The Breeding Birds of

Tommy Thompson Park

2008



Gray Catbird Nest (D. Johnston)

Toronto and Region Conservation





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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. Annual surveys of breeding non-colonial waterbird 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 annually in spring and summer.

Methods

A combination of variable circular plot (VCP) counts, nest searching and casual observations was employed from April – August 2008 (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



Savannah Sparrow (I. Sturdee)

The specific protocol for the counts during summer 2008 at Tommy Thompson Park was for 5-minute-long VCP counts at nine stations. 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 17 and July 8. A summary of station information is presented below in Table 1.

Station	UTM Zone	Easting	Northing	Location	Habitat Type
1	17	635198	4834430	Baselands	Wet Meadow
2	17	635219	4834206	Baselands	Forest
3	17	634948	4834140	Baselands	Dry Meadow
4	17	635276	4833959	Baselands	Dry Meadow
5	17	635101	4832683	Causeway	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

 Table 1. VCP Station Information

The habitat type has tended to change over time, such that, for instance, Station 1 has started to evolve into shrubland, while Station 7 is as likely to be dry meadow as wet. It should be noted that Station 9 is located within the Double-crested Cormorant colony on Peninsula C.

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 35 species were detected for all counts in 2008, down from the 39 species detected during summer 2006 and the 38 species detected in 2007, but up one species from 34 in 2005.

There were a few species that were detected this year, but not from 2005 to 2007, including Gadwall, Traill's Flycatcher and Blue Jay. Several species were recorded on counts in earlier years, but not in 2008, 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 2008 it is clear that the VCP counts are successful in deriving representative samples of avian communities for key habitats.

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

Table 2. VCP Species Lists for from 2005 to 2008

denotes presumed migrant species

Species richness and abundance per station in 2008 was similar to earlier years (Table 3). The stations with the highest overall diversity in 2008 (19, 20 and 24 species) were Stations 2, 3 and 4, all located in the Baselands. Once again, the weakest station was Station 9 located on Peninsula C within the Double-crested Cormorant colony. Proximity to waterbird colonies may also be the reason behind the consistently low abundance and diversity at Station 8 recorded in all years.

In terms of total station abundance (within 100 m) Station 3 (dry meadow) ranked at the top of the list in 2008 followed by Stations 5 (shrubland) and 4 (dry meadow). Overall abundance from VCP counts in 2008 did not differ significantly from earlier years for most stations.

		Total	Birds			Spe	cies					
Station	2005	2006	2007	2008	2005	2006	2007	2008				
1	74	69	83	78	19	24	23	17				
2	67	61	73	83	19	15	23	19				
3	116	64	99	104	22	18	19	20				
4	120	61	199	88	20	24	23	24				
5	118	93	101	96	19	21	19	17				
6	124	101	92	86	19	20	19	17				
7	60	97	97	77	15	20	17	15				
8	39	45	34	22	10	12	14	10				
9	23	17	26	34	6	8	4	5				
Totals	741	608	804	668	34	39	38	35				

Table 3. Total Abundance and 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 four years of VCP counts include Red-winged Blackbird, Song Sparrow and Yellow Warbler, all of which require basic habitat conditions to thrive (i.e., early successional environment with water sources, food sources and nesting availability). A summary of abundance per species detected by VCP counts (<100 meters) is presented below in Table 4. 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 four years of data. The unusually high numbers (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. There were no significant increases in abundance for any common species; however, an overall increase in diversity of species is apparent.

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

Table 4. Total Birds Detected by Species within 100 meters

Nest Searching

Protocol



Toplands Meadow Habitat (D. Derbyshire)

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 2008 essentially followed the 2007 protocol. It involved exhaustive area searches of as much of the TTP area as time and personnel permitted. To satisfy the requirement of standardizing effort, a suggestion was made to limit nest searching and monitoring effort to five specific periods during the breeding season. This suggestion was not accepted for practical reasons (weather, volunteer availability), but as a compromise, the date of each visit (detection and subsequent nest checks) was recorded. This way any subset of the database could be extracted if desirable for standardizing. 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 2008, a total of 279 hours and 30 minutes were logged by three participants (see Table 5). 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. The entire land area encompassing Tommy Thompson Park/Leslie Street Spit was divided into six zones (i.e., A - F) based on habitat type. (Starting in 2008, nests located in Grids C1 and E1 were no longer recorded separately from the rest of Zones C and E, respectively, as had been done in 2006 and 2007.) Effort was recorded separately for each zone. Table 6 describes the zone habitat types, while Figure 1 shows the breakdown of effort per zone/grid. It can be seen that the effort per zone has gradually become more uniform.

Table 5. 2008 Effort by Project Participants

Name	Total Hours
Andrew Jano	51:00
Don Johnston	105:30
Ian Sturdee	122:00
Total	279:30

Table 6. Primary Habitat Type by Zone

Zone	Primary Habitat Type
А	forest, meadow
В	meadow, shrubland, forest
С	forest
D	meadow, shrubland
Е	meadow
F	meadow, forest

Figure 1. Effort per Zone/Grid from 2006 to 2008 (hours)



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

Results



Heavily Parasitized Red-winged Blackbird Nest (A. Jano)

The introduction of standard nest searching data forms, combined with experience gained in previous years, was very successful as a total of 363 nests were discovered, and 298 of them were monitored. This figure is an increase of 26 % over 2007 when 236 nests were documented. Nests of 27 species were found this year compared to 30 in 2007, 33 in 2006 and 20 in 2005. New species in 2006 included some unusual nest records for Tommy Thompson Park. Least Flycatcher (2nd nesting record for TTP), Orchard Oriole (2nd record), Eastern Meadowlark (2nd record), Northern Rough-winged Swallow (1st record) and Belted Kingfisher (1st record) were all significant findinas in 2006. While nests of only three new species were found in 2007, all three species (Downy Woodpecker, Eastern Wood Pewee and House Finch) represent first nesting records for TTP. In 2007 two Least Flycatcher nests and two Orchard Oriole nests were found, while Belted Kingfisher and Northern Rough-winged Swallow, both first nesting records in 2006, nested in 2007 again. No new species were added to the TTP breeding species list in 2008. Increases in the

number of American Goldfinch and Cedar Waxwing nests are the result of targeting these common breeding species and extending the search period into late summer. The total number of confirmed nesters (excluding colonial waterbirds) after three years of surveys stands at 37. Refer to Species Accounts below for information on these records.

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

 Table 7. Total Nests by Species from 2005 to 2008

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 8.

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 are approximately the same in 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.

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

Table 8. Nests by Species and Zone from 2006 to 2008.

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

A total of 297 nests was recorded online with ONRS in 2008. In terms of nest productivity, 52 of 149 nests with known outcomes failed, while 97 were successful in fledging young. The remaining 148 nests have unknown outcomes. The 2008 failure rate of 35% is low compared to 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 52 failures, 21 occurred at the egg stage, 7 at young stage and 24 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 2008 a total of 45 nests of five species were found with cowbird eggs. The most heavily parasitized species were Yellow Warbler (21 nests) and Red-winged Blackbird (18 nests). Willow Flycatcher (4), American Goldfinch (1) and American Robin (1) were also parasitized.

The rate of parasitism among known host species at TTP is shown below in Table 9. (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 in 2007 and 2008, 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 not 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. (It should be noted that some species [e.g., Yellow Warbler] recognize Cowbird eggs and remove them, or construct a new floor in the nest to bury the unwanted eggs.)

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

 Table 9. Brown-headed Cowbird parasitism data and rates from 2005 to 2008.

The Overall Picture



Mourning Dove (I. Sturdee)

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 and Northern Bobwhite). A complete historical breeding bird species list is presented below in the section titled "Species Accounts".

During summer 2008, 74 species were detected at Tommy Thompson Park through VCP counts, nest searching and casual observations. Of these, 15 were designated as possible breeders, nine as probable and 34 species were confirmed breeders. An additional 16 species were observed and classified as non-breeders (habitat unsuitable for breeding). In 2007, 73 species were recorded, of which 43 were confirmed. 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 confirmed breeders list.

Table 10. Breeding Status Codes for Each Species Detected In 2008

OBSERVED	POSSIBLE	PROBABLE	CONFIRMED
American Black Duck	American Redstart	American Woodcock	American Goldfinch
American Crow	Bank Swallow	Blue-gr. Gnatcatcher	American Robin
Black-th. Green Warbler	Black-billed Cuckoo	Canvasback	Baltimore Oriole
Blue Jay	Common Yellowthroat	House Finch	Barn Swallow
Cliff Swallow	Downy Woodpecker	Least Flycatcher	Belted Kingfisher
Common Loon	Eastern Wood Pewee	Mourning Dove	Black-cr. Night-Heron
Great Blue Heron	Eastern Meadowlark	N.R-wing. Swallow	BI-cap. Chickadee
Greater Scaup	Field Sparrow	Northern Flicker	Brown Thrasher
Green Heron	Great-crest. Flycatcher	Savannah Sparrow	Brown-head Cowbird
Northern Waterthrush	Hooded Merganser	Caspian Tern	Canada Goose
Purple Martin	House Sparrow		Canvasback
Red-tailed Hawk	House Wren		Cedar Waxwing
Rock Pigeon	Northern Harrier		Common Grackle
Rose-breasted Grosbeak	White-br. Nuthatch		Common Tern
Sharp-shinned Hawk	Yellow-billed Cuckoo		Double-cr Cormorant
Turkey Vulture			Eastern Kingbird
			European Starling
			Gadwall
			Gray Catbird
			Great Egret
			Herring Gull
			Killdeer
			Mallard
			Mute Swan
			Northern Cardinal
			Orchard Oriole
			Red-wing 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)				
Describe	Singing male present or breeding calls heard in breeding season in suitable nesting habitat				
Possible	Species observed in breeding season in suitable nesting habitat				
	Nest building or excavation of nest hole				
Probable	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				
	Adults leaving or entering nest site in circumstances indicating occupied nest				
	Adult carrying food for young				
Confirmed	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 2008 as well as historically confirmed breeders. Species highlighted in red were detected in 2008 during the breeding bird survey, but have not yet been classified as confirmed breeders at Tommy Thompson Park/Leslie Street Spit.

American Crow (2008-observed) Known to have bred historically at TTP.

American Goldfinch (2008-confirmed) This species is a regular nester at TTP. In 2008 twenty-two nests were discovered.

American Kestrel (2008-absent) Known to have bred historically at TTP.

American Redstart (2008-possible) This species has never been confirmed as a breeder at TTP. In June 2008 a singing 1st year male was observed on several occasions at base of Peninsula C.

American Robin (2008-confirmed) Common nesting species in forested areas throughout TTP. 51 nests were recorded in 2008 in nearly all zones at TTP.

American Woodcock- (2008-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 2008 the species was observed several times at different locations in June and July in suitable habitat.

American Black Duck (2008-possible) Known to have bred historically at TTP although no nesting evidence was obtained in 2008 beyond observation of the species in suitable habitat.

Baltimore Oriole (2008-confirmed) Common nesting species in forest areas of TTP. A total of 9 nests were recorded in 2008.

Bank Swallow (2008-probable) Small nesting colonies were discovered in both the meadows and southern shoreline of the toplands area in earlier years. No nests were found in 2008, but the species has been observed in suitable habitat during the breeding season.

Barn Swallow (2008-confirmed) Barn Swallows are regular nesters at TTP under the eaves of buildings, particularly the trailers located near the Port Authority booth. Three nests were discovered here in 2008.

Belted Kingfisher (2008-confirmed) This species was confirmed for the first time in 2003 based on observations of fledged young. Two nests were found in 2008.

Black-billed Cuckoo (2008-possible) Known to have bred historically at TTP. In 2008 the species has been observed on five separate occasions.

Black-capped Chickadee (2008-confirmed) A regular but uncommon nester at TTP. One nest was detected in 2008. This is a very difficult species to find outside of the forested areas of Peninsula D.

Black-crowned Night Heron (2008-confirmed) An abundant nesting colonial waterbird species at TTP. An estimated 30% of the Canada-wide population of Black-crowned Night Heron breeds here.

Black-throated Green Warbler (2008-observed) This species has never been confirmed as a breeder at TTP. No breeding evidence was obtained in 2008 beyond the observation of the species in suitable habitat during in June.

Blue Jay (2008-observed) This species has never been confirmed as a breeder at TTP. No nesting evidence was obtained in 2008 beyond observation of the species in suitable habitat during in June and July.

Blue-gray Gnatcatcher- (2008-confirmed) Known to have bred historically. First nest for this project was found in the baselands forest in 2006. The same nest was used in 2007 and again it was successful in fledging young. In 2008 a nest was built in the same vicinity then abandoned later at an unknown state.

Blue-winged Teal (2008-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 (2008-confirmed) Brown Thrasher is a regular but uncommon nester at TTP. Three nests were discovered in 2008. In 2007 a nest was discovered on Peninsula D. It was successful.

Brown-headed Cowbird (2008-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 (2008-confirmed) Canada Goose is a common breeder at TTP along shoreline edges of embayments and containment cells.

Canvasback (2008-probable) Canvasback has bred almost annually in recent years in the Triangle Pond area at TTP. In 2008 the species has been observed in suitable habitat on July 7.

Caspian Tern (2008-probable) Known to have bred in 2006 at TTP. The species has been observed in suitable habitat during the breeding season.

Cedar Waxwing (2008-confirmed) A common late nester at TTP, 14 nests were found in 2008

Chimney Swift (2008-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.

Cliff Swallow (2008-observed) This species has never been confirmed as a breeder at TTP. No nesting evidence was obtained in 2008 beyond observation of the species.

Common Loon (2008-observed) This species has never been confirmed as a breeder at TTP. Flyovers were recorded on June 24 and 27.

Common Grackle (2008-confirmed) Common Grackle is a regular nester at TTP. Although the species is common throughout the summer, only a single nest was found in 2008.

Common Tern (2008-confirmed) An abundant nesting colonial waterbird species at TTP.

Common Yellowthroat (2008-possible) Individuals of the species were found in the same locations as in previous years. In 2008, two individuals were observed at different locations.

Double-crested Cormorant (2008-confirmed) An abundant nesting colonial waterbird species at TTP.

Downy Woodpecker (2008-possible) In 2008 the species was observed in suitable habitat during the breeding season.

Eastern Kingbird (2008-confirmed) A regular breeder at TTP along forest edges where meadow and shrubs are present. In 2008 a total of 26 nests were found.

Eastern Meadowlark (2008-possible) In 2008 this species was present from May to July in Baselands meadow habitats. The only indication of breeding obtained so far was that of a partially constructed nest in 2007.

Eastern Wood Pewee (2008-possible) No nesting evidence was obtained in 2008 beyond observation of two singing individuals in June at different locations. In 2007 a nest was discovered near the Goldfish Pond.

European Starling (2008-confirmed) Starlings are an abundant species at TTP although their breeding density is difficult to estimate. The species is known to nest in man-made structures and natural cavities throughout the area. Five nests were documented In 2008.

Field Sparrow (2008-possible) This species has never been confirmed as a breeder at TTP. In 2008 two juveniles were seen on August 19.

Gadwall (2008-confirmed) Gadwall is a surprisingly common nesting species at TTP. Three nests were found in 2008.

Gray Catbird (2008-confirmed) Gray Catbird is a regular nester at TTP, preferring dense shrubs with some tree cover. A total of eleven nests were found.

Great black-backed Gull (2008-absent)

Great Egret (2008-confirmed) Regular nester on Peninsula C.

Great Blue Heron (2008-observed) This species has never been confirmed as a breeder at TTP. In 2008 17 individuals were seen in Cell 1 and Triangle Pond including juveniles on July 16 and 24.

Great-crested Flycatcher (2008-possible) This species has never been confirmed as a breeder at TTP. Singles were observed in 2008 in suitable habitat.

Greater Scaup (2008-observed) This species has never been confirmed as a breeder at TTP. In 2008 a single bird was seen in Cell 2 on June 24, and four were detected off Peninsula D on July 31.

Green Heron (2008-observed) This species has never been confirmed as a breeder at TTP. A single individual was seen on August 6, 2008 at Triangle Pond. Observed in previous years.

Green-winged Teal (2008-absent) Known to have bred historically at TTP.

Herring Gull (2008-confirmed) A common nesting colonial waterbird species at TTP.

Hooded Merganser (2008-possible) This species has never been confirmed as a breeder at TTP. In 2008 several individuals and groups (31 in total) were seen in Cell 2, Cell 3, Embayment D 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 (2008-absent) Known to have bred historically at TTP.

House Finch (2008-possible) In 2008 the species was observed singing in suitable habitat, a pair was seen on July 22 at Cell 1.

House Sparrow (2008-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 (2008-possible) In 2008 the species has been observed singing in suitable habitat, two dummy nests were found.

Killdeer (2008-confirmed) Killdeer is a common nesting species at TTP in open areas with low vegetation. A total of five nests were found in 2008.

Least Flycatcher (2008-possible) No evidence of nesting was found in 2008.

Mallard (2008-confirmed) Mallard is a regular nester at TTP. Nine Mallard nests were documented in 2008; mostly predated.

Mourning Dove (2008-possible) Although Mourning Dove is a common breeder at TTP, no nests were found in 2008.

Mute Swan (2008-confirmed) Mute Swan is a regular nesting species along TTP shorelines.

Northern Rough-winged Swallow (2008-probable) Observed frequently during breeding season at several locations in 2008.

Northern Bobwhite (2008-absent) Known to have bred historically, species not detected in 2008.

Northern Cardinal (2008-confirmed) Northern Cardinal is an uncommon but annually nesting species at TTP. In 2008 two nests were found.

Northern Flicker (2008-possible) Northern Flicker is a regular nesting species at TTP. No nests were found in 2008.

Northern Harrier (2008-observed) Known to have bred historically at TTP although no nesting evidence was obtained in 2008 beyond observation of the species in suitable habitat on July 24.

Orchard Oriole (2008-confirmed) Nest records of this species at TTP are few and far between. In 2008 an adult was observed carrying food, several observations between June 12 and August 5.

Purple Martin (2008-observed) This species has never been confirmed as a breeder at TTP. In 2008 three individuals were observed on June 24 flying over Cell 2.

Redhead (2008-absent) Known to have bred historically, species not detected in 2008.

Red-winged Blackbird (2008-confirmed) A common breeding species throughout the TTP area. The most abundant nesting species at TTP (excluding waterbirds). A total of 82 nests were found in 2008.

Ring-billed Gull (2008-confirmed) An abundant nesting colonial waterbird species at TTP.

Ring-necked Pheasant (2008-absent) Known to have bred historically, species not detected in 2008.

Rock Pigeon (2008-observed) Known to have bred historically at TTP. No nesting evidence was obtained in 2008 beyond observation of the species in suitable habitat during the breeding season.

Savannah Sparrow (2008-probable) Savannah Sparrow is a common nester in open areas of TTP with substantial ground cover, particularly in the baselands, along the causeway and in some areas of the toplands. No nesting evidence was obtained in 2008 beyond observation of singing individuals in suitable habitat during the breeding season.

Sharp-shinned Hawk (2008-observed) In 2008 there were three sightings between June 24 and July 31. In 2007 a single individual was observed on June 15.

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

Sora (2008-absent) Known to have bred historically, species not detected in 2008.

Spotted Sandpiper (2008-confirmed) A common nester at TTP in open areas near water. Three nests were found in 2008. Observations of juveniles along roadways are frequent.

Tree Swallow (2008-confirmed) Tree Swallow is a common breeder at TTP. In 2008 many nest boxes were occupied; however, only nine nests were documented and monitored. In general, tree swallows using nest boxes are not monitored.

Turkey Vulture (2008-observed) This species has never been confirmed as a breeder at TTP. One individual was seen on July 25 flying over the park.

Virginia Rail (2008-absent) Known to have bred historically, species not detected in 2008.

Warbling Vireo (2008-confirmed) A common nesting species in forested areas of TTP. In 2008 seven nests were found.

White-breasted Nuthatch (2008-observed) This species has never been confirmed as a breeder at TTP. Heard singing in woodlot north of Goldfish Pond on July 15, 2008.

Willow Flycatcher (2008-confirmed) Willow Flycatcher is a common nesting species in more open areas with dense shrubs. In 2008 fifteen nests were found.

Wilson's Phalarope (2008-absent) Known to have bred historically, species not detected in recent years.

Yellow-billed Cuckoo (2008-observed) This species has never been confirmed as a breeder at TTP. An individual was heard on August 4 at the baselands.

Yellow Warbler (2008-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 causeway. A total of 71 nests were found. This species is frequently parasitized at TTP by Brown-headed Cowbirds.

Acknowledgements

Andrew Jano compiled the data, provided all of the analysis and created the mapping components for this report. It would not have been completed without his tireless efforts and perseverance. 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 fourth year of the project detailed in this report are due to the efforts of the volunteer project participants Andrew Jano, Don Johnston and Ian Sturdee.

Appendices

Appendix A. Map of TTP Breeding Bird Survey Zones



Species	TTP	Nest Card	UTM	UTM	UTM	NAD	Success	Observer
Code	Zone	Filed	Easting	Northing	Zone		(see codes	
							below)	
AMGO	С	Y	634609	4832298	17	83	YC	IS
AMGO	D	Y	634859	4831259	17	83	OU	IS
AMGO	D	Y	635248	4832073	17	83	OU	IS
AMGO	С	Y	634783	4831896	17	83	OU	IS
AMGO	С	Y	634698	4832323	17	83	OU	IS
AMGO	D	Y	634955	4831305	17	83	EX	IS
AMGO	D	Y	635046	4831280	17	83	OU	IS
AMGO	D	Y	635208	4831697	17	83	JD	IS
AMGO	С	Y	634782	4831894	17	83	EB	IS
AMGO	С	Y	634392	4832198	17	83	NN	IS
AMGO	A	Y	635088	4834156	17	83	EE	AJ
AMGO	А	Y	635154	4834086	17	83	JP	AJ
AMGO	А	Y	635046	4834302	17	83	NN	AJ
AMGO	Α	Y	635019	4834117	17	83	YC	AJ
AMGO	Α	Y	635356	4834084	17	83	JP	AJ
AMGO	E	Y	634654	4831264	17	83	NE	DJ
AMGO	Е	Y	634420	4831339	17	83	NE	DJ
AMGO	E	Y	634385	4831202	17	83	EX. YC	DJ
AMGO	E	Y	634296	4831147	17	83	OU	DJ
AMGO	F	Y	633790	4830875	17	83	NE. YC	DJ
AMGO	F	Y	634451	4831531	17	83	YC	DJ
AMGO	F	Y	633749	4830818	17	83	YC	DJ
AMRO	С	Y	634353	4832254	17	83	OU	IS
AMRO	C	Y	634664	4832325	17	83	OU	IS
AMRO	С	Y	634442	4832205	17	83	ED	IS
AMRO	С	Y	634570	4832295	17	83	OU	IS
AMRO	С	Y	634459	4832296	17	83	YC	IS
AMRO	С	Y	634952	4832318	17	83	JD	IS
AMRO	С	Y	634379	4832242	17	83	XE	IS
AMRO	С	Y	634936	4832294	17	83	OU	IS
AMRO	С	Y	634648	4831792	17	83	OU	IS
AMRO	С	Y	634330	4832176	17	83	OU	IS
AMRO	А	Y	635062	4834446	17	83	OU	AJ
AMRO	А	Y	635177	4834198	17	83	OU	AJ
AMRO	А	Y	635341	4834109	17	83	OU	AJ
AMRO	А	Y	635307	4834292	17	83	OU	AJ
AMRO	А	Y	635094	4834288	17	83	OU	AJ
AMRO	А	Y	635127	4833962	17	83	хо	AJ
AMRO	А	Y	635247	4834279	17	83	OU	AJ
AMRO	А	Y	635239	4834219	17	83	OU	AJ
AMRO	В	Y	635068	4832502	17	83	OU	AJ
AMRO	А	Y	635190	4834581	17	83	ED	AJ
AMRO	А	Y	635233	4834291	17	83	OU	AJ
AMRO	А	Y	635271	4834425	17	83	OU	AJ
AMRO	А	Y	635223	4834250	17	83	OU	AJ
AMRO	А	Y	635146	4833977	17	83	YC	AJ
AMRO	А	Y	634963	4834038	17	83	OU	AJ
AMRO	А	Y	635006	4834175	17	83	OU	AJ
AMRO	В	Y	635173	4832637	17	83	OU	IS
AMRO	Δ	v	635306	4834177	17	83	011	
	^	~	625260	1021102	17	00 02	vc	
	A _	T V	005005	4004492	47	00		
AMRO	A	Y	635205	4834204	17	83	00	DJ
AMRO	A	Y	634895	4834393	17	83	NE	DJ

Appendix B. Summary of 2008 Nest Records.

Species	TTP	Nest Card	UTM	UTM	UTM	NAD	Success	Observer
Code	Zone	Filed	Easting	Northing	Zone		(see codes	
							below)	
AMRO	E	Y	634421	4831469	17	83	OU	DJ
AMRO	F	Y	633794	4830851	17	83	NE	DJ
AMRO	F	Y	633632	4830720	17	83	OU	DJ
AMRO	F	Y	634413	4831546	17	83	NN	DJ
AMRO	F	Y	633695	4830842	17	83	OU	DJ
AMRO	F	Y	634377	4831468	17	83	YC	DJ
AMRO	F	Y	634438	4831569	17	83	AC	DJ
BAOR	С	Y	634673	4831814	17	83	OU	IS
BAOR	С	Y	634369	4832173	17	83	OU	IS
BAOR	С	Y	634673	4832307	17	83	OU	IS
BAOR	В	Y	635092	4832563	17	83	OU	IS
BAOR	F	Y	634005	4831079	17	83	AC	DJ
BAOR	F	Y	634310	4831413	17	83	NN	DJ
BARS	С	Y	634682	4832292	17	83	EI	IS
BARS	А	Y	635405	4833926	17	83	NN	DJ
BARS	А	Y	635405	4833926	17	83	NN	DJ
BCCH	В	Y	635039	4832474	17	83	OU	IS
BEKI	С	Y	634526	4832337	17	83	OU	IS
BGGN	А	Y	635210	4834190	17	83	E	AJ
BRTH	С	Y	634357	4832196	17	83	VA	IS
BRTH	А	Y	634985	4834118	17	83	EM	AJ
BRTH	А	Y	635330	4833994	17	83	OU	DJ
CEDW	С	Y	634281	4832141	17	83	OU	IS
CEDW	D	Y	635164	4831756	17	83	OU	IS
CEDW	С	Y	634397	4832100	17	83	NN	IS
CEDW	С	Y	634904	4832079	17	83	OU	IS
CEDW	A	Y	635239	4834072	17	83	YC	AJ
CEDW	A	Y	635215	4834288	17	83	EE	AJ
CEDW	В	Y	635138	4832595	17	83	NE	AJ
CEDW	E	Y	634051	4831086	17	83	YC, AC	DJ
CEDW	E	Y	634442	4831503	17	83	AC	DJ
CEDW	E	Y	634474	4831200	17	83	AC	DJ
CEDW	F	Y	634363	4831453	17	83	OU	DJ
CEDW	F	Y	634426	4831522	17	83	AC	DJ
CEDW	F	Y	634458	4831558	17	83	AC	DJ
CEDW	F	Y	634356	4831450	17	83	AC	DJ
COGR	С	Y	634779	4832386	17	83	OU	IS
EAKI	D	Y	635183	4832120	17	83	NN	IS
EAKI	С	Y	634859	4832087	17	83	AC	IS
EAKI	С	Y	634288	4832112	17	83	OU	IS
EAKI	С	Y	634404	4832157	17	83	NN	IS
EAKI	С	Y	634863	4832334	17	83	NN	IS
EAKI	A	Y	635158	4834563	17	83	NN	AJ
EAKI	В	Y	635229	4832793	17	83	NN	AJ
EAKI	В	Y	635373	4833626	17	83	YC	AJ
EAKI	В	Y	635155	4832589	17	83	YC	IS
EAKI	В	Y	635070	4832677	17	83	OU	IS
EAKI	В	Y	635246	4832960	17	83	XD	IS
EAKI	A	Y	635404	4834337	17	83	OU	DJ
EAKI	E	Y	634614	4831264	17	83	NN	DJ
EAKI	E	Y	634034	4830976	17	83	OU	DJ
EAKI	E	Y	634440	4831712	17	83	NN	DJ
EAKI	E	Y	634052	4831116	17	83	YC, AC	DJ
EAKI	Е	Y	634383	4831463	17	83	OU	DJ
EAKI	F	Y	634397	4831539	17	83	AC	DJ
EAKI	F	Y	633810	4830860	17	83	NN	DJ
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Species	TTP	Nest Card	UTM	UTM	UTM	NAD	Success	Observer
Code	Zone	Filed	Easting	Northing	Zone		(see codes	
							below)	
EAKI	F	Y	634144	4831437	17	83	AC	DJ
EAKI	F	Y	633692	4830714	17	83	AC	DJ
EUST	С	Y	634648	4832280	17	83	OU	IS
EUST	С	Y	634256	4832108	17	83	OU	IS
EUST	С	Y	634665	4832314	17	83	OU	IS
EUST	D	Y	635228	4832387	17	83	OU	IS
EUST	В	Y	634982	4832319	17	83	OU	IS
GADW	С	Y	634268	4832134	17	83	XP	IS
GADW	Е	Y	634718	4831149	17	83	EP	DJ
GADW	Е	Y	634218	4831182	17	83	XP	DJ
GRCA	С	Y	634356	4832098	17	83	OU	IS
GRCA	С	Y	634324	4832188	17	83	OU	IS
GRCA	В	Y	635101	4832650	17	83	EE	IS
GRCA	Α	Y	635085	4834174	17	83	NE	DJ
GRCA	А	Y	634847	4834138	17	83	OU	DJ
GRCA	Е	Y	634459	4831463	17	83	OU	DJ
GRCA	Е	Y	634403	4831463	17	83	NE, VA	DJ
GRCA	F	Y	633675	4830858	17	83	OU	DJ
GRCA	F	Y	633599	4830809	17	83	OU	DJ
GRCA	F	Y	633664	4830845	17	83	OU	DJ
GRCA	F	Y	633663	4830714	17	83	NE	DJ
KILL	D	Y	634838	4931243	17	83	NN	IS
KILL	D	Y	634833	4831246	17	83	NN	IS
KILL	А	Y	635371	4834151	17	83	EJ	AJ
KILL	А	Y	635315	4834320	17	83	ED	AJ
KILL	Α	Y	635358	4833906	17	83	XP	IS
MALL	С	Y	634727	4832347	17	83	OU	IS
MALL	С	Y	634481	4832255	17	83	OU	IS
MALL	С	Y	634699	4832358	17	83	XP	IS
MALL	D	Y	635106	4832102	17	83	OU	IS
MALL	В	Y	635150	4832605	17	83	EP	AJ
MALL	Е	Y	634756	4831187	17	83	XP	DJ
MALL	Е	Y	634508	4831139	17	83	XF, XP	DJ
MALL	Е	Y	634497	4831191	17	83	XP	DJ
MALL	Е	Y	634227	4831189	17	83	XP	DJ
NOCA	С	Y	634550	4832321	17	83	OU	IS
NOCA	С	Y	634273	4832105	17	83	OU	IS
OROR	Е	Y	634226	4831289	17	83	YC	DJ
RWBL	С	Y	634783	4832379	17	83	OU	IS
RWBL	D	Y	634995	4832077	17	83	XP	IS
RWBL	С	Y	634379	4832298	17	83	OU	IS
RWBL	С	Y	634620	4831784	17	83	OU	IS
RWBL	D	Y	635186	4831319	17	83	VA	IS
RWBL	D	Y	635114	4831323	17	83	OU	IS
RWBL	D	Y	635100	4831311	17	83	OU	IS
RWBL	D	Y	635181	4831719	17	83	OU	IS
RWBL	D	Y	635178	4831731	17	83	OU	IS
RWBL	С	Y	634226	4832061	17	83	OU	IS
RWBL	С	Y	634773	4832007	17	83	OU	IS
RWBL	С	Y	634746	4831987	17	83	OU	IS
RWBL	С	Y	634794	4832490	17	83	OU	IS
RW/RI	C	v	634700	4832410	17	83	011	18
	<u> </u>	v I	604000	4000404	47	00	00	10
		Ť	034608	4032481	17	00	00	13
RWBL	С	Y	634414	4832216	17	83	UU	IS
RWBL	С	Y	634296	4832190	17	83	OU	IS
RWBL	D	Y	635170	4831176	17	83	OU	IS

Species	TTP	Nest Card	UTM	UTM	UTM	NAD	Success	Observer
Code	Zone	Filed	Easting	Northing	Zone		(see codes	
							below)	
RWBI	А	Y	635296	4834247	17	83	OU	A.I
RWBL	A	Y	635144	4834485	17	83	EJ	AJ
RWBL	A	Y	635383	4834182	17	83	YC	AJ
RWBL	А	Y	635165	4834550	17	83	ED	AJ
RWBL	В	Y	634978	4832314	17	83	OU	IS
RWBL	В	Y	635004	4832436	17	83	OU	IS
RWBL	В	Y	635091	4832552	17	83	OU	IS
RWBL	В	Y	635163	4832611	17	83	OU	IS
RWBL	В	Y	635106	4832598	17	83	OU	IS
RWBL	В	Y	635176	4832578	17	83	OU	IS
RWBL	В	Y	635121	4832647	17	83	OU	IS
RWBL	В	Y	635181	4832737	17	83	OU	IS
RWBL	В	Y	635129	4832782	17	83	OU	IS
RWBL	В	Y	635212	4832772	17	83	OU	IS
RWBL	В	Y	635219	4832901	17	83	OU	IS
RWBL	В	Y	635052	4832775	17	83	XE	IS
RWBL	В	Y	635150	4832845	17	83	OU	IS
RWBL	А	Y	634977	4834320	17	83	OU	DJ
RWBL	А	Y	635449	4834106	17	83	NN	DJ
RWBL	А	Y	635233	4833931	17	83	OU	DJ
RWBL	А	Y	635348	4834083	17	83	NE	DJ
RWBL	Е	Y	634463	4831299	17	83	XE	DJ
RWBL	Е	Y	634386	4831285	17	83	NE	DJ
RWBL	E	Y	634316	4831264	17	83	XJ	DJ
RWBL	E	Y	634392	4831245	17	83	NE	DJ
RWBL	Е	Y	634744	4831152	17	83	OU	DJ
RWBL	E	Y	634755	4831101	17	83	OU	DJ
RWBL	Е	Y	634741	4831220	17	83	OU	DJ
RWBL	Е	Y	634028	4830994	17	83	OU	DJ
RWBL	Е	Y	634016	4830980	17	83	OU	DJ
RWBL	Е	Y	634116	4831131	17	83	NE	DJ
RWBL	F	Y	634132	4831239	17	83	VA, NN	DJ
RWBL	F	Y	634126	4831301	17	83	XP	DJ
RWBL	F	Y	633932	4831181	17	83	NE	DJ
RWBL	F	Y	633686	4830793	17	83	OU	DJ
RWBL	F	Y	633686	4830793	17	83	OU	DJ
RWBL	F	Y	634472	4831646	17	83	OU	DJ
RWBL	F	Y	633659	4830925	17	83	OU	DJ
RWBL	F	Y	633914	4831196	17	83	OU	DJ
SPSA	С	Y	634328	4832221	17	83	EA	IS
SPSA	Е	Y	634723	4831127	17	83	OU	DJ
SPSA	Е	Y	634519	4831120	17	83	NE	DJ
TRES	С	Y	634622	4832321	17	83	OU	IS
TRES	D	Y	635258	4832436	17	83	OU	IS
TRES	С	Y	634340	4832242	17	83	OU	IS
TRES	С	Y	634385	4832218	17	83	OU	IS
TRES	С	Y	634643	4832349	17	83	EP	IS
TRES	F	Y	633990	4831160	17	83	AC	DJ
TRES	F	Y	634367	4831505	17	83	OU	DJ
TRES	F	Y	633674	4830396	17	83	AC	DJ
WAVI	С	Y	634713	4832364	17	83	OU	IS
WAVI	С	Y	634425	4832210	17	83	NN	IS
WAVI	A	Y	635411	4834342	17	83	OU	AJ
WAVI	A	Y	635278	4834404	17	83	OU	DJ
WAVI	Е	Y	634383	4831456	17	83	AC	DJ
WAVI	F	Y	634418	4831563	17	83	YC	DJ

Code Zone Filed Easting Northing Zone (see codes below) WAVI F Y 633991 4831176 17 83 OU WIFL A Y 634894 4834320 17 83 EE WIFL A Y 634883 4834333 17 83 JP WIFL A Y 635180 4834543 17 83 JE WIFL A Y 635180 4834543 17 83 JE WIFL A Y 635180 4834502 17 83 JE WIFL A Y 635180 4834503 17 83 YC WIFL B Y 635158 4832803 17 83 YC	DJ AJ AJ AJ AJ AJ AJ IS IS IS
WAVI F Y 633991 4831176 17 83 OU WIFL A Y 634894 4834320 17 83 EE WIFL A Y 634894 4834330 17 83 EE WIFL A Y 634883 4834333 17 83 JP WIFL A Y 635180 4834543 17 83 JE WIFL A Y 635287 4834102 17 83 YC WIFL B Y 635158 4832803 17 83 YC WIFL B Y 635158 4832803 17 83 YC	DJ AJ AJ AJ AJ AJ IS IS IS
WAVI F Y 633991 4831176 17 83 OU WIFL A Y 634894 4834320 17 83 EE WIFL A Y 634893 4834333 17 83 JP WIFL A Y 635180 4834543 17 83 JE WIFL A Y 635287 4834102 17 83 YC WIFL B Y 635158 4832803 17 83 YC WIFL B Y 635158 4832803 17 83 YC	DJ AJ AJ AJ AJ AJ AJ IS IS IS
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WIEI D V 625000 4020760 47 00 NIE	IS IS IS
	IS IS
WIFL B Y 635069 4832778 17 83 NE	IS
WIFL B Y 635096 4832796 17 83 NE	
WIFL A Y 634950 4834318 17 83 NE	DJ
WIFL E Y 634725 4831282 17 83 OU	DJ
WIFL E Y 634411 4831245 17 83 NN	DJ
WIFL E Y 634499 4831190 17 83 NE	DJ
WIFL E Y 634857 4831156 17 83 NE	DJ
WIFL E Y 634648 4831272 17 83 NN, YC	DJ
WIFL D Y 635145 4831259 17 83 OU	IS
YWAR D Y 635012 4831315 17 83 OU	IS
YWAR D Y 635225 4831692 17 83 XP	IS
YWAR D Y 635183 4831714 17 83 OU	IS
YWAR C Y 634288 4832112 17 83 OU	IS
YWAR C Y 634449 4832232 17 83 OU	IS
YWAR C Y 634330 4832182 17 83 OU	IS
YWAR C Y 634741 4832392 17 83 XP	IS
YWAR C Y 634362 4832122 17 83 OU	IS
YWAR C Y 634297 4832157 17 83 OU	IS
YWAR C Y 634329 4832189 17 83 OU	IS
YWAR C Y 634849 4832294 17 83 OU	IS
YWAR C Y 634608 4832329 17 83 OU	IS
YWAR C Y 634890 4832308 17 83 OU	IS
YWAR C Y 634449 4832230 17 83 OU	IS
YWAR A Y 635240 4834159 17 83 EE	AJ
YWAR B Y 635153 4832651 17 83 EP	AJ
YWAR B Y 635041 4832708 17 83 EX	AJ
YWAR B Y 635070 4832676 17 83 OU	IS
YWAR B Y 635119 4832530 17 83 OU	IS
YWAR B Y 635159 4832651 17 83 OU	IS
YWAR B Y 635121 4832666 17 83 OU	IS
YWAR B Y 635169 4832695 17 83 OU	IS
YWAR B Y 635140 4832758 17 83 ED	IS
YWAR B Y 635157 4832828 17 83 XE	IS
YWAR B Y 635214 4832775 17 83 OU	IS
YWAR B Y 635194 4832889 17 83 NE	IS
YWAR B Y 635078 4832791 17 83 NE	IS
YWAR A Y 634946 4834192 17 83 OU	DJ
YWAR A Y 635309 4834221 17 83 XE	DJ
YWAR A Y 634983 4834225 17 83 JP	DJ
YWAR A Y 634963 4834306 17 83 NE	DJ
TWAR A T 030304 4834040 17 83 XP VMAR A V 605064 4000005 47 00 011	DI
TWAR A T 030304 4833980 17 83 OU VWAR A V 625220 4922004 47 92 01	D1 D1
TWAR A T 030330 4833994 17 83 OU VMAR A V 605040 4004000 47 00 N/F	
TWAR A T 030243 4834339 17 83 NE VMAR A V 625246 4004400 47 00 NE	
VIVAD A V 625270 4024402 47 92 NE	D1
IVVAIN A I 03037.0 463410.3 17 83 NE VMAD A V 626005 402446.4 47 92 011	D1
IVVAIN A I 030000 4634104 17 83 UU VMAD A V 626044 4024465 47 00 01	D1
YWAR A I 055041 4634105 17 65 00 YWAR A Y 634889 4834334 17 83 011	5

Species Code	TTP Zone	Nest Card Filed	UTM Easting	UTM Northing	UTM Zone	NAD	Success	Observer
			C	J. J			below)	
YWAR	А	Y	635186	4834564	17	83	NE	DJ
YWAR	Е	Y	634715	4831254	17	83	OU	DJ
YWAR	Е	Y	634854	4831282	17	83	XE	DJ
YWAR	E	Y	634869	4831278	17	83	OU	DJ
YWAR	Е	Y	634661	4831262	17	83	OU	DJ
YWAR	E	Y	634109	4831029	17	83	XE	DJ
YWAR	Е	Y	633981	4831035	17	83	NE	DJ
YWAR	Е	Y	634506	4831551	17	83	NE	DJ
YWAR	E	Y	634400	4831182	17	83	OU	DJ
YWAR	Е	Y	634533	4831190	17	83	NE	DJ
YWAR	E	Y	634599	4831258	17	83	OU	DJ
YWAR	E	Y	634723	4831268	17	83	NE	DJ
YWAR	Е	Y	634765	4831277	17	83	XE	DJ
YWAR	E	Y	634055	4831110	17	83	EX	DJ
YWAR	E	Y	634437	4831252	17	83	NN	DJ
YWAR	F	Y	633861	4830918	17	83	NE	DJ
YWAR	F	Y	634375	4831534	17	83	AC	DJ
YWAR	F	Y	634285	4831408	17	83	OU	DJ
YWAR	F	Y	634232	4831317	17	83	NE	DJ
YWAR	F	Y	633697	4830775	17	83	NE	DJ

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) \mathbf{E} = at egg stage; \mathbf{J} = at young stage; \mathbf{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 2008 Nest Locations

