

The Breeding Birds of Tommy Thompson Park

2018



First Cliff Swallow Nests Under Construction at Tommy Thompson Park (A. Cui)

Toronto and Region Conservation Authority



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1. Introduction

1.1 Study Area



TTP Aerial View (TRCA, 2014)

natural succession and habitat enhancement projects by the TRCA. A variety of vegetation communities, including successional forests, meadows, coastal wetlands and sand dunes, provide diverse habitats for a wide range of species. Gulls and terns began nesting in the early 1970s, and continued nesting by these species and night-herons earned TTP the designation of an *Environmentally Significant Area* in 1982. Further, in 2015, this designation was extended to the entire Spit due to rare species and/or rare communities, and significant ecological functions.

The diverse habitats at the park, along with the geographical position have made it a critical site for birds throughout the year. To date, 323 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 populations of nesting colonial waterbirds, the continentally significant numbers of overwintering waterfowl, and nationally significant numbers of migratory birds.

Tommy Thompson Park is located on the Leslie Street Spit, a 471-ha, 5-km long man-made peninsula extending into Lake Ontario in Toronto. When construction of the Spit began in 1959 by the Toronto Harbour Commission (now Ports Toronto), 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. Landform construction was ongoing until 2015, and while the final size of the Spit (including waterlots) is complete, occasional works will be required into the future to maintain shoreline stability.

Over the years, the Spit evolved into the largest area of natural habitat on the Toronto waterfront, both through

2. Colonial Waterbirds and Managed Waterfowl

2.1 Project Background



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).

In 2018, six species of colonial waterbirds nested at Tommy Thompson Park, namely two species of tree-nesters (Black-crowned Night-Heron and Great Egret), three species of ground-nesters (Common Tern, Herring Gull and Ring-billed Gull), and one species which nests both in trees and on the ground (Double-crested Cormorant).

Double-crested Cormorant (D. Johnston)

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. Since 2014 Caspian Terns are counted following the Ground Nest Survey Methodology. 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 mid-June, 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 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 three 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 24m², 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 120m², 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. Since 2016, a single population count has been conducted for Common Tern colonies in mid-June by aerial photography from a helicopter. Individual nests can be seen in the images and are counted using GIS software by placing a dot on each nest.

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.

Double-crested Cormorant ground nest estimates occur once management has largely stopped to account for birds that may have attempted to tree nest and instead ground nested. Nest counts for both cormorants and Caspian Terns are undertaken at the peak nesting period using aerial photography from a helicopter. This method minimizes disturbance to the ground nesting colonies. Individual nests can be seen in the images and are counted using GIS software by placing a dot on each nest.

2.3 Results

In 2018 Double-crested Cormorants nested in trees on Peninsulas B and C, as well as on the ground on Peninsulas A and B. Black-crowned Night-Herons nested at the base of Peninsula B. Great Egrets nested on Peninsula B. Ringed-billed Gulls nested on the ground on Peninsulas A, B and C, and on the Embayment A Common Tern nesting raft. Apart from one attempted nesting on the Endikement, Common Tern nesting only took place on the artificial nesting raft in Embayment D. Caspian Tern nesting attempts were not observed. Peninsula B held the only Herring Gull nest attempt that was observed. See Figure 2.A below for a map of all nesting locations.

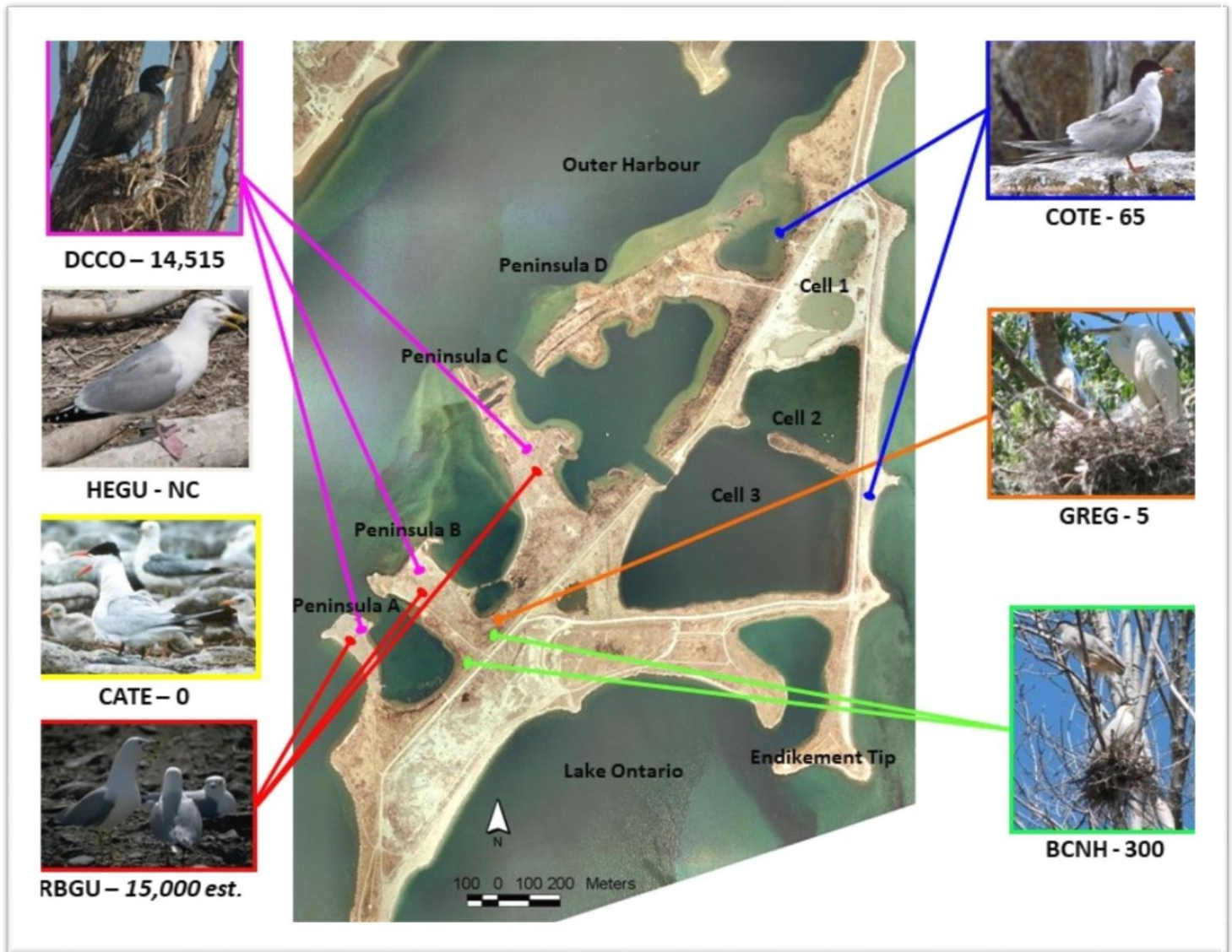


Figure 2.A. Colonial Waterbird Nesting Areas, 2018

Cormorant nests numbered 14,515, including 10,506 ground nests (Figure 2.B). The overall population increased 13 percent, recovering from the three percent decline in 2017; tree nesting decreased 23 percent and ground nesting population increased by 37 percent over the previous year. As indicated in Figure 2.B, 72 percent of the TTP cormorant colony nested on the ground in 2018. 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).

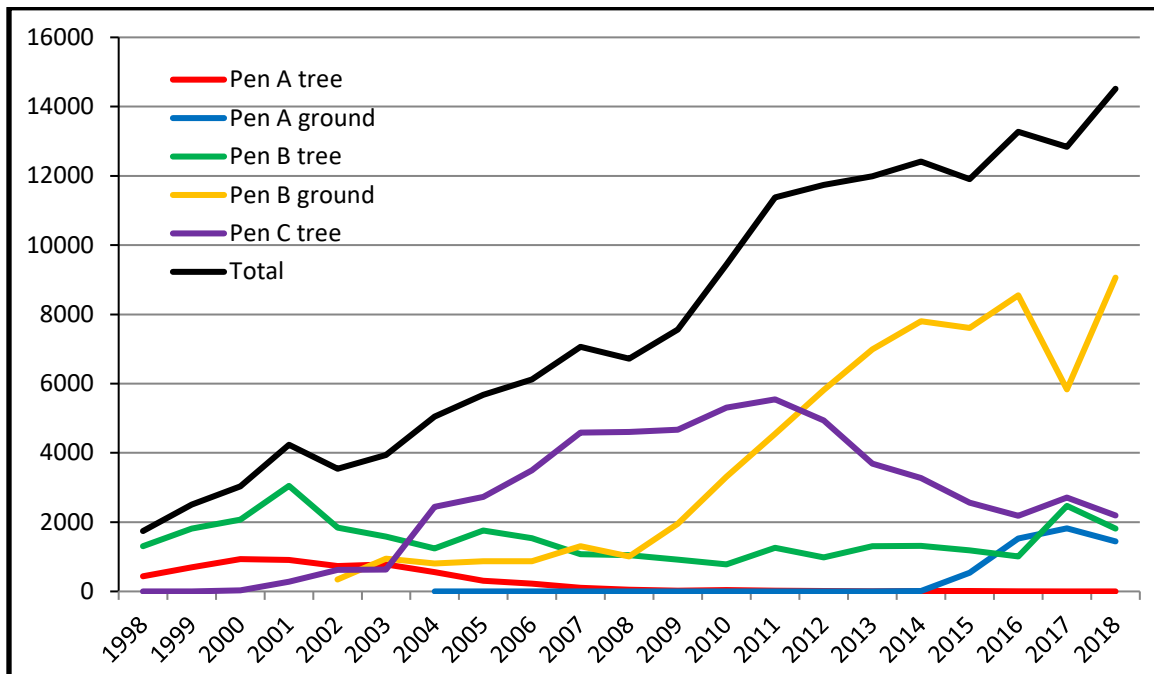


Figure 2.B. Double-crested Cormorant Nests at TTP by Sub-colony, 1998 - 2018

Black-crowned Night-Heron nests numbered 300, a decrease of 16 percent from the previous year (Table 2.C). Most night-heron nesting occurred at the base of Peninsula B, where they face less competition from cormorants.

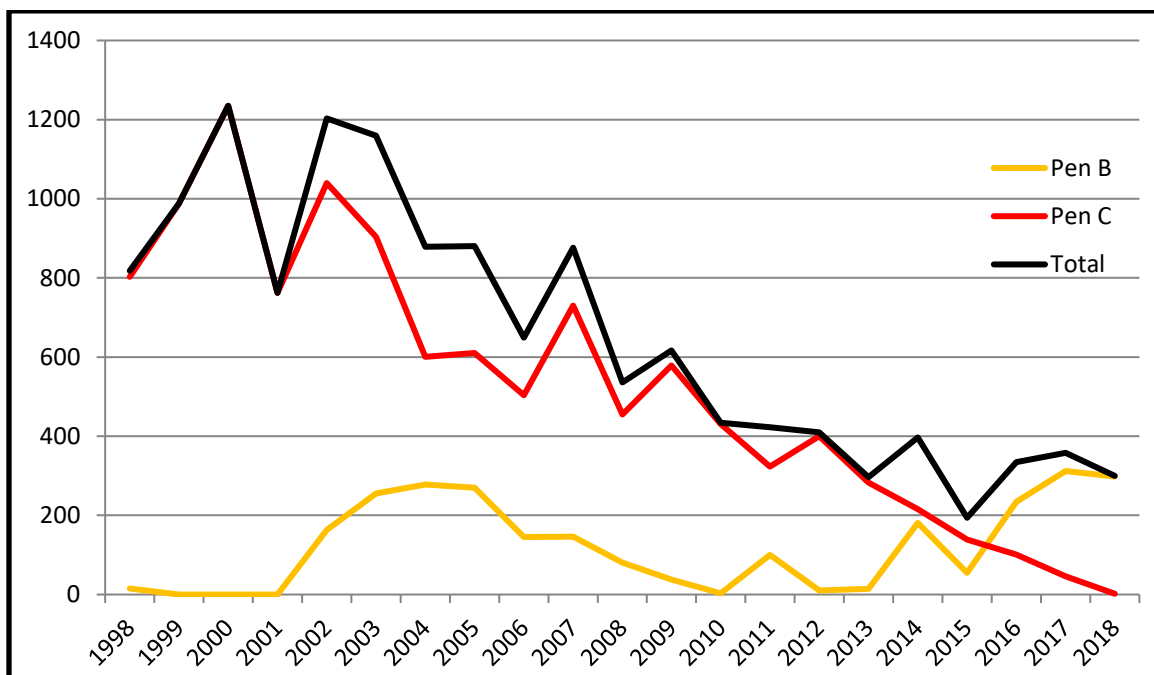


Figure 2.C. Black-crowned Night-Heron Nests at TTP by Sub-colony, 1998 - 2018



Great Egrets at Nest (D. Johnston)

Table 2.1. Colonial Waterbird Nests at TTP, 2008 – 2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
DCCO	6717	7564	9434	11374	11741	11990	12409	11908	13275	12,841	14,515
BCNH	455	617 ^a	431	423	410	297	397	194	335	358	300
GREG	5	7	5	7	8	4	6	6	6	11	5
RBGU	30000	30000*	28000*	32000*	32000*	35000*	35000*	35000*	35000*	NC	15,000*
HEGU	30	NC	<20*	NC	NC	NC	NC	NC	NC	NC	NC
COTE	310	354	231	54	24*	0	179	176	142	142	65
CATE	0	0	0	0	5*	98	263	NC	56 ^a	0	0

a - Nesting attempts failed

*- Estimate

NC – no count

During 2018 Common Terns nested predominately on the raft in Embayment D, which was in a poor state of repair. Two other rafts were available, in Embayment C and Embayment A, but were unused, and the island in Cell 1 was flooded early in the breeding season which presumably discouraged colonization. One pair attempted nesting on the Endikement, but was unsuccessful. A total of 65 nests was recorded.

Gull population counts were not undertaken in 2018, although a very rough estimate based on satellite images has the population around 15,000 nests, about half of the 30,000 recorded in the last official count in 2008 (Table 2.1). Ring-billed Gulls nested on Peninsulas A, B and C, and on the Embayment A Common Tern nesting raft. Nesting was not observed on the Endikement this year. Herring Gulls typically nest among the Ring-billed Gulls in much lower numbers, however, only one was observed in 2018, and later failed. 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 contaminant research.

2.3.1 Managed Waterfowl

Canada Geese and Mute Swans regularly nest at TTP and are monitored and managed by TRCA. The Mute Swan is a non-native 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 egg addling by removal to eliminate or reduce reproduction. This technique mimics natural predation events, after which the adults typically leave the nest site and forgo nesting until the next breeding season. In 2018 there were a total of 12 Canada Goose nests and eight Mute Swan nests at TTP.

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. TRCA volunteers, with some staff support, have carried out the project annually in spring and summer since 2005.

3.1.2 Change in Data Reporting

Commencing with the 2016 Breeding Bird Report, project data are presented on a rolling 10-year basis. (Data from earlier years, commencing with 2005, the first year of the project, are available in earlier annual reports.)



Baltimore Oriole Feeding Young at Nest (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.

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 below in Figure 3.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 2016, and should continue to be repeated every three years to help quantify changes in the vegetation communities. See Table 3.3 for the most recent station vegetation analysis.

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. See Appendix A for station maps.

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 B, 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

Starting in mid-April and continuing until early September, 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 and monitor 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, Canvasback, Eastern Meadowlark, Gadwall, Killdeer, Mallard, Savannah Sparrow, Song Sparrow and Spotted Sandpiper. These species represented 7% of nests found from 2005 to 2011, inclusive, and 2% of nests found since 2011, so the change in protocol has had some affect, although these species have never represented a significant portion of the nests that are found each year.

While most nest records gathered are submitted to Project NestWatch at Bird Studies Canada, nests discovered after nesting is complete are typically not. Researchers are able to access Project NestWatch data via BSC's NatureCounts tool. Past Breeding Bird Reports are available at www.ttpbrs.ca.

3.3 Results

3.3.1 Variable Circle Plot Point Count Results

3.3.1.1 VCP Station Vegetation Survey

Table 3.3 below depicts the result of vegetation surveys conducted in 2010 and 2016 for each station. In addition, Appendix A contains a habitat sketch and photographs for each station in 2016. (The habitat sketches and photographs from 2010 can be found in the Breeding Bird Reports of 2010 – 2012, while the sketches and photographs from 2013 can be found in the reports of 2013 - 2015.)

As can be seen from Table 3.3, several changes in habitat have occurred over the past six 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 wetland increase has resulted largely from the spread of phragmites.

Station 2: 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.

Station 4: A portion of the meadow has been overtaken by phragmites, shrub willows and goldenrod.

Station 5: The area along the shoreline has been largely rebuilt, resulting in less shoreline and water, and more reeds. The dogwood and forest have also increased significantly.

Station 6: The sand barren has been overgrown by the vegetation.



Figure 3.A Annotated Map of TommyThompson Park with VCP Stations

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

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 - 2016 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
Reeds (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
2016 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%)	52		59	85	6	3	78	6	12
Thicket (tree cover ≤ 25%; shrub cover ≥ 25%)	7	59	23	1	66	23		14	21
Deciduous Forest (tree cover ≥ 60%)	20	41	10		18	51		70	19
Dead Deciduous Forest									30
Mixed Forest (tree cover ≥ 60%; conifers ≥ 25%)									
Wetland (permanently saturated; water ≤ 2 m)	18			8	5		2		
Vegetation Sub-total (see detail below)	95	100	92	94	95	77	80	90	82
Sand Dune/Sand Barren (incl active shorelines)								2	3
Roads, Trails and other man-made areas	3		7	6	3		20		
Lake Ontario Shoreline (open water)			1		2	23		8	15
Non-vegetation Sub-total	5		8	6	5	23	20	10	18
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	15	40	5	60	30
Dogwoods (e.g., Red-osier Dogwood)	15	40	15		50	15		5	20
Honeysuckles						12			
Shrub Willows		5	5	5	20	5	5	5	
Grasses and Sedges	35	20	35	45	5	5	40	15	10
Goldenrods and Asters			5	30			10		5
Reeds (e.g., Cattails, Bulrushes, Phragmites)	20			8	5		5	5	
Miscellaneous Herbs (e.g., Vetch, Nettles, etc.)			27	1			15		17
Vegetation Sub-total	95	100	92	94	95	77	80	90	82

While some VCP locations have not seen a major change in vegetation over the course of the project, others have demonstrated significant change. The following photographs demonstrate one station (4) which is an example of the former and two stations (2 and 9) which are examples of the latter.

The south view at Station 4 (dry meadow) has seen little change over the life of the project other than changes in the make-up of the ground cover.



2010



2013



2016

Station 2 (forest – north view) exhibits little change between 2010 and 2013, but very noticeable additional shrub growth between 2013 and 2016.



2010



2013



2016

Station 9 (forest – north view) is located within the Double-crested Cormorant colony, and the effect of the birds' excrement on both the trees and the ground-level vegetation can be seen from 2010 to 2013 to 2016.



2010



2013



2016

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	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	AVG
ALFL			1								0
AMGO	8	22	35	8	14	19	7	37	36	19	20
AMKE									1		0
AMRO	26	34	41	40	22	15	25	23	27	26	28
AMWO	1				1						0
BANS	5	4	14	35	7	22	4	106	7	9	21
BAEA					*						0
BAOR	23	13	28	22	26	21	25	15	23	19	22
BARS	11	8	32	31	22	15	55	48	41	68	27
BCCH	2	4	3	1	3		5	7	2	3	3
BEKI	2	1				1					0
BGGN	8					3	2	3	2		2
BHCO	19	19	10	17	12	5	3	6	7	3	11
BLJA	1	1		1					1		1
BLPW	1										0
BOBO											0
BRTH					1	3	1				1
CANG		*				*			7		1
CEDW	39	19	31	47	17	16	12	18	12	1	22
CHSW	*		2		3	2	2				1
CLSW										*	
COGR	9	17	23	8	12	5	17	5	11	14	12
COHA							1				0
COYE		2	2			4			1		1
DOWO			2	1	1	1			2	1	1
EAKI	12	20	18	12	7	2	9	3	6	8	11
EAME											1
EAWP	3	1	8	6	8	6	9	7	2	2	5
EUST	116	41	52	39	8	44	9	46	18	18	41
FISP											0
GADW	*	1	16		*	2			*	2	2
GBHE									*		0
GCFL	3							1		1	0
GRCA	17	38	16	21	16	21	12	18	22	18	20
HOFI			1								0
HOSP											0
HOWR					2	1		1		1	0
KILL	8	3		2	5	4	5	2	7		4
LEFL	7	11	11	8	10	4	5	1	3	6	7
MALL	4			*	*	2			5	1	1
MAWA	1										0
MODO		*			3			1	2	1	1
NOCA	4	3	1	2	5	3	3	10	21	17	5
NOFL	2		2						2	4	1
NOMO		*				1	1		1		0
NRWS	8	5	14	*	4	*	9	10	5	7	6
OROR				1	1	1		2	2	5	1
RBNU								1			0
REVI						1					0
ROPI											0
RWBL	312	199	244	295	265	276	247	192	214	316	245
SAVS	1							1			0
SOSP	81	55	46	50	66	47	51	59	57	102	58
SPSA	6	3	4	2	1	5	7	2	2	1	4
TEWA								1			0
TRES	9	16	24	11	25	30	52	41	54	37	28
TRFL		1				2			2		1
VEER											0
WAVI	41	30	39	50	53	46	32	46	27	44	39
WIFL	26	14	25	16	17	20	18	16	27	24	20
Yewa	134	100	168	136	146	166	155	169	181	201	146
Birds	950	685	913	862	783	816	783	898	840	979	820
Species	36	32	30	28	34	37	29	32	38	32	33

* Species observed beyond 100 metres and/or flying over

Species recording a new high VCP count for the most recent 10 years were Barn Swallow, Northern Flicker, Orchard Oriole, Red-winged Blackbird, Song Sparrow and Yellow Warbler. In addition, the total number of birds recorded in all VCP counts exceeded the previous high for the past ten years.

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, 92 EUST in 2006, 106 BANS in 2016, 68 BARS in 2018) 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 32 species was detected for all counts in 2018, slightly below the average of 33 species for the past 10 years.

Points worth noting about the VCP observations include:

- Barn Swallow sightings have increased in recent years as the number of nests has increased, as would be expected; the same is true of Northern Cardinals.
- The number of Brown-headed Cowbirds observed continues to be much lower than the numbers observed in earlier years of the project, which corresponds to the lower rate of nest parasitism by these birds (see Section 3.3.2.3.).
- Since the nests of some species are well hidden, such as Common Grackle, European Starling and Song Sparrow, they are recorded much more frequently on VCP counts than the number of nests would suggest.
- Conversely to the previous point, Cedar Waxwing nests are more numerous than VCP sightings as the waxwings are late nesters and are not present in large numbers prior to nesting.
- Eastern Kingbird VCP sightings are always lower than the number of nests would suggest because very few VCP stations are close to kingbirds' preferred habitat. Similarly, VCP sightings of Red-winged Blackbirds and Yellow Warblers have become fewer than the number of their nests as the growth in the number of nests has largely occurred in areas separate from the VCP locations.

It must be recognized that the number of birds recorded each year on VCP counts for many of the species is largely a matter of chance since only five minutes are spent at each station. (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.)



Common Grackle Nest (M. Dupuis-Desormeaux)

As can be seen in Figure 3.B below, the total number of birds recorded at each VCP station was at the higher end of the experience for that station. Not only did the total number of birds recorded for all stations in 2018 exceed the previous 10-year high, the number of birds recorded at each individual station exceeded the most recent 10-year average, particularly Station 8 (forest – 151% of the 10-year average for that station) and Station 9 (forest - 143% of the 10-year average for that station).

Stations 8 and 9 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, replacing several Double-crested Cormorant nests. The night-heron's excretions are not toxic like the cormorant's, and this change to the night-herons may have encouraged other bird life in the area.

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. However, lamb's quarters, which produces a thick herbaceous vegetation up to almost three m in height, was able to grow in this area in 2018 and provided cover for birds to forage, particularly Song Sparrows. In addition, the nearby vegetation beyond the cormorant colony has become more nest-friendly in recent years, which also helps to explain the increased number of birds recorded in 2018.

Future years' observations will be required to determine whether the increased abundance observed at both stations 8 and 9 in 2018 was an anomaly or not. See Appendix A for station locations.

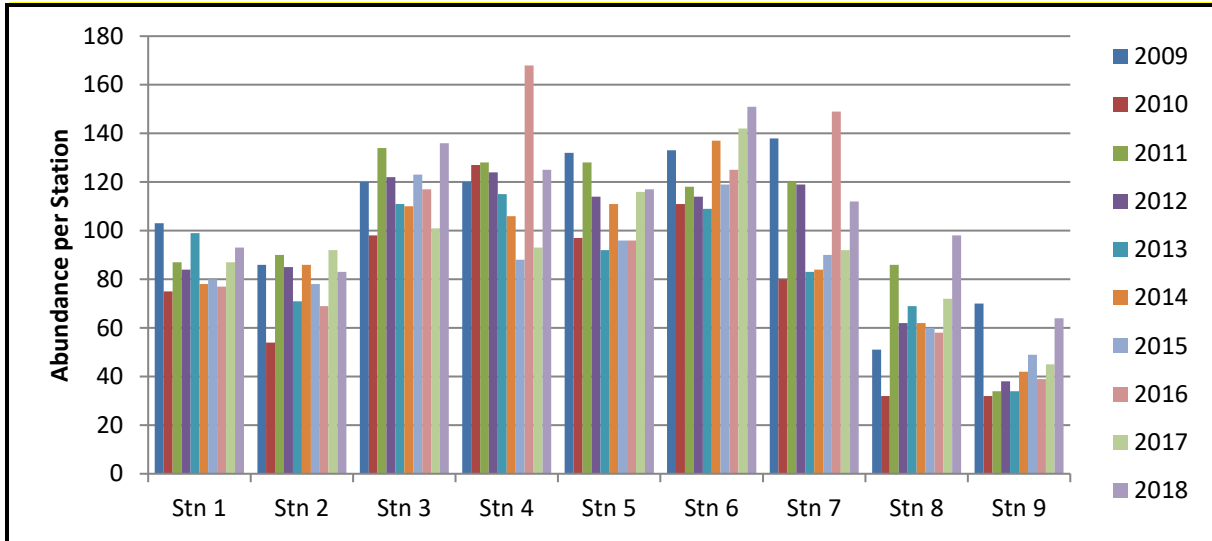


Figure 3.B. Total Bird Abundance per VCP Station

Species richness, or diversity, is shown in Figure 3.C below. In 2018, Stations 1 (wet thicket) and 6 (forest) experienced diversity that was significantly lower than the most recent 10-year average. The other stations were all within 10% of the 10-year average for the station.

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.

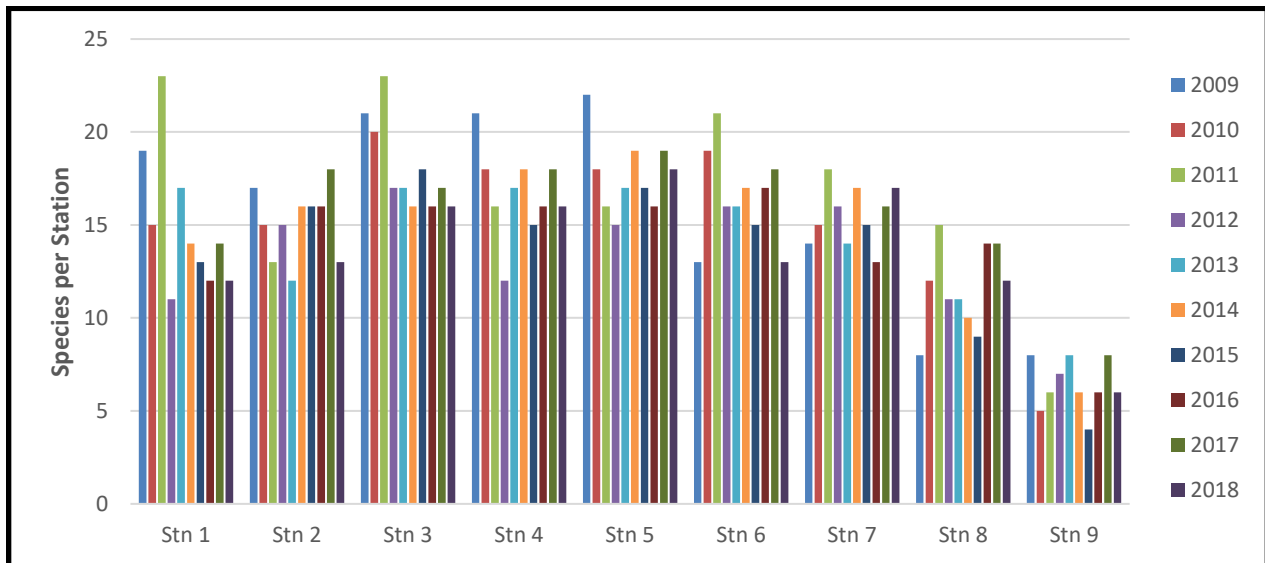


Figure 3.C. Species Richness per VCP Station

3.3.2 Nest Searching and Monitoring Results

In 2018, 10 volunteers contributed a total of 676 hours to the project. This level of participation is a continuation of recent years' volunteer experience, which has been a major contributor to the number of nests which have been found over the past few years. Figure 3.D shows the breakdown of effort per zone. Zone D continued to experience the fewest number of nests, due to lack of suitable habitat and the conversion of Cell 2 to wetland, so that limited monitoring time continued to be required in that zone.

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

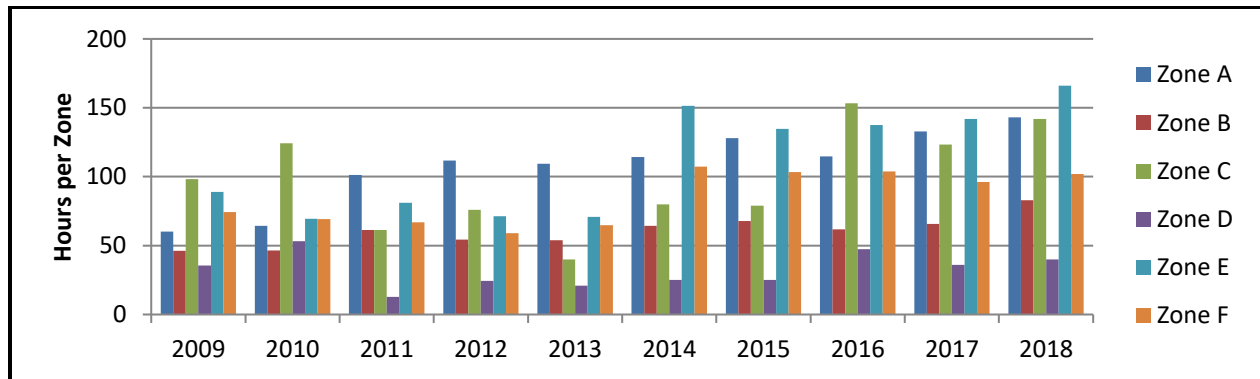


Figure 3.D. Nest Searching Effort per Zone from 2009 to 2018 (hours)

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 2018, a total of 1,027 nests was discovered, significantly higher than the most recent 10-year average of 807. Of the total, 663 nests were monitored and reported to Bird Studies Canada's Project Nestwatch (see Tables 3.5 and 3.7).



Warbling Vireo Constructing Nest (P. Robillard)

Table 3.5. Total Nests by Species from 2009 to 2018

Species	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	AVG
AMGO	44	33	23	13	17	18	16	23	26	14	23
AMRO	93	69	115	93	93	89	78	113	125	104	97
AMWO		3	1	1			1		1		1
BANS	4	2	1					15	16		4
BAOR	9	10	17	16	15	35	17	18	24	16	18
BARS	3	2	4	11	26	31	24	29	49	51	23
BBCU						1		1			0
BCCH	2			1	2	1		2	2		1
BEKI						1					0
BGGN	3			2	4	6	7	6	4	4	4
BRTH	4	2		2	1	2	2		2	1	2
CANV						1					0
CEDW	40	14	21	23	19	37	40	49	33	35	31
CLSW										24	
COGR		4	4	2	3	2	5	5	1	7	3
DOWO		1	1	1	1		1	2	3	1	1
EAKI	22	14	12	27	21	20	27	24	25	21	21
EAME		1									0
EAWP		1	1	1		1					0
EUST	7	12	4	5	8	4	5	3	1	2	5
GADW	3	1	3	4	1	2	1	1			2
GRCA	23	11	16	21	24	34	30	46	33	21	26
HOFI										2	0
HOSP											0
HOWR	2	2	1						1	3	1
KILL	8	13	2	4	3	4	3	4	5	1	5
LEBI									2		0
LEFL	3	1				3	2			1	1
MALL	12	12	6	9	8	5	5	8	5	2	7
MODO	3			1				1	1	3	1
NOCA	4	1		1	1	3	2	4	14	12	4
NOFL		3	3			1		1	5	3	2
NOMO										2	0
NRWS	2		1			1	2		2		1
OROR		2	1	2	3	2	1	2	1	3	2
RWBL	130	167	232	268	310	361	404	356	464	418	311
SOSP	7	8	2	3	2	8	10	7	4	10	6
SPSA	5	8	4	5	6	3	6	3	5	4	5
TRES	9	9	5	5	12	13	20	20	28	15	14
TRUS						1	1	1	1	2	1
WAVI	7	9	15	12	13	31	12	18	21	18	16
WIFL	25	15	12	14	13	18	15	19	18	15	16
WODU										1	0
YEWA	75	82	88	86	127	164	189	237	253	211	151
Total	549	512	595	633	733	902	926	1,018	1,175	1,027	807
Total Effort (hours)	404	427	385	397	360	542	538	618	596	676	494
Efficiency (nests/hour)	1.36	1.2	1.54	1.59	2.04	1.67	1.72	1.65	1.97	1.52	1.63

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 subsequent reports for completeness. The Trumpeter Swan is the species of swan native to the Toronto region. Nearly extirpated in the early-mid 1900s, recovery efforts in southern Ontario are seeing success. From 2013 through 2017, there has been one nest annually at TTP, fledging between five and seven cygnets. In 2018, there were two successful nests.

The 1,027 total nests located in 2018 were significantly fewer than the 1,175 nests found in 2017, and surprising after fairly steady annual increases in the number of nests. The 2018 total is similar to the totals of 2014 – 2016, so it may be that 2017 will turn out to be a one-time experience. In retrospect, possible reasons for 2017 having been higher include:

- a) 2017 was the year of extraordinary water levels in Lake Ontario, resulting in higher than normal levels of insects for the birds to eat. This may have encouraged some species to have second (or more) broods.
- b) Heavy rains in the spring of 2017 destroyed some early nests, particularly those of Red-winged Blackbirds and American Robins, again possibly resulting in second (or more) nestings.

Subsequent years will determine whether 2017's total was unique or not.

The reasons for the continued high number of nests include: (a) extensive tree and shrub planting by TRCA over recent years; (b) the natural spreading and maturation of appropriate breeding habitat in some areas, particularly dogwood, honeysuckle and reeds, which represent the most common hosts for Red-winged Blackbirds and Yellow Warblers, the most prolific non-colonial-waterbird nesters at TTP; (c) the ever-increasing nest-searching skills in the project participants; (d) the availability of more volunteer effort; and (e) the discovery of areas rich in nests that had not been explored until recent years.

Table 3.6 lists those species realizing new nest highs for the project in 2018.

Table 3.6. Species Reaching New Nest Highs in 2018

Species	Increase in Number of Nests over Previous High
Barn Swallow	4%
Cliff Swallow	New in 2018
Common Grackle	40%
House Finch	100%
House Wren	50%
Mourning Dove	200%
Northern Mockingbird	New in 2018
Trumpeter Swan	100%

Five species nesting in 2018 deserve special mention.

There were two first-time nesters for TTP: Cliff Swallow and Northern Mockingbird. Cliff Swallows nested on one of the TRCA buildings erected in 2011/2012 and between that and another building produced a remarkable 24 nests.

Northern Mockingbirds have frequented the area around TTP for several years, presumably nesting nearby, and often being seen visiting TTP. Thus, it was expected that they would eventually nest at TTP and, in 2018, two nests were found at TTP.

In addition to the new nesting species, nesting by three other species was confirmed by the presence of recently-fledged young: Bank Swallow, Black-capped Chickadee and Least Bittern. The area used for nesting by several Bank Swallows (another species listed as Threatened in Ontario) in 2016 and 2017 was not used in 2018, but another suitable area was obviously found. It is encouraging that Least Bitterns (yet another Threatened species in Ontario) returned for a second year of nesting at TTP.

Table 3.6 also points out that Common Grackle nests were up significantly in 2018. The nests of this species can be difficult to find, but a number were located in Triangle Pond in 2018. While significant increases over previous highs were recorded for House Finch, House Wren, Mourning Dove and Trumpeter Swan, the percentage increases shown in Table 3.6 are somewhat misleading since these four species all nest in such small numbers at TTP.

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 2018 was down somewhat from recent years.

3.3.2.1 Changes in Nest Density for Each Zone

In looking at the contribution of each zone to the overall number of nests each year, it is useful to examine the nest density of each zone, as shown in Figure 3.E

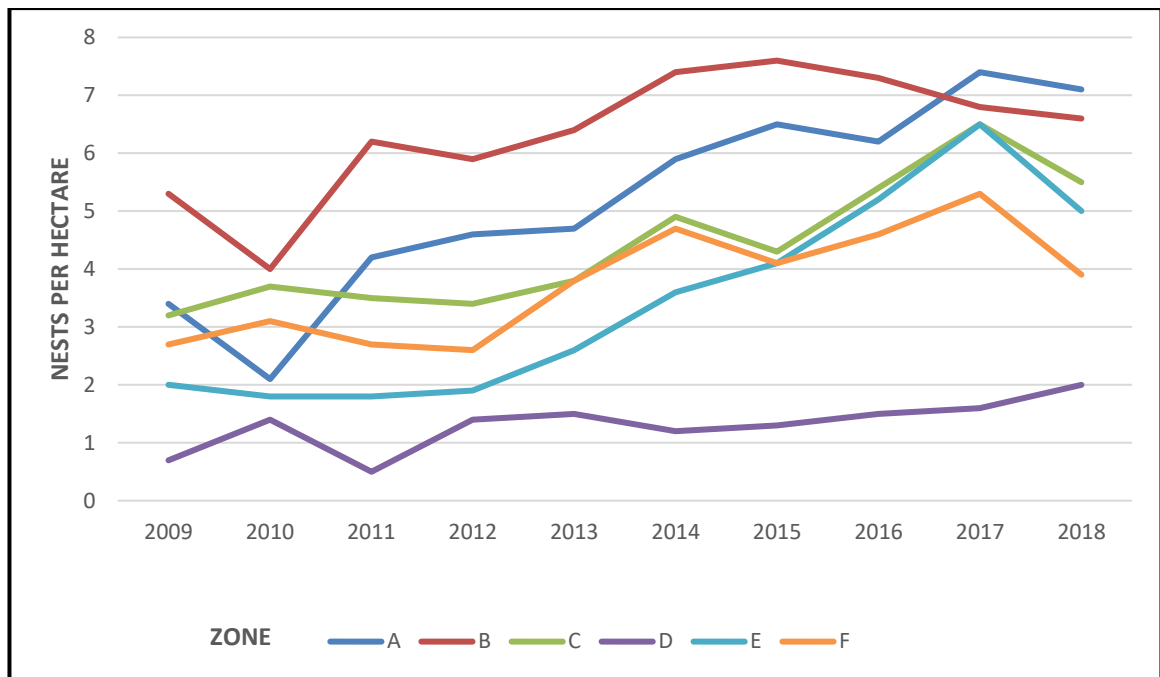


Figure 3.E Nest Density by Zone

In Figure 3.E, the nest density is determined by the number of nests per hectare. (In this chart, the number of hectares for Zone F has been reduced to eliminate the area occupied by the colonial waterbird nests.) A map of the zones can be found in Appendix B.

- In general, the nest density has increased in each zone over the most recent 10 years. This can be attributed to the same reasons given in the previous section for the increase in overall nest numbers in the last few years.
- There is, of course, a spike in nest density in 2017, which reflects the high number of nests found that year. It is interesting, however, that there was no spike in Zones B and D.
- Zones A and E have shown the greatest increase in nest density over the past 10 years, probably primarily because of the increase in nest-friendly shrubs in these zones. As they are the two largest zones, they have therefore contributed significantly to the overall increase in nest totals.
- Zone B, the smallest zone, had the highest nest density until 2017, and levelled off after 2014. A possible reason for this and the lack of a spike in 2017 could be the shrubs in a major section becoming so dense in recent years as to restrict nesting opportunities.
- Zone D has shown the least growth in nest density, and this and the lack of a spike in 2017 would be due to (i) the considerable construction on the Endikement and in Cell 2 in recent years, and (ii) the lack of trees in this zone, which means fewer nesting options and also less protection for the other vegetation.

It will be interesting to see the direction that the nest density takes in each zone in future years as the vegetation continues to evolve.

3.3.2.2 Nest Productivity

A total of 663 nests was recorded online with Bird Studies Canada's Project NestWatch in 2018 (Table 3.7). In terms of nest productivity, 86 (i.e., 20%) of 421 nests with known outcomes failed, while 335 were successful in fledging young. The remaining 244 monitored nests had unknown outcomes. (The nests with unknown outcomes included all ground nests from Canvasback, Gadwall, Killdeer, Mallard, Song Sparrow and Spotted Sandpiper, which, commencing in 2012, were not monitored once found.)

As can be seen in Table 3.7, the 2018 nest failure rate of 20% is the lowest of the last 10 years. Nest predation continues to be the most common cause of nest failure. Possible predators at TTP include raccoons, gartersnakes, mink and coyotes, as well as other bird species. Of the 86 failures, 33 occurred at the egg stage, 5 at young stage and 48 at either egg or young stage.

Table 3.7. Nest Productivity from 2009 to 2018

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	AVG
Nests discovered	549	512	595	633	733	902	926	1,018	1,175	1,027	807
Nests monitored & reported to NestWatch	456	440	430	464	549	690	657	702	801	663	585
• Unknown outcome	170	213	155	213	266	232	226	211	301	244	223
• Known outcome	286	227	275	251	283	458	431	491	500	421	362
➤ Successful	162	144	177	171	186	338	323	388	394	335	262
➤ Failed	124	83	98	80	97	120	108	103	106	86	101
➤ Failure rate	43%	37%	36%	32%	34%	26%	25%	21%	21%	20%	28%

Figure 3.F demonstrates how the known nest failure rate has been steadily trending down. One can speculate on the reasons for this, but confirming them is beyond the scope of the current project.

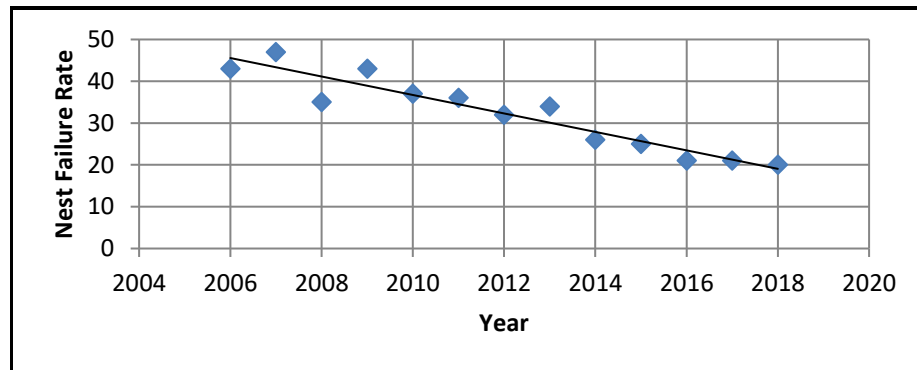


Figure 3.F Known Nest Failure Rate Trend

In Table 3.8, all years of the project are shown because the "Other Species Observed" has been adjusted to eliminate species that would never breed at TTP, such as most shorebirds and north-nesting warblers. In previous reports, these northern breeders were included in the "Other Species Observed" tally. As can be seen in Table 3.8, the 44 confirmed breeders and 71 total species detected in 2018 are at the high end of the numbers recorded over the entire project to date. (In the first two years of the project, as is apparent in Table 3.8, species were more likely to be categorized as Possible Breeders rather than Other Species Observed, as has been the practice since 2007 when there is no evidence of breeding intent observed.)

The first section of Table 3.8 provides a breakdown of the 44 confirmed breeders in 2018. Nests of 32 species of landbirds were found in 2018. To this were added Brown-headed Cowbird and three other species confirmed as breeders by the presence of recently fledged young: Bank Swallow, Black-capped Chickadee and Least Bittern. When the six confirmed colonial waterbird nesters (i.e., Black-crowned Night-Heron,

Common Tern, Double-crested Cormorant, Great Egret, Herring Gull and Ring-billed Gull), as well as Canada Goose and Mute Swan, are added, the total becomes 44 species nesting at TTP in 2018.

Table 3.8. Summary of Species Detected During Breeding Season From All Studies

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Breeding Species:														
A Colonial Waterbirds	7	7	6	6	6	6	6	7	7	7	5	7	5	6
Managed Waterfowl	2	2	1	2	2	2	2	2	2	2	2	2	2	2
Sub-total	9	9	7	8	8	8	8	9	9	9	7	9	7	8
B Landbirds	26	36	37	26	28	31	28	29	26	32	29	30	33	33
Nests confirmed by young					1	1	0	2	5	2	3	0	1	3
Sub-total	26	36	37	26	29	32	28	31	31	34	32	30	34	36
Confirmed Breeding Species (total of above)	35	45	44	34	37	40	36	40	40	43	39	39	41	44
Probable Breeding Species	10	4	5	10	11	2	4	3	5	5	3	4	3	2
Possible Breeding Species	22	19	11	15	14	8	3	6	4	8	14	11	8	5
Other Species Observed		2	9	10	10	11	14	17	11	8	15	12	17	20
Total Species Detected	67	70	69	69	72	61	57	66	60	64	71	66	69	71

Looking at the past 10 years of data, some conclusions and trends continue to emerge. As noted previously, 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 has an adverse effect on nesting suitability for these and other ground-nesting species. At the same time, the spread of dogwood, honeysuckle and reeds, as well as tree and shrub planting by TRCA, has created more nesting opportunities for species such as Red-winged Blackbirds, American Robins and Yellow Warblers.



Yellow Warbler on Nest (P. Robillard)

3.3.2.3 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 2018, a total of 29 nests of five species were parasitized by Brown-headed Cowbirds, including for the first time during the project, House Finch (Table 3.9). (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 3.9 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.)

The overall rate of parasitism in 2018 of 10% matched the lowest rate experienced during this project. Red-winged Blackbirds, the most heavily parasitized species at TTP in terms of total number of nests parasitized, reached its lowest rate of parasitism at 9% in 2018.

Based on the average rate of parasitism over the past 10 years, Red-winged Blackbirds, Song Sparrows and Yellow Warblers are the most heavily parasitized species, each with an average rate of around 20% per year of observable nests (see Table 3.9). (House Finch shows a higher average rate, but this is based on only two nests.).

Table 3.9. Brown-headed Cowbird Parasitism Data and Rates from 2009 to 2018.

Brown-headed Cowbird Parasitism											
		American Goldfinch	American Robin	Gray Catbird	House Finch	Northern Cardinal	Red-winged Blackbird	Song Sparrow	Willow Flycatcher	Yellow Warbler	Totals
2009	Nests checked*	21	44	23	0	4	112	4	24	68	300
	No. parasitized	5	0	0	0	0	32	2	4	34	77
	% parasitized	24%	0%	0%	0%	0%	29%	50%	17%	50%	26%
2010	Nests checked*	19	28	11	0	1	110	4	11	66	250
	No. parasitized	0	0	0	0	0	27	1	2	21	51
	% parasitized	0%	0%	0%	0%	0%	25%	25%	18%	32%	20%
2011	Nests checked*	13	26	16	0	0	81	2	11	36	185
	No. parasitized	2	0	0	0	0	18	0	0	10	30
	% parasitized	15%	0%	0%	0%	0%	22%	0%	0%	28%	16%
2012	Nests checked*	8	17	19	0	1	77	2	8	33	165
	No. parasitized	0	0	0	0	0	30	0	2	7	39
	% parasitized	0%	0%	0%	0%	0%	39%	0%	25%	21%	24%
2013	Nests checked*	9	26	20	0	1	145	2	11	75	289
	No. parasitized	1	1	0	0	0	33	0	1	22	58
	% parasitized	11%	4%	0%	0%	0%	23%	0%	9%	29%	20%
2014	Nests checked*	10	27	27	0	3	134	6	13	96	316
	No. parasitized	0	0	0	0	0	22	0	2	11	35
	% parasitized	0%	0%	0%	0%	0%	16%	0%	15%	11%	11%
2015	Nests checked*	5	18	21	0	2	181	7	7	82	323
	No. parasitized	0	0	1	0	0	27	1	0	8	37
	% parasitized	0%	0%	5%	0%	0%	15%	14%	0%	10%	11%
2016	Nests checked*	7	38	18	0	4	133	3	12	123	338
	No. parasitized	0	0	1	0	0	26	0	1	28	56
	% parasitized	0%	0%	6%	0%	0%	20%	0%	8%	23%	17%
2017	Nests checked*	12	45	20	0	7	182	4	12	128	410
	No. parasitized	1	0	0	0	1	24	1	1	12	40
	% parasitized	8%	0%	0%	0%	14%	13%	25%	8%	9%	10%
2018	Nests checked*	6	34	10	2	6	153	6	9	73	299
	No. parasitized	0	0	0	1	1	14	3	0	10	29
	% parasitized	0%	0%	0%	50%	17%	9%	50%	0%	14%	10%
AVG	Avg nests checked *	11.0	30.3	18.5	0.2	2.9	130.8	4.0	11.8	78.0	287.5
	Avg parasitized	0.9	0.1	0.2	0.1	0.2	25.3	0.8	1.3	16.3	45.2
	Avg % parasitized	8.2%	0.3%	1.1%	50.0%	6.9%	19.3%	20.0%	11.0%	20.9%	15.7%

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

The overall parasitism rate in 2018 of 10% continued the 10-year downward trend, as demonstrated in Figure 3.G. Not surprisingly, the number of cowbirds observed in the VCP counts continued to remain below that observed in the years of the project prior to 2014. As mentioned in earlier reports, possible explanations for this downward 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 the Breeding Birds of Ontario, 2001-2005 (p. 602).

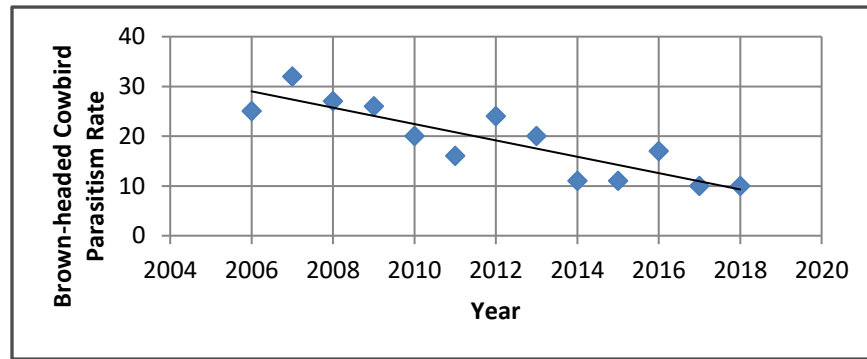


Figure 3.G Brown-headed Cowbird Parasitism Rate Trend

3.4 The Overall Picture in 2018

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 10 years of VCP counts include Red-winged Blackbird, Yellow Warbler, Song Sparrow and European Starling, all of which require basic habitat conditions with a few fundamental components to thrive.

With the addition of Cliff Swallow and Northern Mockingbird in 2018, there have been 48 nesters confirmed since the current project commenced. This total includes the 44 species listed in Table 3.5, plus Brown-headed Cowbird, Green-winged Teal (confirmed in 2017 by presence of recently-hatched young), Canada Goose and Mute Swan, with the latter two 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 73 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 C, 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 continue to grow. Natural change, along with the habitat creation and restoration projects carried out by TRCA throughout TTP, such as the changes to Cell 2 to create a new marsh similar to Cell 1 (which are now largely complete), 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 3.10). 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., Trumpeter Swan), (ii) secretive habits (e.g., Black-billed Cuckoo), (iii) well-hidden nests (e.g., Least Flycatcher), (iv) nests or normal habitat not located near VCP stations, and (v) nests not located at TTP.

Willow Flycatcher Nest in Sumac (P. Robillard)

Table 3.10 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	Blue-gray Gnatcatcher
Black-capped Chickadee	Brown Thrasher
Eastern Wood-Pewee	House Finch
Gadwall	Killdeer
Great Crested Flycatcher	Northern Mockingbird
	Trumpeter Swan
	Wood Duck

4. Acknowledgements

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

The landbird and non-colonial waterbird section of this report is the result of the ongoing efforts of several dedicated volunteers. The 2018 VCP observations were collected by Ian Sturdee, and the volunteer contributions to the nest searching phase of the project in 2018 are enumerated in Table 3.11.

Table 3.11 2018 Effort by Nest Searching Project Participants

Name	Total Hours
Jack Alvo	49
Alex Desormeaux	12
Marc Dupuis-Desormeaux	12
Lynne Freeman	30
Hellen Fu	15
Don Johnston	71
Jan McDonald	79
Pierre Robillard	113
Ian Sturdee	165
Paul Xamin	130
Total	676

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Appendices

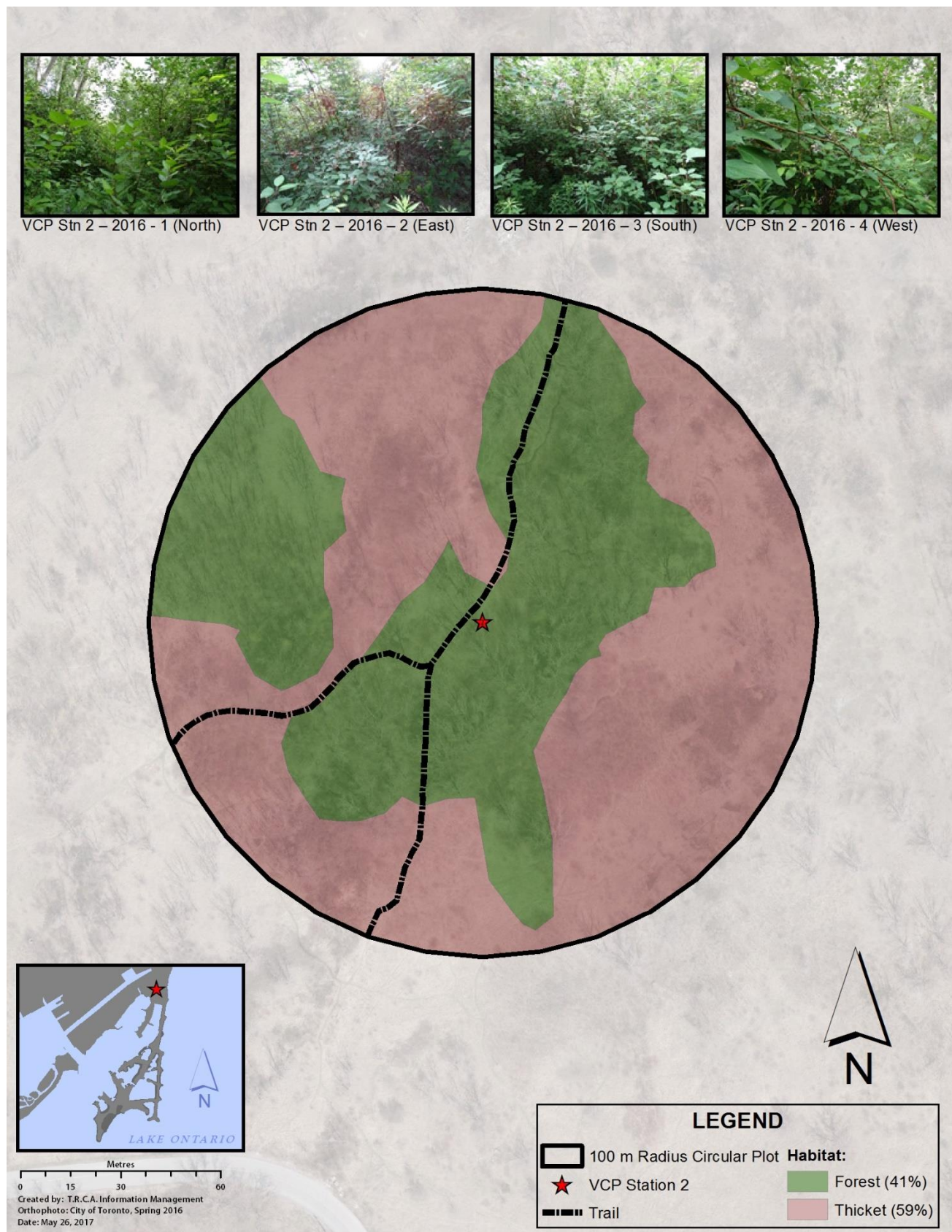
Appendix A: Description of VCP Stations (Habitat Pictures and Sketches)

Station 1



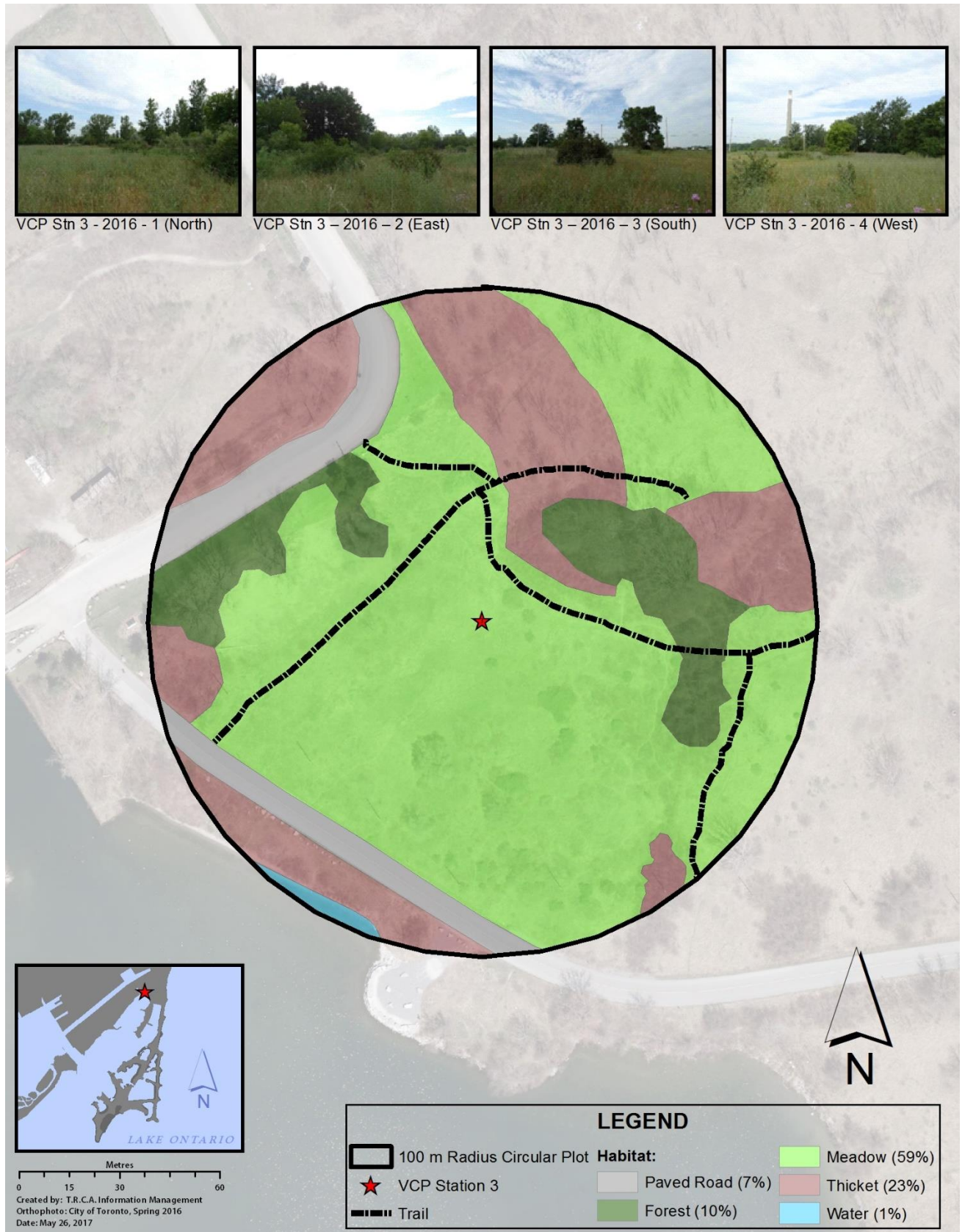
Appendix A: Description of VCP Stations (Habitat Pictures and Sketches)

Station 2



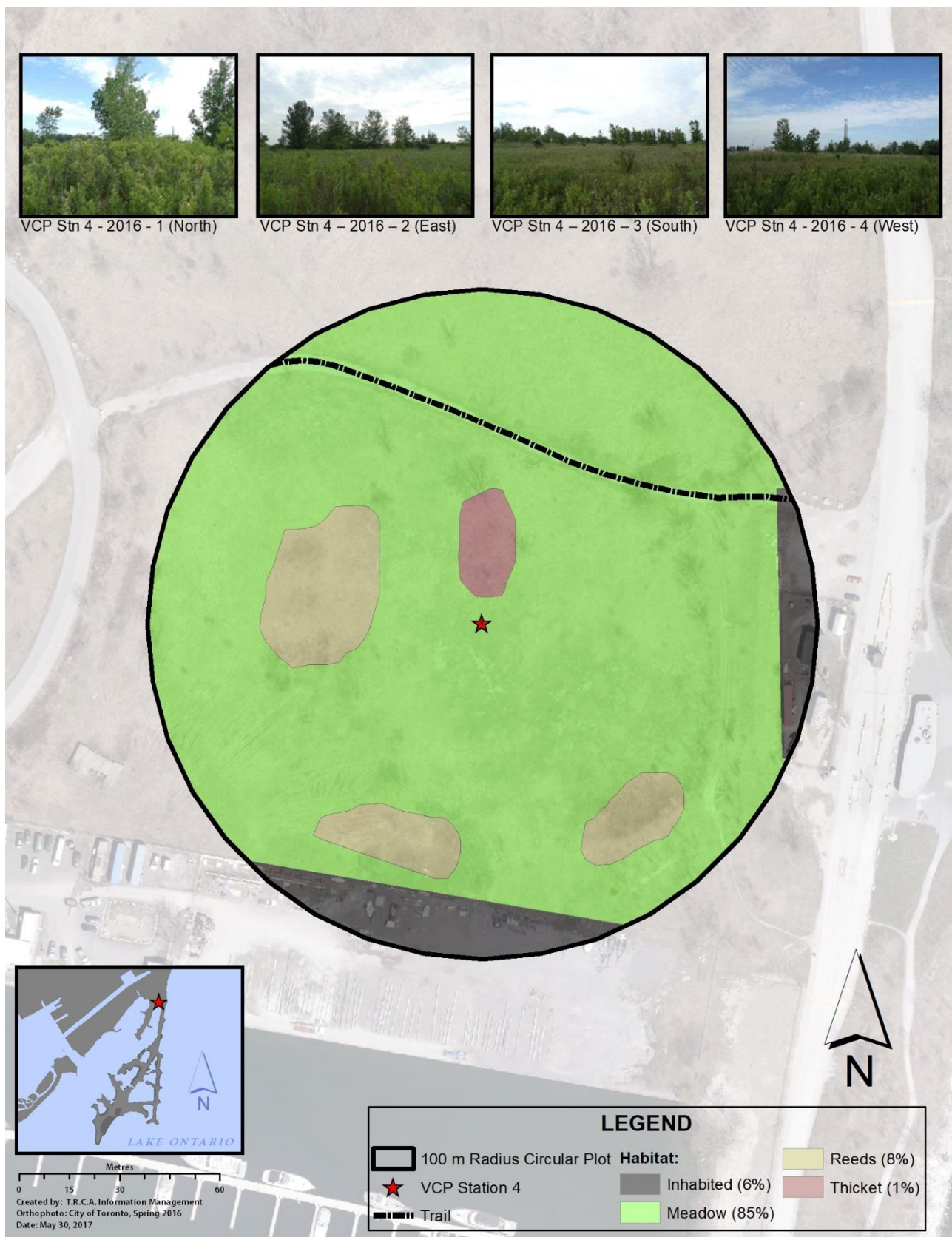
Appendix A: Description of VCP Stations (Habitat Pictures and Sketches)

Station 3



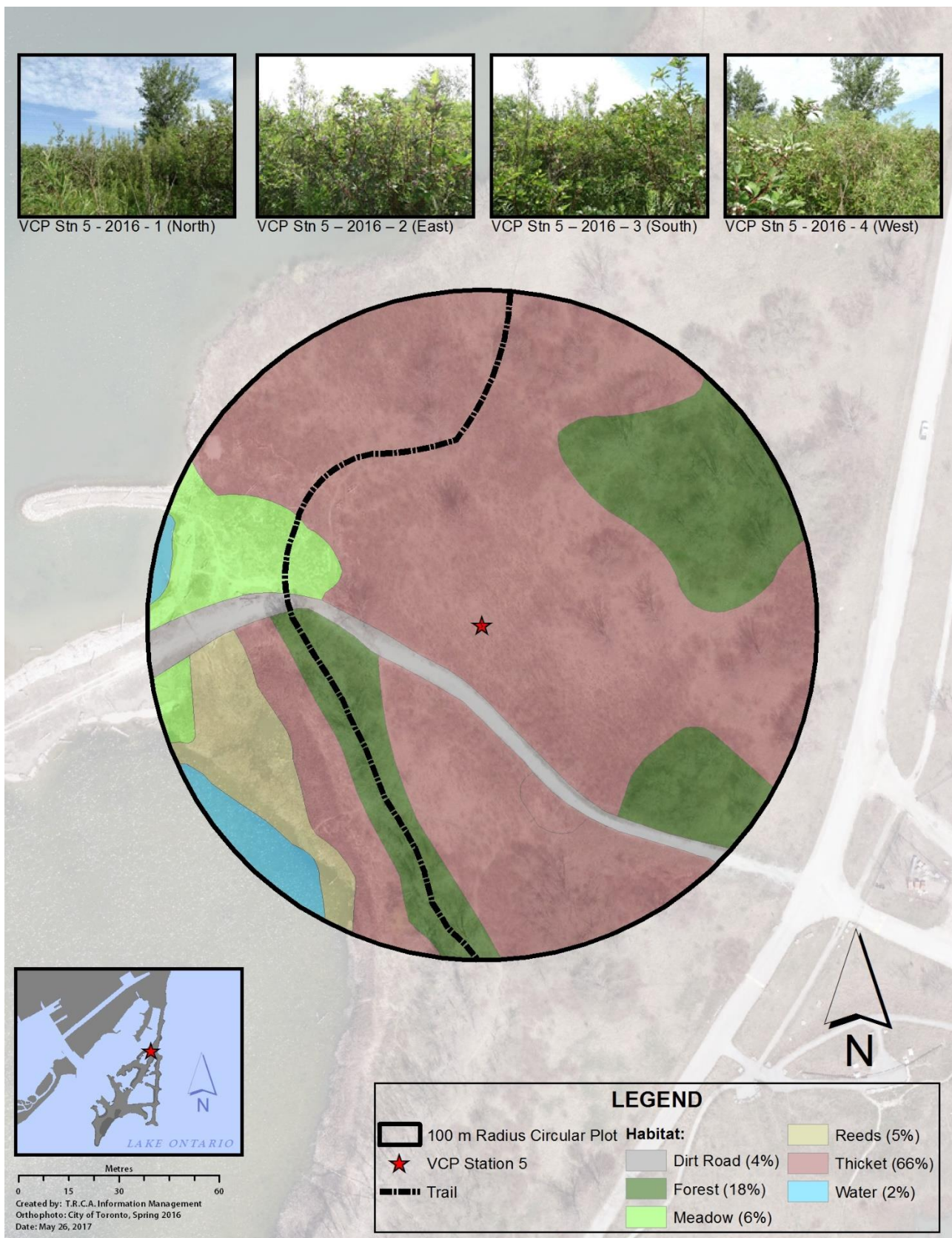
Appendix A: Description of VCP Stations (Habitat Pictures and Sketches)

Station 4



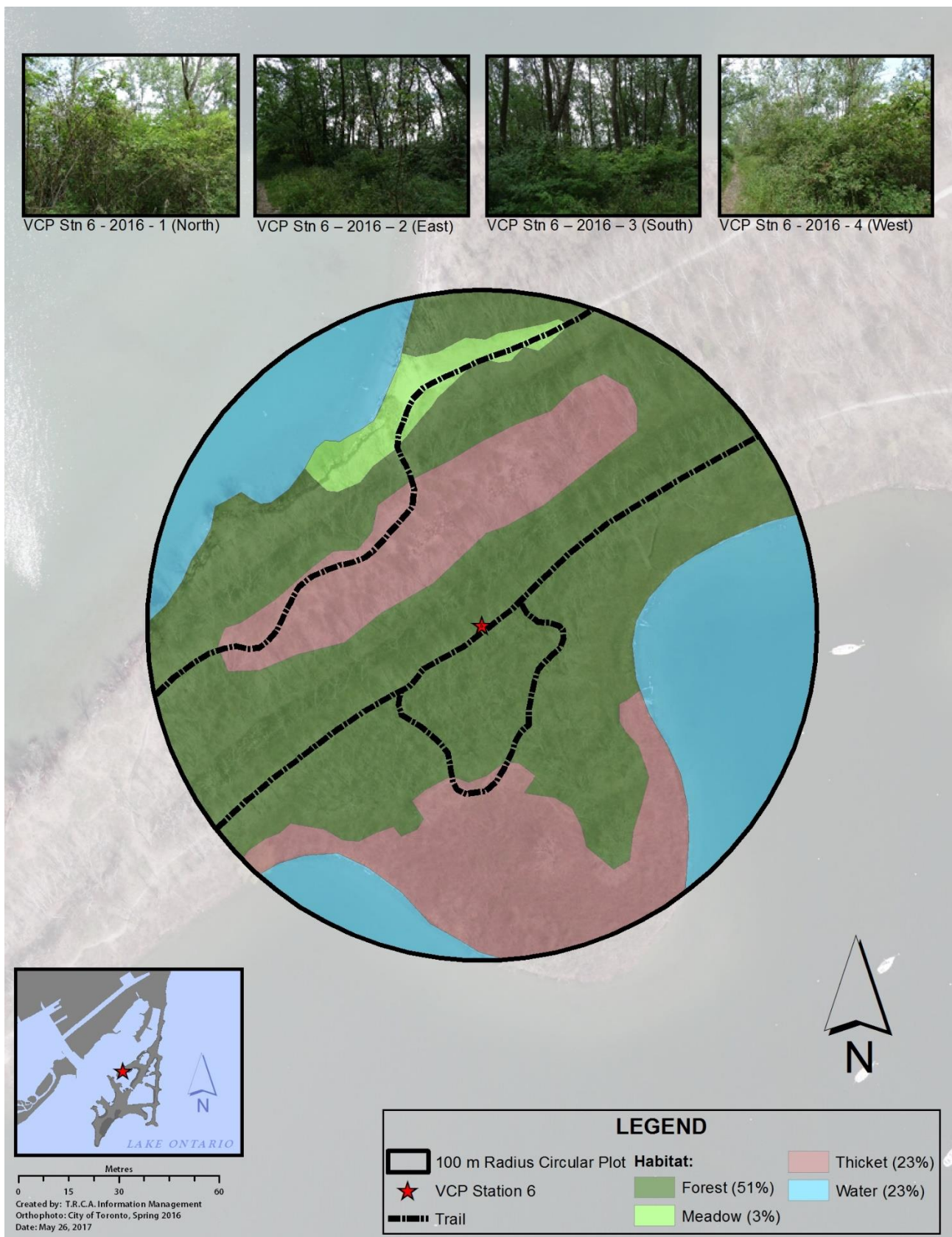
Appendix A: Description of VCP Stations (Habitat Pictures and Sketches)

Station 5



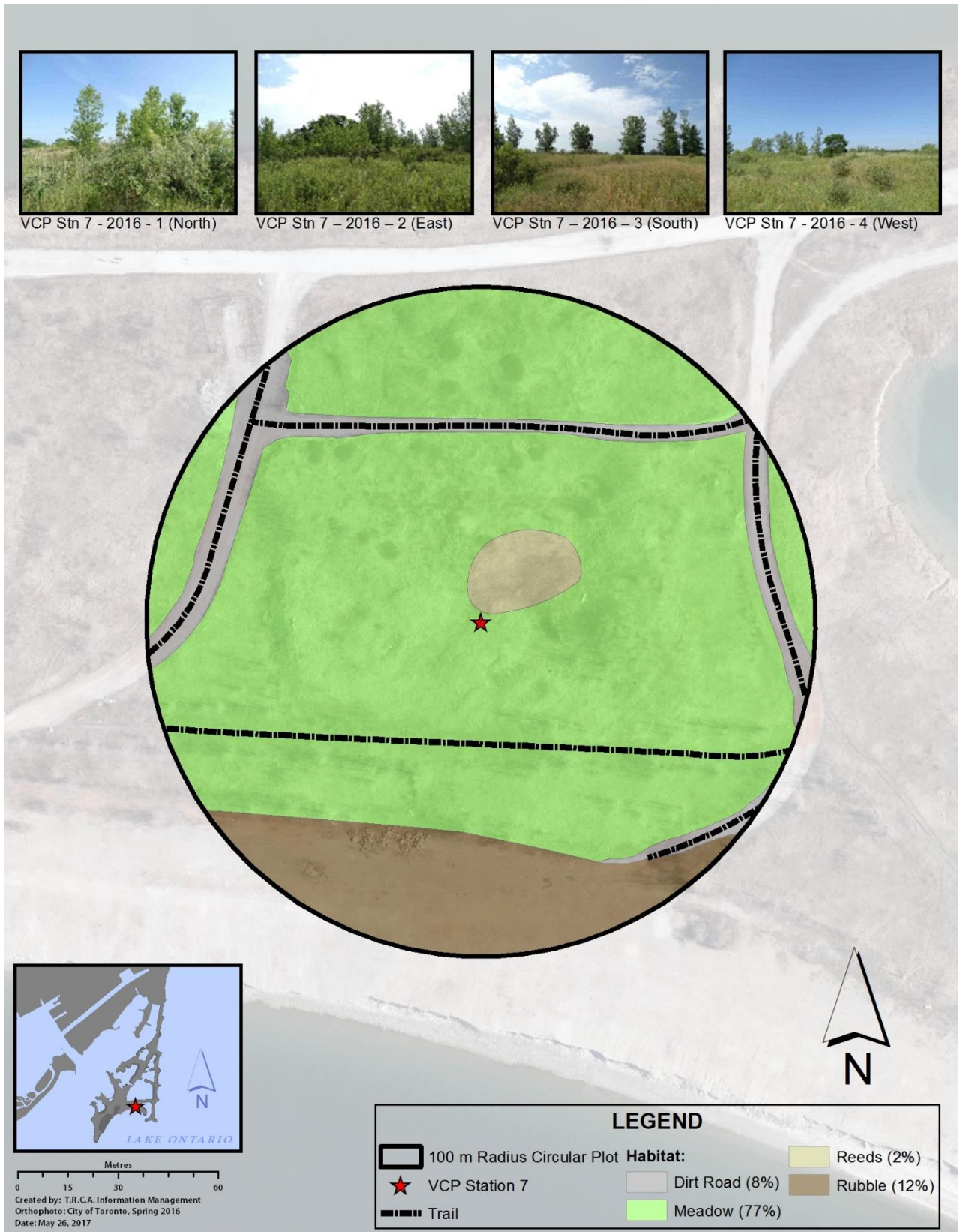
Appendix A: Description of VCP Stations (Habitat Pictures and Sketches)

Station 6



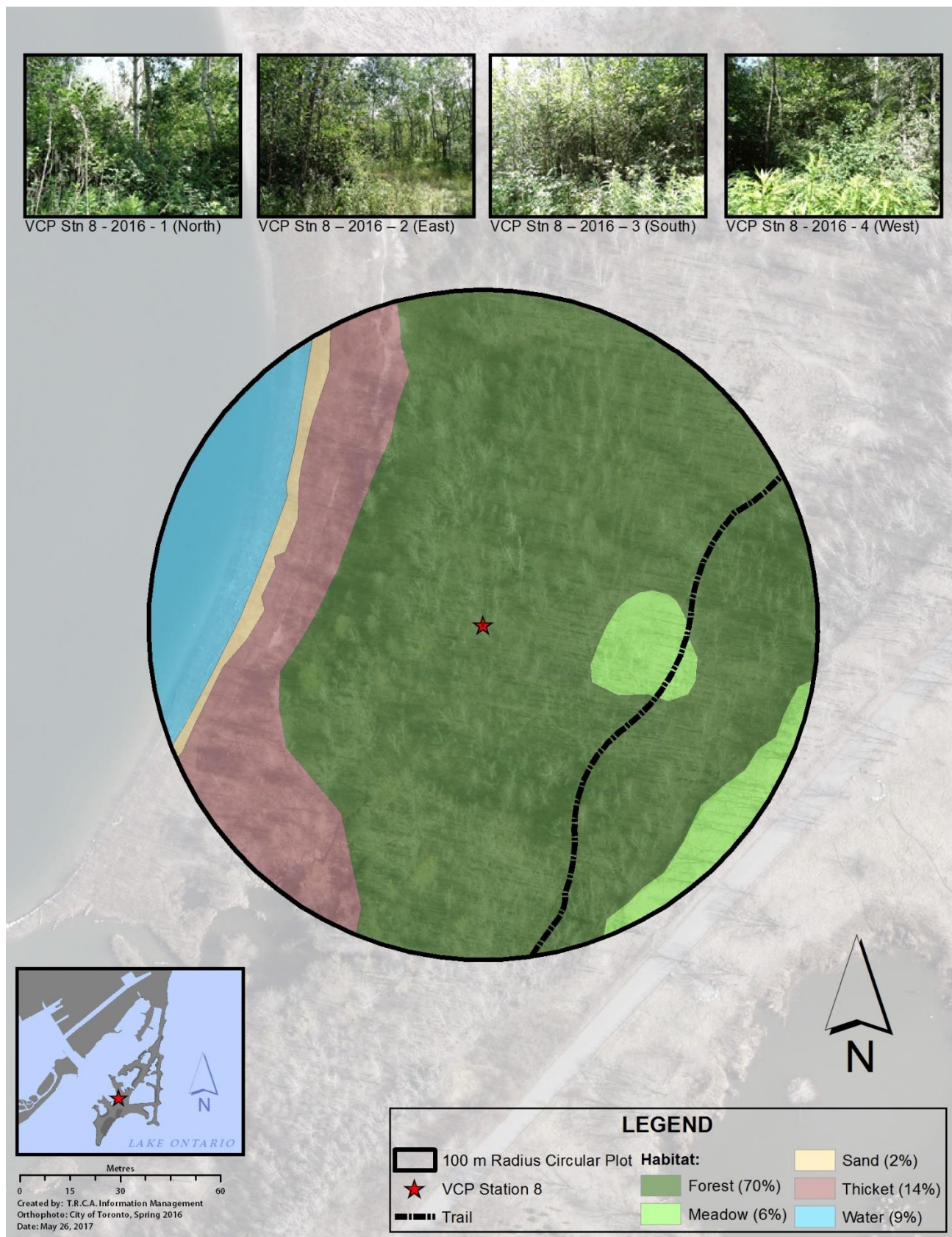
Appendix A: Description of VCP Stations (Habitat Pictures and Sketches)

Station 7



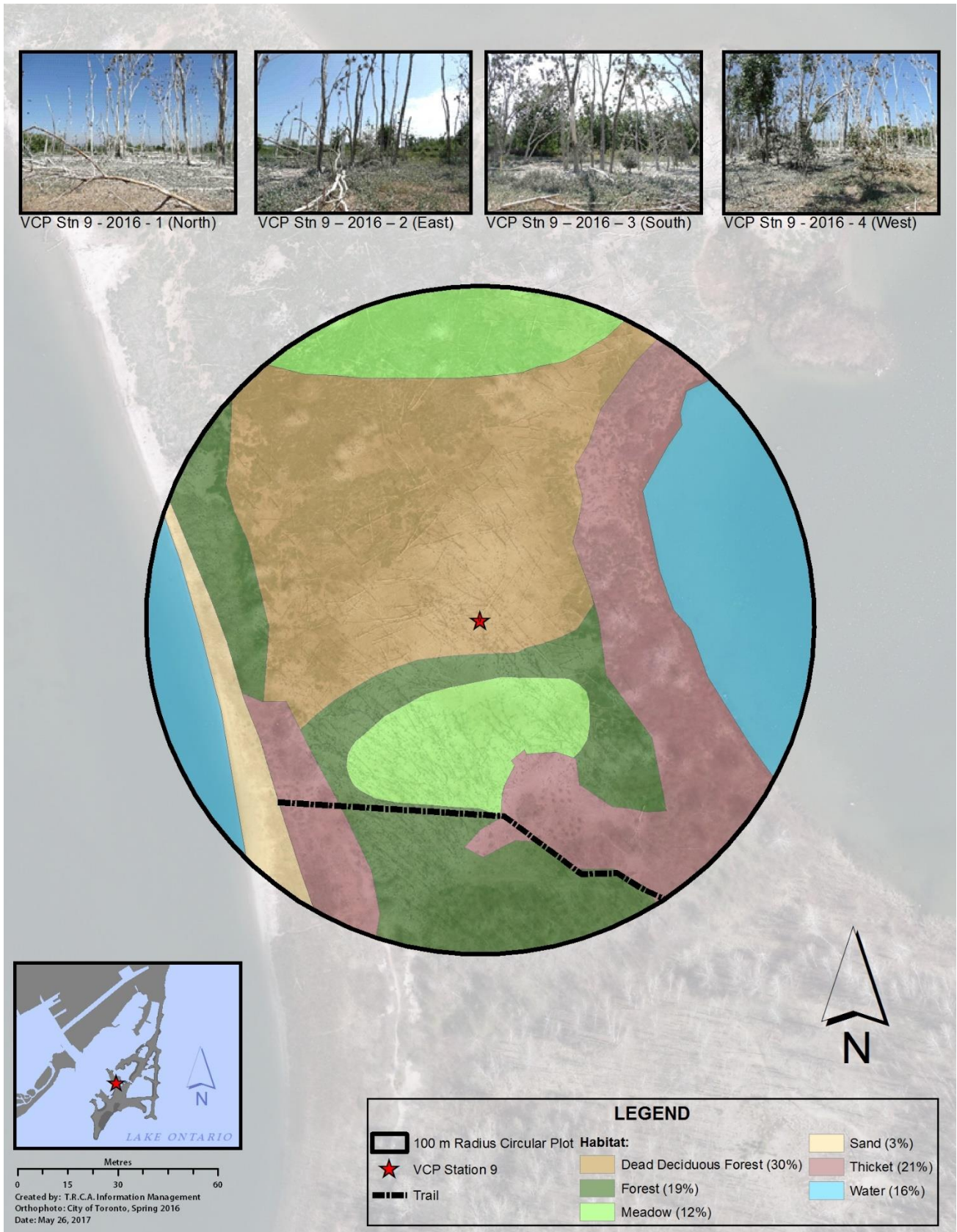
Appendix A: Description of VCP Stations (Habitat Pictures and Sketches)

Station 8

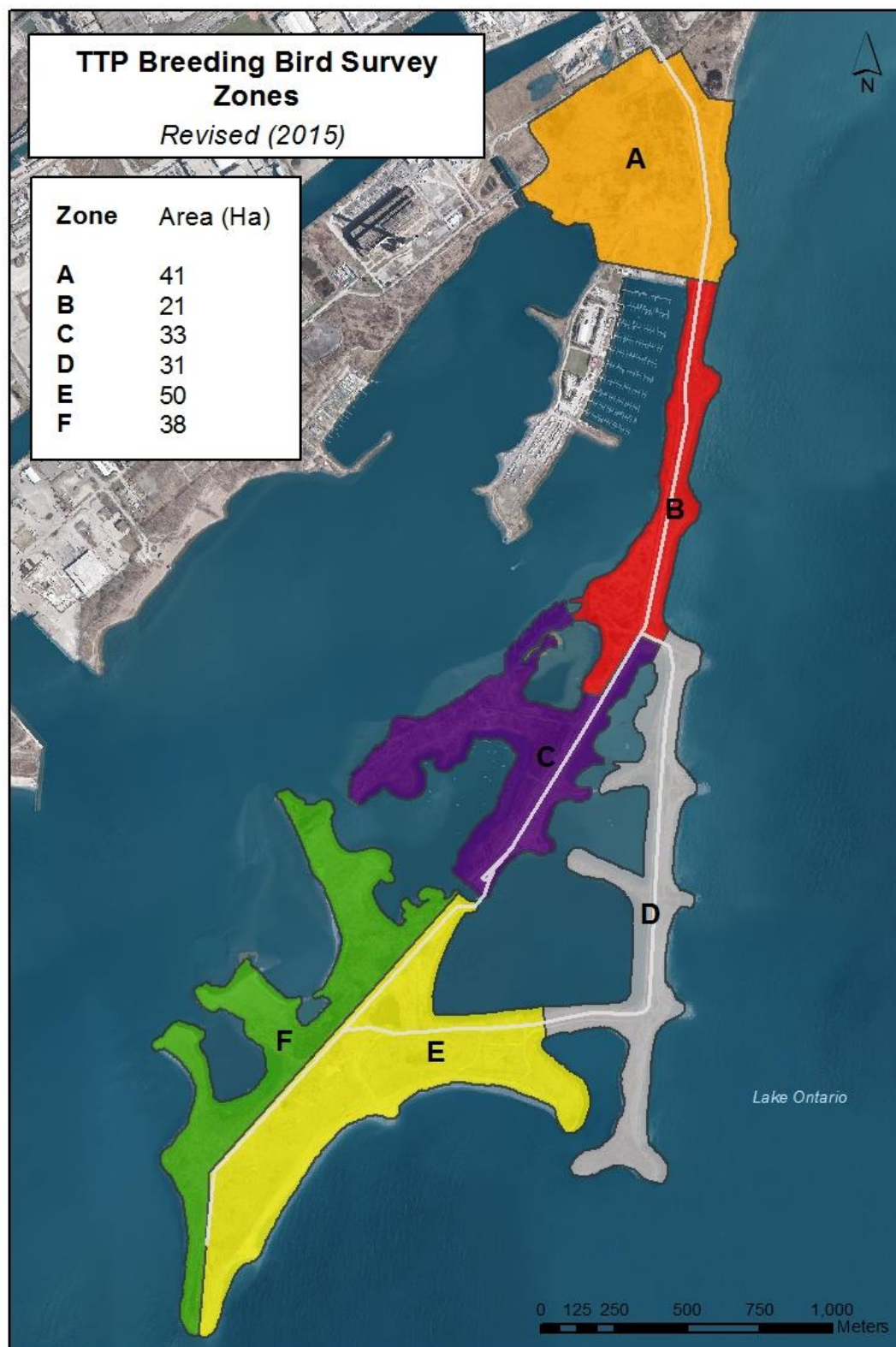


Appendix A: Description of VCP Stations (Habitat Pictures and Sketches)

Station 9



Appendix B: Map of TTP Breeding Bird Survey Zones



This map was updated in 2015 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 C: Species Accounts

The following accounts include species that were listed as observed during the breeding season, or as possible, probable or confirmed breeders in 2018, as well as historically confirmed breeders. Species highlighted in red were detected in 2018 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 (2018 - absent) Known to have bred historically at TTP.

American Crow (2018 - observed) Known to have bred historically at TTP, but not in recent years.

American Goldfinch (2018 - confirmed) This species is a regular late nester at TTP. In 2018, 14 nests were discovered, which is well below the most recent 10-year average.

American Kestrel (2018 – absent) Known to have bred historically at TTP. A single bird was observed hunting during the breeding season.

American Robin (2018 - confirmed) Common nesting species in forested areas throughout TTP. In 2018, 104 nests were recorded, slightly above the most recent 10-year average.

American Redstart (2018 - observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2018 in the Baselands was presumably a late migrant.

American Woodcock (2018 - probable) This species is found regularly throughout much of TTP during the spring and summer. In 2018, birds were discovered displaying in several apparent territories at TTP. The 2012 change in protocol with regard to ground-nesting birds makes locating nests much less likely.

Baltimore Oriole (2018 - confirmed) Common nesting species in forest areas of TTP. A total of 16 nests was recorded in 2018, slightly below the average of the past 10 years of this project.

Bank Swallow (2018 - confirmed) The nesting site occupied in 2016 and 2017 by this species was not used in 2018, but recently-fledged birds were observed, confirming that an alternative site had been used.

Barn Swallow (2018 - confirmed) Barn Swallows are regular nesters at TTP under the eaves of buildings. In 2018, 51 nests were found, a new high for the project. This species, listed as Threatened on the Ontario Species at Risk, continues to take advantage of three buildings constructed by TRCA in 2011/2012.

Belted Kingfisher (2018 - possible) This species was confirmed for the first time in 2003 based on observations of fledged young. In 2018, a bird was observed on the Neck and another in Embayment D in suitable nesting habitat during the breeding season.

Black-capped Chickadee (2018 - confirmed) A regular but uncommon nester at TTP. While no nests were found in 2018, the presence of recently-fledged young confirmed nesting.

Black-crowned Night-Heron (2018 - confirmed) 300 nests were confirmed in 2018, which is 23% lower than the 10-year average, but consistent with the last five 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 (2018 - confirmed) In 2018, four nests were found. These very small nests are always difficult to find and often moved if the birds feel the nest has been discovered.

Blue Jay (2018 - observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2018 was presumably a late migrant.

Blue-winged Teal (2018 – absent) Known to have bred historically at TTP, although not in recent years.

Bobolink (2018 – observed) This species has never been confirmed as a breeder at TTP. Three birds observed in 2018 on the Flats were presumably late migrants.

Brown-headed Cowbird (2018 - confirmed) In 2018, a total of 29 nests of House Finch (1 – the first nest of this species found parasitized during this project), Northern Cardinal (1), Red-winged Blackbird (14), Song Sparrow (3) and Yellow Warbler (10), were found to have been parasitized by cowbirds.

Brown Thrasher (2018 - confirmed) Brown Thrasher is a regular but uncommon nester at TTP. In 2018, one nest was located.

California Gull (2018 – absent) Known to have bred historically at TTP, but not detected in recent years.

Canada Goose (2018 - confirmed) 10 nests were confirmed in 2018 and were managed according to the TRCA Canada Goose Management Strategy.

Canvasback (2018 - observed) Canvasback has bred almost annually in recent years in the Triangle Pond area at TTP.

Caspian Tern (2018 - observed) This species is an intermittent ground-nester at TTP, last confirmed in 2016. Adults were observed loafing in Cell 2 throughout the breeding season.

Cedar Waxwing (2018 - confirmed) A common late nester at TTP; 35 nests were found in 2018, 13% above the most recent 10-year average for this project.

Chestnut-sided Warbler (2018 – observed) This species has never been confirmed as a breeder at TTP. Ten birds were observed in 2018 in May in various parts of TTP and were presumably all late migrants.

Chipping Sparrow (2018 – observed) This species has never been confirmed as a breeder at TTP. Eight birds were observed in 2018 in May in various parts of TTP and were presumably all late migrants.

Cliff Swallow (2018 - confirmed) In 2018, this species nested at TTP for the first time, building nests under the eaves of one of the structures erected by TRCA in 2011/2012 and another building. A total of 24 nests was built.

Common Grackle (2018 - confirmed) Common Grackle is a regular nester at TTP, although nests are often well hidden. In 2018, seven nests – a new high for the project - were found, primarily in Triangle Pond.

Common Raven (2018 – observed) This species has never been confirmed as a breeder at TTP, although a pair nested immediately north of TTP in 2018 and were seen from time to time foraging in TTP during the breeding season.

Common Tern (2018 – confirmed) 65 nests were confirmed on the Embayment D raft and on the Endikement in 2018.

Common Yellowthroat (2018 - possible) Known to have bred historically at TTP. In 2018, a singing male was observed in suitable nesting habitat in the Baselands during the breeding season.

Double-crested Cormorant (2018 - confirmed) 14,515 nests were confirmed in the tree and ground nest colonies at TTP in 2018. This represents the largest breeding colony of Double-crested Cormorants in North America. Cormorants are managed for spatial distribution, where ground nesting is encouraged and tree nesting is discouraged, following the Tommy Thompson Park Double-crested Cormorant Management Strategy. 72% of the nesting population was on the ground in 2018.

Downy Woodpecker (2018 - confirmed) A regular breeder at TTP, but in very low numbers. One nest was found in 2018.

Eastern Kingbird (2018 - confirmed) A regular breeder at TTP along forest edges where meadow and shrubs are present. In 2018, a total of 21 nests was found, the same as the average for the most recent 10 years.

Eastern Meadowlark (2018 - absent) 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. The change in protocol with regard to ground-nesting birds will make locating nests in future more difficult.

Eastern Wood-Pewee (2018 – probable) In 2018, singing males were observed in apparent territories in multiple locations during the breeding season. 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 this project than confirmed.

European Starling (2018 - 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. Two nests were found in 2018.

Field Sparrow (2018 - observed) This species has never been confirmed as a breeder at TTP. Five birds observed in 2018 in early May in various parts of the Baselands were presumably all late migrants.

Gadwall (2018 - observed) Gadwall has been a regular ground-nesting species at TTP. In 2018, no nests were located. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Gray Catbird (2018 - confirmed) Gray Catbird is a regular nester at TTP, preferring dense shrubs with some tree cover. A below-average total of 21 nests was found in 2018.

Great black-backed Gull (2018 - absent) Known to have bred historically at TTP.

Great Blue Heron (2018 - observed) Known to have bred historically at TTP. In 2018, two birds observed in Cell 2 were presumably late migrants or visiting from a nearby heronry.

Great-crested Flycatcher (2018 - possible) This species has never been confirmed as a breeder at TTP, although it has been observed regularly in suitable nesting habitat during this project in the breeding season, often calling, including in 2018.

Great Egret (2018 - confirmed) Five nests were confirmed on Peninsula B, a new nesting location, as the trees on Peninsula C where they had nested in recent years were blown over.

Green Heron (2018 - observed) Known to have nested historically at TTP, but no nests have been detected during this project. A bird was observed in 2018 in Embayment D during the breeding season.

Green-winged Teal (2018 – absent) In 2017, this species was confirmed as a breeding species at TTP for the first time when an adult female and three young approximately one week old were observed in Embayment D. Not seen in 2018.

Herring Gull (2018 – confirmed) One nest was confirmed, but later failed. Herring Gull populations have been declining in recent years.

Hooded Merganser (2018 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2018 in Cell 3 was presumably a late migrant.

Horned Lark (2018 - absent) Known to have bred historically at TTP.

House Finch (2018 - confirmed) In 2018, two nests were located in the Baselands, the first nests for this species since 2007.

House Sparrow (2018 - observed) Known to have bred historically at TTP. In 2018, the bird observed in the Baselands was presumably visiting from somewhere nearby.

House Wren (2018 - confirmed) Believed to be a regular nester at TTP, but in low numbers. In 2018, three nests were found, a new high for the project.

Killdeer (2018 - confirmed) Killdeer is a regular ground-nesting species at TTP in open areas with low vegetation, although only one was found in 2018. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Least Bittern (2018 – confirmed) In 2017, this Threatened species was confirmed as a breeding species at TTP for the first time. Successful breeding in 2018 was confirmed by the discovery of recently-fledged young in Triangle Pond.

Least Flycatcher (2018 - confirmed) A regular but uncommon breeder at TTP. In 2018, a nest was found which was later predated.

Mallard (2018 - confirmed) Mallard is a regular ground-nester at TTP. Two nests were documented in 2018, well below the average for the most recent 10 years of this project. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Mourning Dove (2018 - confirmed) Three nests were found in 2018, matching the previous high for the project. Mourning Dove nests have been scarce at TTP in recent years.

Mute Swan (2018 - confirmed) Eight nests were confirmed and managed according to the TRCA Mute Swan Management Strategy.

Nashville Warbler (2018 – observed) This species has never been confirmed as a breeder at TTP. The four birds observed in 2018 in two areas of TTP were presumably late migrants.

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 (2018 - confirmed) Until 2017, Northern Cardinal had been an uncommon but usually an annually-nesting species at TTP. In 2017, however, 14 nests were found, by far the highest total for this project, and 12 nests were found in 2018. As the nests of this species are usually well hidden in dense shrubs, the increase in nests may be the result of increasingly dense dogwood and honeysuckle found in certain areas.

Northern Flicker (2018 - confirmed) Northern Flicker is an uncommon but regular nesting species at TTP. Three nests were found in 2018.

Northern Mockingbird (2018 - confirmed) Two nests were found in 2018 in the Baselands, the first time this species has nested at TTP. There is a possibility that both nests were built by the same pair as the second nest was within 50 m of the first, and the species is often double-brooded.

Northern Rough-winged Swallow (2018 - possible) An uncommon nester at TTP. No nests were found in 2018, although the species was observed in suitable nesting habitat near East Cove during breeding season.

Orchard Oriole (2018 - confirmed) Three nests were found in 2018, matching the high for the project.

Ovenbird (2018 – observed) This species has never been confirmed as a breeder at TTP. A total of three birds were observed in 2018 in two areas and were presumably late migrants.

Purple Martin (2018 – observed) This species has never been confirmed as a breeder at TTP. The birds observed in 2018 were presumably foraging from the city, possibly from nests immediately north of TTP. There is no suitable nesting habitat at TTP.

Red-eyed Vireo (2018 - observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2018 was presumably a late migrant.

Redhead (2018 - absent) Known to have bred historically at TTP.

Red-winged Blackbird (2018 - confirmed) The most abundant nesting species at TTP (excluding colonial waterbirds), found throughout the TTP area. In 2018, 418 nests were found, the second highest total recorded during this project.

Ring-billed Gull (2018 - confirmed) Confirmed nesting with an estimated 15,000 nests.

Ring-necked Pheasant (2018 - absent) Known to have bred historically at TTP, but not detected in many years.

Rock Pigeon (2018 - observed) Known to have bred historically at TTP. Observed in 2018, but no nest was found.

Savannah Sparrow (2018 - possible) Prior to the start of this project, Savannah Sparrow was a common ground 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 in 2018 a singing male was observed in suitable nesting habitat during the breeding season. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Song Sparrow (2018 - confirmed) Song Sparrow is one of the most abundant nesting species at TTP, although few of its well-concealed nests are ever found. In 2018, 10 nests were found in a variety of habitats, matching the previous 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 (2018 - absent) Known to have bred historically at TTP, but not detected in recent years.

Spotted Sandpiper (2018 - confirmed) A common ground nester at TTP in open areas near water. Four nests were found in 2018, close to the most recent 10-year average of this project. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Tree Swallow (2018 - confirmed) Tree Swallow is a common breeder at TTP. In 2018, 15 nests were found in nest boxes and natural cavities around TTP and were documented and monitored, down significantly from recent years but still slightly above the most recent 10-year average.

Trumpeter Swan (2018 - confirmed) This species was confirmed as a breeder at TTP for the first time in 2013. After five years of a single nest, two nests were located in 2018.

Virginia Rail (2018 - absent) Known to have bred historically at TTP.

Warbling Vireo (2018 - confirmed) A common nesting species in forested areas in TTP, usually high in the trees, where the nest can often be found by hearing the female singing on the nest. In 2018, 18 nests were found, slightly above average for this project.

White-throated Sparrow (2018 - observed) This species has never been confirmed as a breeder at TTP. Many birds of this species were observed in 2018 and were presumably all late migrants.

Willow Flycatcher (2018 - confirmed) Willow Flycatcher is a common nesting species in more open areas with dense shrubs. In 2018, 15 nests were found, slightly below average for this project.

Wilson's Phalarope (2018 - absent) Known to have bred historically at TTP, but not detected in recent years.

Wood Duck (2018 - confirmed) This species was confirmed in 2012 as a breeder at TTP for the first time, and a nest was finally located Cell 1 in 2018.

Yellow Warbler (2018 - confirmed) Yellow Warblers are common to abundant through much of TTP, usually nesting in dogwoods and honeysuckle. A total of 211 nests was found in 2018, down significantly from the previous two years, but well above the most recent 10-year average for this project. This species continues to show the highest rate of parasitism by Brown-headed Cowbirds at TTP.

Appendix D: Map of 2018 Landbird Nest Locations *



* Excludes colonial waterbirds, Canada Goose and Mute Swan nests

Appendix E: Breeding Status Codes for Each Species Detected In 2018

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

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

