

The Breeding Birds of Tommy Thompson Park

2014



Willow Flycatcher Nest With One Brown-headed Cowbird Egg (I. Sturdee)

Toronto and Region Conservation



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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, 316 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



Ring-billed Gulls (P. Xamin)

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 seven species of colonial waterbirds nested at Tommy Thompson Park: two species are tree nesters, Black-crowned Night-Heron and Great Egret; four species are ground nesters, Ring-billed Gull, Herring Gull, Caspian Tern 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 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.

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 occur between the last week of May and the beginning of June, at peak nesting period. In 2014 high resolution aerial photographs were taken from a helicopter above the colony to minimize disturbance to the nesting cormorants. Individual nests can be seen in the images and are counted using GIS software by placing a dot on each nest. The same method was also used to count nesting Caspian Terns. (See Appendix E for examples of the aerial photographs.)

2.3 Results

In 2014 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 nested 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).

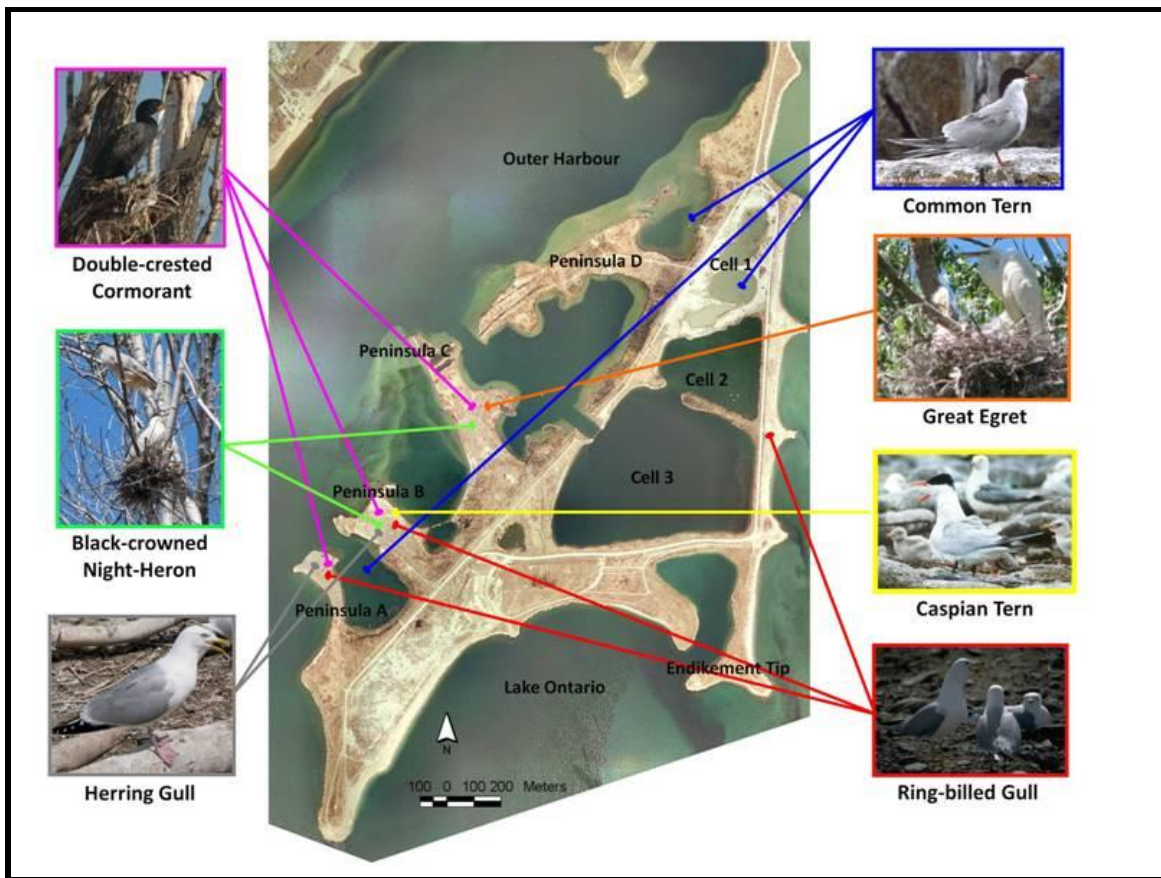


Figure 2.A. Colonial Waterbird Nesting Areas, 2014

Cormorant nests numbered 12,409, including 7,809 ground nests (Figure 2.B). The overall population increased three and a half percent; while the ground nesting population increased 11 percent over the previous year (Figure 2.B). As indicated in Figure 2.B, 63 percent of the TTP cormorant colony nested on the ground in 2014, with 10 nests on Peninsula A for the first time. 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). As in 2013, tree nesting continued to decrease on Peninsula C, however, Peninsula B remained consistent and Peninsula A saw an increase (Figure 2.B).



Double-crested Cormorants on Nest (D. Johnston)

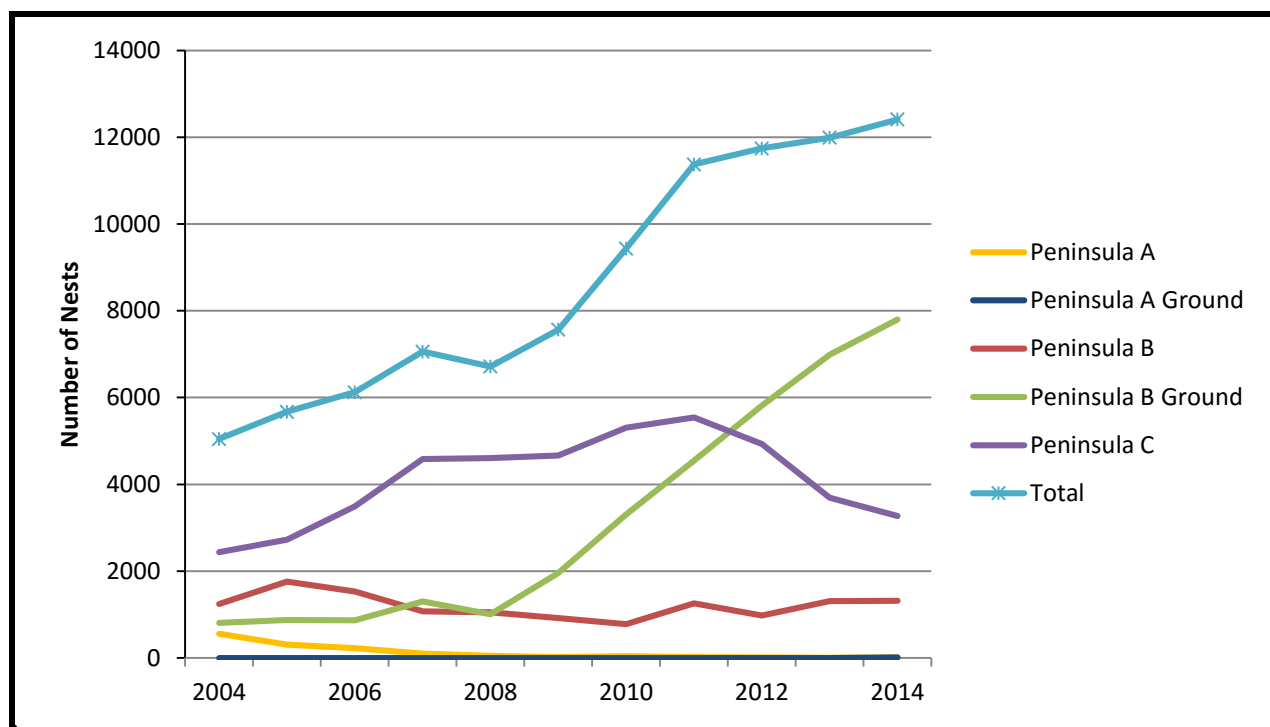


Figure 2.B. Double-crested Cormorant Nests at TTP by Location, 2004 - 2014

Black-crowned Night-Heron nests numbered 397 (Table 2.1). Unlike the two previous years, a relatively large population nested on Peninsula B, while the population on Peninsula C declined by 24 percent. Note, however that the largest night-heron nesting population remains on Peninsula C, where they shifted into a new stand of trees away from the cormorants. Great Egrets had 6 nests. Caspian Terns continued to nest and expand their colony on Peninsula B with 263 nests counted.

Table 2.1. Colonial Waterbird Nests at TTP, 2003 - 2014

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
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
BCNH	904	601	610	504	730	455	546 ^a	431	423	410	297	397
GREG	0	1	4	3	5	5	7	5	7	8	4	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*
HERG	48	79	NC	NC	45	30	NC	<20*	NC	NC	NC	NC
COTE	420	433	448	NC	367	310	354	231	54	24*	0	179
CATE	252	350*	0	0	0	0	0	0	0	5*	98	263

a - Nesting failed by June 30

*- Estimate

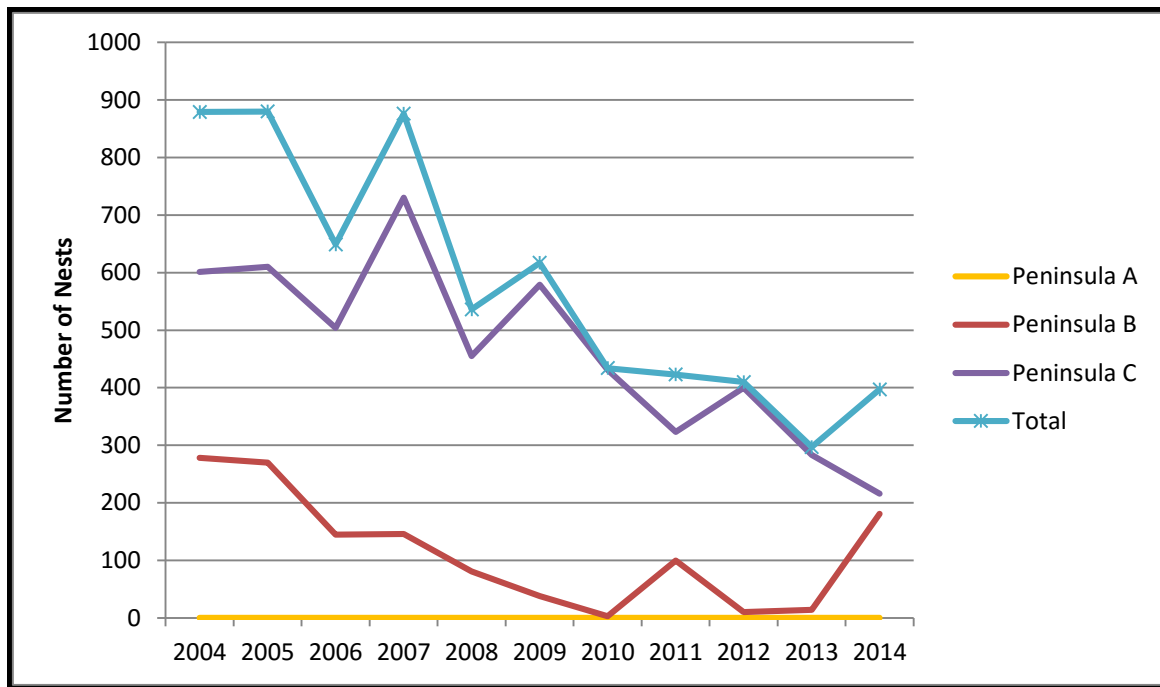


Figure 2.C. Black-crowned Night-Heron Nests at TTP by location, 2004-2014

After three years of failed breeding attempts primarily due to mammalian predation, Common Terns had a successful season at TTP in 2014. Prior to the breeding season, the artificial nesting rafts were redesigned to include a substantial 'L' shaped metal panel on all sides to act as a mammalian predator guard. One raft was deployed in Embayment D (as in previous years), and another in Embayment A. The Cell 2 rafts were removed due to the Cell 2 wetland creation project commencement. The new predator guard proved to be effective and both rafts fledged chicks. Nest counts were undertaken at a distance to reduce stress on the terns. Approximately 44 nests were observed on the raft in Embayment A, and 65 in Embayment D. Nesting was also attempted on the Cell One Island where 70 nests were observed.

Gull population estimates were not undertaken in 2014, 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 second 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.



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 will no longer be 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 Nest (M. Dupuis-Desormeaux)

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 – 2102.)

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 develop 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 excretions 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	AVG
ALFL						1				0
AMGO	22	15	10	8	22	35	8	14	19	17
AMRO	14	25	31	26	34	41	40	22	15	28
AMWO				1				1		0
BANS	*	104	2	5	4	14	35	7	22	21
BAEA								*		0
BAOR	21	29	22	23	13	28	22	26	21	23
BARS	1	31	3	11	8	32	31	22	15	17
BCCH	3	1	3	2	4	3	1	3		2
BEKI	3			2	1				1	1
BGGN	3	3	2	8					3	2
BHCO	15	22	11	19	19	10	17	12	5	14
BLJA			3	1	1		1			1
BLPW				1						0
BOBO	*	3								0
BRTH		4						1	3	1
CANG	*				*				*	0
CEDW	12	12	11	39	19	31	47	17	16	23
CHSW	*	*	2	*		2		3	2	1
COGR	21	12	11	9	17	23	8	12	5	13
COYE	1	2	1		2	2			4	1
DOWO						2	1	1	1	1
EAKI	12	18	25	12	20	18	12	7	2	14
EAME	1	2	5							1
EAWP		1	1	3	1	8	6	8	6	4
EUST	24	21	35	116	41	52	39	8	44	42
FISP		3								0
GADW			3	*	1	16		*	2	2
GCFL		2		3						1
GRCA	26	24	19	17	38	16	21	16	21	22
HOFI	1	*				1				0
HOSP	3		2							1
HOWR								2	1	0
KILL	3	1	7	8	3		2	5	4	4
LEFL	5	17	6	7	11	11	8	10	4	9
MALL	*		*	4			*	*	2	1
MAWA				1						0
MODO	1	6	1		*			3		1
NOCA	2	3		4	3	1	2	5	3	3
NOFL	2	1	1	2		2				1
NOMO					*				1	0
NRWS	*	22	7	8	5	14	*	4	*	7
OROR							1	1	1	0
REVI									1	0
ROPI	*	*	*							0
RWBL	167	154	203	312	199	244	295	265	276	235
SAVS	12	2		1						2
SOSP	74	72	68	81	55	46	50	66	47	62
SPSA	6	7	9	6	3	4	2	1	5	5
TRES	*	8	15	9	16	24	11	25	30	15
TRFL			1		1				2	0
VEER		1								0
WAVI	25	31	22	41	30	39	50	53	46	36
WIFL	23	27	17	26	14	25	16	17	20	21
YEWA	105	118	109	134	100	168	136	146	166	131
Birds	608	804	668	950	685	913	862	783	816	788
Species	37	38	35	37	32	30	28	34	37	34

* Species observed beyond 100 metres and/or flying over

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 37 species was detected for all counts in 2014, including one new species for VCP counts, i.e., Red-eyed Vireo. Additionally, House Wren and Northern Mockingbird were recorded for only the second time, while Brown Thrasher, Orchard Oriole and Trail's Flycatcher were observed for only the third time over the last nine years. The total of 37 species is the highest since 2009, and slightly above the nine-year average of 34.2.

It is interesting that numbers of Eastern Kingbird and Least Flycatcher were the lowest of the past nine years, yet there was no parallel decrease in nests located (see Table 3.5). A possible explanation is that few of the nests in 2014 were near any of the VCP locations, and this is true for Least Flycatchers, but not for Eastern Kingbirds.

As can be seen in Figure 3.A, most VCP stations experienced total bird abundance in 2014 that was at least average. In fact, six of the stations (2, 3, 5, 6, 8 and 9) exceeded the average of the past nine years. Total abundance for all stations in 2014 (816 birds) was slightly higher than the nine-year average (792 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,

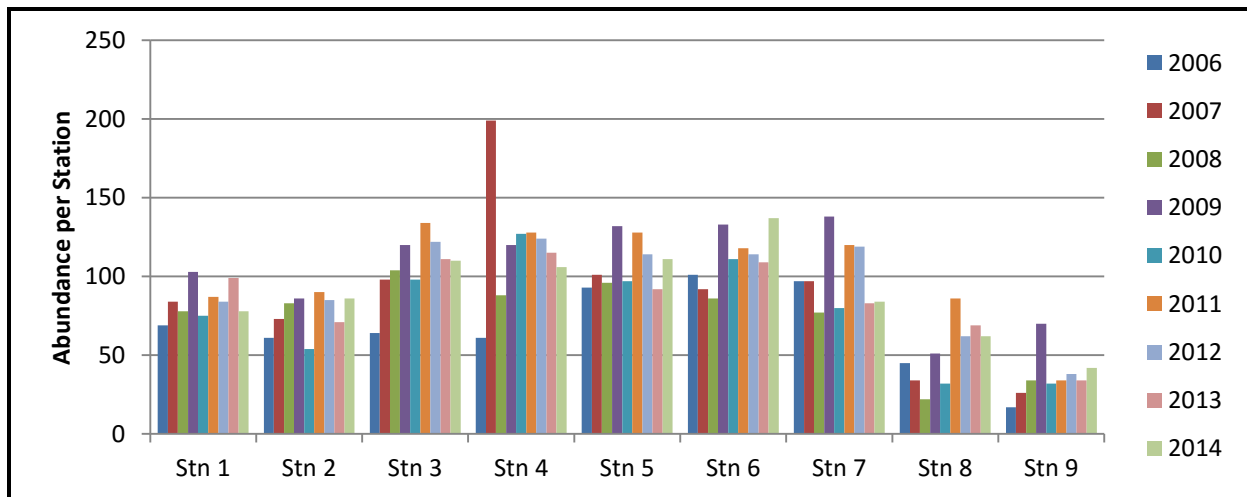


Figure 3.A. Total Bird Abundance per VCP Station

Species richness, or diversity, (Figure 3.B) for Stations 1 (wet thicket) and 3 (dry meadow) was slightly below the average of the past nine years, but all of the other stations experienced species diversity at or near the nine-year average.

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.

Species recording a new high VCP count, or matching the previous high, were Common Yellowthroat, Northern Mockingbird, Orchard Oriole, Tree Swallow, Trail's Flycatcher and Warbling Vireo.

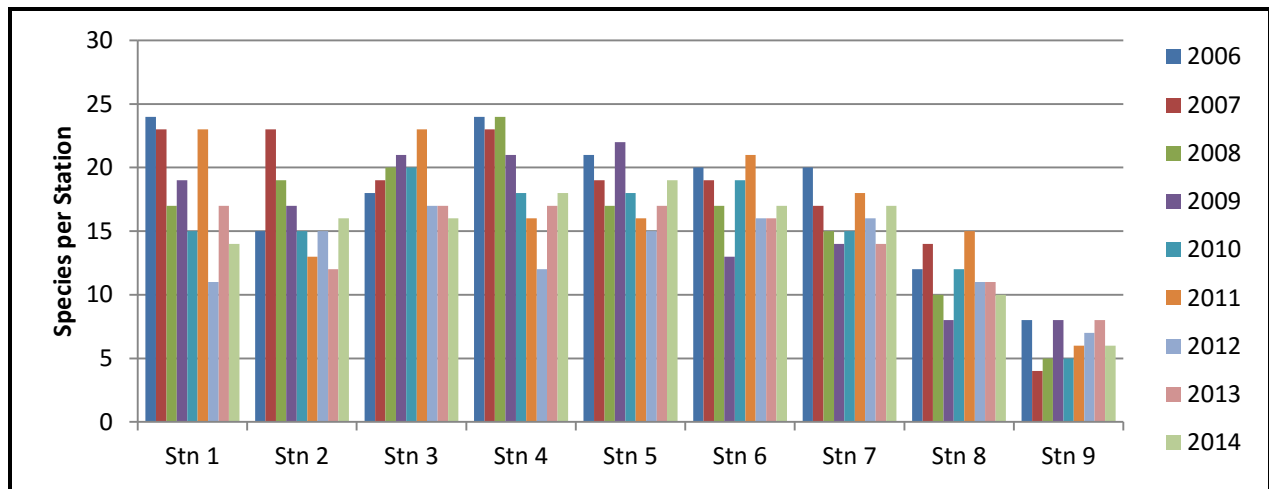


Figure 3.B. Species Richness per VCP Station

3.3.2 Nest Searching and Monitoring Results

In 2014, a total of 542.3 hours was logged by seven volunteers. Figure 3.C shows the breakdown of effort per zone. As in the previous three years, the greater effort in Zone A reflects the presence of additional volunteer time, as well as the discovery of nests in a section not previously extensively examined due to high water levels in early spring. There was also a significant increase in volunteer effort in Zones E and F. 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.

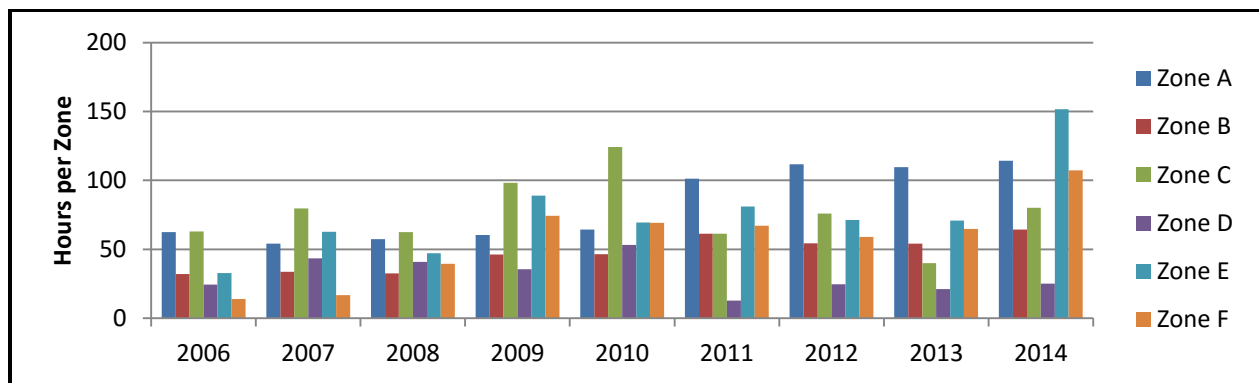


Figure 3.C. Nest Searching Effort per Zone from 2006 to 2014 (hours)

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 2014, a total of 902 nests was discovered, by far the highest number of nests found to date, and 690 of these nests were monitored (see Tables 3.5 and 3.6), excluding ground nests. Excluding the seven colonial waterbird species, nests of 32 species were found in 2014. Further, nesting was confirmed for an additional four species through observations such as recently-fledged young and adults carrying food (i.e., American Woodcock, Canada Goose, Trumpeter Swan, and, of course, Brown-headed Cowbird), making 43 confirmed nesters in total for TTP.

Table 3.5. Total Nests by Species from 2006 to 2014

Species	2006	2007	2008	2009	2010	2011	2012	2013	2014	AVG
AMGO	1	19	25	44	33	23	13	17	18	21
AMRO	12	26	51	93	69	115	93	93	89	71
AMWO					3	1	1			1
BANS	2			4	2	1				1
BAOR	13	12	9	9	10	17	16	15	35	15
BARS	5	5	3	3	2	4	11	26	31	10
BBCU									1	0
BCCH			1	2			1	2	1	1
BEKI	1	1	2						1	1
BGGN	1	1	1	3			2	4	6	2
BRTH	1	1	3	4	2		2	1	2	2
CANV									1	0
CEDW	3	7	14	40	14	21	23	19	37	20
COGR	3	2	1		4	4	2	3	2	2
DOWO		1			1	1	1	1		1
EAKI	11	17	26	22	14	12	27	21	20	19
EAME	1				1					0
EAWP		1			1	1	1		1	1
EUST	5	2	5	7	12	4	5	8	4	6
GADW	1	4	3	3	1	3	4	1	2	2
GRCA	12	9	11	23	11	16	21	24	34	18
HOFI		1								0
HOSP	1									0
HOWR	1		2	2	2	1				1
KILL	3	2	5	8	13	2	4	3	4	5
LEFL	1	2		3	1				3	1
MALL	6	7	9	12	12	6	9	8	5	8
MODO	4	4		3			1			1
NOCA	1	6	2	4	1		1	1	3	2
NOFL	4		1		3	3			1	1
NRWS	1	1		2		1			1	1
OROR	1	2	1		2	1	2	3	2	2
RWBL	45	58	82	130	167	232	268	310	361	184
SOSP	6	5	1	7	8	2	3	2	8	5
SPSA	5	6	3	5	8	4	5	6	3	5
TRES	7	6	9	9	9	5	5	12	13	8
WAVI	8	4	7	7	9	15	12	13	31	12
WIFL	13	21	15	25	15	12	14	13	18	16
Yewa	34	71	71	75	82	88	86	127	164	89
Total	213	304	363	549	512	595	633	733	902	534
Total Effort (hours)	228	289.2	279.5	403.7	427	384.6	397	360.1	542.3	367.9
Efficiency (nests/hour)	0.94	1.05	1.3	1.36	1.2	1.54	1.59	2.04	1.66	1.45

The 902 total nests located in 2014 were 23% more than the previous high in 2013 and a 64% increase over the five years since 2009. This naturally raises the question of why the project has been able to achieve such an increase. As can be seen from Appendix G, which depicts the 549 nests of 2009 along with the 902 nests found in 2014, the additional nests are scattered throughout TTP, rather than being concentrated in one or two locations. The increase can be explained by: (a) the increase and maturation of nesting habitat throughout TTP; (b) the ever-increasing nest-searching skills in the project participants; (c) the availability of significantly more volunteer time, resulting in a 34% increase in the number of participant hours over 2009; and (d) 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 nine years of the project for Baltimore Orioles (up 106% from the previous high), Barn Swallows (up 71%), Blue-gray Gnatcatchers (up 50%), Warbling Vireos (up 138%), Red-winged Blackbirds (up 16%), Gray Catbirds (up 42%) and Yellow Warblers (up 29%). The latter

three species are taking advantage of the increasing number and densification of dogwood, honeysuckle and reeds. It should be noted that the vegetation throughout the park in general appears to be gradually maturing more each year as one moves south on TTP. This vegetation development, of course, serves to provide more nesting habitat for the birds.

The dramatic increase in Barn Swallow nests in the past three years is 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.



Black-billed Cuckoo Nest (D. Johnston)

The first Black-billed Cuckoo nest of the project was located, although this species is reported to have nested at TTP previously. Single nests were also confirmed for Black-capped Chickadee, Eastern Wood-Pewee, Gadwall, Northern Flicker and Northern Rough-winged Swallow, species which are relatively rare at TTP or whose nests are difficult to locate.

Some grassland management was undertaken by TRCA in early spring of 2013 when the vegetation on part of the Toplands was mowed. The area chosen had previously been frequented by Savannah and Song Sparrows during past breeding seasons, but these birds had almost totally disappeared from the area in recent years as the vegetation (such as clover and goldenrod) became denser and taller. Unfortunately, both 2013 and 2014 experienced a very wet spring, such that the area was not conducive to nesting, and no evidence of sparrows was detected in the area during 2013's and 2014's breeding season. Nevertheless, careful monitoring of the area will continue in future years.

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. While 2014's efficiency did not match that seen in 2013 (when the efficiency was somewhat inflated due to a project participant being ill and unable to maintain normal searching and monitoring activity), it was higher than any other year of the project.

3.3.2.1 Nest Productivity

A total of 690 nests was recorded online with ONRS in 2014 (Table 3.6). In terms of nest productivity, 120 (i.e., 26%) of 458 nests with known outcomes failed, while 338 were successful in fledging young. The remaining 232 monitored nests had unknown outcomes, with the 2014 ratio of unknown outcomes to nests monitored (i.e., 34%) almost matching the previous low (i.e., 33%) recorded in 2006. That is, 2014 was particularly successful in being able to determine nest outcomes. (The nests with unknown outcomes included all ground nests, of which there were 15 in 2014 and which, commencing in 2012, were not monitored once found.)

As can be seen in Table 3.6, the 2014 nest failure rate of 26% is the lowest of the last nine years. Nest predation was the most common cause of nest failure again in 2014. Possible predators at TTP include raccoons, gartersnakes, mink and coyotes, as well as other bird species. Of the 120 failures, 23 occurred at the egg stage, 9 at young stage and 88 at either egg or young stage.

Table 3.6. Nest Productivity from 2006 to 2014

	2006	2007	2008	2009	2010	2011	2012	2013	2014	AVG
Nests discovered	214	304	363	549	512	593	633	733	902	534
Species	33	30	27	27	34	27	28	25	31	29
Nests monitored & reported to ONRS	214	236	297	456	440	430	464	549	690	419
- Unknown outcome	71	160	148	170	213	155	213	266	232	182
- Known outcome	143	144	149	286	227	275	251	283	458	246
- Successful	82	77	97	162	144	177	171	186	338	159
- Failed	61	67	52	124	83	98	80	97	120	74
- Failure rate	43%	47%	35%	43%	37%	36%	32%	34%	26%	30%



Red-winged Blackbird Nest (P. Xamin)

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.

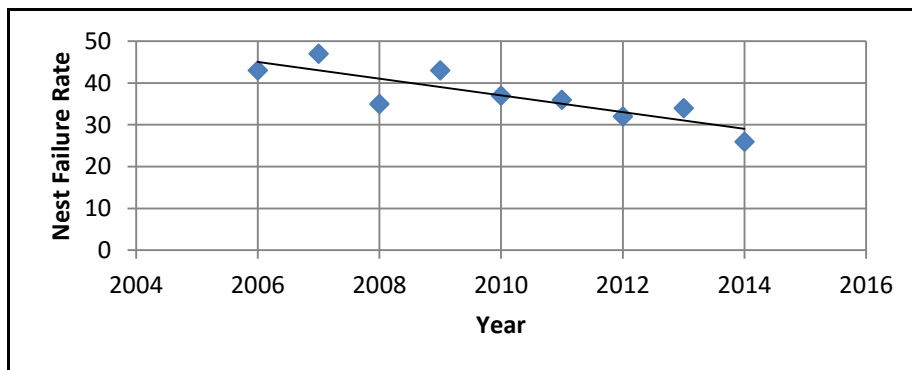


Figure 3.D Known Nest Failure Rate Trend

As can be seen in Table 3.7, the 43 confirmed breeders in 2014 were somewhat above the nine-year average. The 68 total species detected during all surveys is slightly below the nine-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 VCP Counts and Nest Searching

	2006	2007	2008	2009	2010	2011	2012	2013	2014	AVG
Confirmed Breeding Species	45	43	34	37	40	36	40	40	43	40
Probable Breeding Species	4	7	9	11	2	4	3	5	5	6
Possible Breeding Species	19	10	15	14	8	3	6	4	8	10
Other Species Observed	7	13	16	20	17	21	36	22	12	18
Total Species	75	73	74	82	67	64	85	71	68	73

Looking at the past nine 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 2014, a total of 35 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.)

The overall rate of parasitism in 2014 was the lowest by far of the last nine years. In particular, the two species previously experiencing the highest rate of parasitism, Red-winged Blackbirds and Yellow warblers, had their lowest levels of the nine years.

Despite the lower rates of parasitism in 2014, 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 32% per year of observable nests, followed by Red-winged Blackbirds at 26% average per year (see Table 3.8).



Brown-headed Cowbird Fledgling Being Fed by Yellow Warbler (D. Johnston)

Table 3.8. Brown-headed Cowbird Parasitism Data and Rates from 2006 to 2014.

Brown-headed Cowbird Parasitism								
		American Goldfinch	American Robin	Red-winged Blackbird	Song Sparrow	Willow Flycatcher	Yellow Warbler	Totals
2006	Total nests *	1	5	41	6	13	30	96
	Nests parasitized	1	0	12	2	3	9	27
	% parasitized	100%	0%	29%	33%	23%	30%	28%
2007	Total nests *	8	3	36	5	17	56	125
	Nests parasitized	2	0	8	0	4	29	43
	% parasitized	25%	0%	22%	0%	24%	52%	34%
2008	Total nests *	15	28	45		15	51	154
	Nests parasitized	1	1	18		4	21	45
	% parasitized	7%	4%	40%		27%	41%	29%
2009	Total nests *	21	44	112	4	24	68	273
	Nests parasitized	5	0	32	2	4	34	77
	% parasitized	24%	0%	29%	50%	17%	50%	28%
2010	Total nests *	19	28	110	4	11	66	238
	Nests parasitized	0	0	27	1	2	21	51
	% parasitized	0%	0%	25%	25%	18%	32%	21%
2011	Total nests *	13	26	81	2	11	36	169
	Nests parasitized	2	0	18	0	0	10	30
	% parasitized	15%	0%	22	0%	0%	29%	19%
2012	Total nests *	8	17	77	2	8	33	145
	Nests parasitized	0	0	30	0	2	7	39
	% parasitized	0%	0%	39%	0%	25%	21%	27%
2013	Total nests *	9	26	145	2	11	75	268
	Nests parasitized	1	1	33	0	1	22	58
	% parasitized	11%	4%	23%	0%	9%	29%	22%
2014	Total nests *	10	27	134	6	13	96	286
	Nests parasitized	0	0	22	0	2	11	35
	% parasitized	0	0	16%	0%	15	12%	12%
AVG	Avg total nests *	12	23	87	3	14	57	195
	Avg parasitized	1	0	22	1	2	18	45
	% parasitized	12%	1%	26%	16%	18%	32%	23%

* 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

The overall parasitism rate in 2014 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. 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).

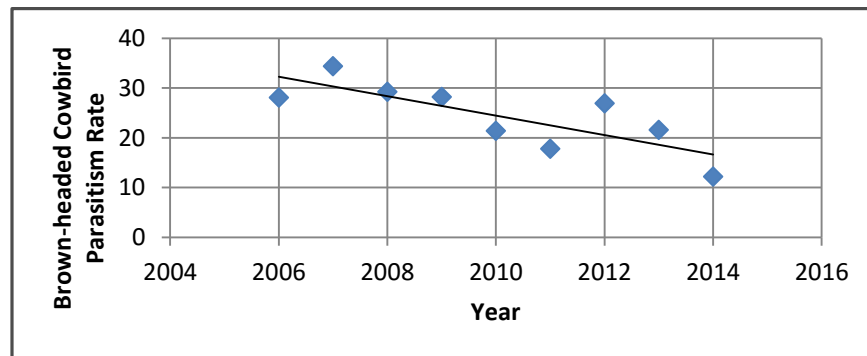


Figure 3.E Brown-headed Cowbird Parasitism Rate Trend

3.3.2.3 Song Sparrow Nests

In 2014, eight Song Sparrow nests were discovered, with the location of these nests illustrating the adaptability of this species. Although the project protocol was changed in 2012 to avoid seeking ground-nesting birds, three Song Sparrow ground nests were found by accident as volunteers crisscrossed TTP. (None of these ground nests was subsequently monitored.) Of the remaining five nests, two were in spruce trees, one was in a pine tree, one was in a black locust tree, and the fifth was in a wild rose bush. This species must surely be the most adaptable of all the species nesting regularly at TTP.



Song Sparrow Nests in a Black Locust Tree (left) and Wild Rose Bush (right) (D. Johnston)

3.4 The Overall Picture in 2014

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

With the addition of Black-billed Cuckoo in 2014, there have been 43 nesters confirmed since the current project commenced. This total includes the 38 species listed in Table 3.5, plus Brown-headed Cowbird, Wood Duck (nesting confirmed in 2012 by 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 68 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 or Northern Bobwhite). 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 will grow in the future. Natural change and habitat creation and restoration projects carried out by TRCA, such as the changes to Cell 2 which have recently started, are also expected to increase the variety of habitats suitable for species not yet on the confirmed breeders list.

It is 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., Black-billed Cuckoo), (ii) secretive habits, (iii) well-hidden nests (e.g., Downy Woodpecker), (iv) nests or normal habitat not located near VCP stations, (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 Chimney Swift Common Yellowthroat Downy Woodpecker House Wren Northern Mockingbird Red-eyed Vireo	Black-billed Cuckoo Black-capped Chickadee Northern Flicker Northern Rough-winged Swallow



Young Brown Thrasher (M. Dupuis-Desormeaux)

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 2014 VCP observations were collected by Ian Sturdee and Don Johnston, and the volunteer contributions to the nest searching phase of the project in 2014 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 detailed maps and vegetation graphics in the annual reports, and also helped write several of the annual reports.

Table 3.10 2014 Effort by Nest Searching Project Participants

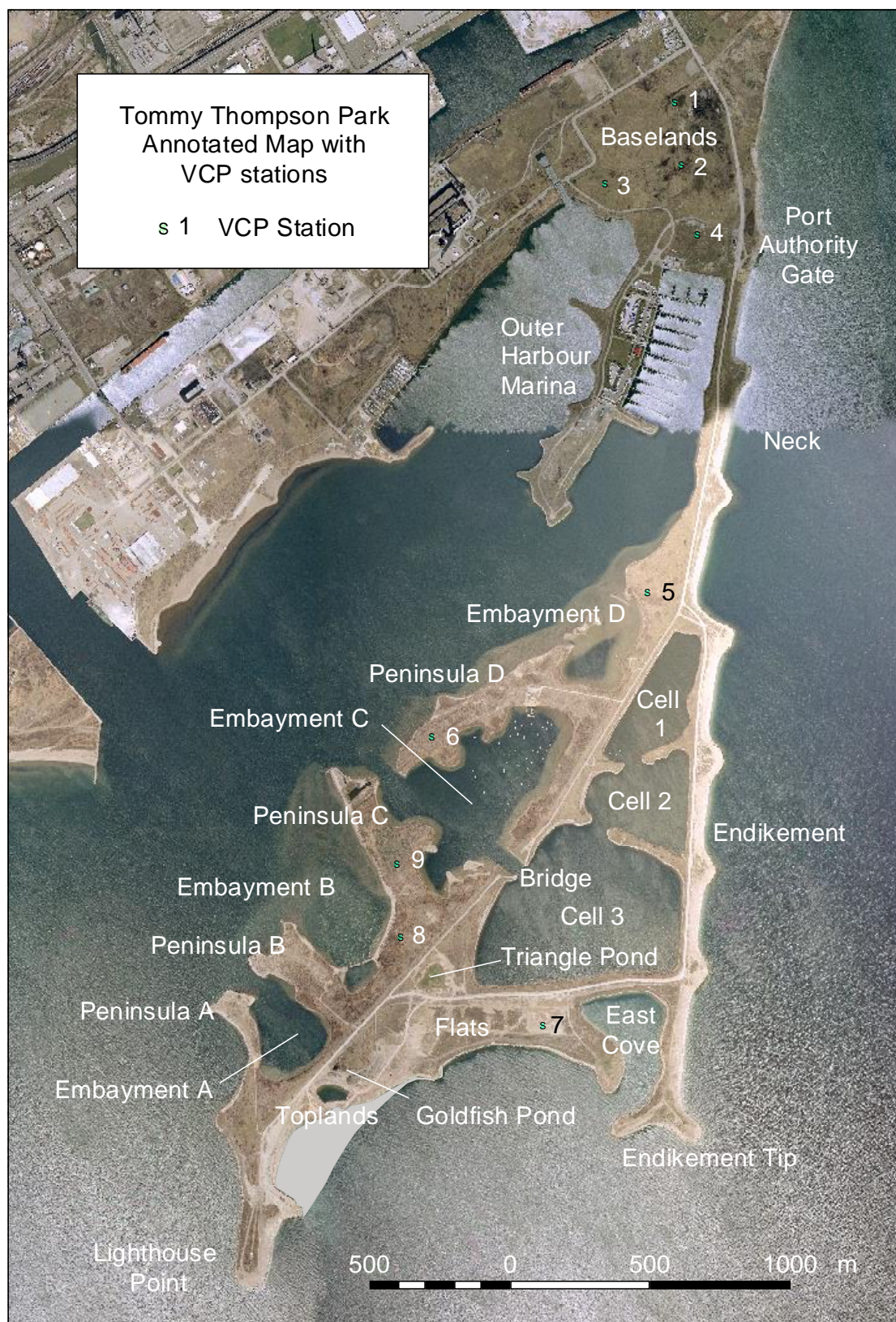
Name	Total Hours
Marc Dupuis-Desormeaux	31.00
Don Johnston	130.50
Jan McDonald	39.75
Pierre Robillard	46.25
Ian Sturdee	147.50
Bert Vanderzon	42.25
Paul Xamin	106.00
Total	542.25

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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)

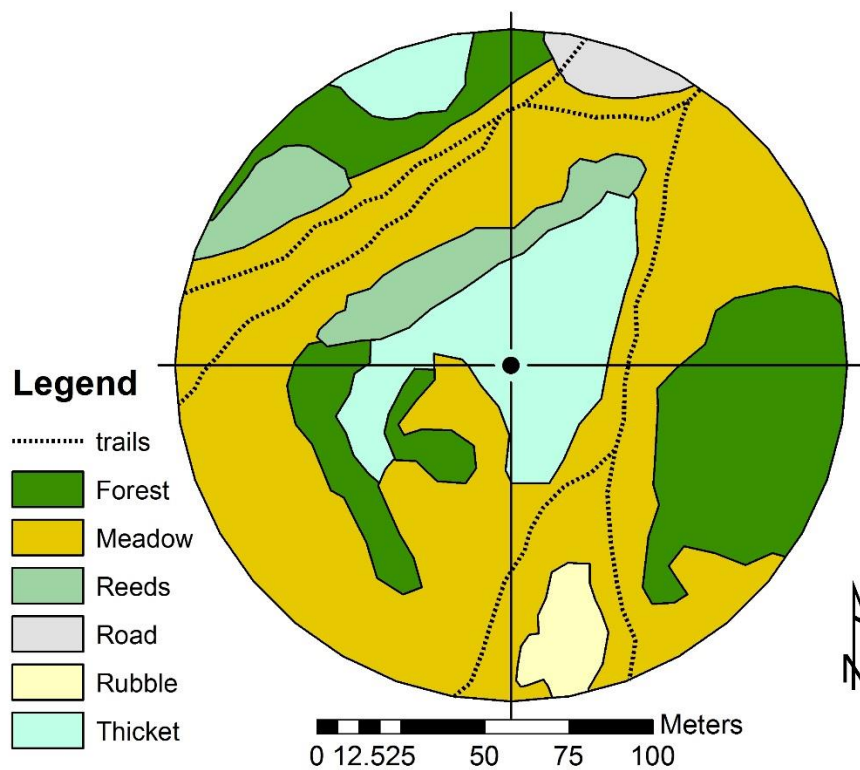


VCP Stn 1 – 2013 – 3 (South)



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)

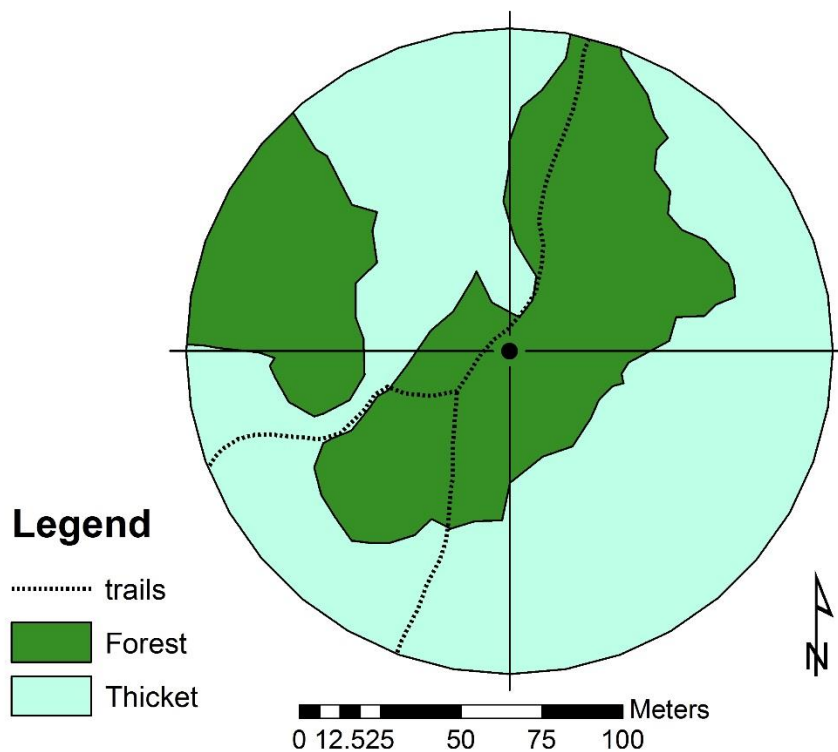


VCP Stn 2 – 2013 - 3 (South)



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)

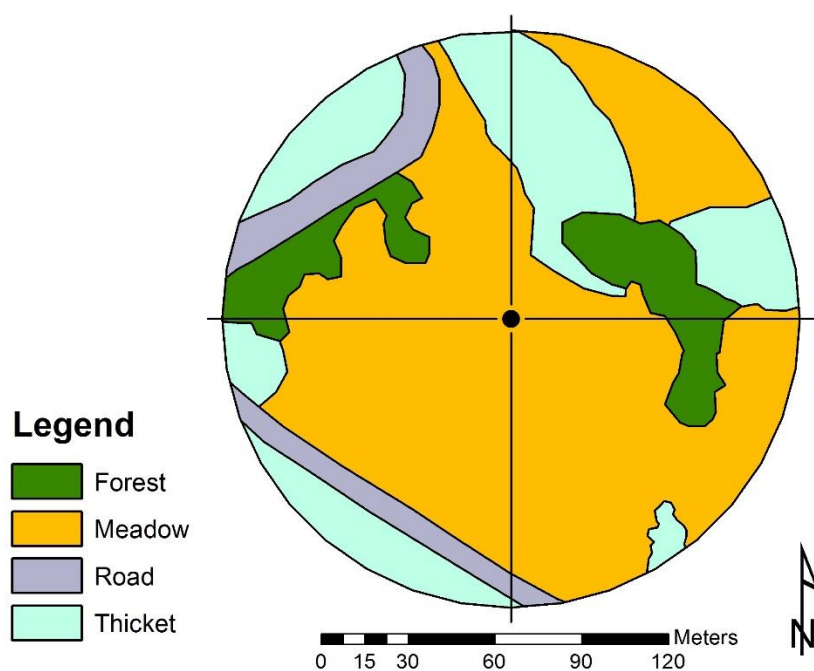


VCP Stn 3 - 2013 - 3 (South)



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)

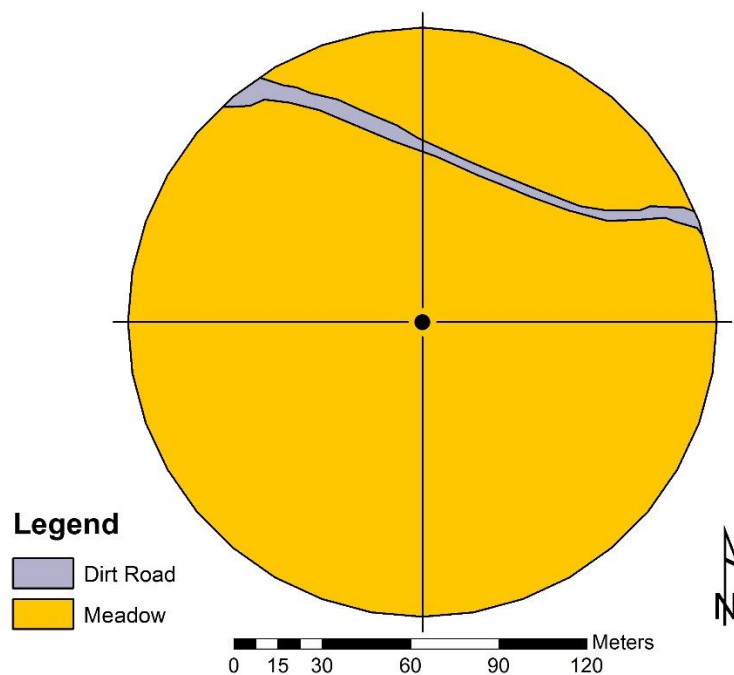


VCP Stn 4 - 2013 - 3 (South)



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)

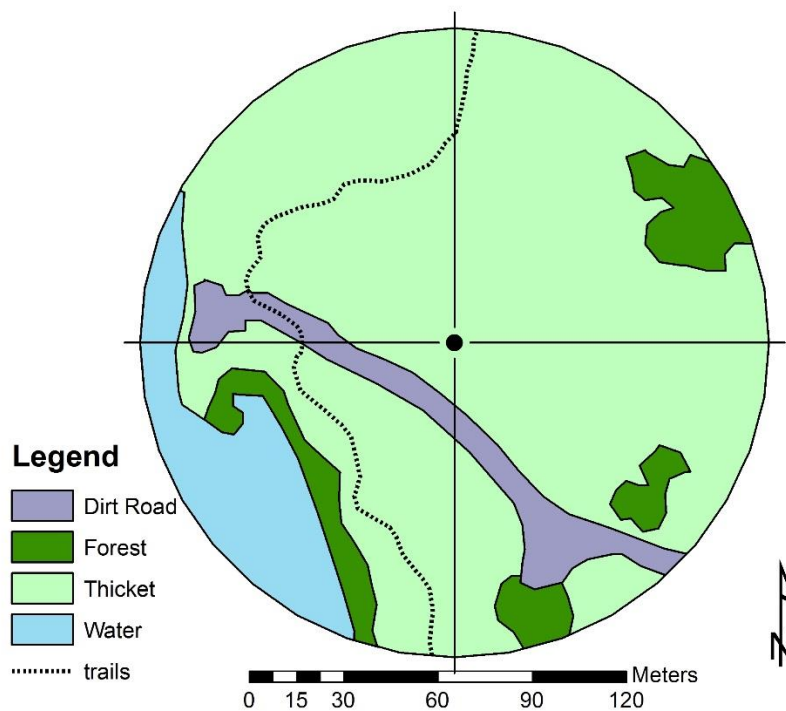


VCP Stn 5 - 2013 - 3 (South)



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)

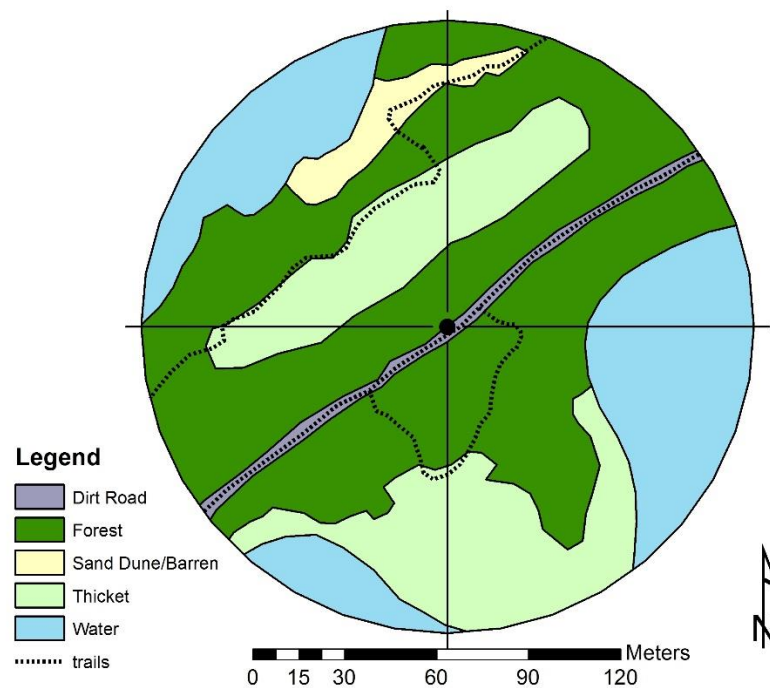


VCP Stn 6 - 2013 - 3 (South)



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)

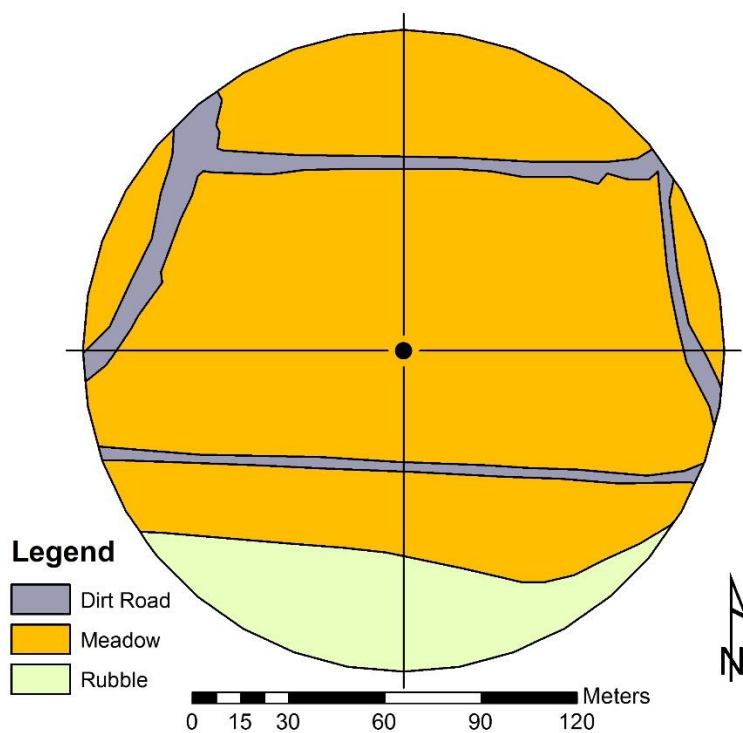


VCP Stn 7 - 2013 - 3 (South)



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)

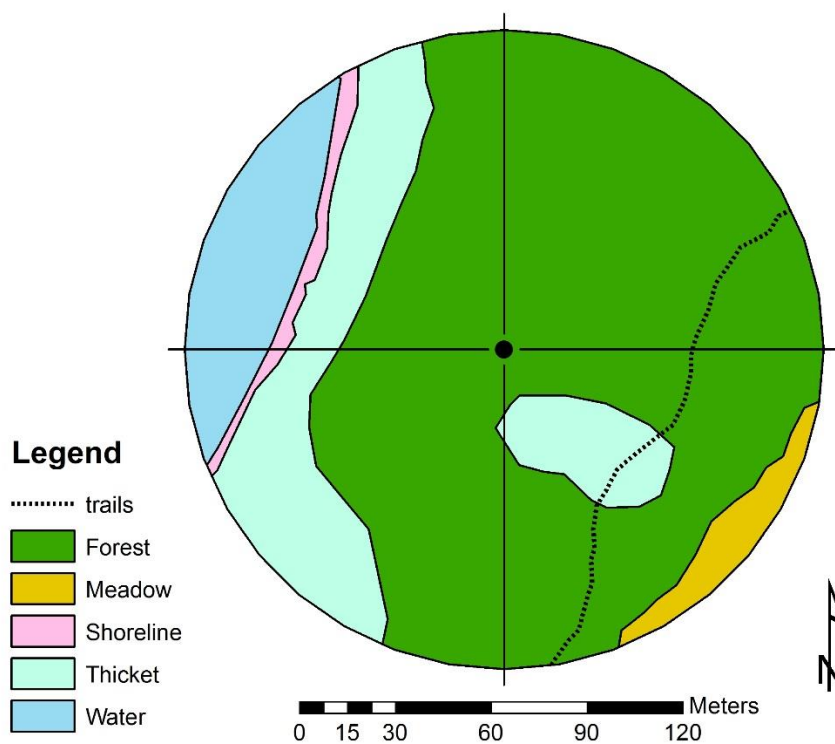


VCP Stn 8 - 2013 - 3 (South)



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)

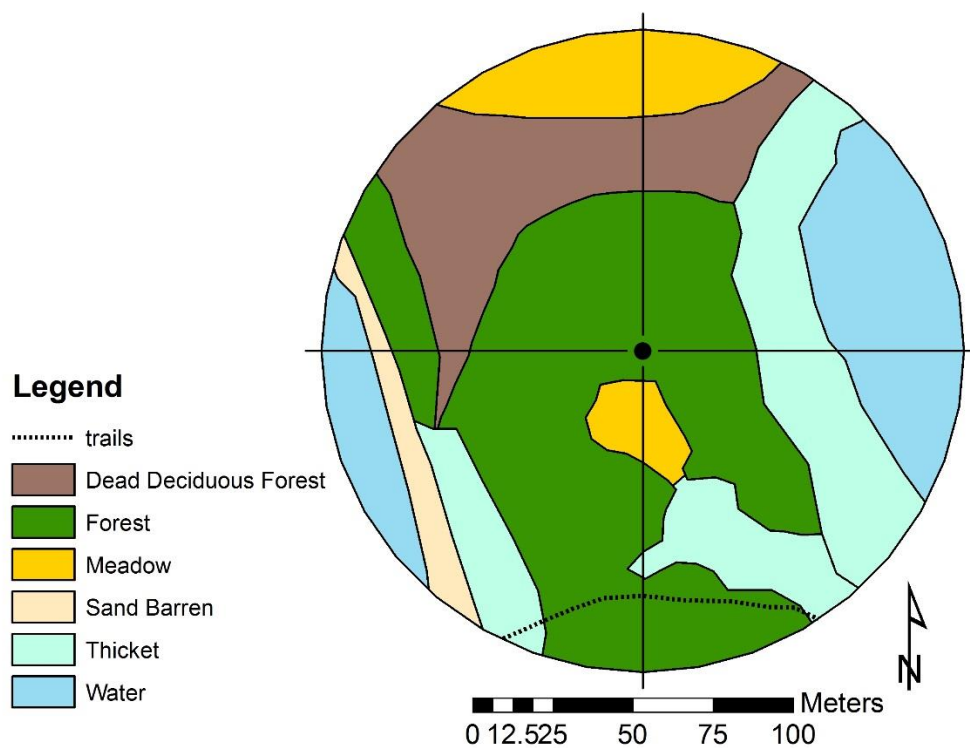


VCP Stn 9 - 2013 - (South)

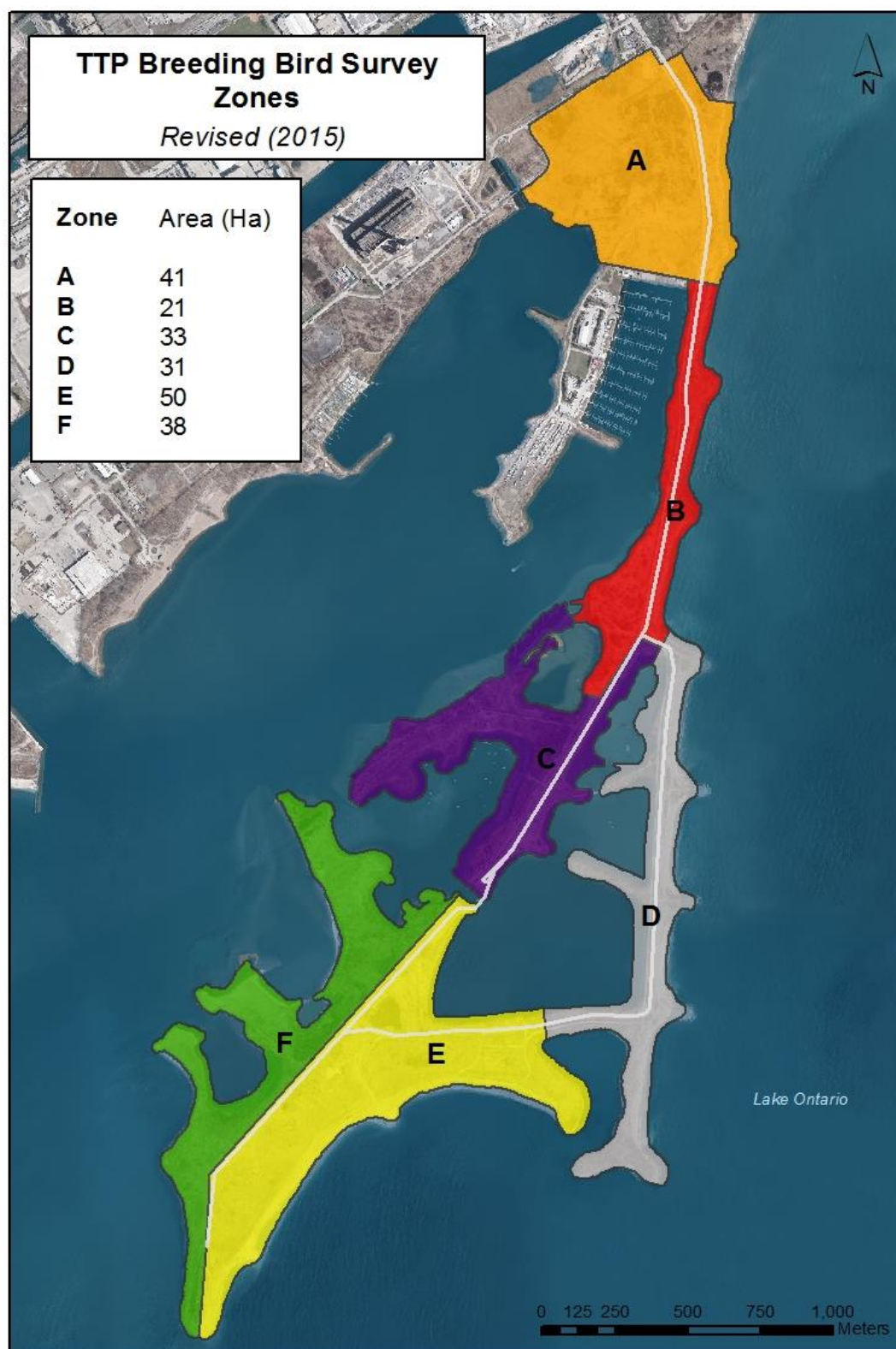


VCP Stn 9 - 2013 - 4 (West)

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 2014, as well as historically confirmed breeders. Species highlighted in red were detected in 2014 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 Crow (2014 - absent) Known to have bred historically at TTP.

American Goldfinch (2014 - confirmed) This species is a regular late nester at TTP. In 2014, 18 nests were discovered, an increase over 2012 and 2013, but still below the annual average for the project.

American Kestrel (2014 – absent) Known to have bred historically at TTP.

American Robin (2014 - confirmed) Common nesting species in forested areas throughout TTP. In 2014, 89 nests were recorded, well above the project's annual average.

American Woodcock (2014 - confirmed) Although no nests were located in 2014, recently-fledged young were observed, along with several individuals seen throughout TTP. The 2012 change in protocol with regard to ground-nesting birds makes locating nests much less likely.

American Black Duck (2014 - absent) Known to have bred historically at TTP.

Bald Eagle (2014 – observed) This species has never been confirmed as a breeder at TTP. An immature bird was observed on a number of occasions in the spring and summer of 2014.

Baltimore Oriole (2014 - confirmed) Common nesting species in forest areas of TTP. A total of 35 nests was recorded in 2014, more than twice the previous highest number (i.e., 17 in 2011) of the project.

Bank Swallow (2014 - probable) Individuals were observed visiting a probable nesting site in 2014 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 (2014 - confirmed) Barn Swallows are regular nesters at TTP under the eaves of buildings. In 2014, 31 nests were discovered at TTP, the highest number so far. This continues the rapid increase in nests of this species in the past three years following the construction of three new buildings by TRCA.

Belted Kingfisher (2014 - confirmed) An individual was observed entering and leaving the nest site. This species was confirmed for the first time in 2003 based on observations of fledged young.

Black-capped Chickadee (2014 - confirmed) A regular but uncommon nester at TTP. One nest was detected in 2014 through observing adults carrying food to the nest.

Black-crowned Night-Heron (2014 - confirmed) The population of this species 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.

Black-billed Cuckoo (2014 – confirmed) Known to have bred historically at TTP. The first nest of this species of the project was found in 2014.

Blue-gray Gnatcatcher (2014 - confirmed) In 2014, six nests were found, representing a new high for the project.

Blue Jay (2014 - observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2014 in the Baselands was presumably a late migrant.

Bobolink (2014 - observed) This species has never been confirmed as a breeder at TTP. Several birds which were observed in 2014 near the Lighthouse and on the Toplands were presumably late migrants. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Brown-headed Cowbird (2014 - confirmed) Brown-headed Cowbird is a common species throughout TTP during summer, and in 2014, a total of 35 nests of Yellow Warbler (11), Red-winged Blackbird (22) and Willow Flycatcher (2) were found to have been parasitized by cowbirds. This is the lowest percentage of parasitized nests of the project.

Brown Thrasher (2014 - confirmed) Brown Thrasher is a regular but uncommon nester at TTP. Two nests were discovered in 2014, in line with the project average.

California Gull (2014 – absent) Known to have bred historically at TTP, but not detected in recent years.

Canada Goose (2014 - confirmed) Canada Goose is a regular breeder at TTP along shoreline edges of embayments and containment cells.

Canvasback (2014 - confirmed) Canvasback has bred almost annually in recent years in the Triangle Pond area at TTP. In 2014, a pair was observed nesting on Goldfish Pond, although the outcome was not confirmed.

Caspian Tern (2014 - confirmed) xx nests were located on Peninsula B in 2014.

Cedar Waxwing (2014 - confirmed) A common late nester at TTP; 37 nests were found in 2014, well above the average for the project.

Chimney Swift (2014 - observed) This species has never been confirmed as a breeder at TTP. Several birds which were observed in 2014 in many areas of TTP were presumably foraging from the city.

Cliff Swallow (2014 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2014 near East Cove may have been nesting in the vicinity of TTP.

Common Grackle (2014 - confirmed) Common Grackle is a regular nester at TTP. In 2014, two nests were found, about average for the project.

Common Merganser (2014 – observed) This species has never been confirmed as a breeder at TTP. A male was observed near the Flats in 2014.

Common Raven (2014 – observed) This species has never been confirmed as a breeder at TTP, although a pair nested immediately north of TTP in 2014 and were seen regularly throughout TTP.

Common Tern (2014 – confirmed) The introduction of new nesting rafts designed to repel predators resulted in a successful nesting season for this species.

Common Yellowthroat (2014 - probable) Known to have bred historically at TTP. A pair was observed in 2014 in their breeding season in suitable nesting habitat on the Toplands.

Double-crested Cormorant (2014 - confirmed) TTP has the largest colony in the lower Great Lakes region. xx% of the colony nests on the ground on Peninsula B.

Downy Woodpecker (2014 - probable) Although no nests were found in 2014, a pair was observed during their breeding season in suitable nesting habitat on Peninsula D.

Eastern Kingbird (2013 - confirmed) A regular breeder at TTP along forest edges where meadow and shrubs are present. In 2014, a total of 20 nests was found, close to the average for the project.

Eastern Meadowlark (2014 - 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 (2014 – confirmed) One nest was found in 2014. 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 (2014 - 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. Four nests were documented in 2014, slightly below average for the project.

Gadwall (2014 - confirmed) Gadwall is a surprisingly common nesting species at TTP, although in 2014, only two nests were confirmed. The 2012 change in protocol with regard to ground-nesting birds makes locating nests less likely.

Gray Catbird (2014 - confirmed) Gray Catbird is a regular nester at TTP, preferring dense shrubs with some tree cover. A total of 34 nests were found in 2014, well above the previous high for the project.

Great black-backed Gull (2014 - absent) Known to have bred historically at TTP.

Great-crested Flycatcher (2014 - probable) This species has never been confirmed as a breeder at TTP, but a pair was observed in courtship display near Peninsula A during the breeding season.

Great Egret (2014 - confirmed) Regular nester in small numbers on Peninsula C.

Great Blue Heron (2014 - absent) Known to have bred historically at TTP.

Green Heron (2014 - possible) This species has never been confirmed as a breeder at TTP, but two juvenile birds were observed in 2014 in the vicinity of Embayment D during their breeding season.

Green-winged Teal (2014 – observed) This species has never been confirmed as a breeder at TTP. A pair was observed in Cell 3 towards the end of their breeding season.

Herring Gull (2014 - confirmed) A common annual nesting colonial waterbird species at TTP.

Hooded Merganser (2014 - observed) This species has never been confirmed as a breeder at TTP. In 2014, as in previous years, several individuals were seen in the waters around and on TTP in June and July.

Horned Lark (2014 - absent) Known to have bred historically at TTP.

House Finch (2014 - absent) Known to have bred historically at TTP.

House Sparrow (2014 - possible) Known to have bred historically at TTP. In 2014, an individual was observed in the Baselands in suitable nesting habitat during its breeding season.

House Wren (2014 - possible) A regular nester at TTP, but in low numbers. In 2014, singing males were observed during the breeding season on Peninsula D and in the Baselands.

Killdeer (2014 - confirmed) Killdeer is a common nesting species at TTP in open areas with low vegetation. Four nests were found in 2014, 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 Bittern (2014 – observed) This species has never been confirmed as a breeder at TTP. An individual was observed in Triangle Pond towards the end of its breeding season.

Least Flycatcher (2014 - confirmed) A regular but uncommon breeder at TTP. In 2014, three nests were located, matching the previous high of the project.

Mallard (2014 - confirmed) Mallard is a regular nester at TTP. Five nests were documented in 2014, 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 (2014 - probable) Mourning Dove nests have been scarce at TTP in recent years, although a pair was observed in 2014 in their breeding season on the Neck.

Mute Swan (2014 - confirmed) Mute Swan is a regular nesting species along TTP shorelines.

Northern Bobwhite (2014 - absent) Known to have bred historically at TTP, but not detected in recent years.

Northern Cardinal (2014 - confirmed) Northern Cardinal is an uncommon but usually an annually-nesting species at TTP. In 2014, three nests were found, the highest number since 2009.

Northern Flicker (2014 - confirmed) Northern Flicker is an uncommon but regular nesting species at TTP. One nest was found in 2014 in the Baselands.

Northern Mockingbird (2014 - 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 2014 during its breeding season in suitable nesting habitat.

Northern Rough-winged Swallow (2014 - confirmed) Nesting was confirmed in 2014 through the observation of recently fledged young near Cell 1.

Orchard Oriole (2014 - confirmed) One or two nests of this species have been found in most years of the project, and in 2014, two nests were found.

Osprey (2014 – observed) This species has never been confirmed as a breeder at TTP.

Red-eyed Vireo (2014 - possible) This species has never been confirmed as a breeder at TTP. In 2014, a singing male was observed during its breeding season in suitable nesting habitat.

Redhead (2014 - absent) Known to have bred historically at TTP.

Red-winged Blackbird (2014 - confirmed) The most abundant nesting species at TTP (excluding waterbirds), found throughout the TTP area. In 2014, 361 nests were found, a new high for the project and almost double the annual average of the project to date.

Ring-billed Gull (2014 - confirmed) An abundant nesting colonial waterbird species at TTP.

Ring-necked Pheasant (2014 - absent) Known to have bred historically at TTP, but not detected in many years.

Rock Pigeon (2014 - observed) Known to have bred historically at TTP. Observed in 2014, but no nest was found.

Savannah Sparrow (2014 - 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 birds were observed and

heard singing in 2014 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 (2014 - confirmed) Song Sparrow is one of the most abundant nesting species at TTP, although few of its well-concealed nests are ever found. In 2014, eight nests were found in a variety of habitats. 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 (2014 - absent) Known to have bred historically at TTP, but not detected in recent years.

Spotted Sandpiper (2014 - confirmed) A common nester at TTP in open areas near water. Three nests were found in 2014, despite the 2012 change in protocol with regard to ground-nesting birds making locating nests less likely.

Tree Swallow (2014 - 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 13 nests in other nest boxes and natural cavities around TTP were documented and monitored in 2014.

Trumpeter Swan (2014 - confirmed) This species was confirmed as a breeder at TTP for the first time in 2013. The 2013 breeding pair was observed nesting again in 2014 in the Triangle Pond, producing seven cygnets, five of which survived.

Virginia Rail (2014 - absent) Known to have bred historically at TTP.

Warbling Vireo (2014 - confirmed) A common nesting species in forested areas of TTP. In 2014, 31 nests were found, by far the highest total of the past nine years of the project.

White-throated Sparrow (2014 - possible) This species has never been confirmed as a breeder at TTP. The singing male observed in 2014 during the breeding season was found in suitable nesting habitat near Embayment D.

Willow Flycatcher (2014 - confirmed) Willow Flycatcher is a common nesting species in more open areas with dense shrubs. In 2014, 18 nests were found, slightly above average for the project.

Wilson's Phalarope (2014 - absent) Known to have bred historically at TTP, but not detected in recent years.

Wood Duck (2014 - possible) This species was confirmed in 2012 as a breeder at TTP for the first time. In 2014, an individual was observed during its breeding season in Cell 1.

Yellow Warbler (2014 - confirmed) Yellow Warblers are common to abundant through much of TTP, usually nesting in dogwoods and honeysuckle. A total of 164 nests were found in 2014, by far the highest total for the project. This species continues to be the most frequently parasitized species by Brown-headed Cowbirds at TTP.

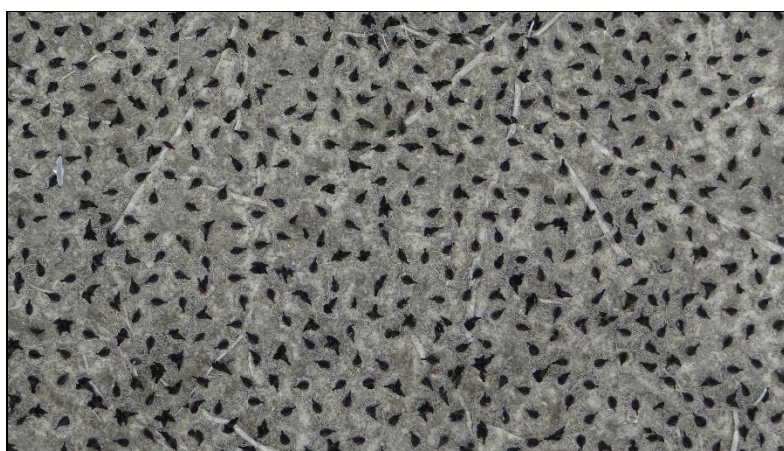
Appendix E: Aerial Photographs of Cormorant and Caspian Tern Colonies



Double-crested Cormorant Nests (green) and Caspian Tern Nests (purple) on Peninsula B

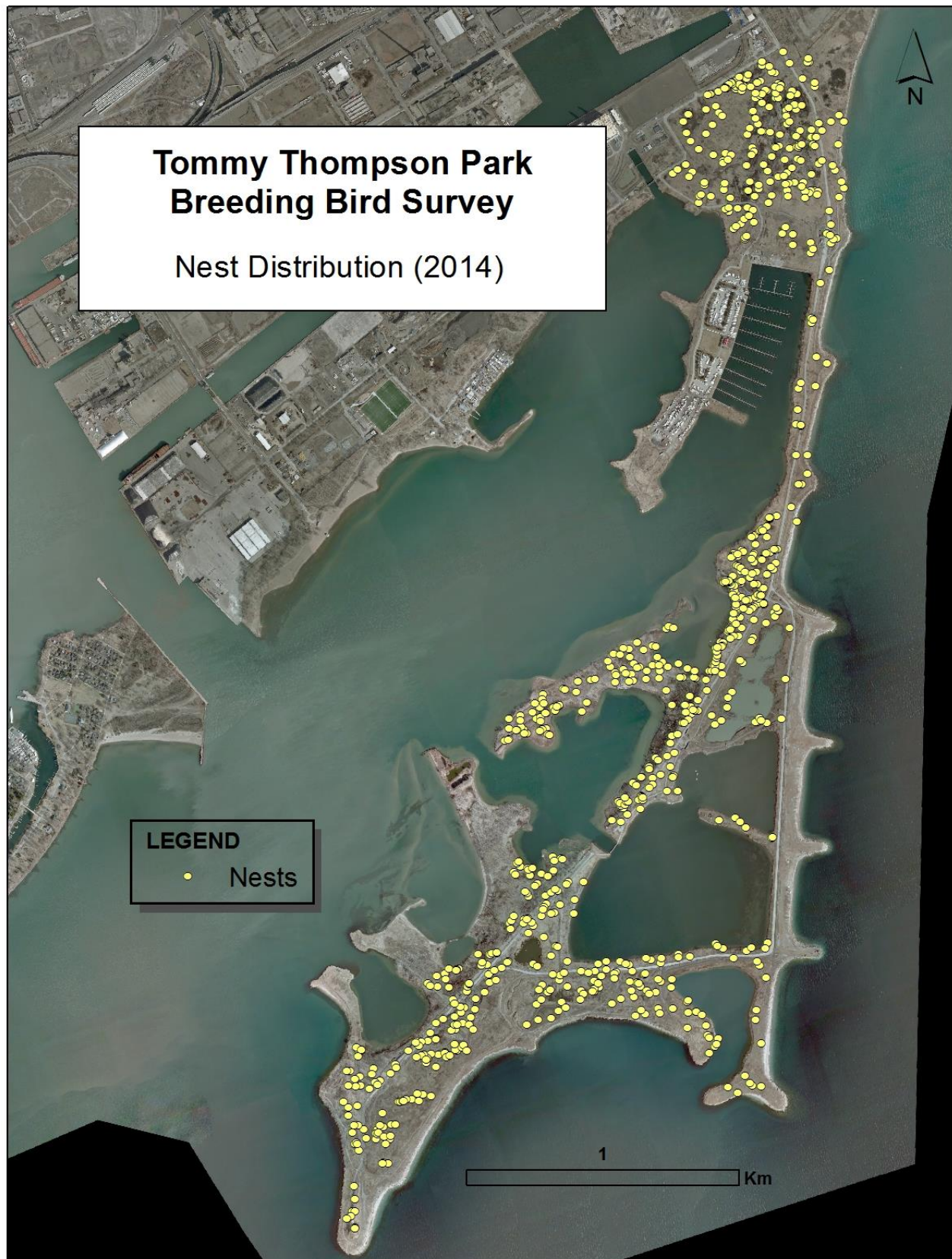


Portion of Peninsula B Double-crested Cormorant Colony



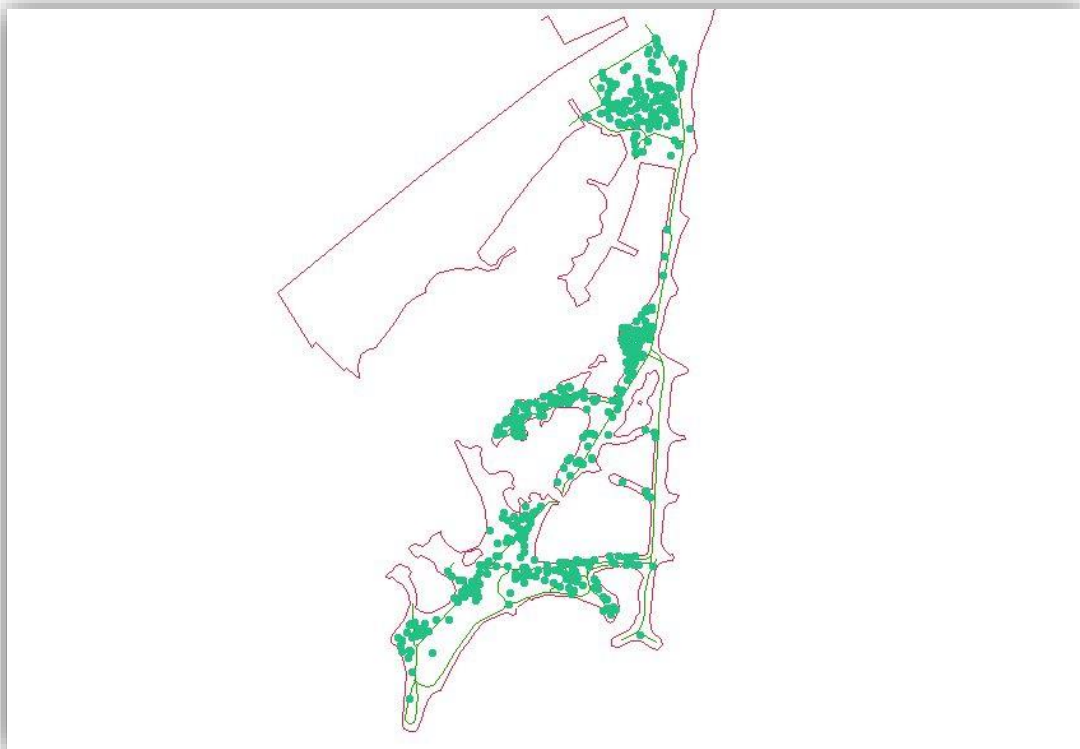
Close-up of Double-crested Cormorant Colony Used for Population Estimate

Appendix F: Map of 2014 Landbird Nest Locations

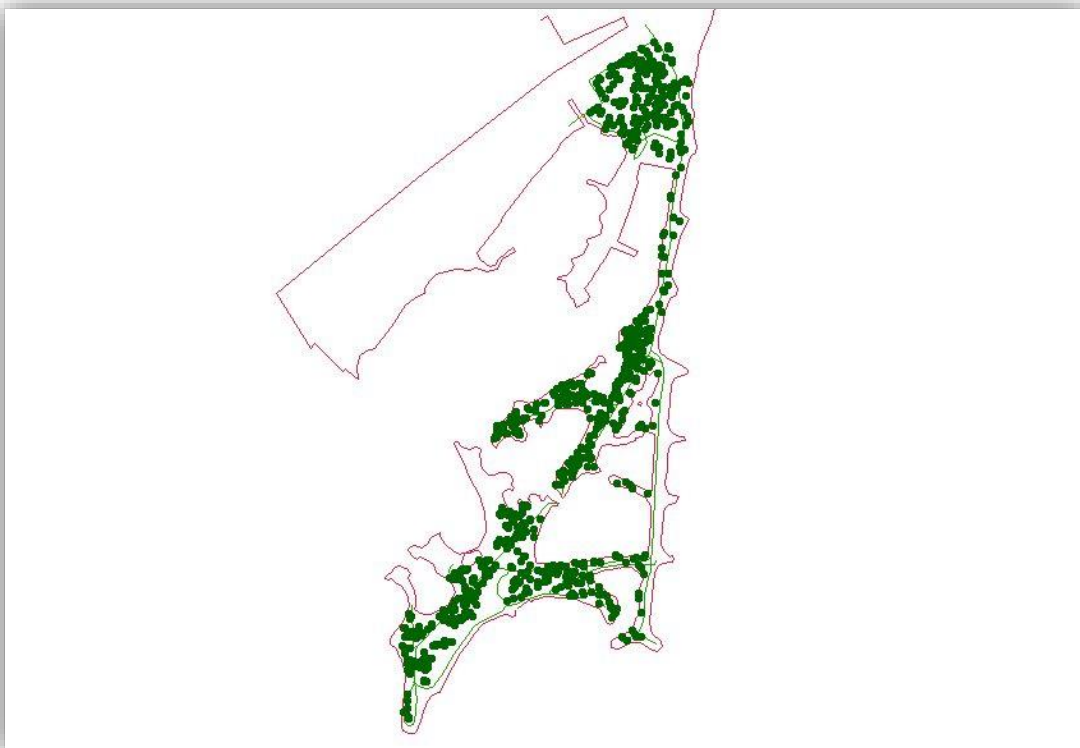


Appendix G: Comparison of Landbird Nest Locations – 2009 vs 2014

2009 Nests



2014 Nests



Appendix H: Breeding Status Codes for Each Species Detected In 2014

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