

Teslin Lake Bird Observatory Annual Report 2017



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Society of Yukon Bird Observatories
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**Environment
Canada**

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**Yukon Fish and Wildlife
Enhancement Trust**



**Yukon
Bird Club**

Cover Photo: A hatch year Magnolia Warbler banded at the observatory on August 24, 2017 was the fourth record of the species at the site (Photo: Jukka Jantunen).

The Teslin Lake Bird Observatory is operated by the **Society of Yukon Bird Observatories** (SOYBO; PO Box 30056, Whitehorse, YT, Y1A 5M2). SOYBO was established in 2010 to serve as an umbrella society to coordinate bird monitoring activities and associated educational programs at the Yukon Bird Observatories field stations. The objectives of SOYBO are: (1) contribute to the conservation of migratory birds in western North America, (2) to help people learn about the natural history and conservation of Yukon avifauna, and, (3) to work with other societies, organizations and individuals with similar objectives. For further information, visit the SOYBO website at www.yukonbirdobservatories.org

SUMMARY

During 2015, the Yukon Bird Observatories (Teslin Lake and Albert Creek) were granted full membership status to the Canadian Migration Monitoring Network (CMMN). The Yukon Bird Observatories are the northernmost and the only stations located within the core of Canada's Boreal Forest.

The Teslin Lake Bird Observatory completed its tenth consecutive year of fall migration monitoring in 2017. The field station operated for a total of 85 days between July 26 and October 20. The observatory has followed the same operating procedures since standardized migration monitoring began during the fall of 2008.

Crews followed standard methods to mist net, handle, band and record information from captured birds. They banded a total of 3,369 birds of 47 species with 7,812 net hours (43.13 birds/100 net hours). Myrtle Warbler, Alder Flycatcher, Boreal Chickadee, Slate-colored Junco and Orange-crowned Warbler were the five most common species banded, accounting for over 68% of all individuals banded. These have been among the top species banded in previous years although the banding total of 654 Myrtle Warblers was higher than average and very near the highest total to date (637 during 2011).

Visual migration and lake counts were conducted to collect monitoring data for bird species not adequately sampled by mist netting (for example diurnal raptors, loons and grebes). Between July 26 and October 20, personnel spent 235.58 hours doing visual counts and observed 24,539 (87 birds per hour) which is the lowest recorded to date (previous low of 147 birds per hour during 2013). The 2017 observations included 980 individuals of 12 diurnal raptor species, of which two are regional species of interest for monitoring - Swainson's Hawk and American Kestrel. The remaining visual migrants included a number of species with the most common species being Tundra Swan, unidentified passerines, American Robin/Varied Thrush, White-winged Crossbill/unidentified crossbills and Common Redpoll/Pine Siskin. Lake counts were done daily throughout each day of the observatory's operation and tallied 120 bird days of shorebirds, 5,153 bird days of loons, grebes and gulls, and 774 bird days of waterfowl. The most frequently observed species within each species group included: Spotted Sandpiper, Herring Gull and Red-breasted Merganser.

Building upon testing of methods in previous years, audio equipment was used to broadcast recorded calls to lure and band Boreal Owls in the standard count area. On 3 nights between September 13 and October 10, 3 Boreal Owls were banded with 30.5 net hours of effort.

Noteworthy results from 2017 included:

- The number of birds banded was above the long term and the capture rate of birds per 100 net hours (43.1) was also slightly above the long-term average (42.3) but below the long-term high of 61.4 during 2009.
- Numerous species were banded in relatively high numbers with Myrtle Warbler and Boreal Chickadee being the most notable.
- A single new species was banded at the observatory (Black-billed Magpie) and three new species were observed including: Ring-billed Gull, Western Kingbird and Clark's Nutcracker.
- To date a total of 35,335 birds of 94 species have been banded at the observatory and 204 species have been observed.

- The visual counting effort was consistent with the amount of effort in previous years and the total number of birds observed (87 birds/hour) was the lowest recorded to date; the previous low was 147 birds/hour during 2013.
- A total of 980 raptors and 9,497 waterfowl were observed on the visual migration counts with the most common species being Northern Harrier and Tundra Swan respectively.
- The lake counts tallied a total of 120 bird days of shorebirds (11 species), 757 bird-days of loons (4 species), 759 bird-days of grebes (3 species) and 3,608 bird-days of gulls/terns/jaegers (9 species).
- A total of 19 volunteers spent a total of 780 hours at the observatory and a total of 74 individuals visited the observatory totaling 159 visitor hours.

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1.0 Introduction

This report describes methods and results of work done at the Teslin Lake Bird Observatory from July 26 to October 20, 2017, the tenth year of fall operation at this site. No new activities were undertaken at the observatory in 2017.

Previous annual reports and the database of band recoveries can be found on the Society of Yukon Bird Observatories website: www.yukonbirdobservatories.org

1.1 Background

The observatory collects information on birds which is shared through an international bird banding database (Canadian Wildlife Service Bird Banding Office and USGS Bird Banding Laboratory), Society of Yukon Bird Observatories annual station reports, and other publications. During 2015, the Yukon Bird Observatories (Teslin Lake and Albert Creek) were granted full membership status to the Canadian Migration Monitoring Network (CMMN). The CMMN is a nationwide network of 26 member stations from across Canada that collect standardized bird monitoring data and collaborate on research projects. The Yukon Bird Observatories are the northernmost stations and are located within the core of Canada's western Boreal Forest.

Many of the birds banded and observed at Teslin Lake are highly migratory, spending the winter months as far south as Central and South America. In addition to the knowledge gained from band recoveries, the observatory also continues to gather baseline data of birds (and their migration) in the Teslin region and the Yukon as a whole. Due to the large landmass of the territory, and the relatively few bird biologists and advanced birders in the Yukon, there is still a great deal to be learned regarding the bird life of the Yukon. The observatory serves as a highly valuable research and monitoring project to better understand the distribution of the Yukon's bird species, some of which are considered uncommon or rare. Over the long term, the data collected at the observatory will facilitate trend analysis for a number of species. Such information will be valuable for conservation and monitoring of bird populations not only in the Yukon, but North America as a whole. In addition to monitoring bird populations, the observatory collects a substantial amount of data on each bird banded. Information such as age, sex, measurements (wing, tail, etc.) and molt timing continue to add to the knowledge base of such information across North America.

The observatory plays a role in education as a place where the public, volunteers and students can take part in a unique, community-based research and monitoring project. Numerous people visit the observatory on an annual basis and the field station has become a valuable training opportunity for individuals interested in learning about ornithological research and monitoring methods.

1.2 Goals of the Teslin Lake Bird Observatory

The goals of the Teslin Lake Bird Observatory are to:

- Gather baseline information on birds and bird migration in the Teslin area.
- Collect data to facilitate the long-term monitoring (*i.e.* trend analysis) of birds in the southern Yukon.
- Conduct and participate in specific studies such as feather collecting for stable isotope analysis and color banding.
- Provide a setting for the public including school groups to learn about birds and bird migration.
- Provide employment and training opportunities for students and volunteers.
- Provide a unique tourist attraction for the community of Teslin.

1.3 Objectives of the 2017 Season

The objectives of the 2017 field season at the Teslin Lake Bird Observatory were to:

- Continue the fall monitoring work using previously established protocols,
- Collect an additional year of bird monitoring data to be used for future trend analysis,
- Further refine the techniques to capture and band owls,
- Collect information on the molt timing of adult passerines banded, and,
- Compare 2017 bird migration results to the previous 8 years of similarly collected data.

1.5 Acknowledgements

The 2017 operation of the Teslin Lake Bird Observatory would not have been possible without financial assistance from the following organizations/groups: Environment and Climate Change Canada (Canadian Wildlife Service), Yukon Fish & Wildlife Enhancement Trust Fund, Teslin Renewable Resources Council, Environment Yukon (Environmental Awareness Fund) and EDI Environmental Dynamics Inc. Yukon Parks provided use of a space in the Teslin Lake campground for an extended period of time to allow our long-term volunteers a place to camp for the duration of the 2017 season. Jukka Jantunen's excellent bird identification skills ensured high quality data collection, particularly during the visual migration counts which are challenging to complete with a high level of accuracy and consistency. Jukka has been the Bander in Charge at TLBO since full scale fall operation of the observatory began during 2008. Ted Murphy-Kelly assisted with field operations and observatory logistics including scheduling of volunteers. James Hawkings provided editorial comments on the draft version of this report.

We appreciate the help from the following volunteers without whom the operation of the observatory would not have been possible:

- more than 20 days – Alyshia Skurdal;
- 10 to 20 days – Julie Bauer, Ted Murphy-Kelly, Andrew Glacier and Mithuna Sothieson;
- 5 to 10 days – Brenna Kelly, Kristina Beckmann, Dawn Hansen and Shyloh van Delft;
- Less than 5 days – Gwen Baluss, Anne MacLeod, Cameron Eckert, Carrie Boles, Lila Tauzer, Hollie Murphy-Kelly, Andrea Sidler, Ben Schonewille and Johanne Maisonneuve.

2.0 Methods

2.1 Study Site

Teslin Lake is a 125 km long by 2-5 km wide lake in the south-central Yukon near the border with British Columbia. The standard count area is located near the outlet of 10 Mile Creek at the site known locally as Ten-mile Point; this area is located on the east shore within the north third of the lake. The lake falls in a natural trench that runs to the northwest and serves as a migration route for many bird species coming from breeding areas to the north in Yukon and Alaska. The site falls within the Yukon Southern Lakes Ecoregion (Boreal Cordillera Ecozone)¹.

During the 2005 season, the observatory was located on the shoreline of Nisutlin Bay; however, issues associated with land tenure of the site led to a new site being used since 2006. The current site is located on 10 Mile point approximately 10 km northwest of the community of Teslin. The observatory is located in the riparian zone between Teslin Lake and the Yukon Government Campground (Figure 1). The vegetation within the site is a mixture featuring a transition from bare gravel lakeshore to shrubs and larger deciduous trees. Also within the site is a small wetland area connected to Teslin Lake which has seasonally fluctuating water levels. The area is dominated by willow (*Salix* spp.) and alder (*Alnus* spp.) with some mature white spruce (*Picea glauca*), trembling aspen (*Populus tremuloides*) and balsam poplar (*P. balsamifera*) scattered throughout.

2.2 General Methods

The methods for the operation of the bird observatory follow the Teslin Lake Bird Observatory Field Protocol and Manual². A summary of the field protocol is described in the following sections; however, for a detailed description refer to the publications page of the Society of Yukon Bird Observatories website (www.yukonbirdobservatories.org).

All monitoring activities at the observatory can be separated into standardized and non-standardized methods. To facilitate long-term analysis of the observatory's data, the standardized data is collected in the same format year after year. Non-standardized activities may include species-specific mist nets within the count area or the collection of banding/observation data outside of the standard count period.

¹ Smith, C.A.S., Meikle, J.C., and Roots, C.F. (editors), 2004. Ecoregions of the Yukon Territory: Biophysical properties of Yukon landscapes. Agriculture and Agri-Food Canada, PARC Technical Bulletin No. 04-01, Summerland, British Columbia, 313 p.

² Schonewille, B. 2011. Teslin Lake Bird Observatory (TLBO) Field Protocol (version 2). Society of Yukon Bird Observatories.



Figure 1. Overview of the Teslin Lake Bird Observatory (60.2319 °N, -132.9159 °W). The numbers and red lines are mist nets, each 12 m long with the exception of net 28 which is 18 m in length. There is a campground bordering the mist netting area on the south side (right hand side of the photo). The red line with the “C” is the non-standard canopy net which was not used during 2017.

For every species observed, estimated totals are calculated for each day of operation using the following categories:

- Band: new birds banded.
- Recaptures: previously banded birds, not included if recaptured on the original day of banding.
- Visual Migrants
 - Migration Watch: birds observed in obvious migration flight, only includes individuals observed during the visual migration counts.
 - Incidental: birds observed in obvious migration flight, only includes individuals observed incidentally (i.e., not during the visual migration counts).
- Observed: birds observed, but not in obvious migration flight; includes incidental observations and the lake counts.

Using the categories outlined above, the Bander-In-Charge estimates the total number of individuals observed within/passing through the count area within the standard count period on a daily basis. Using only the standard count period data, this number represents the Daily Estimated Total (DET) and when the non-standard data is included, this number represents the Daily Species Total (DST). The DET data will provide the basis for future trend analysis of the data collected at the observatory.

During 2017, the operation of the Teslin Lake Bird Observatory was led by the Primary Bander in Charge Jukka Jantunen. Jukka was responsible for overseeing all activities at the observatory including the capture/banding of birds, supervising volunteers, conducting the visual migration watches, recording the daily estimated total data and entering the data. Ted Murphy-Kelly was Co-Station Manager which included station logistics, staffing and filling in for the primary bander. Ben Schonewille was also a Co-Station Manager and looked after data analysis and the preparation of this report. Board members of the Society of Yukon Bird Observatories helped administer the Yukon Bird Observatories.

Site infrastructure is minimal at this site. A narrow trail connects the banding table to the nets and to the station access point via the Yukon Government campground. There is no covered blind from which to watch birds and nets are removed at the end of the season and are stored away from the site. The site is partially below the high-water mark of Teslin Lake and on land owned by the Yukon Government as a component of the campground reserve. To date this level of activity has not required any permitting aside from the federal and territorial permits required for the capture and banding of birds, and a permit from Yukon Parks allowing extended use of a campground site.

2.3 Mist Netting

The primary method of monitoring the movement of birds through the study site is the use of mist nets for the purpose of capturing and banding birds. The observatory operates with 22 standard mist nets and one non-standard mist net (Figure 1). No non-standard nets were used in 2016; note that in previous years a trial canopy net (net ID = C on Figure 1) was used. All nets are 30 mm mesh, 4 panels tall, and 12 m in length, with the exception of net 28 which is 18 m in length. The standard mist netting effort begins at official sunrise and continues for 6 hours. The full mist netting effort is achieved only on days when adequate personnel are present onsite and weather conditions are favourable. If full effort is not possible, then the number of nets operated is reduced rather than reducing the duration of effort.

2.4 Visual Migration Watch

Visual migration counts are conducted on all days of operation to supplement the banding data. All watches are conducted from the observation site (Figure 1) and involve scanning the sky with binoculars and a spotting scope to observe and count all birds flying past the site. The protocol states that as a minimum, 10 minutes of watch shall be conducted per hour (6 hours) followed by a 1 hour watch at the end of the mist netting period. On many days of operation the visual count effort is substantially more. The visual migration counts aim to monitor diurnal migrating species such as raptors and large waterfowl. Most nocturnal migrants such as most warblers, sparrows and thrush are well-monitored by mist netting. However, for some species which are not adequately covered by mist netting, the visual counts allow for monitoring data to be collected for these species.

Whenever possible, additional information on age, sex and/or color morph is collected for the birds observed during the visual migration watches. Particularly for raptors, the information can supplement the data collected by providing information on the proportion of younger birds.

2.5 Lake Counts

Completed in conjunction with the visual migration counts, a thorough lake count is performed daily from the observation site with a spotting scope to enumerate all birds on or over Teslin Lake which are visible from the predetermined viewing location. These counts target a wide range of species including; loons, grebes, some waterfowl, gulls and some species of shorebirds.

2.6 Incidental Observations

Incidental observations are collected on a continuous basis at the observatory. For example, birds observed while conducting mist net checks would be considered incidental observations. Birds in obvious directed migration but not during standard visual migration watches, e.g. flying overhead in flocks or raptors passing overhead, were recorded as ‘incidental migrants’.

2.7 Molt Scoring

As supplementary information, in order to assess the timing of molt, we rate the growth of new flight feathers in adult birds that are banded. Although information on the prebasic molt (amount of juvenile plumage remaining) is collected for hatch year birds, a particular emphasis was placed upon collecting wing molt scores for molting adult individuals because this tells us about the timing of the molt as it relates to the timing of migration in various species of adult birds.

Wing molt score is achieved by assigning each individual wing flight feather a score from zero (old feather remaining) to five (new feather fully grown) and adding them together. Birds that have not yet started to molt have a cumulative score of zero whereas individuals which have completed molt would have a score of 75 (based on 9 primary flight feathers) or 80 (10 primary flight feathers).

2.8 Special Projects

2.8.1 Spring Banding Demonstration

A spring banding demonstration was conducted in the standard count area on June 3 and 4, 2017. This activity was planned to coincide with the Renewable Resource Council (RRC) Annual Generating Meeting held in Teslin at this time. The Teslin RRC has been a long-time supporter of TLBO and this event was intended to provide a means for RRC council members and other meeting attendees from across the Yukon to visit the observatory. Twelve mist nets were used during the demonstration which was conducted between the hours of 5:00 and 10:00 on each day.

2.8.2 Owl Banding

Based on owl capture methods used to capture Northern Saw-whet Owls in southern Canada that we had tested in previous years on Boreal Owls, we decided to do additional trials using these methods to build upon the success of this program during 2014 and 2015. This method uses nocturnal call playback in the vicinity of a mist net array.

During 2017, we broadcasted only Boreal Owl calls using an iPod connected to a portable speaker system with an internal battery. We broadcast within the standard count area at the bird observatory. The effort was relatively limited, with the call playback used on three evenings: September 13, 22 and October 10. Up to five 12 m nets were used in the standard count area. At this site the owl calls were broadcast constantly for between 2.0 and 4.0 hours beginning at dusk and ending shortly after midnight.

2.9 *Public Engagement*

To attract members of the public to the observatory, we put up posters at various common buildings in Teslin including the Nisutlin Trading Post, Yukon Motel, Teslin Tlingit Council Administration Office and Post Office. We also advertised the observation through digital media including the Yukon Bird Observatories blog, Facebook page and website. Interested individuals could also find articles in the Yukon News in May and September, on the Yukon Government Wildlife viewing program calendars and media advertising.

Thanks to a contribution from the Teslin RRC, a large sign was designed and erected adjacent to the bird observatory entrance on the Alaska Highway. The sign includes a sliding panel that observatory personnel could switch between open and closed to allow visitors to know when the station was open. A dry erase white board was also included on the sign to allow for station highlights to be recorded for the visiting public (Photo 1).



Photo 1. Large portable sign advertising TLBO.

3.0 Results & Discussion

3.1 Station Operation

The 2017 fall season included a total of 85 field days between July 26 and October 20. Standardized mist netting occurred on 62 days between July 26 and September 29; opportunistic banding occurred on seven days (September 7/26/30 and October 1/2/3/4). After October 4, activities at the observatory were limited to visual migration counts, lake counts and incidental observations.

A total of 3,369 birds of 47 species were banded (excluding special projects) and 143 species were observed (Table 1, Table 2). The all-time total number of birds banded at Teslin Lake Bird Observatory is now 35,335 birds of 94 species and 204 species/forms have been observed (Appendix A). New species added to the station checklist during 2017 included: Ring-billed Gull, Western Kingbird and Clark's Nutcracker. Black-billed Magpie was the only new species banded during 2017.

Table 1. Summary statistics for the 2017 fall season.

Week	Date	Days Operated ¹	Birds Banded				Visual Counts		Total Species Observed
			#	Species	Net Hours	#/100 Net Hours	# of Visual Migrants ²	Counting Hours	
1	26 Jul – 1 Aug	6	84	17	533.0	15.76	1594	6.3	62
2	2 – 8 Aug	7	183	23	755.0	24.24	277	4.5	56
3	9 – 15 Aug	7	321	23	929.0	34.55	869	11.2	68
4	16 – 22 Aug	6	394	27	733.0	53.75	547	6.8	63
5	23 – 29 Aug	7	593	31	759.0	78.13	2048	11.9	76
6	30 Aug – 5 Sep	7	483	27	839.5	57.53	4291	18.7	78
7	6 – 12 Sep	7	484	26	849.0	57.01	3957	19.8	78
8	13 – 19 Sep	7	507	22	918.0	55.23	1727	13.4	68
9	20 – 26 Sep	7	224	21	826.0	27.12	883	15.4	64
10	27 Sep – 3 Oct	7	90	12	559.0	16.10	3306	24.7	63
11	4 – 10 Oct	7	6	4	111.0	5.41	2744	42.5	55
12	11 – 17 Oct	7	-	-	-	-	2697	36.7	48
13	18 – 20 Oct	3	-	-	-	-	1894	12.3	41
ALL	26 Jul – 20 Oct	85	3369	47	7811.5	43.13	26834	224.2	143

¹ Requires a minimum of 3 hours onsite with full estimated totals recorded (does not require mist netting if weather conditions are adverse).

² Note this total includes visual migrants counted during the visual counts and incidental visual migrants observed.

Table 2. Birds banded during the 2017 fall season (not including special projects).

Common Name	Scientific Name	# Banded	# Banded / 1000 Net Hrs
Sharp-shinned Hawk	<i>Accipiter striatus</i>	12	1.53
Merlin	<i>Falco columbarius</i>	2	0.26
Belted Kingfisher	<i>Ceryle alcyon</i>	3	0.38
Three-toed Woodpecker	<i>Picodes dorsalis</i>	1	0.13
Northern Flicker	<i>Colaptes auratus</i>	1	0.13
Western Wood-Pewee	<i>Contopus sordidulus</i>	1	0.13
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	14	1.79
Alder Flycatcher	<i>Empidonax alnorum</i>	548	70.15
Least Flycatcher	<i>Empidonax minimus</i>	2	0.26
Hammond's Flycatcher	<i>Empidonax hammondi</i>	10	1.28
Dusky Flycatcher	<i>Empidonax oberholseri</i>	4	0.51
Northern Shrike	<i>Lanius excubitor</i>	2	0.26
Warbling Vireo	<i>Vireo gilvus</i>	19	2.43
Black-billed Magpie	<i>Pica hudsonica</i>	4	0.51
Black-capped Chickadee	<i>Poecile atricapillus</i>	95	12.16
Boreal Chickadee	<i>Poecile gambelli</i>	1	0.13
Boreal Chickadee	<i>Poecile hudsonicus</i>	473	60.55
Red-breasted Nuthatch	<i>Sitta canadensis</i>	4	0.51
Golden-crowned Kinglet	<i>Regulus satrapa</i>	4	0.51
Ruby-crowned Kinglet	<i>Regulus calendula</i>	114	14.59
Gray-cheeked Thrush	<i>Catharus minimus</i>	4	0.51
Swainson's Thrush	<i>Catharus ustulatus</i>	26	3.33
Hermit Thrush	<i>Catharus guttatus</i>	2	0.26
American Robin	<i>Turdus migratorius</i>	1	0.13
Varied Thrush	<i>Ixoreus naevius</i>	5	0.64
Northern Waterthrush	<i>Parkesia noveboracensis</i>	34	4.35
Tennessee Warbler	<i>Oreothlypis peregrina</i>	17	2.18
Orange-crowned Warbler	<i>Oreothlypis celata</i>	176	22.53
Common Yellowthroat	<i>Geothlypis trichas</i>	59	7.55
American Redstart	<i>Setophaga ruticilla</i>	23	2.94
Yellow Warbler	<i>Setophaga petechia</i>	163	20.87
Magnolia Warbler	<i>Setophaga magnolia</i>	1	0.13
Blackpoll Warbler	<i>Setophaga striata</i>	71	9.09
Myrtle Warbler	<i>Setophaga coronate</i>	654	83.72
Townsend's Warbler	<i>Setophaga townsendi</i>	16	2.05
Wilson's Warbler	<i>Cardellina pusilla</i>	68	8.71
American Tree Sparrow	<i>Spizella arborea</i>	27	3.46
Chipping Sparrow	<i>Spizella passerina</i>	38	4.86
Savannah Sparrow	<i>Passerculus sandwichensis</i>	12	1.54
Fox Sparrow	<i>Passerella iliaca</i>	13	1.66
Lincoln's Sparrow	<i>Melospiza lincolni</i>	14	1.79
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	20	2.56
Slate-colored Junco	<i>Junco hyemalis</i>	443	56.71
Rusty Blackbird	<i>Euphagus carolinus</i>	14	1.79
Common Redpoll	<i>Acanthis flammea</i>	2	0.26
Pine Siskin	<i>Spinus pinus</i>	151	19.33
TOTAL		3369	43.13

Weather conditions largely influence the activities at the observatory. Windy conditions and periods of prolonged precipitation reduce the mist netting effort. Weather conditions also influence the number of birds counted on the visual migration counts due to challenges associated with visibility and the dynamic nature of bird migration in relation to wind patterns. The 2017 season saw temperatures which were slightly above average compared to previous years and the amount of wind was near average

(Table 3, Table 4). The number of days with precipitation (25) was also very near the average of 24.6 days.

Table 3. Summary of weather conditions during the 2017 fall season.

Weather Parameter	Week							
	1	2	3	4	5	6	7	8
Average Opening Temperature (°C)	7.8	8.6	8.0	7.2	7.6	7.4	6.9	2.3
Average Closing Temperature (°C)	16.2	21.7	19.1	14.2	14.7	15.2	14.9	12.9
Average Opening Wind (Beaufort scale)	1.5	1.4	1.6	1.8	1.7	1.7	1.1	0.9
Average Closing Wind (Beaufort scale)	1.4	1.6	2.4	2.8	3.0	3.1	2.6	2.0
Days with Rain (during count period)	2	0	1	3	3	2	4	0
Days with Snow (during count period)	0	0	0	0	0	0	0	0
Weather Parameter	Week					Whole Season		
	9	10	11	12	13			
Average Opening Temperature (°C)	3.0	2.3	3.0	-1.9	-1.5	4.7		
Average Closing Temperature (°C)	13.4	9.8	8.4	2.8	1.0	12.6		
Average Opening Wind (Beaufort scale)	1.4	2.0	2.6	2.1	1.0	1.6		
Average Closing Wind (Beaufort scale)	1.9	2.4	3.1	2.6	1.0	2.3		
Days with Rain (during count period)	2	1	3	0	0	21		
Days with Snow (during count period)	0	0	0	3	1	4		

Table 4. Comparison of weather conditions during 2017 as compared to previous years.

Weather Parameter	Annual Average								2010 - 2017 Average
	2010	2011	2012	2013	2014	2015	2016	2017	
Average Opening Temperature (°C)	4.4	3.5	2.6	6.0	4.7	4.4	4.8	4.7	4.4
Average Closing Temperature (°C)	13.0	10.4	10.7	14.4	11.8	10.2	12.1	12.6	11.9
Average Opening Wind (Beaufort scale)	2.3	1.7	1.7	1.5	1.4	1.3	1.6	1.6	1.6
Average Closing Wind (Beaufort scale)	2.8	2.6	2.9	2.7	2.3	2.5	2.4	2.3	2.6
Days with Rain (during count period)	20	33	17	14	32	19	16	21	21.5
Days with Snow (during count period)	3	4	6	0	5	2	1	4	3.1

3.2 *Patterns in Captures*

Each component of the 2017 data is summarized and presented in the following subsections; however, a summary account of the 2017 estimated total data is shown in Appendix B. Unless otherwise stated, the results presented in this report combine and summarize both standard and non-standardized data. Note that the estimated totals are derived on a daily basis by the Bander in Charge and incorporate all data collection components (mist netting captures and all observations) to estimate the number of birds of each species within or passing through the count area.

Among the top 15 species banded during 2016, 6 were captured in above average numbers and 9 below average (Table 5). Among the species banded in above average numbers, Boreal Chickadee and Myrtle Warbler were the most notable. A total of 473 Boreal Chickadees were banded compared to the long-term average of 201 and the record high of 831 during 2009. The total of 654 Myrtle Warblers was well above the long-term average of 294 and slightly below the record high of 673 during 2010. The most notable species banded in below average numbers was Yellow Warbler of which 163 were banded in 2017 as compared to the long-term average of 382 and the previous record low of 225 in 2012.

Table 5. The 15 most common bird species banded in 2017 as compared to 2008–2016 totals (numbers in brackets indicate the annual ranking in birds banded). The prefix “T” indicates a tied in annual banding totals.

Species	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2008-2017 Average
Myrtle Warbler	654 (1)	286 (4)	311 (5)	178 (4)	163 (4)	195 (3)	142 (5)	673 (1)	284 (5)	49 (9)	294
Alder Flycatcher	548 (2)	498 (1)	1,058 (1)	506 (1)	770 (1)	827 (1)	637 (1)	620 (2)	631 (2)	811 (1)	691
Boreal Chickadee	473 (3)	40 (12)	131 (9)	3 (T31)	23 (16)	142 (4)	233 (4)	0 (-)	831 (1)	138 (4)	201
Slate-colored Junco	443 (4)	229 (5)	211 (7)	140 (7)	341 (2)	116 (7)	331 (2)	420 (4)	582 (3)	182 (3)	300
Orange-crowned Warbler	176 (5)	364 (3)	331 (4)	149 (6)	124 (6)	88 (8)	57 (14)	271 (5)	180 (6)	101 (6)	184
Yellow Warbler	163 (6)	449 (2)	556 (2)	504 (2)	333 (3)	225 (2)	310 (3)	471 (3)	325 (4)	486 (2)	382
Pine Siskin	151 (7)	3 (33)	1 (45)	303 (3)	8 (24)	3 (31)	27 (10)	91 (10)	1 (44)	1 (35)	59
Ruby-crowned Kinglet	114 (8)	89 (8)	284 (6)	69 (9)	125 (5)	134 (5)	86 (8)	109 (8)	175 (7)	29 (12)	225
Black-capped Chickadee	95 (9)	24 (15)	31 (18)	16 (18)	31 (14)	65 (10)	92 (7)	22 (18)	26 (19)	57 (8)	46
Blackpoll Warbler	71 (10)	134 (7)	99 (10)	61 (10)	87 (8)	87 (9)	58 (13)	194 (6)	107 (10)	47 (10)	95
Wilson’s Warbler	68 (11)	172 (6)	386 (3)	164 (5)	122 (7)	134 (T5)	133 (6)	177 (7)	161 (8)	113 (5)	163
Common Yellowthroat	59 (12)	57 (10)	89 (11)	82 (8)	65 (9)	45 (13)	72 (12)	70 (11)	113 (9)	66 (7)	72
Chipping Sparrow	38 (13)	31 (14)	29 (17)	15 (19)	20 (16)	17 (18)	28 (18)	18 (22)	24 (20)	6 (25)	23
Northern Waterthrush	34 (14)	34 (13)	53 (15)	48 (12)	46 (12)	47 (11)	42 (15)	54 (12)	53 (12)	46 (11)	46
American Tree Sparrow	27 (15)	20 (17)	137 (8)	22 (15)	19 (17)	17 (18)	77 (10)	21 (19)	54 (11)	19 (13)	41

Among the top 10 species banded in 2017, the majority of birds banded across all species were hatch year individuals (Table 6) which is consistent with previous years. Numerous species show a considerable amount of year to year variability in hatch year proportions. For example, Alder Flycatchers have ranged from 41 to 90% hatch year individuals banded. For such species banded in relatively high numbers, the proportion of hatch year birds may be able to be used to provide perspective on regional productivity.

Table 6. Age ratios (% hatch year) for the top 10 species banded during the fall of 2017.

Species	2017	2016	2015	2014	2013	2012	2011	2010	2010-2017 Average
Myrtle Warbler	98	90	76	90	81	83	70	95	84
Alder Flycatcher	83	41	73	85	84	81	72	90	75
Boreal Chickadee	99	93	100	100	100	93	100	-	98
Slate-colored Junco	95	97	69	94	94	89	81	96	99
Orange-crowned Warbler	91	81	62	82	81	84	79	90	80
Yellow Warbler	77	44	48	48	68	61	71	73	60
Pine Siskin	96	-	-	100	75	33	94	90	81
Ruby-crowned Kinglet	98	92	81	93	79	96	81	92	89
Black-capped Chickadee	100	78	90	100	93	84	95	91	91
Blackpoll Warbler	94	86	64	84	91	90	88	92	86

The peak period for banding occurred during week 5 (August 23-29) with a weekly total of 593 birds (78.13 birds/100 net hours; Figure 2). The daily banding totals during this period were dominated by Myrtle Warbler, Alder Flycatcher and Pine Siskin.

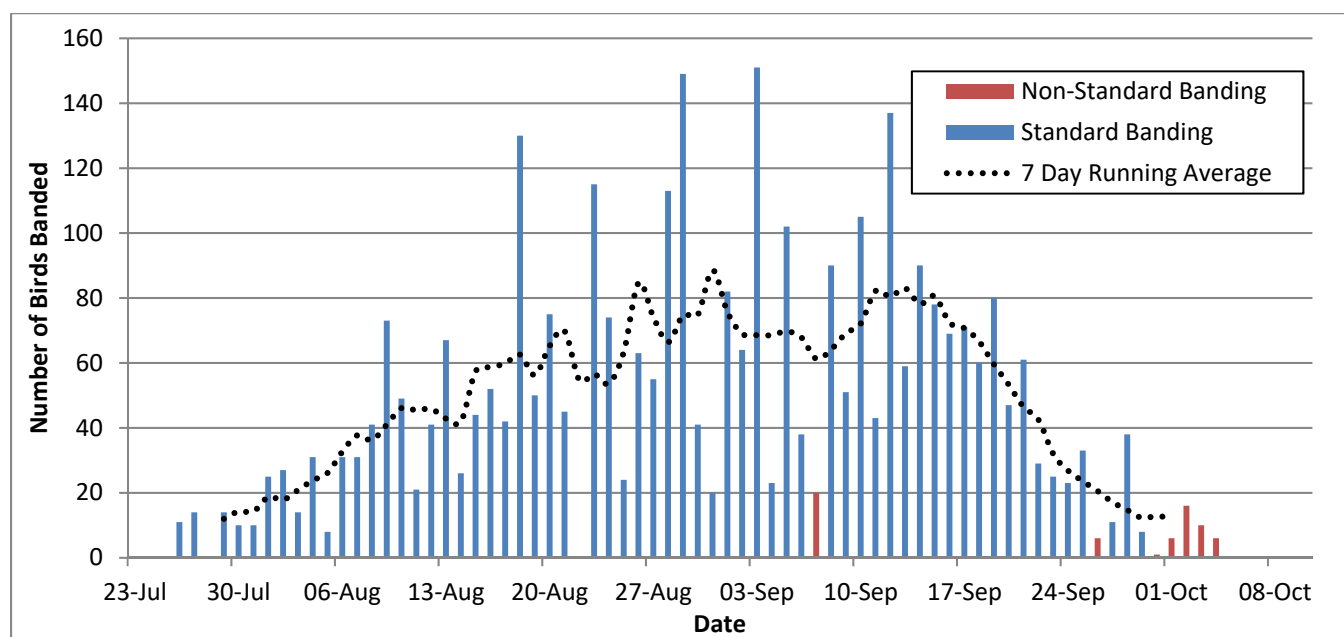


Figure 2. Summary of birds banded per day during the fall of 2017.

The 2017 banding total of 3,369 birds was above the 2009 to 2016 average of 3,116 birds but considerably lower than the highest banding total of 4,186 during 2015. When the amount of mist netting effort is taken into consideration, the number of birds/100 net hours in 2017 (43.1) was also

above the 2009 to 2015 average of 42.3 but lower than the all-time high of 61.4 during 2009 (Figure 3).

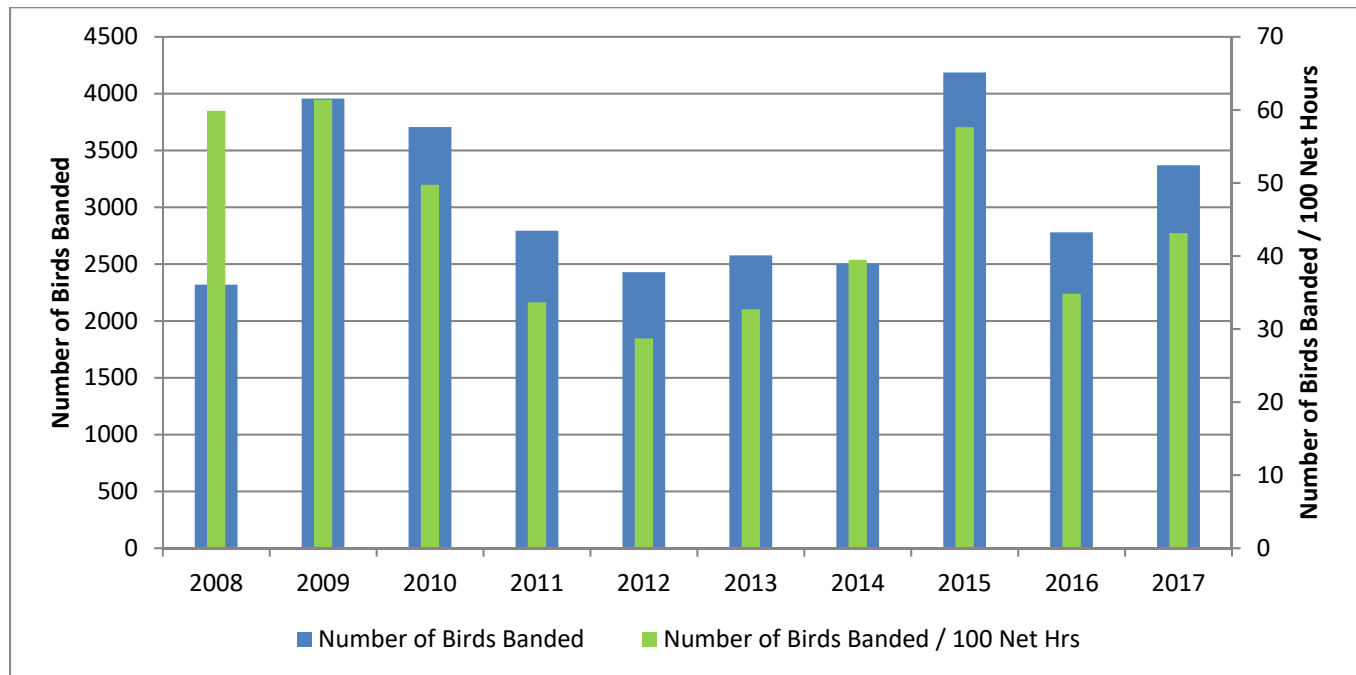


Figure 3. Summary of birds banded during the fall from 2008 to 2017.

The high level of consistency in effort across all standard mist nets (Figure 4) demonstrates the adherence to the observatory's monitoring protocol. Note that nets 7, 10, 18 and 20 are located on the sparsely vegetated shoreline and are more frequently closed midway through the daily count period due to wind. Net 28 stands out in Figure 4 as it is an 18 m net meaning that the effort is multiplied by 1.5; this net is also frequently closed due to wind.

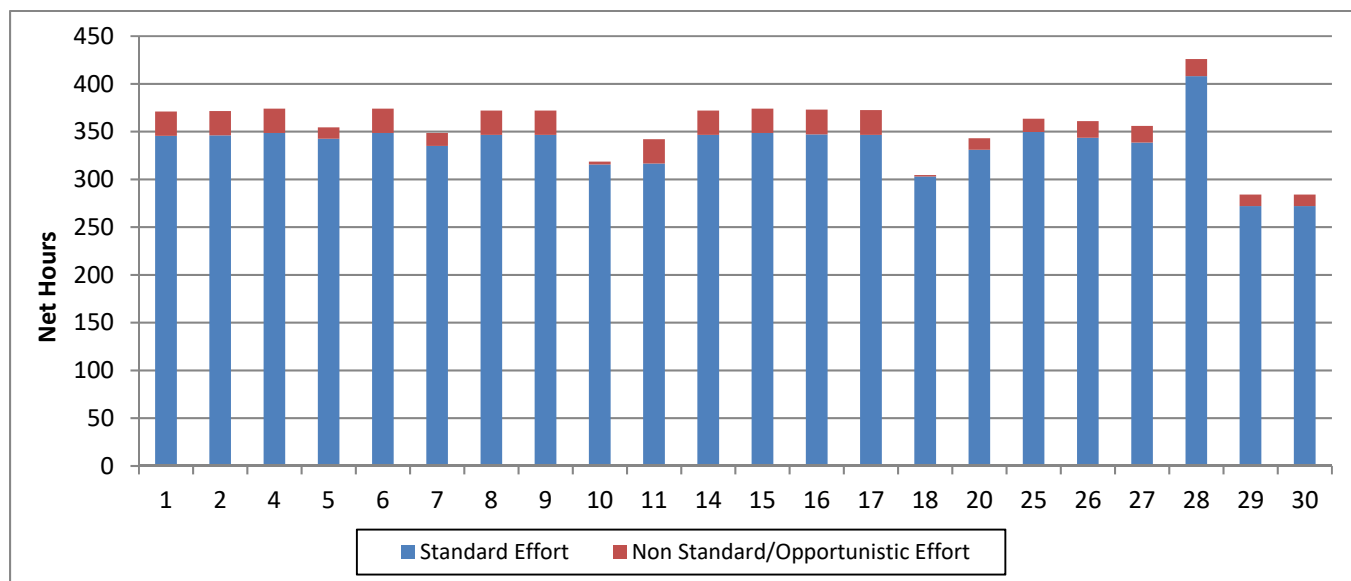


Figure 4. Summary of hours per mist net during the fall of 2017 (note net 28 is an 18 m net whereas all other nets are 12m).

The majority of birds and species moving through the count area that are captured in the nets pass directly along the shoreline of Teslin Lake. We see this in the highest capture rates in mist nets 10, 18, 20 and 28 (Figure 5) which are closest to the lake edge. This pattern is consistent with previous years. Nets 1 and 2 are located adjacent to the small wetland within the count area and likely captured a number of migrants feeding in this productive habitat while moving through the area. Although a portion of the mist nets placed away from the lakeshore and in taller vegetation (nets 5, 25, 26 and 27) catch fewer birds per net-hour, these nets capture species such as Swainson's Thrush and Varied Thrush which are not typically caught on the lakeshore.

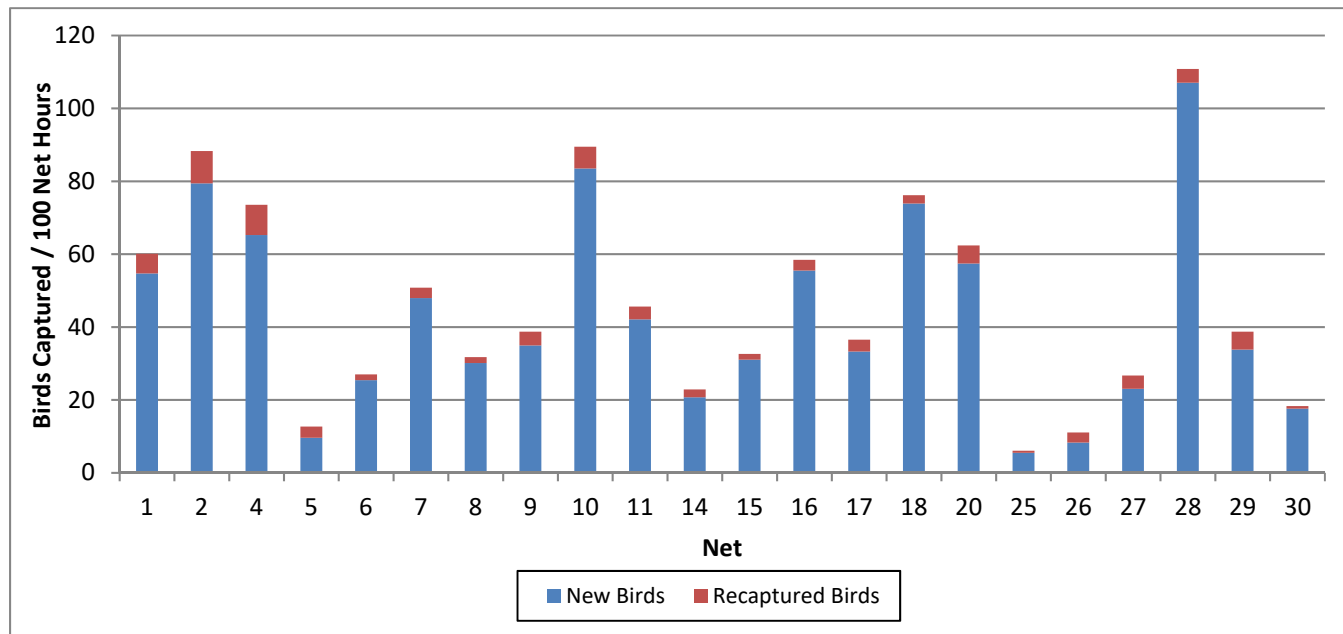


Figure 5. Number of birds banded per mist net during the fall of 2017.

3.3 Band Repeats, Returns & Recoveries

The proportion of birds caught that had been previously banded at the site in 2016 (band repeats) was low (4.7%) during the 2017 season (Table 7) which is identical to 2016 and very near the long-term average. These results indicate that there continues to be a very high turnover of migrants through the study site, particularly for species banded in high numbers. For the purpose of migration monitoring, this is the preferred scenario as there is a limited amount of double counting the same individuals on consecutive days.

Table 7. Summary of band repeats during the fall of 2017.

Species	# of Individuals Recaptured	% of 2017 Original Bandings	Maximum # of Days From Original Banding	Average # of Days From Original Banding
Sharp-shinned Hawk	1	8.3	3	-
Belted Kingfisher	1	33.3	3	-
Alder Flycatcher	3	0.5	3	2.0
Black-capped Chickadee	18	18.9	42	11.4
Boreal Chickadee	11	2.3	16	3.5
Ruby-crowned Kinglet	6	5.3	2	1.2
Northern Waterthrush	3	8.8	10	5.0
Orange-crowned Warbler	4	2.3	8	4.3
Myrtle Warbler	37	5.7	14	4.5
Yellow Warbler	21	12.9	19	3.8
Common Yellowthroat	10	16.9	5	1.8
American Redstart	2	8.7	4	2.5
Wilson's Warbler	2	2.9	1	-
American Tree Sparrow	4	14.8	3	1.5
Savannah Sparrow	2	16.7	1	-
Fox Sparrow	1	7.7	1	-
Slate-colored Junco	46	10.4	25	5.3
Rusty Blackbird	2	14.3	3	2.0
Pine Siskin	1	0.7	5	-
TOTAL	174	5.2	42	4.7

Band returns (individuals banded at the site in previous years) typically represent individuals that breed within the study site as the likelihood of re-trapping migrants is relatively low. During 2017, the observatory had 3 band returns representing 2 species (Table 8).

Table 8. Summary of band returns during the fall of 2017.

Species	Band Number	Banded		Recaptured
		Date	Age – Sex ¹	Date in 2017
Black-capped Chickadee	2810-13153	26 Jul 2016	HY – U	21 Aug 2017
Black-capped Chickadee	2610-90865	29 Aug 2013	HY – U	3 Aug 2017
Warbling Vireo	2610-93009	28 Jul 2011	AHY – U	27 Jul 2017

¹ HY – hatch year, AHY – after hatch year, ASY – after second year; M – male, F – female, U – unknown.

Foreign band recoveries are a very infrequent event; to date the observatory has had seven such recoveries and also recovered one bird from another SOYBO study site (Table 9). The most recent recovery was an Myrtle Warbler banded on August 29, 2017 and recovered near Norintosh, Saskatchewan on September 25, 2017. The longest distance band recovery to date is an Alder Flycatcher banded at Teslin Lake on August 24, 2009 and recaptured at Tacarcuna Nature Reserve in Colombia on April 29, 2011.

Table 9. Summary of foreign band returns for TLBO to date.

Species	Banded		Recovered	
	Location	Date	Location	Date
Yellow Warbler	Texas, USA	12 May 2008	Teslin Lake	9 Sep 2009
Alder Flycatcher	Teslin Lake	25 Aug 2008	SW Saskatchewan	12 Jun 2009
Sharp-shinned Hawk	Teslin Lake	14 Aug 2009	Boise, Idaho	9 Oct 2010
Alder Flycatcher	Teslin Lake	24 Aug 2009	Sapzurro, Choco, Colombia	29 Apr 2011
Myrtle Warbler	Teslin Lake	7 Sep 2010	McIntyre Marsh Bird Banding Station – Whitehorse, YT	25 May 2013
American Robin	Teslin Lake	8 Aug 2014	Dunburn, Saskatchewan	11 Apr 2015
Slate-colored Junco	Teslin Lake	5 Sep 2016	Grand Forks, North Dakota	14 Apr 2017

3.5 Molt Scoring

As supplementary information, data was collected on the stage of molt for large proportion of the birds banded. Although information on the prebasic molt (amount of juvenile plumage remaining) was collected for hatch year birds, a particular emphasis was placed upon collecting wing molt scores for molting adult individuals as this provides information on the progress of molt in relation to migration timing for various species.

Wing molt score is achieved by assigning each individual wing flight feather a score from zero (old feather remaining) to five (new feather fully grown) and adding them together. Note that birds symmetrically molt their wing feathers; however, the scores collected are typically on the right wing. During 2017, a total of 45 molt scores were obtained from 38 individuals of 14 species (Table 10). No additional analysis is provided here; however, additional analysis could be conducted to compare the stage of molt in comparison to timing. This can be done to compare the timing of molt between species and/or sex within species. For example, females typically molt later than males due to the energetic requirements for females which are typically greater than that for males.

Table 10. Summary of wing molt scores collected from adult birds during the fall of 2017. Note that the total number of molt score is often greater than the number of individuals given that some recaptured birds are scored more than once on subsequent days.

Species	Number of Individuals Scored	Total Number of Molt Scores
Black-capped Chickadee	1	1
Swainson's Thrush	1	1
American Robin	1	1
Orange-crowned Warbler	3	3
Myrtle Warbler	11	12
Yellow Warbler	9	14
Blackpoll Warbler	2	2
Townsend's Warbler	1	1
Common Yellowthroat	1	1
American Redstart	2	3
Wilson's Warbler	1	1
Slate-colored Junco	2	2
Common Redpoll	2	2
Pine Siskin	1	1
TOTAL	38	45

3.6 Visual Migration Counts

The visual migration counts provide a method of estimating relative numbers of individuals in the migrant species that would not be caught in mist nets. The counts are especially useful in observing raptors in migration and also serve as a method for monitoring waterbirds, waterfowl and some species of passerines. Note that birds seen during the migration counts which are not in active migration flight are not included in this section. Birds “in active migration flight” typically show a directed flight over the count area and do not appear to linger within the count area.

During the fall 2017 season, visual migration counts (standard & nonstandard) were conducted for 235.8 hours (Figure 6). Non-standard counts were limited to days when the total amount of observing effort was insufficient to constitute standard effort and days where the allowable duration of standard effort was too high (i.e., extra effort).

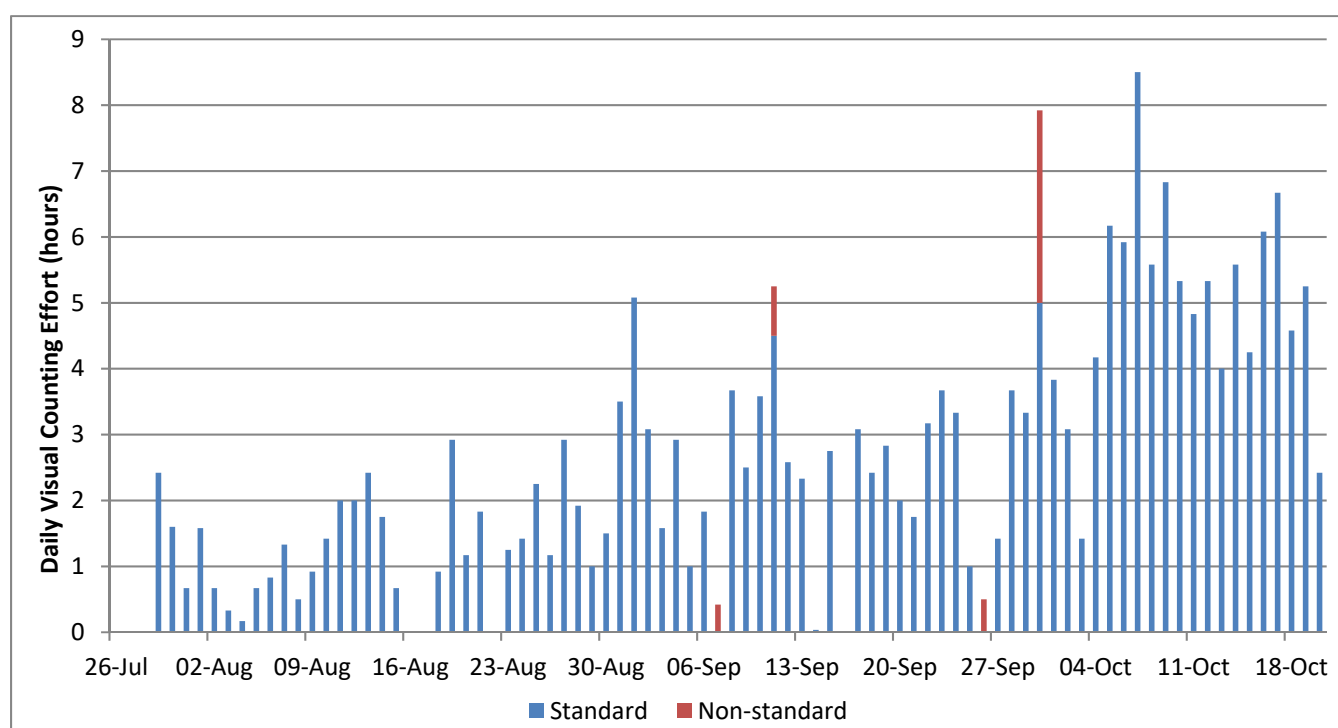


Figure 6. Visual counting effort, in hours each day, over the duration of the 2017 season.

A total of 24,539 birds were observed during the 2017 visual migration counts with passerines and waterfowl accounting for the largest proportion of the birds observed (Table 11). Compared to previous years, the number of birds observed during 2017 was the lowest to date. Weather conditions drastically influence the number of birds observed on the visual migration counts and large numbers of birds can occasionally be observed in a short period of time.

Table 11. Summary of birds observed on the visual migration counts from 2009 to 2017.

Group	2017	2016	2015	2014	2013	2012	2011	2010	2009	2009-2016 Average
Waterbirds ¹ & shorebirds	436	1,043	3,878	721	2,166	1,583	1,072	3,491	4,927	2,360
Waterfowl	9,497	14,885	22,560	28,556	7,852	35,044	31,548	22,258	8,219	21,365
Raptors	980	1,946	4,211	2,300	2,466	1,977	3,680	1,710	1,612	2,488
Passerines ²	13,626	20,182	11,797	23,397	28,839	21,408	37,951	16,277	11,000	21,536
TOTAL BIRDS OBSERVED	24,539	38,056	42,446	54,974	41,323	60,012	74,251	43,736	25,758	47,570
TOTAL BIRDS OBSERVED / HR	87	204	218	197	147	169	218	188	201	193
Visual Counting Effort (hrs)	235.58	186.74	194.6	279.0	280.9	354.8	340.6	232.4	128.1	249.64

¹ Waterbirds include loons, grebes, gulls and cranes.

² Includes woodpeckers.

3.6.1 Raptors

The number of raptors observed on the 2017 visual migration counts was the lowest recorded to date (980) and well below both the previous low of 1,612 during 2009 and the long-term average of 2,488 (Figure 8). All regularly occurring species were observed during 2017, although all were observed in below average numbers. The most numerous species observed were Northern Harrier (20% of all raptors), Sharp-shinned Hawk (20%), Harlan's Red-tailed Hawk (17%), Golden Eagle (13%) and Rough-legged Hawk (11%; Table 12).

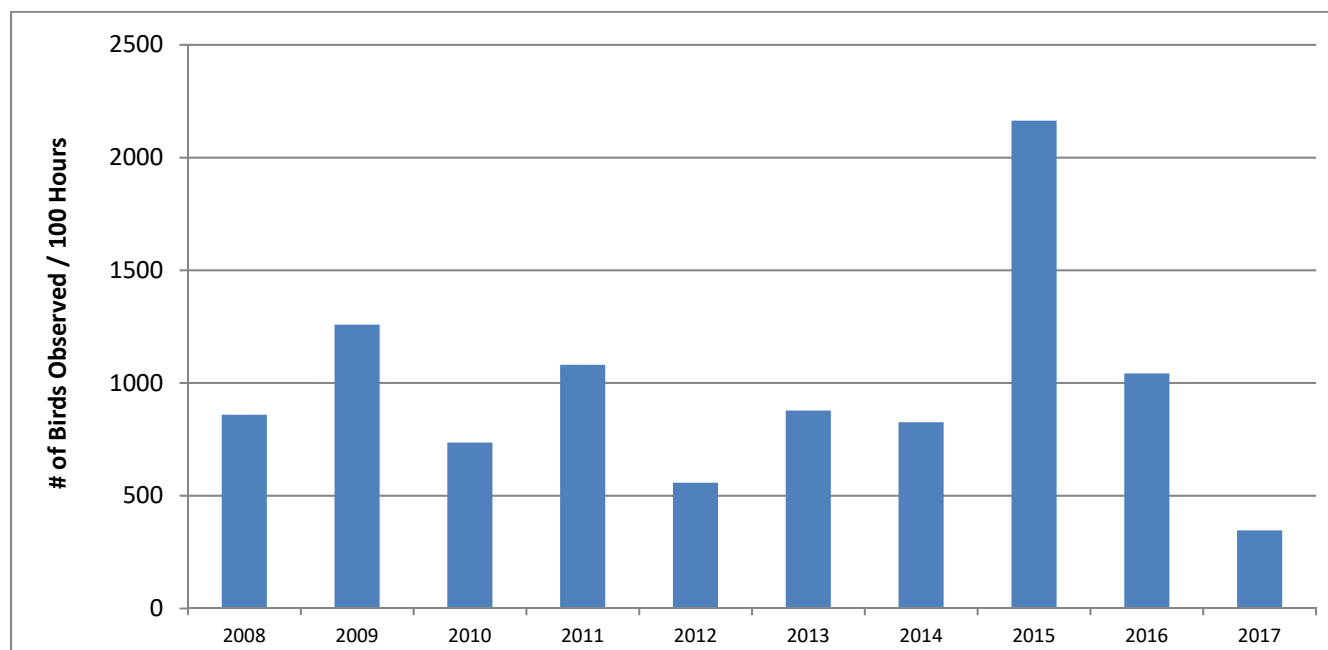
**Figure 7.** Number of raptors observed per 100 watching hours during 2017.

Table 12. Summary of raptor visual migrants observed during 2017.

Species	Total # Counted		
	Migration Counts	Incidental Migrants	TOTAL
Bald Eagle	49	0	49
Northern Harrier	229	2	231
Sharp-shinned Hawk	227	3	230
Northern Goshawk	4	0	4
Swainson's Hawk	1	0	1
Red-tailed Hawk (unspecified)	4	0	4
Red-tailed Hawk (Harlan's)	189	3	192
Rough-legged Hawk	116	5	121
<i>Unidentified Buteo</i>	8	1	9
Golden Eagle	144	10	154
<i>Unidentified Eagle</i>	3	0	3
American Kestrel	64	3	67
Merlin	20	0	20
Peregrine Falcon	19	0	19
Osprey	32	0	32
<i>Unidentified Raptor</i>	6	0	6
TOTAL	1,115	27	1,138

A breakdown of color morph data collected from 2010 to 2017 is shown in Table 13 and

Table 14 for Rough-legged and Red-tailed hawks, respectively. The majority of Rough-legged Hawks observed were classified as light morph individuals. By far the most common Red-tailed Hawk was the Harlan's dark morph, while the Harlan's light morph was the second most common. These patterns have been very consistent from year to year. The observation of possible western, northern and eastern Red-tailed Hawks are also notable given the limited information on these subspecies in the Yukon.

Table 13. Summary of color morph data recorded for Rough-legged Hawks observed from 2010 to 2017.

Year	Dark Morph (%)	Light Morph (%)
2010	21.7	78.3
2011	13.5	86.5
2012	18.8	81.2
2013	11.1	88.9
2014	11.8	88.2
2015	8.5	91.5
2016	7.3	92.7
2017	16.7	83.3
Average	13.7	86.3

Table 14. Summary of color morph data recorded for Red-tailed Hawks observed from 2010 to 2017.

Year	Harlan's Dark Morph (%)	Harlan's Light Morph (%)	Western (<i>calarus</i>)	Northern (<i>abieticola</i>)	Eastern (<i>borealis</i>)
2010	95.1	4.3	0.5 (2 birds)		
2011	95.0	4.6	0.2 (2 bird)		0.2 (2 birds)
2012	92.0	7.1	0.3 (1 bird)		0.6 (2 birds)
2013	88.4	10.3	0.6 (3 birds)		0.6 (3 birds)
2014	91.3	7.1	1.0 (7 birds)		0.5 (3 birds)
2015 ¹	91.0	8.6	0.3 (7 birds)		0.1 (2 birds)
2016	92.9	6.4	0.3 (2 birds)	0.3 (2 birds)	
2017	92.6	5.3	1.6 (3 birds)	0.5 (1 bird)	
Average	92.3	6.7	0.6	0.1	0.3

¹ One additional leucistic individual was observed and not included in this table.

We could reliably determine the age and sex of five species of visual migrants when viewing conditions were suitable (Table 15). Over the 7 years, most raptor species show consistently low proportions of juveniles.

Table 15. Summary of age and sex data collected for raptors observed on visual migration counts from 2010 to 2017. Note that additional individuals with an undetermined color morph age/sex categories are excluded.

Species	Year	Proportion of Individuals Counted (%)						
		Adult			Sub - adult	Immature	Juvenile	Female Plumaged (juv/female)
		Male	Female	Not Determined				
Bald Eagle	2010	-	-	42.3	32.1	11.6	14.1	-
	2011	-	-	14.7	37.3	33.3	14.7	-
	2012	-	-	54.3	33.7	12.0	0.0	-
	2013	-	-	28.2	58.3	6.3	7.3	-
	2014	-	-	35.6	40.2	11.5	12.6	-
	2015	-	-	14.5	60.0	14.5	10.9	-
	2016	-	-	32.0	28.0	32.0	8.0	-
	2017	-	-	19.1	34.0	27.7	19.2	-
	Avg.	-	-	30.1	40.5	18.6	10.9	-
Golden Eagle	2010	-	-	68.2	12.6	8.3	10.9	-
	2011	-	-	52.3	18.7	18.0	11.0	-
	2012	-	-	74.5	9.2	12.3	4.1	-
	2013	-	-	63.7	26.7	5.0	4.6	-
	2014	-	-	77.3	8.5	7.8	6.4	-
	2015	-	-	40.2	27.1	22.4	10.3	-
	2016	-	-	50.0	14.4	21.1	14.4	-
	2017	-	-	57.5	18.9	6.3	17.3	-
	Avg.	-	-	60.5	17.0	12.7	9.8	-
Northern Harrier	2010	11.3	12.2	-	-	-	37.1	39.3
	2011	8.9	10.7	-	-	-	26.5	53.9

Species	Year	Proportion of Individuals Counted (%)						
		Adult			Sub - adult	Immature	Juvenile	Female Plumaged (juv/female)
		Male	Female	Not Determined				
	2012	13.9	13.1	-	-	-	26.4	46.6
	2013	12.0	14.3	-	-	-	22.3	51.5
	2014	16.4	16.4	-	-	-	19.5	47.7
	2015	6.8	8.2	-	-	-	22.1	62.9
	2016	8.5	8.1	-	-	-	24.6	23.2
	2017	8.7	7.8	-	-	-	30.7	52.8
	Avg.	10.8	11.4	-	-	-	26.2	47.2
Rough-legged Hawk	2010	38.0	23.0	11.5	-	-	27.6	-
	2011	28.3	37.1	21.0	-	-	15.2	-
	2012	25.7	25.7	18.9	-	-	30.1	-
	2013	28.9	35.6	17.1	-	-	18.6	-
	2014	24.6	33.9	15.4	-	-	26.1	-
	2015	10.5	24.4	5.8	-	-	59.3	-
	2016	29.7	8.1	32.4	-	-	29.7	-
	2017	21.8	29.9	39.1	-	-	9.2	-
	Avg.	25.9	27.2	20.2	-	-	27.0	-
Harlans / Red-tailed Hawk	2013	-	-	94.0	-	-	6.0	-
	2014	-	-	89.3	-	-	10.7	-
	2015	-	-	86.9	-	-	13.1	-
	2016	-	-	92.6	-	-	7.4	-
	2017	-	-	94.5	-	-	5.5	-
	Avg.	-	-	91.5	-	-	8.5	-

3.7 Lake Counts

The lake counts provide monitoring data for various species of shorebirds, loons, grebes, waterfowl, and gulls/terns/ jaegers. Eleven shorebird species were observed during the lake counts with all species observed in relatively low numbers with the exception of Spotted Sandpiper. Although the total number of individuals observed was relatively low, the species diversity was modest with one locally rare species detected (Western Sandpiper).

The majority of loons and grebes counted at the observatory are observed on the lake counts and this was once again the case during 2017 with a total of 757 loons and 777 grebes (Table 16). Geese and swans were observed in very low numbers during the lake counts; these species are typically observed flying over the site only (i.e. are visual migrants). However, for some duck species (scoters and mergansers), the lake counts record data to supplement the visual migration counts (Table 16). Only small numbers of dabbling and diving ducks are seen mostly due to scarcity of suitable stopover and feeding habitats near the observatory. As a group, gulls, terns and jaegers are well monitored through the use of the lake counts; species of this group are the most commonly recorded birds using this method. A total of 10 species of gulls/terns/jaegers were observed on the 2017 lake counts.

Table 16. Summary of shorebirds (left), waterbirds (middle) and waterfowl (right) observed on the lake counts during 2017. One bird day represents one individual on one day; two bird days could represent single birds on two days or two birds on the same day.

Species	Total # of Bird Days	Species	Total # of Bird Days	Species	Total # of Bird Days
Semi-palmated Plover	6	Pacific Loon	229	Canada Goose	116
Sanderling	3	Common Loon	399	Greater White-fronted Goose	35
Least Sandpiper	10	Red-throated Loon	125	Trumpeter Swan	11
Baird's Sandpiper	1	Yellow-billed Loon	3	Mallard	59
Pectoral Sandpiper	1	<i>Unidentified Loon</i>	1	Surf Scoter	128
Western Sandpiper	2	Horned Grebe	19	<i>Unidentified Scoter</i>	14
Red-necked Phalarope	3	Red-necked Grebe	757	Common Goldeneye	13
Spotted Sandpiper	77	Western Grebe	1	<i>Unidentified Goldeneye</i>	3
Solitary Sandpiper	4	Mew Gull	361	Bufflehead	3
Lesser Yellowlegs	9	Herring Gull	2973	Common Merganser	171
Wilson's Snipe	2	Sabine's Gull	3	Red-breasted Merganser	176
<i>Unidentified Shorebird</i>	2	Thayer's Gull	168	<i>Unidentified Merganser</i>	18
		Glaucous Gull	5	<i>Unidentified Duck</i>	27
		California Gull	8		
		Ring-billed Gull	2		
		Bonaparte's Gull	30		
		Arctic Tern	50		
		Parasitic Jaeger	8		
		<i>Unidentified Gull</i>	11		
TOTAL	120	TOTAL	5153	TOTAL	774

3.8 Special Projects

3.8.1 Spring Banding Demonstration

A total of 21 birds of 11 species were banded during the demonstration, including: Hammond's Flycatcher – 1, Least Flycatcher – 1, Alder Flycatcher – 2, Yellow-bellied Flycatcher – 1, Swainson's Thrush – 3, American Robin – 3, Orange-crowned Warbler – 1, Myrtle Warbler – 1, Yellow Warbler – 4, Wilson's Warbler – 3 and Common Yellowthroat – 1. Given the seasonal timing of this banding, the birds captured are likely dominated by local breeders and some late migrants such as the Yellow-bellied Flycatcher.

3.8.2 Owl Banding

Call playback was used to target owls on 3 evenings (30.5 net hours) and a total of 3 Boreal Owls were banded (Table 17). The number of owls banded during 2017 was relatively low compared to previous years; however, the amount of effort was also considerably less. The highest number of owls banded was during 2014 when 40 Boreal Owls and 2 Northern Saw-whet Owls were banded. but very similar to the results from 2015 and 2013. The capture rate of 9.8 owls per 100 net hours during 2017 was actually relatively high compared to previous years with the exception of 2014 (2016 – 1.8, 2015 – 3.9, 2014 – 25); however, the mist netting effort has been highly variable between years.

Owl populations and reproductive output are known to vary from year to year due to changes in prey (small mammal) abundance. These differences between years are likely to be exacerbated within the owl banding results as most owls captured are juvenile birds and these individuals are most likely to migrate/irrupt during years when the owls have high breeding success. There was also high variation in the captures between different evenings in 2014 when total captures were high. We may need to increase the number of evenings of sampling during future years to get a more representative sample. This is however very challenging for the personnel operating the observatory given that their priority is the standardized migration during the day time hours.

Table 17. Summary of 2017 owl banding results.

Species	Date			TOTAL
	13 Sep	22 Sep	10 Oct	
Total Net Hours	10.0	12.5	8.0	30.5
Boreal Owl (banded)	0	1	2	3

3.9 Interesting & Notable Captures / Observations

The vast majority of birds banded and observed at Teslin Lake in 2017 were species which are common and widespread north and west of the study site. These common species will be the primary focus of the long-term species trend analysis to be conducted following additional years of data collection. In addition to common species, the observatory continues to add to the knowledge base for rare and uncommon bird species in the Yukon. Notable captures and observations during 2017 included:

- Western Grebe observed on October 5,
- Ring-billed Gull observed on October 6 and 8.
- Single Sabine's Gulls observed on July 29 and September 25.
- Western Kingbird observed on July 29 (new species for the observatory).
- Clark's Nutcracker observed on August 29 (new species for the observatory).
- Cedar Waxwing observed on 3 days between July 26 and August 31 with a high count of 14 on August 31.
- Smith's Longspur observed on August 29.
- Magnolia Warbler (hatch year) banded on August 24.
- Brewer's 'Timberline' Sparrow banded on August 15.

3.9.1 Chickadees

Chickadees are considered year-round residents, but the observatory has documented Boreal Chickadee irruptions in six of the last ten years with variation in the magnitude of irruptions between years (Table 18). The high number of individuals banded and observed in some years indicates that a substantial number of birds are involved in these irruptions. The relative proportion of the species encountered is likely an indication of the relative abundance in the southern Yukon; however, it is possible that certain species may be more likely to stage fall irruptions. Of particular interest, nearly all chickadees banded are hatch year individuals. Also note that Black-capped Chickadee is the only chickadee species which breeds within the study site and therefore a portion of the individuals banded are probable local residents and their offspring.

Table 18. Summary of chickadees banded and observed at the observatory from 2008 to 2017.

Year		Boreal Chickadee	Black-capped Chickadee	Mountain Chickadee	Chestnut-backed Chickadee	Hybrid Chickadee
2008	# Banded	128	57	15	1	1
	# of Bird Days	293	172	20	1	1
2009	# Banded	831	26	11	-	-
	# of Bird Days	1,612	221	24	-	-
2010	# Banded	-	22	-	-	-
	# of Bird Days	12	295	-	-	-
2011	# Banded	233	92	2	-	-
	# of Bird Days	486	270	3	1	-
2012	# Banded	142	65	1	-	12
	# of Bird Days	230	231	5	-	-
2013	# Banded	24	33	-	-	-
	# of Bird Days	40	209	1	-	-
2014	# Banded	3	16	-	-	-
	# of Bird Days	9	157	-	-	-
2015	# Banded	131	31	4	-	-
	# of Bird Days	304	169	11	-	-
2016	# Banded	40	24	-	-	-
	# of Bird Days	62	162	-	-	-
2017	# Banded	473	95	-	-	-
	# of Bird Days	1,047	330	-	-	-

3.10 Species of Conservation Concern

In conjunction with the other Yukon Bird Observatories field stations, all Rusty Blackbirds captured were fitted with a color band (light blue) in addition to the regular numbered leg band. As each observatory uses a different color, the color bands help to identify the origin of a re-sighted individual without the need to recapture it. Additionally, from 2008 to 2010 a feather was collected from each Rusty Blackbird captured. Feather samples were analyzed for stable isotopes in an effort to make linkages between

breeding and wintering grounds of this species. During the fall of 2017, 14 hatch year individuals were banded and the species was observed on 33 days with a total of 356 bird days.

3.11 Visitors and Volunteers

Once again the observatory hosted numerous visitors and volunteers. On most days of operation, adequate personnel were available onsite to assist with the banding operation. This was largely due to the commitment of long-term volunteers who provide valuable assistance at the observatory. During 2017, the observatory hosted long-term volunteers Alyshia Skurdal, Mithuna Sothieson and Andrew Glacier who volunteered for 29, 11 and 11 days, respectively. Qualified volunteers such as are necessary to allow for the observatory to be successful over the long term and there are also a number of other volunteers who live in the Yukon and volunteer a considerable amount of their time at the observatory. During 2017, the observatory recorded a total of 1,374 hours of observer effort (paid and volunteer) by 19 individuals. A total of 74 individuals visited the observatory and tallied a total of 159 visitor hours. Visitors were defined as those people who visited the observatory (often for a short time) and did not take part in activities at the observatory. Volunteers were those people who took part in the operation of the observatory (often extensively) without being financially compensated. Paid hours were spent by individuals being paid to be at the observatory. This category includes the Bander In Charge Jukka Jantunen. Note that the values shown for “paid hours” only include those spent at the observatory and do not include the extensive amount of travel to and from the site, data entry, data analysis, report writing and other communication of the observatory’s results.

Table 19. Hours spent at the observatory by volunteers and paid observers during 2017.

Paid		Volunteer	
# of Individuals	Hours	# of Individuals	Hours
1	582	19	779.75

Table 20. Hours spent at the observatory by visitors during 2017.

Yukon		Canada		USA	
#	Hours	#	Hours	#	Hours
34	122	21	16	19	21

In comparison to previous years, the total number of volunteer hours was less than the record high of 1,267 during 2015 but near average compared to previous years (Figure 8). The total visitor hours was also less than the high of 210 hours during 2009 but still slightly above the average of 152 hours. The amount of paid hours has been declining over time and this is primarily due to having few paid personnel at the observatory on a daily basis. This has been possible in recent years due to the increased availability of qualified volunteers to assist with day to day activities at the observatory.

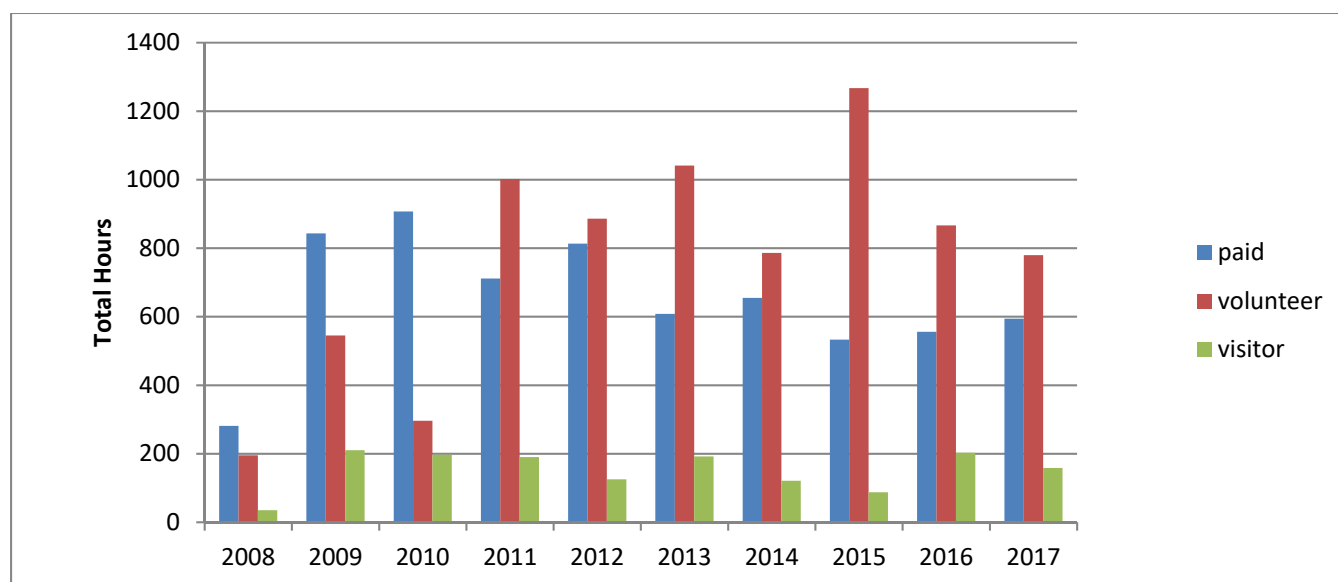


Figure 8. Volunteer and visitor hours at the observatory from 2008 to 2017.

4.0 Conclusion

The results from the operation of the Teslin Lake Bird Observatory in 2017 have continued to add to the knowledge of numerous aspects of bird biology in the Yukon, including: species distribution, migration timing and productivity. The location of the study site has proven to be effective for monitoring songbird migration. The primary reason for this is the close proximity of the site to Teslin Lake. As the lake is a very large body of water which migrating landbirds are hesitant to cross, many birds concentrate along the lakeshore and pass directly through and over the study site. On numerous occasions, flocks of migrating birds have been observed moving along the lakeshore and thus have yielded some very impressive banding and observation totals at the observatory.

Following ten years of fall migration monitoring at the observatory, the ability to monitor songbirds has been well demonstrated by the large numbers of migrants observed and banded on an annual basis. The results gathered this season also confirm the previous assumption that few birds stopover at the study site for extended periods of time. The majority of birds simply pass through the site while in migration and this is supported by the low proportion of band repeats within each season.

The visual migration and lake counts increase the number of bird species which may be monitored at the observatory and are now a key component of the observatory's activities. Together they serve to collect monitoring data for species not banded (or banded only in low numbers) including: waterfowl, loons/grebes, gulls/terns, raptors and some species of passerines, particularly American Robin, Varied Thrush, American Pipit, Rusty Blackbird, Common Redpoll and Pine Siskin. The raptors are a primary focus of these counts as these species are readily observed and identified from a distance. The ability to collect data on ages and color morphs of these species make this data even more valuable.

Over the long term, the data collected at the observatory will be used to calculate species trends to determine the status on bird populations. Given the location of the observatory, the birds counted at the site are known to originate in the Yukon and Alaska. Species trend data from this relatively small catchment area will be useful when used in combination with more southerly bird observatories which monitor birds from a much larger catchment area. For trend analysis to be possible, the observatory must continue to operate on an annual basis for at least 10 years and continue monitoring using standardized methods (i.e., follow the monitoring protocol) that are consistent with what has been done during the previous six years. Given that 2017 marked the tenth consecutive year of fall migration monitoring, Bird Studies Canada will conduct trend analysis for the TLBO data during late 2018 or 2019.

The observatory continues to be successful in attracting members of the public to the observatory to learn about birds and bird migration. During 2017, numerous individuals visited the observatory and were given an introduction to birds, their migration and methods used for ornithological data collection.

4.1 Recommendations

We recommend the following for the future operation of the Teslin Lake Bird Observatory:

- Continue standardized monitoring to allow for the continued analysis of species trends.
- Continue the owl banding program with more regular and frequent effort as available personnel allows.
- Continue to expand species specific banding projects at the observatory, particularly for species such as woodpeckers and potentially raptors which are seldom captured in the standard mist nets.
- Make efforts to attract additional qualified volunteers to assist with activities at the observatory.
- Make efforts to diversify the funding base for the bird observatory to ensure long-term operation.

Appendix A – Species Checklist

Table A1. Birds banded and observed (✓) at Teslin Lake Bird Observatory from 2008 to 2016. Note that observations were not collected during the fall of 2005, 2006 and 2007; observatory was located at a different location on Nisutlin Bay during 2005.

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	Taxon Order
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				
Bean Goose										✓								-	-	-	237
Greater White-fronted Goose	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	246
Snow Goose					✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	265
Cackling Goose												✓						-	-	-	285
Canada Goose	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	296
Trumpeter Swan	✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	328
Tundra Swan			✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	330
Bewick’s Tundra Swan										✓	✓							-	-	-	332
Gadwall	✓						✓								✓			-	-	-	408
American Wigeon	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	414
Mallard	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	424
Blue-winged Teal							✓											-	-	-	461
Northern Shoveler	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	473
Northern Pintail	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	486
American Green-winged Teal	✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	509
Canvasback								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	552
Redhead									✓	✓				✓	✓			-	-	-	553
Ring-necked Duck	✓						✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	556
Greater Scaup								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	570
Lesser Scaup							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	576
Harlequin Duck							✓	✓		✓	✓	✓	✓	✓		✓		-	-	-	598
Surf Scoter	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	602
White-winged Scoter	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	603
Long-tailed Duck							✓			✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	612
Bufflehead	✓				✓					✓	✓	✓	✓	✓		✓	✓	-	-	-	613
Common Goldeneye	✓		✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	614
Barrow’s Goldeneye							✓		✓	✓	✓		✓	✓	✓	✓	✓	-	-	-	618
Hooded Merganser									✓	✓		✓				✓		-	-	-	622
Common Merganser	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	629
Red-breasted Merganser	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	637
Ruffed Grouse	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1552
Spruce Grouse	✓						✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1571
Red-throated Loon	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1677
Pacific Loon								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1681
Common Loon	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1683
Yellow-billed Loon										✓	✓	✓		✓		✓	✓	-	-	-	1684
Horned Grebe								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1730

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				Taxon Order
Red-necked Grebe	✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	1733
Western Grebe											✓						✓	-	-	-	1752
Double-crested Cormorant							✓											-	-	-	2214
Great Blue Heron																✓		-	-	-	2312
Turkey Vulture														✓				-	-	-	2549
Osprey	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	2565
Golden Eagle							✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	-	-	-	2793
Northern Harrier	✓		✓		✓		1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	-	1	2861
Sharp Shinned hawk	✓		✓		2		1	10	23	14	7	13	6	14	25	10	12	3	134	137	3020
Northern Goshawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3050
Bald Eagle	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3094
Swainson’s Hawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3209
Red-tailed Hawk			✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3213
Rough-legged Hawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3232
Sandhill Crane								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3797
Black-bellied Plover											✓			✓				-	-	-	3895
American Golden-Plover							✓			✓	✓		✓		✓	✓	✓	-	-	-	3899
Semipalmated Plover	✓				✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	3997
Killdeer	✓		✓		✓		✓			✓	✓					✓		-	-	-	4019
Upland Sandpiper													✓		✓			-	-	-	4078
Black Turnstone												✓			✓			-	-	-	4116
Stilt Sandpiper													✓					-	-	-	4137
Sanderling								✓	✓	✓	✓	✓		✓	✓	✓	✓	-	-	-	4143
Baird’s Sandpiper							✓	✓	✓		✓		✓		✓		✓	-	-	-	4165
Least Sandpiper					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	1	✓	-	1	1	4168
Pectoral Sandpiper					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4173
Semipalmated Sandpiper								✓	✓	✓	✓	✓	✓		✓	✓		-	-	-	4176
Western Sandpiper											✓					✓	✓	-	-	-	4177
Short-billed Dowitcher							✓								✓			-	-	-	4181
Long-billed Dowitcher								✓	✓	✓	✓	✓		✓	✓	✓	✓	-	-	-	4185
Wilson’s Snipe	✓		✓		✓		1	1	1	✓	✓	✓	✓	1	✓	1	✓	1	4	5	4204
Red-necked Phalarope									✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4241
Red Phalarope																✓		-	-	-	4242
Spotted Sandpiper	1		2		1		1	✓	✓	1	2	✓	1	✓	✓	1	✓	5	5	10	4246
Solitary Sandpiper	✓		✓	2	✓		✓	2	5	1	3	3	2	1	3	✓	✓	-	22	22	4249
Wandering Tattler										✓								-	-	-	4253
Greater Yellowlegs			✓		✓		✓		✓		✓		✓					-	-	-	4256
Lesser Yellowlegs	✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4263

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				Taxon Order
Parasitic Jaeger								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4396
Long-tailed Jaeger													✓					-	-	-	4398
Black-legged Kittiwake										✓				✓				-	-	-	4473
Sabine’s Gull								✓	✓	✓	✓	✓		✓		✓	✓	-	-	-	4479
Bonaparte’s Gull	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4486
Little Gull										✓	✓							-	-	-	4505
Mew Gull	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4531
Ring-billed Gull																	✓	-	-	-	
California Gull										✓		✓					✓	-	-	-	4546
Herring Gull	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4549
Thayer’s Gull								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4566
Iceland Gull																✓		-	-	-	4569
Glaucous-winged Gull										✓	✓							-	-	-	4586
Glaucous Gull								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4592
Arctic Tern	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	4734
Great Horned Owl								✓	✓	✓	✓			✓	✓	✓	✓	-	-	-	6556
Northern Hawk Owl									✓	✓	✓	✓	✓	✓		✓		-	-	-	6640
Short-eared Owl			✓							✓	✓	✓						-	-	-	6893
Boreal Owl											4			40	✓	5		-	49	49	6925
Northern Saw-whet Owl														2				-	2	2	6926
Common Nighthawk								✓	✓	✓	✓		✓	✓	✓		✓	-	-	-	7101
Pacific Swift										✓								-	-	-	7680
Rufous Hummingbird					✓											✓	✓	-	-	-	8354
Belted Kingfisher	✓		✓	8	✓		✓	8	6	5	6	6	2	9	6	4	3	-	63	63	9517
Yellow-bellied Sapsucker	2		2		2		1		✓		3	1	1					7	5	12	10416
Downy Woodpecker	✓		✓					2	1	3	7			1	1	✓	✓	4	19	19	10643
Hairy Woodpecker	2		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	-	2	10661
Three-toed Woodpecker	✓							✓	✓	✓	✓	✓	1	✓	✓	✓	1	-	2	2	10700
Black-backed Woodpecker								✓	✓	✓	✓	✓	✓	✓	✓		✓	-	-	-	10704
Northern Flicker	1		✓		1		✓	✓	✓	1	1	✓	3	✓	✓	3	1	2	9	11	10814
Pileated Woodpecker	✓																	-	-	-	10894
American Kestrel	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	11197
Merlin				✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	-	3	3	11230
Gyr Falcon									✓	✓		✓		✓	✓			-	-	-	11275
Peregrine Falcon				✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	11276
Olive-sided Flycatcher	✓		11		✓		6		✓	✓	1	✓	✓	✓	2	✓	✓	17	3	20	15401
Western Wood-pewee	3		2		2		✓	3	6	5	10	3	4	4	4	✓	1	7	40	7	15414
Yellow-bellied Flycatcher	2	2	1		1			9	8	11	7	9	11	3	11	16	14	4	101	105	15460

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				Taxon Order
Alder Flycatcher	17	9	41	18	10	5	9	811	631	620	637	827	770	506	1058	498	548	77	6938	7015	15462
Least Flycatcher	3		4		3		2	2	1	3	10	3	6	2	4	7	2	12	40	52	15474
Hammond’s Flycatcher	7		5		11		18	6	12	17	28	7	12	8	21	19	10	41	140	181	15475
Dusky Flycatcher	2				2			1	6	3	6	3	3	4	2		4	4	32	36	15477
Western Flycatcher												1				1		-	2	2	15486
Eastern Phoebe			1															1	-	1	15517
Say’s Phoebe			2		2		1	1	1	1	✓	✓	✓	✓	2	2	✓	5	7	12	15519
Western Kingbird																	✓				
Northern Shrike	✓								✓	1	1	1	1	1	✓	1	2	-	8	8	18662
Warbling Vireo	13		1	4	✓		1	9	10	19	17	15	48	12	10	24	19	15	187	202	18955
Gray Jay	5		✓		1		✓		5	4	✓	✓	✓	1	1	✓	✓	6	11	17	19818
Steller’s Jay											✓							-	-	-	19909
Black-billed Magpie					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	4	-	4	4	20113
Clark’s Nutcracker																	✓				
Common Raven	✓		✓		✓		✓	✓	1	1	✓	✓	✓	✓	1	✓	✓	-	3	3	20256
Horned Lark			3		✓		✓		✓	✓							✓	3	-	3	20822
Northern Rough-winged Swallow																✓					21089
Tree Swallow	5		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5	-	5	21126
Violet-green Swallow	✓		✓		✓		✓	✓		✓	✓	✓			✓	✓	✓	-	-	-	21136
Bank Swallow	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	21157
Barn Swallow	✓		✓		✓			✓	1	✓	✓	✓	✓	✓		✓	✓	-	1	1	21203
Cliff Swallow	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	21294
Black-capped Chickadee	✓	4	4	3	2		2	57	26	22	92	65	31	16	31	24	95	8	466	474	21514
Mountain Chickadee							2	15	11		2	1	✓		4		1	2	34	36	21526
Chestnut-backed Chickadee								1			✓							-	1	1	21542
Boreal Chickadee	2		3		2		8	138	831	✓	233	142	23	3	131	40	473	15	2014	2029	21546
Hybrid Chickadee			1					1										1	1	2	21552
Red-breasted Nuthatch	✓				✓		1	3	2	2	5	12	6	3	9	3	4	1	49	50	21849
Brown Creeper											✓							-	-	-	21939
Winter Wren	1										✓			1				1	1	2	22131
American Dipper														✓				-	-	-	22583
Golden-crowned Kinglet		1					✓		10	2	1	3	1		2	3	4	-	27	27	23061
Ruby-crowned Kinglet	25	7	51	3	27		72	29	175	109	86	134	125	69	284	89	114	175	1224	1399	23068
Mountain Bluebird	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	27338
Townsend's Solitaire								✓	1	✓	1	1	✓	✓	✓	2	✓	-	5	5	27342
Gray-cheeked Thrush	4	2	2		5		1	1	2	8	2	4	2	10	11	8	4	12	54	66	27436
Swainson's Thrush	99	7	39	10	48		21	19	49	53	85	41	55	49	68	82	26	207	544	751	27442
Hermit Thrush	1		1		✓		1	1	7	12	12	3	2	1	8	7	2	3	55	58	27451

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				Taxon Order
American Robin	27	1	36	5	17		4	✓	27	9	11	✓	4	9	3	✓	1	84	70	154	27765
Varied Thrush	✓		1		2		✓	3	12	5	2	2	5	3	2	✓	5	3	39	42	27795
European Starling							✓											-	-	-	28048
American Pipit	✓		2		✓		1	1	3	✓	2	✓	2	✓	6	2	✓	3	16	19	29190
Bohemian Waxwing	✓		40		✓		23	✓	✓	✓	1	✓	✓	✓	✓	✓	✓	63	1	64	29257
Cedar Waxwing									✓	2			8	✓			✓	-	10	10	29261
Lapland Longspur	✓		✓		✓		5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5	-	5	29292
Smith's Longspur									✓				✓				✓	-	-	-	29297
Snow Bunting										✓	✓	✓	✓	✓			✓	-	-	-	29300
Northern Waterthrush	4	1	14	10	11		4	46	53	54	42	47	46	48	53	34	34	33	468	501	29314
Black-and-white Warbler															1				1	1	29323
Tennessee Warbler	4		4		6		2		9	40	4	1	1	1	8	13	17	16	94	110	29333
Orange-crowned Warbler	16	6	26	1	47		61	101	180	271	57	88	124	149	331	364	176	150	1848	1998	29334
Nashville Warbler								1				1						-	2	2	29342
MacGillivray's Warbler	1		1					1	3	2		1	1					2	8	10	29365
Common Yellowthroat	1		17	4	11	6	21	66	113	70	72	45	65	82	89	57	59	50	728	778	29385
American Redstart			6	4	1			10	43	30	39	21	33	25	47	15	23	7	290	297	29414
Cape May Warbler							1					1						1	1	2	29416
Magnolia Warbler	1							1			✓	1	1				1	1	4	5	29438
Blackburnian Warbler															1				1	1	29441
Yellow Warbler	10	6	50	19	37	3	31	486	325	471	310	225	333	504	556	449	163	128	3850	3978	29443
Blackpoll Warbler	3	2	21	4	10		5	47	107	194	58	87	87	61	99	134	71	39	951	990	29486
Yellow-rumped Warbler							1	1										1	1	2	29500
Yellow-rumped Warbler (Myrtle)	60	3	63	5	29		78	49	284	673	142	195	163	178	311	286	654	230	2943	3173	29501
Yellow-rumped Warbler (Audubon's)										✓	1							-	1	1	29502
Townsend's Warbler			✓				1	✓	8	10	6	6	7	10	2	2	16	1	67	68	29536
Wilson's Warbler	116	8	54	5	63		151	113	161	177	133	134	122	164	386	172	68	384	1643	2027	29667
American-tree Sparrow	220		13	1	72		41	19	54	21	77	17	19	22	137	20	27	346	414	760	31100
Chipping Sparrow	28		4	1	6		3	6	24	18	28	17	20	15	29	31	38	41	227	268	31103
Brewer's Sparrow				1					1		2						1	-	5	5	31120
Fox Sparrow	106		3		17		26	11	28	28	17	6	7	17	42	10	13	152	179	331	31208
Dark-eyed Junco					9		31	11	✓	✓	✓	✓			2			40	13	53	31232
Dark-eyed Junco (Slate-colored)	165	12	139	5	135		224	182	582	420	331	116	341	140	209	229	443	663	3012	3675	31234
White-crowned Sparrow	86	3	13		579		311	1	33	36	34	22	16	15	23	15	20	989	218	1207	31294
Golden-crowned Sparrow	1				16		9						1	1	2			26	4	30	31302
White-throated Sparrow			✓		1													1	-	1	31306
Savannah Sparrow	11	2	2	2	24		10	14	18	18	23	25	18	17	55	17	12	47	221	268	31326
Song Sparrow										1						1		-	2	2	31352

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL	
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall				Taxon Order
Lincoln's Sparrow	9	1	6		39		21	5	16	15	27	9	9	9	65	13	14	75	183	258	31385
Swamp Sparrow										1								-	1	1	31389
Western Tanager			1						1		✓	✓						1	1	2	31767
Red-winged Blackbird	✓		1		1		✓		✓		✓	✓	✓			✓		2	-	2	31953
Rusty Blackbird	19		3		2	1	✓	11	30	20	16	9	14	10	18	6	14	24	149	173	32034
Brown-headed Cowbird	1		✓		✓		✓			✓	1		✓	2	1			1	4	5	32143
Pine Grosbeak			2					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	-	2	32477
Purple Finch	27		3		6		1	✓	✓	10	1	2	1	3	✓	✓	✓	37	17	54	32576
Red Crossbill	3						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	3	-	3	32678
White-winged Crossbill			5					2	2	100	1	2	5	2	✓	46	✓	5	160	165	32718
Common Redpoll	✓		107		1		22	✓	6	1	75	47	✓	1	8	3	2	130	143	273	32722
Hoary Redpoll					3						2			✓				3	2	5	32729
Pine Siskin	28		1				✓	1	1	91	10	3	8	303	1	3	151	29	572	601	32736
Evening Grosbeak														✓				-	-	-	32968
TOTAL SPECIES BANDED	43	18	48	21	43	4	45	48	53	52	57	51	51	48	51	51	47	70			
TOTAL BIRDS BANDED	1142	77	814	115	1267	15	1238	2319	3956	3706	2793	2429	2,577	2,510	4,186	2,780	3,369	4,461			

Appendix B – Daily Species Total Summary

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Greater White-fronted Goose	6-Aug	20	1722	19-Sep	909	24-Aug
Snow Goose	19-Sep	2	396	30-Sep	393	30-Sep
Canada Goose	29-Aug	16	751	30-Sep	208	18-Sep
Unidentified Goose	-	5	105	-	35	-
Trumpeter Swan	5-Sep	17	1022	20-Oct	388	17-Oct
Tundra Swan	30-Sep	13	4231	20-Oct	1864	30-Sep
Unidentified Swan	-	15	1004	-	320	-
American Wigeon	26-Sep	3	328	20-Oct	323	09-Oct
Mallard	29-Jul	24	112	10-Oct	20	10-Oct
Northern Shoveler	4-Aug	3	55	26-Sep	45	04-Aug
Northern Pintail	4-Aug	8	90	10-Oct	21	10-Oct
Green-winged Teal	31-Jul	2	8	09-Aug	4	both days
Canvasback	19-Aug	4	111	08-Oct	76	30-Sep
Ring-necked Duck	31-Jul	2	3	01-Aug	2	31-Jul
Greater Scaup	30-Sep	2	12	09-Oct	10	09-Oct
Lesser Scaup	29-Jul	19	393	19-Oct	120	19-Sep
Unidentified Scaup	-	4	80	-	40	-
Surf Scoter	31-Jul	23	369	15-Oct	69	12-Sep
White-winged Scoter	14-Aug	8	85	16-Oct	45	14-Oct
Unidentified Scoter	-	1	14	-	14	-
Long-tailed Duck	18-Oct	1	8	-	8	18-Oct
Bufflehead	5-Sep	6	37	17-Oct	20	10-Oct
Common Goldeneye	14-Sep	12	69	19-Oct	17	14-Oct
Barrow's Goldeneye	3-Oct	1	4	-	4	03-Oct
Unidentified Goldeneye	-	4	15	-	5	-
Common Merganser	27-Jul	43	356	18-Oct	46	26-Aug
Red-breasted Merganser	26-Jul	37	192	17-Oct	21	12-Aug
Unidentified Merganser	-	2	18	-	15	-
Unidentified Duck	-	7	73	-	75	-
Ruffed Grouse	26-Jul	45	102	19-Oct	10	02-Aug
Spruce Grouse	20-Sep	1	1	1	1	20-Sep
Red-throated Loon	27-Jul	52	148	08-Oct	10	09-Sep
Pacific Loon	29-Jul	49	282	19-Oct	20	06-Sep
Common Loon	26-Jul	69	446	20-Oct	32	06-Sep
Yellow-billed Loon	5-Oct	3	3	18-Oct	1	all days
Unidentified Loon	-	16	28	-	4	-
Horned Grebe	6-Aug	10	19	29-Sep	5	29-Sep
Red-necked Grebe	27-Jul	71	799	17-Oct	36	04-Aug
Western Grebe	5-Oct	1	1	-	1	05-Oct

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Osprey	12-Aug	18	34	09-Oct	5	17-Sep
Golden Eagle	27-Aug	23	154	20-Oct	23	07-Oct
Northern Harrier	5-Aug	50	233	19-Oct	41	11-Sep
Sharp-shinned Hawk	6-Aug	52	267	19-Oct	56	11-Sep
Northern Goshawk	27-Aug	32	46	20-Oct	3	05-Oct
Bald Eagle	27-Jul	50	119	20-Oct	15	19-Sep
Unidentified Eagle	-	2	3	-	2	-
Swainson's Hawk	12-Sep	1	1	-	1	12-Sep
Red-tailed Hawk	-	8	8	-	1	-
Red-tailed Hawk (Harlan's)	21-Aug	35	206	20-Oct	43	11-Oct
Rough-legged Hawk	11-Sep	20	122	20-Oct	41	09-Oct
Unidentified Buteo	-	6	9	-	3	-
Unidentified Raptor	-	5	8	-	2	-
Sandhill Crane	11-Sep	4	141	10-Oct	81	30-Sep
American Golden-Plover	11-Aug	1	2	-	2	11-Aug
Semipalmated Plover	26-Jul	14	16	25-Aug	2	4, 15 Aug
Sanderling	16-Sep	2	3	17-Sep	2	16-Sep
Baird's Sandpiper	1-Aug	2	2	09-Aug	1	both days
Least Sandpiper	26-Jul	12	16	24-Aug	5	02-Aug
Pectoral Sandpiper	29-Jul	2	2	17-Sep	1	both days
Western Sandpiper	23-Aug	1	2	-	2	23-Aug
Unidentified Peep	-	2	6	-	3	-
Long-billed Dowitcher	27-Sep	1	1	-	1	27-Sep
Wilson's Snipe	25-Aug	2	2	27-Sep	1	-
Red-necked Phalarope	29-Jul	4	7	27-Aug	3	29-Jul
Spotted Sandpiper	26-Jul	40	77	10-Sep	8	11-Aug
Solitary Sandpiper	1-Aug	5	5	16-Aug	1	all days
Lesser Yellowlegs	30-Jul	4	11	07-Aug	6	31-Jul
Unidentified Shorebird	-	2	3	-	2	-
Parasitic Jaeger	25-Aug	5	9	18-Sep	3	27-Aug
Sabine's Gull	29-Jul	2	2	25-Sep	1	both days
Bonaparte's Gull	27-Jul	12	38	12-Aug	9	29-Jul
Mew Gull	27-Jul	59	378	28-Sep	39	27-Aug
Ring-billed Gull	6-Oct	2	2	08-Oct	1	both days
California Gull	3-Oct	8	8	20-Oct	1	all days
Herring Gull	26-Jul	85	2973	20-Oct	170	07-Aug
Thayer's Gull	25-Aug	40	238	20-Oct	51	21-Sep
Glaucous Gull	8-Oct	4	5	20-Oct	2	15-Oct
Arctic Tern	26-Jul	14	88	01-Sep	27	01-Aug

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Unidentified Gull	-	3	39	-	20	-
Great Horned Owl	29-Jul	2	2	08-Sep	1	both days
Common Nighthawk	1-Sep	1	1	-	1	01-Sep
Belted Kingfisher	26-Jul	30	40	23-Sep	3	26-Jul
Downy Woodpecker	28-Aug	9	9	19-Oct	1	all days
Hairy Woodpecker	21-Aug	4	4	12-Oct	1	all days
American Three-toed Woodpecker	27-Aug	11	12	19-Oct	2	17-Sep
Black-backed Woodpecker	6-Sep	2	2	15-Sep	1	both days
Unidentified Woodpecker	-	12	13	-	2	-
Northern Flicker	26-Jul	6	8	10-Sep	3	01-Sep
American Kestrel	29-Aug	18	67	20-Sep	19	11-Sep
Merlin	19-Aug	26	40	19-Oct	8	11-Sep
Peregrine Falcon	1-Sep	12	20	02-Oct	4	17-Sep
Olive-sided Flycatcher	14-Aug	4	4	09-Sep	1	all days
Western Wood-Pewee	10-Aug	2	2	27-Aug	1	both days
Yellow-bellied Flycatcher	7-Aug	11	14	31-Aug	2	18, 19, 23 Aug
Alder Flycatcher	26-Jul	43	574	12-Sep	61	23-Aug
Least Flycatcher	8-Aug	2	2	10-Aug	1	both days
Hammond's Flycatcher	26-Jul	10	12	01-Sep	2	26 Jul, 18 Aug
Dusky Flycatcher	17-Aug	4	4	10-Sep	1	all days
Say's Phoebe	1-Sep	1	1	-	1	01-Sep
Western Kingbird	29-Jul	1	1	-	1	29-Jul
Northern Shrike	10-Sep	7	9	29-Sep	2	13, 24 Sep
Warbling Vireo	26-Jul	19	32	13-Sep	6	29-Jul
Gray Jay	28-Sep	3	5	15-Oct	2	12, 15 Oct
Black-billed Magpie	29-Aug	52	82	20-Oct	7	29-Sep
Clark's Nutcracker	29-Aug	1	1	-	1	29-Aug
Common Raven	26-Jul	85	292	20-Oct	10	19-Oct
Horned Lark	17-Oct	1	1	-	1	17-Oct
Tree Swallow	29-Jul	2	45	30-Jul	44	29-Jul
Violet-green Swallow	30-Jul	7	24	25-Aug	8	17-Aug
Bank Swallow	29-Jul	15	299	25-Aug	170	29-Jul
Barn Swallow	29-Jul	4	8	27-Aug	5	29-Jul
Cliff Swallow	29-Jul	2	4	25-Aug	2	29-Jul
Unidentified Swallow	-	10	1035	-	646	-
Black-capped Chickadee	26-Jul	80	330	20-Oct	20	18-Sep
Mountain Chickadee	7-Aug	2	3	28-Sep	2	07-Aug
Boreal Chickadee	1-Aug	54	1047	20-Oct	130	17-Sep
Unidentified Chickadee	-	1	2	-	2	-

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Red-breasted Nuthatch	29-Jul	22	26	20-Oct	2	12, 27, 28 Aug
Golden-crowned Kinglet	12-Aug	5	7	21-Sep	2	3, 17 Sep
Ruby-crowned Kinglet	3-Aug	41	157	15-Oct	30	19-Sep
Mountain Bluebird	6-Oct	2	3	10-Oct	2	06-Oct
Townsend's Solitaire	29-Jul	20	118	25-Sep	39	01-Sep
Gray-cheeked Thrush	23-Aug	4	4	21-Sep	1	all days
Swainson's Thrush	3-Aug	18	33	13-Sep	6	20-Aug
Hermit Thrush	26-Sep	2	2	28-Sep	1	both days
American Robin	27-Jul	42	774	17-Oct	134	15-Sep
Varied Thrush	15-Aug	29	1285	28-Sep	441	08-Sep
Unidentified Large Thrush	-	18	214	-	36	-
American Pipit	20-Aug	31	627	20-Oct	244	08-Sep
Bohemian Waxwing	13-Aug	24	640	20-Oct	130	18-Oct
Cedar Waxwing	26-Jul	3	29	31-Aug	14	31-Aug
Unidentified Waxwing	-	1	2	-	2	-
Lapland Longspur	4-Sep	16	29	19-Oct	4	10, 15 Sep
Smith's Longspur	29-Aug	1	1	-	1	29-Aug
Snow Bunting	12-Oct	3	5	20-Oct	2	17, 20 Oct
Northern Waterthrush	31-Jul	20	44	06-Sep	6	09-Aug
Tennessee Warbler	1-Aug	12	17	13-Sep	3	23-Aug
Orange-crowned Warbler	30-Jul	46	207	23-Sep	18	10-Sep
Common Yellowthroat	27-Jul	47	88	25-Sep	6	16-Aug
American Redstart	6-Aug	15	26	12-Sep	3	18, 19, 20 Aug
Magnolia Warbler	24-Aug	1	1	-	1	24-Aug
Yellow Warbler	26-Jul	53	247	13-Oct	19	18-Aug
Blackpoll Warbler	26-Jul	34	100	12-Sep	8	29-Aug
Yellow-rumped Warbler (Myrtle)	26-Jul	67	2220	10-Oct	200	01-Sep
Townsend's Warbler	29-Jul	9	17	01-Sep	6	10-Aug
Wilson's Warbler	26-Jul	34	77	27-Sep	10	01-Aug
Unidentified Warbler	-	18	66	-	11	-
American Tree Sparrow	29-Aug	25	50	20-Oct	5	12, 20 Sep
Chipping Sparrow	26-Jul	21	63	02-Sep	11	20-Aug
Brewer's Sparrow	15-Aug	1	1	-	1	15-Aug
Fox Sparrow	3-Sep	14	19	07-Oct	3	14-Sep
Dark-eyed Junco (Slate-colored)	26-Jul	72	770	19-Oct	55	03-Sep
White-crowned Sparrow	6-Aug	14	21	12-Sep	3	18, 28 Aug
Savannah Sparrow	26-Jul	15	23	28-Sep	5	20-Sep
Lincoln's Sparrow	18-Aug	10	15	28-Sep	3	03-Sep
Unidentified Sparrow	-	2	2	-	1	-

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Rusty Blackbird	25-Aug	33	356	18-Oct	87	20-Sep
Pine Grosbeak	6-Sep	14	90	20-Oct	22	16-Oct
Purple Finch	26-Jul	5	5	06-Aug	1	all days
Red Crossbill	27-Jul	29	190	14-Sep	29	12-Aug
White-winged Crossbill	26-Jul	21	137	18-Oct	42	29-Jul
Unidentified Crossbill	-	5	56	-	21	-
Common Redpoll	31-Jul	32	1237	20-Oct	186	09-Oct
Pine Siskin	26-Jul	55	1689	18-Oct	140	16-Sep
Unidentified Small Finch	-	31	1214	-	138	-
Unidentified Finch	-	4	15	-	5	-
Unidentified Passerine	-	68	4841	-	567	-