



# Beaverhill Bird Observatory

Summer Report 2015

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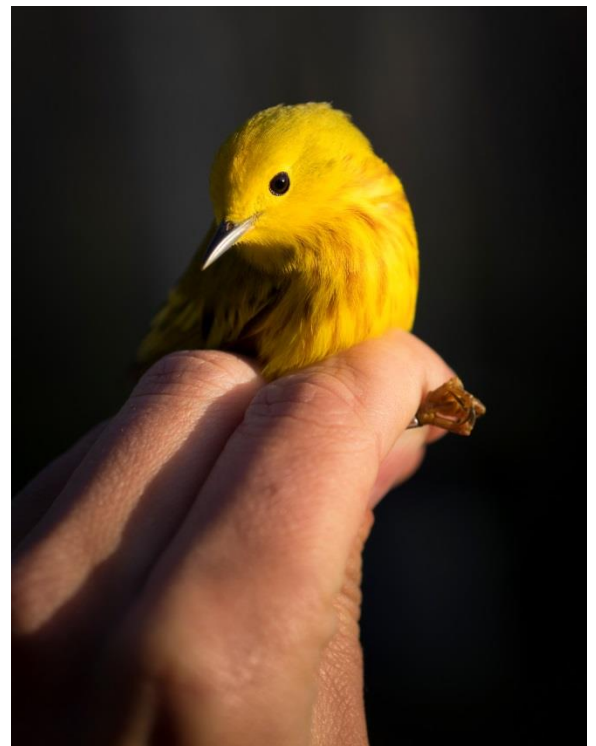
## **Executive Summary**

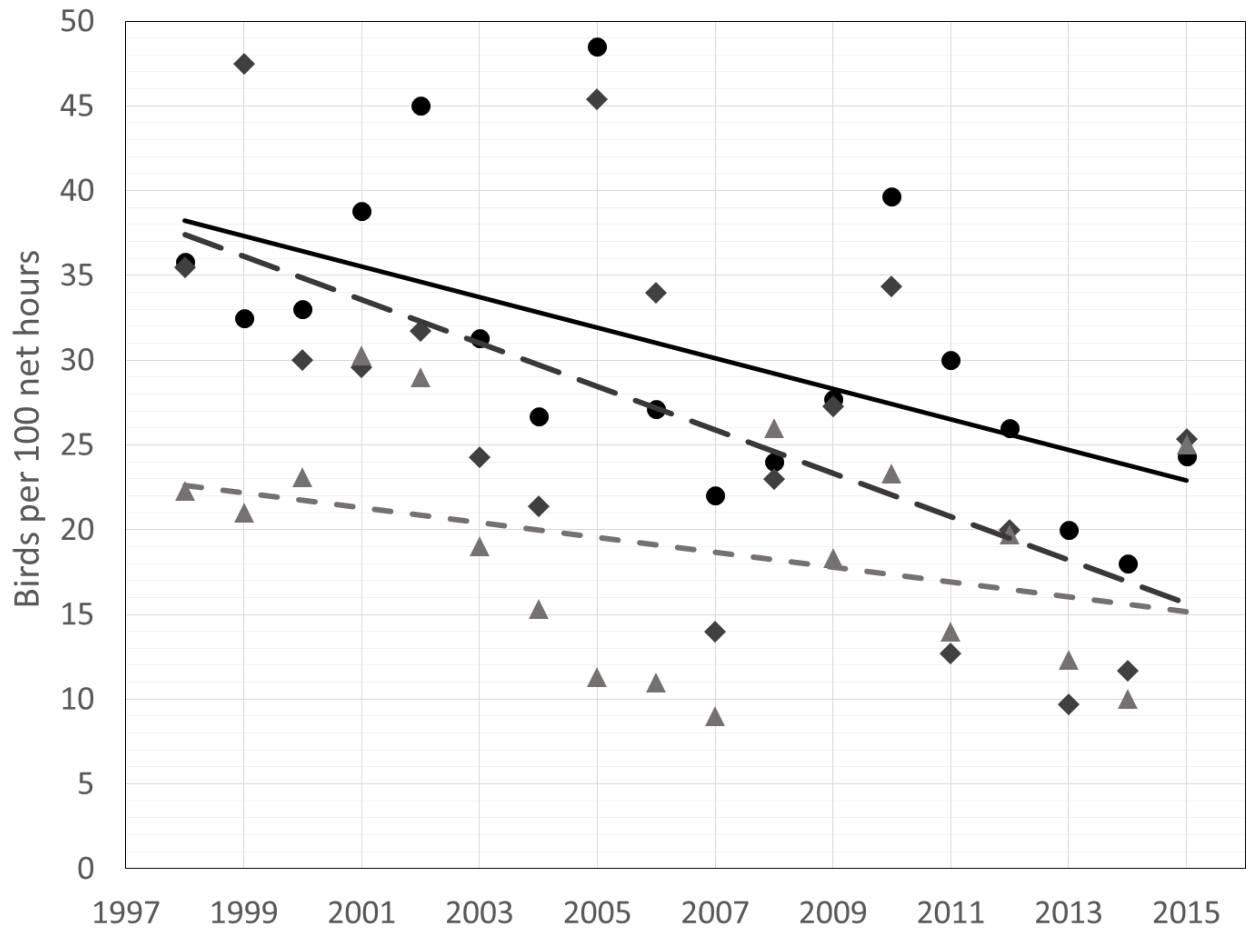
The Beaverhill Bird Observatory summer programs were run by Head Biologist Jonathan DeMoor, and Assistant Biologists Emily Cicon and Meghan Jacklin. Banding activities included three MAPS (Monitoring Avian Productivity and Survivorship) stations, and over 1000 Tree Swallow and House Wren hatchlings banded from nest boxes. Capture rates at the MAPS stations were higher than in recent years, but the species diversity of the birds captured was lower. Five rounds of point counts were conducted at nine stations in each of the three MAPS stations. Staff initiated a new vegetation monitoring program, and sampled the vegetation structure at 110 plots along 500 meter transects crossing the habitat gradient from young forest out to the grassland on the old Beaverhill lakebed. Staff searched for and monitored natural nests and bat boxes, wrote scientific and interpretive articles, and interacted with volunteers and visitors to the lab.

## **Monitoring Avian Productivity and Survivorship**

The Monitoring Avian Productivity and Survivorship (MAPS) program was initiated in 1989 by the Institute for Bird Populations, and is a cooperative effort by banders across Canada and the United States to provide long-term, continuous data on the population demographics of bird species that breed in North America. Mist-netting and banding is the primary data collection method for the MAPS program. The data collected at MAPS stations allow researchers to assess whether observed population changes are due to changes in annual reproductive success (productivity, i.e. how many new birds are fledged in the summer), inter-annual mortality (survivorship, i.e. how many birds survive the winter to return to breed), or both.

The Beaverhill Bird Observatory has been participating in the MAPS program since its pilot year, and currently operates three stations in the Beaverhill Natural Area each year. Prior to the start of the summer season, we conducted an analysis of the capture rates at each of the MAPS stations and made the decision to continue operating all three, despite declining capture rates at each station.





**Figure 1. Capture rates since 1998 at three MAPS (Monitoring Avian Productivity and Survivorship) stations at the Beaverhill Bird Observatory. BLAB station: black circles, WEIR station: dark grey diamonds, PARK station: light grey triangles.**

### *Mist Netting Summary*

Constant effort mist-netting is the main method of data collection for MAPS. At each station we set up ten standard songbird mist nets (12 m long by 2.6 m tall, 30mm mesh) at sunrise and monitored them for 6 hours in each ten day period between June 10 and July 30. Banding only occurred during standard weather conditions with no significant precipitation, temperatures between 0 °C and 27 °C, and wind speed less than 20 km/h. Overall, capture rates were higher than in recent years but species diversity was lower.

### *BLAB Station*

The BLAB station (est. 1989) is located in the area immediately surrounding the BBO banding lab (N53.38055° W112.52737°). The habitat structure is described as young poplar, aspen, and willow adjacent to a riparian habitat. However, due to low lake levels the station is no longer adjacent to a riparian area, and no riparian bird species were

captured. We banded at BLAB on June 10 and 23, and July 1, 10, and 21. We made up two hours that were missed on one net (due to necessary repairs) later in the same period, so that all 300 hours of standard effort were completed.



We recorded 73 captures of 49 individual birds, for a capture rate of 24.3 birds per 100 net-hour (b/100 nh). This is a higher capture rate than the past two years, but is close to the average for this station over the past ten years (28.3 b/100 nh, Figure 1). Least Flycatchers were by far the most dominant species captured, accounting for 92% of all captures, and 88% of the individuals caught (Table 1). We captured only six species at the BLAB station, which is 65% lower than the average species diversity caught in the past ten years (average=9.2 species/year), and the lowest species diversity of the three stations this year.

One highlight was the recapture of a Least Flycatcher, pictured here, originally banded in 2013 Veracruz, Mexico—a 4300 km straight-line distance from BBO! We caught this bird last year as well, and she is clearly breeding in the Natural Area.

### *WEIR Station*

The WEIR station (est. 1994) is located 1.5 km east of the lab (N53.37997° W112.50539°). The habitat structure of the station is described as balsam poplar, aspen and willow adjacent to a riparian habitat. There was sufficient water in Lister Lake this year for this description to remain accurate, however no riparian species were captured. We banded at WEIR on June 11 and 25, and July 2, 13, and 22 with no hours missed, for a total of 300 net-hours.

We recorded 76 captures of 54 individual birds, for a capture rate of 25.3 birds per 100 net-hours. This is a higher capture rate than any of the past four years, and higher than the average for this station over the past ten years (21.2 b/100 nh, Figure 1). Least Flycatchers were the most common species captured, accounting for 75% of all captures, and 72% of the individuals caught (Table 1). House Wrens were the second most commonly captured species, yet they accounted for only 12% of captures. Species

diversity was higher at the WEIR site than the past two years with seven species captured, but this is still lower than the average species diversity at this station over the past ten years (average=9.2 species/year).

### *PARK Station*

The PARK station (est. 1996) is located 0.5 km south of the lab (N53.37619° W112.52912°). The habitat structure of the station is described as balsam poplar, aspen, and willow with a raspberry and wild rose shrub layer. We banded at the PARK station on June 12 and 26, and July 3, 14, and 23 with no hours missed, for a total of 300 net-hours.

We recorded 75 captures of 55 individual birds, for a capture rate of 25.0 birds per 100 net-hours. This is the highest capture rate recorded at the PARK station since 2002, and 61% higher than the average for this station over the past ten years (15.5 b/100 nh, Figure 1). Least Flycatchers were the dominant species captured, accounting for 83% of all captures, and 78% of the individual birds caught (Table 1). Species diversity at the PARK station was the highest of the three stations this year, with nine species captured. This is unusual—in 9 of the 10 previous years PARK has had the lowest diversity. This difference is accounted for more by decreased diversity in the other two sites this year, as species diversity at PARK was only 20% higher than the average diversity at this station over the past ten years (average=7.4 species per year).



**Table 1. Total number and type of capture per species during 2015 summer banding programs at Beaverhill Bird Observatory (BBO). Repeat captures were banded in 2015 at BBO, Return captures were banded at BBO in a previous year, Foreign captures were banded at a location other than BBO, and Other captures were caught in a mist net but released un-banded.**

<b>a) BLAB MAPS station</b>		<b>Captures</b>					
<b>Species</b>	<b>Individuals</b>	<b>New</b>	<b>Repeat</b>	<b>Return</b>	<b>Foreign</b>	<b>Other</b>	<b>Total</b>
Least Flycatcher	43	26	29	11	1		67
American Robin	2	2					2
Brown-Headed Cowbird	1		1				1
American Goldfinch	1	1					1
Yellow Warbler	1	1					1
House Wren	1	1					1
<b>Total</b>	<b>49</b>	<b>31</b>	<b>30</b>	<b>11</b>	<b>1</b>		<b>73</b>

<b>b) WEIR MAPS station</b>		<b>Captures</b>					
<b>Species</b>	<b>Individuals</b>	<b>New</b>	<b>Repeat</b>	<b>Return</b>	<b>Foreign</b>	<b>Other</b>	<b>Total</b>
Least Flycatcher	39	30	18	9			57
House Wren	5	5	4				9
Brown-Headed Cowbird	4	2		2			4
Warbling Vireo	2	2					2
American Robin	2	2					2
Yellow-Bellied Sapsucker	1	1					1
Tree Swallow	1	1					1
<b>Total</b>	<b>54</b>	<b>43</b>	<b>22</b>	<b>11</b>			<b>76</b>

<b>c) PARK MAPS station</b>		<b>Captures</b>					
<b>Species</b>	<b>Individuals</b>	<b>New</b>	<b>Repeat</b>	<b>Return</b>	<b>Foreign</b>	<b>Other</b>	<b>Total</b>
Least Flycatcher	43	33	22	7			62
Brown-Headed Cowbird	2	2					2
American Goldfinch	2	2					2
Warbling Vireo	2	2					2
Black-Capped Chickadee	2	1	1				2
Clay-Colored Sparrow	1	1	1				2
Downy Woodpecker	1	1					1
White-Breasted Nuthatch	1	1					1
Hermit Thrush	1	1					1
<b>Total</b>	<b>55</b>	<b>44</b>	<b>24</b>	<b>7</b>			<b>75</b>

<b>d) BBO lab and nest boxes</b>		<b>Captures</b>					
<b>Species</b>	<b>Individuals</b>	<b>New</b>	<b>Repeat</b>	<b>Return</b>	<b>Foreign</b>	<b>Other</b>	<b>Total</b>
Tree Swallow	922	879	5	42			926
House Wren	122	122					122
Black-Capped Chickadee	7	5	1	1			7
American Goldfinch	5	5					5
Mountain Bluebird	5	5					5
<b>Total</b>	<b>1061</b>	<b>1016</b>	<b>6</b>	<b>43</b>			<b>1065</b>

### *Point Counts*

We conducted standard 10-minute point count surveys at nine locations at each MAPS station on the same day that banding occurred. Although this data is no longer collected by MAPS program coordinators, they remain a valuable part of the long-term population monitoring of the Beaverhill Bird Observatory. Point count surveys are especially important for monitoring species that are less likely to be trapped in the mist nets.

We recorded 1405 detections of individual birds from 54 species (Table 2). The BLAB station had the highest bird abundance with 573 (40%) detections, followed by WEIR and PARK with 471 (35%) and 361 (25%) detections, respectively. Species diversity was highest in BLAB and WEIR with 39 species detected at both stations, although the species composition differed substantially between these stations. The PARK station had the lowest species diversity with 32 species detected.

At all three stations, Least Flycatchers were the most commonly detected, accounting for 27% of all detections. Overall, Warbling Vireo (9% of detections) and House Wren (8% of detections) were the next-most commonly detected species (Table 2). The BLAB station accounted for the majority of the detections of the next-most commonly detected species: Canada Goose (due to a single flock flying over during the first round), American Goldfinch (due to the presence of feeders near the lab), and Tree Swallow (due to the station's close proximity to the Tree Swallow nest box grid). Brown-headed Cowbird, Black-capped Chickadee, and Yellow Warbler were the next-most commonly detected species that were abundant at all three stations.



**Table 2. Number of detections per species during point count surveys at three MAPS (Monitoring Avian Productivity and Survivorship) stations in 2015 at the Beaverhill Bird Observatory.**

Species	BLAB	WEIR	PARK	Total	Species	BLAB	WEIR	PARK	Total
Pied-billed Grebe		3	1	4	Brown-headed Cowbird	24	22	21	67
Common Loon		1		1	Yellow-headed Blackbird		13		13
Franklin'S Gull	1	3	4	8	Red-winged Blackbird	13	20	11	44
Black Tern		6		6	Baltimore Oriole	8	13	6	27
Mallard			1	1	White-winged Crossbill		1		1
Blue-winged Teal		1		1	American Goldfinch	38	13	25	76
Unknown Duck	1	21		22	Pine Siskin	5	1	5	11
Canada Goose	80	4		84	White-throated Sparrow			2	2
American Bittern	2	2		4	Clay-colored Sparrow	10	6	1	17
Sora	2	4	2	8	Song Sparrow	1	2		3
American Coot	3	17	1	21	Rose-breasted Grosbeak	2	1	2	5
Wilson's Snipe	3	6		9	Tree Swallow	63	8	3	74
Greater Yellowlegs	2	4		6	Cedar Waxwing	6	1	6	13
Lesser Yellowlegs		1		1	Red-eyed Vireo	2	2	2	6
Red-tailed Hawk			1	1	Warbling Vireo	44	36	40	120
Long-eared Owl		2		2	Tennessee Warbler	1		3	4
Ruffed Grouse	1			1	Yellow Warbler	19	21	18	58
Hairy Woodpecker	5			5	Magnolia Warbler	1	1		2
Downy Woodpecker	1	3	3	7	Ovenbird	1			1
Yellow-bellied Sapsucker	3		4	7	Common Yellowthroat		1	1	2
Yellow-shafted Flicker	1		1	2	American Redstart	3			3
Ruby-throated Hummingbird			1	1	House Wren	34	47	31	112
Alder Flycatcher	1			1	White-breasted Nuthatch	2		2	4
Least Flycatcher	144	129	112	385	Black-capped Chickadee	26	16	20	62
Black-billed Magpie		1		1	Swainson'S Thrush	1			1
Blue Jay	1	1		2	Hermit Thrush			1	1
Common Raven	7	12	24	43	American Robin	11	24	6	41
					<b>Total detections</b>	<b>573</b>	<b>471</b>	<b>361</b>	<b>1405</b>
					<b>Total species</b>	<b>17</b>	<b>19</b>	<b>12</b>	<b>27</b>



## **Other Banding**

### *Tree Swallows*

Three interns (Drew, Jordan, and Martijn, supervised by Geoff) monitored 205 nest boxes for the presence and development of Tree Swallow nestlings. The monitored boxes were located along the old shoreline north of the lab (older “T” grid, 90 boxes), in the grassland northwest of the weir (newer “S” grid, 50 boxes), and along Township Road 510 just south of the Natural Area (“R” grid, 65 boxes). Interns noted clutch sizes, approximate hatch dates, and nest success rates. Using the dates provided by the interns, we banded as many of the nestlings as possible while they were between 10-12 days old.

Helen Trefry and Geoff Holroyd re-trapped adult Tree Swallows in the spiral grid to determine return rates and particularly retrieve geolocators. They retrieved 13 geolocators for a two year total of 24. Maps and an article will be compiled in cooperation with Bird Studies Canada and University of Guelph.

A University of Alberta graduate student studied biochemistry of nestling swallows on the “S” grid and 30 Tree Swallow nests (15 from Gregg Lake) were supplied to another UofA graduate student for her study of nest parasites.

We also opportunistically banded any adults that we found in the nest boxes while banding nestlings. In total we banded 879 new Tree Swallows, and recorded 47 recaptures of previously banded birds (Table 1).

### *Mountain Bluebirds*

We continued to monitor the three Tree Swallow boxes occupied by Mountain Bluebird pairs, and banded an additional five nestlings in addition to those banded earlier in the spring.

### *House Wrens*

Two interns (Cala and Danielle, supervised by Emily) monitored 99 nest boxes in four grids in the Natural Area. Interns noted clutch sizes, approximate hatch dates, and nest success rates, and collected additional data to use for an analysis on nest site selection. Using the dates provided by the interns, we banded as many of the nestlings as possible while they were between 12-14 days old. We also opportunistically banded any adults that we found in the nest boxes while banding nestlings. In total we banded 122 new House Wrens from the nest boxes (Table 1).

### *Feeder Nets*

We set up two nets near the feeders by the banding lab to use for banding demonstrations and training purposes. We opened these nets for a short time on the 20<sup>th</sup> of June while hosting a group from the Tofield Nature Centre and caught seven Black-capped Chickadees and five American Goldfinches (Table 1).

### **Nest Searches**

We attempted to locate and monitor as many natural nests as possible during the course of our other summer activities. In the end, we found 22 nests from 8 species (Table 3). For each nest we found, we completed a nest record card to be submitted to the Prairie Nest Records Scheme. This data is used to study breeding biology as well as monitor distributional changes and nesting success of birds in the prairie provinces.



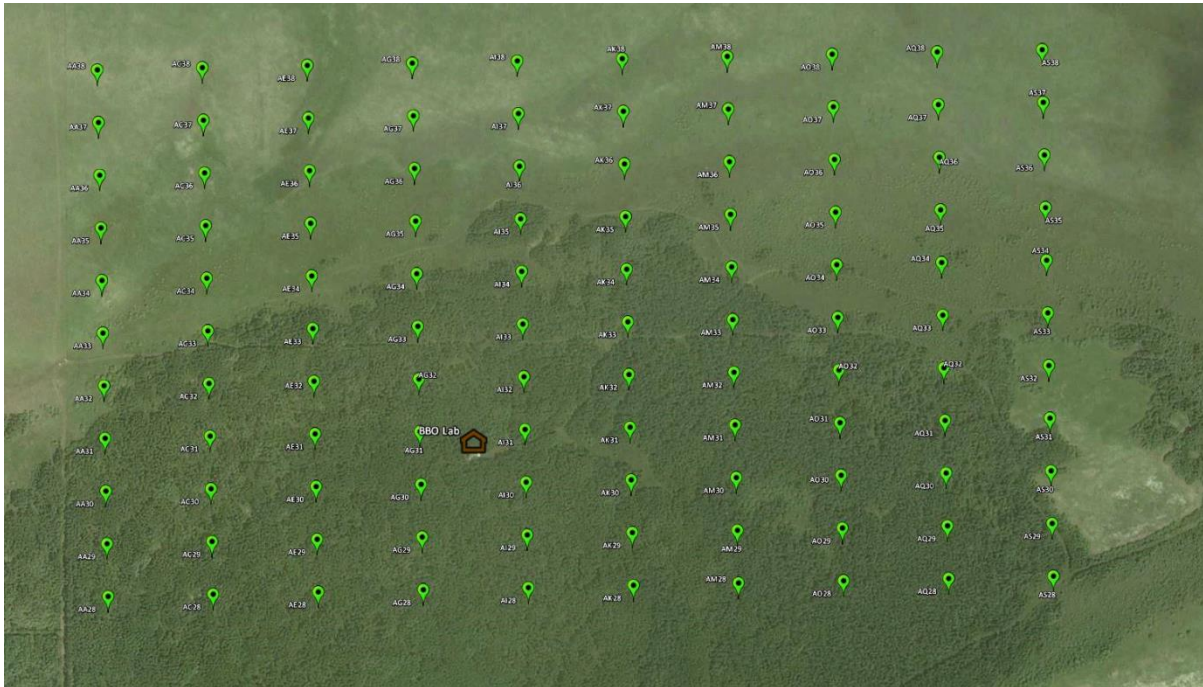
**Table 3. Number of nests found per species in the Beaverhill Natural Area in June and July 2015**

<b>Species</b>	<b>Number of nests found</b>
Duck species	3
Northern Saw-whet Owl	1
Downy Woodpecker	1
Least Flycatcher	6
Common Raven	1
Clay-colored Sparrow	1
Yellow Warbler	3
Mountain Bluebird	6

### **Vegetation Monitoring**

Significant habitat change has occurred at BBO since the original net lanes were established over thirty years ago. As the lake receded, and eventually dried up completely, the habitat in the vicinity of the lab and surrounding the net lanes has progressed from shoreline and willow habitat to young aspen and balsam poplar forest. Unfortunately, this transition has not been well documented, despite being a requirement for Canadian Migration Monitoring Network stations. In June and July 2015, we began to implement a new protocol to make systematic measurements of the vegetation at all current and previous net lane locations, and across the habitat gradient along the old lake shoreline.

We measured vegetation structure and species composition at 110 plots spaced 50 m apart along 10 transects running north-south across the transition from poplar forest through the shrubby transition zone to grassland on the old lakebed (Figure 2). This was a time-consuming and laborious task, and we appreciated the help of the volunteers who came to help out. The data that we collected will be compiled and analyzed over the winter and a preliminary report will be written to summarize our findings.



**Figure 2. Location of 110 vegetation structure measurement plots established and sampled in the Beaverhill Natural Area in July 2015.**

### **Bat boxes**

In early July we installed 6 additional bat boxes in the Natural Area to increase roosting options for little brown bats—a federally listed species—and monitored the boxes for occupancy several times a week, with a total of ten checks. We found bats on nearly half the checks, usually in singles or occasionally in pairs. With the assistance of intern Steven and Geoff, we placed two of the new boxes out in the open, two in small openings in the forest, and two under the closed canopy. Over the winter we will analyze the data to determine if any of these boxes were used preferentially, which will allow us to optimally position any additional bat boxes installed in the future.

## **Outreach and Interpretation**

The number of walk-in visitors to the lab decreased somewhat compared to this spring, but there were still plenty of opportunities to interact with people out for a walk in the Natural Area. We hosted groups from the Tofield Nature Centre, the Clandonald and Tofield schools, and led a nature walk with Nature Alberta's NatureKids club.

The reach of the Beaverhill Bird Observatory Facebook page continued to grow, from 543 people following the page in June to 576 (increase of 33) by the end of August. Staff and volunteer board members posted six updates to the page in June and July.

## **Other Activities**

Between banding rounds and veg surveys we kept busy repairing nets, doing maintenance around the lab, catching up on data entry, and writing reports. Emily and Meghan spent three days banding at a MAPS station in Cypress Hills and three days at the Lesser Slave Lake Bird Observatory (LSLBO) to gain experience in how other stations operate. An intern (Nikki, supervised by John Acorn) conducted eight surveys for butterflies in the Natural Area, and another (Robert, supervised by Geoff Holroyd) conducted spot-mapping surveys in a newly established forest breeding bird grid.

## **Acknowledgements**

We'd like to thank the volunteers and visitors that came out to the lab this summer to help out and provide good company. Special thanks to Robin who came out for ten days of banding and vegetation surveys—your help was very much appreciated!

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