

MIGRATION MONITORING AT TTPBRS: Spring 2006



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Cover-Yellow-billed Cuckoo (Derbyshire), Pg.1-Aerial View of TTP (TRCA), Pg.5-Least Sandpiper (Derbyshire), Pg.10-"Yellow" Palm Warbler (Derbyshire), Pg.11-Savannah Sparrow (Derbyshire), Pg.13-Winged Migration group (TRCA)

Introduction

In April of 2003, Toronto and Region Conservation Authority (TRCA) established a research station at Tommy Thompson Park (TTP). The primary objective of this endeavour was to aid conservation efforts at the local, national and international level through monitoring, research and education. The core program of the Tommy Thompson Park Bird Research Station (TTPBRS) is the Migration Monitoring Program (MMP). This report details results of the spring 2006 MMP.

Study Site



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 that extends 5 kilometers in a southwestern direction into Lake Ontario. Tommy Thompson Park has a total land base of approximately 160 hectares and a water surface area of 100 hectares.

The geographic situation of the park and its natural features make it very suitable for large numbers of breeding and migrating birds. 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 Tommy Thompson Park Bird Research Station is located on peninsula D, which is one of several peninsulas that branch off the main "spine" of the spit. The peninsula is bordered by the Toronto harbour on the north side and an inner bay on the south side. The habitat is composed of early succession cottonwood, willow and birch forest. Beach and meadow features are also present in the study area.

Toronto and Region Conservation (TRCA)

Toronto and Region Conservation (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 watersheds, sound environmental 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 and conservation education and heritage programs.

Objectives of the Living City Campaign (run by TRCA) 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 this Living City vision.

Rationale

Migration Monitoring Overview

The Breeding Bird Survey (BBS) is the principal method used by conservation organizations to monitor bird populations. This method is effective only where breeding populations are accessible to roadside surveying. The remoteness of much of northern Canada precludes such survey methods. It is therefore necessary to monitor these populations on their southward and northward migrations.

Methods

Protocol

The protocol for data collection at TTPBRS is detailed in the Operations Manual for Tommy Thompson Park Bird Research Station (Derbyshire 2004). The protocol employs fixed effort census and point count surveys as well as a fully standardized capture regimen. Spring migration monitoring operates on a daily basis from April 1-June 9. Data used in this report alternates between ST and NST. Standard Total (ST) is the final tally from all standard surveys while the Non-standard Total (NST) includes the standard surveys as well as any non-standard banding and casual observations.

Spring Migration Monitoring Results

Weekly Synopsis

(figures are banding totals or NST)

April 1-7

The fourth year of Migration Monitoring at Tommy Thompson Park began on April 1st with warm temperatures and an eager crew of five volunteers. A total of 5 American Woodcocks were heard and observed displaying during net opening. Brown Creeper, American Robin, Red-winged Blackbird, Brown-headed Cowbird, and Song Sparrow were the most conspicuous species during the first few days of the period. The weather turned cold on April 2nd when just 10 birds were banded. Thereafter, an unprecedented 3 consecutive days of fieldwork at TTPBRS were lost to weather! Our return on the 6th yielded several new arrivals including, Savannah Sparrow, Eastern Meadowlark, Myrtle Warbler, and Rusty Blackbird. A total of 39 birds were banded of which 20 were Golden-crowned Kinglets. Rain returned on the 7th limiting our coverage to census and a few net hours. Out of a possible 630 net hours for the 7-day period, just 274.5 hours were logged during the week, which is record low (427 in 2004, 385 in 2005). A total of 71 birds were banded and 59 species were recorded during the week.

April 8-14

Cold temperatures cancelled our banding efforts on the 8th and delayed net opening on the 9th. Conditions improved around mid-morning on the 9th, which permitted banding operations to recommence. A total of 38 birds were banded on this day, which included 28 Golden-crowned Kinglets. A full day of fieldwork was carried out on the 10th and several new species for the spring were encountered including **Sandhill Crane**, Great Egret, and Swamp Sparrow. The Sandhill Crane sighting was just the second record for TTPBRS. More bird activity was evident on the 11th as 44 birds were banded, and an impressive 17 Fox Sparrows were banded. Another 46 birds of 13 species were banded on the following morning, which included Hermit Thrush, Myrtle Warbler and Winter Wren. The highlight of the 13th was the first sighting of Palm Warbler for spring 2006. It was also a good day for sparrows as Eastern Towhee, Dark-eyed Junco, American Tree, Chipping, Field, Fox, and Song Sparrow were present in good numbers. Overall it was another quiet week at TTPBRS although our *Winged Migration* education program for schools kicked off on the 13th.

April 15- 21

Staff and volunteers entered the third week of coverage and felt as though spring migration hadn't yet begun! For the first 21 days, migrants trickled through the Toronto lakeshore, while the bulk of them were likely held back by predominantly northern winds. The third week began with a moderate influx of Brown Creeper and Golden-crowned Kinglet. Season firsts of **Glaucous Gull**, Common Tern and Red-necked Grebe appeared on this day along with a decent passage of Common Loon. It remained relatively quiet on the 16th when 20 birds were banded. The continuation of northerly winds on the

18th resulted in few new bands being issued, however, an Osprey and the station's first ever **Forster's Tern** were recorded. Kinglets, Hermit Thrush, Red-winged Blackbird, and Swamp Sparrow were the primary species banded on the 19th, which featured a good diversity of species but low numbers overall. Our second record of **Red-throated Loon** was spotted on this day. The strong winds relented a bit on the 20th, which contributed to a small influx of northbound migrants. A total of 46 birds were banded and some impressive observations were made including 95 Brown Creeper and 50 Hermit Thrush. April 21 was equally active as 50 birds were banded and 3 recaptured. Most distinctive about this day was a sudden increase in numbers of White-throated Sparrow.

April 22-28

The research station was closed on the 22nd and 23rd due to very high winds and rain. Staff and volunteers returned on the 24th and found respectable totals of White-throated Sparrow, Hermit Thrush, and Brown Creeper. On this day, Ruby-crowned Kinglets outnumbered Golden-crowns for the first time of the spring and there was also a good diversity of sparrows. Despite the north winds, a total of 77 birds were banded on the 24th, which included the first Pine Warbler banded for the season and the first ever banding of "**Yellow**" **Palm Warbler** at the station. Higher wind speed (northerly) on the 25th stalled migration once again as just 12 birds were banded before the rain and hail began falling on Toronto. April 26 saw the arrival of Northern Rough-winged Swallow at TTPBRS and season firsts of Black-and-white Warbler, Merlin, and Purple Martin appeared on the 27th. The weather was quite consistent throughout the update period and continued on the 28th, as there were few new migrants and many recaptures. Highlight of the 28th was the second sighting of **Forster's Tern** this spring (likely the same individual from April 18th).

April 29-May 5

The week of April 29-May 5 was very good as impressive numbers of sparrows passed through and some brightly coloured new arrivals appeared! April 29 was relatively quiet as 22 birds were banded of 7 species, which included 8 Hermit Thrush. The wind switched to the east late on the 29th, which increased numbers of birds on the 30th when 59 birds were banded and we encountered the first Least Sandpiper and Rose-breasted Grosbeak of the spring. Birds likely took advantage of the favourable conditions after the prolonged April headwinds and a constant turnover of migrants occurred throughout the remainder of the week. On May 1st, a total of 110 birds were banded, which included 57 White-throated Sparrows and 14 Hermit Thrushes. Another pulse of migrants was detected on May 2nd when 94 birds were banded, which included 51 White-throated Sparrow, 5 Myrtle Warbler and a smattering of other lingering early spring species. May 3rd was more of the same except for a major influx of White-crowned Sparrow and the first sightings of Veery and Northern Waterthrush this spring. Several new arrivals were noted on the 4th of May including, Least Flycatcher, Ovenbird and the first **Clay-coloured Sparrow** for TTPBRS.

May 6-12

The 7-day period began on a high note on May 6 with the spring arrival of many warbler species including Blackburnian, Chestnut-sided, Cape May, and Northern Parula, among others. A total of 91 birds were banded that day with only about half of our nets running due to high winds. Myrtle Warbler and White-throated Sparrow were the primary species encountered on both the surveys and in the nets. Calm conditions that evening gave these birds an opportunity to leave as far fewer warblers were around on the 7th and for the rest of the week. It was a little more active on the 8th of May, 66 birds were banded and season firsts of Swainson's Thrush, Ruby-throated Hummingbird, and Great Crested Flycatcher were recorded. Relatively few migrants were found on the 9th as birds had ample opportunity to pass over us with the warm and calm conditions. Singles of **Hooded Warbler**, **Blue-winged Warbler** and **Brewster's Warbler** were banded. Warblers were notable in their absence on the 10th as 32 birds were banded which consisted of a small influx of Least Flycatcher and Wood Thrush amongst the sparrows. The first ever record of **Virginia Rail** for TTPBRS occurred on this day. The final day of the update period featured decent tallies of Least Flycatcher (6 banded), White-throated Sparrow, and Magnolia Warbler, but low species diversity overall as only 8 species of warbler were found. The second record of **Clay-coloured Sparrow** for TTPBRS occurred on this day when a singing bird was heard and observed in the dogwood patch near the parking lot.

May 13-19

Weather during the week was dominated by high winds from the east, north, and west and a fair bit of rain resulting in fewer birds than "normal" for the period. On May 13 Toronto and Region Conservation celebrated the International Migratory Bird Day in conjunction with the annual "Bring Back the Birds Festival." Heavy winds on the 14th resulted in only 1.5 hours of banding, although small pockets of birds were observed, which included a Bay-breasted Warbler and an unforgettable sighting of recently hatched American Woodcocks performing a synchronized display. High winds again on the 15th limited bird migration. Warblers were much in evidence on the 16th as high totals were drawn for Tennessee, Nashville, Magnolia, Black-throated Green, and Blackburnian. The first record of **Grasshopper Sparrow** at TTPBRS was observed near the junipers on the north trail. A total of 63 birds were banded on the 17th, which included a good selection of warbler species and an increase in numbers of Veery, Swainson's Thrush and Lincoln's Sparrow (13 Lincoln's banded). The day also featured yet another **Clay-colored Sparrow**. Rain moved in mid-morning on the 18th, which abbreviated a productive morning of fieldwork that yielded a **Lesser Black-backed Gull** (1st for TTPBRS) and an influx of shorebirds, mainly Semipalmated Plover, Ruddy Turnstone, and Dunlin. The high winds and rain finally relented on the 19th, which led to a full morning of banding and surveys and a total of 60 birds banded and 76 total species detected. Of note on this day were the first banding records of **Dunlin** and **Least Sandpiper** for TTPBRS.

May 20-26

The week began with high winds and rain on the 20th and 21st which limited our coverage to a few meager net hours and the daily census. Despite the inclement conditions, a very high diversity of species was detected during census on the 21st as 54 species were observed, which included the second record of **Northern Mockingbird** for TTPBRS. May 22nd featured a sharp rise in abundance of birds as 98 were banded and our first spring record of **Olive-sided Flycatcher** was recorded. Warblers were seemingly everywhere, especially Myrtle, Magnolia, and **Cape May Warbler**. A remarkable 13 Cape Mays were banded and 22 were detected. May 23rd was also quite active as 70 birds were banded and 76 species were detected. A total of 9 Cape May Warblers were banded on this day and 28 were recorded in total. Shorebirds were numerous during this period with significant tallies of Dunlin, Least Sandpiper, Short-billed Dowitcher, and Semipalmated Plover. May 25th featured another influx of migrants as 116 birds were banded and 81 species were recorded. Dominant species on the day were Least Flycatcher, Swainson's Thrush, Red-eyed Vireo, Magnolia Warbler, and American Redstart. Birds were less numerous on the 25th, however we did capture and band the first Gray-cheeked Thrush of the spring.

May 27-June 2

On May 27th, the first Yellow-bellied Flycatcher of the season was recorded along with an unusual TTPBRS sighting of an **American Bittern**. A shift to south winds on the 28th brought in more birds to Tommy Thompson Park as 92 birds were banded, which included high numbers of Swainson's and Gray-cheeked Thrush, Gray Catbird, and Red-eyed Vireo. A total of 40 Red-eyed Vireos were tallied on the day along with 18 American Redstarts and a record high 14 Mourning Warblers. The second record of **Green Heron** for TTPBRS was also detected on this day. Overnight migration was heavy on the night of May 28/29, which led to the banding of 85 birds on the 29th. Eastern Wood-Pewee (2 banded), Yellow-bellied Flycatcher (8 banded) and Traill's Flycatcher (50 observed) were well represented along with another high count of Red-eyed Vireos. A total of 92 birds were banded and 6 recaptured on the 30th of May, which included 12 Gray-cheeked Thrush, 27 Swainson's Thrush and the first Yellow-billed Cuckoo since 2004. The weather pattern of high temperatures and heavy fog continued on the 31st when TTPBRS staff encountered another decent passage of late spring migrants.

June 3-9



Thursday, June 8th was our last day of coverage for spring 2006, providing closure to a week that was typically quiet for the time of year. Banding totals reached a low of 8 on June 4 and a high of 28 on June 7th. Migrant species were captured on a daily basis, the most notable of which were Gray-cheeked Thrush, Swainson's Thrush, and Yellow-bellied Flycatcher. June 3rd featured a small trickle of passing warblers including Blackburnian, Blackpoll,

Northern Waterthrush, and Wilson's Warbler. On June 5th, a good selection of flycatcher species were evident along with another **Blue-winged Warbler**. Most of the birds banded on June 6 and 7 were captured on the first two net rounds and were almost entirely late migrant thrushes. Of note on the 7th was the banding of 4 Ovenbird, 1 Canada Warbler, and the discovery of a Great-horned Owl near nets 10 -11. Great-horned Owl is often heard and only sometimes seen during our Northern Saw-whet Owl Monitoring Program in late fall but the bird on June 7 was one of just a few ever encountered during the day at TTPBRS.

Overview of Spring Coverage and Results

Coverage in spring 2006 was good as 64 of 70 target days received at least some coverage. This is a little below the coverage level set in 2005 (67/70) and 2004 (69/70). After each field day at TTPBRS, a coverage code is assigned based on completeness of all surveys. The optimal coverage code of 7 indicates that there were 90 total net hours, a completed census and 3 completed point counts. This spring, 37 days were coded with a 7 compared to 50 days in 2005 and 37 in 2004. In terms of net hours, 4,687 hours were logged which is 74% of the target, down from 87% in 2005 and 84% in 2004. Weather is responsible for most of the lost hours as we experienced more wet and windy weather than in previous years.

During spring 2006, 2,570 birds were banded, 470 recaptured and an additional 54 birds were released unbanded. A total of 179 species were recorded for the season, which is the highest spring species total recorded from all years. Spring 2006 eclipsed previous spring seasons in terms of total birds banded, banding rate, and total species observed. Refer to Table 1 for a summary of spring 2006 coverage and results compared to previous years.

Table 1. Coverage Statistics and Results Summary

Unit	2006	2005	2004
Days with at least some coverage	64	67	69
Days with full coverage (Code 7)	37	50	37
Total Species Detected	179	173	161
Birds Banded	2570	2547	2519
Birds Recaptured	470	468	604
Captured Unbanded	54	78	236
Total Captures	3094	3093	3359
Net Hours	4687.25	5492	5317
Birds banded/net hour	.54	.46	.47

Banding Summary and Discussion

This past season was just our third “complete” season of migration monitoring during spring because 2003 was a pilot year with coverage not beginning until early May. The three full spring seasons at TTPBRS since 2003 have all been very different and yet very similar. The similarities are apparent in the final banding totals, which range from a low of 2,519 in 2004 to a high of 2,570 in 2006, the difference being only 51 birds. The total number of birds banded in any given season is not particularly relevant as a means of measuring the quality of our efforts. What is important is that our efforts are consistent and that our sampling methods are rigorous.

Weekly capture statistics for all spring seasons (Table 2) are beginning to show a pattern of low volume migration during the month of April. We have not encountered many busy days during the month, which is likely due to a lack of warm fronts since we started in 2004. Weekly banding totals in 2006 are consistent with other years with a low rate of capture (birds banded/net hour) until the warm fronts of May arrive.

Table 2. Weekly Capture Statistics

Week	Banded 2004	Rate	Banded 2005	Rate	Banded 2006	Rate
April 1-7	42	.09	252	.65	71	.24
April 8-14	67	.12	283	.47	199	.48
April 15-21	161	.30	138	.23	200	.34
April 22-28	153	.28	71	.21	167	.46
April 29-May 5	249	.49	133	.25	487	.78
May 6-12	663	1.15	418	.66	332	.67
May 13-19	265	.44	410	.65	244	.51
May 20-26	575	1.03	281	.46	347	.97
May 27-June 2	267	.52	446	.75	409	.69
June 3-8	77	.14	115	.19	114	.23
April 1-June 8	2519	.47	2547	.46	2570	.54

A total of 2,576 birds of 87 species and forms were banded this spring, which are the highest totals of any spring season at TTPBRS. Banding totals for each species are presented in appendix A. Five species and forms were banded at TTPBRS for the first time, which include, Hooded Warbler, Dunlin, Least Sandpiper, Brewster’s Warbler, and “Yellow” Palm Warbler. With these additions the TTPBRS species banded list now stands at 108. There were six shorebirds captured in a ground trap on the east point, which are considered non-standard bandings. Therefore the season total from standard capture parameters is 2,570.

While a record high number of birds were banded in spring 2006, the season as a whole was typical for most species. White-throated Sparrow was again the most abundant species found in the nets, while Myrtle Warbler, Magnolia Warbler, Swainson’s Thrush, and Hermit Thrush again appeared in the top ten species banded list (Table 3). A record high number of both Ruby-crowned Kinglet and Red-winged Blackbird were banded this spring. It is interesting to note that five of the top ten species banded for the entire spring are April migrants given that only 27% of birds this spring were banded in April. This is a reflection of abundant populations of a few key species that come through the Great Lakes in March, April, and October.

Table 3. Top Ten Species Banded, 2004-2006

2006 Rank	Species	2006 Banded	2005 rank	2004 rank
1	White-throated Sparrow	363	2	1
2	Myrtle Warbler	165	4	2
3	Swainson's Thrush	158	3	5
4	Hermit Thrush	127	6	10
5	Golden-crowned Kinglet	116	1	-
6	Ruby-crowned Kinglet	103	-	-
7	Red-winged Blackbird	91	-	-
8	Brown Creeper	85	7	-
9	Magnolia Warbler	78	5	3
10	Gray Catbird	68	-	-

An incredible twenty-five Cape May Warblers were banded this spring, which is much higher than previous years. On May 22nd a remarkable 13 Cape Mays were banded and 22 detected. The previous high cumulative total for an entire spring season was 10 in 2005 (5 in 2004)! An estimated 83% of the world population of this species nests in Canada's boreal forest and the species has been declining since the 1970s due to waning densities of the spruce budworm. Most of the records in spring 2006 occurred between May 22 and May 25 and could represent an isolated "fallout". However, a record number of Cape May Warblers were encountered last fall at TTPBRS and hopefully this is the beginning of an upward trend for this colourful species that has been on the decline for many years.

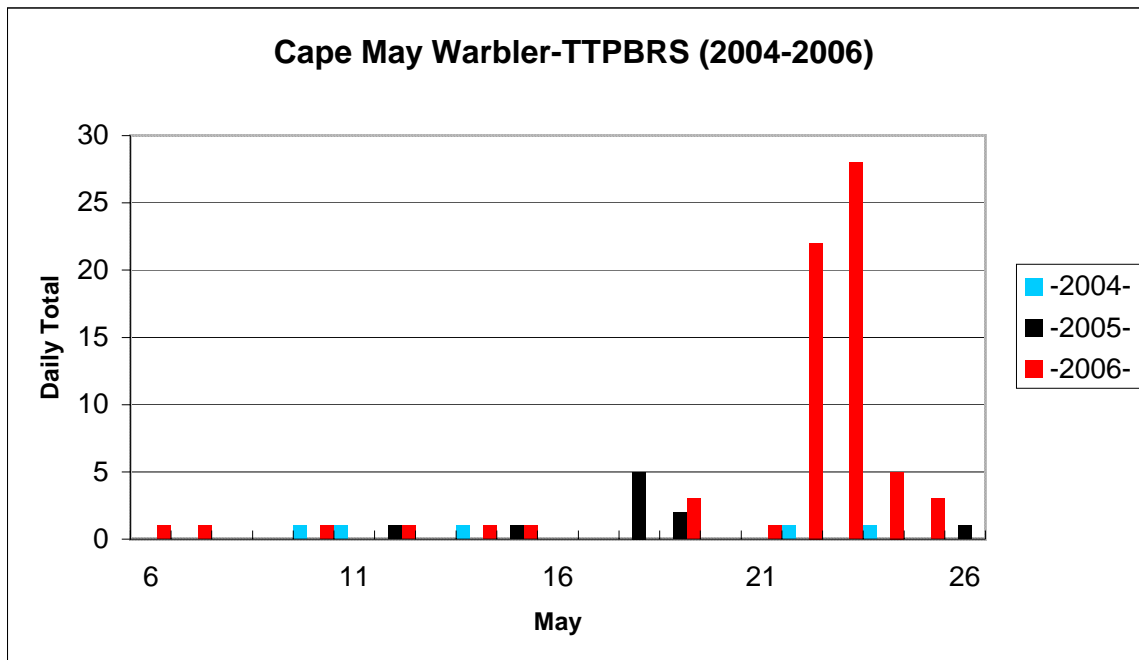


Figure 1. Cape May Warbler, 2004-2006 (figures are non-standard total)

Cape May Warbler was a standout in what was an average to low season for most warbler species at TTPBRS. Several species showed significant decreases over previous season banding totals. Refer to Table 4 for a list of select species showing marked increase or decrease in 2006.

Table 4. Selected species showing marked decrease/increase in 2006

Increase				Decrease			
Species	2006	2005	2004	Species	2006	2005	2004
Cape May Warbler	25	2	1	Black-throat. Blue Warbler	14	22	33
Hermit Thrush	127	94	65	Brown Thrasher	1	15	26
Red-winged Blackbird	91	51	50	Canada Warbler	9	15	25
Ruby-crowned Kinglet	103	59	61	Chestnut-sided Warbler	23	41	47
White-throated Sparrow	363	206	264	Common Yellowthroat	41	80	68
				Magnolia Warbler	78	104	164
				Northern Waterthrush	5	23	14

Recaptures

A total of 469 birds were recaptured this spring, all of which were originally banded at TTPBRS. A complete list of recapture totals by species is presented in Table 5.

Table 5. Spring 2006 Recapture Totals

species	recap	species	recap
Hairy Woodpecker	2	Yellow Warbler	69
Downy Woodpecker	3	Black-throated Blue Warbler	3
Eastern Phoebe	1	Myrtle Warbler	13
Traill's Flycatcher	9	Magnolia Warbler	6
Least Flycatcher	1	Chestnut-sided Warbler	1
European Starling	1	Blackpoll Warbler	1
Brown-headed Cowbird	9	Western Palm Warbler	3
Red-winged Blackbird	5	Ovenbird	1
Baltimore Oriole	9	Mourning Warbler	3
American Goldfinch	12	Common Yellowthroat	7
Eastern White-crowned Sparrow	2	Wilson's Warbler	1
White-throated Sparrow	46	Canada Warbler	1
American Tree Sparrow	6	American Redstart	6
Slate-colored Junco	7	Gray Catbird	18
Song Sparrow	29	Brown Thrasher	1
Lincoln's Sparrow	2	Brown Creeper	15
Swamp Sparrow	15	Black-capped Chickadee	10
Fox Sparrow	6	Golden-crowned Kinglet	38
Northern Cardinal	4	Ruby-crowned Kinglet	23
Tree Swallow	6	Veery	3
Northern Rough-winged Swallow	1	Gray-cheeked Thrush	2
Warbling Vireo	12	Hermit Thrush	43
Black-and-White Warbler	2	American Robin	6
Nashville Warbler	3		
Cape May Warbler	2	Total	469

Over 3,500 recapture records have been accumulated from the TTPBRS migration monitoring program, which represents a veritable goldmine for data analysis. One of "our" resident Yellow Warblers was originally banded on May 20, 2003 as an adult male and has since been recaptured twenty-one times (Table 6). This bird has traveled back and forth between Toronto and Latin America at least ten times which encompasses a distance of at least 30,000 kilometres! Each day during migration a warbler will typically consume 1.2 - 1.7 times their body weight in insects to sustain their taxing journeys (Graber 1983). The Yellow Warbler ranges in weight from 8-13g, which means that for a migration lasting 25 days, roughly 500g of insects are consumed by each individual warbler! Bird Migration remains one of the great mysteries of the natural world and the ability of this bird to travel 3,000km twice per year back and forth to an area no larger than a handful of acres is a vivid demonstration of this point.

Table 6. Banding history of a Yellow Warbler at TTPBRS

band number	age	sex	wing	weight	fat	dd	mm	yy	bander	net #
2210-25811	1	4	60	9.4	0	20	5	2003	PV	6
"	1	4	60	9.3	T	22	5	2003	PV	4
"	6	4	61	9.6	0	25	5	2003	PNP	3
"	5	4	60	9.6	0	1	6	2003	PV	15
"	1	4	60	9.5	0	3	6	2003	PV	2
"	1	4	62	9.4	0	13	8	2003	DGD	8
"	6	4	61	9.8	0	16	5	2004	DGD	8
"	6	4	62	9.8	0	18	5	2004	SNL	8
"	6	4	62	10	T	25	5	2004	DGD	8
"	6	4	61	9.7	0	26	5	2004	DGD	13
"	6	4	62	9.9	0	1	6	2004	SNL	6
"	6	4	62	10.2	0	6	6	2004	SNL	9
"	6	4	61	9.8	T	11	5	2004	DGD	12
"	6	4	63	10.8	3	9	5	2005	DGD	7
"	6	4	63	9.8	0	16	5	2005	SNL	9
"	6	4	63	10	0	17	5	2005	SNL	12
"	6	4	62	9.5	0	28	5	2005	DGD	7
"	6	4	63	10.1	0	7	6	2005	KM	4
"	6	4	63	9.8	0	15	5	2006	DGD	8
"	6	4	63	9.8	0	24	5	2006	DGD	12
"	6	4	62	9.8	0	30	5	2006	DGD	9
"	6	4	62	9.8	0	1	6	2006	SNL	8

The recapture database from TTPBRS will continue to grow and function as a monitoring tool for the understanding of migratory stopover values and energetics in the Greater Toronto Area. We still have many questions to answer about the positives and negatives of stopover habitats in general and in particular urban environments along migratory corridors.

Table 7. Notable Recaptures

Band number	Species	Date Banded	Date Recaptured
1212-61116	Hairy Woodpecker	November 11-2005	April 15-2006
1551-44619	Tree Swallow	April 25-2003	April 20-2006
2290-06863	American Tree Sparrow	October 28-2003	April 1-2006



Unusual Sightings

Below are a few of the interesting sightings at the bird research station this spring. There were a total of 6 additions to the official TTPBRS checklist. These new species bring the checklist to a total of 223 species.

Sandhill Crane- (2nd TTPBRS record) A single flyover on April 9 (DGD et.al.)

Forster's Tern- (1st TTPBRS record) Four sightings of what is likely the same individual between April 18 and May 7 (WTF et.al.)

Red-throated Loon- (2nd TTPBRS record) A single bird observed from the north beach (CJD)

“Yellow” Palm Warbler- (2nd TTPBRS record) First banding record of this subspecies on April 24

Clay-colored Sparrow- (1st TTPBRS record) A remarkable season for this species with three sightings from May 4-12 (DGD et.al.)

Red Bat- (1st TTPBRS record) First record of this bat species was captured on May 4

Hooded Warbler- (3rd TTPBRS record) First banding record of the species was of a male on May 9

Brewster's Warbler- (1st TTPBRS record) A single male banded on May 9

Blue-winged Warbler- First of three records this spring was a banded female on May 9

Virginia Rail- (1st TTPBRS record) A single individual observed throughout the morning of May 10 near net 9 (PV)

Grasshopper Sparrow- (1st TTPBRS record) Long overdue, the first of this species was observed and heard on the north shore on May 16 (DGD et.al.)

Lesser Black-backed Gull- (1st TTPBRS record) A single individual observed on the east point on May 18 (DGD)

Northern Mockingbird- (2nd TTPBRS record) Unusual at TTPBRS, this individual was recorded during a windy census on May 21 (DGD)

Olive-sided Flycatcher- A single individual on May 22nd was our first spring record of this species (DGD et.al.)

American Bittern- Single individual on May 27th (mob)

Green Heron- (2nd TTPBRS record) A single bird observed at the tip on May 28 (SG)

Yellow-billed Cuckoo- The first of this species since spring 2004 was recorded on May 30

Great-horned Owl- First record of this species during standard count period on June 7 (AJ et.al.)

Key to Observers

DGD	Dan Derbyshire	PV	Paolo Viola
WTF	Tom Flinn	SG	Steve Gillis
CJD	Chris Dunn	AJ	Andrew Jano
MOB	Many Observers		

Personnel

A total of 25 volunteers contributed 1,682 hours to the spring migration monitoring program at TTPBRS! Many of these volunteers put in extra hours toward data management and fundraisers. Thanks are due to all of our volunteers for their help this past spring!

Table 8. Volunteer Effort

Name	Hours	Name	Hours
Andrew Jano	196	Tom Flinn	46.3
Larry Menard	182	Chris Dunn	45.5
Don Johnston	168	Dave Langford	44.5
Ian Sturdee	148	Steve Gillis	40
Seabrooke Leckie	139	Chris Sawa	31.5
Bert Vanderzon	111	Kerry McGuire	20.5
Teresa Carlin	79.5	Paolo Viola	17
Rick Miller	70.5	John Maybury	13
Pierre Robillard	68	Mitch Meredith	11
Julia Marko	60.5	Melissa Rose	7
Attila Fust	60	Andrew McDonald	7
Norma Vanderzon	57.5	Lori Nichols	3
Jan McDonald	56	total	1682

Average Capture Time



Below are a series of tables and figures examining the average time of capture at TTPBRS in fall 2005 and spring 2006. Quite simply we wanted to know when birds come through in the highest density to improve our understanding of migration dynamics on the Toronto lakeshore. In order to provide appropriate

stopover conditions for migratory birds we need to first understand when and where birds arrive in Toronto. A “fallout” is a term often used by birders to describe a day with a sudden and marked increase in numbers and variety of birds. This occurs when birds encounter overnight foul weather and are forced to abandon their flight for the nearest point of land with suitable habitat. The result is a rapid swelling of bird numbers in a relatively small area.

Anyone who has completed a census at TTPBRS will know that the walk back from the end of the route is often noticeably busier than during the actual census despite the fact that the area covered is the same. When migrants are abundant and moving diurnally, the orientation is almost always southwest, from the base of the peninsula toward the tip, regardless of season. This pattern suggests that a general outflow of migrants from the mainland rather than a “fallout” is more typical at Tommy Thompson Park. Banding results from fall 2005 and spring 2006 were examined to assess temporal distribution and abundance of migrants at TTPBRS.

Each field day at TTPBRS begins a half hour before sunrise and continues for six hours. Analysis of mean capture time indicates that migrants are most abundant at TTPBRS around the third hour of the six-hour period. Average time of capture was 3 hours and 2 minutes after net opening in spring 2006 and 2 hours and 54 minutes in fall 2005. A summary of statistics for spring 2006 and fall 2005 is found in Table 9.

Table 9. Summary of Mean Capture Time in Spring and Fall at TTPBRS

Criteria	Spring	Fall
average net opening	532am	639am
average capture time	834am	935am
average time after net opening	3:02:00	2:54:00

Analysis of mean capture time by month reveals very little variation in average capture time, ranging from a low of 2 hours, 41 minutes in August to a high of 3 hours and 2 minutes in May.

Table 10. Average Capture Time by Month

Month	Ave. Capture time	Elapsed time
Aug	841am	2:41
Sept	925am	2:56
Oct	954am	2:58
Nov	912am	2:44
April	859am	2:59
May	826am	3:02
June	803am	2:56

In order to determine the existence of more specific variables that contradict this “average”, mean capture time was examined for days with exceptionally high capture volume and for different species. Six days (3 from fall 2005 and 3 from spring 2006) that normally would be referred to as “fallout” days were examined and found to be consistent with season averages (see Table 11).

Table 11. Average Capture Time for Select Dates

Date	Ave. Capture Time	Ave. Net Opening	Elapsed time
May 1-2006	845am	540am	3:05
May 22-2006	756am	516am	2:40
May 24-2006	812am	514am	2:58
Sept 9-2005	920am	620am	3:00
Sept 24-2005	924am	637am	2:47
Oct 8-2005	944am	653am	2:51

Variability in mean capture time by species is also low with the exception of Gray-cheeked Thrush, a known crepuscular species (Table 12).

Table 12. Average Capture Time for Select Species During Spring 2006 (average net opening is an average of net opening times for the species migration period)

Species	Ave. Capture Time	Ave. Net Opening	Elapsed time
Gray-cheeked Thrush	642am	509am	1:33
Brown Creeper	922am	602am	3:20
Yellow-bellied Flycatcher	741am	509am	2:32
Golden-crowned Kinglet	912am	602am	3:10
Magnolia Warbler	829am	517am	3:12

Results of mean capture time analysis at TTPBRS are very consistent and indicate that the highest level of bird activity occurs around mid-morning or three hours after nets are opened. This result would indicate that birds typically arrive at TTPBRS post-sunrise rather than pre-sunrise.

This could, however, reflect that migrant density is distributed evenly throughout the morning. Therefore, the analysis must assess capture time by specific time periods. Figures 2 and 3 demonstrate something distinct from mean capture results. In both spring and fall, migrants reach highest density within the first 1.5 hours, followed by a downward trend at mid-morning and finally by an interesting increase in late morning. We have to consider that the trendline for total captures in these figures are heavily weighted to the “busy” months of May and October in each season and therefore it is important to consider each month individually.

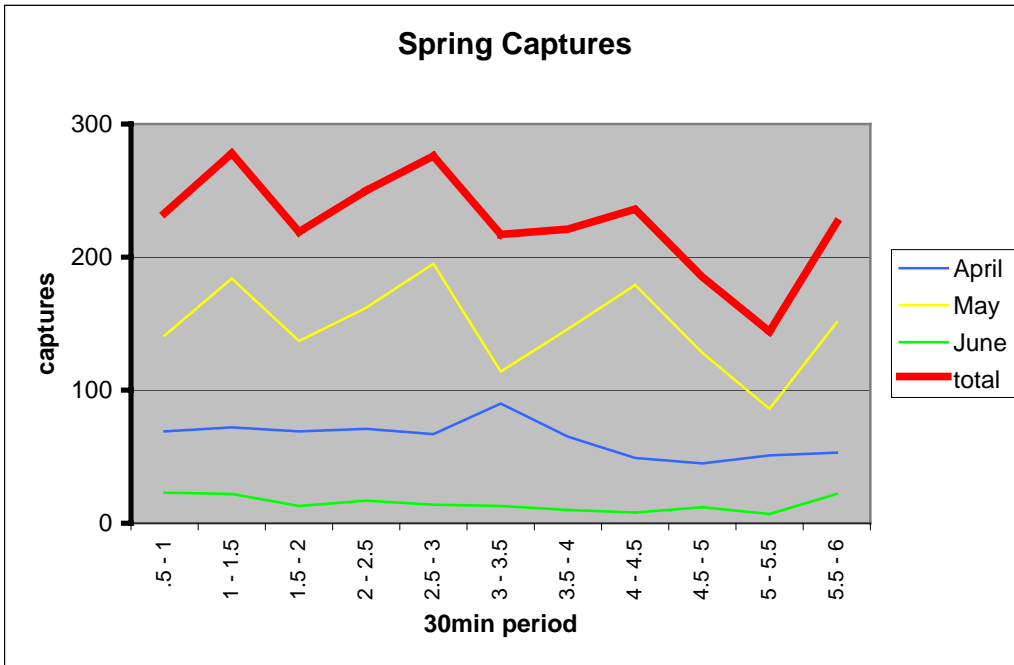


Figure 2. Spring Capture Time by Half-hour Blocks

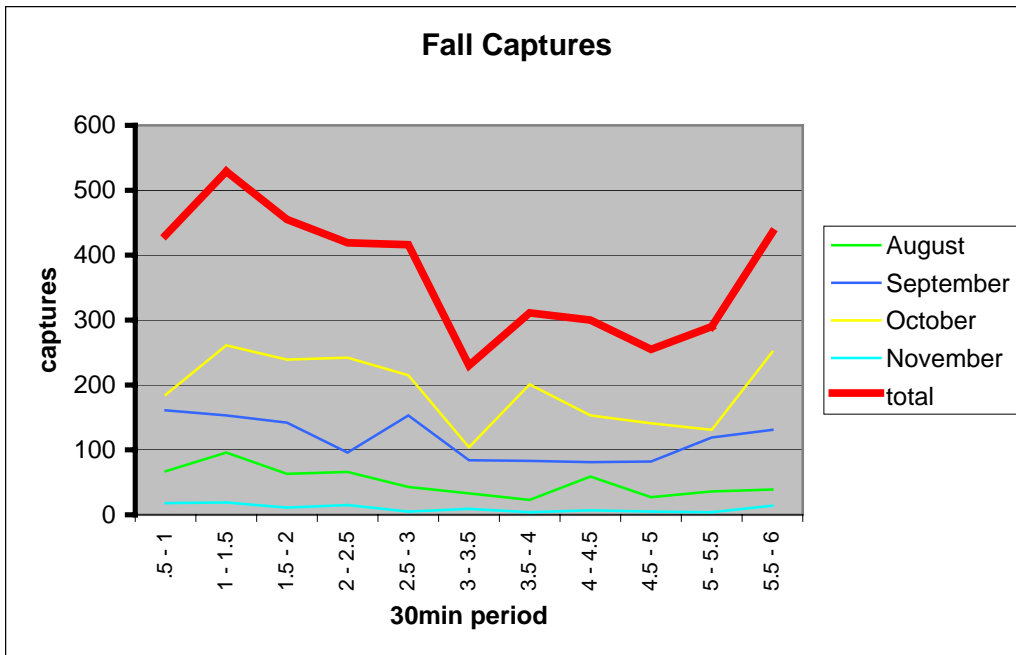


Figure 3. Fall Capture Time by Half-hour Blocks.

Analysis of daily capture time trends for specific “fallout days” indicate something slightly different. Capture time is low during the first hour, followed by a sharp increase through mid-morning, a downward trend through the fourth hour, and finally an upswing at the end of the period.

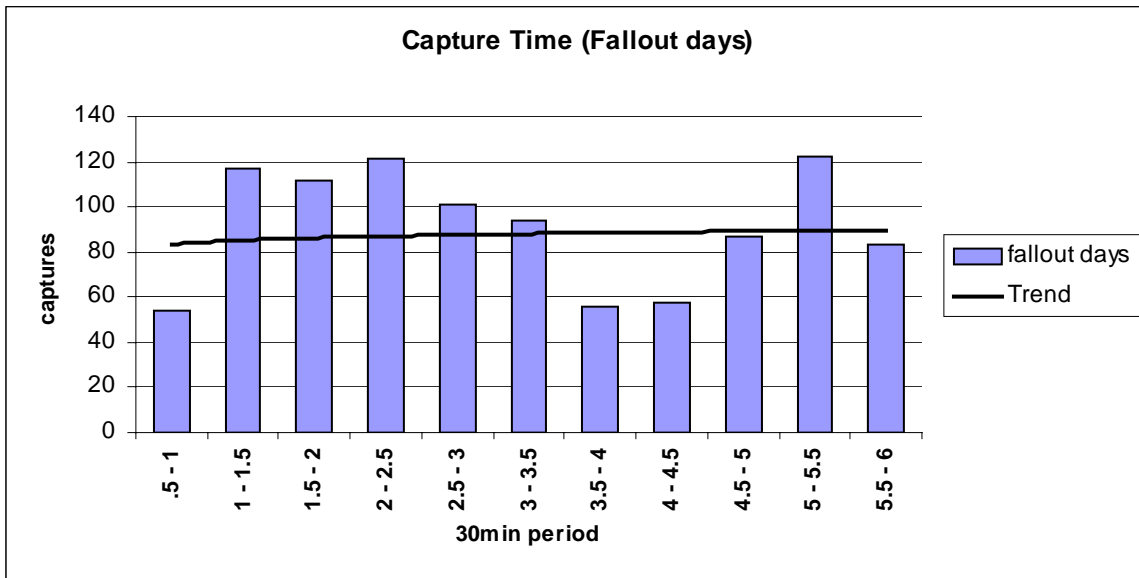


Figure 4. Capture Time for Select Dates

The mode of capture for fall, and specific dates show a pattern of high captures in the first half of the daily banding period, low captures during a mid-period and a late surge of migrants at the end. Based on a high percentage of captures during the early part of the banding period, we cannot rule out the existence of fallout events at Tommy Thompson Park. The high capture rate towards the end of the banding period is unusual and is suggestive of diurnal movement from other areas, presumably the mainland.

The analysis presented here was successful in describing temporal characteristics of bird migration in both spring and fall at Tommy Thompson Park. It is expected that “fallout” events occur occasionally at Tommy Thompson Park but that the majority of birds sampled at the research station have dispersed from mainland areas. The bright lights of the city must have an effect on nocturnally migrating birds, magnetizing them to greenspaces within the city core, and thereby limiting pre-sunrise arrival on lakeshore peninsulas and islands.

Deriving further meaning from this analysis would be subjective as a significant number of variables are involved and are difficult to assess with current data available. A research project focused around nocturnal radar and acoustics would be instrumental in providing insight into migration dynamics in the Toronto area. We also have much to learn about diurnal orientation and movement of migrants post-arrival. A better understanding of these phenomena will be paramount to any land management practices affecting migratory birds in the city.

Collaborative Research Projects

TTPBRS collaborated with Dr. Nicolas Ogden once again for his project on the dispersal of ticks by migratory birds. This project is examining range expansion of the Black-legged Tick due to climate change. Tick samples taken from birds at TTPBRS and other similar stations across Canada will help greatly with this important study. A total of 603 birds were scanned and over 30 ticks were found and sent to Winnipeg for analysis.

TTPBRS also entered into a new collaborative project with PhD candidate Simone Immler of the University of Sheffield in the UK. This project examining the evolution of sperm morphology in passerine birds involves the collection of sperm samples from new world warbler species. TTPBRS staff and volunteers submitted several samples from new world warbler species to this research endeavour.

Education and Events

Banding demonstrations and interpretive talks were given to 787 people at TTPBRS in spring 2006 which is a significant jump from 389 in 2005. This figure includes park visitors, students and special groups. The Winged Migration program for schools was in full swing this season as groups of 20-30



students from grades 4-7 participated in the program on a daily basis from mid-April-mid May. The program is delivered through the Investigating the Living City Spaces program of Toronto and Region Conservation. Thanks to Dan Stuckey, Paul Barrie and Nicolas Tredille for their excellent work this spring.

This spring was a busy time indeed as both the TTPBRS newsletter and the TTPBRS Baillie Birdathon were launched! The first issue of the full colour newsletter was well received and will be sent out on a tri-annual basis (spring, summer/fall, winter). The newsletter features reports and articles related to ornithology, education, the environment and of course the latest updates from the research station at Tommy Thompson Park.

A volunteer committee met in March to discuss fundraising strategies for the Baillie Birdathon. The Baillie Birdathon is a long-standing fundraiser administered by Bird Studies Canada that raises funds for critical projects related to bird conservation. Migration Monitoring stations such as TTPBRS have a unique opportunity to raise funds for their own operations through the program. To summarize, the TTPBRS birdathon in year 1 was a great success as 15 birders participated! The total amount raised has not yet been released by Bird Studies Canada but I will say that all of the birdathoners performed a tremendous service to the operation of TTPBRS!

2006 Birdathon Participants

*Andrew Jano	Nicolas Tredille
Anne McConnell	*Norma Vanderzon
*Bert Vanderzon	Pierre Robillard
*Dan Derbyshire	Rick Miller
Dan Stuckey	*Seabrooke Leckie
*Don Johnston	Steve Gillis
Jan McDonald	*Teresa Carlin
Julia Marko	

*denotes fundraising committee members

Acknowledgements

On behalf of Toronto and Region Conservation (TRCA), I would like to extend a sincere thanks to the following for their support this past spring!

- Tamara Chipperfield was a major asset to the development of TTPBRS since 2003 and we wish her well in her future endeavours.
- Thanks as always to the 25 Volunteer Field Assistants who lent their skilled hands to the fieldwork this spring and summer.
- Jon McCracken of Bird Studies Canada provided advice and assistance with our fundraising strategies and has helped greatly with our membership application to the Canadian Migration Monitoring Network.
- A terrific job by all of the 2006 TTPBRS Birdathon Participants who have certainly set the bar!
- Larry Menard entered almost all of the spring data and did a fantastic job!

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Appendices

Appendix A. Banding Totals, spring 2004-2006

Species	2006	2005	2004	Species	2006	2005	2004
American Goldfinch	44	43	54	Least Sandpiper	2		
American Redstart	47	48	50	Lincoln's Sparrow	47	40	27
American Robin	31	21	22	Magnolia Warbler	78	104	164
American Tree Sparrow	16	14	13	Mourning Warbler	15	13	13
American Woodcock	2	6	2	Myrtle Warbler	165	145	210
Baltimore Oriole	17	13	12	Nashville Warbler	34	49	55
Bay-breasted Warbler	3	4	8	Northern Cardinal	5	4	2
Black-and-White Warbler	13	21	19	Northern Parula	2		2
Blackburnian Warbler	8	9	13	Northern Rough-wing. Swallow	2		2
Black-capped Chickadee	5	5	3	Northern Waterthrush	5	23	14
Blackpoll Warbler	18	11	29	Orange-crowned Warbler	3	2	5
Black-throated Blue Warbler	14	22	33	Ovenbird	27	49	28
Black-throat. Green Warbler	15	9	36	Philadelphia Vireo	2	3	14
Blue Jay	3	1	4	Pine Warbler	1		3
Blue-gray Gnatcatcher	1	1	1	Purple Finch		1	1
Blue-headed Vireo	2	4	4	Red-breasted Nuthatch	3		1
Blue-winged Warbler	3	3	4	Red-eyed Vireo	14	3	60
Brewster's Warbler	1			Red-winged Blackbird	91	51	50
Brown Creeper	85	84	23	Rose-breasted Grosbeak	10	13	4
Brown Thrasher	1	15	26	Ruby-crowned Kinglet	103	59	61
Brown-headed Cowbird	25	13	20	Rusty Blackbird		3	1
Canada Warbler	9	15	25	Savannah Sparrow	2	2	
Cape May Warbler	25	2	1	Scarlet Tanager	1	3	6
Cedar Waxwing	4		1	Slate-colored Junco	54	67	47
Chestnut-sided Warbler	23	41	47	Song Sparrow	65	78	65
Chipping Sparrow	1	5	5	Spotted Sandpiper			1
Common Grackle	13	23	6	Swainson's Thrush	158	175	99
Common Yellowthroat	41	80	68	Swamp Sparrow	68	48	70
Downy Woodpecker	4	1		Tennessee Warbler	1	2	2
Dunlin	4			Trail's Flycatcher	54	43	115
Eastern Kingbird	3	2	2	Tree Swallow	15	14	3
Eastern Phoebe	11	10	5	Veery	36	47	30
Eastern Towhee	4	3	3	Warbling Vireo	4	9	9
Eastern White-crown. Sparrow	29	24	22	Western Palm Warbler	24	28	53
Eastern Wood-Pewee	5	4	5	White-breasted Nuthatch			2
European Starling	5	1	5	White-throated Sparrow	363	206	264
Field Sparrow	6	12	3	Wilson's Warbler	26	37	46
Fox Sparrow	22	21	10	Winter Wren	18	20	20
Golden-crowned Kinglet	116	281	27	Wood Thrush	9	17	5
Golden-winged Warbler		1	4	Yellow Palm Warbler	1		
Gray Catbird	68	43	51	Yellow Warbler	56	65	82
Gray-cheeked Thrush	50	42	27	Yellow-bellied Flycatcher	29	22	35
Great Crested Flycatcher	2	3	3	Yellow-bellied Sapsucker		3	1
Hairy Woodpecker	1		1	Yellow-billed Cuckoo	1		1
Hermit Thrush	127	94	65	Yellow-shafted Flicker	4	9	6
Hooded Warbler	1			Total Banded	2576	2547	2519
House Wren	7	8	6	Species	88	81	87
Indigo Bunting	2	1	3				
Least Flycatcher	41	26	69				

*Species in bold indicate new banding records for TTPBRS

Appendix B. Daily Totals

date	pks	Band	recap	Cap	census	PC1	PC2	PC3	ST	nsband	nsrec	Casual	NST	tot_specie
01-Apr-06	2	16	2	0	273	19	10	4	319	0	0	348	525	34
02-Apr-06	2	9	2	0	239	20	12	9	283	0	0	316	469	38
05-Apr-06	0	0	0	0	153	0	0	0	153	0	0	601	696	34
06-Apr-06	2	39	2	0	181	20	23	15	250	0	0	576	738	44
07-Apr-06	1	7	1	0	229	0	0	0	237	0	0	2	238	22
08-Apr-06	0	0	0	0	308	0	0	0	308	0	0	0	308	27
09-Apr-06	4	38	4	0	368	12	12	27	448	0	0	244	601	37
10-Apr-06	11	25	11	1	227	10	9	22	288	0	0	536	671	48
11-Apr-06	5	44	5	0	319	26	13	26	402	0	0	688	934	55
12-Apr-06	8	46	8	1	710	77	0	0	830	0	0	485	1102	53
13-Apr-06	20	41	20	3	300	24	21	17	399	0	0	492	722	51
14-Apr-06	2	5	2	0	0	0	0	0	7	0	0	41	48	15
15-Apr-06	13	27	13	1	429	16	22	23	498	0	0	515	769	54
16-Apr-06	13	20	13	0	305	18	22	36	373	0	0	287	555	48
17-Apr-06	7	17	7	0	388	42	20	20	477	0	0	375	663	48
18-Apr-06	3	14	3	0	196	20	25	20	260	0	0	513	687	62
19-Apr-06	4	26	4	1	248	22	19	24	321	0	0	416	572	51
20-Apr-06	3	46	3	1	235	31	29	30	337	0	0	474	703	47
21-Apr-06	3	50	3	0	143	24	12	18	230	0	0	274	445	46
24-Apr-06	12	77	12	2	307	22	19	17	433	0	0	343	682	46
25-Apr-06	4	12	4	3	182	0	0	0	197	0	0	0	197	29
26-Apr-06	14	14	14	0	243	19	22	13	297	0	0	249	468	42
27-Apr-06	9	41	9	1	174	27	29	22	274	0	0	356	549	49
28-Apr-06	11	23	11	0	125	18	16	29	200	0	0	326	468	41
29-Apr-06	5	22	5	0	192	18	15	23	255	0	0	305	466	49
30-Apr-06	6	59	6	0	182	18	20	9	269	0	0	346	521	49
01-May-06	9	110	9	11	162	19	38	28	305	0	0	470	655	48
02-May-06	12	94	12	3	253	37	36	29	422	0	0	558	770	66
03-May-06	18	80	18	6	245	31	31	42	378	0	0	424	617	61
04-May-06	10	78	10	1	185	36	26	34	349	0	0	400	660	63
05-May-06	14	44	14	0	179	13	8	5	249	0	0	359	518	59
06-May-06	9	91	9	1	269	49	29	42	459	0	0	347	721	63
07-May-06	22	49	22	0	137	23	25	16	239	0	0	125	330	52
08-May-06	13	66	13	0	128	15	41	41	268	0	0	243	441	63
09-May-06	5	29	5	2	172	22	30	22	251	0	0	155	366	58
10-May-06	0	32	0	0	173	28	32	23	252	0	0	238	418	63
12-May-06	14	65	14	0	91	27	8	23	203	0	0	293	437	63
13-May-06	13	23	13	1	157	25	24	24	228	0	0	162	319	49
14-May-06	1	2	1	0	121	0	0	0	124	0	0	98	202	49
15-May-06	9	27	9	0	110	21	26	17	183	0	0	158	278	54

date	pks	band	recap	cap	census	PC1	PC2	PC3	ST	nsband	nsrec	casual	NST	tot_specie
16-May-06	3	39	3	0	105	25	28	8	198	0	0	336	463	69
17-May-06	8	63	8	0	125	34	23	31	262	0	0	218	401	68
18-May-06	3	30	3	0	141	14	0	0	187	0	0	125	285	66
19-May-06	7	60	7	1	121	40	23	19	248	3	0	333	503	76
20-May-06	2	3	2	0	105	0	0	0	110	0	0	72	164	50
21-May-06	0	0	0	0	235	0	0	0	235	0	0	218	402	58
22-May-06	19	99	19	1	224	21	40	39	401	0	0	428	725	76
23-May-06	8	70	8	5	138	29	28	27	278	3	0	483	620	77
24-May-06	11	117	11	3	163	34	21	37	360	0	0	334	613	81
25-May-06	7	58	7	0	169	26	36	39	300	0	0	268	448	74
26-May-06	0	0	0	0	153	0	0	0	153	0	0	0	153	37
27-May-06	9	39	9	0	127	34	22	31	245	0	0	216	391	61
28-May-06	7	94	7	1	162	23	23	40	319	0	0	220	485	64
29-May-06	14	85	14	1	147	13	28	31	306	0	0	331	558	67
30-May-06	6	92	6	1	153	34	31	0	299	0	0	286	484	66
31-May-06	9	52	9	1	167	30	22	31	288	0	0	302	505	60
01-Jun-06	7	30	7	0	130	16	28	31	220	0	0	162	333	53
02-Jun-06	11	17	11	0	141	24	27	28	216	0	0	283	428	58
03-Jun-06	2	16	2	0	134	29	0	0	178	0	0	104	255	44
04-Jun-06	8	8	8	1	155	26	23	22	222	0	0	45	257	46
05-Jun-06	7	20	7	0	156	14	23	16	219	0	0	167	325	55
06-Jun-06	3	23	3	0	139	33	23	31	220	0	0	174	341	61
07-Jun-06	2	28	2	0	131	25	15	26	202	0	0	229	355	49
08-Jun-06	4	19	4	0	164	27	28	33	240	0	0	0	240	43
	470	2570	470	54	12623	1400	1216	1270	18161	6	0	18472	31263	