

Migration Monitoring at Tommy Thompson Park: Spring 2004



Photo by Seabrooke Leckie

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*Prepared
For:*

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Preface

In April of 2003, Toronto and Region Conservation Authority (TRCA) and Toronto Bird Observatory (TBO) established a partnership to steer and develop a pilot migration monitoring station at Tommy Thompson Park (TTP). The objective of this endeavour was to accurately assess the significance of the park for migrating birds through research and also to increase awareness of migrant ecology and conservation through education.

Spring Migration Monitoring in 2004 established the first complete season of spring coverage. In 2004, data was collected on a daily basis from April 1st-June 8th compared to only May 3rd-June 8th in 2003. Therefore, results summarized in this report provide the first comprehensive assessment of spring migration at Tommy Thompson Park.

INTRODUCTION

Study Site



Net 6-Tommy Thompson Park Bird Research Station, May 2004
(photo by Seabrooke Leckie)

Tommy Thompson Park (TTP) is located on Toronto's waterfront, which is situated on the northwestern shore of Lake Ontario. The park (formerly Leslie Street Spit) is a man made peninsula, which extends 5 kilometers in a southwestern direction into Lake Ontario. The Toronto Harbour Commission (now known as the Toronto Port Authority (TPA) began construction of a landbase at the base of Leslie Street in the late 1950's to expand port facilities in anticipation of increased shipping activity in the Great Lakes. From the late 1950's until present day, a

combination of lakefilling and dredging activities created the current configuration of TTP. TTP has a total land base of approximately 160 hectares and a water surface area of 100 hectares composed of the western embayments and the inner disposal cells.

Much of the land area of TTP has, through natural succession processes, been colonized by a variety of plant and animal communities. The geographical situation of the park and also its natural features, make it very suitable for large numbers of colonial waterbirds and migrating landbirds. Overall, the Park represents the largest area of existing natural habitat on the Toronto waterfront. Tommy Thompson Park has been designated as an Environmentally Significant Area (ESA) and was designated as an Important Bird Area (IBA) by Birdlife International in 2001.

The site selected for migration monitoring is located on peninsula D (one of many peninsulas which branch off the main spine of the spit). The habitat consists of early succession cottonwood, willow and birch. Silver Maple, alder and cedar are interspersed in low density.

Project Partners

The Toronto and Region Conservation Authority (TRCA) was formed in 1957 for the management and conservation of natural resources in the Greater Toronto Area (GTA). Since its formation Toronto and Region Conservation has prepared and delivered programs for the management of the renewable natural resources within its watersheds. Thanks to the support of all levels of government and the valuable partnerships we have established, the Authority provides: protection, enhancement, and regeneration of natural resources on a watershed basis sound environmental information and advice to promote good land management practices, community action on environmental projects outdoor recreation opportunities on 13,000 hectares of open space, forest lands, and Conservation Areas conservation education and heritage programs through our outreach education programs, residential and day-use Outdoor Education Centres and Black Creek Pioneer Village

Objectives of TRCA and the Living City Campaign include the maintenance of healthy rivers and shorelines, regional biodiversity, sustainable communities and business excellence. Migration monitoring at Tommy Thompson Park was born out of the objectives of TRCA's Living City vision.

Toronto Bird Observatory (TBO) is a non-profit organization dedicated to bird monitoring in the Toronto region. Formed in 1978, TBO was principally active on the Toronto Islands (adjacent to TTP), where through volunteer support, migration monitoring was the main objective.

TRCA and TBO are partners in the development and management of the Tommy Thompson Park Migration Monitoring Program. The objective for the partnership is to collect quality scientific data that can be used for the monitoring of population changes in migratory landbirds, and also to foster awareness through education.

SPRING 2004 RESULTS

Spring Synopsis

April 1-7

Spring Migration Monitoring in 2004 began on April 1st. Landbird migration during the first week was rather slow with only a trickle of northbound birds detected on a daily basis. A Yellow-bellied Sapsucker was banded on April 1st was noteworthy. The first Hermit Thrush was observed on April 5th, and the first Yellow-rumped Warbler on April 7th. Song Sparrow, Winter Wren, Brown Creeper and Golden-crowned Kinglet were the dominant species for the first week of spring monitoring. Weather for the period was wet and cold with primarily northerly winds, which was clearly a deterrent to migrating landbirds.

April 8-14

Northern winds continued throughout the second week and as a result, migrant numbers were low throughout southern Ontario. American Robin, Brown-headed Cowbird, Red-winged Blackbird and Song Sparrow were the most abundant species detected during the week (not including Gulls and Cormorants of course!). The first Ruby-crowned Kinglet, Fox Sparrow and Eastern Phoebe were banded on April 10th. Staff and volunteers of Tommy Thompson Park Bird Research Station (TTPBRS) did manage to find 27 new species for the spring season, which included a House Sparrow (TTPBRS 1st), Eastern Bluebird, Northern Goshawk and Horned Lark.

April 15-21

The week began with very light migration again but the arrival of the seasons first warm front on the 17th did produce some busier mornings in terms of species diversity, although we still had yet to encounter any major movements of landbirds at the park in spring 2004. White-throated Sparrow, Hermit Thrush and Ruby-crowned Kinglet numbers increased substantially from the previous week. Impressive tallies of Pine Warbler were being recorded during this week, 2 were banded on April 19th along with the first Field Sparrow of the spring. Notable observations from the week included; 1 Glaucous Gull on the 15th (TTPBRS 1st), 1 Eastern Meadowlark on the 17th (TTPBRS 1st), 1 Purple Martin and 17 Bonaparte's Gull on the 21st of April.

April 22-28

A Trumpeter Swan observed on the 22nd and a Rough-legged Hawk on the 23rd were the first records of these species for Tommy Thompson Park Bird Research Station. North winds on the 22nd resulted in only 14 birds banded and 35 species on census. There were more migrants present on the 24th as 39 birds were banded, mainly composed of Slate-coloured Junco, Brown Creeper and Myrtle Warbler. The most active day of the spring to this point was the 26th as 57 birds were banded and a respectable 5 Pine Warbler were tallied. 5 new arrivals were recorded on this date, which included; Black-throated Green, Black-and-white, and Orange-crowned Warbler. The return of cold northerly winds kept migrants at bay for the remainder of the week.

April 29-May 5

The week began with southwest winds and warmer temperatures but it seemed the weather was a little too nice as migrants had optimal conditions for passing us by. A highflying Northern Mockingbird on April 30th was a noteworthy observation. Cooler Temperatures and thick fog for the next two days produced the following spring arrivals; Northern Waterthrush, Black-throated Blue Warbler, Veery, Baltimore Oriole and Solitary Sandpiper. The first major push of migrant landbirds was observed on the 3rd of May as 114 birds were banded, consisting primarily of White-throated and Swamp Sparrow and Myrtle Warbler. A rather early Yellow-billed Cuckoo was banded on May 4th. A small group of kettling Turkey Vultures on May 5th was an unusual sighting for Tommy Thompson Park.

May 6-May 12

A fallout occurred on May 7th as 104 birds were banded of 23 species (mostly Myrtle, Nashville and Palm Warbler as well as White-throated Sparrow). The female Rusty Blackbird banded on May 7th was the first ever captured at TTPBRS! The high volume of birds recorded on the 7th was not evident on the 8th and 9th, however a Hairy Woodpecker was banded on the 8th (1st Banding record for TTPBRS). Overnight South winds and an early morning thunderstorm on the 10th produced a massive fallout at Tommy Thompson Park. Warblers were everywhere, moving through the fog in a southwestern direction along the peninsula throughout the count period. Despite running only 6 of our 15 nets for much of the 6-hour banding period, we still managed to band 273 birds. An additional 136 birds were released unbanded and 82 species were observed. 13 new species for the spring migration monitoring were tallied on this date, which

included the sudden appearance of 75 Bobolinks. The banding total included 92 Myrtle Warblers, 18 Magnolia Warblers, 2 Golden-winged Warblers and 9 Least Flycatchers. Another strong passage of migrants was sampled on the 11th as 122 birds were banded. From then on, warm and clear conditions provided a perfect opportunity for migrants to sail over the GTA, as evidenced by only 34 birds being banded on the 12th.

Table 1. Banding Totals for May 10th, 2004

species	banded	species	banded
American Redstart	1	Northern Parula	1
Black-and-White Warbler	5	Northern Waterthrush	1
Blue-headed Vireo	2	Orange-crowned Warbler	1
Blackburnian Warbler	2	Ovenbird	4
Brown Thrasher	1	Rose-breasted Grosbeak	1
Black-throated Blue Warbler	10	Ruby-crowned Kinglet	2
Black-throated Green Warbler	2	Red-winged Blackbird	3
Blue-winged Warbler	1	Scarlet Tanager	1
Common Yellowthroat	3	Song Sparrow	1
Chestnut-sided Warbler	6	Swamp Sparrow	7
Gray Catbird	1	Swainson's Thrush	4
Golden-winged Warbler	2	Veery	5
Hermit Thrush	3	Wood Thrush	2
Least Flycatcher	9	Western Palm Warbler	11
Lincoln's Sparrow	2	White-throated Sparrow	45
Magnolia Warbler	18	Yellow Warbler	6
Myrtle Warbler	92		
Nashville Warbler	12	Total	267

May 13-19

Weather for third week of May was not particularly conducive to grounding migrants as high pressure and/or northerly winds dominated. Highlight of the 13th was the first troupe of students (grade 7) at TTP Bird Research Station. Banding totals for the week hovered around the 30-40 birds per day range with a low of 9 on the 16th and a high of 75 on the 18th. TRCAs "Bring Back the Birds Festival" was held on May 15th, which went very well despite a general dearth of birds. Approximately 80 visitors were treated to banding demonstrations at the research station. The single Cape May Warbler banded on the 14th and Tennessee banded on the 15th were significant as these two species were very scarce at TTP in spring 2004 (more on this later). Most of the migrant species we expect to see at TTP had already arrived, but we were still awaiting the peak of migration for flycatchers, vireos and thrushes in the next couple of weeks.

May 20-26

Landbird migration was more impressive during this week, particularly the latter half. A very late Fox Sparrow was found on May 20th along with a Winter Wren and a Slate-coloured Junco! 138 Whimbrel flew over on the 22nd. Heavy fog and SE winds on May 23rd led to another fallout of migrants at TTP. Magnolia Warbler, Red-eyed Vireo and empidonax flycatchers were the dominant species. Highlights of banding on the 23rd include; 1 Blue-winged, 3 Mourning, and 15 Traill's Flycatcher. The concentration of birds was even higher on the following day as 171 birds were banded from only 45 of 90 standard net hours. The season's only Connecticut Warbler was observed on the 24th. In the remaining days of the update period, banding totals gradually subsided as weather changed to cold with unfavourable winds

May 27-June 2

Migration monitoring during the week yielded lower banding and detected totals for most species. Flycatchers, American Redstarts, Wilson's Warbler and thrushes were the standout migrants of the period. A Yellow-crowned Night Heron observed on a point count on May 30th was the first for TTPBRS. The first Common Nighthawk of the spring was finally detected on the same day. Following high winds on the 31st, there was an increase in numbers of migrants for the following 2 days of the period. 14 Traill's Flycatcher were banded on the first of June along with a Spotted Sandpiper, the first ever banded at TTPBRS.

June 3-8

The final week of migration monitoring for spring 2004 was a quiet one. Banding totals went from a high of 27 on the 3rd to 7 on the 8th. Most of the birds present in the count area during this period were already nesting. Conversely, June was a busy migration period in 2003 due to an unusually cold May. Spring 2004 was probably more of an average year with respect to both weather and bird migration.

Overview of Spring Coverage

Coverage in spring 2003 was excellent as weather was favourable to a project of this kind. Spring migration was sampled on 68 of 70 attempted days in 2004 (97%). Only two days were entirely lost due to weather. 2,519 birds of 87 species were banded and 604 birds were recaptured from 3517 net hours. An additional 236 birds were released unbanded due to excessive capture volume on some busy mornings in May! Netting coverage was 84% of the spring target (compared to 54% in 2003). The captures/net hour rate is an accurate calculation of migrant abundance based solely on the banding component. Despite a much higher banding total in 2004, the capture rate was actually higher in 2003. The rate was .47 birds/net hour for spring 2004 versus .51 in 2003. Census was completed on 67 days for the spring and point counts were completed on 60 days. A total of 171 species were detected in spring 2004 (see appendix B for complete species list)

Banding Data

Capturing and banding birds is an important component of the methodology at a migration monitoring site. A fully standardized banding program is a strong method of sampling bird populations, especially when utilized in concert with surveys. Banding also provides valuable information on migrant stopover rates and ecology, migrant fitness, age ratios, and is also an important aspect of our education program at TTPBRS.

2004 marked the first year that migration monitoring was carried out in April at Tommy Thompson Park. Based on spring 2003 (see Derbyshire, January 2004), we were expecting that April would be a busy period of migration. However, April was quite the opposite as tallies were pretty low across the board. Bird numbers didn't really pick up until early May. Weather in April was dominated by north winds and cold temperatures, which most likely kept migrants in a holding pattern further south. Table 2 provides a week-by-week comparison of banding totals.

Table 2. Weekly Capture Statistics

Week	Banded	Net Hours	Banded/Hour
April 1-7	42	427.5	.09
April 8-14	67	540	.12
April 15-21	161	532.5	.30
April 22-28	153	540	.28
April 29-May 5	249	504.75	.49
May 6-12	663	576	1.15
May 13-19	265	598.5	.44
May 20-26	575	554.25	1.03
May 27-June 2	267	504	.52
June 3-8	77	540	.14
April 1-June 8	2519	5317	.47

Prior to the 2004 field season, we were anticipating or hoping that April would feature some heavy migration because of the paucity of results from May 2003. In 2004, the opposite was evident as May was a far more productive month. It is important to stress that the determination of what is a "normal" or "average" spring will not be clear until we have a few more years of experience at Tommy Thompson Park. A few warm fronts in April 2005 may yield more interesting results!

Lastly, the capture rate being higher in spring 2003 (.51) than 2004 (.47) is misleading. When the data sets are filtered to the same coverage period (May 3-June 8), 2004 was the busier spring season. See Table 3 for details.

Table 3. Comparison of Capture Rates (Data filtered by coverage period, May 3-June 8)

Year	Banded	Hours	Capture Rate
2003	870	1719.25	.51
2004	2030	3042.75	.67

Banding totals for each species are presented in appendix A. Totals for 2004 are generally higher than 2003, with a few exceptions. White-throated Sparrow, Myrtle Warbler, Magnolia Warbler and Traill's Flycatcher were dominant in 2004. As expected, totals for kinglets, juncos, flickers, robins and creepers were lower than expected as a result of a quiet month of April.

Comparisons to 2003 in terms of individual species abundance is difficult as net array and overall coverage broadly differ. It is therefore necessary to consider 2004 as the first spring by which all future seasons should be compared. However, the banding totals presented below are satisfactory with respect to overall species composition and density. In particular, the number of warblers, flycatchers and vireos banded in spring 2004 are impressive, especially compared to results from the previous fall. A comparison of the top ten species banded for 2003 and 2004 is presented in table 4.

A total of 9 new species were added to the TTPBRS banding list and they include; Rusty Blackbird, Blue-gray Gnatcatcher, Pine Warbler, Spotted Sandpiper, Blue-winged and Golden-winged Warbler, White-breasted Nuthatch and Hairy Woodpecker. The addition of these banding records brings the species banded total to 99. A total of 6,777 birds have been banded since the inception of the project in May, 2003.

Table 4. Top Ten Species Banded for 2004 vs. 2003

Rank	Species	Banded	Rank	Species	Banded
2004			2003		
1	White-throated Sparrow	264	1	Swainson's Thrush	86
2	Myrtle Warbler	210	2	Yellow Warbler	51
3	Magnolia Warbler	164	3	Magnolia Warbler	48
4	Traill's Flycatcher	115	4	White-throated Sparrow	47
5	Swainson's Thrush	99	5	Gray Catbird	43
6	Yellow Warbler	82	6	Common Yellowthroat	41
7	Swamp Sparrow	70	7	American Goldfinch	37
8	Least Flycatcher	69	8	Least Flycatcher	36
9	Common Yellowthroat	68	9	Myrtle Warbler/Gray-cheeked Thrush	29
10	Hermit Thrush	65	10	Lincoln's Sparrow	27
	Total	1206		Total	474

Recaptures

604 birds were recaptured in spring 2004. The overall recapture rate was .23. There was a single foreign recovery of an American Redstart, recaptured at TTPBRS on May 24th. Details on the origin of this bird are not yet available at the time of this writing. This encounter constitutes the 7th foreign recovery for the project!

Foreign Recovery

Band Number	Species	Date Recaptured	Age	Sex
2240-63049	American Redstart	May 24-2004	After-Second Year	Female

Many returning birds were recaptured in spring 2004, confirming the status of breeding and resident species. A few return records are presented in table 5 below.

Table 5. Notable Recapture Records

Band	Species	Banded	Recaptured
2290-06863	American Tree Sparrow	Oct 28-2003	Apr 03-2004
1453-31817	Yellow-shafted Flicker	May 14-2003	Apr 28-2004
1551-44620	Tree Swallow	May 25-2003	Apr 28-2004
2060-40829	Traill's Flycatcher	May 26-2003	May 21-2004

Recapture totals by species are given in table 6.

Table 6. Recapture Totals

Species	Recap	Foreign	Species	Recap	Foreign
American Goldfinch	24		Magnolia Warbler	26	
American Redstart	13	1	Mourning Warbler	5	
American Robin	3		Myrtle Warbler	6	
American Tree Sparrow	2		Nashville Warbler	10	
Baltimore Oriole	1		Northern Cardinal	3	
Black-and-White Warbler	1		Northern Waterthrush	1	
Black-capped Chickadee	9		Ovenbird	7	
Brown-headed Cowbird	7		Philadelphia Vireo	1	
Blackburnian Warbler	1		Ruby-crowned Kinglet	28	
Blackpoll Warbler	7		Red-eyed Vireo	2	
Brown Creeper	10		Red-winged Blackbird	5	
Brown Thrasher	8		Slate-colored Junco	2	
Black-throated Blue Warbler	6		Song Sparrow	30	
Black-throated Green Warbler	4		Swamp Sparrow	21	
Blue-winged Warbler	1		Swainson's Thrush	4	
Canada Warbler	15		Tree Swallow	1	
Common Yellowthroat	29		Traill's Flycatcher	17	
Chestnut-sided Warbler	11		Veery	1	
Eastern Phoebe	1		Warbling Vireo	7	
European Starling	1		Wilson's Warbler	15	
Fox Sparrow	2		Winter Wren	5	
Golden-crowned Kinglet	16		Western Palm Warbler	5	
Gray-cheeked Thrush	7		White-throated Sparrow	39	
Gray Catbird	39		Yellow-bellied Flycatcher	6	
Hermit Thrush	32		Yellow-shafted Flicker	1	
House Wren	6		Yellow Warbler	93	
Least Flycatcher	4				
Lincoln's Sparrow	2		Total	603	1

The rate of recapture varies widely between species at every CMMN station. Recapture rates are highest for species breeding at the site as is the case for TTPBRS for Yellow Warbler, the most common breeding songbird there. However, there is also variation between species that do not breed at the site, called "passage migrants". For example, Magnolia Warblers are not as inclined to stopover at TTP as are Canada Warblers and Ruby-crowned Kinglet.

Table 7. Rate of Recapture for Selected Species

Species	Banded	Recaptured	Rate of Recapture
Myrtle Warbler	210	6	0.02
Swainson's Thrush	99	4	0.04
Least Flycatcher	69	4	0.05
Magnolia Warbler	164	26	0.15
Wilson's Warbler	46	15	0.32
Mourning Warbler	13	5	0.38
Song Sparrow	65	30	0.46
Ruby-crowned Kinglet	61	28	0.49
Canada Warbler	25	15	0.6
Yellow Warbler	82	93	1.1
Spring 2004 Total	2519	604	0.23

Net Productivity

The mist-net setup at TTPBRS has been firmly established for all subsequent migration monitoring at the site. Net 4 was shifted closer to the shoreline in May 2004 as the habitat around it had become severely denuded by beavers and was therefore exposed to visitors. Compared to fall 2003, individual net productivity is quite similar for all 15 nets. Once again the most productive net group was 9-10-11 (block E), which is located in the most mature habitat of the count area. Hopefully these nets will be as successful in August and September, 2004. See table 8 for details on individual net location success.

Table 8. Net Productivity

Net	Captured	Hours	Captures Hour
1	202	362.75	.55
2	188	362.75	.51
3	182	362.75	.50
4	204	355	.57
5	124	356.75	.34
6	179	358.25	.49
7	179	355	.50
8	193	355	.54
9	173	339.25	.50
10	214	339.25	.63
11	254	339.25	.74
12	110	357.25	.30
13	90	357.25	.25
14	91	357.25	.25
15	135	359.75	.37
Total	2518	3517.5	.47

The growing number of Beavers at the site was presenting a problem as we want to avoid any habitat disturbance around the nets. Unfortunately, the beaver found the cleared net lanes to be a good runway through which they could cut and drag trees to the water's edge! Trees around the net lanes have now been protected from any further impact. A thorough habitat assessment is planned for these net locations in 2005, which will be used in tandem with current habitat data at TRCA offices.

Species Coverage

Species coverage is a significant factor in the evaluation of a migration monitoring site. Bird Studies Canada uses a system that ranks each landbird species according to conservation priority. The rankings are based on the percentage of a species range that is covered by Breeding Bird Survey. Therefore, priority A species (highest priority) are species whose range is covered the least by the Breeding Bird Survey because of the remoteness of territories in northern Canada and Alaska. Species coverage for spring 2003 was incomplete as the only statistically viable data set from that season was the banding data. Table 9 lists the species covered based on banding data in 2003.

Table 9. Spring Species Coverage Summary 2003 (successfully monitored).

Priority A-	Priority B	Priority C	Priority D
Gray-cheek. Thrush	Myrtle Warbler	American Redstart	Eastern Phoebe
Lincoln's Sparrow	Ruby-crowned Kinglet	Common Yellowthroat	Hermit Thrush
Magnolia Warbler	Palm Warbler	Least Flycatcher	Red-winged Blackbird
Swainson's Thrush	White-throated Sparrow	Ovenbird	Song Sparrow
Wilson's Warbler	White-crowned Sparrow	Yellow Warbler	

Species coverage for 2004 is much improved because of a broader coverage window and a more intensive monitoring strategy. A species is considered monitored when at least 10 (preferably 20) individuals are recorded in a season on an average of 5 dates. Table 9 details species coverage for spring 2004. Most target species were covered based on the spring data however there were some misses. American Pipit, Cape May Warbler, Orange-crowned Warbler, Savannah Sparrow, Tennessee Warbler and Yellow-bellied Sapsucker are all priority A species that were not sampled in sufficient quantity. All of these species were scarce in spring 2003. All of these species except Savannah and Cape May Warbler can be monitored during fall migration as was the case in 2003. Most of the priority B species that we missed do not occur regularly in southern Ontario, with the exception of Lapland Longspur and Snow Bunting.

Table 10. Spring Species Coverage Summary 2004

PRIORITY A	PRIORITY B	PRIORITY C	PRIORITY D
Alder Flycatcher	American Tree Sparrow	American Redstart	American Crow
Bay-breasted Warbler	Dark-eyed Junco	Black-and-white Warbler	American Robin
Blackpoll Warbler	Fox Sparrow	Black-thr. Green Warbler	Black-capped Chickadee
Gray-cheeked Thrush	Myrtle Warbler	Bank Swallow	Belted Kingfisher
Lincoln's Sparrow	Ruby-crowned Kinglet	Barn Swallow	Brown Creeper
Magnolia Warbler	Rusty Blackbird	Blue Headed Vireo	Cedar Waxwing
Northern Waterthrush	Swamp Sparrow	Canada Warbler	Common Grackle
Swainson's Thrush	Western Palm Warbler	Chipping Sparrow	Downy Woodpecker
Wilson's Warbler	White-crowned Sparrow	Common Yellowthroat	Eastern Phoebe
Yellow-bellied Flycatcher	White-throated Sparrow	Eastern Kingbird	European Starling
American Pipit	Bohemian Waxwing*	Least Flycatcher	Golden-crowned Kinglet
Cape May Warbler	Boreal Chickadee*	Mourning Warbler	Great-crested Flycatcher
Connecticut Warbler*	Common Redpoll*	Ovenbird	Hermit Thrush
Orange-crown. Warbler	Harris Sparrow*	Philadelphia Vireo	Northern Flicker
Savannah Sparrow	Lapland Longspur	Red-eyed Vireo	Purple Finch
Tennessee Warbler	Leconte's Sparrow*	Tree Swallow	Red-winged Blackbird
Yellow-bell. Sapsucker	Northern Shrike*	Warbling Vireo	Song Sparrow
	Pine Grosbeak*	Yellow Warbler	Winter Wren
	Snow Bunting	Clay-coloured Sparrow	Hairy Woodpecker
	White-winged Crossbill*	Common Nighthawk	Horned Lark
		Cliff Swallow	Marsh Wren
		Olive-sided Flycatcher	Pine Siskin
			Red-breasted Nuthatch
			Vesper Sparrow

*Species not monitored anywhere by CMMN or species not expected in the Lake Ontario region.
Protocol

Spring 2004 marked the first migration monitoring season that the Operations Manual was put to use. Overall, the protocol was effective, however there will be some minor changes. The most significant change from last fall (2003) was the incorporation of 3 Point Counts into the daily routine. Ten-minute stationary counts were conducted from 3 fixed positions in the count area on a daily basis. Each day, a count was done at 3, 4, and 5 hours after sunrise. The purpose of these counts was to boost detected totals for landbirds with the hope of augmenting the census data.

When comparing the results of the census vs. point counts, the point counts appear to have been worthwhile. Waterbirds were taken out of the analysis so as not to bias the census (waterbirds were not counted on point counts). The average abundance per hour of surveying was higher for point counts. In terms of species diversity, 103 species were detected on census and 94 were detected on point counts. Census was more effective for elusive species such as thrushes and sparrows (an effect of walking during the census which flushes birds from their cover). The stationary point counts do not have this advantage. Not surprisingly, the point counts were most effective for birds vocalizing prominently and also for birds flying over. TTPBRS is by no means a good site for observing raptors in the spring, however, the point counts turned up 5 species of raptor not detected by any other method. Furthermore, these records comprise nearly the sum total of all raptor sightings for the spring!

Table 11. Comparison of Point Counts and Census Surveys

Survey	Effort (Hours of observation)	Abundance Detected	Average Abundance/Hour	Diversity
Census	67	6485	96	103
Point Counts	28.5	3790	132	94

In terms of species coverage, the point counts sampled 7 species in enough quantity to raise them to monitoring level (10 birds per season on an average of 5 dates).

Table 12. Species Summary for Point Counts

Species Detected Exclusively on Point Counts (not censused)	Species monitored* because of Point Counts (not sampled enough by other methods)
Bobolink	White-breasted Nuthatch
Eastern Meadowlark	Blue-headed Vireo
Golden-winged Warbler	Blue-gray Gnatcatcher
Northern Goshawk	Scarlet Tanager
Northern Harrier	Ruby-throated Hummingbird
Rough-legged Hawk	Rusty Blackbird
Sharp-shinned Hawk	Chipping Sparrow
Turkey Vulture	

*Monitored refers to the detection of at least 10 individuals on an average of 5 dates per season.

Overall, the point counts were effective insofar as they did produce significant quantities and diversity of birds and did not detract from the rest of the monitoring activities. Point counts will be incorporated into the operations manual as standard data alongside the census and banding components.

Personnel

Thirty-two volunteers contributed 1261 hours to the spring effort. The volunteers are essential for the completion of the field program at Tommy Thompson Park Bird Research Station. Thanks to the following for their dedication and good company!

Table 13. Volunteer Effort

Name	Hours	Name	Hours	Name	Hours
Ian Sturdee	185.5	Paolo Viola	36	Al Woodhouse	14
Mike Boyd	136	Jan Macdonald	25.5	Tove Christensen	12.5
Dave Langford	87	Barbara Myers	24	Andre Nobes	12
Richard Joos	87	Carol Gordon	24	Al Gregory	11
Julia Marko	84.5	Lori Gilkes	24	Sandra Znajda	10
Mary Boswell	82	Louise McCrae	24	Janet Grand	8
Bert Vanderzon	79	Merrilea Shields	24	Janet Mannone	6
Bob Kortright	60	Diego Garcia-Bellido	18	Mary-Anne Cain	4.5
Teresa Carlin	44	Howard Shapiro	18	David Beadle	4
Norma Vanderzon	43	Lisa Wong	18	Patrick Scanlon	4
Mitch Meredith	36	Paul Barrie	16	Total Volunteer Hours	1261.5

Developments at TTBRs

It has been a productive year for Tommy Thompson Park Bird Research Station (TTPBRS). We were very fortunate to be able to hire a Migration Monitoring Assistant (MMA) for the spring and fall migration seasons in 2004. This was made possible by the funding secured by the Toronto Bird Observatory through the Ontario Trillium Foundation. Seabrooke Leckie, a volunteer from fall 2003, is the Assistant for 2004.

Improvements to the banding lab in 2004 include the installation of composting toilets, which will house solar panels for powering the banding lab. The addition of a constant power source will finally fix our lighting issues! A new floor for the lab will be installed prior to August 2004, which will make maintenance much easier.

ACKNOWLEDGEMENTS

The following are to be acknowledged for their contributions to the Tommy Thompson Park Migration Monitoring Program in 2004.

- Toronto and Region Conservation Authority and Toronto Bird Observatory
- Ontario Trillium Foundation
- Jan MacDonald for her generous donations of equipment
- The 32 volunteers from spring 2004 for their spirited support!

The author especially thanks the following for their assistance in spring 2004: Tamara Chipperfield, Seabrooke Leckie, Ralph Toninger, and Paolo Viola.

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Appendices

Appendix A. Banding Totals, spring 2004

Species	2004	2003	Species	2004	2003
American Goldfinch	54	37	Least Flycatcher	69	36
American Redstart	50	25	Lincoln's Sparrow	27	27
American Robin	22	8	Magnolia Warbler	164	48
American Woodcock	2		Mourning Warbler	13	6
American Tree Sparrow	13		Myrtle Warbler	210	29
Bank Swallow		1	Nashville Warbler	55	18
Barn Swallow		3	Northern Cardinal	2	3
Baltimore Oriole	12	6	Northern Parula	2	
Black-and-White Warbler	19	4	Northern Waterthrush	14	7
Bay-breasted Warbler	8	2	Northern Rough-winged Swallow	2	4
Black-capped Chickadee	3	2	Orange-crowned Warbler	5	1
Blue-gray Gnatcatcher	1		Ovenbird	28	13
Brown-headed Cowbird	20	4	Philadelphia Vireo	14	2
Blue-headed Vireo	4		Pine Warbler	3	
Blackburnian Warbler	13	3	Purple Finch	1	
Blue Jay	4		Rose-breasted Grosbeak	4	3
Blackpoll Warbler	29	8	Red-breasted Nuthatch	1	
Brown Creeper	23		Ruby-crowned Kinglet	61	21
Brown Thrasher	26	10	Red-eyed Vireo	60	6
Black-throated Blue Warbler	33	11	Rusty Blackbird	1	
Black-throated Green Warbler	36	4	Red-winged Blackbird	50	23
Blue-winged Warbler	4		Savannah Sparrow		1
Canada Warbler	25	5	Slate-colored Junco	47	
Cedar Waxwing	1		Scarlet Tanager	6	2
Chipping Sparrow	5	2	Song Sparrow	65	17
Cape May Warbler	1		Spotted Sandpiper	1	
Common Grackle	6	4	Swamp Sparrow	70	4
Common Yellowthroat	68	41	Swainson's Thrush	99	86
Chestnut-sided Warbler	47	8	Tennessee Warbler	2	1
Eastern Kingbird	2	4	Tree Swallow	3	6
Eastern Phoebe	5	2	Trail's Flycatcher	115	22
Eastern Towhee	3	1	Veery	30	9
Eastern Wood-Pewee	5	4	Warbling Vireo	9	8
European Starling	5	11	White-breasted Nuthatch	2	
Eastern White-crowned Sparrow	22	21	Wilson's Warbler	46	19
Field Sparrow	3	1	Winter Wren	20	
Fox Sparrow	10		Wood Thrush	5	1
Great Crested Flycatcher	3	1	Western Palm Warbler	53	19
Golden-crowned Kinglet	27		White-throated Sparrow	264	47
Gray-cheeked Thrush	27	29	Yellow-billed Cuckoo	1	
Gray Catbird	51	43	Yellow-bellied Flycatcher	35	4
Golden-winged Warbler	4		Yellow-bellied Sapsucker	1	
Hairy Woodpecker	1		Yellow-shafted Flicker	6	2
Hermit Thrush	65	14	Yellow Warbler	82	51
House Wren	6	2			
Indigo Bunting	3	3	Total	2519	870

*Species in bold indicate first banding records for TTPBRS

Appendix B. List of Species, spring 2004. (Total of 171 species, species in **bold** were new records for TTPBRS)

Alder Flycatcher	Chipping Sparrow	House Finch	Red-necked Grebe
American Coot	Cliff Swallow	House Sparrow	Red-tailed Hawk
American Crow	Common Goldeneye	House Wren	Red-winged Blackbird
American Goldfinch	Common Grackle	Indigo Bunting	Ring-billed Gull
American Kestrel	Common Loon	Killdeer	Ring-necked Duck
American Pipit	Common Merganser	Least Flycatcher	Rock Pigeon
American Redstart	Common Nighthawk	Lesser Scaup	Rose breasted Grosbeak
American Robin	Common Redpoll	Lesser Yellowlegs	Rough-legged Hawk
American Tree Sparrow	Common Tern	Lincoln's Sparrow	Ruby-crowned Kinglet
American Wigeon	Common Yellowthroat	Long-tailed Duck	Ruby-throated Hummingbird
American Woodcock	Connecticut Warbler	Magnolia Warbler	Rusty Blackbird
American-black Duck	Dark-eyed Junco	Mallard	Savannah Sparrow
Baltimore Oriole	Double-crested Cormorant	Merlin	Scarlet Tanager
Bank Swallow	Downy Woodpecker	Mourning Dove	Sharp-shinned Hawk
Barn Swallow	Dunlin	Mourning Warbler	Solitary Sandpiper
Bay-breasted Warbler	Eastern Bluebird	Mute Swan	Song Sparrow
Belted Kingfisher	Eastern Kingbird	Myrtle Warbler	Spotted Sandpiper
Black-and-white Warbler	Eastern Meadowlark	Nashville Warbler	Swainson's Thrush
Black-bellied Plover	Eastern Phoebe	Northern Cardinal	Swamp Sparrow
Blackburnian Warbler	Eastern Towhee	Northern Flicker	Tennessee Warbler
Black-capped Chickadee	Eastern Wood Pewee	Northern Goshawk	Tree Swallow
Black-crowned Night Heron	European Starling	Northern Harrier	Trumpeter Swan
Blackpoll Warbler	Field Sparrow	Northern Mockingbird	Tundra Swan
Black-throated Blue Warbler	Fox Sparrow	Northern Parula	Turkey Vulture
Black-throated Green Warbler	Gadwall	Northern Pintail	Veery
Blue Jay	Glaucous Gull	Northern Rough-winged Swallow	Warbling Vireo
Blue-gray Gnatcatcher	Golden-crowned Kinglet	Northern Shoveller	Western Palm Warbler
Blue-headed Vireo	Golden-winged Warbler	Northern Waterthrush	Whimbrel
Blue-winged Teal	Gray Catbird	Orange-crowned Warbler	White-breasted Nuthatch
Blue-winged Warbler	Gray-cheeked Thrush	Osprey	White-crowned Sparrow
Bobolink	Great black-backed Gull	Ovenbird	White-throated Sparrow
Bonaparte's Gull	Great Egret	Peregrine Falcon	White-winged Scoter
Brown Creeper	Great-blue Heron	Philadelphia Vireo	Willow Flycatcher
Brown Thrasher	Great-crested Flycatcher	Pied Billed Grebe	Wilson's Warbler
Brown-headed Cowbird	Greater Scaup	Pine Siskin	Winter Wren
Bufflehead	Greater Yellowlegs	Pine Warbler	Wood Duck
Canada Goose	Green-winged Teal	Purple Finch	Wood Thrush
Canada Warbler	Hairy Woodpecker	Purple Martin	Yellow Warbler
Cape May Warbler	Hermit Thrush	Red-breasted Merganser	Yellow-bellied Flycatcher
Caspian Tern	Herring Gull	Red-breasted Nuthatch	Yellow-bellied Sapsucker
Cedar Waxwing	Hooded Merganser	Red-eyed Vireo	Yellow-billed Cuckoo
Chestnut-sided Warbler	Horned Grebe	Redhead	Yellow-crown. Night Heron
Chimney Swift	Horned Lark	Red-headed Woodpecker	

Appendix C. Species Accounts, spring 2004

Species	# of Dates	Season High Date	Season High	*Total Individuals
American Black Duck	15	17-Apr	5	27
American Green-winged Teal	2	5-May, 23-Apr	1	2
Alder Flycatcher	6	23,24-May	3	11
American Coot	2	24,27-Apr	1	2
American Crow	10	9-Apr	5	18
American Goldfinch	55	1-Jun	20	319
American Pipit	4	several	1	4
American Redstart	24	24-May	22	98
American Robin	64	27-Apr	14	264
American Wigeon	2	3-Apr	3	5
American Woodcock	7	several	1	7
American Tree Sparrow	13	8-Apr	8	43
Bank Swallow	14	31-May	24	46
Baltimore Oriole	31	3-Jun	6	88
Barn Swallow	19	31-May	5	41
Black-and-white Warbler	11	10-May	15	35
Black-bellied Plover	1	30-May	1	1
Bay-breasted Warbler	7	24-May	10	21
Black-capped Chickadee	30	9-Apr	7	47
Black-crowned Night Heron	8	27-Apr	10	27
Belted Kingfisher	13	19-Apr	2	14
Blue-gray Gnatcatcher	4	8, 15-May	2	6
Brown-headed Cowbird	65	11-Apr	25	509
Blue-headed Vireo	3	10-May	5	7
Blackburnian Warbler	14	10,24-May	6	29
Blue Jay	17	4-May	14	46
Blackpoll Warbler	20	3-Jun	8	65
Bonaparte's Gull	5	21-Apr	17	27
Brown Creeper	24	24-Apr	7	66
Brown Thrasher	41	9,14-May	5	76
Black-throated Blue Warbler	17	10-May	14	48
Black-throated Green Warbler	19	10-May	17	77
Bufflehead	36	27-Apr	75	820
Blue-winged Teal	1	10,11-May	3	3
Blue-winged Warbler	5	10-May	3	7
Canada Goose	64	2-Jun	86	601
Caspian Tern	33	21-Apr, 16-May	4	55
Canada Warbler	15	24-May	11	51
Cedar Waxwing	11	24-May	12	36
Chipping Sparrow	7	24-Apr	4	12

Cape May Warbler	3	several	1	3
Common Goldeneye	13	30-Apr	20	77
Common Grackle	59	17-Apr	43	338
Common Loon	25	21-Apr	8	51
Common Merganser	3	20-Apr	10	13
Common Tern	48	12-May	60	583
Common Yellowthroat	27	25-May	14	134
Chestnut-sided Warbler	21	24-May	17	82
Double-crested Cormorant	30	27-Apr	700	2235
Downy Woodpecker	2	8,22-May	4	5
Dunlin	1	22-May	4	4
Eastern Kingbird	22	20-May, 1-Jun	5	47
Eastern Phoebe	14	19-Apr	4	18
Eastern Towhee	9	4,11-May	3	15
Eastern Wood Pewee	18	2-Jun	7	38
European Starling	64	2-Apr	28	418
Field Sparrow	3	several	1	3
Fox Sparrow	9	16-Apr	7	23
Gadwall	42	3-Apr	15	122
Great Black-backed Gull	9	2-Apr	4	12
Great Blue Heron	2	28-May	2	3
Great-crested Flycatcher	10	1,5-Jun	3	17
Golden-crowned Kinglet	20	10-Apr	12	87
Gray-cheeked Thrush	18	30-May	6	40
Gray Catbird	34	14-May, 3-Jun	12	206
Great Egret	4	several	1	4
Greater Scaup	25	23,28-Apr	39	341
Greater Yellowlegs	2	20-Apr, 3-May	1	2
Golden-winged Warbler	2	10,24-May	2	4
Hairy Woodpecker	2	10-Apr, 8-May	1	2
Herring Gull	25	2-Apr	30	126
Hermit Thrush	27	21-Apr	13	111
House Finch	2	10,11-Apr	1	2
Horned Grebe	9	24-Apr	4	18
Horned Lark	1	9-Apr	2	2
Hooded Merganser	1	5-May	1	1
House Wren	17	several	3	28
Indigo Bunting	5	20-May	2	6
Killdeer	7	several	1	7
Least Flycatcher	25	24-May	16	95
Lesser Scaup	21	3-Apr	54	242
Lesser Yellowlegs	4	several	1	4
Lincoln's Sparrow	18	18-May	7	33
Mallard	65	3-Apr	22	367

Magnolia Warbler	27	10-May	30	229
Mourning Dove	22	several	2	28
Mourning Warbler	10	25-May	6	26
Mute Swan	47	several	7	146
Myrtle Warbler	31	10-May	210	514
Nashville Warbler	20	10-May	23	106
Northern Cardinal	46	6-May	3	64
Northern Parula	3	10,11-May	2	5
Northern Waterthrush	12	17-May	5	21
Northern Rough-winged Swallow	6	31-May	6	16
Northern Shoveller	1	20-Apr	2	2
Orange-crowned Warbler	5	several	1	5
Long-tailed Duck	47	9-Apr	187	2493
Ovenbird	23	24-May	7	44
Philadelphia Vireo	8	26-May	10	23
Pine Siskin	1	4-May	2	2
Pine Warbler	7	19-Apr	4	12
Purple Finch	5	24-Apr	4	10
Purple Martin	2	21-Apr	1	2
Rose-breasted Grosbeak	7	7-May	4	12
Ring-billed Gull	29	27-Apr	1000	6128
Red-breasted Merganser	7	20-May	11	21
Red-breasted Nuthatch	3	2-Apr	2	4
Ruby-crowned Kinglet	25	19-Apr	12	118
Redhead	3	9-Apr	3	6
Red-eyed Vireo	20	24-May	22	125
Ring-necked Duck	2	6-Apr	2	3
Red-necked Grebe	1	30-Apr	1	1
Rock Pigeon	1	21-Apr	1	1
Ruby-throated Hummingbird	8	several	1	8
Rusty Blackbird	3	7-May	18	25
Red-winged Blackbird	65	8-Apr	51	955
Slate-coloured Junco	16	19-Apr	15	87
Scarlet Tanager	6	11-May	3	9
Song Sparrow	66	8-Apr	20	506
Spotted Sandpiper	35	29-May, 1-Jun	5	87
Swamp Sparrow	31	11-May	14	113
Swainson's Thrush	23	17,20-May	19	126
Tennessee Warbler	4	several	1	4
Tree Swallow	58	31-May	31	486
Trail's Flycatcher	23	1-Jun	18	146
Trumpeter Swan	1	22-Apr	1	1
Veery	25	10,11-May	5	46
Warbling Vireo	31	3-Jun	9	106

White-breasted Nuthatch	6	10,22-Apr	2	8
White-crowned Sparrow	13	11-May	15	48
Willow Flycatcher	15	1-Jun	8	51
Wilson's Warbler	14	27-May	12	74
Winter Wren	19	2-Apr	7	38
Wood Duck	2	15-Apr	2	3
Wood Thrush	5	10-May	4	9
Western Palm Warbler	15	10-May	20	100
White-throated Sparrow	35	3-May	80	528
White-winged Scoter	13	5-Apr	48	139
Yellow-billed Cuckoo	2	4,11-May	1	2
Yellow-bellied Flycatcher	15	25-May, 1-Jun	8	50
Yellow-bellied Sapsucker	6	several	1	6
Yellow-shafted Flicker	56	23,27-Apr	6	138
Yellow Warbler	39	13-May	30	531

*Total individuals includes multiple counts of same individuals (totals inflated for year-round residents and breeders)

Appendix D. Survey Analysis, spring 2004

Species	Census- Dates Encountered	Point Counts- Dates Encountered	Census- Total Individuals	Point Counts- Total Individuals
ALFL	6	4	11	7
AMCR	10	10	18	14
AMGO	53	54	250	186
AMPI	4	1	4	1
AMRE	16	15	34	27
AMRO	63	52	245	154
AMWO	5	2	5	2
ATSP	10	2	29	2
BANS	13	10	45	22
BAOR	31	31	79	66
BARS	18	13	40	22
BAWW	5	3	15	8
BBWA	4	3	14	5
BCCH	28	14	37	25
BEKI	13	13	14	16
BGGN	4	3	5	4
BHCO	64	59	483	292
BHVI	2	2	4	2
BLBW	11	5	17	8
BLJA	14	19	36	66
BLPW	17	11	30	19
BOBO		2		2
BRCR	18	7	34	10
BRTH	31	9	45	9
BTBW	8	6	11	8
BTNW	14	9	34	26
BWWA	1		3	
CAWA	8	3	14	4
CEDW	10	11	35	44
CHSP	6	3	7	5
CMWA	2		2	
COGR	59	49	331	187
COYE	16	10	38	11
CSWA	11	6	24	13
DOWO	2	1	5	2
EAKI	21	22	44	43
EAME		1		1
EAPH	10	6	12	6
EATO	7	6	12	9
EAWP	18	12	34	22
EUST	64	50	412	174
FOSP	6	2	11	4
GCFL	10	2	15	4

GCKI	13	7	52	12
GCTH	5	1	6	1
GRCA	32	27	144	56
GWWA		1		1
HAWO	2		2	
HETH	10	6	21	6
HOFI	2		2	
HOLA	1		2	
HOWR	13	8	18	8
INBU	3		3	
LEFL	13	13	24	23
LISP	1		1	
MAWA	18	8	38	19
MODO	22	10	28	15
MOWA	7	1	8	1
MYWA	31	23	280	123
NAWA	10	7	33	13
NOCA	44	21	60	29
NOGO		1		1
NOHA		1		1
NOPA	2	1	3	1
NOWA	5	2	6	2
NRWS	5	5	14	6
OCWA	1		1	
OVEN	7	6	10	7
PHVI	4	1	8	1
PISI	1	1	2	2
PIWA	6	2	9	3
PUFI	4		9	
PUMA	2		2	
RBGR	5	2	8	2
RBNU	1	1	1	1
RCKI	13	7	32	11
REVI	19	16	69	41
RODO	1		1	
RLHA		1		1
RTHU	2	1	2	1
RUBL	3	2	24	5
RWBL	65	60	901	549
SCJU	11	8	41	18
SCTA	4	2	5	4
SOSP	65	58	455	266
SSHA		1		1
SWSP	11	5	15	6
SWTH	13	5	26	5
TEWA	2		2	
TRES	58	54	482	406

TRFL	8	7	18	10
TRUS	1		1	
TUVU		1		3
VEER	12	2	14	2
WAVI	31	28	94	76
WBNU	5	2	6	3
WCSP	8	2	26	2
WIFL	14	14	50	41
WIWA	6	1	16	3
WIWR	10		16	
WODU	2	2	3	2
WOTH	3		4	
WPWA	12	3	38	6
WTSP	30	19	264	58
YBCU	1	1	1	1
YBFL	8	3	9	4
YBSA	5	1	5	1
YSFL	55	44	128	76
YWAR	38	36	404	322

Appendix E. Arrival Dates, spring 2004

Species	Date	Observer	Species	Date	Observer	Species	Date	Observer
Alder Flycatcher	23-May	MOBS	Dunlin	22-May	DGD	Orange-crowned Warbler	26-Apr	MOBS
American Coot	8-Apr	SNL	Eastern Bluebird	9-Apr	DGD	Osprey	9-Apr	MDB
American Crow	1-Apr	MOBS	Eastern Kingbird	10-May	MOBS	Ovenbird	1-May	MOBS
American Goldfinch	16-Apr	MDB	Eastern Meadowlark	17-Apr	SNL	Peregrine Falcon	9-Apr	MDB
American Kestrel	24-Apr	MOBS	Eastern Phoebe	7-Apr	MOBS	Philadelphia Vireo	10-May	SNL
American Pipit	2-Apr	MOBS	Eastern Towhee	16-Apr	MOBS	Pied Billed Grebe	3-Apr	DGB
American Redstart	10-May	MOBS	Eastern Wood Pewee	20-May	DGD	Pine Siskin	19-Apr	DGD
American Robin	1-Apr	MOBS	European Starling	1-Apr	MOBS	Pine Warbler	17-Apr	MDB
American Tree Sparrow	1-Apr	MOBS	Field Sparrow	19-Apr	MOBS	Purple Finch	19-Apr	SNL
American Wigeon	3-Apr	MDB	Fox Sparrow	6-Apr	MOBS	Purple Martin	22-Apr	MDB
American Woodcock	2-Apr	MOBS	Gadwall	1-Apr	MOBS	Red-breasted Merganser	7-Apr	DSL
American-black Duck	3-Apr	MOBS	Glaucous Gull	15-Apr	MDB	Red-breasted Nuthatch	7-May	SNL
Baltimore Oriole	1-May	MOBS	Golden-crowned Kinglet	1-Apr	MOBS	Red-eyed Vireo	10-May	MOBS
Bank Swallow	19-Apr	DGD	Golden-winged Warbler	10-May	MOBS	Redhead	9-Apr	MDB
Barn Swallow	19-Apr	DGD	Gray Catbird	30-Apr	MOBS	Red-headed Woodpecker	18-May	IS
Bay-breasted Warbler	15-May	MOBS	Gray-cheeked Thrush	12-May	MOBS	Red-necked Grebe	10-Apr	RK
Belted Kingfisher	1-Apr	MOBS	Great black-backed Gull	2-Apr	MDB	Red-tailed Hawk	14-Apr	MOBS
Black-and-white Warbler	26-Apr	MOBS	Great Egret	19-Apr	MOBS	Red-winged Blackbird	1-Apr	MOBS
Black-bellied Plover	22-May	RJ	Great-blue Heron	8-Apr	MOBS	Ring-billed Gull	1-Apr	MOBS
Blackburnian Warbler	7-May	MOBS	Great-crested Flycatcher	30-Apr	DSL	Ring-necked Duck	3-Apr	DGB
Black-capped Chickadee	1-Apr	MOBS	Greater Scaup	3-Apr	DGB	Rock Pigeon	8-Apr	IS
Black-crowned Night Heron	5-Apr	MOBS	Greater Yellowlegs	15-Apr	DGD	Rose breasted Grosbeak	6-May	SNL
Blackpoll Warbler	6-May	SNL	Green-winged Teal	7-Apr	RJ	Rough-legged Hawk	23-Apr	MDB,DSL
Black-throated Blue Warbler	1-May	MOBS	Hairy Woodpecker	10-Apr	MOBS	Ruby-crowned Kinglet	10-Apr	MOBS
Black-throated Green Warbler	26-Apr	MOBS	Hermit Thrush	5-Apr	MOBS	Ruby-throat. Hummingbird	8-May	RJ
Blue Jay	22-Apr	MDB	Herring Gull	2-Apr	MDB	Rusty Blackbird	10-Apr	DGD,RK
Blue-gray Gnatcatcher	24-Apr	PV	Hooded Merganser	5-May	DSL	Savannah Sparrow	11-May	MOBS
Blue-headed Vireo	26-Apr	DGD	Horned Grebe	1-Apr	DGD	Scarlet Tanager	10-May	MOBS

Blue-winged Teal	26-Apr	DGD	Horned Lark	9-Apr	MOBS	Sharp-shinned Hawk	8-May	RJ
Blue-winged Warbler	10-May	MOBS	House Finch	3-Apr	SNL	Solitary Sandpiper	1-May	PNP
Bobolink	10-May	MOBS	House Sparrow	11-Apr	DGD	Song Sparrow	1-Apr	MOBS
Bonaparte's Gull	15-Apr	MOBS	House Wren	22-Apr	MOBS	Spotted Sandpiper	30-Apr	MDB
Brown Creeper	1-Apr	MOBS	Indigo Bunting	10-May	MOBS	Swainson's Thrush	10-May	MOBS
Brown Thrasher	8-Apr	MOBS	Killdeer	3-Apr	MDB	Swamp Sparrow	7-Apr	MOBS
Brown-headed Cowbird	1-Apr	MOBS	Least Flycatcher	29-Apr	MGM,DGD	Tennessee Warbler	15-May	MOBS
Bufflehead	1-Apr	MOBS	Lesser Scaup	1-Apr	MOBS	Traill's Flycatcher	12-May	MOBS
Canada Goose	1-Apr	MOBS	Lesser Yellowlegs	22-Apr	MDB	Tree Swallow	3-Apr	MDB
Canada Warbler	17-May	MOBS	Lincoln's Sparrow	30-Apr	MOBS	Trumpeter Swan	22-Apr	MDB
Cape May Warbler	10-May	SNL	Long-tailed Duck	1-Apr	MOBS	Tundra Swan	3-Apr	MDB
Caspian Tern	10-Apr	MOBS	Magnolia Warbler	7-May	MOBS	Turkey Vulture	3-May	SNL
Cedar Waxwing	11-Apr	RK	Mallard	1-Apr	MOBS	Veery	2-May	DGD
Chestnut-sided Warbler	7-May	MOBS	Merlin	9-Apr	DGD	Warbling Vireo	1-May	DGD
Chimney Swift	5-May	DGD	Mourning Dove	2-Apr	DGD	Western Palm Warbler	24-Apr	MOBS
Chipping Sparrow	19-Apr	DGD	Mourning Warbler	15-May	HSS	Whimbrel	22-May	MOBS
Cliff Swallow	9-May	DGD	Mute Swan	2-Apr	MOBS	White-breasted Nuthatch	8-Apr	DGD
Common Goldeneye	1-Apr	MOBS	Myrtle Warbler	7-Apr	DSL	White-crowned Sparrow	29-Apr	MOBS
Common Grackle	1-Apr	MOBS	Nashville Warbler	30-Apr	DGD	White-throated Sparrow	17-Apr	MDB
Common Loon	8-Apr	DGD	Northern Cardinal	2-Apr	MOBS	White-winged Scoter	1-Apr	DGD,MDB
Common Merganser	3-Apr	MOBS	Northern Flicker	1-Apr	MOBS	Willow Flycatcher	22-May	RJ
Common Nighthawk	30-May	DGD	Northern Goshawk	9-Apr	SNL	Wilson's Warbler	13-May	MOBS
Common Redpoll	6-Apr	MOBS	Northern Harrier	16-Apr	SNL	Winter Wren	1-Apr	MOBS
Common Tern	19-Apr	DGD	Northern Mockingbird	30-Apr	DGD	Wood Duck	8-Apr	MDB
Common Yellowthroat	7-May	MOBS	Northern Parula	10-May	MOBS	Wood Thrush	9-May	SNL
Connecticut Warbler	24-May	RJ	Northern Pintail	8-Apr	MDB	Yellow Warbler	23-Apr	DGD
Dark-eyed Junco	2-Apr	MOBS	North. R-wing. Swallow	21-Apr	IS	Yellow-bellied Flycatcher	18-May	MOBS
Double-crested Cormorant	1-Apr	MOBS	Northern Shoveller	20-Apr	DSL	Yellow-bellied Sapsucker	1-Apr	MOBS
Downy Woodpecker	9-Apr	DGD,PB,JM	Northern Waterthrush	1-May	MOBS	Yellow-billed Cuckoo	4-May	MOBS

