

The Breeding Birds of Tommy Thompson Park

2009



Cedar Waxwing Nest (A. Jano)

Toronto and Region Conservation



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Table of Contents

Introduction	
Study Area.....	3
Tommy Thompson Park.....	3
Project Background.....	3
Rationale.....	3
Methods.....	3
Results	
Variable Circular Plot Counts	4
Nest Searching.....	8
The Overall Picture.....	12
Species Accounts.....	14
Acknowledgments	18

Tables, Figures and Appendices

Tables	
1 VCP Station Information.....	4
2 VCP Species Lists from 2005 to 2009	5
3 Total Birds Detected by Species Within 100 Meters.....	7
4 2009 Effort by Project Participants.....	8
5 Primary Habitat Type by Zone (hours).....	8
6 Total Nests by Species from 2005 to 2009.....	9
7 Nests per Species by Area in 2009.....	10
8 Brown-headed Cowbird parasitism rates	12
9 Breeding Status Codes for Each Species Detected in 2009.....	13
Figures	
1 Total Abundance per Station.....	6
2 Species Richness per Station.....	6
3 Effort per Zone from 2006 to 2009.....	8
Appendices	
A Map of TTP Breeding Bird Zones.....	20
B Summary of 2009 TTP Nest Records.....	21
C Map of 2009 Nest Locations.....	30
D Annotated map of Tommy Thompson Park with VCP station locations.....	31

Introduction

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.

Project Background

Toronto and Region Conservation (TRCA) has invested significant effort into annual assessments of nesting colonial waterbirds at Tommy Thompson Park. This is due to the significance of the site for continentally and globally significant populations of several waterbird species, which include Common Tern, Caspian Tern, Ring-billed Gull, Black-crowned Night Heron and Double-crested Cormorant. Until 2005, comparatively little effort had been put toward other bird species. The Breeding Birds of Tommy Thompson Park Project detailed in this report was initiated in 2005 as a method of monitoring and documenting other nesting bird species for the site.

Rationale

The Breeding Birds of Tommy Thompson Park project is organized around monitoring of breeding bird density and diversity in response to habitat succession and restoration. Regular surveys of breeding non-colonial waterbird and landbird species at TTP will 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, expertise is readily available and also because monitoring of avian response to habitat restoration efforts is lacking. The Tommy Thompson Park Bird Research Station, through volunteers and some staff support will carry out the project regularly in spring and summer.

Methods

A combination of variable circular plot (VCP) counts, nest searching and casual observations was employed from April – August 2009 (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 recently completed 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. Most nest records gathered are submitted to the Ontario Nest Records Scheme (ONRS).

Results

Variable Circular Plot (VCP) Counts

Protocol



Northern Flicker (I. Sturdee)

The specific protocol for the counts during summer 2009 at Tommy Thompson Park was for 5-minute-long VCP counts at nine stations, the same protocol used in all previous years. The VCP counting method has been widely promoted by biologists over the more popular point count method. VCP counts are much more applicable to analysis and have less bias. Analysis in this report is limited; however, this survey protocol ensures that future analysis will be efficient. Locations were targeted based on proportion of individual habitat types within the entire land area. Stations were visited on a rotational schedule such that time of day and season were equally represented. All counts were conducted between 7:00 am and 10:00 am. The protocol involved recording of start time, finish time (5 min), date, visit number and UTM location for each of the nine stations. Temperature, percentage cloud cover and wind speed and direction were also recorded. Counts were completed on days with fair weather conditions such that visibility was high, wind speed was low to moderate (0-15 kph) and precipitation was absent. All birds detected were estimated to the

following distance parameters: <10m, 10-20m, 20-30m, 30-50m, 50-100m and >100m. Any flyovers and any birds detected beyond 100m were recorded in separate columns. The circumstances of each detection were also noted (e.g., observed, singing, territorial dispute, family group).

Station locations were 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. Each station was visited on six occasions between June 9 and June 30. A summary of station information is presented below in Table 1. The locations of the stations are shown on Appendix D, an annotated map of Tommy Thompson Park.

Table 1. VCP Station Information

Station	UTM Zone	Easting	Northing	Location	Habitat Type
1	17	635198	4834430	Baselands	Wet Thicket
2	17	635219	4834206	Baselands	Forest
3	17	634948	4834140	Baselands	Dry Meadow
4	17	635276	4833959	Baselands	Dry Meadow
5	17	635101	4832683	Neck	Shrubland
6	17	634332	4832165	Peninsula D	Forest
7	17	634726	4831138	Flats	Wet Meadow
8	17	634220	4831453	Peninsula C	Forest
9	17	634208	4831715	Peninsula C	Forest

The habitat type has continued to change over time. Station 1 has continued to evolve into shrubland, while Station 7 is more often dry meadow than wet. It should be noted that Station 8 is now located within part of the Black-crowned Night-Heron colony and Station 9 is within the Double-crested Cormorant colony.

VCP Results

Analysis of VCP count data presented here is a basic summation of results. More sophisticated analysis using DISTANCE software will be necessary in the future once more data is collected to make the effort worthwhile.

As shown in Table 2, a total of 38 species were detected for all counts in 2009, down from the 39 species detected during summer 2006, matching the 38 species detected in 2007, but up two species from 34 in 2005. There were a two species that were detected this year, but not from 2005 to 2008, namely American Woodcock and Blackpoll Warbler. Several species were recorded on counts in earlier years, but not in 2009, although they were detected during other surveys. The frequency of detection for all of the above mentioned species is low at TTP and therefore we can expect year-to-year fluctuations in representation by VCP counts. Based on cumulative work from 2005 to 2009, it is clear that the VCP counts are successful in deriving representative samples of avian communities for key habitats.

Table 2 VCP Species Lists for from 2005 to 2009

Species	2005	2006	2007	2008	2009	Species	2005	2006	2007	2008	2009
AMGO	*	*	*	*	*	GRCA	*	*	*	*	*
AMKE	*					HOFI	*	*	*		
AMRO	*	*	*	*	*	HOSP		*		*	
AMWO					*	KILL	*	*	*	*	*
BANS	*	*	*	*	*	LEFL		*	*	*	*
BAOR	*	*	*	*	*	MALL		*		*	*
BARS	*	*	*	*	*	MAWA					*
BCCH	*	*	*	*	*	MODO	*	*	*	*	
BEKI	*	*			*	NOCA	*	*	*		*
BGGN		*	*	*	*	NOFL	*	*	*	*	*
BHCO	*	*	*	*	*	NRWS	*	*	*	*	*
BLJA				*	*	ROPI		*	*	*	
BLPW					*	RWBL	*	*	*	*	*
BOBO		*	*			SAVS	*	*	*		*
BRTH	*		*			SOSP	*	*	*	*	*
CANG		*				SPSA	*	*	*	*	*
CEDW	*	*	*	*	*	TRES	*	*	*	*	*
CHSW		*	*	*	*	TRFL				*	
CLSW	*					UNDO [#]	*				
COGR	*	*	*	*	*	UNSW					*
COLO [#]	*	*				VEER			*		
COTE		*				WAVI	*	*	*	*	*
COYE	*	*	*	*		WIFL	*	*	*	*	*
EAKI	*	*	*	*	*	YWAR	*	*	*	*	*
EAME		*	*	*							
EAWP	*		*	*	*						
EUST	*	*	*	*	*						
FISP			*								
GADW				*	*						
GBHE [#]					*						
GCFL			*		*	Total	34	39	38	35	38

denotes presumed migrant species

Species richness and abundance per station in 2009 were similar to earlier years (Figures 1 and 2). The stations with the highest overall diversity in 2009 (22, 21 and 21 species) were Stations 5, 4 and 3, respectively, located in the Neck and the Baselands. 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. This may be the reason behind the consistently low abundance and diversity at these stations recorded in all years.

In terms of total station abundance (within 100 m), Station 7 (wet meadow) ranked at the top of the list in 2009 followed closely by Stations 6 (forest) and 5 (shrubland). Overall abundance from VCP counts in 2009 was uniformly higher than in earlier years for all stations.

Figure 1. Total Abundance per Station

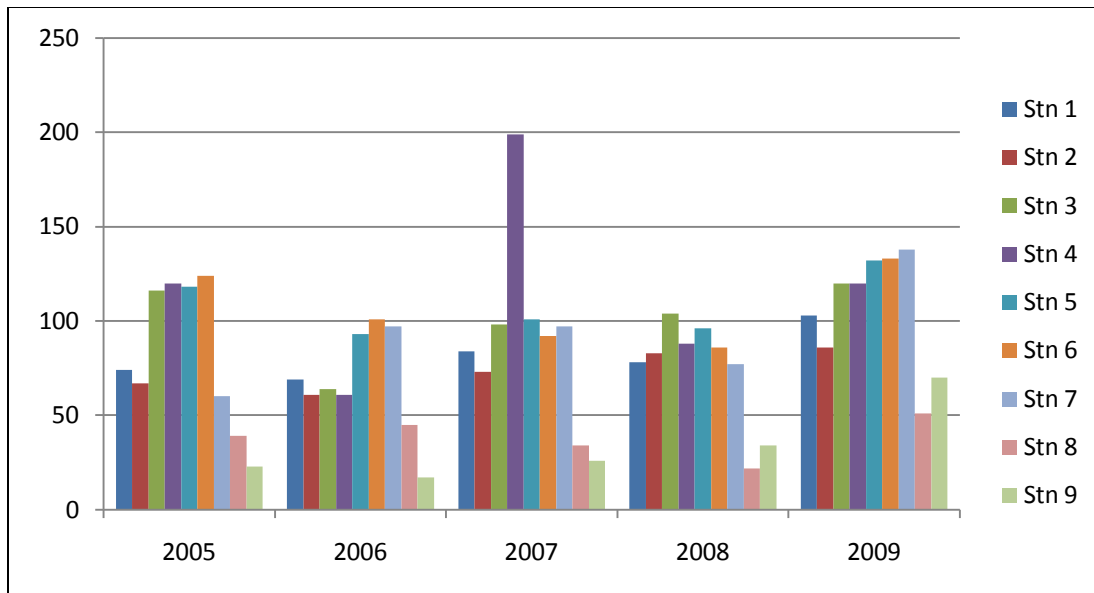
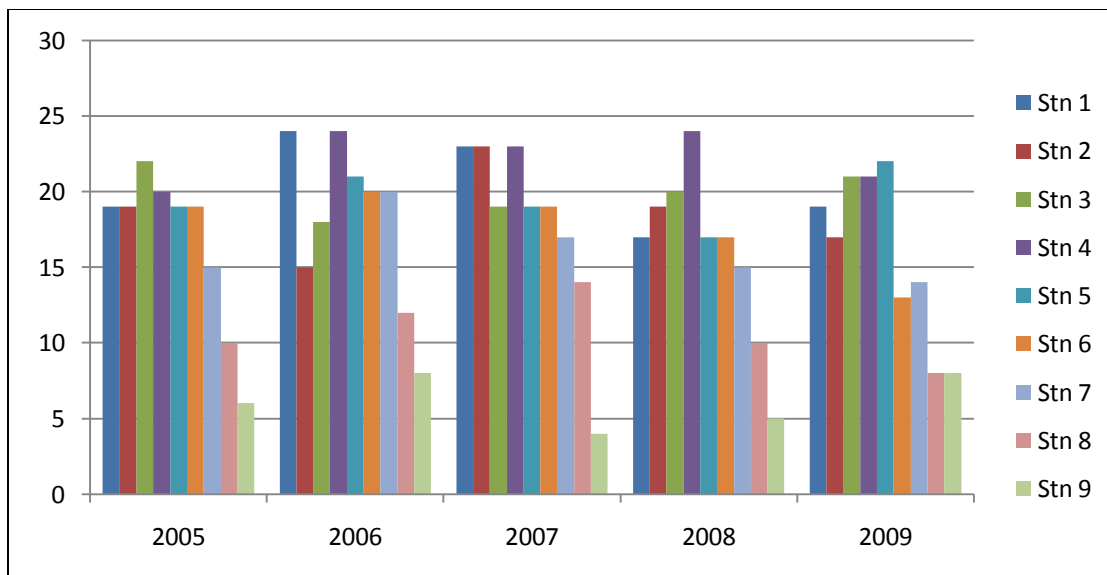


Figure 2. Species Richness per Station



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 restoration. At present the breeding bird communities (non-colonial waterbirds) are typical of early successional environments. Dominant species in all five years of VCP counts include Red-winged Blackbird, Song Sparrow and Yellow Warbler, all of which require basic habitat conditions to thrive. A summary of abundance per species detected by VCP counts (<100 meters) is presented below in Table 3. Both in 2006 and 2007 there were some notable changes in total abundance for some species; however, it is difficult to attach any significance to these changes based on only five years of data. The unusually high numbers (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 2009, with the exception of Red-winged Blackbird, there were no significant changes in abundance for any common species, or in the overall diversity of species.

Table 3. Total Birds Detected by Species within 100 meters

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

Nest Searching

Protocol



House Wren (I. Sturdee)

The nest searching survey method is valuable to bird conservation because it provides indicators of breeding success and parasitism/predation rates. The protocol used in 2009 essentially followed previous years' protocol. It involved exhaustive area searches of as much of the TTP area as time and personnel permitted. From 2008 on the use of ONRS nest cards was discontinued in favour of recording information in field notebooks and submitting the same to ONRS online. Consequently no unique ONRS numbers appear in Appendix B listing the data submitted to ONRS. However, each submitted record can still be identified by a combination of unique codes, such as observer code, waypoint number or UTM coordinates.

In 2009, a total of 403 hours and 40 minutes were logged by eight participants (see Table 4). Each participant was given a specific area to work in, which was necessary to avoid overlap in data collection. This approach was effective and will be utilized in future years of the project. As shown in Appendix A, the entire land area encompassing Tommy Thompson Park/Leslie Street Spit was

divided into six survey zones (i.e., A – F) based on habitat type. Effort was recorded separately for each zone. Table 5 describes the zone habitat types, while Figure 3 shows the breakdown of effort per zone. The increased effort in some zones in 2009 is a result of the additional project participants concentrating on those zones.

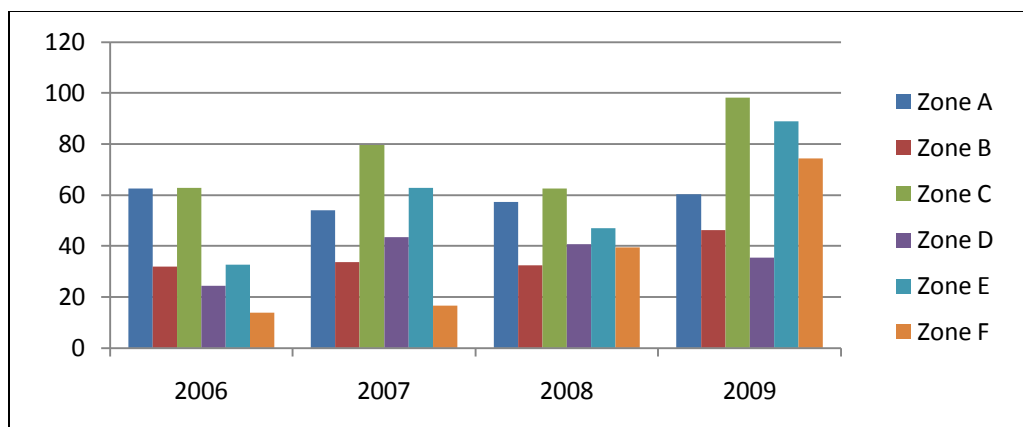
Table 4. 2009 Effort by Project Participants

Name	Total Hours
Heidi Brown	9:00
Mark Field	5:30
Andrew Jano	106:40
Don Johnston	105:15
Jan McDonald	32:30
Glen Reed	22:00
Ian Sturdee	97:15
Bert Vanderzon	25:30
Total	403:40

Table 5. Primary Habitat Type by Zone

Zone	Primary Habitat Type
A	forest, meadow
B	meadow, shrubland, forest
C	forest
D	meadow, shrubland
E	meadow
F	meadow, forest

Figure 3. Effort per Zone from 2006 to 2009 (hours)



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

Results



Song Sparrow Nest (A. Jano)

The introduction of standard nest searching data forms, greater nest searching and monitoring effort combined with experience gained in previous years was very successful as a total of 549 nests were discovered, and 456 of them were monitored. This figure is an increase of 53 % over 2008 when 298 nests were documented. Nests of 27 species were found this year compared to 27 in 2008, 30 in 2007, 33 in 2006 and 20 in 2005. No new species were added to the TTP breeding species list in 2009. Increases in the number of American Goldfinch, American Robin, Red-winged Blackbird and Cedar Waxwing nests are the result of targeting these common breeding species by starting the search period earlier and extending it into late summer. The nest searching period covered 111 days in 2008 (April 30 to August 19), and in 2009 it was extended to 131 days (April 10 to August 19), an 18% increase. The total number of confirmed nesters (excluding colonial waterbirds) after three years of surveys stands at 37. Refer to the Species Accounts below for information on these records.

Table 6. Total Nests by Species from 2005 to 2009

Species	2005	2006	2007	2008	2009	Species	2005	2006	2007	2008	2009
AMGO		1	19	25	44	HOFI			1		
AMRO	3	12	26	51	93	HOSP	1	1			
BANS	15	2			4	HOWR		1		2	2
BAOR	5	13	12	9	9	KILL		3	2	5	8
BARS	7	5	5	3	3	LEFL		1	2		3
BCCH	2			1	2	MALL	1	6	7	9	12
BEKI		1	1	2		MODO		4	4		3
BGGN		1	1	1	3	NOCA	2	1	6	2	4
BRTH	1	1	1	3	4	NOFL	2	4		1	
CANG		1				NRWS		1	1		2
CEDW		3	7	14	40	OROR		1	2	1	
COGR		3	2	1		RWBL	5	45	58	82	130
DOWO			1			SOSP	1	6	5	1	7
EAKI	3	11	17	26	22	SPSA	2	5	6	3	5
EAME		1				TRES	4	7	6	9	9
EAWP			1			WAVI	1	8	4	7	7
EUST		5	2	5	7	WIFL	2	13	21	15	25
GADW	5	1	4	3	3	YWAR	8	34	71	71	75
GRCA	3	12	9	11	23	Total	73	214	304	363	549

Splitting the study area into specific zones and recording time spent in each zone allows us to assess nesting density on a spatial scale and determine species distribution. A breakdown of nests per species for each zone, along with a summary of visit effort and efficiency (nests/effort), is presented below in Table 7.

Efficiency figures are somewhat misleading, as they are highly dependent on the vegetation type of the area (forest versus shrubland), the species found in the dominant habitat (shrub nesters versus ground nesters) and the time spent on monitoring as opposed to finding nests. Area size and nesting density also play a role. The six zones have approximately the same area, yet some of them have large proportions with very few nests. Such are Zone D that includes active and recent lakefill areas, and Zone F that has large areas hosting colonial waterbird colonies.

Table 7. Nests by Species and Zone from 2006 to 2009.

Zone	A				B				C			
Species	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
AMGO		6	7	16			1	5		3	5	8
AMRO	5	10	23	44			4	6	5	11	14	16
BANS												
BAOR	2	2	1	1	2	2	1	1	6	4		2
BARS	5	5	2	1								2
BCCH							1					1
BEKI									1	1	2	
BGGN	1	1	1	1								1
BRTH			2							1	1	2
CANG									1			
CEDW		3	2	11			1	7	3	1	3	10
COGR					1				1	2	1	
DOWO										1		
EAKI	2	2	4	2	2	5	5	4	4	7	7	7
EAWP												
EAME	1											
EUST							1		2	2	3	3
GADW									1	2	1	
GRCA	3	1	2	3		2	1	7	8	2	2	4
HOFI		1										
HOSP	1											
HOWR									1		2	2
KILL		2	3	2	2							2
LEFL	1	2		3								
MALL				2	1	1	1	1	4	5	3	2
MODO	1				1				1	3		3
NOCA				1				1	1	3	2	2
NRWS												1
OROR					1	1						
RWBL	7	15	12	19	20	13	25	49	12	17	14	17
SOSP		2	1	2					2	2		3
SPSA		1		1					2	3	1	1
TRES			1						3	6	4	2
WAVI			2	1					3	3	2	4
WIFL	5	6	5	8	4	6	4	7	1	3		2
YSFL			1						3			
YWAR	9	27	21	20	12	13	15	24	9	19	11	9
Nests	43	86	90	138	46	43	60	112	74	101	78	106
Species	13	16	17	18	10	8	12	11	23	23	18	24
Effort (hh:mm)	62:50	54:00	57:15	60:25	31:50	33:40	32:30	46:15	62:40	79:10	62:30	98:15
Nests/Effort	0.7	1.6	1.6	2.3	1.4	1.3	1.8	2.4	1.2	1.3	1.2	1.1

Zone	D				E				F			
Species	2006	2007	2008	2009	2006	2007	2008	2009	2006	2007	2008	2009
AMGO		1	5	3	1	8	4	7		1	3	5
AMRO	1	1		1	1	2	1	5		2	7	21
BANS				1	2			2				1
BAOR					1	1			2	3	4	5
BARS												
BCCH												
BEKI												1
BGGN												1
BRTH					1			2				
CANG												
CEDW			1			3	3	4			4	8
COGR					1							
DOWO												
EAKI			1	2		2	5	4	3	1	4	3
EAWP						1						
EAME												
EUST			1		2			2	1			2
GADW						2	2	3				
GRCA	1					4	2	7			4	2
HOFI												
HOSP												
HOWR												
KILL			2	2	1			2				
LEFL												
MALL			1	1		1	4	4	1			2
MODO					1	1						
NOCA						3						
NRWS					1			1				
OROR							1			1		
RWBL	1	3	7	4	3	9	16	34	2	1	8	7
SOSP				2	3	1			1			
SPSA	2	1			1	1	2	3				
TRES			1		2			1	2		3	6
WAVI							1	1	5	1	2	1
WIFL	1	3	1	2	1	2		6	1	1	4	
YSFL	1											
YWAR		3	3	3	1	8	16	11	3	1	5	8
Nests	7	12	23	21	23	48	57	99	21	12	48	73
Species	6	6	10	10	17	16	12	17	10	9	11	16
Effort (hh:mm)	24:20	43:20	40:45	35:30	32:30	62:40	47:00	89:00	13:50	16:20	39:30	74:15
Nests/Effort	0.3	0.3	0.6	0.6	0.7	0.8	1.2	1.1	1.5	0.7	1.2	1.0

A total of 456 nests was recorded online with ONRS in 2009. In terms of nest productivity, 124 of 286 nests with known outcomes failed, while 162 were successful in fledging young. The remaining 170 nests have unknown outcomes. The 2009 failure rate of 43% is average compared to earlier years: 33% in 2008, 46% in 2007, 42% in 2006 and 57% in 2005. The larger sample sizes in later years 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 2008. Possible predators at TTP include raccoons, garter snakes, mink and coyotes, as well as other bird species. Of the 124 failures, 102 occurred at the egg stage, 6 at young stage and 16 at either egg or young stage.

Brown-headed Cowbird parasitism has become a major issue for small landbird populations in more open habitats and forest fragments. In 2009 a total of 77 nests of five species were found with cowbird eggs. The most heavily parasitized species were Yellow Warbler (34 nests) and Red-winged Blackbird (32 nests). American Goldfinch (5), Willow Flycatcher (4) and Song Sparrow (2) were also parasitized.

The rate of parasitism among known host species at TTP is shown below in Table 8. (For purposes of this report, a nest was considered parasitized if a Cowbird egg was observed, regardless of what happened to that egg.) In previous reports only a total parasitism rate was presented. With the larger data sets available from 2007 on it is reasonable to present parasitism rates by individual species. The parasitism rates were calculated as the ratio of parasitized nests to the parasitized and non-parasitized nests. Nests of the parasitized species where evidence of parasitism could not be determined were not considered in the calculation. However, it would be unwise to visualize trends on the basis of such a short time span and - in some cases – such a small number of nests.

Table 8. Brown-headed Cowbird parasitism data and rates from 2005 to 2009.

Brown-headed Cowbird parasitism															
Year	2005			2006			2007			2008			2009		
Nests	Y	N	%	Y	N	%	Y	N	%	Y	N	%	Y	N	%
AMGO				1	0	100	2	6	25	1	14	7	5	16	24
AMRO										1	27	4			
RWBL	1	4	20	12	29	29	8	28	22	18	27	40	32	80	29
SOSP	1	0	100	2	4	33							2	2	50
WIFL	1	1	50	3	10	23	4	13	24	4	11	27	4	20	17
YWAR	2	5	29	9	21	30	29	27	52	21	30	41	34	34	50
All	5	10	33	27	64	30	43	74	37	45	109	29	77	152	34

The Overall Picture



Red-winged Blackbird (I. Sturdee)

confirmed breeders list.

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 below in the section titled "Species Accounts". During the summer of 2009, eighty-two species were detected at Tommy Thompson Park through VCP counts, nest searching and casual observations. Of these, 14 were classified as possible breeders, 11 as probable and 37 species (including colonial waterbirds, not monitored by this project) were confirmed breeders. An additional 20 species were observed and classified as non-breeders (habitat unsuitable for breeding). In 2008, 74 species were recorded of which 34 were confirmed as breeders. Current habitat conditions are appropriate for nesting by some other species as well, 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

Table 9. Breeding Status Codes for Each Species Detected In 2009

OBSERVED	POSSIBLE	PROBABLE	CONFIRMED
American Black Duck	Black-billed Cuckoo	American Redstart	American Goldfinch
American Crow	Bobolink	American Woodcock	American Robin
American Kestrel	Common Yellowthroat	Belted Kingfisher	Baltimore Oriole
Black-bellied Plover	East Wood Pewee	Canvasback	Bank Swallow
Blue Jay	Field Sparrow	Caspian Tern	Barn Swallow
Chimney Swift	Great-crested Flycatcher	Downy Woodpecker	Black-cr. Night-Heron
Dunlin	Hooded Merganser	Eastern Meadowlark	Black-cap. Chickadee
Great Blue Heron	House Finch	House Finch	Blue-gray Gnatcatcher
Greater Scaup	House Sparrow	Northern Flicker	Brown Thrasher
Least Sandpiper	Mourning Warbler	Orchard Oriole	Brown-h. Cowbird
Lesser Yellowlegs	Northern Harrier	Savannah Sparrow	Canada Goose
Northern Mockingbird	Red-eyed Vireo		Cedar Waxwing
Red Knot	Red-necked Grebe		Common Grackle
Rock Pigeon	Wood Duck		Common Tern
Scarlet Tanager			Double -Cr Cormorant
Semipalmated Plover			Eastern Kingbird
Semipalmated Sandpiper			European Starling
Short-eared Owl			Gadwall
Whimbrel			Gray Catbird
White-breasted Nuthatch			Great Egret
			Herring Gull
			House Wren
			Killdeer
			Least Flycatcher
			Mallard
			Mourning Dove
			Mute Swan
			N.R-winged Swallow
			Northern Cardinal
			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

Species Accounts

The following accounts include species that were listed as possible, probable or confirmed in 2009 as well as historically confirmed breeders. Species highlighted in red were detected in 2009 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 D, an annotated map of the park.

American Crow (2009-observed) Known to have bred historically at TTP.

American Goldfinch (2009-confirmed) This species is a regular nester at TTP. In 2009 forty-four nests were discovered.

American Kestrel (2009-observed) Known to have bred historically at TTP.

American Redstart (2009-probable) This species has never been confirmed as a breeder at TTP. In June 2009 a pair was observed in the woods north of Goldfish Pond.

American Robin (2009-confirmed) Common nesting species in forested areas throughout TTP. 93 nests were recorded in 2009 in nearly all zones at TTP.

American Woodcock- (2009-probable) This species is an early nester (April) and as such will likely be missed in most years of the project. Confirmed nester in earlier years, in 2009 the species was observed several times at different locations in June and July in suitable habitat.

American Black Duck (2009-observed) Known to have bred historically at TTP.

Baltimore Oriole (2009-confirmed) Common nesting species in forest areas of TTP. A total of 9 nests were recorded in 2009.

Bank Swallow (2009-confirmed) Small nesting colonies were discovered in both the meadows and southern shoreline of the Toplands area in earlier years. 4 nests were found in 2009.

Barn Swallow (2009-confirmed) Barn Swallows are regular nesters at TTP under the eaves of buildings, particularly the garage located near the Port Authority booth. Three nests were discovered here and at the Aquatic Sailing Club's clubhouse in 2009.

Belted Kingfisher (2009-probable) This species was confirmed for the first time in 2003 based on observations of fledged young. No nests were found in 2009.

Black-billed Cuckoo (2009-possible) Known to have bred historically at TTP. In 2009 the species has been observed in early August.

Black-capped Chickadee (2009-confirmed) A regular but uncommon nester at TTP. Two nests were detected in 2009. This is a very difficult species to find outside of the forested areas of Peninsula D.

Black-crowned Night Heron (2009-confirmed) An abundant nesting colonial waterbird species at TTP. An estimated 30% of the Canada-wide population of Black-crowned Night Heron breeds here.

Blue Jay (2009-observed) This species has never been confirmed as a breeder at TTP. No nesting evidence was obtained in 2009 beyond observation of the species in suitable habitat during in June and July.

Blue-gray Gnatcatcher- (2009-confirmed) Known to have bred historically. First nest for this project was found in the baselands forest in 2006. In 2009 three nests were found.

Blue-winged Teal (2009-absent) Known to have bred historically at TTP. In previous years the species has been observed in suitable habitat during the breeding season.

Bobolink (2009-possible) This species has never been confirmed as a breeder at TTP. In 2009, three females and a singing male were recorded on May 27.

Brown Thrasher (2009-confirmed) Brown Thrasher is a regular but uncommon nester at TTP. Four nests were discovered in 2009.

Brown-headed Cowbird (2009-confirmed) Brown-headed Cowbird is a common species throughout TTP during summer where it was noted to have parasitized American Goldfinch, Yellow Warbler, Song Sparrow, Red-winged Blackbird and Willow Flycatcher.

Canada Goose (2009-confirmed) Canada Goose is a common breeder at TTP along shoreline edges of embayments and containment cells.

Canvasback (2009-probable) Canvasback has bred almost annually in recent years in the Triangle Pond area at TTP. In 2009 the species has been observed in suitable habitat in July.

Caspian Tern (2009-probable) Known to have bred in 2006 at TTP. In 2009 the species has been observed in suitable habitat during the breeding season.

Cedar Waxwing (2009-confirmed) A common late nester at TTP, 40 nests were found in 2009.

Chimney Swift (2009-observed) This species has never been confirmed as a breeder at TTP. Observations of foraging birds near the baselands are frequent; however, at present there are no suitable nesting locations for the species at TTP.

Common Grackle (2009-confirmed) Common Grackle is a regular nester at TTP. Although the species is common throughout the summer, no nest was found in 2009, but recently fledged young was seen.

Common Tern (2009-confirmed) An abundant nesting colonial waterbird species at TTP.

Common Yellowthroat (2009-possible) Individuals of the species were found in the same locations as in previous years. In 2009 a singing male was observed on June 19.

Double-crested Cormorant (2009-confirmed) An abundant nesting colonial waterbird species at TTP.

Downy Woodpecker (2009-probable) In 2009 the species was observed in suitable habitat during the breeding season.

Eastern Kingbird (2009-confirmed) A regular breeder at TTP along forest edges where meadow and shrubs are present. In 2009 a total of 22 nests were found.

Eastern Meadowlark (2009-possible) In 2009 a pair was present during May in Baselands meadow habitats. The only indication of breeding obtained so far was that of a partially constructed nest in 2007.

Eastern Wood Pewee (2009-possible) No nesting evidence was obtained in 2009 beyond observation of two individuals in June and July at different locations. In 2007 a nest was discovered near the Goldfish Pond.

European Starling (2009-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. Seven nests were documented In 2009.

Field Sparrow (2009-possible) This species has never been confirmed as a breeder at TTP. In 2009 a singing male was observed.

Gadwall (2009-confirmed) Gadwall is a surprisingly common nesting species at TTP. Three nests were found in 2009.

Gray Catbird (2009-confirmed) Gray Catbird is a regular nester at TTP, preferring dense shrubs with some tree cover. A total of 23 nests were found.

Great black-backed Gull (2009-absent) Known to have bred historically at TTP. A few individuals were observed in previous years.

Great Egret (2009-confirmed) Regular nester on Peninsula C.

Great Blue Heron (2009-observed) This species has never been confirmed as a breeder at TTP. In 2009 Two individuals were seen in Cell 1 on July 7.

Great-crested Flycatcher (2009-possible) This species has never been confirmed as a breeder at TTP. A single individual was observed in 2009 in suitable habitat.

Green-winged Teal (2009-absent) Known to have bred historically at TTP.

Herring Gull (2009-confirmed) A common nesting colonial waterbird species at TTP.

Hooded Merganser (2009-possible) This species has never been confirmed as a breeder at TTP. In 2009 several individuals and groups were seen in Cell 3, East Cove and Triangle Pond 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 (2009-absent) Known to have bred historically at TTP.

House Finch (2009-possible) In 2009 the species was observed singing in suitable habitat, a pair was seen early July in the Baselands.

House Sparrow (2009-possible) House Sparrow is a regular but uncommon nester at TTP. This species is expanding at TTP. The species was frequently encountered at the Port Authority buildings and in Cell 1.

House Wren (2009-confirmed) In 2009 two nests were found.

Killdeer (2009-confirmed) Killdeer is a common nesting species at TTP in open areas with low vegetation. A total of 8 nests were found in 2009.

Least Flycatcher (2009-confirmed) Three nests were found in 2009.

Mallard (2009-confirmed) Mallard is a regular nester at TTP. 12 Mallard nests were documented in 2009; mostly predated.

Mourning Dove (2009-confirmed) Mourning Dove is a common breeder at TTP, three nests were found in 2009.

Mourning Warbler (2009-possible) This species has never been confirmed as a breeder at TTP. A singing male was heard.

Mute Swan (2009-confirmed) Mute Swan is a regular nesting species along TTP shorelines.

Northern Rough-winged Swallow (2009-confirmed) Two nests were found in 2009.

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

Northern Cardinal (2009-confirmed) Northern Cardinal is an uncommon but annually nesting species at TTP. In 2009 four nests were found.

Northern Flicker (2009-possible) Northern Flicker is a regular nesting species at TTP. No nests were found in 2009.

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

Orchard Oriole (2009-probable) Nest records of this species at TTP are few and far between. In 2009 the species was observed in late May to late July.

Redhead (2009-absent) Known to have bred historically.

Red-eyed Vireo (2009-possible) This species has never been confirmed as a breeder at TTP. A singing male was observed in the Neck on June 12.

Red-necked Grebe (2009-observed) This species has never been confirmed as a breeder at TTP. Three individuals were seen on May 25.

Red-winged Blackbird (2009-confirmed) A common breeding species throughout the TTP area. The most abundant nesting species at TTP (excluding waterbirds). A total of 130 nests were found in 2009.

Ring-billed Gull (2009-confirmed) An abundant nesting colonial waterbird species at TTP.

Ring-necked Pheasant (2009-absent) Known to have bred historically.

Rock Pigeon (2009-observed) Known to have bred historically at TTP. No nesting evidence was obtained in 2009 beyond observation of the species in suitable habitat during the breeding season.

Savannah Sparrow (2009-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 nesting evidence was obtained in 2009 beyond observation of singing individuals in suitable habitat during the breeding season.

Scarlet Tanager (2009-observed) This species has never been confirmed as a breeder at TTP. An individual was observed at the Goldfish Pond on June 9.

Sharp-shinned Hawk (2009-absent) A few individuals were observed in previous years.

Short-eared Owl (2009-observed) This species has never been confirmed as a breeder at TTP. An individual was observed on May 21 in the Flats.

Song Sparrow (2009-confirmed) Although Song Sparrow is one of the most abundant nesting species at TTP, finding its well concealed nests proved to be difficult. In 2009 seven nests were found. Only one nest was found in 2008. In 2007 a total of five nests were found.

Sora (2009-absent) Known to have bred historically.

Spotted Sandpiper (2009-confirmed) A common nester at TTP in open areas near water. 5 nests were found in 2009. Observations of juveniles along roadways are frequent.

Tree Swallow (2009-confirmed) Tree Swallow is a common breeder at TTP. In 2009 many nest boxes were occupied but only nine nests were documented and monitored. In general, tree swallows using nest boxes are not monitored.

Virginia Rail (2009-absent) Known to have bred historically.

Warbling Vireo (2009-confirmed) A common nesting species in forested areas of TTP. In 2009 seven nests were found.

White-breasted Nuthatch (2009-observed) This species has never been confirmed as a breeder at TTP. Seen on June 24 in Peninsula D.

Willow Flycatcher (2009-confirmed) Willow Flycatcher is a common nesting species in more open areas with dense shrubs. In 2009 twenty-five nests were found.

Wilson's Phalarope (2009-absent) Known to have bred historically, species not detected in recent years.

Wood Duck (2009-possible) This species has never been confirmed as a breeder at TTP. A pair was seen on May 13, 2009.

Yellow Warbler (2009-confirmed) Yellow Warblers are common to abundant at TTP. Yellow Warbler colonies exist on Peninsula D, in the Baselands and in the shrubland area of the Neck. A total of 75 nests were found. This species is frequently parasitized by Brown-headed Cowbirds.

Acknowledgements

Andrew Jano compiled the data, provided all of the analysis and created the mapping components for this report. As with the 2008 report, this report would not have been completed without his considerable contributions. Don Johnston assisted with final editing and charts.

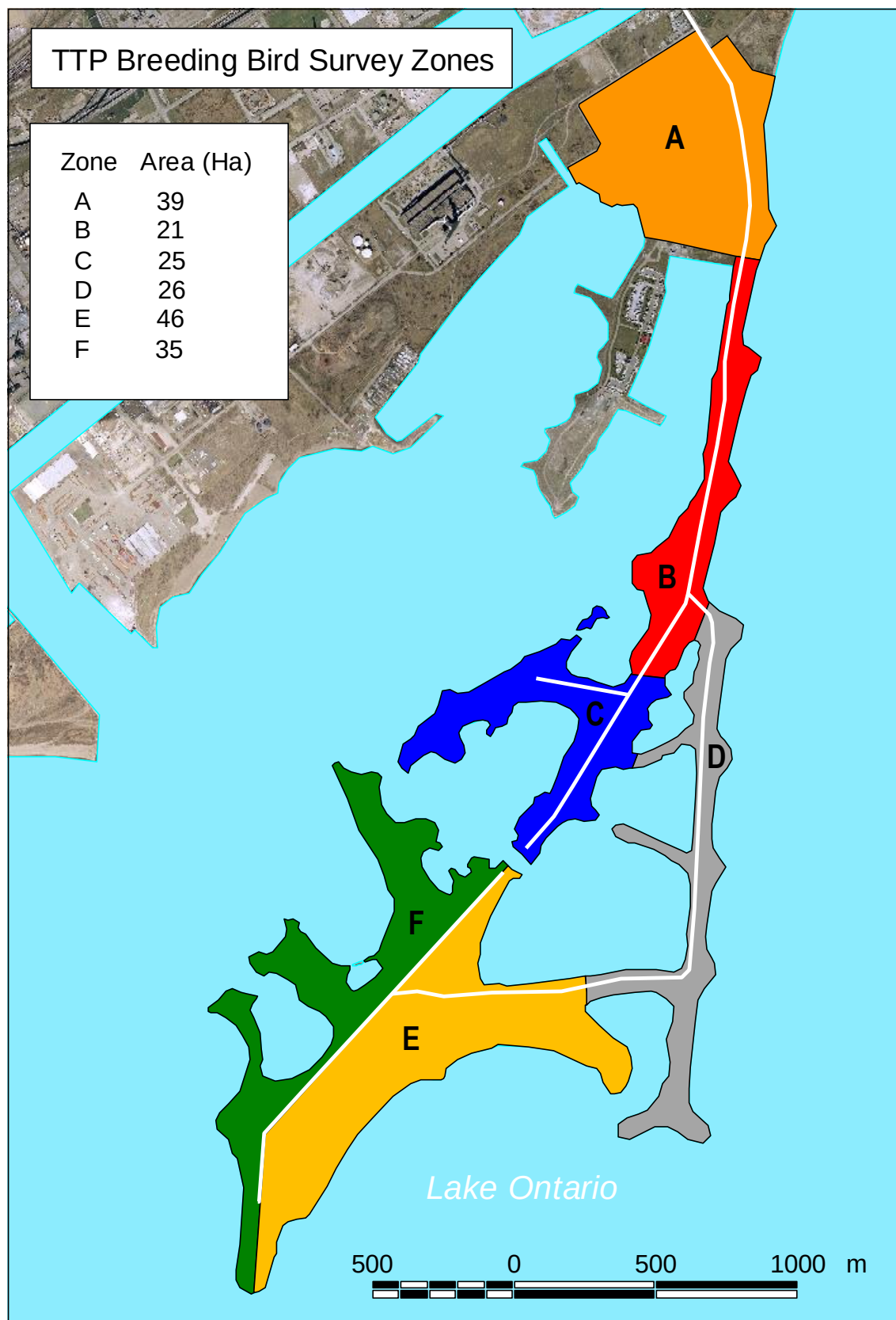
Special thanks should go to Dan Derbyshire, former TTPBRS coordinator, who organized the Breeding Bird Survey project, set up the VCP point count and nest searching protocols and contributed a significant effort to all phases of the project until his departure in 2008. In many respects, the current report is an updated version of his original report "The Breeding Birds of Tommy Thompson Park, 2006".

Credit is also due Karen McDonald (TRCA) for many valuable suggestions which have served to improve the report's accuracy and readability.

The improved results from the fifth year of the project detailed in this report are due to the efforts of the volunteer project participants Heidi Brown, Mark Field, Andrew Jano, Don Johnston, Jan McDonald, Glen Reed, Ian Sturdee and Bert Vanderzon.

Appendices

Appendix A. Map of TTP Breeding Bird Survey Zones



Appendix B. Summary of 2009 Nest Records

Species Code	TTP Zone	Nest Card Filed	UTM Easting	UTM Northing	UTM Zone	NAD	Success (see codes below)	Observer
AMGO	C	Y	634518	634518	17	83	OU	IS
AMGO	C	Y	634429	4832217	17	83	OU	IS
AMGO	C	Y	634611	4832284	17	83	OU	IS
AMGO	C	Y	634703	4831825	17	83	OU	IS
AMGO	C	Y	634780	4831899	17	83	XE	IS
AMGO	C	Y	634649	4832381	17	83	OU	IS
AMGO	D	Y	635219	4831693	17	83	OU	IS
AMGO	D	Y	635251	4832076	17	83	OU	IS
AMGO	E	Y	634480	4831181	17	83	ED	DJ
AMGO	E	Y	634412	4831471	17	83	OU	DJ
AMGO	E	Y	634447	4831530	17	83	OU	DJ
AMGO	E	Y	634370	4831439	17	83	OU	DJ
AMGO	E	Y	634114	4831056	17	83	OU	DJ
AMGO	E	Y	634825	4831271	17	83	OU	DJ
AMGO	E	Y	634653	4831258	17	83	OU	DJ
AMGO	F	Y	633671	4830877	17	83	OU	DJ
AMGO	F	Y	633712	4830800	17	83	OU	DJ
AMGO	F	Y	634125	4831209	17	83	YC	DJ
AMGO	F	Y	634451	4831554	17	83	OU	DJ
AMGO	A	Y	635226	4834139	17	83	NE, OU	AJ
AMGO	A	Y	635160	4834099	17	83	EP, EA, OU	AJ
AMGO	B	Y	635068	4832501	17	83	ED	AJ
AMGO	B	Y	635086	4832698	17	83	NE	AJ
AMGO	A	Y	635319	4834069	17	83	NE, EX, NN	AJ
AMGO	A	Y	635252	4834080	17	83	YC, NE	AJ
AMGO	A	Y	634971	4834203	17	83	NE	AJ
AMGO	A	Y	635095	4834164	17	83	NE	AJ
AMGO	A	Y	634803	4834119	17	83	EE	AJ
AMGO	B	Y	635008	4832321	17	83	NE	AJ
AMGO	B	Y	635099	4832574	17	83	OU	AJ
AMGO	B	Y	635101	4832492	17	83	OU	AJ
AMGO	A	Y	635056	4834198	17	83	EP	AJ
AMGO	A	Y	635038	4834203	17	83	EP	AJ
AMGO	A	Y	635112	4833987	17	83	OU	AJ
AMGO	A	Y	635381	4834093	17	83	OU	AJ
AMGO	A	Y	635332	4834190	17	83	OU	AJ
AMGO	A	Y	635269	4834564	17	83	YC, NE, NN	AJ
AMGO	A	Y	635151	4834290	17	83	EE	AJ
AMGO	A	Y	635216	4834071	17	83	YC, NE	AJ
AMGO	A	Y	635321	4834231	17	83	YC, NE	AJ
AMRO	C	Y	634653	4832305	17	83	AC	IS
AMRO	C	Y	634344	4832131	17	83	OU	IS
AMRO	C	Y	634968	4832312	17	83	EB	IS
AMRO	C	Y	634804	4832253	17	83	OU	IS
AMRO	C	Y	634534	4832213	17	83	OU	IS
AMRO	C	Y	634746	4831913	17	83	OU	IS
AMRO	C	Y	634356	4832112	17	83	OU	IS
AMRO	C	Y	634542	4832271	17	83	OU	IS
AMRO	C	Y	634338	4832195	17	83	OU	IS
AMRO	C	Y	634578	4832293	17	83	AC	IS
AMRO	E	Y	634633	4831220	17	83	NE	DJ
AMRO	E	Y	634391	4831184	17	83	OU	DJ
AMRO	E	Y	634230	4831246	17	83	OU	DJ
AMRO	E	Y	634026	4831056	17	83	OU	DJ

Species Code	TTP Zone	Nest Card Filed	UTM Easting	UTM Northing	UTM Zone	NAD	Success (see codes below)	Observer
AMRO	E	Y	634435	4831494	17	83	AC, YC	DJ
AMRO	F	Y	634413	4831577	17	83	OU	DJ
AMRO	F	Y	634346	4831566	17	83	YC	DJ
AMRO	F	Y	633692	4830571	17	83	OU	DJ
AMRO	F	Y	634403	4831568	17	83	NN	DJ
AMRO	F	Y	634120	4831257	17	83	NE	DJ
AMRO	F	Y	633956	4831047	17	83	XE	DJ
AMRO	F	Y	634366	4831495	17	83	NN	DJ
AMRO	F	Y	634188	4831479	17	83	EX	DJ
AMRO	F	Y	634182	4831283	17	83	OU	DJ
AMRO	F	Y	634074	4831151	17	83	NE	DJ
AMRO	F	Y	633796	4830836	17	83	NN	DJ
AMRO	F	Y	633760	4830829	17	83	OU	DJ
AMRO	F	Y	634327	4831416	17	83	AC	DJ
AMRO	F	Y	633979	4831047	17	83	OU	DJ
AMRO	F	Y	634468	4831590	17	83	OU	DJ
AMRO	F	Y	633681	4830882	17	83	YC	DJ
AMRO	F	Y	634011	4831089	17	83	OU	DJ
AMRO	F	Y	634227	4831314	17	83	YC	DJ
AMRO	A	Y	635259	4834526	17	83	EE	AJ
AMRO	A	Y	634977	4834178	17	83	EE	AJ
AMRO	A	Y	634905	4834411	17	83	EE	AJ
AMRO	A	Y	635119	4833946	17	83	EE	AJ
AMRO	A	Y	635374	4833975	17	83	EE	AJ
AMRO	A	Y	635375	4834501	17	83	EE	AJ
AMRO	A	Y	635415	4834402	17	83	OU	AJ
AMRO	A	Y	635223	4834476	17	83	EE	AJ
AMRO	A	Y	635141	4834207	17	83	EE	AJ
AMRO	A	Y	635306	4834164	17	83	EE	AJ
AMRO	A	Y	635467	4834047	17	83	OU	AJ
AMRO	A	Y	635413	4834371	17	83	EE	AJ
AMRO	A	Y	635248	4834625	17	83	EJ	AJ
AMRO	A	Y	635260	4834617	17	83	EP	AJ
AMRO	A	Y	635404	4834314	17	83	YC,NE	AJ
AMRO	A	Y	635417	4834465	17	83	EJ	AJ
AMRO	A	Y	635357	4834471	17	83	EJ	AJ
AMRO	A	Y	635127	4834008	17	83	ED	AJ
AMRO	A	Y	635158	4833899	17	83	EP,EE	AJ
AMRO	A	Y	635203	4834090	17	83	EP,EJ	AJ
AMRO	A	Y	635072	4834449	17	83	EE	AJ
AMRO	B	Y	635026	4832700	17	83	NE	AJ
AMRO	B	Y	635094	4832550	17	83	NE	AJ
AMRO	B	Y	635089	4832584	17	83	OU, JJ	AJ
AMRO	A	Y	635253	4834586	17	83	EP,EE	AJ
AMRO	A	Y	635335	4834274	17	83	OU	AJ
AMRO	A	Y	634941	4834155	17	83	OU	AJ
AMRO	A	Y	635107	4834072	17	83	EE	AJ
AMRO	B	Y	635104	4832647	17	83	NE, VA	AJ
AMRO	A	Y	635130	4834067	17	83	OU	AJ
BANS	D	Y	635057	4831261	17	83	OU	IS
BANS	E	Y	634912	4830960	17	83	OU	DJ
BANS	E	Y	634078	4831117	17	83	OU	DJ
BAOR	C	Y	634404	4832262	17	83	OU	IS
BAOR	F	Y	634382	4831477	17	83	AC	DJ
BAOR	F	Y	633661	4830658	17	83	OU	DJ
BAOR	F	Y	634300	4831429	17	83	OU	DJ
BAOR	F	Y	634146	4831257	17	83	OU	DJ

Species Code	TTP Zone	Nest Card Filed	UTM Easting	UTM Northing	UTM Zone	NAD	Success (see codes below)	Observer
BAOR	F	Y	633733	4830850	17	83	AC	DJ
BAOR	A	Y	635254	4834254	17	83	OU	AJ
BAOR	B	Y	635100	4832584	17	83	OU	AJ
BARS	C	Y	634683	4832295	17	83	EI	IS
BARS	C	Y	634692	4832290	17	83	OU	IS
BARS	A	Y	635399	4833946	17	83	NN	AJ
BCCH	C	Y	634235	4832126	17	83	AC	IS
BCCH	F	Y	634394	4831549	17	83	AC, NN	DJ
BGGN	C	Y	634359	4832156	17	83	OU	IS
BGGN	F	Y	633768	4830880	17	83	OU	DJ
BGGN	A	Y	635205	4834190	17	83	ED	AJ
BRTH	C	Y	634228	4832091	17	83	OU	IS
BRTH	C	Y	634637	4832393	17	83	OU	IS
BRTH	E	Y	634306	4831007	17	83	OU	DJ
BRTH	E	Y	634306	4831007	17	83	OU	DJ
CEDW	C	Y	634284	4832164	17	83	AC	IS
CEDW	C	Y	634736	4832335	17	83	OU	IS
CEDW	C	Y	634671	4832343	17	83	AC	IS
CEDW	C	Y	634850	4832321	17	83	OU	IS
CEDW	C	Y	634758	4831926	17	83	OU	IS
CEDW	C	Y	634702	4832390	17	83	OU	IS
CEDW	E	Y	634174	4831198	17	83	AC	DJ
CEDW	E	Y	634089	4831099	17	83	OU	DJ
CEDW	E	Y	634435	4831494	17	83	OU	DJ
CEDW	F	Y	634443	4831539	17	83	AC	DJ
CEDW	F	Y	634510	4831634	17	83	OU	DJ
CEDW	F	Y	633709	4830891	17	83	AC	DJ
CEDW	F	Y	633692	4830874	17	83	OU	DJ
CEDW	F	Y	634385	4831482	17	83	AC	DJ
CEDW	F	Y	633628	4830706	17	83	OU	DJ
CEDW	F	Y	633621	4830778	17	83	OU	DJ
CEDW	F	Y	733706	4830616	17	83	YC	DJ
CEDW	A	Y	634817	4834119	17	83	YC,NE	AJ
CEDW	B	Y	635217	4832753	17	83	YC, NE	AJ
CEDW	A	Y	634901	4834150	17	83	YC, NE	AJ
CEDW	B	Y	635185	4832762	17	83	NE	AJ
CEDW	B	Y	635081	4832492	17	83	EE	AJ
CEDW	A	Y	635400	4834335	17	83	OU	AJ
CEDW	A	Y	635130	4834302	17	83	YC, NE	AJ
CEDW	A	Y	635082	4834091	17	83	EP, ED	AJ
CEDW	A	Y	635094	4834286	17	83	NE	AJ
CEDW	A	Y	635121	4834011	17	83	OU	AJ
CEDW	B	Y	635164	4832706	17	83	OU	AJ
CEDW	A	Y	635138	4834341	17	83	YC, NE	AJ
CEDW	A	Y	635051	4834071	17	83	OU	AJ
CEDW	A	Y	635331	4834314	17	83	EE, OU	AJ
EAKI	C	Y	634626	4832305	17	83	OU	IS
EAKI	C	Y	634765	4832350	17	83	NN	IS
EAKI	C	Y	634247	4832136	17	83	NN	IS
EAKI	C	Y	634858	4832093	17	83	OU	IS
EAKI	C	Y	634815	4832014	17	83	OU	IS
EAKI	C	Y	634877	4832320	17	83	OU	IS
EAKI	D	Y	634958	4831318	17	83	OU	IS
EAKI	D	Y	635181	4832122	17	83	OU	IS
EAKI	E	Y	634299	4831252	17	83	OU	DJ
EAKI	E	Y	634555	4831228	17	83	NN	DJ
EAKI	E	Y	634074	4831115	17	83	OU	DJ

Species Code	TTP Zone	Nest Card Filed	UTM Easting	UTM Northing	UTM Zone	NAD	Success (see codes below)	Observer
EAKI	E	Y	634400	4831239	17	83	XP	DJ
EAKI	F	Y	634451	4831553	17	83	OU	DJ
EAKI	F	Y	633678	4830705	17	83	NN	DJ
EAKI	B	Y	635234	4832777	17	83	OU	AJ
EAKI	B	Y	635025	4832359	17	83	OU	AJ
EAKI	B	Y	635068	4832678	17	83	NN, NE	AJ
EAKI	B	Y	635157	4832587	17	83	NN	AJ
EAKI	A	Y	635013	4834086	17	83	OU	AJ
EAKI	A	Y	634804	4834122	17	83	NN	AJ
EUST	C	Y	634676	4832303	17	83	AC	IS
EUST	C	Y	634663	4832308	17	83	JI	IS
EUST	C	Y	634683	4832293	17	83	OU	IS
EUST	E	Y	634305	4831249	17	83	NN	DJ
EUST	F	Y	634364	4831541	17	83	OU	DJ
EUST	F	Y	633916	4831213	17	83	AC	DJ
GADW	E	Y	634690	4831169	17	83	EP	DJ
GADW	E	Y	634714	4831206	17	83	EP	DJ
GADW	E	Y	634596	4831144	17	83	EP	DJ
GRCA	C	Y	634274	4832099	17	83	OU	IS
GRCA	C	Y	634339	4832100	17	83	OU	IS
GRCA	C	Y	634397	4832085	17	83	OU	IS
GRCA	C	Y	634390	4832132	17	83	OU	IS
GRCA	E	Y	634406	4831459	17	83	XE	DJ
GRCA	E	Y	634100	4831025	17	83	NE	DJ
GRCA	E	Y	634102	4831085	17	83	NE	DJ
GRCA	E	Y	634118	4831136	17	83	NE	DJ
GRCA	E	Y	634047	4831077	17	83	NE	DJ
GRCA	E	Y	634080	4831082	17	83	NE	DJ
GRCA	F	Y	633624	4830764	17	83	XE	DJ
GRCA	F	Y	633691	4830790	17	83	VA, YC, EX	DJ
GRCA	B	Y	635038	4832713	17	83	OU	AJ
GRCA	B	Y	635321	4833407	17	83	EP,EE	AJ
GRCA	A	Y	635020	4834156	17	83	NE,VA	AJ
GRCA	A	Y	635183	4834254	17	83	YC,VA	AJ
GRCA	B	Y	635141	4832743	17	83	EP, EJ	AJ
GRCA	B	Y	635093	4832487	17	83	NE, VA	AJ
GRCA	A	Y	635260	4834300	17	83	YC, NE	AJ
GRCA	B	Y	635073	4832661	17	83	YC, VA	AJ
GRCA	B	Y	635080	4832772	17	83	NE, NN, VA	AJ
HOWR	C	Y	634654	4832316	17	83	OU	IS
HOWR	C	Y	634766	4831922	17	83	NN	IS
KILL	C	Y	634971	4832205	17	83	OU	IS
KILL	C	Y	635006	4832257	17	83	OU	IS
KILL	D	Y	635089	4831285	17	83	OU	IS
KILL	D	Y	634970	4831274	17	83	OU	IS
KILL	E	Y	634693	4831111	17	83	NE, VA	DJ
KILL	E	Y	634828	4831249	17	83	EP	DJ
KILL	A	Y	635371	4834160	17	83	EP	AJ
KILL	A	Y	635115	4833894	17	83	NE	AJ
LEFL	A	Y	635181	4834179	17	83	ED	AJ
LEFL	A	Y	635176	4834213	17	83	OU	AJ
LEFL	A	Y	635229	4834220	17	83	YC, NE	AJ
MALL	C	Y	635024	4832295	17	83	OU	IS
MALL	C	Y	634371	4832291	17	83	OU	IS
MALL	D	Y	634989	4831268	17	83	EP	IS
MALL	E	Y	634633	4831116	17	83	EP	DJ
MALL	E	Y	633823	4830690	17	83	EP	DJ

Species Code	TTP Zone	Nest Card Filed	UTM Easting	UTM Northing	UTM Zone	NAD	Success (see codes below)	Observer
MALL	E	Y	634728	4831095	17	83	EP	DJ
MALL	E	Y	634394	4831424	17	83	EP	DJ
MALL	F	Y	634301	4831429	17	83	XP	DJ
MALL	F	Y	634336	4831507	17	83	ED	DJ
MALL	A	Y	635222	4834435	17	83	EP	AJ
MALL	B	Y	635045	4832764	17	83	EP	AJ
MODO	C	Y	634650	4832309	17	83	NN	IS
MODO	C	Y	634426	4832250	17	83	EB	IS
NOCA	C	Y	634358	4832090	17	83	OU	IS
NOCA	C	Y	634345	4832107	17	83	OU	IS
NOCA	A	Y	635013	4834170	17	83	EP,EJ	AJ
NRWS	E	Y	634912	4830960	17	83	OU	DJ
RWBL	C	Y	634297	4832191	17	83	OU	IS
RWBL	C	Y	634623	4831790	17	83	OU	IS
RWBL	C	Y	634701	4831941	17	83	OU	IS
RWBL	C	Y	634785	4832074	17	83	OU	IS
RWBL	C	Y	634808	4832101	17	83	OU	IS
RWBL	C	Y	634858	4832303	17	83	OU	IS
RWBL	C	Y	634364	4832085	17	83	OU	IS
RWBL	C	Y	634790	4832370	17	83	OU	IS
RWBL	C	Y	634365	4832081	17	83	OU	IS
RWBL	C	Y	634841	4831932	17	83	OU	IS
RWBL	C	Y	634320	4832174	17	83	OU	IS
RWBL	C	Y	634344	4832095	17	83	OU	IS
RWBL	D	Y	635113	4831256	17	83	EB	IS
RWBL	D	Y	635180	4831730	17	83	OU	IS
RWBL	E	Y	634409	4831146	17	83	XE	DJ
RWBL	E	Y	634348	4831164	17	83	EO	DJ
RWBL	E	Y	634540	4831157	17	83	ED	DJ
RWBL	E	Y	634699	4831159	17	83	EE	DJ
RWBL	E	Y	634746	4831150	17	83	NE	DJ
RWBL	E	Y	634759	4831284	17	83	ED	DJ
RWBL	E	Y	634734	4831214	17	83	XP	DJ
RWBL	E	Y	634714	4831229	17	83	SL	DJ
RWBL	E	Y	634715	4831214	17	83	XD	DJ
RWBL	E	Y	634710	4831202	17	83	XD	DJ
RWBL	E	Y	634410	4831376	17	83	OU	DJ
RWBL	E	Y	634414	4831243	17	83	NE	DJ
RWBL	E	Y	634669	4831197	17	83	NE	DJ
RWBL	E	Y	634680	4831168	17	83	NE	DJ
RWBL	E	Y	634742	4831192	17	83	OU	DJ
RWBL	E	Y	634603	4831222	17	83	XO	DJ
RWBL	E	Y	634937	4830983	17	83	NE	DJ
RWBL	E	Y	634878	4831098	17	83	NN	DJ
RWBL	E	Y	634497	4831226	17	83	XO	DJ
RWBL	E	Y	634791	4831275	17	83	EP	DJ
RWBL	E	Y	634381	4831309	17	83	NE	DJ
RWBL	E	Y	634411	4831204	17	83	OU	DJ
RWBL	E	Y	634714	4831229	17	83	NN, VA	DJ
RWBL	E	Y	634977	4830984	17	83	OU	DJ
RWBL	E	Y	634966	4830939	17	83	OU	DJ
RWBL	E	Y	634993	4830973	17	83	OU	DJ
RWBL	E	Y	634783	4831130	17	83	XD	DJ
RWBL	E	Y	634754	4831179	17	83	OU	DJ
RWBL	E	Y	634721	4831208	17	83	ED	DJ
RWBL	F	Y	634131	4831254	17	83	NE	DJ
RWBL	F	Y	634415	4831634	17	83	NE	DJ

Species Code	TTP Zone	Nest Card Filed	UTM Easting	UTM Northing	UTM Zone	NAD	Success (see codes below)	Observer
RWBL	F	Y	634238	4831392	17	83	OU	DJ
RWBL	F	Y	633941	4831184	17	83	NE	DJ
RWBL	F	Y	633618	4830744	17	83	NE	DJ
RWBL	F	Y	634416	4831634	17	83	NE	DJ
RWBL	A	Y	635300	4834322	17	83	EJ	AJ
RWBL	A	Y	635285	4834329	17	83	EJ	AJ
RWBL	A	Y	635296	4834254	17	83	EE, XP	AJ
RWBL	A	Y	635299	4834251	17	83	EP	AJ
RWBL	A	Y	635275	4834107	17	83	EJ	AJ
RWBL	A	Y	634958	4834112	17	83	NN,EA	AJ
RWBL	A	Y	635165	4833904	17	83	OU	AJ
RWBL	A	Y	635346	4833880	17	83	EE	AJ
RWBL	B	Y	635165	4832604	17	83	EP, EJ	AJ
RWBL	B	Y	635105	4832528	17	83	XP	AJ
RWBL	B	Y	635041	4832669	17	83	ED	AJ
RWBL	B	Y	635041	4832663	17	83	OU	AJ
RWBL	B	Y	635066	4832623	17	83	OU	AJ
RWBL	B	Y	635069	4832618	17	83	EJ	AJ
RWBL	B	Y	635077	4832553	17	83	NE	AJ
RWBL	B	Y	635004	4832380	17	83	NE	AJ
RWBL	B	Y	635003	4832384	17	83	OU	AJ
RWBL	B	Y	635005	4832382	17	83	EE	AJ
RWBL	B	Y	635208	4832709	17	83	NE, VA	AJ
RWBL	B	Y	635222	4832782	17	83	XP,OU	AJ
RWBL	B	Y	635215	4832779	17	83	EE	AJ
RWBL	B	Y	635159	4832851	17	83	OU	AJ
RWBL	B	Y	635160	4832846	17	83	OU	AJ
RWBL	B	Y	635139	4832660	17	83	OU	AJ
RWBL	B	Y	635106	4832712	17	83	EP,EE	AJ
RWBL	B	Y	635214	4832733	17	83	NN,VA	AJ
RWBL	B	Y	635211	4832784	17	83	EE	AJ
RWBL	B	Y	635215	4832895	17	83	OU	AJ
RWBL	B	Y	635294	4833110	17	83	EP	AJ
RWBL	A	Y	635257	4834115	17	83	NE	AJ
RWBL	A	Y	635237	4834123	17	83	ED	AJ
RWBL	B	Y	635068	4832779	17	83	EP,EE	AJ
RWBL	B	Y	635073	4832755	17	83	JP, JD	AJ
RWBL	B	Y	635066	4832696	17	83	NE, VA	AJ
RWBL	B	Y	635216	4832748	17	83	EJ,EP	AJ
RWBL	B	Y	635205	4832745	17	83	XP, EE	AJ
RWBL	B	Y	635126	4832818	17	83	NE, VA	AJ
RWBL	B	Y	635155	4832852	17	83	YC, NE	AJ
RWBL	B	Y	635191	4832891	17	83	EP, EE	AJ
RWBL	B	Y	635068	4832546	17	83	EP,EE	AJ
RWBL	A	Y	634940	4834240	17	83	NN, VA	AJ
RWBL	B	Y	635223	4832902	17	83	NN, VA	AJ
RWBL	B	Y	635206	4832779	17	83	NE, VA	AJ
RWBL	B	Y	635110	4832542	17	83	EP	AJ
RWBL	B	Y	635067	4832617	17	83	NE	AJ
RWBL	B	Y	635180	4832815	17	83	YC, EA	AJ
RWBL	B	Y	635195	4832885	17	83	YC, NE	AJ
RWBL	B	Y	635213	4832779	17	83	NE, VA	AJ
RWBL	B	Y	635193	4832892	17	83	YC, NE, VA	AJ
RWBL	B	Y	635160	4832848	17	83	OU	AJ
RWBL	A	Y	635127	4834379	17	83	YC, NE	AJ
RWBL	B	Y	635042	4832747	17	83	NE, VA	AJ
SOSP	C	Y	634943	4832087	17	83	OU	IS

Species Code	TTP Zone	Nest Card Filed	UTM Easting	UTM Northing	UTM Zone	NAD	Success (see codes below)	Observer
SOSP	C	Y	634692	4832399	17	83	NN	IS
SOSP	D	Y	635242	4832108	17	83	OU	IS
SOSP	D	Y	635015	4831312	17	83	NE	IS
SOSP	A	Y	635292	4834230	17	83	OU	AJ
SOSP	A	Y	635211	4834049	17	83	NN, EA	AJ
SPSA	C	Y	634347	4832247	17	83	VA	IS
SPSA	E	Y	634917	4831049	17	83	OU	DJ
SPSA	E	Y	634855	4831107	17	83	ED	DJ
SPSA	E	Y	634409	4831340	17	83	OU	DJ
SPSA	A	Y	635351	4834160	17	83	NE, VA, NN	AJ
TRES	C	Y	634343	4832246	17	83	OU	IS
TRES	C	Y	634660	4832320	17	83	VA	IS
TRES	E	Y	633983	4831018	17	83	VA, AC	DJ
TRES	F	Y	633670	4830397	17	83	OU	DJ
TRES	F	Y	634277	4831591	17	83	OU	DJ
TRES	F	Y	634018	4831161	17	83	OU	DJ
TRES	F	Y	634316	4831421	17	83	OU	DJ
TRES	F	Y	633995	4831160	17	83	YC	DJ
WAVI	C	Y	634737	4832343	17	83	OU	IS
WAVI	C	Y	634615	4832327	17	83	OU	IS
WAVI	F	Y	634300	4831544	17	83	NN	DJ
WAVI	A	Y	635206	4834554	17	83	OU	AJ
WIFL	C	Y	634383	4832105	17	83	ED	IS
WIFL	C	Y	634840	4831940	17	83	OU	IS
WIFL	D	Y	635189	4831729	17	83	OU	IS
WIFL	D	Y	635037	4831785	17	83	AC	IS
WIFL	E	Y	634776	4831271	17	83	YC	DJ
WIFL	E	Y	634437	4831194	17	83	YC, NE	DJ
WIFL	E	Y	634667	4831272	17	83	NE, NN	DJ
WIFL	E	Y	634716	4831260	17	83	YC	DJ
WIFL	E	Y	634872	4831140	17	83	NE	DJ
WIFL	A	Y	634910	4834379	17	83	EX, VA	AJ
WIFL	A	Y	634962	4834314	17	83	NE, VA	AJ
WIFL	B	Y	635060	4832718	17	83	YC, VA	AJ
WIFL	A	Y	635253	4834325	17	83	NE, OU	AJ
WIFL	A	Y	635226	4834103	17	83	EP,EE	AJ
WIFL	A	Y	634958	4834351	17	83	EP, ED	AJ
WIFL	B	Y	635218	4832899	17	83	EE, ED	AJ
WIFL	A	Y	635380	4834095	17	83	EP, ED	AJ
WIFL	A	Y	635305	4834217	17	83	NE, VA	AJ
WIFL	B	Y	635075	4832776	17	83	YC, NE, VA	AJ
WIFL	B	Y	635161	4832853	17	83	YC, NE	AJ
WIFL	A	Y	635368	4834089	17	83	NE	AJ
WIFL	B	Y	635090	4832685	17	83	YC, NE, VA	AJ
WIFL	B	Y	635121	4832732	17	83	YC, NE	AJ
WIFL	B	Y	635133	4832707	17	83	YC, VA	AJ
YWAR	C	Y	634352	4832205	17	83	OU	IS
YWAR	C	Y	634381	634381	17	83	ED	IS
YWAR	C	Y	634507	4832210	17	83	OU	IS
YWAR	C	Y	634421	4832214	17	83	OU	IS
YWAR	C	Y	634529	4832278	17	83	OU	IS
YWAR	C	Y	634361	4832120	17	83	OU	IS
YWAR	C	Y	634570	4832340	17	83	XP	IS
YWAR	C	Y	634362	4832162	17	83	OU	IS
YWAR	C	Y	634437	4832294	17	83	ED	IS
YWAR	D	Y	635083	4831309	17	83	OU	IS
YWAR	D	Y	635061	4831302	17	83	OU	IS

Species Code	TTP Zone	Nest Card Filed	UTM Easting	UTM Northing	UTM Zone	NAD	Success (see codes below)	Observer
YWAR	D	Y	635196	4831696	17	83	ED	IS
YWAR	E	Y	634411	4831214	17	83	NE	DJ
YWAR	E	Y	634726	4831269	17	83	NE	DJ
YWAR	E	Y	634497	4831226	17	83	JO	DJ
YWAR	E	Y	634558	4831206	17	83	NE	DJ
YWAR	E	Y	634354	4831204	17	83	ED	DJ
YWAR	E	Y	634090	4831070	17	83	OU	DJ
YWAR	E	Y	634551	4831258	17	83	OU	DJ
YWAR	E	Y	634859	4831291	17	83	EO	DJ
YWAR	E	Y	634473	4831286	17	83	ED	DJ
YWAR	F	Y	634107	4831179	17	83	NE	DJ
YWAR	F	Y	634163	4831245	17	83	NE	DJ
YWAR	F	Y	634291	4831408	17	83	NE	DJ
YWAR	F	Y	633702	4830806	17	83	NE	DJ
YWAR	F	Y	634029	4831110	17	83	NE	DJ
YWAR	F	Y	633674	4830710	17	83	OU	DJ
YWAR	F	Y	634241	4831318	17	83	OU	DJ
YWAR	F	Y	633659	4830826	17	83	NE	DJ
YWAR	A	Y	635269	4834227	17	83	NE	AJ
YWAR	B	Y	635139	4832616	17	83	EP	AJ
YWAR	B	Y	635090	4832659	17	83	OU,EA	AJ
YWAR	B	Y	635106	4832625	17	83	EJ	AJ
YWAR	B	Y	635124	4832576	17	83	OU,EP	AJ
YWAR	B	Y	635082	4832497	17	83	EE	AJ
YWAR	B	Y	635168	4832698	17	83	JP,XE	AJ
YWAR	B	Y	635157	4832692	17	83	NE	AJ
YWAR	B	Y	635051	4832712	17	83	JC,NN	AJ
YWAR	B	Y	635111	4832744	17	83	NE, VA	AJ
YWAR	B	Y	635144	4832725	17	83	NE, VA	AJ
YWAR	B	Y	635137	4832758	17	83	EE	AJ
YWAR	B	Y	635129	4832819	17	83	NE,VA	AJ
YWAR	A	Y	635236	4834155	17	83	OU	AJ
YWAR	A	Y	635178	4834243	17	83	JD, XP	AJ
YWAR	A	Y	635025	4834196	17	83	EP,EE	AJ
YWAR	A	Y	634957	4834199	17	83	NE	AJ
YWAR	A	Y	634925	4834223	17	83	JC,EX	AJ
YWAR	A	Y	635019	4834072	17	83	EC,EA,ED	AJ
YWAR	A	Y	634978	4834206	17	83	YC,VA	AJ
YWAR	A	Y	635311	4834206	17	83	EP,EE	AJ
YWAR	A	Y	635213	4834311	17	83	OU, EP	AJ
YWAR	B	Y	635050	4832752	17	83	NE	AJ
YWAR	B	Y	635064	4832774	17	83	EP,JP, EE	AJ
YWAR	B	Y	635095	4832693	17	83	NE, NN	AJ
YWAR	B	Y	635133	4832707	17	83	EP,EE	AJ
YWAR	B	Y	635206	4832701	17	83	NE, OU	AJ
YWAR	B	Y	635104	4832475	17	83	YC,NE	AJ
YWAR	B	Y	635067	4832438	17	83	EP, EE	AJ
YWAR	A	Y	634900	4834314	17	83	NE	AJ
YWAR	A	Y	634946	4834276	17	83	JP, EE	AJ
YWAR	A	Y	634971	4834312	17	83	NE, VA	AJ
YWAR	A	Y	634967	4834323	17	83	YC, NE	AJ
YWAR	A	Y	634996	4834334	17	83	YC, NN	AJ
YWAR	B	Y	635055	4832765	17	83	EX	AJ
YWAR	B	Y	635111	4832750	17	83	OU	AJ
YWAR	A	Y	635038	4834196	17	83	YC, NE	AJ
YWAR	A	Y	635123	4834179	17	83	EP,EJ	AJ
YWAR	B	Y	635083	4832694	17	83	EP, EJ	AJ

Species Code	TTP Zone	Nest Card Filed	UTM Easting	UTM Northing	UTM Zone	NAD	Success (see codes below)	Observer
YWAR	B	Y	635100	4832757	17	83	NE, VA	AJ
YWAR	A	Y	635251	4834140	17	83	NE, VA	AJ
YWAR	A	Y	635295	4834244	17	83	NE, OU	AJ

Nest Success Codes: **AC** = adult carrying food near nest; **EX** = young exploded from nest; **NE** = nest empty, undisturbed; **NN** = fledged young seen near nest; **VA** = adult visibly agitated near nest; **YC** = young capable of leaving nest on previous visit

Nest Failure Codes: Combination of codes from the following two groups (e.g., EP = predation at egg stage):

- (i) **E** = at egg stage; **J** = at young stage; **X** = at egg or young stage
- (ii) **A** = eggs infertile/addled; **B** = injured/broken; **D** = deserted/starved/dead; **E** = empty damaged nest; **I** = human causes (intentional); **J** = empty undamaged nest; **M** = human causes (unintentional); **O** = other/unknown; **P** = predation

Nest Outcome Unknown = OU

Appendix C. Map of 2009 Nest Locations



Appendix D Annotated map of TommyThompson Park with VCP stations

