The Breeding Birds of

Tommy Thompson Park

2015

Female Yellow Warbler Building Nest (D. Johnston)

Toronto and Region Conservation

Toronto and Region Conservation for The Living City

Tommy Thompson Park
Toronto's Urban Wilderness

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1. Introduction

1.1 Study Area

TTP Aerial View (TRCA, 2014)

Tommy Thompson Park is located on the Leslie Street Spit, a man-made landform that extends five kilometres into Lake Ontario in Toronto. When construction of the Spit began in 1959 by the Toronto Port Authority, the intention was to create new lands for port related facilities. However, for a variety of reasons port related expansion did not occur and natural succession was allowed to progress. As such, the Province of Ontario awarded Toronto and Region Conservation Authority (TRCA) the responsibility of creating a Master Plan for a public park. Although construction of the landform continues to the present day by the Toronto Port Authority to mitigate shoreline erosion, the final size of the Spit (including the waterlots) is complete at approximately 500 hectares.

Over the years, the Spit evolved into the largest area of natural habitat on the Toronto waterfront, both through natural succession and habitat enhancement projects by the TRCA. A range of vegetation communities, including successional forests, meadows, coastal wetlands and sand dunes, provide diverse habitats for a wide range of species. A number of regionally rare plants have earned TTP the designation of an *Environmentally Significant Area*. The geographical location of the Spit is also significant for migrating wildlife; it is the first/last natural area for wildlife as they migrate across the lake or through Toronto. Additionally, the Spit is within close proximity to the Don River valley which provides a corridor of natural vegetation through the city, to larger green spaces, including the Oak Ridges Moraine.

The diverse habitats on the park, along with the geographical position have made it a critical site for birds throughout the year. To date, 318 species have been recorded at the park, and in 2000, the Leslie Street Spit/TTP was named an *Important Bird Area* by BirdLife International. This designation is due to the globally significant number of nesting colonial waterbirds, the nationally significant number of waterfowl during migration and over winter, and the large concentrations of songbirds during migration.

2. Colonial Waterbirds

2.1 Project Background

Great Egrets on Nest (D. Johnston)

Colonial waterbirds have a long history at Tommy Thompson Park and are one of the reasons the park was designated a globally significant *Important Bird Area* in 2000 (Wilson et al., 2001). This year five species of colonial waterbirds nested at Tommy Thompson Park: two species are tree nesters, Black-crowned Night-Heron and Great Egret; two species are ground nesters, Ring-billed Gull and Common Tern; and Double-crested Cormorants nest in trees and on the ground.

2.2 Population Estimate Methodology

Population estimates for tree nesting waterbirds, Double-crested Cormorants and Common Terns are conducted annually, while population estimates for Ringed-billed Gulls typically occur every 5 to 10 years with the 10 year survey coinciding with the Canadian Wildlife Service (CWS) decadal census. Individual Herring Gull nests are monitored by the CWS for ongoing contaminant research, and TRCA does not usually undertake a population census for this species. Caspian Terns are typically counted each year; however they were absent from 2004 to 2011 and were not counted in 2012 due to their proximity to the ground nesting cormorant colony. Population estimates for any species may also be undertaken more frequently in relation to other projects/studies or to address a population concern. All estimates and analysis are conducted by trained TRCA staff and researchers, using in-field techniques. Upon completion of the survey Microsoft Excel is used to store and analyze the population data.

2.2.1 Tree Nest Survey Methodology

Each spring an annual census is conducted during the last week of May, at the peak nesting period, to determine the number of breeding Double-crested Cormorant, Black-crowned Night-Heron and Great Egret pairs and their nest distribution. 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 in 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, 0.050 mm thick) attached with a single 5 cm galvanized roofing nail which is left out approximately 2.5 cm 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. Every tree evaluated is marked with tree marking paint to identify that it has been counted. The tree coordinates and associated nest data are mapped with ArcView GIS software. Additionally, a sample of nest trees are evaluated post-breeding, in the late summer, to assess their health.

2.2.2 Ground Nest Survey Methodology

The census for Common Tern and Ring-billed Gull is conducted at the peak nesting period, typically the last week of May or the first week of June to determine their breeding population. The Common Tern colonies nest on four floating reef-rafts and one artificial island. The colonies can be subject to predation/disturbance pressures that can result in asynchronous nesting, 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 24m^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 120m^2, 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 area, the colony is divided into smaller, discrete sections, and all active nests are counted by section using the rope transect method. Ropes are used to delineate 1m wide transects and observers carefully walk the transect counting all active nests with a manual handheld tally counter and marking each nest with survey paint to identify that it has been counted. Herring Gull nests are recorded on a field data sheet and not included in the tally counter. 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 undertake population estimates of the Ring-billed Gull nesting area.

Cormorant ground nest estimates occurred on June 18, 2015 later than in most years due to continued tree-nesting pressure that required ongoing management. Nest counts occur once management has largely stopped to account for birds that may have attempted to tree nest and instead ground nested. Nest counts are undertaken at the peak nesting period. In 2015 aerial photographs were taken from a drone to minimize disturbance to nesting cormorants, gulls and nearby Caspian Terns, as well as offer a comparison with the helicopter method undertaken in 2014. Individual nests can be seen in the images and are counted using GIS software by placing a dot on each nest. Unfortunately the images taken by the drone are of lower resolution than the 2014 images resulting in a less accurate ground nest count of +/- 623 nests.

2.3 Results

In 2015 Double-crested Cormorants nested in trees on Peninsulas A, B and C, as well as on the ground on Peninsulas A and B. Black-crown Night-Herons nested on Peninsulas B and C. Great Egrets nested on Peninsula C. Ringed-billed Gulls and Herring Gulls nested on the ground on Peninsulas A and B. Caspian Terns attempted

to nest on the ground on Peninsula B. Common Terns nested on 2 artificial reef rafts in Embayments D and A, and a man-made island in Cell One (Figure 2.A).

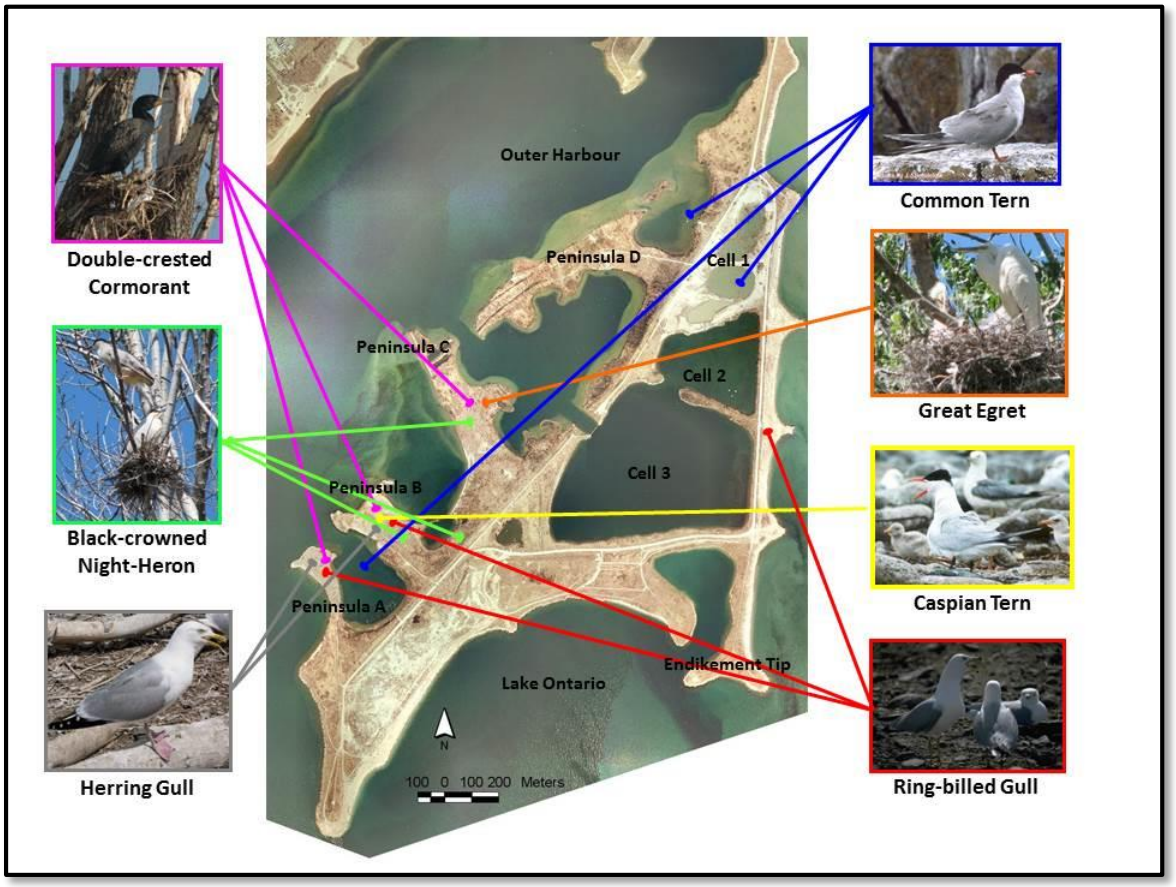

Figure 2.A. Colonial Waterbird Nesting Areas, 2015

Cormorant nests numbered 11,908, including 7,608 ground nests (Figure 2). The overall population decreased four percent; while the ground nesting population decreased 2.5 percent over the previous year, however the 623 unconfirmed ground nests skew this figure, which may in fact result in a static or increasing number of ground nests. As indicated in Figure 2.B, 68 percent of the TTP cormorant colony nested on the ground in 2015, with 541 nests on Peninsula A, a significant increase from 2014. Ground nesting is a target of the Double-crested Cormorant Management Strategy, which aims to achieve a balance between a healthy, thriving cormorant colony and the other ecological, educational, scientific and recreational values at the park (TRCA, 2008). Tree nesting decreased by a total of 18 percent as observed on both Peninsulas B and C in 2015 (Figure 2.B)

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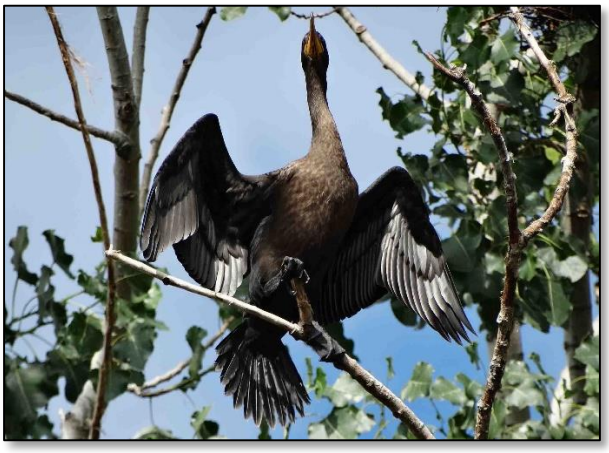

Juvenile Double-crested Cormorant (D. Johnston)

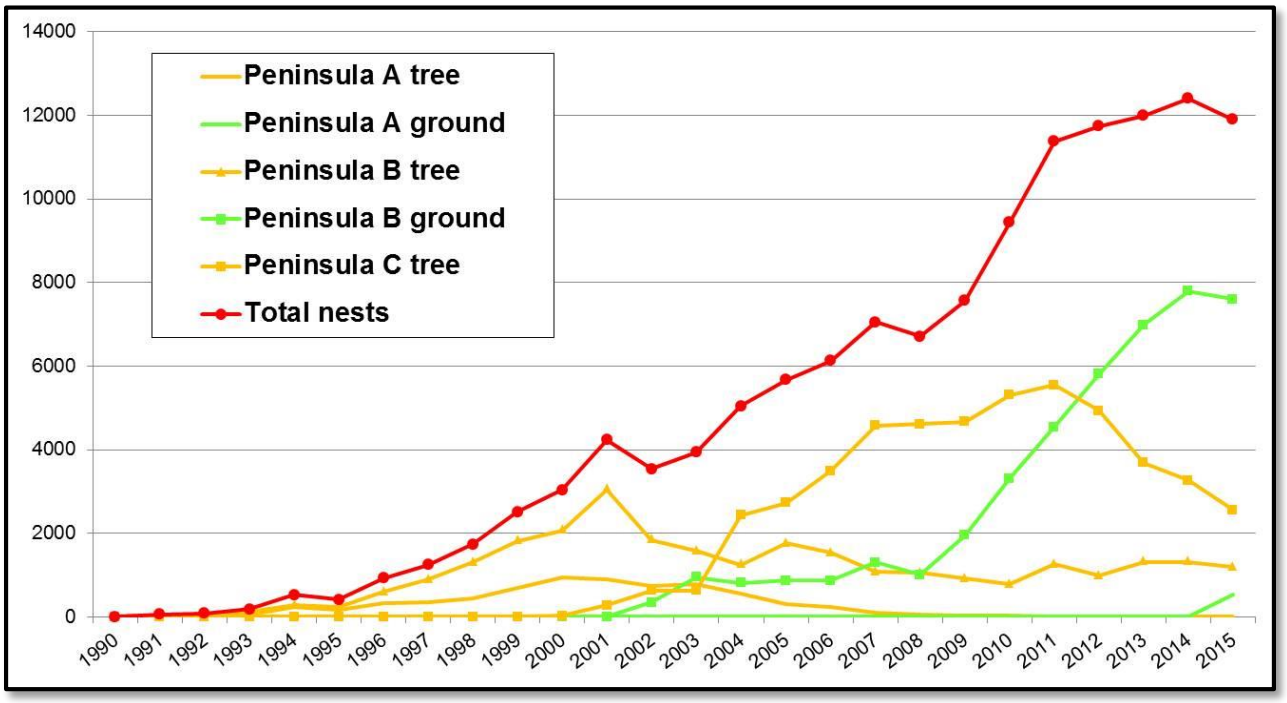

Figure 2.B. Double-crested Cormorant Nests at TTP by Location, 1990 - 2015

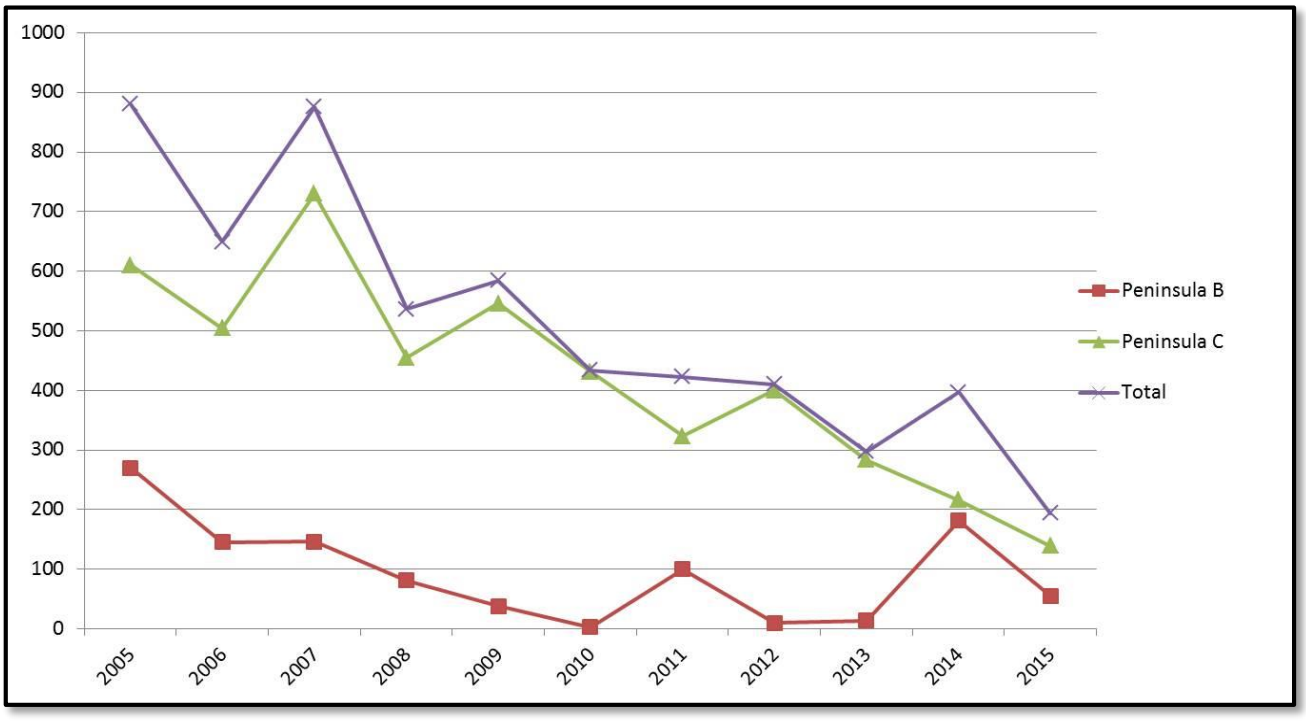

Figure 2.C. Black-crowned Night-Heron Nests at TTP by location, 2005-2015

Black-crowned Night-Heron nests numbered 194, a decrease of 105 percent from the previous year (Figure 2.C and Table 2.1). This represents the lowest nest count since 1986. Most night-heron nesting occurred on Peninsula C and the back area of Embayment B where they appear to be selecting healthier nest trees than in their traditional nest areas that have been affected by cormorant nesting.

Due to the poor resolution of the drone photography Caspian Tern nests were unable to be counted. Observations of the colony indicated that they had little to no nest success possibly due to interspecific competition from cormorants. Efforts to improve Caspian Tern nesting habitat will take place in 2016.

Table 2.1. Colonial Waterbird Nests at TTP, 2003 - 2015

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
DCCO	3,942	5,046	5,674	6,125	7,059	6,717	7,564	9,434	11,374	11,741	11,990	12,409	11,908
BCNH	904	601	610	504	730	455	546[a]	431	423	410	297	397	194
GREG	0	1	4	3	5	5	7	5	7	8	4	6	6
RBGU	56,151	45,000*	40,000*	35,000*	33,000*	30,000	30,000*	28,000*	32,000*	32,000*	35,000*	35,000*	35,000*
HERG	48	79	NC	NC	45	30	NC	<20*	NC	NC	NC	NC	NC
COTE	420	433	448	NC	367	310	354	231	54	24*	0	179	176
CATE	252	350*	0	0	0	0	0	0	0	5*	98	263	NC

a - Nesting failed by June 30
*- Estimate

Common Terns had a fairly successful season at TTP in 2015. The redesigned tern raft that proved successful in 2014 was expanded with another raft deployed in Embayment A for a total of 3 nesting rafts at TTP: two in Embayment A and one in Embayment D. Nest counts were undertaken at a distance to reduce stress on the terns. Approximately 176 nests were observed on rafts and on the Cell One Tern Island, however all of the island nests were predated, likely by Ruddy Turnstone. By mid-July the Embayment A tern rafts were overtaken by roosting cormorants which likely affected nest success. Measures will be taken in 2016 to prevent cormorants from roosting on the rafts.

Gull population estimates were not undertaken in 2015, although anecdotal evidence suggests Ringed-billed Gull nests may be above the last official count in 2008 of 30,000 nests (Table 2.1). Ring-billed Gulls nested on Peninsulas A and B as in previous years, and on the Endikement for a third consecutive year. As per the Ring-billed Gull Management Plan the eggs laid on the Endikement were oiled to control the population. Herring Gulls nest among the Ring-billed Gulls in much lower numbers. TRCA does not undertake a Herring Gull census due to their low numbers and the involvement of the Canadian Wildlife Service in individual nest monitoring for containment research.

2.3.1 Canada Geese and Mute Swans

Canada Geese and Mute Swans regularly nest at TTP and are monitored and managed by TRCA. The Mute Swan is an introduced invasive species and all nests encountered are managed to eliminate reproduction. Canada Goose nests are also managed due to the high number of human-wildlife conflicts on the Toronto waterfront. Management includes the application of food grade mineral oil to eggs to eliminate or reduce reproduction. In 2015 there were a total of 12 Canada Goose nests and six Mute Swan nests at TTP.

Black-crowned Night-Herons on Nest (D. Johnston)

3. Landbirds and Non-colonial Waterbirds

3.1 Project Background

Until 2005, comparatively little effort had been put toward TTP's nesting bird species other than the colonial waterbirds of the previous section. The project detailed in this section of the report was initiated in 2005 as a method of monitoring and documenting landbirds and non-colonial waterbirds for the site.

3.1.1 Rationale

The project is organized around monitoring of breeding landbird and non-colonial waterbird density and diversity in response to habitat succession and restoration. Regular surveys of breeding landbird and non-colonial waterbird species at TTP provide the following:

* Relative abundance data
* Detailed and accurate nest records
* A measurement of breeding bird abundance and diversity in relation to landscape level change
* Assessment of nesting success including parasitism and predation rates
* Data that can help steer habitat restoration work

This project is appropriate for TRCA because the labour and material cost is low, and the expertise is both readily available and able to provide monitoring of avian response to habitat restoration efforts. The Tommy Thompson Park Bird Research Station (TTPBRS), through volunteers and some staff support, has carried out the project annually in spring and summer since 2005.

3.1.2 Change in Data Reporting

Commencing with the 2013 Breeding Bird Report, data from 2005 are no longer included. While the project effort in 2005 established the methodology and determined the viability of the project, the work was completed with minimum resources, with the result that the thoroughness of TTP coverage (and consequently the number of nests detected) was not comparable to subsequent years. (Data from 2005 are still available in all annual reports prior to 2013.)

Yellow Warbler Fledgling (P. Robillard)

3.2 Methodology

Starting in 2005, a combination of variable circular plot (VCP) counts, nest searching and casual observations was employed from April – August each year (VCP counts restricted to June and July). Variable circular plot counts are the most recognized method for assessing breeding bird density and were employed for the Ontario Breeding Bird Atlas (OBBA). Nest searching and monitoring are also employed to provide valuable data on breeding success, nesting ecology and relative density of nesting attempts. Casual observations were recorded to augment the monitoring. While most nest records gathered are submitted to the Ontario Nest Records Scheme (ONRS), nests discovered after nesting is complete are typically not.

3.2.1 Variable Circular Plot (VCP) Protocol

The VCP counting method has been widely promoted by biologists over the more popular point count method, as it is much more applicable to analysis and has less bias. Nine station locations were initially set up based on the proportion of individual habitat types within the entire land area, and these locations have remained constant.

Between approximately June 15 and July 8, each of the nine stations is visited six times on a rotational schedule such that time of day is equally represented at all stations. All counts are conducted between 7:00 am and 10:00 am and last 5 minutes at each station. The protocol involves recording start time, finish time, date and visit number for each of the stations. Temperature, percentage cloud cover and wind speed are also recorded. Counts are completed on days with fair weather conditions such that visibility is high, wind speed is low to moderate (0-15 kph) and precipitation is absent. All birds detected are estimated to the following distance parameters: <10 m, 10-20 m, 20-30 m, 30-40 m, 40-50 m, 50-75 m, 75-100 m and >100 m. Any flyovers and any birds detected beyond 100 m are recorded in separate columns. The circumstances of each detection are also noted (e.g., observed, singing, territorial dispute, family group).

Station locations are distributed in the following manner: four in forest habitats, four in meadow communities (wet and dry) and a single station was placed in an extensive shrub thicket (termed "shrubland") which is bordered by forest. A summary of station information is presented below in Table 3.1. The location of each station is shown on Appendix A, an annotated map of Tommy Thompson Park.

Table 3.1. VCP Station Information

Station	UTM Zone	Easting	Northing	Location	Habitat Type
1	17	635198	4834430	Baselands	Wet Thicket
2	17	635206	4834217	Baselands	Forest
3	17	634930	4834149	Baselands	Dry Meadow
4	17	635300	4833940	Baselands	Dry Meadow
5	17	635101	4832683	Neck	Shrubland
6	17	634360	4832165	Peninsula D	Forest
7	17	634726	4831138	Flats	Wet Meadow
8	17	634220	4831453	Peninsula C	Forest
9	17	634215	4831680	Peninsula C	Forest

3.2.1.1 VCP Station Vegetation Protocol

The habitats at the study area are relatively young in age and may be altered or enhanced through TRCA's habitat restoration efforts, as well as natural succession. Changes in the habitats over time will also lead to changes in the bird communities and should be documented to help understand and interpret these data. Descriptions of the habitats for each of the VCP stations were initiated in 2010, repeated in 2013, and should continue to be repeated every three years to help quantify changes in the vegetation communities.

In any year in which the vegetation analysis is completed, stations are surveyed once during the nesting season (June or July) to record the dominant habitat (meadow, thicket, deciduous forest, mixed forest, wetland, sand dune/sand barren, roads/trails and Lake Ontario/open water), as well as the dominant group of vegetation. Surveyors estimate major type of habitat by percentage via a field visit and orthophoto interpretation. Habitat types must sum to 100% per station. The dominant habitat types are sketched out from a bird's-eye perspective. Dominant groups of vegetation communities are estimated for each station, but do not necessarily need to sum to 100%, as vegetation that is sub-dominant or areas without vegetation are not included in this total.

3.2.2 Nest Searching and Monitoring Protocol

The nest searching survey method is valuable to bird conservation because it provides indicators of breeding success and parasitism/predation rates. As shown in Appendix C, the entire land area encompassing Tommy Thompson Park/Leslie Street Spit was divided into six survey zones (i.e., A – F). Participants are assigned zones to avoid overlap in data collection, and effort is recorded separately for each zone. Table 3.2 describes the primary habitat for each zone.

Table 3.2. Primary Habitat Type by Zone

Zone	Primary Habitat Type
A	forest, meadow
B	meadow, shrubland, forest
C	forest
D	meadow, shrubland, barrens (lakefill)
E	Meadow, barrens (lakefill)
F	meadow, forest

The zones (excluding colonial waterbird nesting areas) are searched carefully for evidence of nesting, focusing primarily on the woodland and shrubland edges favoured by species nesting at TTP. Once the nest of any landbird or non-colonial waterbird is discovered, the UTM co-ordinates are determined by GPS and recorded in field notebooks, along with a description of the nest and the habitat. Following discovery of a nest, and to the extent that time and personnel are available, the nest is monitored to determine the outcome, as well as any incidence of parasitism.

Commencing in 2012, a change in protocol was adopted with regard to ground-nesting birds. In order to avoid providing a trail which would lead predators to ground nests, project participants no longer actively seek such nests. As a result, only ground nests found accidentally are recorded, and no follow-up monitoring to determine nest outcome is conducted. Species affected by this change include American Woodcock, Belted Kingfisher, Eastern Meadowlark, Gadwall, Killdeer, Mallard, Savannah Sparrow, Song Sparrow and Spotted Sandpiper. These species represented 5.0% of nests found from 2006 to 2014, inclusive, and 2.1% of nests found in 2014, so there have never been many such nests found, and the change in protocol does not appear to have had a major impact on the number of such nests found, as they have always been notoriously difficult to locate.

All nesting data are submitted to ONRS online and are available through TTPBRS at ttpbrs@trca.on.ca.

3.3 Results

3.3.1 Variable Circle Plot Point Count Results

3.3.1.1 VCP Station Vegetation Survey

In both 2010 and 2013, a vegetation survey was completed for each station, resulting in the vegetation descriptions found in Table 3.3 below. In addition, Appendix B contains a habitat sketch and photographs for each station in 2013. (The habitat sketches and photographs from 2010 can be found in the Breeding Bird Reports of 2010 – 2012.)

As can be seen from Table 3.3, several changes in habitat have occurred in only three years. This is not surprising, however, since most of TTP is intentionally left to naturally succeed on its own. Changes of note include:

Station 1: The increase in roads and trails in 2013 is due to the nearby parking lot being enlarged.

Stations 2 and 5: The meadow areas observed in 2010 have been completely overtaken by dogwood and willow.

Station 3: Some meadow has been replaced by thicket and forest, but, more significantly, the meadow component was almost entirely taken over by Spotted Knapweed, an invasive species.

Station 7: The increase in non-vegetation area reflects significant lake-filling in the last two years.

Station 8: The meadow area recorded in 2010 has been overtaken by trees, mainly poplar.

Station 9: Station 9 is located within the cormorant colony, and the effect of the nesting behaviours from these birds has been the loss of many trees and other vegetation.

Table 3.3. 2010 - 2013 VCP Station Vegetation Analysis

2010 OBSERVATIONS									
	VCP Station								
	1	2	3	4	5	6	7	8	9
% of Major Habitats Within 100 m Radius of Each VCP Station									
Meadow (tree cover ≤ 25%; shrub cover ≤ 25%)	55	40	70	95	10		85	5	5
Thicket (tree cover ≤ 25%; shrub cover ≥ 25%)	15	20	20		65	20		20	20
Deciduous Forest (tree cover ≥ 60%)	25	40	5		10	50		65	60
Mixed Forest (tree cover ≥ 60%; conifers ≥ 25%)									
Wetland (permanently saturated; water ≤ 2 m)	5								
Vegetation Sub-total (see detail below)	100	100	95	95	85	70	85	90	85
Sand Dune/Sand Barren (incl active shorelines)						5			
Roads/Trails			5	5	5		10		
Lake Ontario Shoreline (open water)					10	25	5	10	15
Non-vegetation Sub-total			5	5	15	30	15	10	15
Total of All Habitats	100	100	100	100	100	100	100	100	100
Dominant Vegetation Within 100 m of Each VCP Station									
Poplars (e.g., Eastern Cottonwood)	20	35	5	5	10	40	5	55	45
Dogwoods (e.g., Red-osier Dogwood)	10	15	10		20	15		5	15
Honeysuckles						10			
Shrub Willows	10	5	5	5	30	5	5	5	
Grasses and Sedges	55	40	65	60	15		45	20	10
Goldenrods and Asters		5	10	20	10		20		5
Aquatic Vegetation (e.g., Cattails, Bulrushes)	5			5				5	
Miscellaneous Herbs (e.g., Vetch, Nettles, etc.)							10		10
Vegetation Sub-total	100	100	95	95	85	70	80	90	85
2013 OBSERVATIONS									
	VCP Station								
	1	2	3	4	5	6	7	8	9
% of Major Habitats Within 100 m Radius of Each VCP Station									
Meadow (tree cover ≤ 25%; shrub cover ≤ 25%)	55		60	100			80		10
Thicket (tree cover ≤ 25%; shrub cover ≥ 25%)	15	60	25		75	20		20	20
Deciduous Forest (tree cover ≥ 60%)	20	40	10		10	50		70	35
Dead Deciduous Forest									15
Mixed Forest (tree cover ≥ 60%; conifers ≥ 25%)									
Wetland (permanently saturated; water ≤ 2 m)	5								
Vegetation Sub-total (see detail below)	95	100	95	100	85	70	80	90	80
Sand Dune/Sand Barren (incl active shorelines)						5			5
Roads/Trails	5		5		5		20		
Lake Ontario Shoreline (open water)					10	25		10	15
Non-vegetation Sub-total	5		5		15	30	20	10	20
Total of All Habitats	100	100	100	100	100	100	100	100	100
Dominant Vegetation Within 100 m of Each VCP Station									
Poplars (e.g., Eastern Cottonwood)	25	35	5	5	10	40	5	60	40
Dogwoods (e.g., Red-osier Dogwood)	10	40	15		40	15		5	20
Honeysuckles						10			
Shrub Willows	10	5	5	5	30	5	5	5	
Grasses and Sedges	50	20	35	35	5		40	15	5
Goldenrods and Asters			5	30			15		5
Aquatic Vegetation (e.g., Cattails, Phragmites)	5			20				5	
Miscellaneous Herbs (e.g., Vetch, Nettles, etc.)			30	5			15		10
Vegetation Sub-total	100	100	95	100	85	70	80	90	80

3.3.1.2 VCP Observations

Analysis of VCP count data presented here is a basic summation of results. More sophisticated analysis will require the use of software such as DISTANCE (a software package that allows users to estimate the size or density of biological populations).

Table 3.4. VCP Species Lists and Total Birds Detected by Species Within 100 Metres

Species	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	AVG
ALFL						1					0
AMGO	22	15	10	8	22	35	8	14	19	7	16
AMRO	14	25	31	26	34	41	40	22	15	25	27
AMWO				1				1			0
BANS	*	104	2	5	4	14	35	7	22	4	20
BAEA								*			0
BAOR	21	29	22	23	13	28	22	26	21	25	23
BARS	1	31	3	11	8	32	31	22	15	55	21
BCCH	3	1	3	2	4	3	1	3		5	3
BEKI	3			2	1				1		1
BGGN	3	3	2	8					3	2	2
BHCO	15	22	11	19	19	10	17	12	5	3	13
BLJA			3	1	1		1				1
BLPW				1							0
BOBO	*	3									0
BRTH		4						1	3	1	1
CANG	*				*				*		0
CEDW	12	12	11	39	19	31	47	17	16	12	22
CHSW	*	*	2	*		2		3	2	2	1
COGR	21	12	11	9	17	23	8	12	5	17	14
COHA										1	0
COYE	1	2	1		2	2			4		1
DOWO						2	1	1	1		1
EAKI	12	18	25	12	20	18	12	7	2	9	14
EAME	1	2	5								1
EAWP		1	1	3	1	8	6	8	6	9	4
EUST	24	21	35	116	41	52	39	8	44	9	39
FISP		3									0
GADW			3	*	1	16		*	2		2
GCFL		2		3							1
GRCA	26	24	19	17	38	16	21	16	21	12	21
HOFI	1	*				1					0
HOSP	3		2								1
HOWR								2	1		0
KILL	3	1	7	8	3		2	5	4	5	4
LEFL	5	17	6	7	11	11	8	10	4	5	8
MALL	*		*	4			*	*	2		1
MAWA				1							0
MODO	1	6	1		*			3			1
NOCA	2	3		4	3	1	2	5	3	3	3
NOFL	2	1	1	2		2					1
NOMO					*				1	1	0
NRWS	*	22	7	8	5	14	*	4	*	9	7
ORORR							1	1	1		0
REVI									1		0
ROPI	*	*	*								0
RWBL	167	154	203	312	199	244	295	265	276	247	236
SAVS	12	2		1							2
SOSP	74	72	68	81	55	46	50	66	47	51	61
SPSA	6	7	9	6	3	4	2	1	5	7	5
TRES	*	8	15	9	16	24	11	25	30	52	19
TRFL			1		1				2		0
VEER		1									0
WAVI	25	31	22	41	30	39	50	53	46	32	37
WIFL	23	27	17	26	14	25	16	17	20	18	20
YEWA	105	118	109	134	100	168	136	146	166	155	134
Birds	**608**	**804**	**668**	**950**	**685**	**913**	**862**	**783**	816	783	787
Species	**37**	**38**	**35**	**37**	**32**	**30**	**28**	**34**	37	29	34

* Species observed beyond 100 metres and/or flying over

Species recording a new high VCP count for the last ten years, or matching the previous high, were Barn Swallow, Black-capped Chickadee, Chimney Swift, Eastern Wood-Pewee, Northern Mockingbird and Tree Swallow.

Prior to 2015, swallows were recorded differently by different project participants during the VCP counts, with the result that swallow numbers in Table 3.4 are somewhat understated for the years 2006 – 2014.

A summary of abundance per species detected by VCP counts (<100 meters) is presented in Table 3.4. Some of the unusually high numbers (e.g., 116 EUST in 2009, 104 BANS, 31 BARS and 22 NRWS in 2007, 92 EUST in 2006) are attributable to one or a few large flocks recorded in one or more of the visits.

As shown in Table 3.4, a total of 29 species was detected for all counts in 2015, including one new species for VCP counts, i.e., Cooper's Hawk. Additionally, Northern Mockingbird was recorded for only the second time in the last 10 years of the project. The total of 29 species is the second lowest of the last ten years, and well below the ten-year average of 34.

The number of Brown-headed Cowbirds observed continued the sharp decrease experienced in 2014, and corresponds with the decrease in Cowbird parasitism (see Table 3.8). It is interesting that the number American Goldfinches was the lowest of the past ten years, yet there was no parallel decrease in nests located (see Table 3.5). Conversely, the number of Eastern Wood-Pewees recorded on the VCP counts was the highest for the last ten years of the project, yet no nests were found for this species (Table 3.5). However, when one examines Table 3.4, it is evident that, with the exception of the most common species, there is considerable variation year to year with many species, so that the number of birds recorded each year for many of the species is largely a matter of chance. (Note that the sequence of stations visited is intentionally different for each of the six VCP counts, so that the possibility of observing, or not observing, certain species at certain times is minimized.)

As can be seen in Figure 3.A, most VCP stations experienced total bird abundance in 2015 that was at least average. Five of the stations (2, 3, 6, 8 and 9) exceeded the average of the past ten years, particularly Stations 3 (dry meadow) and 9 (forest). Of the other four stations, Station 4 (dry meadow) was noticeably below the ten-year average. Total abundance for all stations in 2015 (783 birds) was slightly lower than the ten-year average (787 birds).

Stations 8 (forest) and 9 (forest) consistently reflect the lowest bird abundance of the nine stations. While the habitat for both stations is described as forest, they exhibit very different characteristics. The trees around Station 8 are quite mature and dense, and now house a portion of the Black-crowned Night-Heron colony. Station 9 is surrounded by the Double-crested Cormorant colony, with the excretions from the birds having largely defoliated the trees and other vegetation, resulting in very limited biodiversity. See Appendix A for station locations,

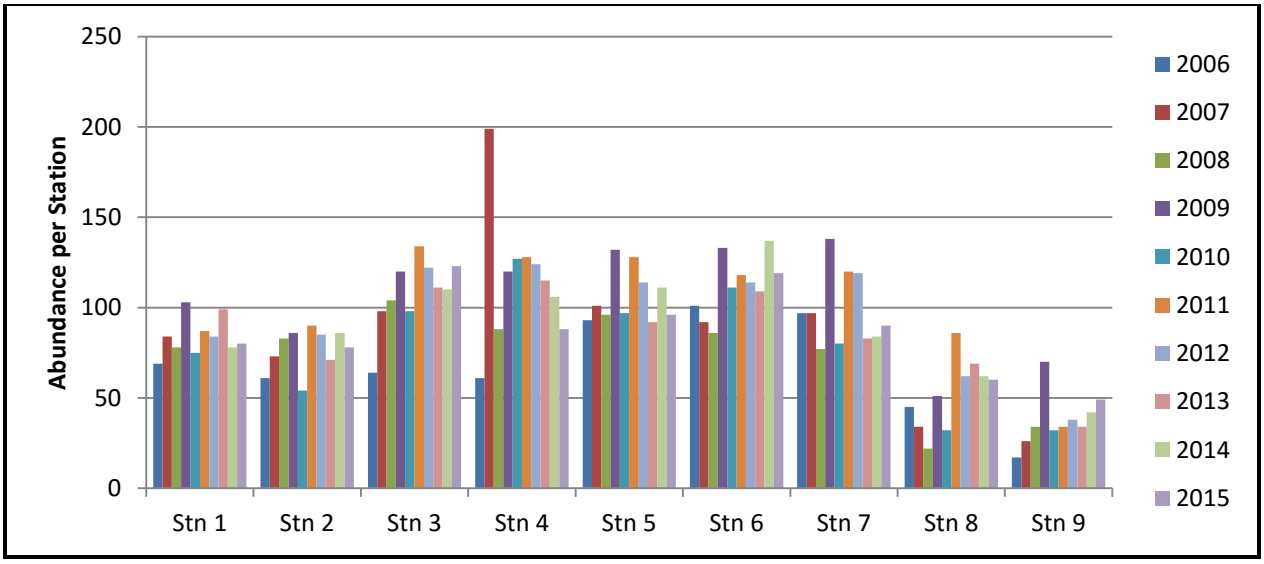

Figure 3.A. **Total Bird Abundance per VCP Station**

Species richness, or diversity, is shown in Figure 3.B. In 2015, all stations experienced species richness below the ten-year average, particularly Stations 1 (wet thicket) and 9 (forest).

As with bird abundance, species diversity at Stations 8 and 9 suffers in comparison to the other stations due to the dense vegetation and Black-crowned Night-Herons at Station 8 and the lack of biodiversity caused by the Double-crested Cormorants at Station 9.

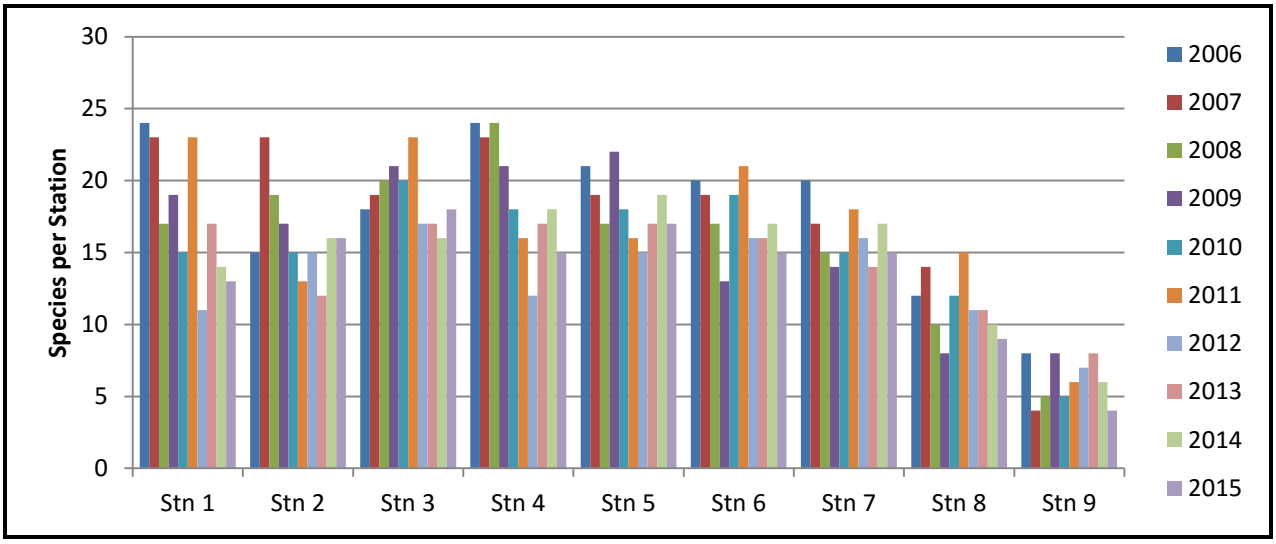

Figure 3.B. Species Richness per VCP Station

3.3.2 Nest Searching and Monitoring Results

In 2015, a total of 538 hours was logged by six volunteers. Figure 3.C shows the breakdown of effort per zone. As in 2014, the greater effort in Zones A, E and F corresponds to a significant increase in the number of nests discovered and monitored in those zones. Zone D continues to experience the fewest number of nests, due to lack of suitable habitat and the ongoing lakefilling activities, so that limited monitoring time is required in that zone.

See Appendix C for a map of the TTP breeding bird survey zones.

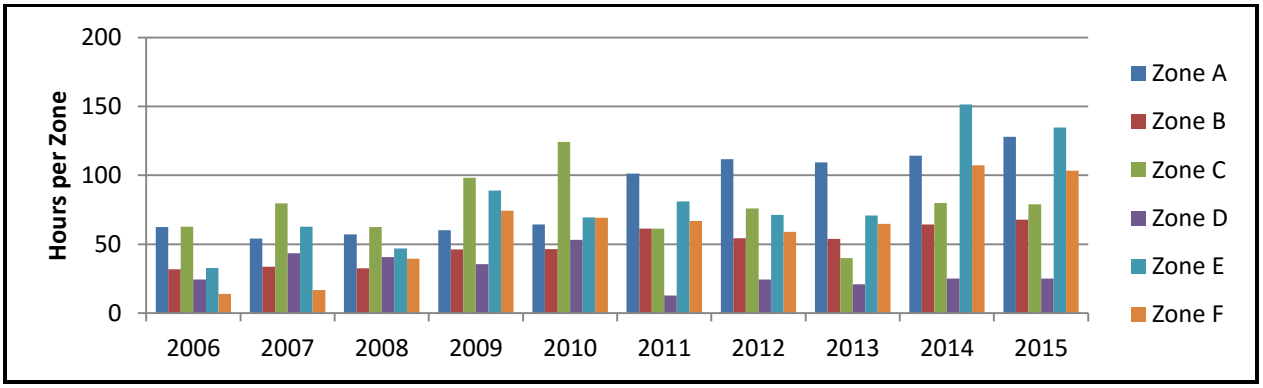

Figure 3.C. Nest Searching Effort per Zone from 2006 to 2015 (hours)

The use of standard nest searching data forms, along with greater nest searching and monitoring effort, combined with experience gained in previous years, have proved to be very successful in increasing the number of nests found in the most recent years of the project. In 2015, a total of 926 nests was discovered, the highest number of nests found to date, and 657 of these nests were monitored (see Tables 3.5 and 3.6), excluding ground nests. Excluding the five colonial waterbird species, Canada Goose and Mute Swan, nests of 28 species were found in 2015. Further, nesting was confirmed for an additional four species through observations such as

recently-fledged young and adults carrying food (i.e., Wood Duck, Canvasback, Bank Swallow and, of course, Brown-headed Cowbird), making 32 confirmed nesters for the project. When the five confirmed colonial waterbird nesters (i.e., Double-crested Cormorant, Great Egret, Black-crowned Night-Heron, Ring-billed Gull and Common Tern), Canada Goose and Mute Swan are added, the total becomes 39 species nesting at TTP in 2015.

Table 3.5. Total Nests by Species from 2006 to 2015

Species	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	AVG
AMGO	1	19	25	44	33	23	13	17	18	16	21
AMRO	12	26	51	93	69	115	93	93	89	78	72
AMWO					3	1	1			1	1
BANS	2			4	2	1					1
BAOR	13	12	9	9	10	17	16	15	35	17	15
BARS	5	5	3	3	2	4	11	26	31	24	11
BBCU									1		-
BCCH			1	2			1	2	1		1
BEKI	1	1	2						1		1
BGGN	1	1	1	3			2	4	6	7	3
BRTH	1	1	3	4	2		2	1	2	2	2
CANV									1		-
CEDW	3	7	14	40	14	21	23	19	37	40	22
COGR	3	2	1		4	4	2	3	2	5	3
DOWO		1			1	1	1	1		1	1
EAKI	11	17	26	22	14	12	27	21	20	27	20
EAME	1				1						-
EAWP		1			1	1	1		1		1
EUST	5	2	5	7	12	4	5	8	4	5	6
GADW	1	4	3	3	1	3	4	1	2	1	2
GRCA	12	9	11	23	11	16	21	24	34	30	19
HOFI		1									-
HOSP	1										-
HOWR	1		2	2	2	1					1
KILL	3	2	5	8	13	2	4	3	4	3	5
LEFL	1	2		3	1				3	2	1
MALL	6	7	9	12	12	6	9	8	5	5	8
MODO	4	4		3			1				1
NOCA	1	6	2	4	1		1	1	3	2	2
NOFL	4		1		3	3			1		1
NRWS	1	1		2		1			1	2	1
OROR	1	2	1		2	1	2	3	2	1	2
RWBL	45	58	82	130	167	232	268	310	361	404	206
SOSP	6	5	1	7	8	2	3	2	8	10	5
SPSA	5	6	3	5	8	4	5	6	3	6	5
TRES	7	6	9	9	9	5	5	12	13	20	10
TRUS									1	1	
WAVI	8	4	7	7	9	15	12	13	31	12	12
WIFL	13	21	15	25	15	12	14	13	18	15	16
YEWA	34	71	71	75	82	88	86	127	164	189	99
Total	**213**	**304**	**363**	**549**	**512**	**595**	**633**	**733**	**903**	**926**	**573**
Total Effort (hours)	**228**	**289**	**280**	**404**	**427**	**385**	**397**	**360**	**542**	**538**	**385**
Efficiency (nests/hour)	**0.94**	**1.05**	**1.3**	**1.36**	**1.2**	**1.54**	**1.59**	**2.04**	**1.67**	**1.72**	**1.44**

Note: A Trumpeter Swan nest was observed in 2014, but not included in the 2014 report. As another nest was observed in 2015 and reported to ONRS, it was decided to include the unreported 2014 nest in this report for completeness.

The 926 total nests located in 2015 represent a slight increase of 2.5% over the previous high in 2014 and a 55% increase over the last five years of the project. This naturally raises the question of why the project has been able to observe such an increase. The spread and maturation of appropriate breeding habitat in some areas, particularly dogwood and honeysuckle, have certainly contributed to the increase, but examination of nest locations over the years (see Appendix F in this and prior years' reports) shows that the additional nests are largely scattered throughout TTP, rather than being concentrated in one or two locations. The increase can further be explained by: (a) the ever-increasing nest-searching skills in the project participants; (b) the availability of significantly more volunteer time; and (c) the discovery of areas rich in nests that had not been explored previously due to high water conditions in the Spring.

New highs for the number of nests were established for the most recent ten years of the project for Blue-gray Gnatcatcher (up 17% from the previous high), Common Grackle (up 25%), Red-winged Blackbird (up 119%), Song Sparrow (up 25%), Tree Swallow (up 54%) and Yellow Warbler (up 15%). The increase in Tree Swallows is the result of monitoring several nesting boxes recently erected by TRCA to confirm usage; most nest boxes are not recorded nor monitored under this project. Other species matching previous highs were Cedar Waxwings, Eastern Kingbirds and Northern Rough-winged Swallows. Red-winged Blackbirds and Yellow Warblers are the species which are particularly taking advantage of the increasing number and densification of dogwood, honeysuckle and reeds.

While the number of Barn Swallow nests declined somewhat from 2014, the dramatic increase in Barn Swallow nests in the past four years continues to be significant in that this species is a provincially-listed Species at Risk and is attributable to the swallows making good use of the new buildings erected by TRCA.

Willow Flycatcher Nest (I. Sturdee)

Single nests were confirmed for American Woodcock, Downy Woodpecker, Gadwall and Orchard Oriole, species which are relatively rare at TTP or whose nests are difficult to locate.

Nest-searching efficiency figures (Table 3.5) can be misleading, as they are highly dependent on an area's vegetation (e.g., forest versus shrubland), the species found in the dominant habitat (e.g., shrub nesters versus high tree nesters) and the time spent on monitoring as opposed to finding nests. The efficiency realized in 2015 continues the improved experience of the last few years and points to the ability of the project participants to make effective use of their time in the field.

3.3.2.1 Nest Productivity

A total of 657 nests was recorded online with the Ontario Nest Record Scheme (ONRS) in 2015 (Table 3.6). In terms of nest productivity, 108 (i.e., 25%) of 431 nests with known outcomes failed, while 323 were successful in fledging young. The remaining 226 monitored nests had unknown outcomes, with the 2015 ratio of unknown outcomes to nests monitored (i.e., 34%) being the same as 2014 and almost matching 2006's low (i.e., 33%). That is, 2015 was particularly successful in being able to determine nest outcomes. (The nests with unknown outcomes included all ground nests from American Woodcock, Gadwall, Killdeer, Mallard, Song Sparrow and Spotted Sandpiper, which, commencing in 2012, were not monitored once found.)

As can be seen in Table 3.6, the 2015 nest failure rate of 25% is the lowest of the last ten years. Nest predation was the most common cause of nest failure again in 2015. Possible predators at TTP include raccoons, gartersnakes, mink and coyotes, as well as other bird species. Of the 108 failures, 14 occurred at the egg stage, 22 at young stage and 72 at either egg or young stage.

Table 3.6. Nest Productivity from 2006 to 2015

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	AVG
Nests discovered	214	304	363	549	512	593	633	733	903	926	573
Species	33	30	27	27	34	27	28	25	32	28	29
Nests monitored & reported to ONRS	214	236	297	456	440	430	464	549	690	657	443
- Unknown outcome	71	160	148	170	213	155	213	266	232	226	185
- Known outcome	143	144	149	286	227	275	251	283	458	431	265
- Successful	82	77	97	162	144	177	171	186	338	323	176
- Failed	61	67	52	124	83	98	80	97	120	108	89
- **Failure rate**	**43%**	**47%**	**35%**	**43%**	**37%**	**36%**	**32%**	**34%**	**26%**	**25%**	**34%**

Predated Red-winged Blackbird Nest (M. Dupuis-Desormeaux)

As shown in Figure 3.D, the known nest failure rate has been trending down over the course of the project. Reasons for this apparent trend are unknown and require further study.

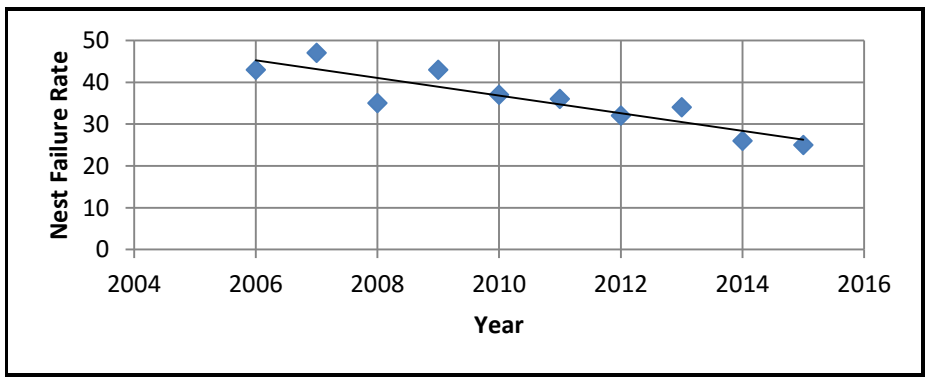

Figure 3.D Known Nest Failure Rate Trend

As can be seen in Table 3.7, the 39 confirmed breeders in 2015 were slightly below the ten-year average, while the 73 total species detected during all surveys matched the 10-year average. The sharp increase in total species observed in 2012 was an anomaly resulting from an unusual number of late migrants being observed.

Table 3.7. Summary of Species Detected Through All Studies

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	AVG
Confirmed Breeding Species	45	43	34	37	40	36	40	40	44	39	40
Probable Breeding Species	4	7	9	11	2	4	3	5	5	3	5
Possible Breeding Species	19	10	15	14	8	3	6	4	8	14	10
Other Species Observed	7	13	16	20	17	21	36	22	12	17	18
Total Species	**75**	**73**	**74**	**82**	**67**	**64**	**85**	**71**	**69**	**73**	**73**

Looking at the past ten years of data, some conclusions and trends continue to emerge. As noted in 2011, Bobolink, Eastern Meadowlark and Savannah Sparrow have virtually disappeared from both the VCP counts and confirmed nests, although there has actually never been a confirmed Bobolink nest at TTP. Herbaceous vegetation at TTP is becoming denser, which may be having an adverse effect on nesting suitability for such species. At the same time, the spread of dogwood, honeysuckle and reeds, as well as tree planting by TRCA, has created more nesting opportunities for species such as Red-winged Blackbirds, American Robins and Yellow Warblers. More study is required.

3.3.2.2 Parasitism by Brown-headed Cowbirds

Brown-headed Cowbird parasitism is a major issue for small landbird populations in more open habitats and forest fragments. In 2015, a total of 36 nests of three species were parasitized by Brown-headed Cowbirds (Table 3.8). (For purposes of this report, a nest was considered parasitized if a cowbird egg was observed, regardless of what happened to that egg.) The parasitism rates in Table 3.8 were calculated as the ratio of parasitized nests to the total parasitized and non-parasitized nests. (Note that nests of parasitized species were not included in this table unless evidence of parasitism, or lack thereof, could be confirmed.)

Brown-headed Cowbird Fledgling Being Fed by Song Sparrow (D. Johnston)

The overall rate of parasitism in 2015 matched 2014 as the lowest by far of the last ten years. In particular, the two species with the most parasitized nests, Red-winged Blackbirds and Yellow warblers, had their lowest rates of parasitism of the ten years.

Despite the lower rates of parasitism in 2015, Yellow Warblers continue to be the most heavily parasitized species by Brown-headed Cowbirds over the duration of the project at an average rate of 29% per year of observable nests, followed by Red-winged Blackbirds at 24% average per year (see Table 3.8).

Table 3.8. Brown-headed Cowbird Parasitism Data and Rates from 2006 to 2015.

	Brown-headed Cowbird Parasitism								
		American Goldfinch	American Robin	Gray Catbird	Red-winged Blackbird	Song Sparrow	Willow Flycatcher	Yellow Warbler	Totals
2006	Total nests *	1	5	12	41	6	13	20	108
	Nests parasitized	1	0	0	12	2	3	9	27
	% parasitized	**100%**	**0%**	**0%**	**29%**	**33%**	**23%**	**30%**	**25%**
2007	Total nests *	8	0	9	38	5	17	56	134
	Nests parasitized	2	3	0	8	0	4	29	43
	% parasitized	**25%**	**0%**	**0%**	**22%**	**0%**	**24%**	**52%**	**32%**
2008	Total nests *	15	28	11	45	0	15	51	165
	Nests parasitized	1	1	0	18	0	4	21	45
	% parasitized	**7%**	**4%**	**0%**	**40%**	**0%**	**27%**	**41%**	**27%**
2009	Total nests *	21	44	23	112	4	24	68	296
	Nests parasitized	5	0	0	32	2	4	34	77
	% parasitized	**24%**	**0%**	**0%**	**29%**	**50%**	**17%**	**50%**	**26%**
2010	Total nests *	19	28	11	110	4	11	66	249
	Nests parasitized	0	0	0	27	1	2	21	51
	% parasitized	**0%**	**0%**	**0%**	**25%**	**25%**	**18%**	**32%**	**20%**
2011	Total nests *	13	26	16	81	2	11	36	185
	Nests parasitized	2	0	0	18	0	0	10	30
	% parasitized	**15%**	**0%**	**0%**	**22%**	**0%**	**0%**	**29%**	**16%**
2012	Total nests *	8	17	19	77	2	8	33	164
	Nests parasitized	0	0	0	30	0	2	7	39
	% parasitized	**0%**	**0%**	**0%**	**39%**	**0%**	**25%**	**21%**	**24%**
2013	Total nests *	9	26	20	145	2	11	75	288
	Nests parasitized	1	1	0	33	0	1	22	58
	% parasitized	**11%**	**4%**	**0%**	**23%**	**0%**	**9%**	**29%**	**20%**
2014	Total nests *	10	27	27	134	6	13	96	313
	Nests parasitized	0	0	0	22	0	2	11	35
	% parasitized	**0%**	**0%**	**0%**	**16%**	**0%**	**15%**	**12%**	**11%**
2015	Total nests *	5	18	21	181	7	7	82	321
	Nests parasitized	0	0	1	27	1	0	8	37
	% parasitized	**0%**	**0%**	**5%**	**15%**	**14%**	**0%**	**10%**	**12%**
AVG	Avg total nests *	10.9	22.2	16.9	96.2	3.8	13.0	59.3	222.3
	Avg parasitized	1.2	0.2	0.1	22.7	0.6	2.2	17.2	44.2
	% parasitized	**11.0%**	**0.9%**	**0.6%**	**23.6%**	**15.8%**	**16.9%**	**29.0%**	**19.9%**

* Total nests includes only those nests where parasitism could be observed and/or monitored; therefore not all nests on site are included in this total

Gray Catbird Nest with One Brown-headed Cowbird Egg (P. Robillard)

A Gray Catbird nest was parasitized in 2015, the first time this has been recorded during the project.

The overall parasitism rate in 2015 continued to trend downwards, as demonstrated in Figure 3.E. While 2012 saw a jump in both the overall parasitism rate and the number of cowbirds recorded in the VCP counts, both of these numbers decreased in 2013 and even further in 2014 and 2015. As mentioned in earlier reports, possible explanations for this downwards trend include (i) a reduction in the cowbirds' preferred foraging habitat at TTP due to the increase in tall herbaceous vegetation, and (ii) an overall decline in cowbird populations in Ontario, with the exception of the Carolinian region, as noted in the Atlas of Breeding Birds of Ontario, 2001-2005 (p. 602).

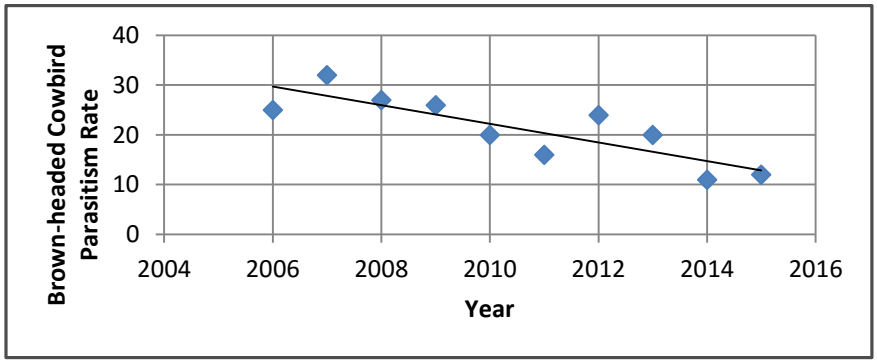

Figure 3.E Brown-headed Cowbird Parasitism Rate Trend

3.4 The Overall Picture in 2015

The most valuable aspect of this project will be its ability to reveal changes in breeding bird abundance and diversity over time at the VCP station, habitat and total area level. Breeding avifauna will respond to changes in habitat distribution, composition and structure due to natural succession and habitat creation. At present, the breeding bird communities (i.e., non-colonial waterbirds and landbirds) are typical of early successional environments. Dominant species in the past ten years of VCP counts include Red-winged Blackbird, Yellow Warbler, Song Sparrow, European Starling and Warbling Vireo, all of which require basic habitat conditions with a few fundamental components to thrive.

Although there were no new breeding species found in 2015, there have been 44 nesters confirmed since the current project commenced. This total includes the 39 species listed in Table 3.5, plus Brown-headed Cowbird, Wood Duck (nesting confirmed in 2012 and 2015 by the presence of recently-hatched young), Canada Goose, Mute Swan and Trumpeter Swan, with the latter three species not being monitored as part of the project. In addition, the seven colonial waterbirds described in Section 2 of this report have also been confirmed as nesters: Black-crowned Night-Heron, Caspian Tern, Common Tern, Double-crested Cormorant, Great Egret, Herring Gull and Ring-billed Gull.

When all species and historical records are included, there are now 69 species confirmed to have bred at Tommy Thompson Park. Some rare and isolated breeding records are unlikely to recur with any regularity, if at all, (e.g., Wilson's Phalarope). A complete historical breeding bird species list is presented in Appendix D, Species Accounts.

Current habitat conditions remain appropriate for nesting by some additional species, so it is anticipated that the list of known breeding species may well grow in the future. Natural change, along with the habitat creation and restoration projects carried out by TRCA throughout TTP, such as the changes to Cell 2, which will create a new marsh similar to Cell 1 and which are now well underway, are also expected to increase the variety of habitats suitable for species not yet on the confirmed breeders list.

It is always interesting to note the species detected during VCP counts, but for which no nest was located, versus those species not detected during VCP counts, but for which a nest was found (Table 3.9). A variety of reasons exist to explain why a species could be recorded by one method, but not the other: (i) low abundance at TTP (e.g., Orchard Oriole), (ii) secretive habits (e.g., American Woodcock), (iii) well-hidden nests (e.g., Black-capped Chickadee), (iv) nests or normal habitat not located near VCP stations, and (v) nests not located at TTP (e.g., Chimney Swift).

Table 3.9 Species Recorded Only by VCP Counts Versus Species Recorded Only By Nest

VCP-recorded Species With No Nest Located	Species With Nest But Not Recorded During VCP
Bank Swallow	American Woodcock
Black-capped Chickadee	Downy Woodpecker
Chimney Swift	Gadwall
Cooper's Hawk	Mallard
Eastern Wood-Pewee	Orchard Oriole
Northern Mockingbird	

4. Acknowledgements

The colonial waterbird data were collected and presented by TRCA staff, who also produced most of the maps in the Appendices and provided valuable assistance in editing the report.

The landbird and non-colonial waterbird section of this report is the result of the ongoing efforts of several dedicated volunteers. The 2015 VCP observations were collected by Ian Sturdee and Don Johnston, and the volunteer contributions to the nest searching phase of the project in 2015 are enumerated in Table 3.10.

Two people who contributed significantly in the past to the progress of the Breeding Bird Survey project are Dan Derbyshire and Andrew Jano. Dan Derbyshire, former TTPBRS coordinator, organized the landbird and non-colonial waterbird aspects of the project and set up the VCP point count and nest searching protocols, as well as participating in the annual surveys until his departure in 2008. Andrew Jano, another active participant in the annual surveys until his untimely death early in 2012, created the initial detailed maps and vegetation graphics in the annual reports, and also helped write several of the reports.

Table 3.10 2015 Effort by Nest Searching Project Participants

Name	Total Hours
Marc Dupuis-Desormeaux	20
Don Johnston	132
Jan McDonald	43
Pierre Robillard	63
Ian Sturdee	176
Paul Xamin	104
Total	**538**

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Appendices

Appendix A: Annotated Map of TommyThompson Park with VCP Stations

Appendix B: Description of VCP Stations (Habitat Pictures and Sketches)

Station 1

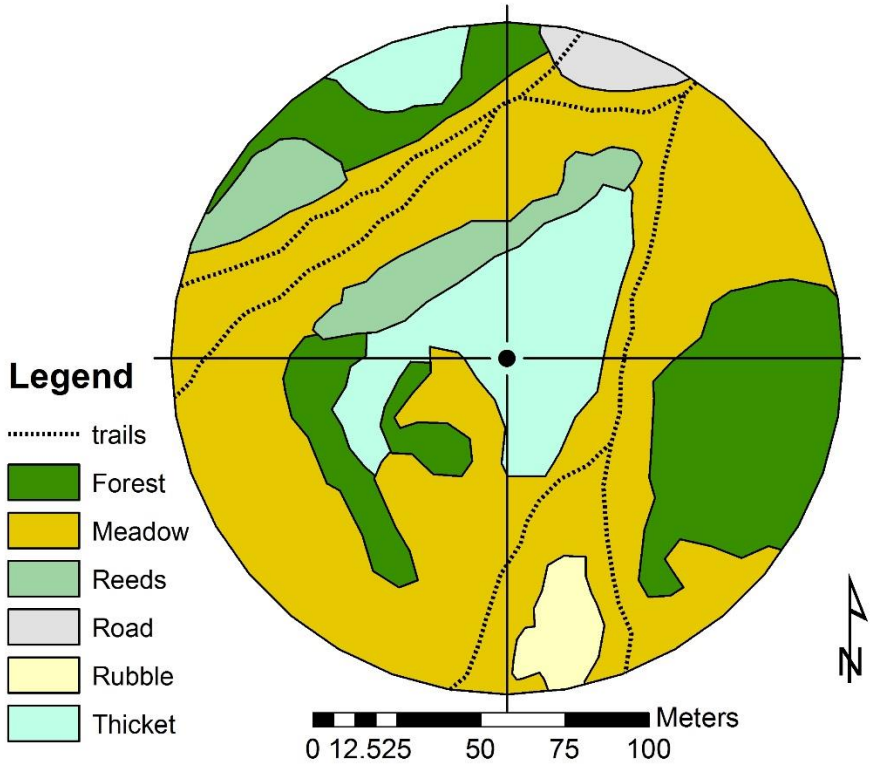
VCP Stn 1 – 2013 – 1 (North)

VCP Stn 1 – 2013 – 2 (East)

VCP Stn 1 – 2013 – 3 (South)

VCP Stn 1 – 2013 – 4 (West)

Sketch Map of Key Habitat Features
100 m radius circular plot



Appendix B: Description of VCP Stations (Habitat Pictures and Sketches)

Station 2

VCP Stn 2 – 2013 - 1 (North)

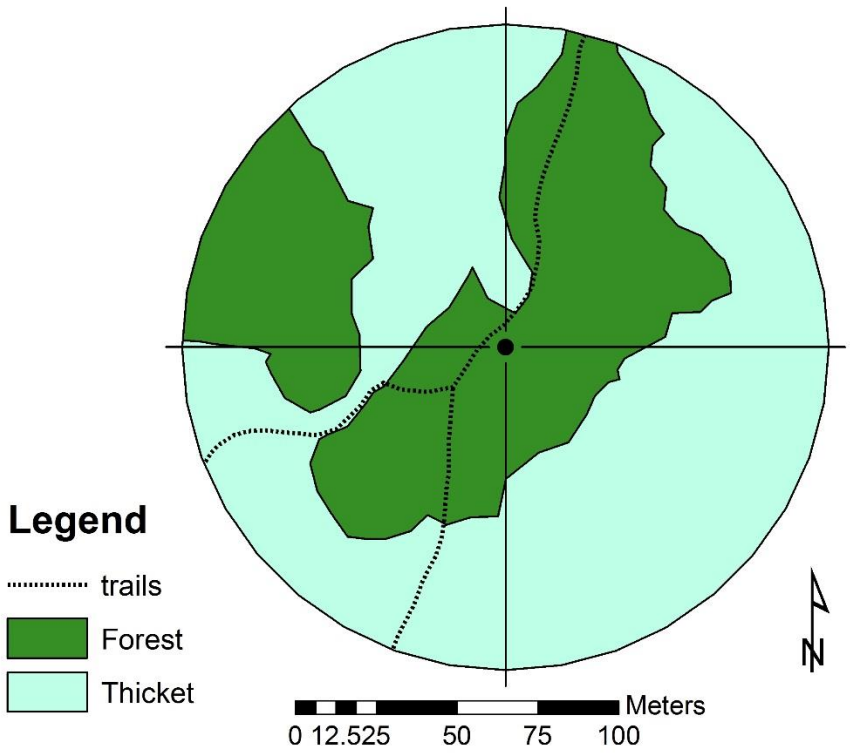
VCP Stn 2 – 2013 – 2 (East)

VCP Stn 2 – 2013 – 3 (South)

VCP Stn 2 - 2013 - 4 (West)

Sketch Map of Key Habitat Features

100 m radius circular plot



Appendix B: Description of VCP Stations (Habitat Pictures and Sketches)

Station 3

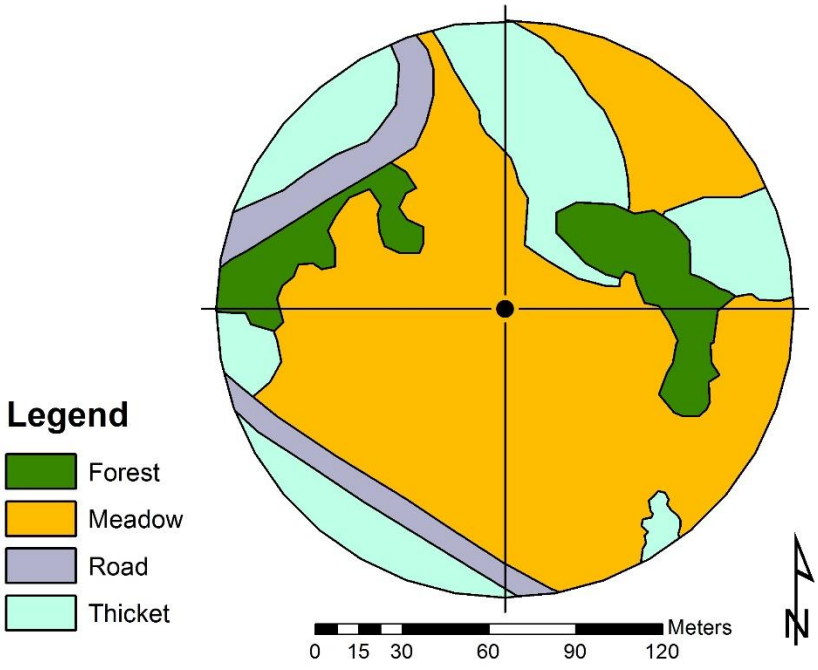
VCP Stn 3 - 2013 - 1 (North)

VCP Stn 3 – 2013 – 2 (East)

VCP Stn 3 – 2013 – 3 (South)

VCP Stn 3 - 2013 - 4 (West)

Sketch Map of Key Habitat Features
100 m radius circular plot



Appendix B: Description of VCP Stations (Habitat Pictures and Sketches)

Station 4

VCP Stn 4 - 2013 - 1 (North)

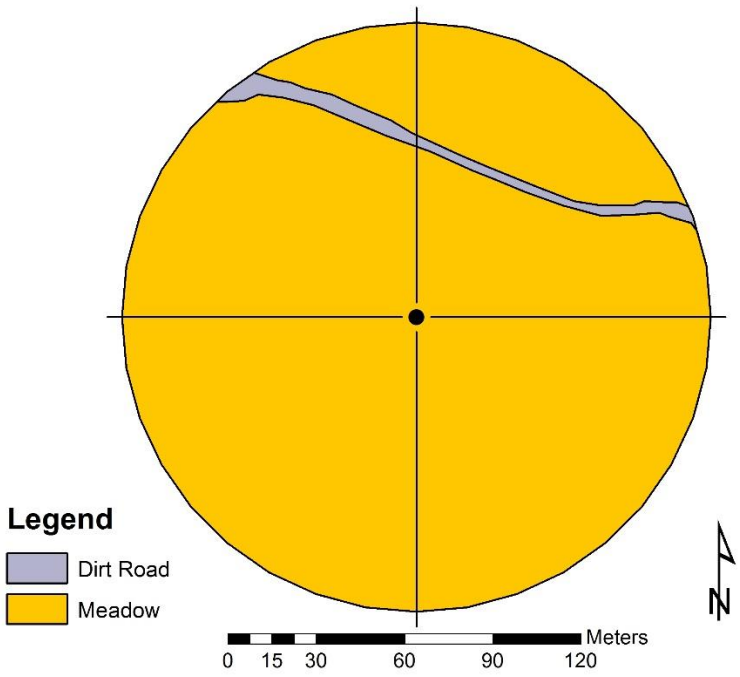
VCP Stn 4 – 2013 – 2 (East)

VCP Stn 4 – 2013 – 3 (South)

VCP Stn 4 - 2013 - 4 (West)

Sketch Map of Key Habitat Features

100 m radius circular plot



Appendix B: Description of VCP Stations (Habitat Pictures and Sketches)

Station 5

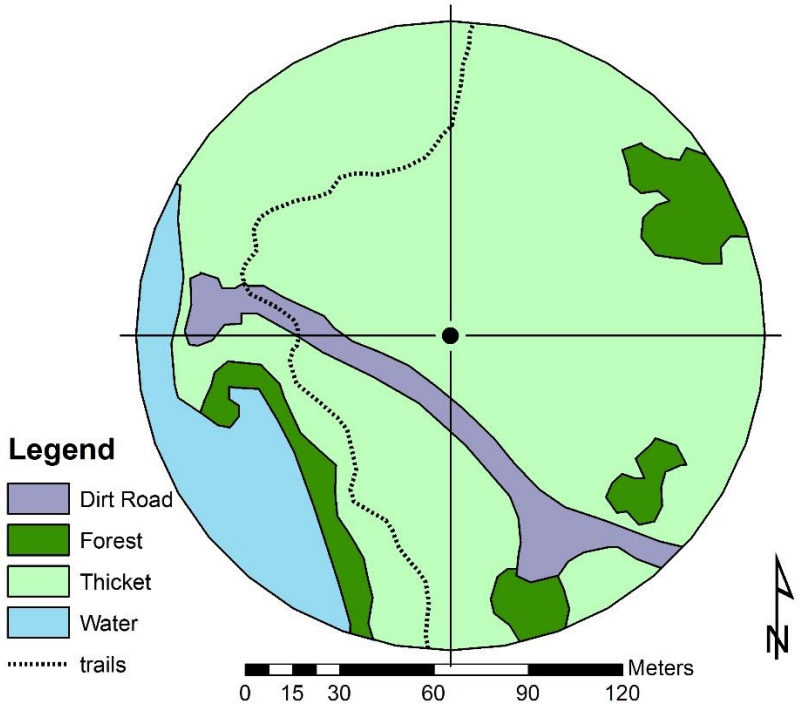
VCP Stn 5 - 2013 - 1 (North)

VCP Stn 5 – 2013 – 2 (East)

VCP Stn 5 – 2013 – 3 (South)

VCP Stn 5 - 2013 - 4 (West)

Sketch Map of Key Habitat Features
100 m radius circular plot



Appendix B: Description of VCP Stations (Habitat Pictures and Sketches)

Station 6

VCP Stn 6 - 2013 - 1 (North)

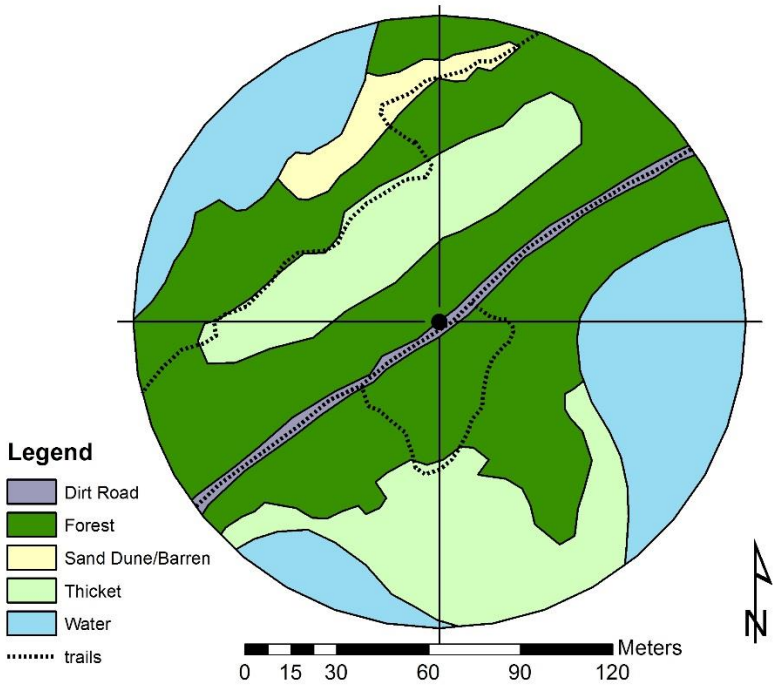
VCP Stn 6 – 2013 – 2 (East)

VCP Stn 6 – 2013 – 3 (South)

VCP Stn 6 - 2013 - 1 (West)

Sketch Map of Key Habitat Features

100 m radius circular plot



Appendix B: Description of VCP Stations (Habitat Pictures and Sketches)

Station 7

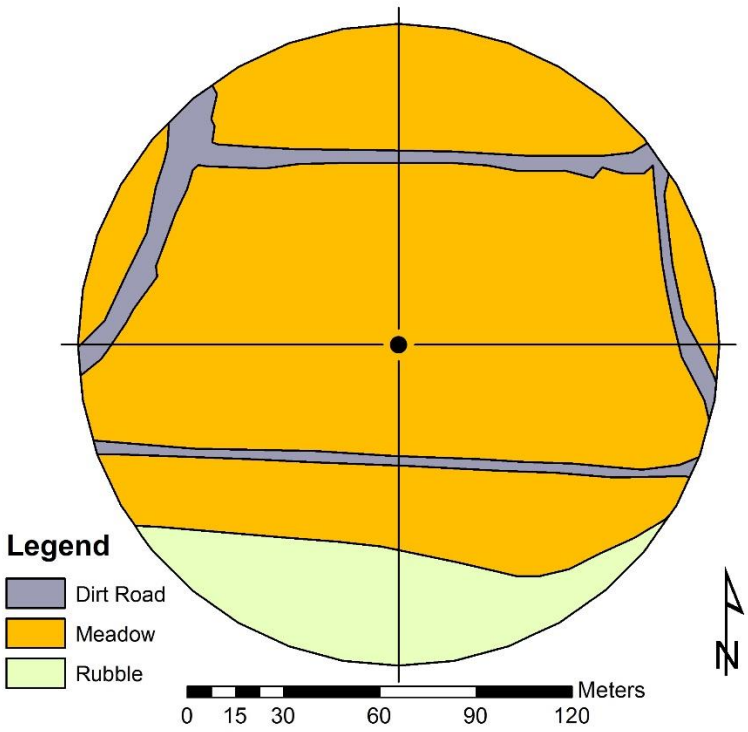
VCP Stn 7 - 2013 - 1 (North)

VCP Stn 7 – 2013 – 2 (East)

VCP Stn 7 – 2013 – 3 (South)

VCP Stn 7 - 2013 - 4 (West)

Sketch Map of Key Habitat Features
100 m radius circular plot



Appendix B: Description of VCP Stations (Habitat Pictures and Sketches)

Station 8

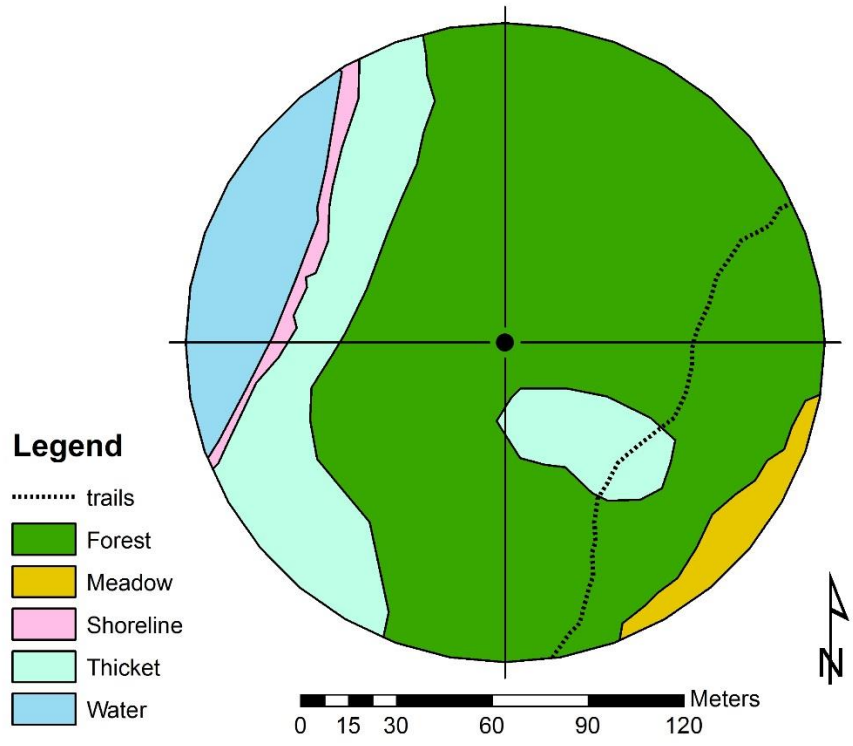
VCP Stn 8 - 2013 - 1 (North)

VCP Stn 8 – 2013 – 2 (East)

VCP Stn 8 – 2013 – 3 (South)

VCP Stn 8 - 2013 - 4 (West)

Sketch Map of Key Habitat Features
100 m radius circular plot



Appendix B: Description of VCP Stations (Habitat Pictures and Sketches)

Station 9

VCP Stn 9 - 2013 - 1 (North)

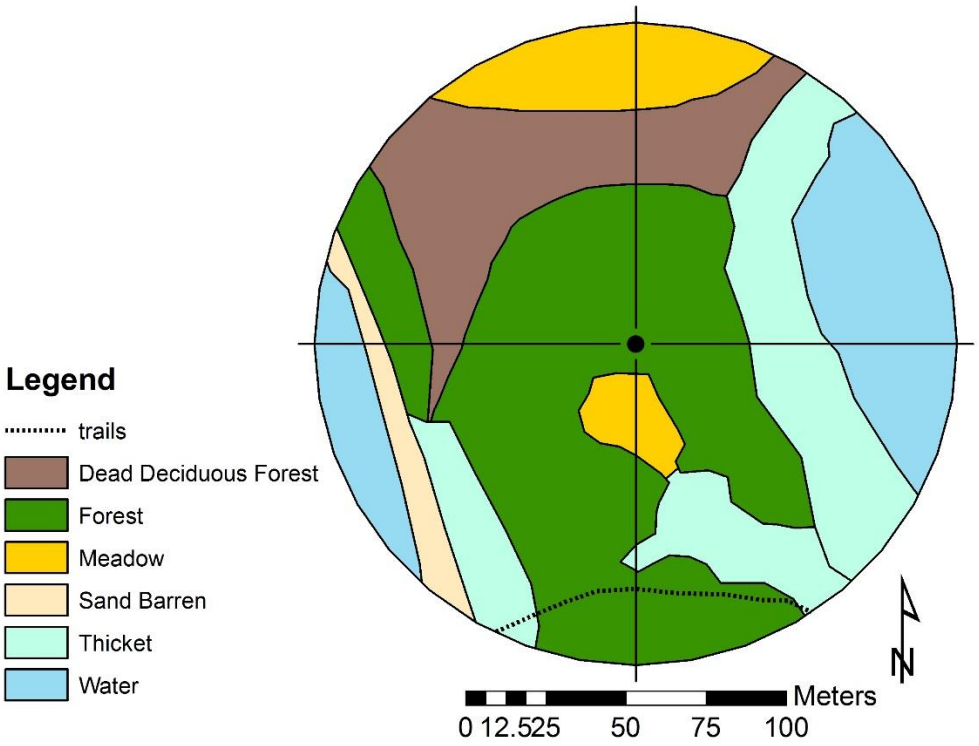
VCP Stn 9 – 2013 – 2 (East)

VCP Stn 9 – 2013 – (South)

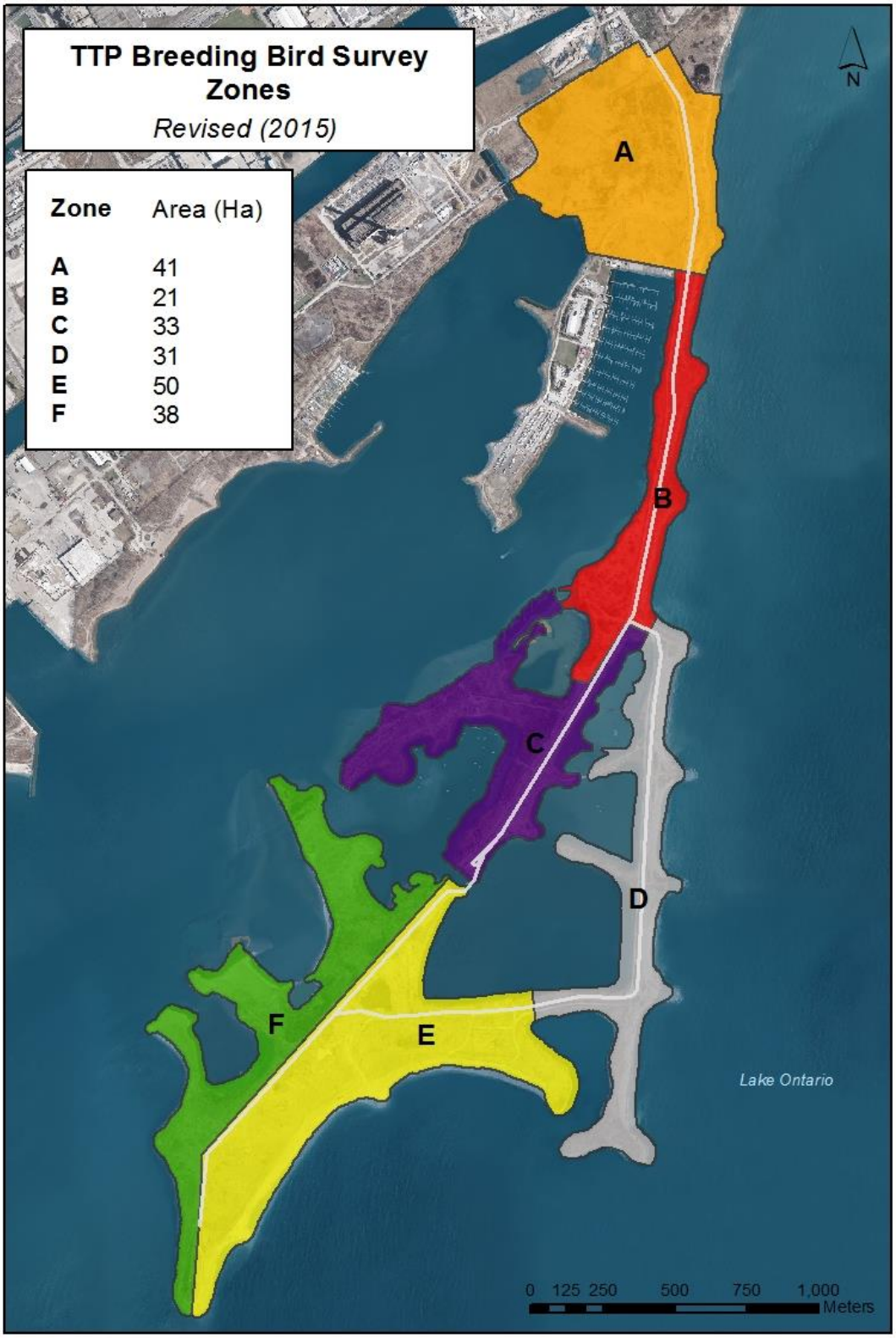
VCP Stn 9 - 2013 - 4 (West)

Sketch Map of Key Habitat Features

100 m radius circular plot



Appendix C: Map of TTP Breeding Bird Survey Zones



This map has been redone to reflect a minor change in zone alignment; changes in the TTP land base due to lake-filling activities; and mapping tool refinements. This has resulted in area increases to every zone except Zone B and an overall area increase of 11.5%. The land base at TTP is expected to continue to change as habitat creation and enhancement work continues.

Appendix D: Species Accounts

The following accounts include species that were listed as observed, or as possible, probable or confirmed breeders in 2015, as well as historically confirmed breeders. Species highlighted in red were detected in 2015 during the breeding bird survey, but have not yet been classified as confirmed breeders at Tommy Thompson Park. Species observed, but clearly out of their breeding range (shorebirds, e.g.) are not included here. For TTP locations specified in the following section, please consult Appendix A, an annotated map of the park.

American Black Duck (2015 - observed) Known to have bred historically at TTP.

American Crow (2015 - observed) Known to have bred historically at TTP, but not in recent years. In 2015, a bird was observed on Peninsula B.

American Goldfinch (2015 - confirmed) This species is a regular late nester at TTP. In 2015, 16 nests were discovered, which is in line with recent experience.

American Kestrel (2015 – absent) Known to have bred historically at TTP.

American Robin (2015 - confirmed) Common nesting species in forested areas throughout TTP. In 2015, 78 nests were recorded, slightly above the project's annual average.

American Redstart (2015 - possible) This species has never been confirmed as a breeder at TTP. The male observed in 2015 was singing in suitable nesting habitat in breeding season.

American Woodcock (2015 - confirmed) One nest was located in 2015, although it was subsequently predated. The 2012 change in protocol with regard to ground-nesting birds makes locating nests much less likely.

Baltimore Oriole (2015 - confirmed) Common nesting species in forest areas of TTP. A total of 17 nests was recorded in 2015, matching the second highest total of the project.

Bank Swallow (2015 - confirmed) Individuals were observed visiting a probable nesting site in 2015 near Cell 1. Small nesting colonies certainly existed in earlier years, although recent lakefilling operations to prevent shoreline erosion, particularly along the southern shoreline, have undoubtedly restricted the swallows' normal nesting habitat.

Barn Swallow (2015 - confirmed) Barn Swallows are regular nesters at TTP under the eaves of buildings. In 2015, 24 nests were discovered at TTP. This species continues to take advantage of three buildings constructed by TRCA in 2011/2012.

Belted Kingfisher (2015 - probable) This species was confirmed for the first time in 2003 based on observations of fledged young. In 2015, a pair was seen around Cell 1 in their breeding season..

Black-billed Cuckoo (2015 – possible) A singing male was recorded in suitable nesting habitat during breeding season. The first nest of this species of the project was found in 2014.

Black-capped Chickadee (2015 - probable) A regular but uncommon nester at TTP. In 2015, excavation of a nest hole was observed, and a pair was also seen in suitable nesting habitat during the breeding season.

Black-crowned Night-Heron (2015 - confirmed) The population of this species at TTP has significantly declined in recent years. At their peak in 2000, an estimated 30% of the Canada-wide population of Black-crowned Night-Herons were breeding at TTP.

Blue-gray Gnatcatcher (2015 - confirmed) In 2015, 7 nests were found, representing a new high for the project.

Blue Jay (2015 - observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2015 was presumably a late migrant.

Blue-winged Teal (2015 – observedt) Known to have bred historically at TTP, although not in recent years. The birds observed in 2015 may have been late migrants.

Bobolink (2015 - possible) This species has never been confirmed as a breeder at TTP. A bird was observed in 2015 singing in breeding season on the Toplands. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Brown-headed Cowbird (2015 - confirmed) In the past, Brown-headed Cowbird has been a common species throughout TTP during summer, but numbers have been declining in recent years. In 2015, a total of 37 nests of Gray Catbird (1), Red-winged Blackbird (27), Song Sparrow (1) and Yellow Warbler (8), were found to have been parasitized by cowbirds. This is the second lowest percentage of parasitized nests of the project and well below the project average.

Brown Thrasher (2015 - confirmed) Brown Thrasher is a regular but uncommon nester at TTP. Two nests were discovered in 2015, in line with the project average.

California Gull (2015 – absent) Known to have bred historically at TTP, but not detected in recent years.

Canada Goose (2015 - confirmed) Canada Goose is a regular breeder at TTP along shoreline edges of embayments and containment cells.

Canvasback (2015 - confirmed) Canvasback has bred almost annually in recent years in the Triangle Pond area at TTP. In 2015, two nests were confirmed, as a female with two young were observed in Embayment D, and a nest was located adjacent to Triangle Pond by Owen Strickland, a regular birder at TTP.

Caspian Tern (2015 - observed) Although a regular nester at TTP most years, no nests were found in 2015.

Cedar Waxwing (2015 - confirmed) A common late nester at TTP; 40 nests were found in 2015, matching the previous high for the project.

Chimney Swift (2015 - observed) This species has never been confirmed as a breeder at TTP. Several birds which were observed in 2015 in many areas of TTP were presumably foraging from the city. There is no suitable nest habitat at TTP, i.e., no chimneys or hollow large-diameter trees.

Chipping Sparrow (2015 - observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2015 was presumably a late migrant.

Common Grackle (2015 - confirmed) Common Grackle is a regular nester at TTP. In 2015, five nests (a new high) were found around Triangle Pond, and, given the presence of birds elsewhere in the park, further nesting was deemed probable.

Common Raven (2015 – observed) This species has never been confirmed as a breeder at TTP, although a pair nested immediately north of TTP in 2015 and were seen regularly throughout TTP.

Common Tern (2015 – confirmed) The introduction of new nesting rafts designed to repel predators resulted in a successful nesting season for this species.

Common Yellowthroat (2015 - possible) Known to have bred historically at TTP. A male was observed in 2015 singing on the Toplands in the breeding season.

Cooper's Hawk (2015 – observed) This species has never been confirmed as a breeder at TTP. In 2015, a bird was recorded during a VCP count in the Baselands.

Double-crested Cormorant (2015 - confirmed) TTP has the largest colony in North America. 68% of the colony nests on the ground on Peninsula B.

Downy Woodpecker (2015 - confirmed) One nest was found in 2015. A regular nester at TTP, although there has never been more than one nest found in any year of the project.

Eastern Kingbird (2015 - confirmed) A regular breeder at TTP along forest edges where meadow and shrubs are present. In 2015, a total of 27 nests was found, matching the previous high for the project.

Eastern Meadowlark (2015 - observed) In 2010, a nest was found in the Baselands meadow habitat, although it was not successful. Previously, the only indication of breeding obtained was that of a partially constructed nest in 2007. In 2015, a bird was observed on the Toplands during the breeding season, although it was presumably a late migrant. The change in protocol with regard to ground-nesting birds will make locating nests in future more difficult.

Eastern Wood-Pewee (2015 – possible) In 2015, singing males were observed in two locations in the park. The nest of this species is always difficult to find, although the existence of singing adults in apparent territories during the breeding season suggests that nesting has probably been more common during the project than confirmed.

European Starling (2015 - confirmed) Starlings are an abundant species at TTP although their breeding density is difficult to estimate. The species is known to nest in man-made structures and natural cavities throughout the area. Five nests were documented in 2015, slightly below average for the project.

Gadwall (2015 - confirmed) Gadwall is a regular nesting species at TTP, although in 2015, only one nest was confirmed. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Gray Catbird (2015 - confirmed) Gray Catbird is a regular nester at TTP, preferring dense shrubs with some tree cover. A total of 30 nests was found in 2015, the second highest number recorded during the project.

Great black-backed Gull (2015 - absent) Known to have bred historically at TTP.

Great-crested Flycatcher (2015 - possible) This species has never been confirmed as a breeder at TTP, but males were observed in 2015 singing during the breeding season in the Baselands and on the Neck.

Great Egret (2015 - confirmed) Regular nester in small numbers on Peninsula C.

Great Blue Heron (2015 - absent) Known to have bred historically at TTP.

Great Horned Owl (2015 – observed) This species has never been confirmed as a breeder at TTP. In 2015, an owl was observed a number of times during the spring and summer.

Green Heron (2015 - possible) Known to have nested historically at TTP, but no nests have been detected during the project. A bird was observed in 2015 at Triangle Pond during the breeding season.

Green-winged Teal (2015 – observed) This species has never been confirmed as a breeder at TTP. In 2015, four birds were observed in Embayment C during their breeding season.

Herring Gull (2015 - observed) Usually a common annual nesting colonial waterbird species at TTP, but no nests were located in 2015.

Hooded Merganser (2015 - observed) This species has never been confirmed as a breeder at TTP. In 2015, four birds were observed in Embayment D during breeding season.

Horned Lark (2015 - absent) Known to have bred historically at TTP.

House Finch (2015 - absent) Known to have bred historically at TTP.

House Sparrow (2015 - absent) Known to have bred historically at TTP.

House Wren (2015 - possible) A regular nester at TTP, but in low numbers. In 2015, singing males were observed during the breeding season on Peninsula D and in the Baselands.

Killdeer (2015 - confirmed) Killdeer is a common nesting species at TTP in open areas with low vegetation. Three nests were found in 2015, and observations of juveniles along roadways were frequent. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Least Flycatcher (2015 - confirmed) A regular but uncommon breeder at TTP. In 2015, two nests were located.

Mallard (2015 - confirmed) Mallard is a regular nester at TTP. Five nests were documented in 2015, somewhat below the average for the project. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Mourning Dove (2015 - possible) Mourning Dove nests have been scarce at TTP in recent years, although birds were observed in 2015 in multiple locations at TTP in their breeding season.

Mute Swan (2015 - confirmed) Mute Swan is a regular nesting species along TTP shorelines.

Northern Bobwhite A known escapee may have bred at TTP in 1980, but the species has not otherwise been recorded in the park. This species is listed here for the sake of completeness, but is not included in the total of known breeding species at TTP.

Northern Cardinal (2015 - confirmed) Northern Cardinal is an uncommon but usually an annually-nesting species at TTP. In 2015, two nests were found, average for the project.

Northern Flicker (2015 - probable) Northern Flicker is an uncommon but regular nesting species at TTP. A pair was observed in 2015 on Peninsula D in their breeding season.

Northern Mockingbird (2015 - possible) This species has never been confirmed as a breeder at TTP, although it is known to breed in the vicinity of TTP. A singing male was observed in 2015 during its breeding season in suitable nesting habitat in the Baselands.

Northern Rough-winged Swallow (2015 - confirmed) Two nests were confirmed in 2015 through the observation of adults carrying food to nest cavities near Cell 1.

Orchard Oriole (2015 - confirmed) One or two nests of this species have been found in most years of the project, and in 2015, one nest was found, while two others were confirmed through adults being observed carrying food.

Ovenbird (2015 – possible) This species has never been confirmed as a breeder at TTP. In 2015, a singing male was observed during its breeding season in suitable nesting habitat.

Red-eyed Vireo (2015 - possible) This species has never been confirmed as a breeder at TTP. In 2015, a singing male was observed during its breeding season in suitable nesting habitat.

Redhead (2015 - absent) Known to have bred historically at TTP.

Red-winged Blackbird (2015 - confirmed) The most abundant nesting species at TTP (excluding waterbirds), found throughout the TTP area. In 2015, 404 nests were found, a new high for the project and almost double the annual average of the project to date. The number of nests found has increased every year of the project, clearly helped by the growth of appropriate nesting habitat.

Ring-billed Gull (2015 - confirmed) An abundant nesting colonial waterbird species at TTP.

Ring-necked Pheasant (2015 - absent) Known to have bred historically at TTP, but not detected in many years.

Rock Pigeon (2015 - observed) Known to have bred historically at TTP. Observed in 2015, but no nest was found.

Ruby-throated Hummingbird (2015 – observed) This species has never been confirmed as a breeder at TTP. In 2015, a bird was observed on Peninsula A during the breeding season.

Savannah Sparrow (2015 - possible) Prior to the start of the project, Savannah Sparrow was a common nester in open areas of TTP with substantial ground cover, particularly in the Baselands, along the Neck and in some areas of the Flats and Toplands. No nests have been found during the project, but a singing male was observed in 2015 on the Flats near East Cove during the breeding season. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Song Sparrow (2015 - confirmed) Song Sparrow is one of the most abundant nesting species at TTP, although few of its well-concealed nests are ever found. In 2015, 10 nests were found in a variety of habitats – a new high for the project. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely, although not all Song Sparrow nests are on the ground.

Sora (2015 - absent) Known to have bred historically at TTP, but not detected in recent years.

Spotted Sandpiper (2015 - confirmed) A common nester at TTP in open areas near water. Six nests were found in 2015, despite the 2012 change in protocol with regard to ground-nesting birds making locating nests less likely.

Swainson's Thrush (2015 - absent) Known to have bred historically at TTP, but not detected in recent years.

Tree Swallow (2015 - confirmed) Tree Swallow is a common breeder at TTP. There are several nest boxes occupied around Cell 1 which are not monitored as part of the project, but 20 nests in other nest boxes and natural cavities around TTP were documented and monitored in 2015. Half of 2015's nests were in nest boxes recently erected by TRCA on the Toplands, and these nest boxes were monitored to confirm usage.

Trumpeter Swan (2015 - confirmed) This species was confirmed as a breeder at TTP for the first time in 2013. This is the third successive year of nesting by the original pair in Triangle Pond, producing five cygnets in 2015, three of which survived.

Virginia Rail (2015 - absent) Known to have bred historically at TTP.

Warbling Vireo (2015 - confirmed) A common nesting species in forested areas of TTP. In 2015, 12 nests were found, average for the project.

Willow Flycatcher (2015 - confirmed) Willow Flycatcher is a common nesting species in more open areas with dense shrubs. In 2015, 15 nests were found, average for the project.

Wilson's Phalarope (2015 - absent) Known to have bred historically at TTP, but not detected in recent years.

Wood Duck (2015 - confirmed) This species was confirmed in 2012 as a breeder at TTP for the first time. In 2015, 12 recently-fledged young were observed in Embayment C.

Yellow Warbler (2015 - confirmed) Yellow Warblers are common to abundant through much of TTP, usually nesting in dogwoods and honeysuckle. A total of 189 nests were found in 2015, the highest total for the project. The number of Yellow Warbler nests has increased almost every year of the project. This species continues to show the highest rate of parasitism by Brown-headed Cowbirds at TTP.

Appendix E: Map of 2015 Landbird Nest Locations *

* Excludes colonial waterbird, Canada Goose and Mute Swan nests

Appendix F: Breeding Status Codes for Each Species Detected In 2015

OBSERVED	POSSIBLE	PROBABLE	CONFIRMED
American Black Duck	American Redstart	Belted Kingfisher	American Goldfinch
American Crow	Black-billed Cuckoo	Black-capped Chickadee	American Robin
Blue Jay	Bobolink	Northern Flicker	American Woodcock
Blue-winged Teal	Common Yellowthroat		Baltimore Oriole
Caspian Tern	Eastern Wood-Pewee		Bank Swallow
Chimney Swift	Field Sparrow		Barn Swallow
Chipping Sparrow	Great Crested Flycatcher		Black-crowned Night-Heron
Common Raven	Green Heron		Blue-gray Gnatcatcher
Cooper's Hawk	House Wren		Brown-headed Cowbird
Eastern Meadowlark	Mourning Dove		Brown Thrasher
Great Horned Owl	Northern Mockingbird		Canada Goose
Green-winged Teal	Ovenbird		Canvasback
Herring Gull	Red-eyed Vireo		Cedar Waxwing
Hooded Merganser	Savannah Sparrow		Common Grackle
Purple Martin			Common Tern
Rock Pigeon			Double Crested Cormorant
Ruby-throated Hummingbird			Downy Woodpecker
			Eastern Kingbird
			European Starling
			Gadwall
			Gray Catbird
			Great Egret
			Killdeer
			Least Flycatcher
			Mallard
			Mute Swan
			Northern Cardinal
			N. Rough-winged Swallow
			Orchard Oriole
			Red-winged Blackbird
			Ring-billed Gull
			Song Sparrow
			Spotted Sandpiper
			Tree Swallow
			Trumpeter Swan
			Warbling Vireo
			Willow Flycatcher
			Wood Duck
			Yellow Warbler

Note: This table does not include colonial waterbirds.

Observed	Species observed in its breeding season (no evidence of breeding)
Possible Status	Singing male present or breeding calls heard in breeding season in suitable nesting habitat
	Species observed in breeding season in suitable nesting habitat
Probable Status	Nest building or excavation of nest hole
	Pair observed in their breeding season in suitable nesting habitat
	Permanent territory presumed through registration of territorial song on at least 2 days, one week or more apart at the same place
Confirmed Status	Adults leaving or entering nest site in circumstances indicating occupied nest
	Adult carrying food for young
	Recently fledged young or downy young
	Nest containing eggs
	Nest with young seen or heard