

EXECUTIVE SUMMARY

Migration monitoring remains one of the core programs of LSLBO. A total of 1928 birds of 55 species and forms was banded during the spring with a capture rate of 53.4 birds per 100 net-hours. Fall banding totals were higher with 2356 banded owing to the longer season but the capture rate was slightly lower at 49 birds per 100 net-hours. Fifty-two species and forms were banded in fall. During spring and fall migration seasons, 169 species were recorded at the station. Wood Duck, American Avocet, and Whimbrel were added to the LSLBO checklist, bringing the total of birds recorded in the area to 231.

Quality of coverage during migration monitoring was again excellent. The revised protocol from 2000 was again followed. There was a substantial increase in volunteer-days (92%) from 2000. This was largely due to two long-term volunteers contributing over 11 weeks of time to the field operations. The spring season had 57 days of coverage from Apr 16 - Jun 11 inclusive. The fall season was shortened somewhat from last year due to funding. There were 69 days of coverage between Jul 14 - Sep 22 inclusive with two days of coverage lost due to the absence of a suitable bander-in-charge.

The three MAPS stations operated by LSLBO received full coverage in 2001. A total of 256 birds of 28 species were captured on the MAPS sites with 196 banded 57 recaptured and 3 unbanded. The Residence MAPS site was again most productive with 139 captures, followed by Road Side (68) and Far Away (49). New species banded on the MAPS sites were Pileated Woodpecker, Brown Creeper, and Philadelphia Vireo. On July 21, 2001 at the ROAD MAPS station, LSLBO banded its 25,000th bird, a hatch-year Magnolia Warbler. Breeding status was determined for the 57 species recorded at the stations.

There were 319 retrap records from the 2001 Migration Monitoring and MAPS seasons involving 193 individuals. The vast majority of these were repeats (birds caught during the same season of banding). Seventy-six birds were captured in 2001 which had been banded in previous years, the majority of these were originally banded in 2000.

Educational aspects of Lesser Slave Lake Bird Observatory continue to grow. In 2001, nearly 900 visitors, including 14 organized tours, came to the observatory and many were given banding demonstrations. In late July, LSLBO co-hosted a bander training workshop with the Canadian Wildlife Service. There were 13 attendees from across western Canada and the United States. The aim of the workshop was to increase the level of skill in current sexing and ageing techniques through lectures, study skin examination and banding of live birds, as well as promoting dialogue between banders in the region. In conjunction with Northern Lakes College, LSLBO now offers a week-long intensive Assistant Bander Training course. The aim of the course is to provide knowledge and skills for safe and ethical handling of birds as well as an introduction to banding. A late mail out of the brochure resulted in a disappointing response in the course. A much better response is anticipated for 2002.

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MIGRATION MONITORING

Spring Migration Summary

Spring migration monitoring had its earliest start ever at LSLBO in 2001, beginning on April 16th and running through to June 11 for a total of 57 days of continuous coverage. It was a much warmer and drier spring than that of 2000. In fact, it was one of the driest springs on record in Alberta, creating ideal conditions for forest fires. Rains started in the last week of May, and fell almost everyday through to the first week of June. Below is a summary of the spring migration at LSLBO.

On arrival at the station April 16, we were greeted by resident Bald Eagles and Black-capped Chickadees and not too much else as only 8 bird species were noted for the day. A good indication that not much migration was underway in the area. Over the next few days there was a small passage of raptors of several species, Northern Harrier being most common with nearly 10 birds seen daily. Waterfowl numbers were also low but Mallard, Canada Geese and Tundra Swans were seen almost daily. Passerine activity was dominated by Snow Buntings and winter finches such as Evening Grosbeaks and Common Redpolls which were seen regularly but in small numbers. The first big push of migrants occurred on April 19 a day before a cold front arrived. Nearly 50 American Robins were detected flying over and almost 15 American Tree Sparrows were recorded. Most common were Dark-eyed Juncos with 63 banded and 170 counted. Things got busier on the 20th. The cold front brought snow and much cooler dawn temperatures (-5 C). Too cold for opening nets, we were kept busy counting the hundreds of juncos moving north through the area. Later in the morning, a reverse migration occurred as over 500 juncos turned around and flew south, joined by several American Tree Sparrows, Northern Harriers, American Robins and several small flocks of Common Redpolls. The highlight of the day was the season's only Golden Eagle. The highlight of the week by far however, was a large black wolf seen from about 30 metres away walking along the lakeshore.

Dawn temperatures were about -1°C during the last week of April, with light winds from the west predominating and partly cloudy skies. Bird numbers were steadily increasing and a warm front arriving on the 27th of April precipitated a large movement of birds. Common Loons, Northern Pintails, Sandhill Cranes, Franklin's Gulls, and Northern Flickers started to show up and peak numbers of several waterfowl species; Tundra Swan (313), White-fronted (734), and Canada (221) geese, American Wigeon (66), and raptors; Sharp-shinned Hawk (8), Northern Harrier (28), as well as early spring passerines; Tree Swallow (148), American Robin (2300), Yellow-rumped Warbler (2634), and Red-winged Blackbirds (700).

May started off quite well with a large arrival of several ducks and passerines as flocks of American Robins and Yellow-rumped Warblers were moving through by the thousands. Peak numbers of American Pipit (242) and Say's Phoebe (20) were recorded on May 1 and first arrivals included Vesper, Savannah, White-throated, and Lincoln's sparrows. The last big push

of American Tree Sparrows (24) and Dark-eyed Juncos (74) occurred on this day. The remainder of the week was equally busy with peak day-totals of Northern Pintail (147), Mallard (176), Sandhill Crane (328), and Northern Flickers (29). First arrivals of several species were noted including Yellow Warbler and Chipping Sparrow but the large daily passages of American Robins and Yellow-rumped Warblers and blackbirds was most impressive. One hundred and thirty-eight birds were banded during the first week of May (Table 1).

Yellow-rumped Warblers and Chipping Sparrows were the most abundant species during the second week of May. On May 11, a quiet sunny day, five gull species including Herring, California, Mew, Ring-billed, and Bonaparte s were present loafing on a small rock islet. Sea ducks such as Surf Scoter and Long-tailed Duck made their first appearances on the lake and several neotropical migrants were arriving including Least Flycatcher, Blue-headed Vireo, Western Tanager, Baltimore Oriole and several warbler species such as Tennessee, Blackpoll, and Black-throated Green warblers, Common Yellowthroat, and Ovenbird. Winds were generally light westerlies during the second week of May but became much stronger on May 13 which was overcast with rain showers. This seemed to push migrants up as more neotropical migrants arrived including Forster s Tern, Swainson s Thrush, and American Redstart. White-throated Sparrows (30), and Black-and-white Warblers (10) peaked on the 14th. It was also getting quite busy in the banding lab with over 300 birds banded on May 13 and 14.

During the third week of May, weather was generally clear with moderate to strong westerly winds. Numbers for most warbler species were steadily increasing. White-winged Scoters and Alder Flycatchers made their first appearances. Peak numbers of Surf Scoter (50) were recorded and overhead and along the shore hundreds of Franklin s Gulls were moving through peaking at 515. Chipping Sparrows were also moving through in large numbers with several hundred recorded daily. Rain on 19th forced an early closure of nets, unable to band, staff were kept busy counting nearly 3500 Chipping Sparrows moving through the area. Winds and rain during middle of the week reduced the netting effort significantly resulting in only 307 birds banded for the week.

It was warming up quite nicely by the fourth week of May with average dawn temperatures about 12°C . Migration activity was heavy with neotropical migrants, especially warblers arriving in large numbers. Peak day-counts of Least Flycatcher (48), Swainson s Thrush (20), and several warblers including Yellow (47), Tennessee (13), and Magnolia (8) warblers, as well as American Redstart (44), and Ovenbird (6). Late spring migrants such as Red-eyed and Philadelphia vireos, Canada and Mourning warblers were making their first appearances. This week was also the busiest in the banding lab with 485 birds banded.

A forest fire that started earlier in the month near Chisholm became out of control and made a run for Slave Lake during the night of the May 27, pushed by the strong southeasterly winds blowing since May 26. It was quite smoky at the station on the morning of the 28th and pretty quiet for migration. The smoke and cloud partially obscured the sun and the resulting light cast an eerie orange glow on everything. Shortly after shutting down for the day the town of Slave

Lake was on an evacuation alert as the fire was getting closer to town. As we packed up and cleared the banding lab a black, soot-filled rain fell. By late afternoon the winds shifted much to the relief of all and the town was spared an evacuation.

During the first few days of June, peak numbers of Common Loons (138), American White Pelicans (65), Alder Flycatcher (10), Red-eyed Vireo (7), and Canada Warblers (16) were recorded. There were also large movements of Canada Geese these being moult migrants forsaking breeding for the year but still flying north to complete their moults in relative safety. Passerine migration was dominated by American Redstarts and Canada Warblers, along with smaller numbers of Alder Flycatchers and Red-eyed Vireos. Forty to fifty birds were being banded each day. By June fifth migration slowed to a trickle and only 46 birds were banded over the next 6 days. It was time to call it the end of an exciting in more ways than one spring season on June 11. A total of 1928 birds were banded of 55 species and forms and nearly 160 species were observed at the LSLBO migration station.

The most notable event of the spring was the very large passage of Chipping Sparrows. This is a continuing trend which has seen this species spring population index increase by +77.8%/year, $p < 0.05$ (based on daily estimated totals). Season banding totals and single-day peak passages in the last three years have risen considerably from the previous five years (Table 2). The possible causes for this increase are 1) an actual increase in the population or; 2) a shift in the spring migratory route. Both possibilities have some merit. Chipping Sparrows are a species which would benefit from increased edge habitat. Timber practices and the large-scale forest fires in recent years may be providing the required breeding habitat for this species. However, a corresponding increase in the number of fall migrants which would be expected if the population was increasing, has not occurred. Since 1996, when water levels on Lesser Slave Lake were extremely high, lake levels have dropped dramatically as a result of several years of drought. The increase in beach habitat has lead to more shoreline vegetation, in particular sweet clover. Seeds of sweet clover and other shoreline plants may be providing a valuable food resource for seed-eaters such as Chipping Sparrows on their northward migrations, when seed resources would be at their lowest. During fall migration, Chipping Sparrows pass through the Lesser Slave Lake area in relatively low numbers, peaking in July. At this time, sweet clover is not yet in seed. Other food sources may be more plentiful elsewhere, not concentrating the migration along the shoreline.

Table 1. Spring 2001 daily captures at LSLBO.

Date	Net-hours	Banded	Recap d	Unbanded	Total Caps.	Birds/ 100 Net-hours
17-Apr	49.67	1	2		3	6.04
18-Apr	83.25	7	3	1	11	13.21
19-Apr	84	67	2	1	70	83.33
20-Apr						N/A
21-Apr	60	15		1	16	26.67
22-Apr	54	23		5	28	51.85
23-Apr	75	11	1		12	16.00
24-Apr	84	4			4	4.76
25-Apr	56	6			6	10.71
26-Apr	81	6			6	7.41
27-Apr	84	6			6	7.14
28-Apr	84	57		1	58	69.05
29-Apr	72	9		1	10	13.89
30-Apr	84	15			15	17.86
01-May	84	55		1	56	66.67
02-May	84	14			14	16.67
03-May	40.68	9		1	10	24.58
04-May	42.75	13			13	30.41
05-May	40.05	22			22	54.93
06-May	49.19	4			4	8.13
07-May	84	21	5	1	27	32.14
08-May	78	36		2	38	48.72
09-May	84	20	2		22	26.19
10-May	84	9			9	10.71
11-May	84	16			16	19.05
12-May	84	10	4		14	16.67
13-May	73.85	203	1	6	210	284.36
14-May	71.5	101		1	102	142.66
15-May	76.25	63	3		66	86.56
16-May	75.33	77	3		80	106.20
17-May	53.47	16	1		17	31.79
18-May	31.57	21	2		23	72.85
19-May	8.65	10			10	115.61
20-May	67.64	42		1	43	63.57
21-May	83.33	78	2	2	82	98.40
22-May	84	34	5	1	40	47.62
23-May	84.67	171	3	7	181	213.77
24-May	82.75	120	5	6	131	158.31
25-May	84	19	5	2	26	30.95
26-May	78	28	4		32	41.03
27-May	58.92	85	2		87	147.66
28-May	64.45	28	3		31	48.10
29-May	81.4	74	5	2	81	99.51
30-May						N/A
31-May	84	36	4	1	41	48.81
01-Jun	84	56	5		61	72.62

02-Jun	84	56	5		61	72.62
03-Jun	84	41	4	1	46	54.76
04-Jun	84	43	8	2	53	63.10
05-Jun	84	24	6	3	33	39.29
06-Jun	84	18	6		24	28.57
07-Jun	84	11	7		18	21.43
08-Jun	84	4	4		8	9.52
09-Jun	84	4	1		5	5.95
10-Jun	66	3	4		7	10.61
11-Jun	82	6	7		13	15.85
Totals	3937.37	1928	124	50	2102	2914.87

Table 2. Spring Chipping Sparrow passage at LSLBO (1994 - 2001).

	1994 - 1998	1999	2000	2001
Spring peak day-total	24 - May 22, 1994	289 - May 21	1660 - May 20	3454 - May 19
Spring season banding total	59 (94-98 combined)	258	615	236

Fall Migration Summary

Fall migration monitoring coverage began on July 14 and continued through September 22. Two days of coverage were lost in mid September, but otherwise coverage was very good and 69 days of coverage were accumulated.

Weather played a key role in the pace of migration, as usual. The wet weather that plagued the area through the late spring continued through the summer. In July, the mornings were generally clear but afternoon showers or thunder showers were common. August was generally sunny and warm but towards the end of the month fall was in the air.

The third week of July was relatively quiet for migration. Many local songbirds were still actively feeding fledglings but there was quite a bit of dispersal taking place by both juveniles and adults. Most young birds captured were still little in juvenal plumage and adults were still in relatively early stages of moult. Yellow-rumped and Yellow warblers, along with American Redstarts were the most common species along with smaller numbers of Tennessee Warblers, which increased later in the week.

By the first week of August migration was truly underway. Thirty to fifty species were being recorded daily and 264 birds were banded during the week (Table 3). Season firsts were recorded for Common Grackle and Wilson's Warbler, the latter typically a later migrant. Most neotropical migrant species were well represented and peak day-totals of Red-eyed Vireos (13)

and Rose-breasted Grosbeaks(15) were recorded. The highlight of the week, however, was the sighting of the station's second-ever Yellow-billed Loon.

Migration was peaking during the second week of August with 50 - 60 species recorded daily. Over 200 birds were banded on August 8th and 9th. Peak single-day counts of Franklin's (4300) and Bonaparte's (42) gulls were flying through as were several neotropical migrant songbirds including Least (15) and Alder (9) flycatchers, Western Tanager (15) and several warblers such as Canada (24), Black-throated Green (5), and Tennessee (486). The latter species had numbers increase towards the end of the week and continued well into the third week of August. Yellow-rumped warbler numbers, which had dropped considerably in the first week of August were also starting to increase again during the second week of August.

The third week of August was still quite active for migration. August 15th and 18th were particularly active with 87 birds banded and 64 species recorded on the 15th. This day also had peak single-day totals for Merlin (3), Say's Phoebe (2), Cedar Waxwing (156), several warbler species including Black-and-white (25), American Redstart (59), Mourning (11), and Wilson's (10) warblers, Common Grackle (36), and Purple Finch (34). The season's only Broad-winged Hawk was also recorded on the 15th. August 18 was not nearly as active for passerines, however, 55 species were noted and peak day-totals were reached for Common Loon (41), Horned (17), and Red-necked (44) grebes, American White Pelican (21), and Solitary Sandpiper (7). Tennessee Warbler numbers were still moderately high but decreasing by week's end. Strong westerly winds and rain on the 19th and 20th of August reduced netting hours for the week and only 165 birds were banded.

By the fourth week of August, neotropical migrant numbers were dropping and passerine migration was easing off noticeably. Only 132 birds were banded between August 21 - 27 despite fairly optimal netting efforts. Last dates were recorded for Baird's Sandpiper, Olive-sided Flycatcher, Tree and Bank swallows, and Black-throated Green Warbler. The last big push of Swainson's thrushes (8) occurred on August 23rd. A few species made first appearances of the fall including Blue-winged Teal, Northern Shoveler, Common Nighthawk, and American Pipit and a notable passage of Red-breasted Nuthatches was beginning. Peak day-totals were recorded for Double-crested Cormorant (6), Sharp-shinned Hawk (20), Common Nighthawk (2), Eastern Kingbird (22), American Magpie (33), Blue Jay (4), and Northern Waterthrush (6).

By late August a hint of fall was in the air. Weather became quite unsettled as several fronts moved through bringing overcast skies with several brief light showers on most days. During the the last few days of August, Eastern Kingbirds, Barn Swallows, Northern Waterthrushes, Blackpoll, Mourning, and Canada warblers were gone.

The unstable weather persisted well into September. The wind was constant. Moderate to strong westerly winds would blow throughout the mornings gusting up to 50 km/h or more on some days. They would generally calm down somewhat by late afternoon but build up again overnight. Net-hours were reduced because of the wind and only 164 birds were banded during

the first week of September, most of these on September 1st and 3rd. Migration was at a near standstill for several days, however, a passage of over 500 Canada Geese on September 7 was noteworthy. A small Black-capped Chickadee and Red-breasted Nuthatch movement was still continuing. Yellow-rumped warblers dropped dramatically from about 1400 to less than 100 seen daily during the first week of September. A small passage of Wilson's Warblers was noted during this time but other warblers were seen or caught only in very low numbers. More temperate migrants were moving and small numbers of American Pipits and Lapland Longspurs were flying along the shoreline in a northerly direction. The season's first White-crowned Sparrows appeared at the station on September 7th.

Winds finally dropped significantly during the night of the 10th. Over the next two days Yellow-rumped Warbler numbers rose and peaked at 1649 birds. A high pressure system brought clear skies and warm temperatures. This system continued well into the third week of September. Clear night skies made for cool mornings and waterfowl numbers started to increase. Several hawks were also seen daily, taking advantage of the thermals provided by the warm weather. Sharp-shinned Hawks were most common but peak number of Northern Harriers (6) were as well as a Northern Goshawk. The season's first Sanderling, Gray-cheeked Thrush, and Fox Sparrow were seen during the third week of September. Other temperate migrants, especially the sparrows were becoming more abundant. White-throated, White-crowned, Savannah, and Lincoln's sparrows. Orange-crowned (28) and Palm warblers (11) peaked, while Yellow-rumped Warbler numbers were decreasing to less than 50 a day.

Due to funding constraints, fall migration coverage ended on September 22. The season's first Snow Geese and Sandhill Cranes appeared this day. While at least 95% of the migratory period of neotropical migrants was sufficiently covered, LSLBO suffered a slight set back in its efforts to extend fall coverage to include the latter part of the migratory period of such temperate migrants as Hermit Thrush, White-throated and White-crowned sparrows and several other sparrow species. It is anticipated that this will be corrected in the near future. In total, 2356 birds were banded at the station of 52 species and forms. Highlights of the fall included significant passages of Tennessee Warblers and Red-breasted Nuthatches. A total of 214 Tennessee Warblers was banded in fall 2001, although not the highest fall total banded at LSLBO, the single-day peak count of 486 birds on August 12 far surpassed the previous record of 72 birds set on August 2nd, 1998. This species, along with Bay-breasted and Cape May warblers are considered Spruce Budworm specialists. Population levels of these species are known to fluctuate greatly and can get quite high during years of heavy budworm outbreaks. The fall passage of Red-breasted Nuthatches is also quite interesting, while not truly a migrant, this resident species is known to be irruptive - sporadic, large movements of the population taking place with no apparent fixed cycle. The cause of these irruptions is not fully understood but is thought to have something to do with food supply or lack of it. A record season banding total of 24 birds was set in fall 2001 as well as a record single-day peak count of 20 birds on September 3rd, surpassing the previous high of 15 birds on August 25th, 1995.

Table 3. Fall 2001 daily capture totals at LSLBO.

Date	Net-hours	Banded	Recap d	Unbanded	Total Caps.	Birds/ 100 Net-hours
14-Jul	84	76	11		87	103.57
15-Jul	84	47	6		53	63.10
16-Jul	60	15	5		20	33.33
17-Jul	84	23	4		27	32.14
18-Jul	84	28	2		30	35.71
19-Jul	60	2	1		3	5.00
20-Jul	84	29	10		39	46.43
21-Jul	84	57	4		61	72.62
22-Jul	84	63	4	2	69	82.14
23-Jul	84	25	1	1	27	32.14
24-Jul	83	63	6	2	71	85.54
25-Jul	84	28	3		31	36.90
26-Jul	76.8	59	0		59	76.82
27-Jul	84	29	2	1	32	38.10
28-Jul	84	37	2		39	46.43
29-Jul	30	17	0		17	56.67
30-Jul	77	41	3		44	57.14
31-Jul	84	67	7		74	88.10
01-Aug	84	52	2		54	64.29
02-Aug	81.08	38	3		41	50.57
03-Aug	84	99	4	3	106	126.19
04-Aug	84	29	4	1	34	40.48
05-Aug	77	20	1		21	27.27
06-Aug	84	17	3		20	23.81
07-Aug	77	8			8	10.39
08-Aug	84	115		1	116	138.10
09-Aug	84	97	1	1	99	117.86
10-Aug	84	26	4	1	31	36.90
11-Aug	84	77	1	1	79	94.05
12-Aug	84	30	1		31	36.90
13-Aug	84	20	2		22	26.19
14-Aug	84	31	1		32	38.10
15-Aug	84	87		4	91	108.33
16-Aug	84	8	3		11	13.10
17-Aug	84	13	3		16	19.05
18-Aug	84	21			21	25.00
19-Aug	34	3		1	4	11.76
20-Aug	70	7	1		8	11.43
21-Aug	84	26	1	2	29	34.52
22-Aug	84	38	1	2	41	48.81
23-Aug	84	47	3		50	59.52
24-Aug	70	5	1		6	8.57
25-Aug	70	11	1		12	17.14
26-Aug	84	18	3	2	23	27.38
27-Aug	84	8			8	9.52
28-Aug	70	5			5	7.14

29-Aug	84	26	1	1	28	33.33
30-Aug	84	10		1	11	13.10
31-Aug	84	173	1	3	177	210.71
01-Sep	84	63	3	2	68	80.95
02-Sep	37.9	6			6	15.83
03-Sep	70	53	1	1	55	78.57
04-Sep	62.9	5	1		6	9.54
05-Sep	65	5	1	1	7	10.77
06-Sep	71.73	11			11	15.34
07-Sep	78.42	21	1	1	23	29.33
08-Sep	70	15			15	21.43
09-Sep	31.7	8	4		12	37.85
10-Sep	30.5	4		1	5	16.39
11-Sep	49.5	115	2	9	126	254.55
12-Sep	57.42	15			15	26.12
13-Sep	84	34	4		38	45.24
16-Sep	59	34			34	57.63
17-Sep	84	17	1		18	21.43
18-Sep	84	20		1	21	25.00
19-Sep	60	4			4	6.67
20-Sep	84	10	2		12	14.29
21-Sep	79	21	2		23	29.11
22-Sep	31.97	5	3		8	25.02
Totals	5150.92	2337	142	46	2525	3302.46

MAPS

Background

The Monitoring Avian Productivity and Survivorship (MAPS) program is a continent wide project run by the Institute for Bird Populations. It is a cooperative effort among public agencies, private organizations, and bird banders. It provides long-term data on population and demographic parameters for target landbird species across the continent.

MAPS utilizes standardized, constant-effort mist netting during the breeding season at a continent-wide network of stations. Annual regional indices of adult population size and post-fledging productivity are estimated from capture data during the breeding season. Annual regional estimates are made of adult survivorship, adult population size and recruitment into the adult population from capture-recapture data.

North America is divided into eight major regions based on geographical and meteorological considerations, and each region has within it, target species. The LSLBO stations fall into the

Boreal & Arctic Canada region. Target species caught in sufficient numbers for analyses include: Alder Flycatcher, Black-capped Chickadee, Swainson's Thrush, Yellow Warbler, and Yellow-rumped Warbler.

LSLBO contributes three of the five MAPS stations for the region which has too few MAPS stations to generate statistically valid results on its own and for the analyses that have been published so far (up to the 1996 season) the data for Boreal & Arctic Canada MAPS stations have been lumped in with that of the "Alaska" region stations.

Objectives

Monitoring objectives of the program are to provide: (a) annual indices of adult population size and post-fledging productivity; and (b) annual estimates of adult survival rate, adult population size, proportion of residents in the adult population, and recruitment into the adult population. The program involves the capture of adult and young birds on their breeding grounds using constant-effort mist-netting.

Methods

The MAPS program consists of standardized constant-effort mist-netting during the breeding season. The breeding season is considered to extend from May through mid August and is divided into 10 ten-day periods. The recommended start date for the Boreal & Arctic Canada region is period 5 (June 10 - 19). Ten 30 mm mist-nets are operated for six hours starting at sunrise, once every 10-day period. The operation of the mist nets must continue for a minimum of three periods in the adult superperiod and two periods into the young superperiod.

In addition, field observations of resident species are made to establish breeding status within the site for those species. Also, a habitat assessment is required annually to record vegetation type and distribution as changes in habitat can cause changes in breeding populations and demographic parameters.

Coverage

The LSLBO has participated in the MAPS program since 1994, the year in which the LSLBO was founded. Three sites have been run each year, but not all sites have received enough coverage to contribute sufficient data for the rigorous analyses done by the MAPS coordinators each year. In 2000, one of the original three sites was dropped and a different site was added. The 2001 season marked the fifth year in total (and fourth year in a row) for which there was sufficient coverage for the two original sites and the second year of good coverage for the newer site.

Site Descriptions

The three sites are named Road site (ROAD), Far Away site (FAWA), and Residence (RESI). ROAD and FAWA are situated along the edge and within a mature mixed wood forest that borders an overgrown (approximately 30 years old) highway right of way that ran along the shore (within 50 metres) of the lake. The ROAD site includes a mature stand of White Spruce and Balsam Fir, along with mature Aspen poplar and some younger stands (approximately 30 years old) of spruce and balsam fir, as well as some old willow and alder stands. The FAWA site is a mature aspen wood with little understorey and a few scattered mature white spruce trees. The RESI is slightly more inland and about 3 km southeast of the other stations. It is characterized by a mature mixed wood stand dominated by Trembling Aspen and White Spruce. A 15 year-old pipeline dominated by dense willow-aspen shrubs bisects it. In its western section, the site includes a beaver pond which represents approximately one quarter of the sites total area. The beaver pond offers abundant edge habitat as well as many standing dead trees. In the extreme northeast corner, there is a mature old-growth White Spruce stand. On the northwest section, an abandoned oil well site is now dominated by grass and dense willow patches, and provides a lot of edge habitat.

Results and Discussion

Effort

For the fourth year in a row the constant-effort mist-netting was accomplished in all six ten-day periods for FAWA and ROAD sites. Both sites had the full complement of 360 net-hours of operation. RESI had slightly fewer hours of operation with 354 due to net opening delay on June 16 and a rain interruption on July 22. The dates of operation were:

	FAWA	ROAD	RESI
Period 5 (Jun 10 - 19)	Jun 16	Jun 17	Jun 15
Period 6 (Jun 20 - 29)	Jun 23	Jun 25	Jun 26
Period 7 (Jun 30 - Jul 9)	Jul 2	Jul 3	Jul 4
Period 8 (Jul 10 - 19)	Jul 10	Jul 11	Jul 13
Period 9 (Jul 20 - 29)	Jul 20	Jul 21	Jul 22
Period 10 (Jul 30 - Aug 9)	Aug 3	Jul 31	Aug 4

Captures

More birds were caught at each MAPS station in 2001 than in 2000 (Tables 4a,4b, & 4c). The Far Away station had the more captures than in the five previous years. The Canopy Project is no longer active at the Road Side station and while it is difficult to assess the impact the Canopy Project had both in terms of increased human activity and habitat disturbance on the breeding

activity at the site, eight more birds were caught there than in 2000. Also, two new species, Pileated Woodpecker and Brown Creeper, were captured there. Of more historic significance, LSLBO banded its 25,000th bird, a hatch-year Magnolia Warbler on July 21 at the ROAD station. The Residence station, which is larger and has a greater habitat diversity than the other sites, was again the most productive by far with nearly twice as many birds banded there as the other two stations combined.

As in previous years, the general trend in capture rates seems to be that the first 3 site visits are fairly productive. These rounds coincide with the MAPS adult superperiod (June 10 - July 19). By the fourth and subsequent rounds, capture rates drop dramatically. The fourth round occurs around the middle of July which coincides with adults and juveniles dispersing from breeding grounds, vacating the forest interior and seeking out edge habitat. This is corroborated by the high bird activity seen at the nearby migration monitoring station, located on the lakeshore by the forest edge. A slight anomaly to this trend was witnessed at the RESI on Aug 4. The last site visit there had 53 birds captured (no recaptures). A strong westerly wind was blowing that day and the migration site was unusually quiet with fewer small passerines moving and only 33 birds captured. It seems the birds moved further inland where the winds was not such a hindrance to flight. Despite the generally lower capture rates in the latter periods it is vital for MAPS productivity analyses that no periods are missed during the young superperiod (periods 9 & 10).

Breeding Status

Breeding status was determined through banding and observational evidence for each species detected at each station (Table 5). Observations were restricted to MAPS banding site visits only. The status on Likely breeders should be explored more thoroughly in future years.

Table 4a. Captures at the Far Away (FAWA) MAPS station.

Species	2001 Captures			Previous Years Total Captures						
	Banded	Recap d	Unbanded	94	95	96	97	98	99	00
Downy Woodpecker										1
Least Flycatcher	9			3	1					
Swainson's Thrush					4	1		1		1
American Robin		1 ¹		3	1	1				1
Cedar Waxwing				1						
Phialdelphia Vireo								1		
Red-eyed Vireo	1			2	2					
Tennessee Warbler	1				1		1			
Yellow-warbler	2			2			1			
Chestnut-sided Warbler				1						
Magnolia Warbler										1
Yellow-rumped Warbler	1	3 ²		1			5	3		3
Black-and-white Warbler										1
American Redstart	5	2 ³		18	10		2	4	2	8
Ovenbird	4			1	1	1	10	1	4	5
Connecticut Warbler										1
Mourning Warbler				11	19	1	3	7	9	4
Common Yellowthroat					1					1
Canada Warbler	3	5 ⁴		4	12	2	8	13	15	10
Western Tanager								1		
Rose-breasted Grosbeak										1
White-throated Sparrow	5	6 ⁵		16	26	12	10	8	10	10
Total	32	17		63	78	18	40	39	45	43

¹- Banded at the migration station spring 2001

²- Two birds banded at FAWA in 2000

³- One banded in Aug 2000 at migration station

⁴- One banded at ROAD in 2000, 2 at FAWA in 2000, one at the migration station in 2001

⁵- Two banded at FAWA in 2000, on banded there in 1999

Table 4b. Captures at the Road Side (ROAD) MAPS station.

Species	2001 Captures			Previous Years Total Captures						
	Banded	Recap d	Unband	94	95	96	97	98	99	00
Ruffed-Grouse								2		
Yellow-bellied Sapsucker				1	3	2				
Pileated Woodpecker	1									
Yellow-bellied Flycatcher				1						
Alder Flycatcher				1		3		1		
Least Flycatcher				4				3		
Black-capped Chickadee	1			1					1	
Red-breasted Nuthatch								1		
Brown Creeper	1									
Winter Wren					1					1
Swainson's Thrush	2	3 ¹		11	3	1	2	11	8	12
American Robin					1			1		
Cedar Waxwing				2				1		
Warbling Vireo								1		
Red-eyed Vireo				1	1					
Tennessee Warbler	1			22	2		2	10	5	
Orange-crowned Warbler				1						
Yellow Warbler				6						
Chestnut-sided Warbler				4						
Magnolia Warbler	8	7 ²		11	6	4	11	10	24	10
Cape May Warbler								2		
Yellow-rumped Warbler	1			16	5	4	1	22	2	1
Black-throated Green Warbler						1		4		1
Palm Warbler				1						
Blackpoll Warbler								2		
Black-and-white Warbler				9			2	3	1	3
American Redstart	6	6 ³		37	22	12	13	21	15	8
Ovenbird	10	2 ⁴		6	1		3	22	9	8
Northern Waterthrush						1				
Mourning Warbler				5	2	1	5		2	
Common Yellowthroat								2		
Canada Warbler	4	9 ⁵		32	19	8	20	13	12	13
Western Tanager				1	1			1		
Rose-breasted Grosbeak				1				3		
Chipping Sparrow				2				4	1	
Song Sparrow				2						
Lincoln's Sparrow						1				
White-throated Sparrow	4	1 ⁶	1	22	16	9	18	16	5	3
Purple Finch								1		
Pine Siskin								1		
Total	39	28	1	200	83	47	77	158	85	60

¹ - One banded at FEGU in 1998, one banded at the migration station in fall 1999

² - One banded at the migration station in spring 1998, another banded there in fall 2000

³ - One banded at the migration station in fall 2000, two banded there in spring 2000

⁴ - One banded at ROAD in 1999, one banded at migration station in fall 2001

⁵- One banded at FEGU in 1998, one at FAWA in 2000, one at migration station in spring 2000, two banded there in spring 2001

⁶- Banded at the Canopy Project in 2000

Table 4c. MAPS captures at Residence (RESI) station in 2001.

Species	2001 Captures			Previous Year Totals 2000
	Banded	Recaptured	Unbanded	
Sharp-shinned Hawk				1
Yellow-bellied Sapsucker	3			2
Western Wood-Pewee				1
Alder Flycatcher	1			
Least Flycatcher	6	2		11
Black-capped Chickadee				1
Winter Wren	1			
Swainson's Thrush	7			8
Hermit Thrush		1	¹	4
American Robin				2
Red-eyed Vireo	2			
Philadelphia Vireo	1			
Warbling Vireo	1			
Blue-headed Vireo	1			
Tennessee Warbler	27		1	9
Yellow Warbler	4			4
Magnolia Warbler	1	1	²	7
Yellow-rumped Warbler	11			7
Black-throated Green Warbler	1			1
Bay-breasted Warbler	3			2
Blackpoll Warbler	1			
Black-and-white Warbler	4			3
American Redstart	21			10
Ovenbird	6	1	1	5
Mourning Warbler		1	³	4
Common Yellowthroat	1			
Canada Warbler	5	2	⁴	3
Western Tanager	1			1
Rose-breasted Grosbeak	1			1
Chipping Sparrow				2
Lincoln's Sparrow				1
White-throated Sparrow	15	4	⁵	14
Pine Siskin				1
Total	125	12	2	105

¹- Banded at RESI in 2000

²- Banded at RESI in 2000

³- Banded at RESI in 2000

⁴- Banded at RESI in 2000

⁵- One bird banded at RESI in 2000

Table 5. Breeding Status of MAPS birds in 2001

Species	RESI	ROAD	FAWA	Species	RESI	ROAD	FAWA
Common Loon	T	T	T	American Robin	L	B	B
Common Goldeneye	B		B	Cedar Waxwing	L	L	L
Osprey	T		T	Tennessee Warbler	B	B	L
Bald Eagle			T	Yellow Warbler	B	L	B
Sharp-shinned Hawk	L			Magnolia Warbler	B	B	
Red-tailed Hawk	T			Yellow-rumped Warbler	B	B	B
Ruffed Grouse	L	L		Black-throated Green Warbler	B	L	
Spotted Sandpiper		L		Bay-breasted Warbler	L		
Yellow-bellied Sapsucker	B			Black-and-white Warbler	B	B	L
Hairy Woodpecker	B	L	L	American Redstart	B	B	B
Three-toed Woodpecker		T		Ovenbird	B	B	B
Northern Flicker	L			Northern Waterthrush	L		
Pileated Warbler	L	L		Mourning Warbler	B	L	B
Alder Flycatcher	B	L		Common Yellowthroat	L	L	L
Least Flycatcher	B	L	B	Canada Warbler	B	B	B
Eastern Phoebe		B		Western Tanager	B	L	
Warbling Vireo	B			Song Sparrow	L		
Blue-headed Vireo	L		L	Lincoln's Sparrow	B		
Red-eyed Vireo	B	B	B	White-throated Sparrow	B	B	B
Blue Jay		T	T	Rose-breasted Grosbeak	B	L	L
Gray Jay		T		Red-winged Blackbird			T
American Crow	T	T		Brown-headed Cowbird	L		T
Common Raven	L	L	L	Purple Finch	L		
Tree Swallow	L		T	White-winged Crossbill	T	T	T
Black-capped Chickadee	B	L	B	Pine Siskin	T	L	T
Red-breasted Nuthatch	B	B	L	Evening Grosbeak	T	T	T
Winter Wren	B						
Ruby-crowned Kinglet	L		T	Total sp. Confirmed (B)	26	13	12
Brown Creeper		T	T	Total sp. Likely (L)	16	16	9
Swainson's Thrush	B	B		Total sp. Transient (T)	7	8	12
Hermit Thrush	B						
				Total sp.	49	37	33

Productivity

Up to 1996, data from the LSLBO MAPS sites has contributed to analyses for six species for productivity (Alder Flycatcher, Black-capped Chickadee, Swainson's Thrush, American Robin, Yellow Warbler and Yellow-rumped Warbler). It is anticipated that in future reports (MAPS annual reports for 1997 & 1998 are in press) more species may be added to the analyses. For productivity analyses described here, the number of young birds captured (HY) was divided by the number of known aged birds (HY and AHY combined but not including unknown - U - birds). Data from the three stations were pooled. Only species that had at least one capture during each year of MAPS operation were used for the analysis (Table 6). The methodology is not as rigorous as the used by MAPS organizers and the results are quite preliminary but they are

nonetheless informative. Of the ten species examined, Tennessee, Yellow, Yellow-rumped, Magnolia, and Canada warblers, as well as American Redstart all had higher productivity rates than in 2001. This can probably be mostly attributed to the high capture total of hatch-year birds on August 4, the last visit to RESI. Fifty-two of 54 birds banded on that day were hatch-year birds. Only Tennessee and Magnolia warblers had higher HY ratios in 2001 than the average for the seven previous years. It is quite possible that the decrease for most species is more of a reflection of the lack of data from the Fern Gulley site which was abandoned in 2000 because it was deemed to be too close to the FAWA and ROAD sites. Fern Gulley routinely had more captures and more hatch-year birds in the later site visits than FAWA and ROAD, probably due to the greater edge habitat found at this more open site.

Quite obviously, one visit can have a tremendous affect on productivity indices. At LSLBO, the last ten-day MAPS period can coincide with a period of heavy southward migration for a number of the locally breeding species. The MAPS coordinators still require the sites to be operated for this period anyway. The argument that has been presented is that productivity indices (which are based in part on data from the last ten-day period) are expected to be "landscape level" indices so that the possible inclusion of young birds from beyond the study area is acceptable (they would not be expected to be from great distances from the station).

The high number of Tennessee Warblers caught at the MAPS station and during fall migration monitoring suggests that numbers may indeed be higher for this species. Tennessee Warblers, along with Bay-breasted and Cape May warblers are considered Spruce Budworm specialists and productivity can get quite during years of heavy budworm outbreaks. Population levels of these species are known to fluctuate greatly.

Table 6. Comparison of productivity (number of HY birds divided by the number of adult birds) of the 10 most commonly captured species at the three MAPS sites in Lesser Slave Lake Provincial Park, 2001 and the 94 - 2000 average.

Species	AHY 2001	HY 2001	HY Ratio 2001	HY Ratio 2000	HY ratio ave 1994-2000
White-throated Sparrow	28	2	0.07	0.09	0.23
Tennessee Warbler	8	22	0.73	0.13	0.66
Yellow Warbler	5	1	0.17	0	0.58
Yellow-rumped Warbler	8	7	0.47	0	0.53
Magnolia Warbler	6	7	0.54	0.09	0.49
Ovenbird	20	3	0.13	0.19	0.42
Mourning Warbler	2	0	0.00	0.33	0.54
Canada Warbler	18	3	0.14	0.05	0.49
American Redstart	22	14	0.39	0.13	0.49
Swainson's Thrush	11	1	0.08	0.13	0.36

Recaptures and Survivorship

For survivorship analyses, survival rate estimates are calculated based on capture (and recapture) histories over five years of all adult birds captured at all stations in a region at which that species was a regular breeder. For the LSLBO ROAD and FAWA stations, 2001 marks the fourth year of consecutive coverage in which at least three periods during the early part of the season were in operation. Given that data from 1997 and 1998 have just gone to press, it will be a few more years before we see our data included in future MAPS survivorship analyses. Even this might be on a limited scale as out of fifteen species for which survival rate estimates in the Alaska/Boreal Canada region were possible between 1992 and 1996, only four species (Alder Flycatcher, Black-capped Chickadee, Swainson's Thrush and Yellow-rumped Warbler) were caught at the LSLBO MAPS sites between 1994 and 1999.

In 2001, recapture data indicated a higher one year return rate but a lower longer return rate (two years or more) compared to 2000. This suggests a high turn-over rate in the breeding population, which is not unusual among relatively short-lived animals such as migratory songbirds. Also, 2001 marked only the second year of operations at the most productive site, RESI, which had five returning birds from 2000 (Table 4c). The most notable recapture was of a Swainson s Thrush banded in the summer of 1998 at the now defunct FEGU MAPS station and recaptured at ROAD on June 25. This adult male was at least six years old in 2001. Other recaptures are listed below (see Recaptures section).

Recommendations

The value of MAPS data in understanding the boreal songbird population dynamics cannot be underestimated. Currently, there are only 5 stations in operation in the Boreal & Arctic Canada region which is not enough for meaningful analysis. Three of these five stations are operated by the LSLBO. The increase in number of sites in the Slave Lake area will still provide a wealth of information on the local level. As recommended in previous LSLBO MAPS reports, the establishment of another site should be looked into for the 2002 season. Different habitat types should be explored for potential establishment of other MAPS stations. However, at this point, any more than one new site would put a strain on LSLBO resources both in terms of staff and equipment.

RECAPTURES

A total of 319 recapture records involving 193 individuals were collected during the 2001 migration monitoring and MAPS seasons. These included 117 birds originally banded in 2001. The following recaptures were of birds banded prior to 2000 or foreign recoveries.

Alder Flycatcher 2100-07004 Banded at the migration station in spring 1997 as an AHY.
Recaptured at migration station on Aug 2. At least 5 years old.

... 2160-64581 Banded at the migration station as an AHY-U in fall 1999. Recaptured at the migration station on Jun 4. At least 3 years old.

Black-capped Chickadee 2031-61702 Banded as a HY bird at the migration station in fall 1997. Recaptured at the station on Apr 17. Four years old.

Swainson s Thrush 1641-32034 Banded as a HY bird at the migration station in fall 1999. Recaptured at the ROAD MAPS station on Jun 25 as an ASY-M. Two years old.

... 1451-87937 Banded as an ASY-M at FEGU MAPS station in summer 1998. Recaptured at ROAD as an ASY-M on Jun 25. At least 6 years old.

... 1591-25963 Banded in 2000 on the canopy project site. Original banding date unknown. Recaptured May 15 at the migration station as an ASY-M.

Magnolia Warbler 2100-08004 Banded at the migration monitoring site on May 19 1998. Recaptured on Jun 10 as an ASY-M.. At least 5 years old.

... 2100-07639 Banded as an ASY-F in fall 1999. Recaptured on May 29 at the migration station. At least 5 years old.

... 2120-51736 Banded in 2000 on canopy project site. Original information unknown. Recaptured as an ASY F at the migration station on May 23.

Yellow-rumped Warbler 1980-87142 Banded at the ROAD site in summer 1998 as an AHY-F. Recaptured at the migration station on Jun 9. At least 4 years old.

... 2160-61606 Banded at the migration station in fall 1999. Recaptured at the migration station as an AHY -F on Jul 14. At least two years old.

... 2160-71457 Banded as a SY-M at the migration station in spring 1999. Recaptured at the site on May 16 as an ASY-M. At least 3 years old.

Black-and-white Warbler 3510-65002 Banded at the migration station as an AHY M in fall 1998. Recaptured there on May 12. At least 4 years old.

American Redstart 2100-07525 Banded at ROAD in summer 1998 as an ASY-M. Recaptured Jun 11 at the migration station. At least 5 years old.

... 2100-08425 Banded as a SY M at the migration station in fall 1998. Recaptured there on May 23. Four years old.

Ovenbird 1671-46015 Banded as an AHY - at the migration station in fall 1999. Recaptured at the migration station on Jul 17 as an AHY-F. At least 3 years old.

... 2191-44429 Banded as an ASY - in summer 1999 at ROAD. Recaptured at the migration station on Jul 20. At least 4 years old.

Canada Warbler 2100-07517 Banded as an ASY M in summer 1998 at FEGU MAPS station. Recaptured at the migration station on Jun 7. At least 5 years old.

... 2130-37110 Banded at the migration station in spring 1999 as an ASY-M. Recaptured there on May 24. At least 4 years old.

Lincoln s Sparrow 2171-14870 Banded as an SY M at the migration station in spring 1999. Recaptured there on May 7. Three years old.

White-throated Sparrow 1451-87996 Banded as an ASY at the FAWA MAPS station in summer 1999. Recaptured there on Jul 2. At least 4 years old.

... 1591-96022 Banded at the canopy project site in 2000. Recaptured as an ASY M at the migration station on May 5.

COVERAGE

Coverage at the migration monitoring station in 2001 was very good and similar to that of 2000. The total number of days of coverage in spring was 57, similar to last year but coverage began and ended a few days earlier than last year, following recommendations made in last year s annual report. Also following recommendations the fall season start was delayed a few days until July 14. Unfortunately, LSLBO suffered a bit of a set back in fall coverage as the season was forced to end prematurely due to a lack of funding. Coverage ended on September 22, the earliest end date since 1995. There were 69 days of fall coverage with 2 days lost due to absence of a suitable bander-in-charge.

The same protocol as in 2000 was adhered to in 2001 and standardized components of the Daily Totals, including netting and banding, census, and visible-migration watches received excellent coverage (Table 7a & 7b). Average daily net-hours were a little higher in spring 2001 than the previous year largely due to less inclement weather and fewer birds, which meant nets did not have to be closed as often.

A total of 355 person-days were accumulated during the migration monitoring and MAPS seasons. Number of volunteer-days were up substantially (92%) from last year, which helped to compensate for the fewer staff days accrued. Assistance through the fall was very good through August. There was less help in September, but by then the peak of migration was past and the pace of migration was much slower. The increase in volunteer-days was largely due to long-term commitments from two volunteers who contributed a total of 11 weeks of time. Local volunteers contributed 24 person-days of help and another 27 volunteer-days were accumulated

by banders attending a week-end banding workshop hosted by LSLBO in July. The assistance from volunteers made a tremendous difference in the quality of coverage in 2001 and their dedication was greatly appreciated. A heart felt thank-you is extended to all the volunteers listed below (Table 8).

Table 7a. Summary of effort during spring migration monitoring at LSLBO, 1994 - 2001.

SPRING	1994	1995	1996	1997	1998	1999	2000	2001
Daily Estimated Totals								
First day	15-May	28-Apr	04-May	30-Apr	04-May	26-Apr	18-Apr	16- Apr
Last day	09-Jun	09-Jun	07-Jun	17-Jun	09-Jun	12-Jun	13-Jun	11- Jun
Number of days	19	39	28	37	36	46	57	57
Number of person-days	40	92	62	67	72	N/A	126	130
Banding¹								
First day	22-May	30-Apr	06-May	01-May	04-May	29-Apr	20-Apr	16- Apr
Last day	08-Jun	09-Jun	07-Jun	17-Jun	09-Jun	12-Jun	13-Jun	11- Jun
Number of days	15	35	25	34	36	42	52	54
Average daily net-hours	37.2	65.5	62.1	58.6	74.5	69.1	62	72.9
Census								
First day	17-May	29-Apr	04-May	30-Apr	04-May	27-Apr	18-Apr	16- Apr
Last day	09-Jun	09-Jun	07-Jun	14-Jun	09-Jun	12-Jun	13-Jun	11- Jun
Number of days	13	35	27	34	32	34	55	57
Vis-Migs²								
First day		04-May	06-May	30-Apr	05-May	27-Apr	18-Apr	16- Apr
Last day		08-Jun	07-Jun	14-Jun	21-May	25-May	13-Jun	11- Jun
Number of days		22	26	33	8	16	57	57
Average daily # Vis-Migs		2.8	3.7	4.5	3.8	N/A	8.2	7.8

¹- Protocol changes in 2000 included increasing the six-hour standard banding period to seven hours

²- Starting in fall 1999 Vis-Migs were reduced from 10 minutes to five minutes

Table 7b. Summary of effort during fall migration monitoring at LSLBO, 1994 - 2000.

FALL	1994	1995	1996	1997	1998	1999	2000	2001
Daily Estimated Totals								
First day	27-Jul	17-Jul	27-Jul	05-Aug	14-Jul	10-Jul	07-Jul	14 -Jul
Last day	11-Sep	24-Sep	29-Sep	26-Sep	24-Sep	25-Sep	06-Oct	22- Sep
Number of days	31	51	41	35	66	78	91	69
Number of person-days	62	116	76	45	126	N/A	207	192
Banding¹								
First day	27-Jul	17-Jul	27-Jul	06-Aug	14-Jul	10-Jul	07-Jul	14 - Jul
Last day	11-Sep	24-Sep	29-Sep	26-Sep	24-Sep	25-Sep	06-Oct	22- Sep
Number of days	30	50	35	33	62	76	89	69
Average daily net-hours	35.7	50.5	40.1	60.9	48.5	56.7	74	74.6
Census								
First day	02-Aug	17-Jul	27-Jul	06-Aug	19-Jul	10-Jul	07-Jul	14 -Jul
Last day	11-Sep	23-Sep	29-Sep	03-Sep	24-Aug	08-Aug	06-Oct	22- Sep
Number of days	18	43	39	8	10	15	90	69
Vis-Mig²								
First day	16-Aug	28-Jul	30-Jul	06-Aug	25-Jul	13-Jul	07-Jul	14 -Jul
Last day	28-Aug	31-Aug	29-Sep	26-Sep	02-Sep	25-Sep	06-Oct	22 -Sep
Number of days	8	18	28	29	20	43	91	69
Average # daily Vis-Migs	N/A	2.7	3.3	1.7	2.8	3.9	7.7	7.9

¹- Protocol changes in 2000 included increasing the six-hour standard banding period to seven hours

²- Starting in fall 1999 Vis-Migs were reduced from 10 minutes to five minutes

Table 8. Person-days contributed to LSLBO 2001 field operations.

Personnel	Spring Mig Mon	MAPS	Fall Mig Mon	Total
Staff				
Jul Wojnowski	43	9	55	107
Christa Beckmann	36	13	29	78
Christine Boulton	10	1	19	30
Staff-days	89	23	103	215
Volunteers				
Tom Bartlett			2	2
Paula Bartlett			2	2
Pete Biro	2			2
Hanneke Brooymans	2		1	3
Christine Boulton			1	1
Ken Burton			2	2
Lynette Dagenais	17		9	26
Brenda Dale			2	2
Miguel Demeulemeester		7	35	42
Patsy Drummond			1	1
Wendy Easton			2	2
Kelly Gray	7			7
Heidi den Haan			2	2
Stefan Jungkind			3	3
Stephen Lane			2	2
Aaron Lehman	13		9	22
Shonna McLeod			2	2
Albert Miller	1			1
Pat Mitchell			2	2
Shawna Pelech			2	2
El Peterson			1	1
Chuck Priestley			2	2
Carl Savignac			1	1
Lisa Takats			2	2
Dennis Verbeek	1			1
Drajs Vujnovic			4	4
Drew Yeo	1			1
Volunteer-days	44	7	89	140

VISITORS AND EDUCATION

Visitors

Nearly 900 visitors, including 14 organized tours, came to the observatory in 2001 (Table 8) and many were given banding demonstrations or talks by the IBA educator. About 150 people visited the station during the Songbird Festival (June 2) and Park s Hike Day (July 15). A lower than usual turnout for the festival was attributed to the forest fire in the area deterring visitors from coming. Several of the groups included local school classes and organised tours.

Workshops and Training Programs

In late July, LSLBO co-hosted a bander training workshop with the Canadian Wildlife Service. There were 13 attendees from across western Canada and the United States. The aim of the workshop was to educate banders in current sexing and ageing techniques through lectures, study skin examinations and banding of live birds, as well as promoting dialogue between banders in the region.

In conjunction with Northen Lakes College, LSLBO is offered a week-long intensive Assistant Bander Training course. The aim of the course is to provide knowledge and skills for safe and ethical handling of birds as well as an introduction to banding. It is intended as a banding primer. A more intensive banding course may follow if a need has been determined. The target audience is biologists and members of the general public who wish to assist at banding stations. The brochure was sent to bird and naturalist clubs, universities and colleges, as well as government branches across the westem provinces. Unfortunately, the mail out was quite late, resulting in a disappointing response. Enrolment was too low to run even one course so the courses were cancelled for 2000. The mail out will be done early in 2001, with the hope that potential participants will have enough time to book holidays or work the course fee into their budgets. Two courses will be offered with the potential to increase the number if the response is good.

Table 8. Number of visitors to the LSLBO banding station in 2001.

Season	Adults	Children	Age not recorded	# of groups	Total Visitors
Spring (Apr 16 - Jun 11)	101	97	100	7	298
Summer (Jun 12 - Jul 13)	54	44		3	98
Fall (Jul 14 - Sep 22)	311	166		4	477
Total	466	267	100	14	873

OTHER OBSERVATORY ACTIVITIES

Parasite Studies

Lesser Slave Lake Bird Observatory has been casually examining birds for ticks for several years as part of a study by the Lyme Disease Association of Ontario. Engorged ticks are usually found on the crown or near the eyes of birds. In 2001, eight ticks (larval and nymphal stages) were removed from four birds. Two Blacklegged Ticks (*Ixodes scapularis*) were removed from a Gray-cheeked Thrush captured on May 16 and another was removed from a Swainson's Thrush captured on May 31. Rabbit Ticks (*Haemaphysalis leporispalustris*) were collected from a hatching-year White-throated Sparrow on July 15 (4 ticks) and a hatching-year Magnolia Warbler on July 16 (1 tick). Rabbit ticks are quite common in the area, however, the presence of Blacklegged Ticks is quite notable. These collections are the most western and northern report of *Ixodes scapularis* in North America (Scott et al. 2001). This tick is the vector for the bacterial spirochete *Borrelia burgdorferi* which causes Lyme Disease. Borrelial testing on the submitted Blacklegged Ticks turned up negative. Birds can be infected by the bacterium and they can act as a reservoir. Infected ticks can drop off birds and attach to another animal host, including humans, which may be susceptible to infection. This is thought to be the source of infection for humans or animals with Lyme Disease who have not been in areas where blacklegged tick are endemic. If *Ixodes scapularis* subspecies have defined geographical distributions, an interesting picture on migratory pathways could emerge.

In another parasite study, LSLBO examined neotropical migrants, *Catharus* thrushes in particular, for a PhD candidate at the University of Michigan. While doing field work in a coffee plantation ecosystem in Chiapas Mexico, Tom Dietsch noted a high incidence of mite infestations. This had not been documented before and Tom wanted to know if this was a local or widespread phenomenon. LSLBO was one of a number of stations collecting data on neotropical migrant mite infestations. Five Gray-cheeked Thrushes and 79 Swainson's Thrushes were thoroughly examined in the spring and found to have no signs of mite infestation.

Reports

LSLBO has come a long way since 1994 and as with any new migration station protocols have been tweaked on occasion to more accurately reflect a particular station's character over time. The original LSLBO station manual has become somewhat dated and in need of revision. LSLBO staff have been working on this revision throughout the year and a final version should be available some time over the winter of 2001-2002. The manual will be more site-specific and most useful when complemented by other manuals and protocols, such as the North American Banding Council manuals. These will be required reading for all future LSLBO staff and recommended reading for volunteers.

A technical report on LSLBO Migration Monitoring and MAPS programs results based on data collected from 1994 - 1999 was produced by Technical Director Stefan Jungkind. The report is quite thorough and provides detailed analyses and recommendations. The report will be available as a .pdf file on the LSLBO web site in the near future.

ACKNOWLEDGEMENTS

The success LSLBO enjoyed in 2001 is largely due to all the received assistance received from partners, organizations, and dedicated individuals. I would like to thank the following for all their help:

The staff of LSLBO: Christa Beckmann, and Christine Boulton.

The LSLBO board for their guidance and direction in all aspects of the organization. They are: Bob Deacon (chair), Frank Fraser, Ronda Groom, Stefan Jungkind, Peter Moore, Mike Norton, and Chris Peters. Their volunteer efforts are commended.

Volunteer Debra Belmonte for her assistance as volunteer coordinator.

The administration and staff of Lesser Slave Lake Provincial Park for logistical support and advice in particular, Doug Geenfield and Jamie Payne.

Kit Bennett and the staff of Northern Lakes College for development work on an Assistant Bander Training program and use of facilities for the Bander Training Workshop and several LSLBO board meetings.

The Junior Forest Wardens for their assistance in clearing trails on the RESI MAPS site.

Aaron Lehman, Frank Fraser and Aicha Gaboune for use and donations of equipment and fresh produce.

Drajs Vujnovic for his assistance and advice on matters pertaining to data management and programming.

Bird Studies Canada for provision of a naturalist club mailing list.

Last but not least, I would like to thank all the volunteers who assisted in the field operation of the migration monitoring program. They are: Tom and Paula Bartlett, Pete Biro, Hanneke Brooymans, Ken Burton, Lynette Dagenais, Brenda Dale, Miguel Demeulemeester, Wendy Easton, Kelly Gray, Heidi den Haan, Stefan Jungkind, Stephen Lane, Aaron Lehman, Shona McLeod, Albert Miller, Pat Mitchell, Shawna Pelech, El Peterson, Chuck Priestley, Carl Savignac, Lisa Takats, Dennis Verbeek, Drajs Vujnovic, and Drew Yeo.

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APPENDIX I. Birds banded in 2001 at LSLBO.

Species	Spring	MAPS	Fall	Total
Sharp-shinned Hawk	6		25	31
Hairy Woodpecker	1			1
Downy Woodpecker	1		2	3
Yellow-bellied Sapsucker		3		3
Pileated Woodpecker		1		1
Eastern Phoebe	15		3	18
Western Wood-Pewee	2		2	4
Yellow-bellied Flycatcher	3		1	4
Alder Flycatcher	42	1	49	92
Least Flycatcher	80	15	67	162
Blue Jay	1		2	3
Purple Finch	1		2	3
Savannah Sparrow	13		2	15
White-crowned Sparrow	27		7	34
White-throated Sparrow	89	24	32	145
American Tree Sparrow	47		1	48
Chipping Sparrow	236		22	258
Clay-colored Sparrow	76		1	77
Dark-eyed Junco	107		16	123
Unidentified Dark-eyed Junco	1			1
Song Sparrow	2		1	3
Lincoln Sparrow	22		16	38
Swamp Sparrow	1			1
Fox Sparrow	1		1	2
Rose-breasted Grosbeak	4	1	12	17
Western Tanager	2	1	8	11
Red-eyed Vireo	15	3	24	42
Philadelphia Vireo	1	1	13	15
Warbling Vireo		1	1	2
Blue-headed Vireo	2	1	5	8
Black-and-white Warbler	33	4	69	106
Orange-crowned Warbler	44		55	99
Tennessee Warbler	27	29	214	270
Cape May Warbler	1		5	6
Yellow Warbler	92	6	181	279
Yellow-rumped Warbler	389	13	652	1054
Magnolia Warbler	27	9	63	99
Bay-breasted Warbler		3	5	8
Blackpoll Warbler	11	1	17	29
Black-throated Green Warbler	1	1	15	17
Palm Warbler	7		4	11
Ovenbird	26	20	93	139
Northern Waterthrush	18		14	32
Connecticut Warbler	2			2
Mourning Warbler	12	1	29	42

Common Yellowthroat	15	1	13	29
Wilson's Warbler	5		27	32
Canada Warbler	56	12	110	178
American Redstart	202	32	302	536
Gray Catbird	2			2
Brown Creeper		1	3	4
House Wren	5			5
Winter Wren	1	1		2
Red-breasted Nuthatch			24	24
Black-capped Chickadee	20	1	17	38
Boreal Chickadee			3	3
Golden-crowned Kinglet	1			1
Ruby-crowned Kinglet	5		7	12
Gray-cheeked Thrush	9		2	11
Swainson's Thrush	102	9	109	220
Hermit Thrush	6		7	13
American Robin	11		1	12
Total # of birds banded	1928	196	2356	4480
Total # of species banded	55	28	52	62

APPENDIX II. Species arrival and departure dates and maxima at LSLBO in 2001.

The following list includes seasonal first and last dates and maximum total (in bold) for each species in Spring (April 16 - June 11) and Fall (July 14 - September 22) encountered in 2001. Unless otherwise stated, all sightings are from the migration monitoring station in Lesser Slave Lake Provincial Park.

Common Loon: S: Apr 30 - 2; Jun 9 - 4; **136** - Jun 3; F: Jul 14 - 5; Sep 18 - 2; **41** - Jul 24 & Aug 18

Yellow-billed Loon: Aug 2 - 1

Pied-billed Grebe: S: May 8 - 1; May 22 - 1

Horned Grebe: S: Apr 27 - 1; only spring record; F: Jul 29 - 1; Sep 22 - 1; **17** - Aug 18

Red-necked Grebe: S: May 15 - 2; May 25 - 2; **6** - May 22; F: Jul 14 - 2; Sep 21 - 3; **44** - Aug 18

Eared Grebe: F: Aug 18 - 5

Western Grebe: F: Jul 17 - 37; Sep 18 - 12; **47** - Jul 24

American White Pelican: S: May 24 - 2; Jun - 11; **65** - May 22; F: Jul 14 - 18; Sep 21 - 1; **21** - Jul 30 & Aug 18

Double-crested Cormorant: S: Apr 21 - 1; Jun 7 - 12; **12** - Jun 7; F: Aug 19 - 1; Aug 26 - 6

Great Blue Heron: S: Apr 18 - 1; May 3 - 5; F: Jul 23 - 1; F: Jul 23 - 1; Sep 12 - 1; **3** - Aug 6

Tundra Swan: S: Apr 17 - 7; May 9 - 4; **313** - Apr 27

Greater White-fronted Goose: S: Apr 27 - 734

Snow Goose: S: May 8 - 2; only spring record; F: Sep 22 - 54

Canada Goose: S: Apr 16 - 3; Jun 9 - 17; **221** - Apr 27; F: Aug 9 - 8; Sep 21 - 2; **570** - Sep 7

Wood Duck: S: May 3 - 1; first ever record for LSLBO;

American Green-winged Teal: S: Apr 26 - 3; Jun 11 - 4; **31** - Apr 28; F: Sep 6 - 2; Sep 22 - 5

Mallard: S: Apr 17 - 4; Jun 11 - 15; **131** - Apr 28; F: Jul 14 - 7; Sep 22 - 20; **60** - Sep 18

Northern Pintail: S: Apr 28 - 6; May 26 - 1; **147** - May 3; F: Aug 14 - 2; Sep 8 - 1

Blue-winged Teal: S: May 5 - 40; Jun 11 - 1; 40 - May 5; F: Aug 23 - 5; Sep 7 - 1; **5** - Sep 23, 26 & 27

Northern Shoveler: S: Apr 26 - 6; Jun 3 - 4; **27** - May 5; F: Aug 23 - 3

Gadwall: S: May 5 - 5; Jun 11 - 1; **6** - May 13 & 15; F: Jul 23 - 1; Jul 30 - 17

American Wigeon: S: Apr 17 - 5; Jun 11 - 1; **66** - Apr 28; F: Jul 17 - 1; Sep 22 - 35

Canvasback: F: Jul 18 - 1; Jul 23 - 1

Greater Scaup: S: Apr 28 - 6; May 14 - 6

Lesser Scaup: S: Apr 29 - 2; May 27 - 1; 7 - May 24; F: Jul 29 - 9; Aug 13 - 15

Long-tailed Duck: S: May 14 - 56; May 17 - 14

Surf Scoter: S: May 14 - 4; May 24 - 25; **50** - May 21; F: Jul 30 - 3

White-winged Scoter: S: May 21 - 3; May 31 - 2; 5 - May 25

Common Goldeneye: S: Apr 17 - 3; Jun 11 - 40; 92 - May 10; F: Jul 14 - 4; Sep 22 - 148

Bufflehead: S: May 3 - 7; Jun 11 - 4; 7 - May 3; F: Jul 17 - 1; Sep 22 - 30

Common Merganser: S: Apr 19 - 1; Jun 9 - 12; 82 - May 28; F: Jul 14 - 10; Sep 22 - 1 37 - Jul 24

Red-breasted Merganser: S: Apr 24 - 2; Jun 9 - 1; 14 - May 11; F: Jul 14 - 2; Jul 18 - 3

Osprey: S: Apr 26 - 1; Jun 10 - 3; F: Jul 14 - 2; Sep 17 - 1; 5 - Jul 17

Bald Eagle: S: Apr 16 - 1; Jun 11 - 2; 4 - Apr 27, May 15 & 25; F: Jul 18 - 1; Sep 22 - 2; 8 - Aug 20

Northern Harrier: S: Apr 16 - 1; Jun 9 - 1; 28 Apr 28; F: Jul 17 - 1; Sep 17 - 6

Sharp-shinned Hawk: S: Apr 18 - 1; Jun 8 - 1; 8 - Apr 29; F: Jul 14 - 1; Sep 22 - 4; 20 - Aug 23 & 26

Northern Goshawk: S: May 4 - 1; May 22 - 1; F: Sep 17 - 1

Broad-winged Hawk: S: Apr 17 - 1; F: Aug 15 - 1

Red-tailed Hawk: S: Apr 17 - 2; Jun 10 - 1; 4 - Apr 27; F: Jul 22 - 1; Sep 9 - 1

Rough-legged Hawk: S: Apr 18 - 1; May 21 - 1

Golden Eagle: S: Apr 20 - 1

American Kestrel: S: Apr 20 - 1; May 7 - 1; 3 May - 5; F: Aug 12 - 1; Sep 3 - 1

Merlin: S: Apr 17 - 3; Jun 4 - 1; 4 Apr 30; F: Jul 17 - 1; Sep 22 - 1; 3 - Aug 15 & 23

Peregrine Falcon: S: May - 1; May 15 - 1; F: Sep 4 - 1

Ruffed Grouse: S: Apr 18 - 1; Jun 11 - 2; F: Jul 16 - 1; Sep 20 - 1

Sandhill Crane: S: Apr 28 - 100; May 22 - 2; 328 - May 4; F: Sep 22 - 2

American Golden Plover: S: May 26 - 4

Semipalmated Plover: S: May 13 - 2; Jun 3 - 2; 10 - May 21; F: Jul 24 - 1; Aug 13 - 4

Killdeer: S: Apr 18 - 1; Jun 11 - 1; 8 - Apr 29; F: Jul 16 - 2; Aug 9 - 1; 2 - Jul 16 & 18

American Avocet: S: May 13 - 4; May 20 - 2; first records at LSLBO

Greater Yellowlegs: S: Apr 25 - 8; Jun 9 - 1; 27 - May 1; F: Jul 24 - 2; Sep 18 - 1; 4 - Aug 13

Lesser Yellowlegs: S: Apr 25 - 4; May 17 - 1; 33 - May 11; F: Jul 17 - 1; Sep 7 - 1; 16 - Jul 29

Solitary Sandpiper: S: Apr 28 - 4; May 14 - 3; 4 - Apr 28; F: Jul 29 - 2; Aug 18 - 7

Spotted Sandpiper: S: May 8 - 3; Jun 11 - 2; **6** - May 21 & 22; F: Jul 14 - 1; Sep 6 - 2; **9** - Aug 30

Sanderling: F: Sep 18 - 2

Upland Sandpiper: F: Jul 29 - 1

Whimbrel: S: Jun 1 - **5**; 1st observatory record

Semipalmated Sandpiper: S: May 19 - **6**; only spring record

Baird s Sandpiper: S: May 16 - 13; Jun 3 - **15**; F: Jul 18 - 7; Aug 25 - 3

Pectoral Sandpiper: S: May 19 - 1

Comm on Snipe: S: May 5 - 1; May 14 -**1**; F: Aug 13 - 1

Wilson s Phalarope: F: Aug 13 - 6

Franklin s Gull: S: Apr 27 - 53; Jun 7 - 1; **515** - May 21; F: Jul 14 - 60; Sep 4 - 2; **4300** - Aug 8

Bonaparte s Gull: S: May 11 - 1; May 24 - **32**; F: Jul 14 - 3; Aug 14 - **42**

Mew Gull: S: May 9 - **22**; May 14 - 1; **22** - May 9 & 10; F: Jul 29 - 1

Ring-billed Gull: S: Apr 18 - 2; Jun 11 - 5; **23** - May 29; F: Jul 14 - 53; Sep 22 - 3; **253** - Aug 7

California Gull: S: May 11 - 6; May 29 - 1; **6** - May 11 & 13; F: Jul 24 - 1; Sep 17 - 1; **12** - Aug 7

Herring Gull: S: Apr 17 - 1; Jun 11 - 3; **14** - Jun 3; F: Jul 14 - 2; Sep 7 - 1; **20** - Aug 11

Caspian Tern: F: Aug 13 - 4

Common Tern: F: Jul 14 - 5; Sep 13 - 2; **12** - Aug 23

Forster s Tern: S: May 23 - 1; Jun 10 - 3; **49** - May 28; F: Jul 14 - 23; Sep 17 - 12; **30** - Aug 2

Black Tern: S: May 29 - 1; only spring record; F: Jul 28 - 3; Jul 29 - **168**

Mourning Dove: S: May 29 - 1

Barred Owl: S: May 19 - 1; May 22 - 1

Short-eared Owl: S: May 4 - 1

Comm on Nighthawk: S: Jun 4 - 2; Jun 6 - 1; F: Aug 23 - 1; Aug 27 - 2

Ruby-throated Hummingbird: S: Jun 4 - 1; only spring record; F: Jul 16 - 1; Aug 12 - 1; **2** - Jul 17

Belted Kingfisher: S: May 2 - 2; May 10 - 1; F: Jul 28 - 1; Sep 16 - 1

Yellow-bellied Sapsucker: S: Apr 29 - 1; Jun 4 - 1; **4** - May 10; F: Jul 20 - 1; Jul 28 - 1

Downy Woodpecker: S: Apr 25 - 1; Jun 4 - 1; F: Jul 14 - 1; Sep 21 - 1; **2** - Jul 17, 21, Aug 3 & 13

Hairy Woodpecker: S: May 7 - 1; Jun 5 - 2; F: Jul 21 - 1; Sep 21 - 1; 3 - Sep 18

Northern Flicker: S: Apr 28 - 5; Jun 11 - 1; 29 - May 2; F: Jul 17 - 2; Sep 21 - 1; 2 - Jul 17 & Sep 3

Pileated Woodpecker: S: Apr 16 - 1; Apr 29 - 1; 2 - Apr 28; F: Aug 17 - 2; Sep 17 - 1;

Olive-sided Flycatcher: S: Jun 10 - 1; only record; F: Aug 11 - 1; Aug 25 - 1

Western Wood-Pewee: S: May 29 - 1; Jun 4 - 1; F: Jul 14 - 1; Aug 18 - 1; 3 - Aug 9

Yellow-bellied Flycatcher: S: Jun 1 - 1; Jun 8 - 1; F: Aug 8 - 1

Alder Flycatcher: S: May 16 - 1; Jun 11 - 3; 10 - Jun 4, 5, 6, & 7; F: Jul 14 - 3; Sep 19 - 1; 9 - Aug 9

Least Flycatcher: S: May 6 - 1; Jun 11 - 2; 48 - May 23; F: Jul 14 - 2; Sep 13 - 1; 15 - Aug 11

Eastern Phoebe: S: Apr 27 - 1; Jun 11 - 2; 8 - May 1; F: Jul 14 - 4; Sep 13 - 1; 6 - Jul 26

Say's Phoebe: S: Apr 29 - 1; May 19 - 4; 20 - May 1; F: Aug 15 - 2; Aug 28 - 1

Eastern Kingbird: S: Jun 2 - 3; only spring record; F: Jul 23 - 1; Aug 30 - 1; 14 - Aug 22

Horned Lark: S: May 17 - 6; May 23 - 1

Tree Swallow: S: Apr 28 - 19; Jun 8 - 2; 148 - Apr 29; F: Jul 17 - 1; Aug 22 - 32; 94 - Jul 27

Bank Swallow: S: May 21 - 6; Jun 11 - 1; 20 - May 23; F: Jul 23 - 1; Aug 26 - 2; 45 - Jul 28

Cliff Swallow: S: May 23 - 3; May 26 - 1; F: Jul 23 - 1

Barn Swallow: S: May 16 - 1; Jun 11 - 1; 2 - May 26 & Jun 7; F: Jul 15 - 1; Aug 30 - 1; 7 - Jul 25

Gray Jay: S: Jun 9 - 1

Blue Jay: S: May 7 - 2; Jun 9 - 1; 15 - May 26; F: Jul 22 - 1; Sep 21 - 1; 4 - Aug 22

American Magpie: S: Apr 19 - 5; Jun 9 - 1; 5 - Apr 19; F: Aug 10 - 5; Sep 20 - 2; 33 - Aug 26

American Crow: S: Apr 16 - 2; Jun 11 - 6; 16 - Apr 29; F: Jul 14 - 4; Sep 18 - 1; 43 - Aug 14

Common Raven: S: Apr 17 - 3; Jun 10 - 1; 13 - May 22; F: Jul 14 - 2; Sep 22 - 4; 20 - Jul 23

Black-capped Chickadee: S: Apr 16 - 10; Jun 8 - 1; 17 - Apr 27; F: Jul 14 - 9; Sep 22 - 6; 15 - Sep 5

Boreal Chickadee: S: May 13 - 1; F: Aug 12 - 1; Sep 16 - 3; 4 - Sep 13

Red-breasted Nuthatch: S: Apr 26 - 1; Jun 9 - 1; F: Jul 14 - 2; Sep 22 - 1; 20 - Sep 3

White-breasted Nuthatch: S: May 10 - 1

Brown Creeper: F: Jul 18 - 1; Sep 13 - 1

House Wren: S: May 24 - 1; Jun 6 - 1; 2 - Jun 4 & 5

Winter Wren: S: May 7 - 1; May 11 - 1; F: Jul 28 - 1; Aug 18 - 1

Golden-crowned Kinglet: S: Apr 23 - 1; May 13 - 1; F: Jul 28 - 1; Sep 20 - 1; 3 - Sep 12

Ruby-crowned Kinglet: S: Apr 19 - 1; May 29 - 1; 5 - Apr 29; F: Jul 16 - 1; Sep 22 - 1; 7 - Sep 16

Mountain Bluebird: S: Jun 7 - 2

Gray-cheeked Thrush: May 10 - 1; May 29 - 1; 4 - May 16; F: Sep 17 - 1; Sep 21 - 2

Swainson s Thrush: S: May 14 - 3; Jun 11 - 1; 20 - May 23; F: Jul 14 - 7; Sep 20- 1; 8 - Jul 23 & 27, Aug 9 & 23

Hermit Thrush: S: Apr 29 - 1; Jun 9 - 1; 3 - May 1; F: Jul 22 - 1; Sep 20 - 1; 3 - Sep 18

America n Robin: S: Apr 17 - 1; Jun 11 - 2; 2300 - Apr 29; F: Jul 14 - 1; Sep 18 - 1; 14 - Jul 28

America n Pipit: S: Apr 24 - 2; May 24 - 1; 242 - May 1; F: Aug 26 - 1; Sep 22 - 6; 36 - Sep 11

Cedar Waxwing: S: May 28 - 2; Jun 9 - 4; 120 - May 29; F: Jul 14 - 10; Sep 21 - 3; 156 - Aug 15

European Starling: S: Apr 26 - 4; May 25 - 8; 21 - Apr 29

Gray Catbird: S: May 29 - 1; May 31 - 1

Blue-headed Vireo: S: May 10 - 1; May 27 - 1; 3 - May 15; F: Aug 8 - 3; Sep 11 - 1

Warbling Vireo: F: Jul 14 - 1; Aug 11 - 1; 2 - Aug 9

Philadelphia Vireo: S: May 27 - 1; only spring record; F: Jul 22 - 2; Sep 18 - 1; 5 - Aug 9

Red-eyed Vireo: S: May 27 - 4; Jun 11 - 3; 7 Jun 2 & 3; F: Jul 14 - 4; Sep 18 - 1; 13 - Aug 3

Tennessee Warbler: S: May 12 - 2; Jun 11- 2; 13 - May 23; F: Jul 14 - 6; Sep 6 - 2; 486 - Aug 12

Orange-crowned Warbler: S: Apr 30 - 2; May 14 - 2; 21 - May 1; F: Jul 22 - 1; Sep 22 - 9; 28 - Sep 16

Yellow Warbler: S: May 5 - 3; Jun 11 - 3; 47 - May 23; F: Jul 14 - 15; Sep 16 - 2; 44 - Jul 18

Magnolia Warbler: S: May 21 - 1; Jun 10 - 2; 8 - May 27; F: Jul 14 - 4; Sep 8 - 1; 27 - Aug 9

Cape May Warbler: S: May 16 - 1; only spring record; F: Jul 28 - 1; Aug 31 - 1; 2 - Aug 8

Yellow-rumped Warbler: S: May 5 - 3; Jun 11 - 2; 2634 - Apr 29; F: Jul 14 - 63; Sep 22 - 5; 1649 - Sep 12

Black-throated Green Warbler: S: May 13 - 1; Jun 11 - 1; 4 - May 14 & 16; F: Jul 21 - 1; Aug 22 - 1; 5 - Aug 11 & 12

Palm Warbler: S: Apr 30 - 1; May 24 - 1; 6 - May 14; F: Aug 17 - 1; Sep 21 - 3; 11 - Sep 17

Bay-breasted Warbler: F: Jul 22 - 1; Sep 3 - 1; 4 - Aug 9

Blackpoll Warbler: S: May 11 - 2; May 31 - 1; 3 - May 18; F: Jul 24 - 1; Sep 3 - 1; 10 - Aug 31

Black-and-white Warbler: S: May 4 - 1; Jun 11 - 2; 10 - May 14; F: Jul 15 - 2; Sep 16 - 1; 25 - Aug 15

American Redstart: S: May 14 - 2; Jun 11 - 11; 44 - May 27; F: Jul 14 - 20; Sep 17 - 2; 59 - Aug 15

Ovenbird: S: May 13 - 3; Jun 11 - 2; 6 - May 29; F: Jul 14 - 11; Sep 17 - 1

Northern Waterthrush: S: May 9 - 2; Jun 4 - 1; 5 - May 11 & 15; F: Jul 14 - 1; Aug 30 - 2; 6 - Aug 27

Connecticut Warbler: S: May 22 - 1; Jun 8 - 1

Mourning Warbler: S: May 23 - 2; Jun 8 - 1; 4 - Jun 4 & 6; F: Jul 14 - 1; Aug 30 - 1; 11 - Aug 15

Common Yellowthroat: S: May 13 - 1; Jun 11 - 2; 5 - May 23 & Jun 4; F: Jul 17 - 2; Sep 16 - 1; 6 - Jul 26 & Aug 11

Wilson's Warbler: S: May 21 - 2; May 27 - 2; F: Aug 1 - 1; Sep 16 - 3; 10 - Aug 15

Canada Warbler: S: May 22 - 2; Jun 11 - 4; 16 - Jun 2; F: Jul 14 - 1; Aug 31 - 1; 24 - Aug 9

Western Tanager: S: May 8 - 1; Jun 11 - 1; 2 - May 12, 19, & 21; F: Jul 14 - 2; Sep 6 - 1; 15 - Aug 11

Rose-breasted Grosbeak: S: May 12 - 1; Jun 9 - 1; 4 - May 15, 16, & 23; F: Jul 14 - 1; Aug 21 - 1; 15 - Aug 3

American Tree Sparrow: S: Apr 19 - 13; May 5 - 1; 85 - Apr 22; F: Sep 21 - 3

Chipping Sparrow: S: May 3 - 1; Jun 11 - 1; 3454 - May 19; F: Jul 15 - 7; Sep 21 - 1; 90 - Jul 28

Clay-colored Sparrow: S: May 8 - 4; Jun 11 - 1; 55 - May 23; F: Jul 14 - 1; Aug 29 - 2; 4 - Jul 25

Vesper Sparrow: S: May 1 - 1; May 15 - 1

Savannah Sparrow: S: Apr 28 - 3; May 23 - 1; 19 - May 1; F: Aug 30 - 1; Sep 16 - 2

Le Conte's Sparrow: S: May 14 - 1; May 26 - 2; F: Aug 28 - 1

Fox Sparrow: S: May 2 - 1; only spring record; F: Sep 18 - 1; Sep 20 - 1

Song Sparrow: S: Apr 30 - 1; Jun 11 - 1; 7 - May 4; F: Jul 14 - 1; Aug 14 - 1; 4 - Jul 26

Lincoln's Sparrow: S: May 1 - 3; Jun 11 - 1; 8 - May 15; F: Jul 17 - 2; Sep 16 - 9

Swamp Sparrow: S: May 23 - 1

White-throated Sparrow: S: May 1 - 2; Jun 11 - 5; 30 - May 14; F: Jul 14 - 6; Sep 22 - 2; 11 - Jul 17 & Aug 2

White-crowned Sparrow: S: Apr 22 - 1; May 23 - 2; 16 - May 15; F: Sep 7 - 3; Sep 22 - 4; 7 - Sep 18

Dark-eyed Junco: S: Apr 17 - 1; Jun 5 - 1; 642 - Apr 20; F: Sep 11 - 2; Sep 22 - 2; 11 - Sep 21

Red-winged Blackbird: S: Apr 26 - 5; Jun 5 - 1; 700 - Apr 29; F: Jul 21 - 16; Sep 13 - 9; 99 - Jul 25

Yellow-headed Blackbird: S: May 16 - 1; May 26 - 1; F: Jul 17 - 2; Aug 14 - 1; 9 - Jul 28

Rusty Blackbird: S: Apr 27 - 15; May 8 - 2; 110 - Apr 29; F: Sep 18 - 7

Common Grackle: S: Apr 28 - 27; Jun 3 - 1; 183 - Apr 29; F: Aug 1 - 4; Sep 21 - 1; 36 - Aug 15

Brown-headed Cowbird: S: Apr 21 - 3; Jun 9 - 1; 142 - May 13; F: Jul 17 - 2; Aug 13 - 1

Baltimore Oriole: S: May 13 - 2; May 26 - 2; 3 - May 23

Purple Finch: S: Apr 26 - 3; May 21 - 1; 54 - Apr 28; F: Jul 21 - 1; Sep 13 - 2; 34 - Aug 15

White-winged Crossbill: F: Jul 14 - 5; Sep 17 - 22; 120 - Jul 23

Common Redpoll: S: Apr 16 - 1; Apr 24 - 2; 79 - Apr 20

Pine Siskin: S: Apr 28 - 1; Jun 6 - 1; 80 - May 29; F: Jul 14 - 6; Sep 22 - 72; 293 - Jul 25

American Goldfinch: S: May 26 - 4; Jun 8 - 6; 26 - Jun 27

Evening Grosbeak: S: Apr 16 - 10; May 19 - 1; 100 - May 3; F: Jul 17 - 2; Sep 17 - 4; 19 - Jul 24