat on the Toronto waterfront (TRCA No date a). The final size of the Spit is complete at approximately 500 ha, including the associated water lots; however the Toronto Port Authority continues to run a lake filling operation in shoreline erosion areas.

Colonial waterbirds have a long history of nesting at Tommy Thompson Park and are one of the reasons the park was designated an *Important Bird Area* (IBA) in 2000 (Wilson *et al.* 2001). Reasons for the IBA designation include globally significant numbers of colonial waterbirds under the general congregatory threshold and nationally significant numbers of waterfowl during spring and fall migration and during winter depending on ice conditions (Wilson *et al.* 2001). Six species of colonial waterbirds breed regularly at Tommy Thompson Park. Three species are predominately tree-nesters, Double-crested Cormorant (*Phalacrocorax auritus*), Black-crowned Night-Heron (*Nycticorax nycticorax*) and Great Egret (*Ardea alba*); and three species are ground-nesters, Ring-billed Gull (*Larus delawarensis*), Herring Gull (*Larus argentatus*) and Common Tern (*Sterna hirundo*).

Methods

Population estimates for tree-nesting waterbirds and Common Terns are conducted annually, while population estimates for Ring-billed Gulls typically occur every 5 to 10 years with the 10 year survey coinciding with the Canadian Wildlife Service (CWS) decadal census (Morris *et al.* 2011). Individual Herring Gull nests are monitored by the CWS for ongoing contaminant research (Morris *et al.* 2003, Weseloh *et al.* 2006), and TRCA does not usually undertake a population census for this species. Population estimates for any species may also be undertaken more frequently in relation to other projects/studies or to address a population concern. All field estimates are conducted by trained TRCA staff and researchers, using standardized techniques. Upon completion of the survey, Microsoft Excel is used to store and analyze the population data.

Figure 1. Tommy Thompson Park (outlined in red) on the Leslie Street Spit

Tree Nests

Each spring a census is conducted during the last week of May, at the peak of their nesting period, to determine the number and distribution of nests (= pairs) of Double-crested Cormorant, Black-crowned Night-Heron and Great Egret, which helps inform management decisions. Active nests of these species are counted by a team of observers who move systematically through the colony recording the tree number, tree species and number of nests of each bird species. As noted by Jarvie *et al.* (1999), each tree containing a nest is marked with a circular 2.5 cm metal tag bearing a unique number (National Band and Tag #85, 1 mm thick) attached with a single 5 cm galvanized roofing nail which is left out approximately 2.5cm to allow for the growth of the tree without damage. Coordinates of each tree are recorded by GPS. All new nest trees are tagged and coordinates recorded each year. Every tree examined is marked with tree marking paint to identify that it has been counted. The tree coordinates and associated nest data are mapped with Arc View GIS software. Additionally, all nest trees are evaluated post-breeding, in the late summer, to assess their health.

Ground Nests

The census for nests of Common Tern and Ring-billed Gull pairs is conducted at the peak of their nesting period, typically the last week of May or the first week of June, to determine their breeding population, which helps inform management decisions. Common Terns nest exclusively on four floating reef-rafts (Jarvie and Blokpoel 1996) and one artificial island at TTP. Predation and disturbance pressures can result in asynchronous nesting across these subcolonies, making it difficult to obtain a reliable estimate of the breeding population. Therefore, depending on the circumstances of the sub-colony, multiple population counts may be conducted throughout the breeding season. The reef-rafts are approximately 24 m^2, so all nests can be counted, noting the nest contents, by walking or canoeing the periphery of the raft. The artificially created tern island in the Cell One wetland is approximately 120 m^2 (depending on water levels), and is more challenging to count because of its size and tall vegetation. Observers carefully walk the island in a grid pattern and note nests and nest contents.

Ring-billed Gulls are surveyed at least every 10 years with the CWS decadal surveys, however CWS also monitors individual Herring Gull nests annually. Because of the large nesting areas the Ring-billed Gull colony is divided into smaller, discrete sections and all active nests are counted by section using the rope transect method (Morris *et al.* 2011). Ropes are used to delineate 1 m wide transects and observers carefully walk the transect counting all active nests with a manual handheld tally counter and mark each nest with survey paint to identify that is has been counted. Herring Gull nests are recorded on a field data sheet and not included in the tally counter.

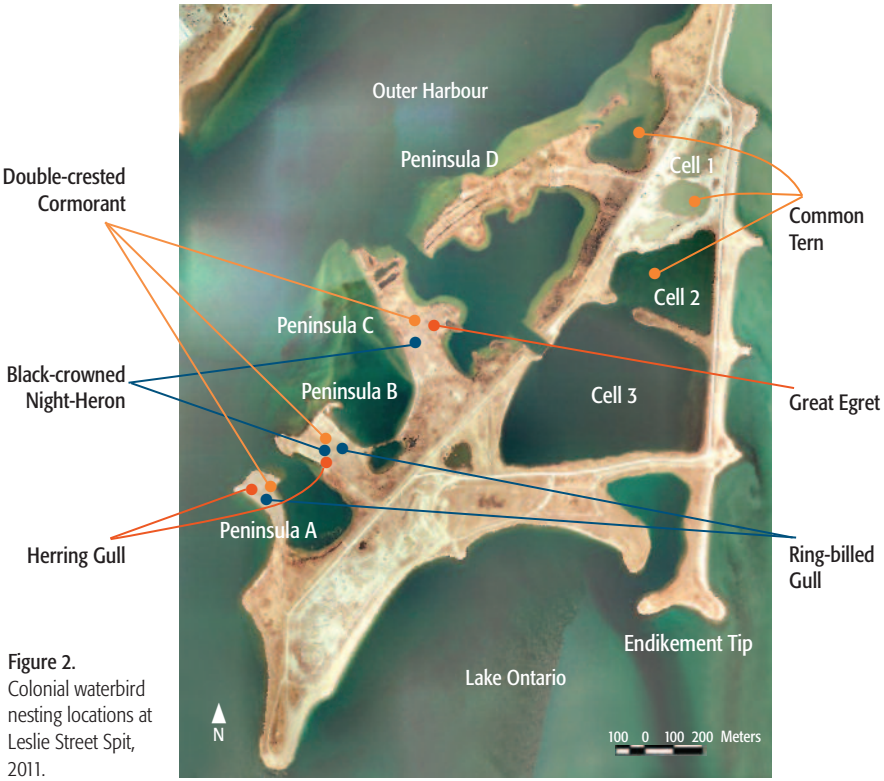

Figure 2.
Colonial waterbird nesting locations at Leslie Street Spit, 2011.

The ropes are then moved to the next transect line until all active nests within the colony are counted. In years where individual nests are not counted, trained staff usually undertake population estimates of the Ring-billed Gull nesting area.

Counts of cormorant ground-nests occur during the last week of May, at their peak nesting period. Nest counts are conducted at night, using minimal light, in order to minimize disturbance and nest predation by Ring-billed Gulls. A minimal number of observers moves quickly and systemically through the ground-nesting area and place a coloured popsicle stick in the nest to mark it as counted.

Results

The first colonial waterbirds to colonize the Leslie Street Spit were Common Terns who were first recorded nesting in 1971 with 30-40 nests reported (Blokpoel and Fetterolf 1978, Wilson *et al.* 2001). As seen in Table 1, the population peaked in 1982 at nearly 1700 nests; however interspecific competition with Ring-billed Gulls for nesting sites, as well as the natural succession of the landscape,

Great Egret *Photo: Saul Bocian*

Table 1. Colonial waterbird nest numbers at Tommy Thompson Park/Leslie Street Spit, 1971-2011[A]

Year	COTE	RBGU	HEGU	BCNH	DCCO	GREG	CATE
1971	30-40	-	-	-	-	-	-
1972	-	-	-	-	-	-	-
1973	170-200	9	0	0	0	0	0
1974	0	"small numbers"	-	-	-	-	-
1975	0	-	-	-	-	-	-
1976	1246	10382	12	0	0	0	4
1977	1238	20564	32	0	0	0	6
1978	1310	22735	48	0	0	0	15
1979	1483	31000*	70	7*	0	0	24
1980	1327	66517	62	42	0	0	62
1981	1310	72500*	88	42	0	0	60
1982	1694	72500*	77	18	0	0	63
1983	847	72500*	74	41	0	0	98
1984	822	74564	91	50	0	0	163

Year	COTE	RBGU	HEGU	BCNH	DCCO	GREG	CATE
1985	564	47895	79	39	0	0	182
1986	583	39788	84	54	0	0	150
1987	424	45355	95	591	0	0	41
1988	447	62782	158	621	0	0	0
1989	108	61945	139	918	0	0	0
1990	136	46799	96	989	6	0	0
1991	346	42495	106	792	62	0	0
1992	329	50000*	102	860	85	0	0
1993	389	40000*	120	911	188	0	0
1994	396	48603	123	536	524	0	1
1995	NC	52500*	NC	790	414	0	3
1996	NC	52500*	NC	1195	931	0	28
1997	NC	57500*	NC	829	1241	0	0
1998	266	57500*	NC	807	1598	0	3
1999	325	59453	111	1001	2539	0	NC
2000	242	58000*	NC	1265	3187	0	18
2001	NC	58000*	NC	762	4237	0	65
2002	445	58000*	NC	1203	3543	2	65
2003	420	56151	48	1159	3942	1	252
2004	433	45000*	79	879	5046	1	350
2005	448	40000*	NC	880	5674	4	0
2006	NC	35000*	NC	649	6125	3	0
2007	367	33000*	45	876	7059	5	0
2008	310	30000*	30	536	6717	5	0
2009	354	30000*	NC	584**	7564	7	0
2010	231	30000*	NC	434	9434	5	0
2011	53	30000*	NC	423	11374	7	0

NC = not counted
* = estimate
** = nesting failed
COTE = Common Tern
RBGU = Ring-billed Gull
HEGU = Herring Gull
BCNH = Black-crowned Night-Heron
DCCO = Double-crested Cormorant
GREG = Great Egret
CATE = Caspian Tern

[A] Data for 1971-2000 from Wilson *et al.* (2001); data for 2001-2011 are from Ontario Breeding Bird Atlas, CWS and TRCA unpublished files.

Figure 3. Artificial reef-raft used by Common Terns. *Photo: Ann Gray*
Figure 4. Cormorant and gull colonies. *Photo: TRCA*

led to a decrease in Common Tern nests (Wilson *et al.* 2001). Ring-billed Gulls arrived at the site in 1973 (Blokpoel and Fetterolf 1978), and their population peaked at nearly 75,000 nests in 1984 (Blokpoel and Tessier 1987). Vegetation management was undertaken in 1982 and a gull management program was initiated in 1985 in response to the Common Tern decline (Morris *et al.* 1992).

Artificial reef-rafts were installed as nesting habitat by the CWS and TRCA in 1990 (Dunlop *et al.* 1991). In 2004, the TRCA created a wetland in the Cell One confined disposal facility, which included an island designed for tern nesting (TRCA No date b). Today, terns nest on four reef-rafts and the Cell One Tern Island (Figure 2 and Figure 3). In 2011, nests numbered only 53 as the Tern Island was submerged due to high water levels in Lake Ontario and the three reef-rafts in Cell Two were depredated by one or several American Mink *(Mustela vison*). This is a 77% decline from last year's population estimate. In 2012, the reef-rafts will receive predator guards to reduce depredation by mammals.

Like Common Terns, Ring-billed Gulls were attracted to the site by the open habitat. From their colonization in 1973 through to 1984 (Wilson *et al.* 2001), their population increased dramatically (Table 1) until management efforts began in 1985 (Blokpoel and Tessier 1987). Management was undertaken for a variety of reasons including their negative impact on vegetation establishment, Common Terns and public complaints (Wilson *et al.* 2001). Without management the population was expected to reach 180,000 pairs (Wilson *et al.* 2001). As vegetation has become established throughout the site and competition for nesting sites with Common Terns has been resolved through habitat creation, management for Ring-billed Gulls has not been undertaken since 2007. Ring-billed Gulls currently nest on Peninsulas A and B (Figure 2). Gull population estimates were not undertaken in 2011, although anecdotal evidence suggests the number of Ring-billed Gulls may be slightly higher than the last official count in 2008 of 30,000 nests (Table 1).

Herring Gulls first occupied the Leslie Street Spit in the mid-1970s (Blokpoel and Fetterolf 1978) and nest among the Ring-billed Gulls in much lower numbers (Wilson *et al.* 2001). Nesting peaked in 1988 and since then has decreased steadily (Table 1). TRCA does not undertake a Herring Gull census due to their low numbers and the involvement of CWS in individual nest monitoring.

Black-crowned Night-Herons likely arrived at the site in 1979 when the Eastern Cottonwood (*Populus deltoides*) trees on the peninsulas reached a sufficient size for nesting (Wilson *et al.* 2001). In 1987, the Mugg's Island colony (part of the Toronto Islands) was abandoned and the number of night-herons nesting at the Leslie Street Spit dramatically increased (Wilson *et al.* 2001). When the population peaked in 2000, they represented 31.6% of the national population

Table 2. Cormorant Nest Numbers by Location at Tommy Thompson Park/Leslie Street Spit, 2001-2011

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Peninsula A	909	730	779	557	311	228	101	49	22	39	19
Peninsula B	3048	1844	1582	1241	1763	1535	1072	1050	917	781	1262
Peninsula B ground nests	0	344	948	809	872	868	1302	1009	1957	3310	4547
Peninsula C	282	625	633	2439	2728	3494	4584	4609	4668	5304	5546
Total Cormorant Nests	**4237**	**3543**	**3942**	**5046**	**5674**	**6125**	**7059**	**6717**	**7564**	**9434**	**11374**

(Wilson *et al.* 2001). Nest numbers have fluctuated at the site, likely in response to human, and predator disturbance, as well as competition for nest sites with Double-crested Cormorants. In 2011, 423 Black-crown Night-Herons nested in trees on Peninsulas B and C (Figure 2), a slight decrease from 2010 (Table 1).

Double-crested Cormorants began nesting on Peninsula B in 1990 (Wilson *et al.* 2001) and expanded to Peninsula A the following year. The population increased and expansion onto Peninsula C occurred in 2000, and ground-nesting on Peninsula B in 2002, likely in response to the loss of tree nesting habitat due to their nesting activities on Peninsulas A and B; as well as an increase in the overall Great Lakes population (Weseloh *et al.* 1995). In 2008, the TRCA developed the Double-crested Cormorant Management Strategy in response to the significant decline and loss of forest habitat on the peninsulas (TRCA 2008). In 2011, cormorants nested in trees on Peninsulas A, B and C, as well as on the ground on Peninsula B (Figure 2 and Figure 4). Their nests numbered 11,374, including 4,547 ground nests (Table 2). The overall population increased 21%, while the ground-nesting population increased 37% over the previous year. Converting tree-nesting birds to ground-nesting birds, as well as protection of the existing ground-nesting colony, is a target of TRCA's management strategy.

The first Great Egret nests were found on 21 May 2002 by Glenn Coady on Peninsula C (Table 1)(Worthington 2002). In 2011, seven nests were confirmed, including one nest where a Black-crowned Night-Heron chick was brooded by egrets and alongside egret chicks and is presumed to have fledged.

Caspian Terns (*Hydropogne caspia*) no longer use the Leslie Street Spit as a nesting area. They occupied the site from approximately 1976 to 1987 and from 1994 to 2004, nesting on the Endikement Tip (Table 1) (Wilson *et al.* 2001). The establishment of vegetation, gull competition for nest sites, unknown predator pressure and habitat creation in Hamilton Harbour are the suggested reasons for their decline at the site (Wilson *et al.* 2001).

Tommy Thompson Park is owned and managed by TRCA and is only open to the public on weekends and holidays. Visitors are reminded the colonial waterbird nesting areas are off limits during the nesting season from April through September. For more information on TTP visit www.tommythompson park.ca.

Acknowledgements

TRCA is very grateful to all those who have worked on the colonies or who have reported their observations over the years. The author expresses a special thank you to Ralph Toninger, Glenn Coady, Dr. Gail Fraser, Ann Gray, Dr. Chip Weseloh and anonymous reviewers.

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