

The Breeding Birds of Tommy Thompson Park

2010



American Woodcock on Nest (A. Jano)

Toronto and Region Conservation



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For
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1. Introduction

1.1 Study Area (Tommy Thompson Park)



TTP Aerial View (TRCA)

Tommy Thompson Park (TTP) is the largest area of existing natural habitat on the central Toronto waterfront. From the late 1950's until present day, a combination of lake-filling and dredging activities created the current configuration of the park. Through natural succession the spit has been colonized by an impressive variety of plant and animal communities. Tommy Thompson Park has been designated as an Environmentally Significant Area (ESA), and in 2000 was designated a globally significant Important Bird Area (IBA) by Birdlife International for its concentration of nesting colonial waterbirds and migratory value. Considerable effort by all three levels of government is being focused on the revitalization of

Toronto's waterfront. The implementation of the Tommy Thompson Park Master Plan is a key piece of the proposed Lake Ontario Park, which will be a major part

of the city's plan for a green waterfront. The geographical location of the park and its natural features make it very attractive for large numbers of migrating birds, butterflies and nesting waterbirds.

2. Colonial Waterbirds

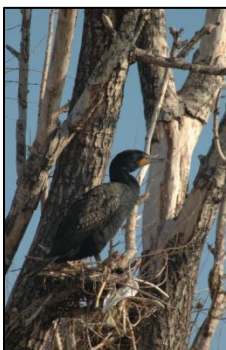
2.1 Project Background

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., 2000). Six species of colonial waterbirds breed at Tommy Thompson Park; three species are predominately tree nesters: Double-crested Cormorant, Black-crowned Night-Heron and Great Egret, and three species are ground nesters: Ring-billed Gull, Herring Gull and Common Tern.

2.2 Population Estimate Methodology

Population estimates for tree nesting waterbirds 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. 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



DCCO on Nest Tree
(G. Fraser)

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 general 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 (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 each year. 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. Additionally, all 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 24 m², so all nests can be counted, noting the nest contents, by walking or canoeing the periphery of the raft. The artificially created tern island in the Cell One wetland is approximately 120 m², 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.

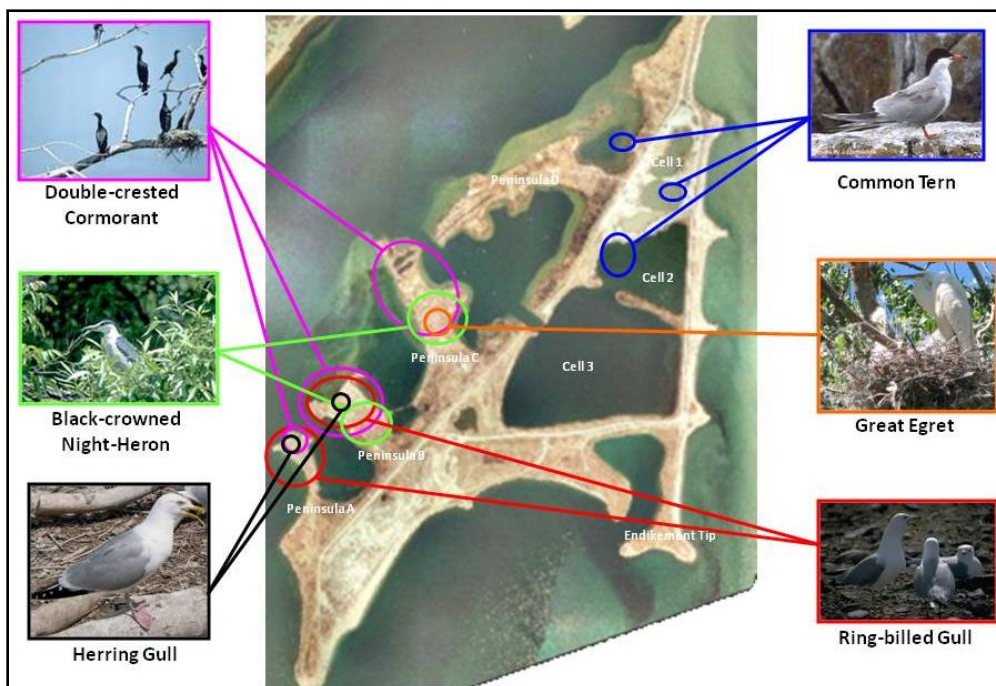
Gulls are surveyed at least every 10 years with the CWS decadal surveys, however CWS also monitors individual Herring Gull nests annually. Because of the large nesting area, the colony is divided into smaller, discrete sections and all active nests are counted by section using the rope transect method. 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 mark 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 during the last week of May, at peak nesting period. Nest counts are conducted at night, using minimal light, in order to minimize disturbance and nest predation by Ring-billed Gulls. A minimal number of observers move quickly and systematically through the ground nesting area and place a coloured popsicle stick in the nest to mark it as counted.

2.3 Results in 2010

In 2010 Double-crested Cormorants nested in trees on Peninsulas A, B and C, as well as on the ground on Peninsula B. Black-crowned Night-Herons nested in trees 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. Common Terns nested on 3 artificial reef rafts in Cell Two, one artificial reef raft in Embayment D, and a man-made island in Cell One (Figure 2.A).

Figure 2.A. Colonial Waterbird Nesting Areas, 2010



Cormorant nests numbered 9,434 in 2010, including 3,310 ground nests (Table 2.1). The overall population increased 24 percent, while the ground nesting population increased from 1,957 to 3,310, a gain of 69 percent (Figure 2.B). 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).



Double-crested Cormorant
Ground Nests (G. Fraser)

Black-crowned Night-Heron nests numbered 471 in 2010, an improvement over 2009 when most of the colony's nesting attempts failed, likely due to raccoon predation (Table 2.1). Five pairs of Great Egrets nested, including one pair that is suspected of raising a double clutch of young. They had 7 nests in 2009 (Table 2.1).



Great Egret Courtship Display (A. Gray)

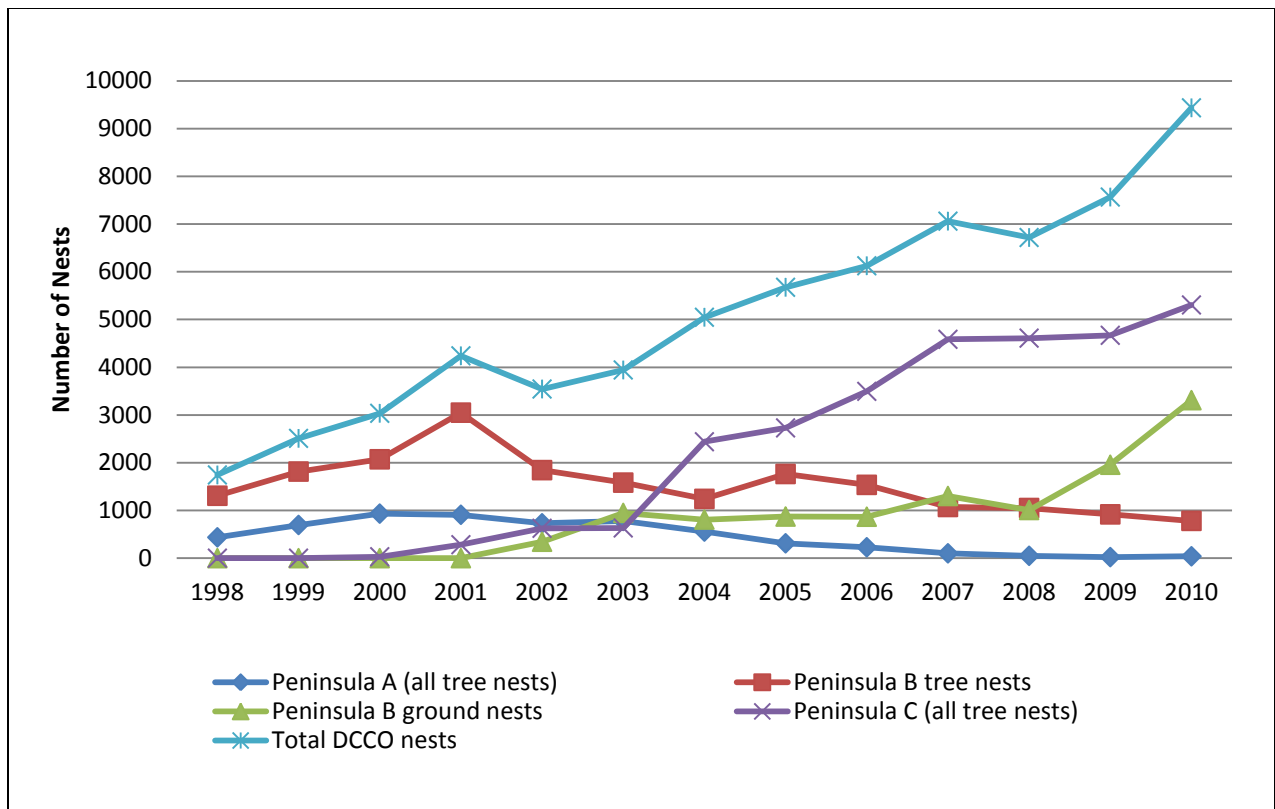
Table 2.1. Colonial Waterbird Nests at TTP, 1999 - 2010

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
DCCO	2,509	3,034	4,237	3,543	3,942	5,046	5,674	6,125	7,059	6,717	7,564	9,434
BCNH	988	1235	762	1,040	904	601	610	504	730	455	546 ^a	431
GREG	0	0	0	0	0	1	4	3	5	5	7	5
RBGU	59,453	58,000*	58,000*	58,000*	56,151	45,000*	40,000*	35,000*	33,000*	30,000	30,000*	28,000*
HERG	111*	NC	NC	NC	48	79	NC	NC	45	30	NC	<20*
COTE	325	242	NC	445	420	433	448	NC	367	310	354	231

a - Nesting failed by June 30

* - Estimate

Figure 2.B. Double-crested Cormorant Nests at TTP by Location, 1998 - 2010



Common Tern nests were estimated at 231 in 2010 (Table 2.1), however this is likely an under representation due to the difficulty of finding nests through thick vegetation on the island. This is a 35 percent decline from 2009's population estimate. The colony, particularly the Embayment D sub-colony and the island sub-colony, were subject to repeated predation by mammals and birds. The Embayment D reef raft (Figure 2.C) was abandoned after nesting attempts due to repeated raccoon predation. The Cell One island did have successful nesting after experiencing mink and Ruddy Turnstone predation.

Figure 2.C. Common Tern Reef Raft (photo: A. Gray)





Ring-billed Gulls on Nests (G. Fraser)

Gull population estimates were not undertaken in 2010, although anecdotal evidence suggests Ringed-billed Gulls may be slightly below the last official count in 2008 of 30,000 nests (Table 2.1). Ringed-billed Gulls have been managed at TTP since the mid-1980s when their nests numbered approximately 75,000 in several nesting areas. Management for Ring-billed Gulls has not been necessary since 2007, when they stopped using the Endikement Tip as a nesting site. Ring-billed Gulls currently nest on Peninsulas A and B. 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 CWS in individual nest monitoring. Herring Gulls nests were estimated to be less than 20 nests in 2010 (CWS, unpubl.).

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.

3.2 Methodology



Killdeer Distraction Display (I. Sturdee)

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 and direction 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 and should be repeated every three years to help quantify changes in the vegetation communities.

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.

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

3.3 Results in 2010

3.3.1 Variable Circle Plot Point Count Results

3.3.1.1 VCP Station Vegetation Survey

In 2010, a vegetation survey was completed for each station, resulting in the vegetation descriptions found in Table 3.3. In addition, Appendix B contains a habitat sketch and photographs for each station. The habitat sketches are based on 2007 satellite digital imagery and current field observations.

Table 3.3. VCP Station Vegetation Analysis

	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
Total of All Habitats	100	100	100	100	100	100	100	100	100
Dominant Vegetation Within 100 m of Each VCP Station									
Poplars (i.e., Eastern Cottonwood)	20	35	5	5	10	40	5	55	45
Dogwoods (i.e., 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 (i.e., Cattails, Bulrushes)	5			5				5	
Miscellaneous Herbs (i.e., Vetch, Nettles, etc.)							10		10
Vegetation Total	100	100	95	95	85	70	85	90	85

3.2.1.2 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 design and analyze distance sampling surveys of wildlife populations).

As shown in Table 3.4, a total of 33 species was detected for all counts in 2010, including one new species for the VCP counts, i.e., Northern Mockingbird. The total of 33 species is in line with the total species of the previous years of the project. Several species were recorded on counts in earlier years, but not in 2010, although they were detected during other surveys. Since some species are present at TTP in relatively low numbers, the frequency of detection for these species is low, and therefore we can expect year-to-year fluctuations in representation by VCP counts. Based on cumulative work from 2005 to 2010, it is clear that the VCP counts are successful in deriving representative samples of avian communities for key habitats.

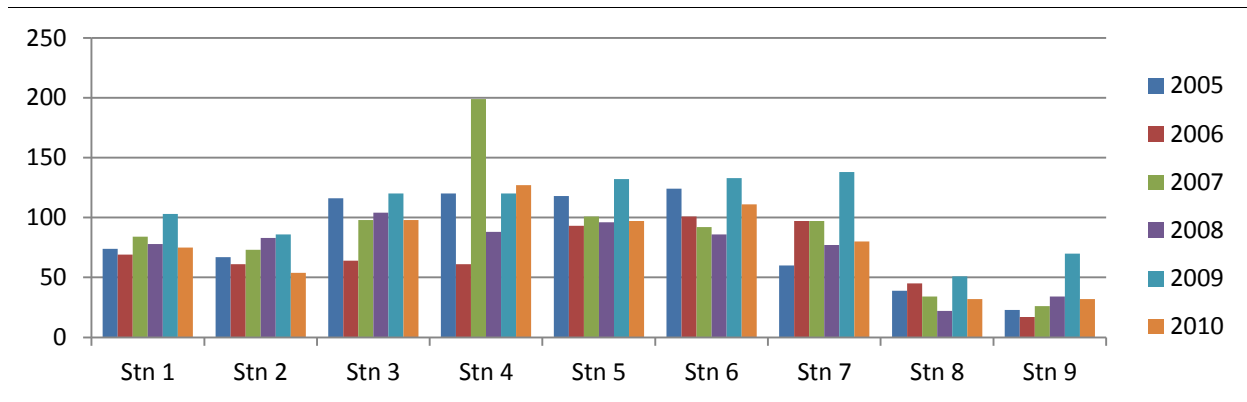
Table 3.4. VCP Species Lists and Total Birds Detected by Species Within 100 Metres

Species	2005	2006	2007	2008	2009	2010	Species	2005	2006	2007	2008	2009	2010
AMGO	19	22	15	10	8	22	GADW				3	*	1
AMKE	1						GCFL			2		3	
AMRO	27	14	25	31	26	34	GRCA	22	26	24	19	17	38
AMWO					1		HOFI	*	1	*			
BANS	*	*	104	2	5	4	HOSP		3		2		
BAOR	30	21	29	22	23	13	KILL	5	3	1	7	8	3
BARS	2	1	31	3	11	8	LEFL		5	17	6	7	11
BCCH	1	3	1	3	2	4	MALL		*		*	4	
BEKI	1	3			2	1	MAWA					1	
BGGN		3	3	2	8		MODO	*	1	6	1		*
BHCO	16	15	22	11	19	19	NOCA	2	2	3		4	3
BLJA				3	1	1	NOFL	3	2	1	1	2	
BLPW					1		NOMO						*
BOBO		*	3				NRWS	*	*	22	7	8	5
BRTH	5		4				ROPI		*	*	*		
CANG		*				*	RWBL	151	167	154	203	312	199
CEDW	9	12	12	11	39	19	SAVS	13	12	2		1	
CHSW		*	*	2	*		SOSP	98	74	72	68	81	55
CLSW	*						SPSA	7	6	7	9	6	3
COGR	18	21	12	11	9	17	TRES	5	*	8	15	9	16
COYE	2	1	2	1		2	TRFL				1		1
EAKI	15	12	18	25	12	20	UNSW					*	10
EAME		1	2	5			VEER			1			
EAWP	1		1	1	3	1	WAVI	34	25	31	22	41	30
EUST	92	24	21	35	116	41	WIFL	35	23	27	17	26	14
FISP			3				YWAR	127	105	118	109	134	100
Total Birds								741	608	804	668	950	695
Total Species								32	37	38	35	37	33

* Species observed beyond 100 metres and/or flying over

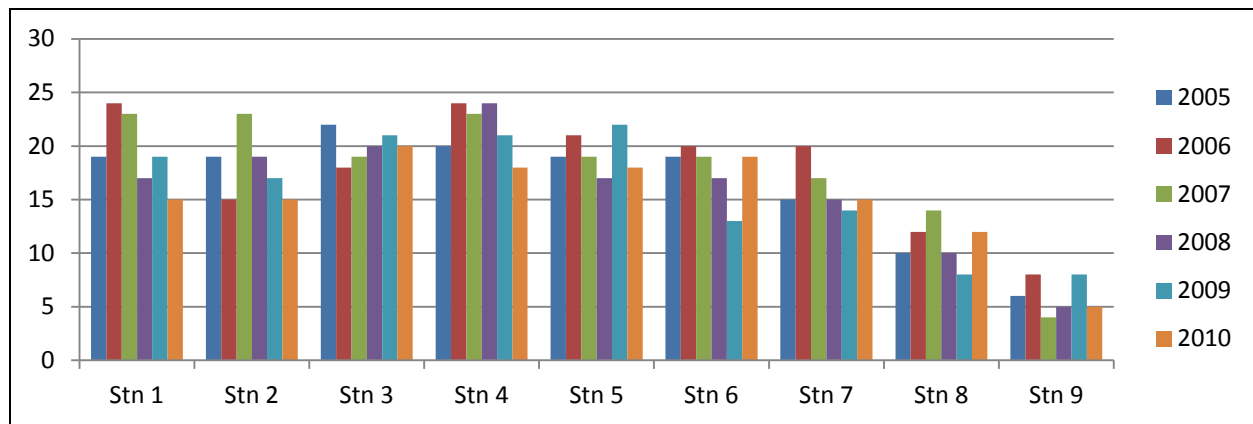
In 2010, total bird abundance (Figure 3.A below) and species richness (Figure 3.B) per station were generally similar to earlier years. In terms of total station bird abundance (within 100 m), Station 4 (dry meadow) ranked at the top of the list in 2010, followed closely by Stations 6 (forest), 3 (dry meadow) and 5 (shrubland). Overall abundance from VCP counts in 2010 was down slightly from 2009, but in line with previous years for all stations.

Figure 3.A. Total Bird Abundance per VCP Station



The stations with the highest overall diversity (i.e., species richness) in 2010 were Stations 3, 6, 4 and 5, with 20, 19, 18 and 18 species, respectively (see Appendix A for station locations). As in previous years, the weakest stations were Stations 8 and 9, both located on Peninsula C. Station 8 is within the Black-crowned Night-Heron colony and Station 9 is within the large Double-crested Cormorant colony, which, along with the low biological diversity around these two stations, may explain the consistently low abundance and diversity at these stations recorded in all years.

Figure 3.B. Species Richness per VCP Station



The most valuable aspect of this project will be its ability to reveal changes in breeding bird abundance and diversity over time at the 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 all six years of VCP counts include Red-winged Blackbird, Song Sparrow, European Starling and Yellow Warbler, all of which require basic habitat conditions with a few fundamental components to thrive.

A summary of abundance per species detected by VCP counts (<100 meters) is presented above in Table 3.4. During the six years of the project, there have been some notable changes in total abundance for some species; however, it is difficult to attach any significance to these changes based on only six years of data. 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 a few of the visits.

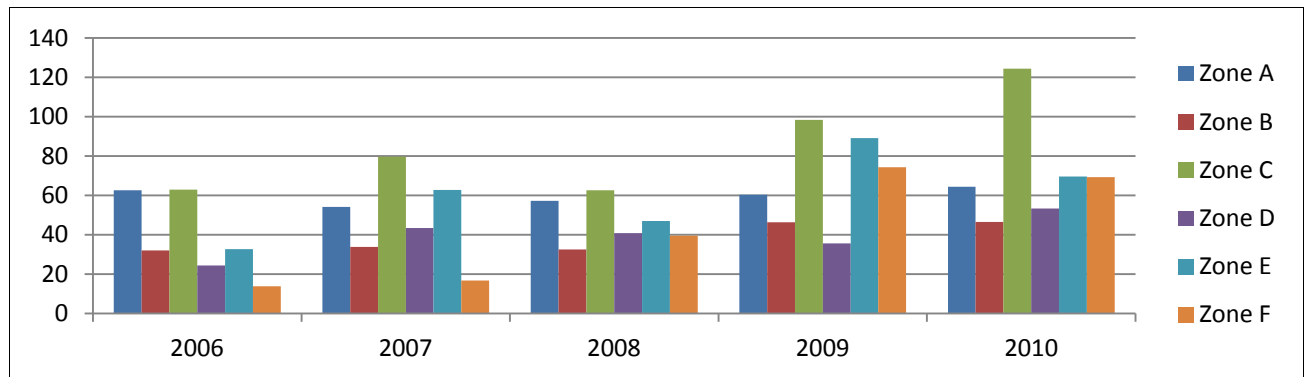
In 2010, with the exception of Gray Catbird and Willow Flycatcher, there were no significant changes in abundance for any common species. It is interesting to note that, while the number of Gray Catbirds observed

in the VCP counts increased, the number of Catbird nests located (see Table 3.5 below) did not similarly increase. At the same time, there was a decline in both the number of Willow Flycatchers detected in the VCP counts and their nests found during nest searching. There were no obvious explanations for the changes for these two species, nor for the slight drop in the number of VCP species detected, and data from subsequent years will determine whether or not these changes are anomalies.

3.3.2 Nest Searching and Monitoring Results

In 2010, a total of 427 hours was logged by eight participants. Figure 3.C below shows the breakdown of effort per zone. The greater effort in Zone C in most years is primarily a result of Zone C coinciding with the TTPBRS banding area, which results in more nests being detected by banding staff, thereby requiring more monitoring time. Further, in 2010, there was additional project participation concentrating on that zone.

Figure 3.C. Nest Searching Effort per Zone from 2006 to 2010 (hours)



Eastern Meadowlark Nest (A. Jano)

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

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 2010, a total of 512 nests were discovered, and 440 of them were monitored (see Table 3.6 below). Nests of 34 species were found in 2010.

No new species were added to the TTP breeding species list in 2010. However, three American Woodcock nests were discovered (the first nests for the six years of the project), and only the second nest for the project was located for Eastern Meadowlark, Eastern Wood Pewee and Downy Woodpecker. The discovery of these nests

is an indication of the increased experience (and perseverance) of the volunteers, and it is hoped that more nests of these species will be found in future years.

As in 2009, the increase in the number of Red-winged Blackbird nests located in 2010 is partially a result of extending the search period, but also a result of the volunteers becoming more experienced in searching the habitat favoured by early-nesting Red-winged Blackbirds. (Prior to 2009, the nest searching period was approximately May 1 – August 30, but this was extended in 2009 to approximately April 1 – September 15 in order to include more early and late nesters.)

In contrast to the Red-winged Blackbirds, and despite the earlier start and later finish, the number of American Goldfinch, American Robin, Cedar Waxwing and Eastern Kingbird nests discovered in 2010 was more in line with earlier years than 2009 nest totals. Subsequent years' results will be required to determine whether the high number of nests in 2009 was an anomaly or not.

The total number of confirmed nesters (excluding colonial waterbirds) after six years of surveys stands at 38. Refer to the Species Accounts in Appendix D for information on these records.

Table 3.5. Total Nests by Species from 2005 to 2010

Species	2005	2006	2007	2008	2009	2010	Species	2005	2006	2007	2008	2009	2010
AMGO		1	19	25	44	33	GRCA	3	12	9	11	23	11
AMRO	3	12	26	51	93	69	HOFI			1			
AMWO						3	HOSP	1	1				
BANS	15	2			4	2	HOWR		1		2	2	2
BAOR	5	13	12	9	9	10	KILL		3	2	5	8	13
BARS	7	5	5	3	3	2	LEFL		1	2		3	1
BCCH	2			1	2		MALL	1	6	7	9	12	12
BEKI		1	1	2			MODO		4	4		3	
BGGN		1	1	1	3		NOCA	2	1	6	2	4	1
BRTH	1	1	1	3	4	2	NOFL	2	4		1		3
CANG		1					NRWS		1	1		2	
CEDW		3	7	14	40	14	OROR		1	2	1		2
COGR		3	2	1		4	RWBL	5	45	58	82	130	167
DOWO			1			1	SOSP	1	6	5	1	7	8
EAKI	3	11	17	26	22	14	SPSA	2	5	6	3	5	8
EAME		1				1	TRES	4	7	6	9	9	9
EAWP			1			1	WAVI	1	8	4	7	7	9
EUST		5	2	5	7	12	WIFL	2	13	21	15	25	15
GADW	5	1	4	3	3	1	YWAR	8	34	71	71	75	82
Total								73	214	304	363	549	512
Effort (total hours)									228.0	289.2	279.5	403.7	427.0
Efficiency (Nests / Effort)									0.94	1.05	1.30	1.36	1.20

Nest-searching efficiency figures (see Table 3.5 above) are somewhat misleading, as they are highly dependent on the vegetation type of the area (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 decrease in efficiency in 2010, after three years of steadily increasing efficiency, presumably relates, in part, to some volunteers having been assigned to new zones.

A total of 440 nests was recorded online with ONRS in 2010 (see Table 3.6 below). In terms of nest productivity, 83 of 227 nests with known outcomes failed, while 144 were successful in fledging young. The remaining 213 nests have unknown outcomes, with the ratio of unknown outcomes to nests monitored being roughly in line with most previous years.

As can be seen in Table 3.6, the 2010 nest failure rate of 37% is on the low end of average compared to earlier years. The larger sample sizes after 2005 are more significant as the results in 2005 were based on only 28 nests with known outcomes. Nest predation was the most common cause of nest failure again in 2010. Possible predators at TTP include raccoons, gartersnakes, mink and coyotes, as well as other bird species. Of the 83 failures, 38 occurred at the egg stage, 16 at young stage and 29 at either egg or young stage.

Table 3.6. Nest Productivity from 2005 to 2010

	2005	2006	2007	2008	2009	2010
Nests discovered	73	214	304	363	549	512
Species	20	33	30	27	27	34
Nests monitored & reported to ONRS	73	214	236	297	456	440
Unknown outcome	45	71	160	148	170	213
Known outcome	28	143	144	149	286	227
- Successful nests	12	82	77	97	162	144
- Failed nests	16	61	67	52	124	83
- Failure rate	57%	43%	47%	35%	43%	37%

3.3.2.1 Parasitism by Brown-headed Cowbirds



Red-winged Blackbird Nest
With Four Cowbird Eggs
(A. Jano)

Brown-headed Cowbird parasitism has become a major issue for small landbird populations in more open habitats and forest fragments. In 2010, a total of 51 nests of four species were found with Cowbird eggs. The most heavily parasitized species were Yellow Warbler (21 nests) and Red-winged Blackbird (27 nests). Willow Flycatcher (2) and Song Sparrow (1) were also parasitized.

The rate of parasitism among known host species at TTP is shown below in Table 3.7. (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 were calculated as the ratio of parasitized nests to the parasitized and non-parasitized nests. While there are insufficient data to confirm any trends, a parasitism rate of around 20% is starting to develop for both American Goldfinches and Willow Flycatchers, approximately 30% for Red-winged Blackbirds, and 40% for Song Sparrows and Yellow Warblers (see Table 3.7 below). (Note that nests of parasitized species where evidence of parasitism could not be determined were not considered in the rate calculations.)

Table 3.7. Brown-headed Cowbird Parasitism Data and Rates from 2005 to 2010.

Brown-headed Cowbird Parasitism								
		American Goldfinch	American Robin	Red-winged Blackbird	Song Sparrow	Willow Flycatcher	Yellow Warbler	All 6 Species
2005	Total nests			5	1	2	7	15
	Nests parasitized			1	1	1	2	5
	- %			20.0	100.0	50.0	28.6	33.3
2006	Total nests	1		41	6	13	30	91
	Nests parasitized	1		12	2	3	9	27
	- %	100.0		29.3	33.3	23.1	30.0	29.7
2007	Total nests	8		36		17	56	117
	Nests parasitized	2		8		4	29	43
	- %	25.0		22.2		23.5	51.8	36.8
2008	Total nests	15	28	45		15	41	144
	Nests parasitized	1	1	18		4	21	45
	- %	6.7	3.6	40.0		26.7	51.2	31.3
2009	Total nests	21		112	4	24	68	229
	Nests parasitized	5		32	2	4	34	77
	- %	23.8		28.6	50.0	16.7	50.0	33.6
2010	Total nests			110	4	11	66	191
	Nests parasitized			27	1	2	21	51
	- %			24.5	25.0	18.2	31.8	26.7
Avg	Average total nests	7.5		58.2	2.5	13.7	44.7	131.2
	Average parasitized	1.5		16.3	1.0	3.0	19.3	41.3
	- %	20.0		28.1	40.0	22.0	43.3	31.5

3.4 The Overall Picture

Historically, a total of 66 species has bred at Tommy Thompson Park. Some rare and isolated breeding records are unlikely to recur with any regularity (e.g., Wilson's Phalarope or Northern Bobwhite). A complete historical breeding bird species list is presented in Appendix D, Species Accounts.



Recently Hatched American Woodcock
(D. Johnston)

During the summer of 2010, 67 species were detected at Tommy Thompson Park through VCP counts, nest searching and casual observations. Of these, eight were classified as possible breeders, two as probable and 40 species (including colonial waterbirds) were confirmed breeders (see Appendix F below for a list of the species in each category, as well as a definition of each category). An additional 17 species were observed and classified as non-breeders (habitat unsuitable for breeding).

It is interesting to note the species detected only by VCP counts versus those recorded only by nest discovery (Table 3.8 below). Most of these species are present at TTP in relatively low numbers, which would help to explain why they might be recorded by one method, but not the other. Also, some are secretive (e.g., Woodcock) and/or are proficient at hiding their nests (e.g., Chickadee, Kingfisher).

Table 3.8 Species Recorded Only by VCP Counts Versus Species Recorded Only By Nest

Species Recorded Only Through VCP Counts	Species Recorded Only Through Nest Discovery
Black-capped Chickadee	American Woodcock
Belted Kingfisher	Brown Thrasher
Blue Jay	Downy Woodpecker
Common Yellowthroat	Eastern Meadowlark
Mourning Dove	House Wren
Northern Mockingbird	Mallard
Northern Rough-winged Swallow	Northern Flicker
	Orchard Oriole

As can be seen in Table 3.8 below, the 40 confirmed breeders in 2010 were in line with experience in the preceding five years of the project. The 67 total species detected, however, matched the lowest total recorded thus far. It is difficult to attach a reason to this lower overall total, and experience from subsequent years will be required to determine whether 2010 being lower has any special significance.

Table 3.9. Summary of Species Detected Through VCP Counts and Nest Searching

	2005	2006	2007	2008	2009	2010
Confirmed Breeding Species	35	45	43	34	37	40
Probable Breeding Species	10	4	7	9	11	2
Possible Breeding Species	22	19	10	15	14	8
Other Species Observed	0	7	13	16	20	17
Total Species	67	75	73	74	82	67

While some possible trends are starting to emerge from the six years of the project, there are still too many instances of significant year-to-year variations to draw many conclusions. It is apparent that more years of data and analysis will be required to confirm any trends and conclusions.

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 are also expected to increase the variety of habitats suitable for species not yet on the confirmed breeders list.

3.5 Acknowledgements

The success of this project is due to the ongoing efforts of several dedicated volunteers who spend many hours collecting, reporting and analyzing data from April through most of the remainder of the year.

The 2010 VCP observations and vegetation analysis were collected by volunteers Ian Sturdee and Don Johnston.

The continued excellent results in the nest searching phase of the project in 2010 were due to the efforts of the volunteer project participants Mark Field, Andrew Jano, Don Johnston, Jan McDonald, Ian Sturdee, Brett Tryon, Bert Vanderzon and Paul Xamin. Their efforts are quantified below in Table 3.10.

Table 3.10 2010 Effort by Nest Searching Project Participants

Name	Total Hours
Mark Field	5:30
Andrew Jano	43:15
Don Johnston	96:30
Jan McDonald	28:30
Ian Sturdee	113:30
Brett Tryon	0:30
Bert Vanderzon	18:45
Paul Xamin	120:30
Total	427:00

Special thanks should go to Dan Derbyshire, former TTPBRS coordinator, who organized the landbird and non-colonial waterbird aspects of the Breeding Bird Survey project, set up the VCP point count and nest searching protocols, and contributed a significant effort to all phases of the project until his departure in 2008.

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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 – 2010 – 1 (North)



VCP Stn 1 – 2010 – 2 (East)



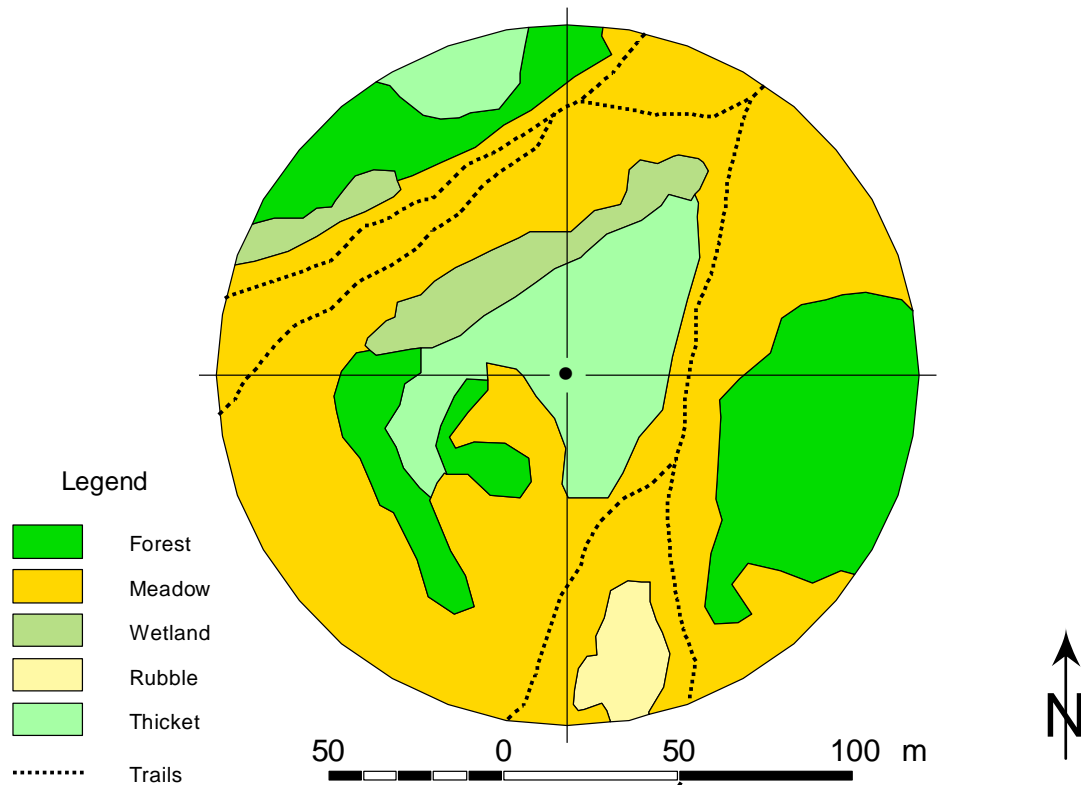
VCP Stn 1 – 2010 – 3 (South)



VCP Stn 1 – 2010 – 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



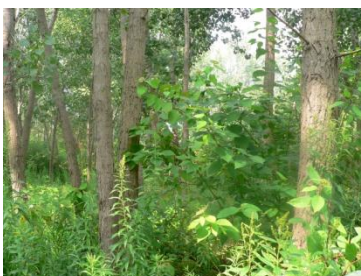
VCP Stn 2 – 2010 - 1 (North)



VCP Stn 2 – 2010 – 2 (East)

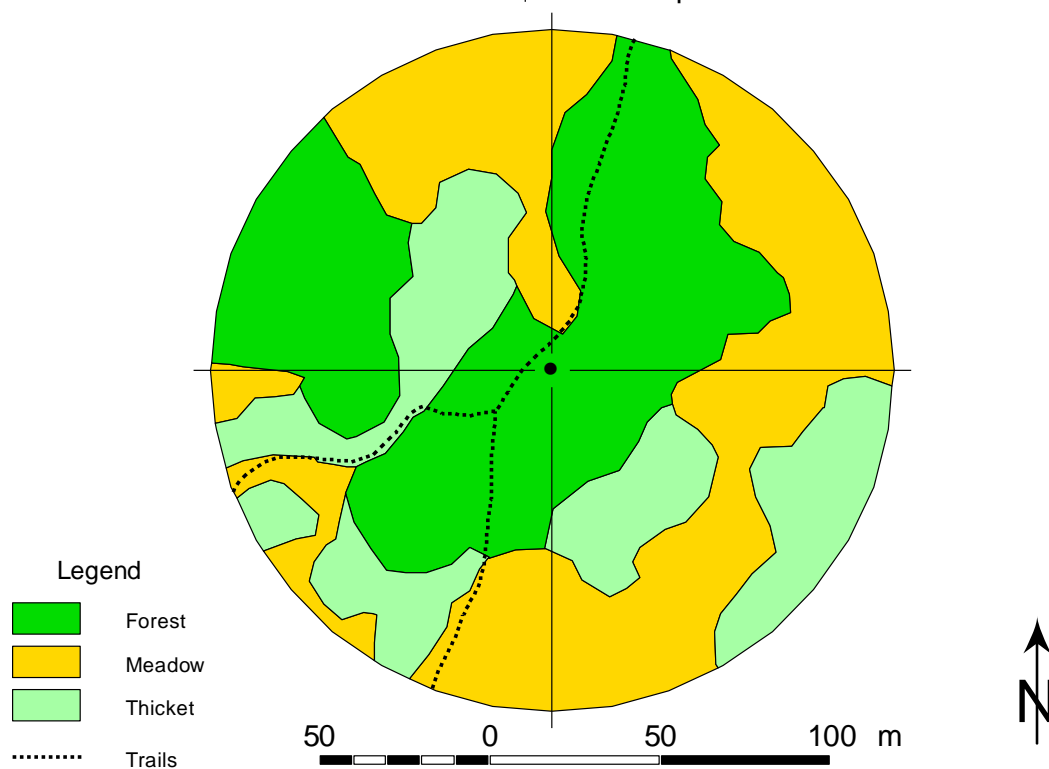


VCP Stn 2 – 2010 – 3 (South)



VCP Stn 2 - 2010 - 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 - 2010 - 1 (North)



VCP Stn 3 - 2010 - 2 (East)

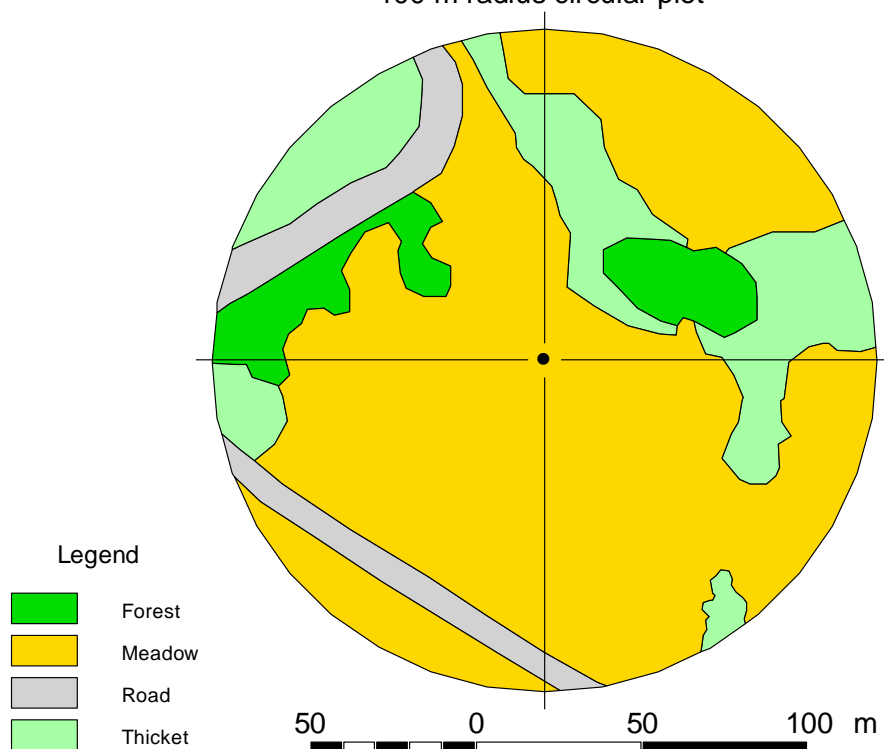


VCP Stn 3 - 2010 - 3 (South)



VCP Stn 3 - 2010 - 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 - 2010 - 1 (North)



VCP Stn 4 - 2010 - 2 (East)

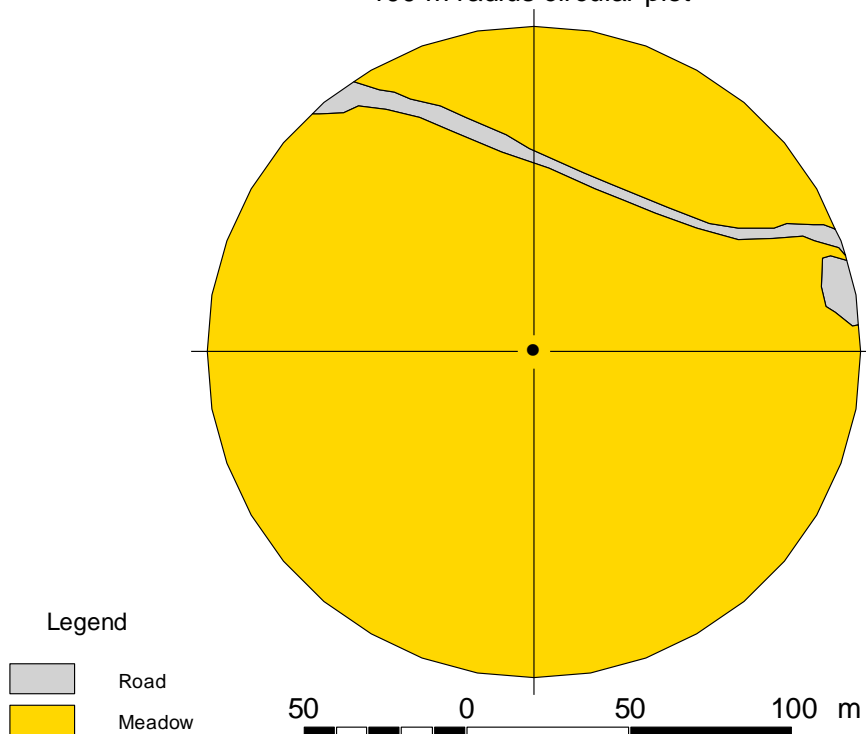


VCP Stn 4 - 2010 - 3 (South)



VCP Stn 4 - 2010 - 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 - 2010 - 1 (North)



VCP Stn 5 - 2010 - 2 (East)

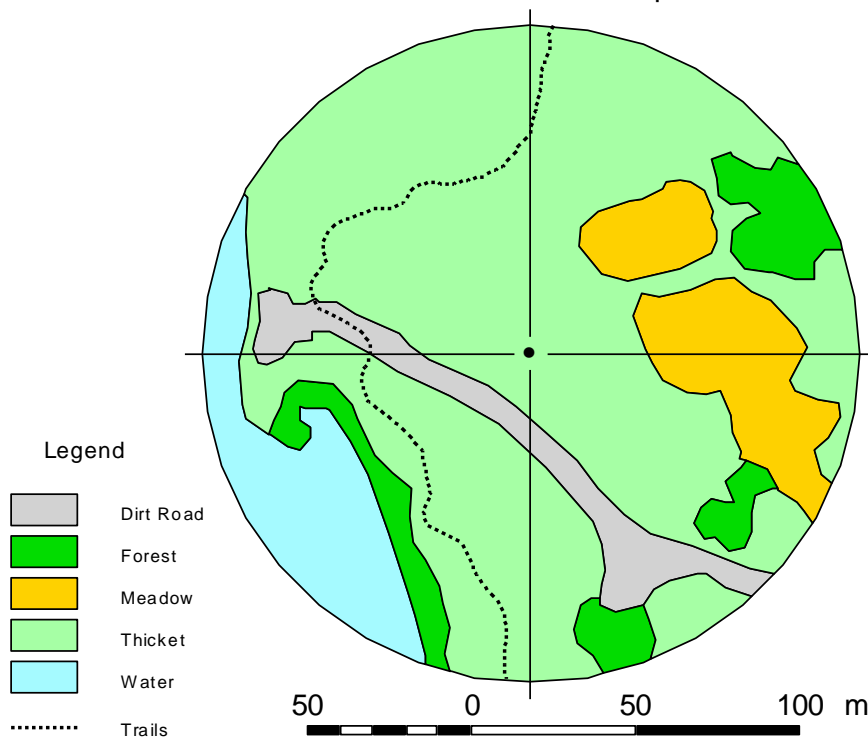


VCP Stn 5 - 2010 - 3 (South)



VCP Stn 5 - 2010 - 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 - 2010 - 1 (North)



VCP Stn 6 - 2010 - 2 (East)

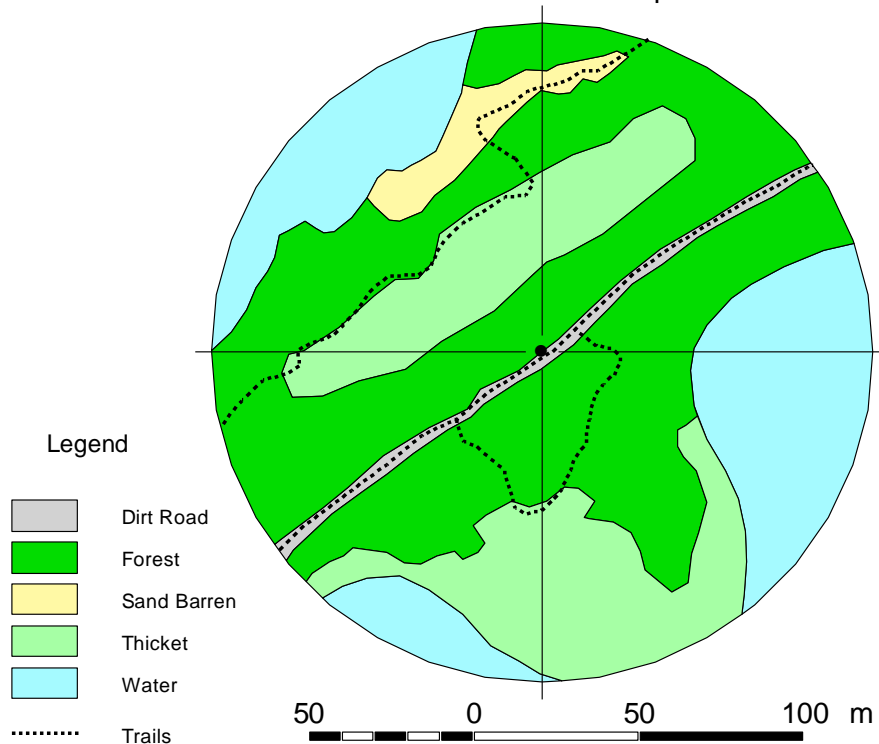


VCP Stn 6 - 2010 - 3 (South)



VCP Stn 6 - 2010 - 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 - 2010 - 1 (North)



VCP Stn 7 - 2010 - 2 (East)

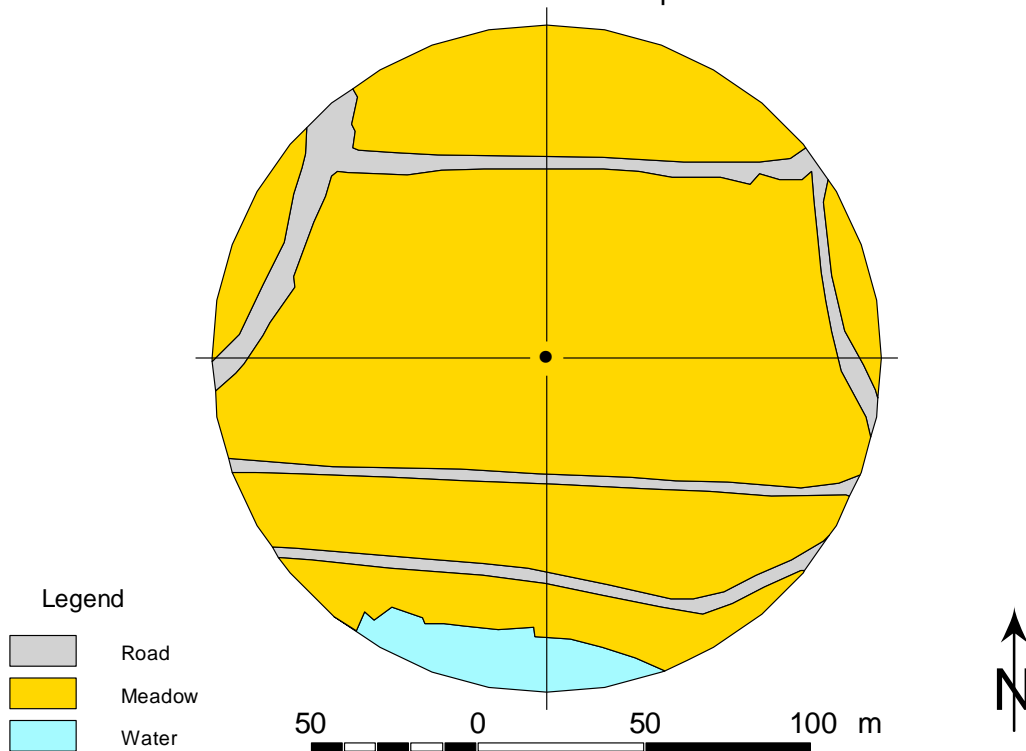


VCP Stn 7 - 2010 - 3 (South)



VCP Stn 7 - 2010 - 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 - 2010 - 1 (North)



VCP Stn 8 - 2010 - 2 (East)

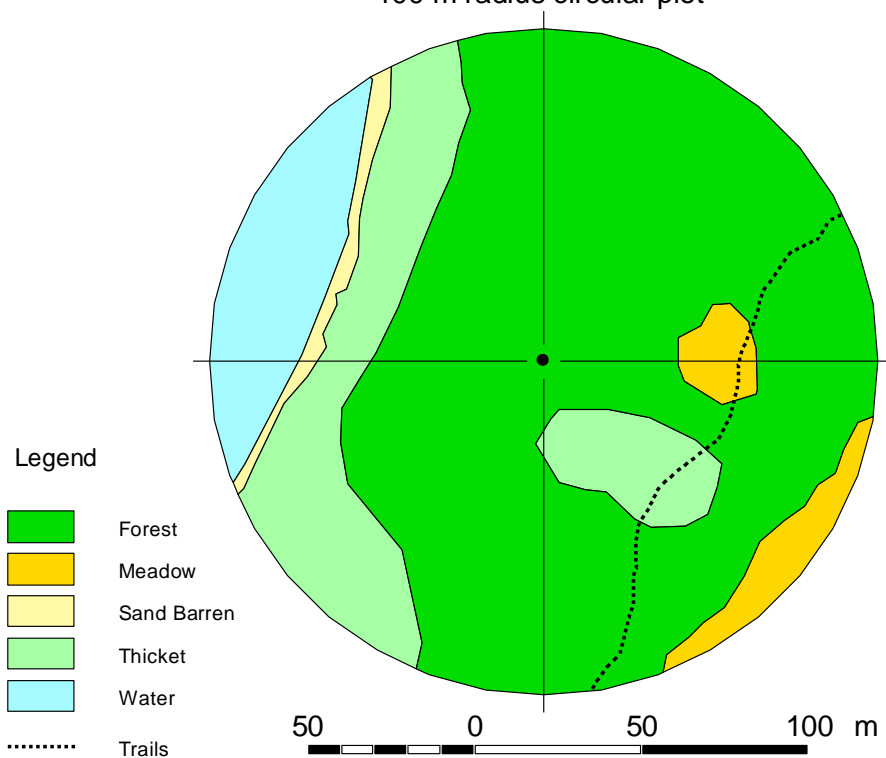


VCP Stn 8 - 2010 - 3 (South)



VCP Stn 8 - 2010 - 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 - 2010 - 1 (North)



VCP Stn 9 - 2010 - 2 (East)

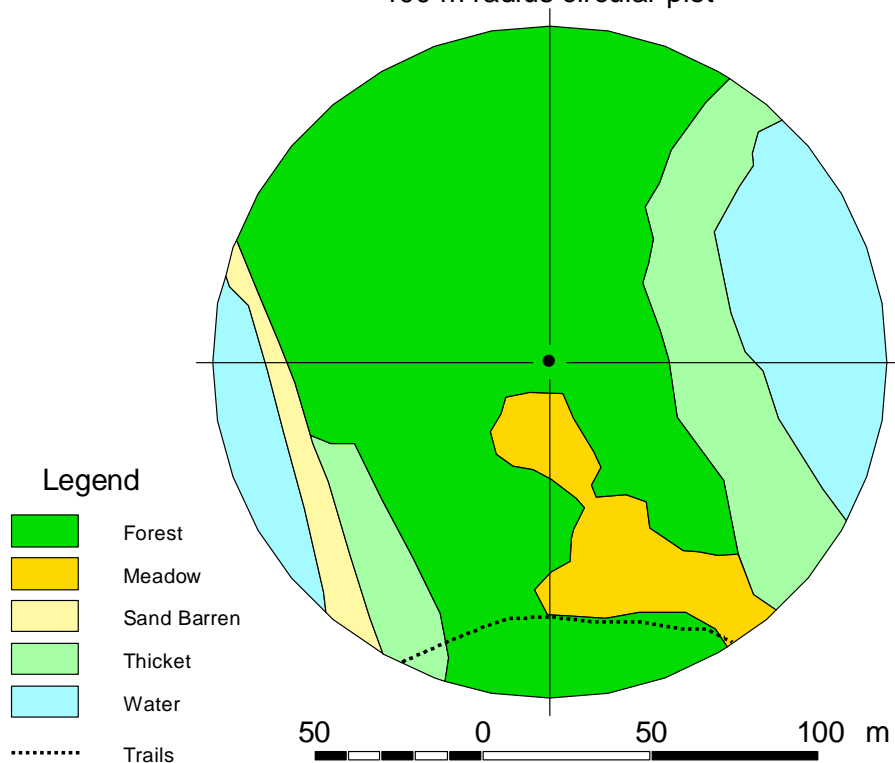


VCP Stn 9 - 2010 - 3 (South)

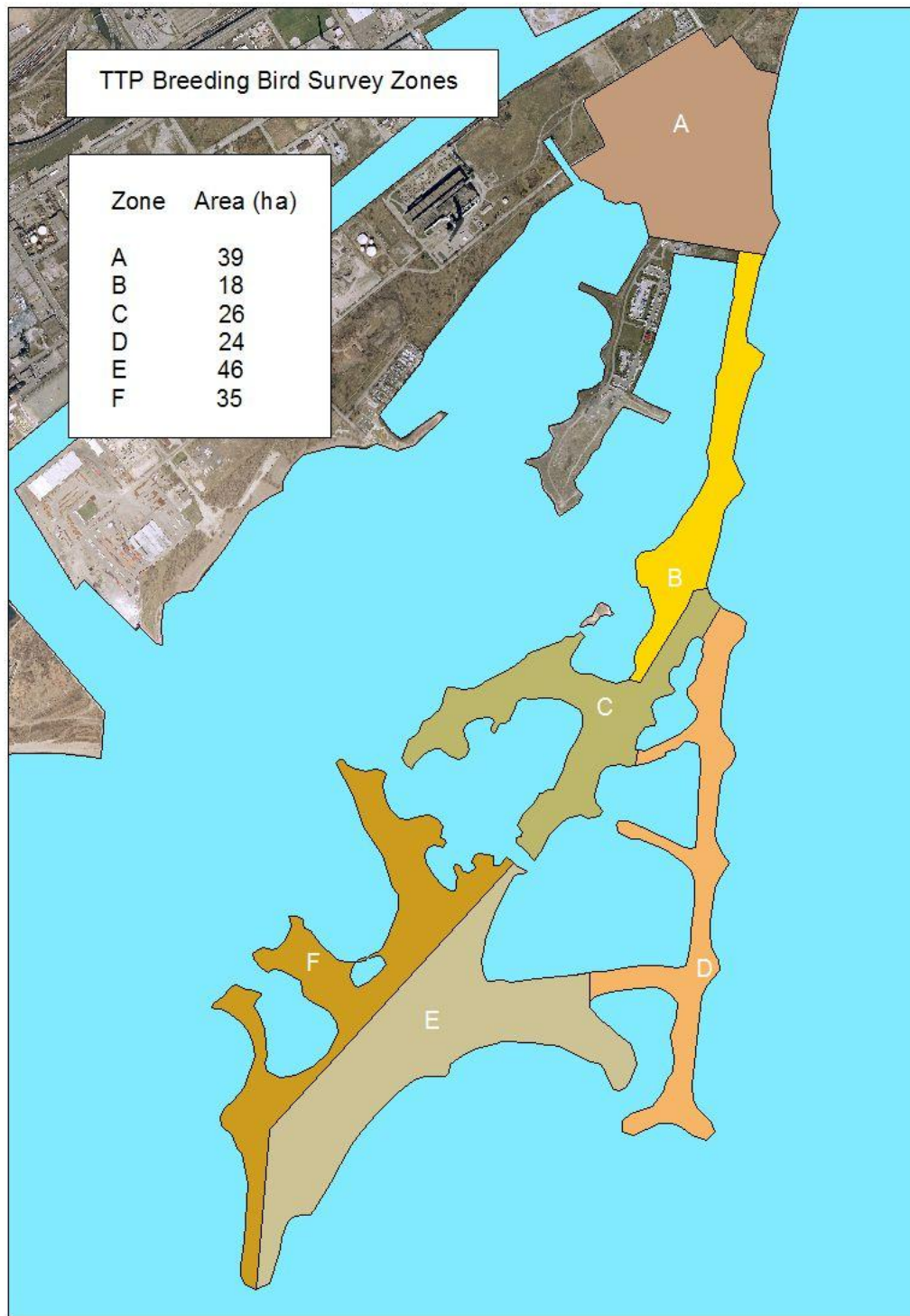


VCP Stn 9 - 2010 - 4 (West)

Sketch Map of Key Habitat Features 100 m radius circular plot



Appendix C: Map of TTP Breeding Bird Survey Zones



Appendix D: Species Accounts

The following accounts include species that were listed as observed, or as possible, probable or confirmed breeders in 2010, as well as historically confirmed breeders. Species highlighted in red were detected in 2010 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 (2010 - absent) Known to have bred historically at TTP.

American Goldfinch (2010 - confirmed) This species is a regular nester at TTP. In 2010, 33 nests were discovered.

American Kestrel (2010 - absent) Known to have bred historically at TTP.

American Redstart (2010 - observed) This species has never been confirmed as a breeder at TTP, but has been observed regularly at TTP during breeding season the last few years.

American Robin (2010 - confirmed) Common nesting species in forested areas throughout TTP. 69 nests were recorded in 2010 in nearly all zones at TTP.

American Woodcock (2010 - confirmed) Three nests were confirmed in 2010, with at least one successful. Additionally, one nest found on May 19 (with eggs) was presumably a second nest, as this species is an early nester (April). One nest was in the Baselands, one in the Toplands, and the third near the main road opposite Peninsula C.

American Black Duck (2010 - absent) Known to have bred historically at TTP.

Baltimore Oriole (2010 - confirmed) Common nesting species in forest areas of TTP. A total of 10 nests were recorded in 2010.

Bank Swallow (2010 - confirmed) Small nesting colonies were discovered in both the meadows and southern shoreline of the Toplands area in earlier years. Two nest sites were found in 2010, each comprised of multiple nest holes and located on the Lake Ontario shoreline bank at the south end of the Flats and Toplands.

Barn Swallow (2010 - confirmed) Barn Swallows are regular nesters at TTP under the eaves of buildings, particularly the garage located near the Port Authority booth. Two nests were discovered here in 2010.

Belted Kingfisher (2010 - possible) This species was confirmed for the first time in 2003 based on observations of fledged young. No nests were found in 2010.

Black-billed Cuckoo (2010 - probable) Known to have bred historically at TTP. In 2010, a recently-fledged bird was recorded, although the nest was not located. Since the bird could have come from outside TTP, it was not counted as a confirmed breeder.

Black-capped Chickadee (2010 - confirmed) A regular but uncommon nester at TTP. No nests were detected in 2010, but recently-fledged young were observed.

Black-crowned Night Heron (2010 - confirmed) An abundant nesting colonial waterbird species at TTP. An estimated 30% of the Canada-wide population of Black-crowned Night Heron breeds here.

Blackpoll Warbler (2010 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2010 during the breeding season was presumably a late migrant.

Black-throated Green Warbler (2010 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2010 during the breeding season was presumably a late migrant.

Blue Jay (2010 - observed) This species has never been confirmed as a breeder at TTP. No nesting evidence was obtained in 2010 beyond observation of the species in suitable habitat during breeding season.

Blue-gray Gnatcatcher (2010 - possible) Known to have bred historically. First nest for this project was found in the Baselands forest in 2006. In 2010, no nests were found.

Blue-winged Teal (2010 - absent) Known to have bred historically at TTP. In previous years the species has been observed in suitable habitat during the breeding season.

Brown Thrasher (2010 - confirmed) Brown Thrasher is a regular but uncommon nester at TTP. Two nests were discovered in 2010.

Brown-headed Cowbird (2010 - confirmed) Brown-headed Cowbird is a common species throughout TTP during summer, and in 2010, a total of 51 nests of Yellow Warbler, Song Sparrow, Red-winged Blackbird and Willow Flycatcher were found to have been parasitized by Cowbirds.

California Gull (2010 – absent) Known to have bred historically at TTP.

Canada Goose (2010 - confirmed) Canada Goose is a common breeder at TTP along shoreline edges of embayments and containment cells.

Canada Warbler (2010 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2010 during the breeding season was presumably a late migrant.

Canvasback (2010 - possible) Canvasback has bred almost annually in recent years in the Triangle Pond area at TTP. In 2010, the species was observed in suitable habitat during the breeding season.

Caspian Tern (2010 - possible) Known to have bred in 2006 at TTP. In 2010, the species was observed in suitable habitat during the breeding season.

Cedar Waxwing (2010 - confirmed) A common late nester at TTP; 14 nests were found in 2010.

Cliff Swallow (2010 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2010 during the breeding season was presumably a late migrant.

Common Grackle (2010 - confirmed) Common Grackle is a regular nester at TTP. In 2010, 4 nests were found.

Common Tern (2010 - confirmed) An abundant annual nesting colonial waterbird species at TTP.

Common Yellowthroat (2010 - possible) Known to have bred historically at TTP. Individuals of the species were found in the same locations as in previous years.

Double-crested Cormorant (2010 - confirmed) An abundant annual nesting colonial waterbird species at TTP.

Downy Woodpecker (2010 - confirmed) In 2010, adults were seen entering and leaving a nest site. This was only the second nest confirmation since the project started in 2005.

Eastern Kingbird (2010 - confirmed) A regular breeder at TTP along forest edges where meadow and shrubs are present. In 2010, a total of 14 nests were found.

Eastern Meadowlark (2010 - confirmed) 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.

Eastern Wood Pewee (2010 - confirmed) One nest was located in 2010 near the TTPBRS banding station. In 2007, the only previous nest of the project was discovered near the Goldfish Pond.

European Starling (2010 - 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. Twelve nests were documented in 2010.

Gadwall (2010 - confirmed) Gadwall is a surprisingly common nesting species at TTP, although only one nest was confirmed in 2010.

Gray Catbird (2010 - confirmed) Gray Catbird is a regular nester at TTP, preferring dense shrubs with some tree cover. A total of 11 nests were found in 2010.

Great black-backed Gull (2010 - absent) Known to have bred historically at TTP. A few individuals were observed in previous years.

Great Egret (2010 - confirmed) Regular nester on Peninsula C.

Great Blue Heron (2010 - absent) Known to have bred historically at TTP.

Great-crested Flycatcher (2010 - observed) This species has never been confirmed as a breeder at TTP. Individual birds were observed in 2010 in a few locations.

Green-winged Teal (2010 - absent) Known to have bred historically at TTP.

Herring Gull (2010 - confirmed) A common annual nesting colonial waterbird species at TTP.

Hooded Merganser (2010 - observed) This species has never been confirmed as a breeder at TTP. In 2010, several individuals and groups were seen in the waters around and on TTP in June and July. Hooded Merganser has been a common summer species in TTP aquatic areas. Observations of the species typically involve counts of multiple adults, usually females. These birds may be breeding at TTP, but are more likely breeders that have dispersed from other areas.

Horned Lark (2010 - absent) Known to have bred historically at TTP.

House Finch (2010 - absent) Known to have bred historically at TTP.

House Sparrow (2010 - absent) Known to have bred historically at TTP.

House Wren (2010 - confirmed) In 2010, two nests were found.

Indigo Bunting (2010 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2010 during the breeding season was presumably a late migrant.

Killdeer (2010 - confirmed) Killdeer is a common nesting species at TTP in open areas with low vegetation. A total of 13 nests were found in 2010.

King Rail (2010 – observed) This species has never been confirmed as a breeder at TTP. An individual was observed in the flooded meadow just north of the Shorebird Habitat in the Flats on August 12.

Least Flycatcher (2010 - confirmed) A regular but uncommon breeder at TTP. One nest was found in 2010.

Mallard (2010 - confirmed) Mallard is a regular nester at TTP. Twelve nests were documented in 2010; mostly predated.

Mourning Dove (2010 - possible) Mourning Dove is a common breeder at TTP. Birds were observed in 2010, although no nests were found.

Mute Swan (2010 - confirmed) Mute Swan is a regular nesting species along TTP shorelines.

Myrtle Warbler (2010 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2010 during the breeding season was presumably a late migrant.

Northern Bobwhite (2009 - absent) Known to have bred historically at TTP.

Northern Cardinal (2010 - confirmed) Northern Cardinal is an uncommon but annually-nesting species at TTP. In 2010, one nest was found.

Northern Flicker (2010 - possible) Northern Flicker is a regular nesting species at TTP. Three nests were found in 2010.

Northern Mockingbird (2010 – observed) This species has never been confirmed as a breeder at TTP, although it is known to breed annually in the vicinity of TTP.

Northern Rough-winged Swallow (2010 - possible) Known to have bred historically at TTP. No nests were found in 2010.

Northern Saw-whet Owl (2010 – observed) This species has never been confirmed as a breeder at TTP. One individual was observed on June 7 in the woods just north of the Goldfish Pond.

Orchard Oriole (2010 - confirmed) One or two nests of this species have been found in most years of the project. In 2010, two nests were found, after being absent in 2009.

Redhead (2010 - absent) Known to have bred historically at TTP.

Red-eyed Vireo (2010 - possible) This species has never been confirmed as a breeder at TTP. In 2010, birds were observed in suitable habitat in the breeding season.

Red-winged Blackbird (2010 - confirmed) The most abundant nesting species at TTP (excluding waterbirds), found throughout the TTP area. A total of 167 nests were found in 2010.

Ring-billed Gull (2010 - confirmed) An abundant nesting colonial waterbird species at TTP.

Ring-necked Pheasant (2010 - absent) Known to have bred historically at TTP.

Rock Pigeon (2010 - absent) Known to have bred historically at TTP.

Ruby-crowned Kinglet (2010 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2010 during the breeding season was presumably a late migrant.

Savannah Sparrow (2010 - probable) Savannah Sparrow is 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 Toplands. No confirmed nesting evidence was obtained in 2010 beyond observation of singing individuals in suitable habitat during the breeding season.

Song Sparrow (2010 - confirmed) Although Song Sparrow is one of the most abundant nesting species at TTP, finding its well-concealed nests has proved to be difficult. In 2010, 8 nests were found.

Sora (2010 - absent) Known to have bred historically at TTP.

Spotted Sandpiper (2010 - confirmed) A common nester at TTP in open areas near water. Eight nests were found in 2010. Observations of juveniles along roadways are frequent.

Tree Swallow (2010 - confirmed) Tree Swallow is a common breeder at TTP. In 2010, several nest boxes were occupied, particularly around Cell 1, but only nine nests were documented and monitored. In general, tree swallows using nest boxes are not monitored.

Virginia Rail (2010 - absent) Known to have bred historically at TTP.

Warbling Vireo (2010 - confirmed) A common nesting species in forested areas of TTP. In 2010, 9 nests were found.

Western Palm Warbler (2010 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2010 during the breeding season was presumably a late migrant.

White-breasted Nuthatch (2010 - observed) This species has never been confirmed as a breeder at TTP.

White-throated Sparrow (2010 – observed) This species has never been confirmed as a breeder at TTP. The bird observed in 2010 during the breeding season was presumably a late migrant.

Willow Flycatcher (2010 - confirmed) Willow Flycatcher is a common nesting species in more open areas with dense shrubs. In 2010, 15 nests were found.

Wilson's Phalarope (2010 - absent) Known to have bred historically at TTP; species not detected in recent years.

Yellow Warbler (2010 - confirmed) Yellow Warblers are common to abundant at TTP. Yellow Warbler colonies exist on Peninsula D, in the Baselands and in the shrubland areas of the Neck and around Cell 3. A total of 82 nests were found in 2010. This species has been observed to be the most frequently parasitized species by Brown-headed Cowbirds at TTP.

Appendix E: Map of 2010 Nest Locations



Appendix F: Breeding Status Codes for Each Species Detected In 2010

OBSERVED	POSSIBLE	PROBABLE	CONFIRMED
American Redstart	Belted Kingfisher	Black-billed Cuckoo	American Goldfinch
Blackpoll Warbler	Blue-gray Gnatcatcher	Savannah Sparrow	American Robin
Black-thr. Green Warbler	Canvasback		American Woodcock
Blue Jay	Caspian Tern		Baltimore Oriole
Canada Warbler	Common Yellowthroat		Bank Swallow
Cliff Swallow	Mourning Dove		Barn Swallow
Great-crested Flycatcher	N.R-winged Swallow		Black-cr. Night-Heron
Hooded Merganser	Red-eyed Vireo		Black-cap. Chickadee
Indigo Bunting			Brown Thrasher
King Rail			Brown-h. Cowbird
Myrtle Warbler			Canada Goose
Northern Mockingbird			Cedar Waxwing
Northern Saw-whet Owl			Common Grackle
Ruby-crowned Kinglet			Common Tern
Western Palm Warbler			Double -Cr Cormorant
White-breasted Nuthatch			Downy Woodpecker
White-throated Sparrow			Eastern Meadowlark
			Eastern Kingbird
			East Wood Pewee
			European Starling
			Gadwall
			Gray Catbird
			Great Egret
			Herring Gull
			House Wren
			Killdeer
			Least Flycatcher
			Mallard
			Mute Swan
			Northern Cardinal
			Northern Flicker
			Orchard Oriole
			Red-winged Blackbird
			Ring-billed Gull
			Song Sparrow
			Spotted Sandpiper
			Tree Swallow
			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

