Teslin Lake Bird Observatory Annual Report 2020

Yukon
BIRD OBSERVATORIES

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Society of Yukon Bird Observatories
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The 2020 operation of the Teslin Lake Bird Observatory was made possible due to support and financial contributions from the following organizations.

Environment Canada

Environnement Canada

Yukon Fish and Wildlife Enhancement Trust

Teslin Renewable Resources Council

EDI Environmental Dynamics Inc.

Yukon Bird Club

Cover Photo: A Gray Catbird banded at the observatory on September 16, 2020 was the first record of the species at TLBO and one of very few Yukon records to date (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 thirteenth consecutive year of fall migration monitoring in 2020. The field station operated for a total of 78 days between July 27 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 2,471 birds of 44 species with 3,105 net hours (79.58 birds/100 net hours). The mist netting effort was reduced significantly after early September which arose due to persist predation risk in the mist netting area (foxes) which could not be mitigated effectively. Alder Flycatcher, Yellow Warbler, Slate-colored Junco, Myrtle Warbler and Wilson's Warbler were the five most common species banded, accounting for over 77% of all individuals banded. These have been among the top species banded in previous years although numerous species were banded in above average or record high totals.

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 August 2 and October 20, personnel spent 448.2 hours doing visual counts and observed 32,989 individuals (74 birds per hour) which is well below average compared to previous years.

Noteworthy results from 2019 included:

- The number of birds banded was well above the long term average and the capture rate of birds per 100 net hours (79.6) was the highest recorded to date.
- Alder Flycatcher is typically the most frequently banded species at TLBO and this was once again the case during 2020 with a record breaking 1,143 individuals.
- One new species – Gray Catbird – was observed and banded for the first time at the observatory during 2020.
- A total of 1,253 raptors and 21,238 waterfowl were observed on the visual migration counts.
- The lake counts tallied a total of 87 bird days of shorebirds (10 species), 311 bird-days of loons (3 species), 345 bird-days of grebes (2 species) and 2,073 bird-days of gulls/terns/jaegers (8 species).
- The number of visitors and volunteers was minimized at the observatory due to the COVID-19 pandemic.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 Introduction

This report describes methods and results of work done at the Teslin Lake Bird Observatory from July 27 to October 20, 2020, the thirteenth year of fall operation at this site. No new activities were undertaken at the observatory in 2020.

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 2020 Season

The objectives of the 2020 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 2020 bird migration results to the previous 11 years of similarly collected data.

1.5 Acknowledgements

The 2020 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, 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 2020 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.

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

- more than 15 days – Ted Murphy-Kelly;
- 10 to 15 days – Rachel Foster, Julie Bauer;
- 5 to 10 days – Cora Kelly, Ben Schonewlle, Hollie Murphy-Kelly, Brenna Kelly, Lila Tauzer, Pam Sinclair and Cameron Eckert;
- Less than 5 days – Mabel Wong, Boris Dobrowolsky, Hilary Cooke, Tracy Allard, Cathy Koot and Dawn Hansen.

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 Manual[2]. 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 2020.

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 2020, 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 2018; 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 on the ground or in the vegetation 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 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 observatory 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.

3.0 Results & Discussion

3.1 Station Operation

The 2019 fall season included a total of 78 field days between July 27 and October 20. Standardized mist netting occurred on 37 days between July 27 and September 16 and no opportunistic (non-standard) banding was done during 2020. As per the observatory's protocol, mist netting is typically conducted until at least the end of September; however, this was reduced during 2020 due to the persistent presence of predators (foxes) within the count area which caused an unpreventable risk to the birds if captured in mist nets. After September 16, activities at the observatory were limited to visual migration counts, lake counts and incidental observations.

A total of 2,471 birds of 44 species were banded and 136 species were observed (Table 1, Table 2). The all-time total number of birds banded at Teslin Lake Bird Observatory is now 47,832 birds of 96 species and 208 species have been observed (Appendix A). One new species – Gray Catbird - was added to the station checklist and banded during 2020.

Table 1. Summary statistics for the 2020 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	27 Jul – 2 Aug	5	140	20	386	36.27	88	0.5	50
2	3 – 9 Aug	7	137	24	514	26.65	66	0.0	59
3	10 – 16 Aug	4	296	21	266	111.28	190	0.0	51
4	17 – 23 Aug	7	1,049	25	673	155.87	6,579	11.9	78
5	24 – 30 Aug	6	600	32	614	97.72	2,447	14.5	84
6	31 Aug – 6 Sep	6	229	23	547	41.87	2,136	13.9	74
7	7 – 13 Sep	6	13	7	82	15.85	2,057	18.3	67
8	14 – 20 Sep	7	7	5	23	30.43	909	20.4	56
9	21 – 27 Sep	7	0	0	0	0	2,619	29.5	72
10	28 Sep – 4 Oct	7	0	0	0	0	1,294	29.2	68
11	5 – 11 Oct	7	0	0	0	0	5,158	37.7	64
12	12 – 18 Oct	7	0	0	0	0	11,085	39.5	60
13	19 – 20 Oct	2	0	0	0	0	212	8.0	27
ALL	27 Jul – 20 Oct	78	2,471	44	3,105	79.58	34,840	448.2	136

[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 2020 fall season (not including special projects).

Common Name	Scientific Name	# Banded	# Banded / 1000 Net Hrs
Sharp-shinned Hawk	*Accipiter striatus*	3	0.97
Belted Kingfisher	*Ceryle alcyon*	6	1.93
Downy Woodpecker	*Picoides pubescens*	1	0.32
Yellow-bellied Flycatcher	*Empidonax flaviventris*	7	2.25
Alder Flycatcher	*Empidonax alnorum*	1143	368.12
Least Flycatcher	*Empidonax minimus*	1	0.31
Hammond's Flycatcher	*Empidonax hammondii*	16	5.15
Dusky Flycatcher	*Empidonax oberholseri*	3	0.97
Say's Phoebe	*Sayornis saya*	1	0.32
Northern Shrike	*Lanius excubitor*	1	0.32
Warbling Vireo	*Vireo gilvus*	15	4.83
Canada Jay	*Perisoreus canadensis*	1	0.32
Black-capped Chickadee	*Poecile atricapillus*	19	6.12
Boreal Chickadee	*Poecile hudsonicus*	25	8.05
Red-breasted Nuthatch	*Sitta canadensis*	3	0.97
Golden-crowned Kinglet	*Regulus satrapa*	4	1.29
Ruby-crowned Kinglet	*Regulus calendula*	54	17.39
Gray-cheeked Thrush	*Catharus minimus*	4	1.29
Swainson's Thrush	*Catharus ustulatus*	58	18.68
American Robin	*Turdus migratorius*	8	2.58
Varied Thrush	*Ixoreus neavius*	3	0.97
American Pipit	*Anthus rubescens*	2	0.64
Northern Waterthrush	*Parkesia noveboracensis*	45	14.49
Tennessee Warbler	*Oreothlypis peregrina*	1	0.32
Orange-crowned Warbler	*Oreothlypis celata*	55	17.71
Common Yellowthroat	*Geothlypis trichas*	74	23.83
American Redstart	*Setophaga ruticilla*	19	6.12
Yellow Warbler	*Setophaga petechia*	404	130.11
Blackpoll Warbler	*Setophaga striata*	35	11.27
Myrtle Warbler	*Setophaga coronata*	138	44.44
Townsend's Warbler	*Setophaga townsendi*	9	2.90
Wilson's Warbler	*Cardellina pusilla*	81	26.09
American Tree Sparrow	*Spizella arborea*	5	1.61
Chipping Sparrow	*Spizella passerina*	34	10.95
Savannah Sparrow	*Passerculus sandwichensis*	16	5.15
Fox Sparrow	*Passerella iliaca*	3	0.97
Lincoln's Sparrow	*Melospiza lincolnii*	11	3.54
White-crowned Sparrow	*Zonotrichia leucophrys*	15	4.83
Golden-crowned Sparrow	*Zonotrichia atricapilla*	1	0.32
Slate-colored Junco	*Junco hyemalis*	139	44.77
Rusty Blackbird	*Euphagus carolinus*	1	0.32
Purple Finch	*Carpodacus purpureus*	2	0.64
Common Redpoll	*Acanthis flammea*	1	0.32
Pine Siskin	*Spinus pinus*	4	1.29
TOTAL		2,471	795.81

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. Wind in particular can be problematic at the observatory due to the site being directly adjacent to Teslin Lake and that a number of the nets are located in minimal cover along the shoreline/beach. The 2020 season saw temperatures which were slightly cooler compared to previous years and the amount of wind was near average (Table 3, Table 4).

The number of days with precipitation (32) was well above average and near the record high of 37 during 2014.

Table 3. Summary of weather conditions during the 2020 fall season.

Weather Parameter	Week							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Average Opening Temperature (°C)	9.0	7.9	7.3	7.7	5.3	5.2	5.2	1.6
Average Closing Temperature (°C)	18.0	14.4	10.5	14.6	13.2	13.7	12.5	13.6
Average Opening Wind (Beaufort scale)	1.2	1.3	1.0	0.4	1.0	1.8	1.5	1.0
Average Closing Wind (Beaufort scale)	2.4	2.0	2.5	1.6	0.8	2.3	2.5	1.4
Days with Rain (during count period)	3	1	5	4	3	2	3	1
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)	3.7	1.1	0.9	-5.4	-8.0	**3.5**
Average Closing Temperature (°C)	10.9	11.1	8.0	0.4	-2.5	**11.1**
Average Opening Wind (Beaufort scale)	1.7	1.1	0.9	2.3	2.0	**1.3**
Average Closing Wind (Beaufort scale)	2.4	2.4	1.4	1.6	2.5	**1.9**
Days with Rain (during count period)	4	2	2	0	0	**30**
Days with Snow (during count period)	0	0	0	1	1	**2**

Table 4. Comparison of weather conditions during 2020 as compared to previous years.

Weather Parameter	Annual Average										2011 - 2019 Average
	2011	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	
Average Opening Temperature (°C)	3.5	2.6	6.0	4.7	4.4	4.8	4.7	3.5	4.1	3.5	4.3
Average Closing Temperature (°C)	10.4	10.7	14.4	11.8	10.2	12.1	12.6	14.3	12.9	11.1	12.1
Average Opening Wind (Beaufort scale)	1.7	1.7	1.5	1.4	1.3	1.6	1.6	1.4	1.4	1.3	1.5
Average Closing Wind (Beaufort scale)	2.6	2.9	2.7	2.3	2.5	2.4	2.3	2.0	1.9	1.9	2.4
Days with Rain (during count period)	33	17	14	32	19	16	21	14	13	30	19.9
Days with Snow (during count period)	4	6	0	5	2	1	4	1	2	2	2.8

3.2 Patterns in Captures

The peak period for banding occurred between August 17 to 26 (Figure 2). This period included the highest daily banding totals of the season of 218 and 204 birds on August 17 and 24, respectively. The birds banded on these days were comprised on a number of species with Alder Flycatcher (214) and Yellow Warbler (103) being the most common. The lack of birds banded after early September was due to the absence of mist netting effort during this time.

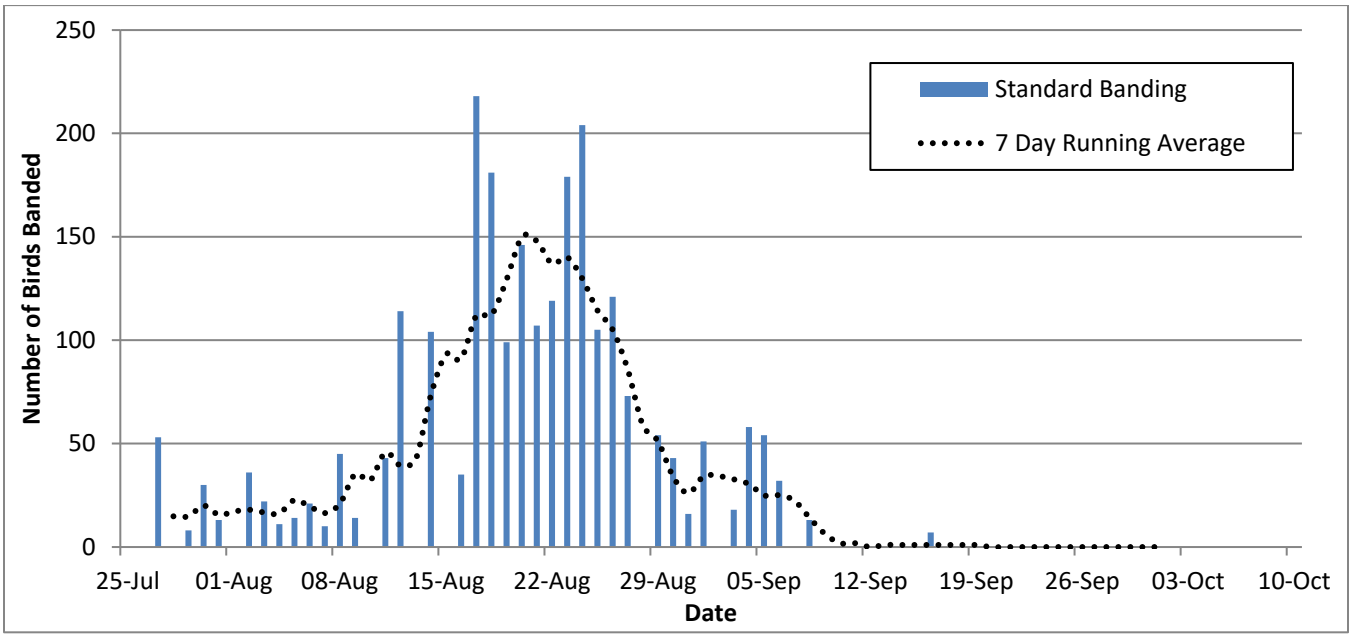

Figure 2. Summary of birds banded per day during the fall of 2020.

The number of birds banded during 2020 (2,471) was slightly below the long-term average of 3,005; however, the 2020 total is not directly comparable due to the limited mist netting effort through much of September. When birds per net hour are taken into consideration, the 2020 value of 79.6 birds per 100 net hours was the highest to date and surpassed the long-term average of 47.5 and the previous high of 67.0 during 2019 (Figure 3).

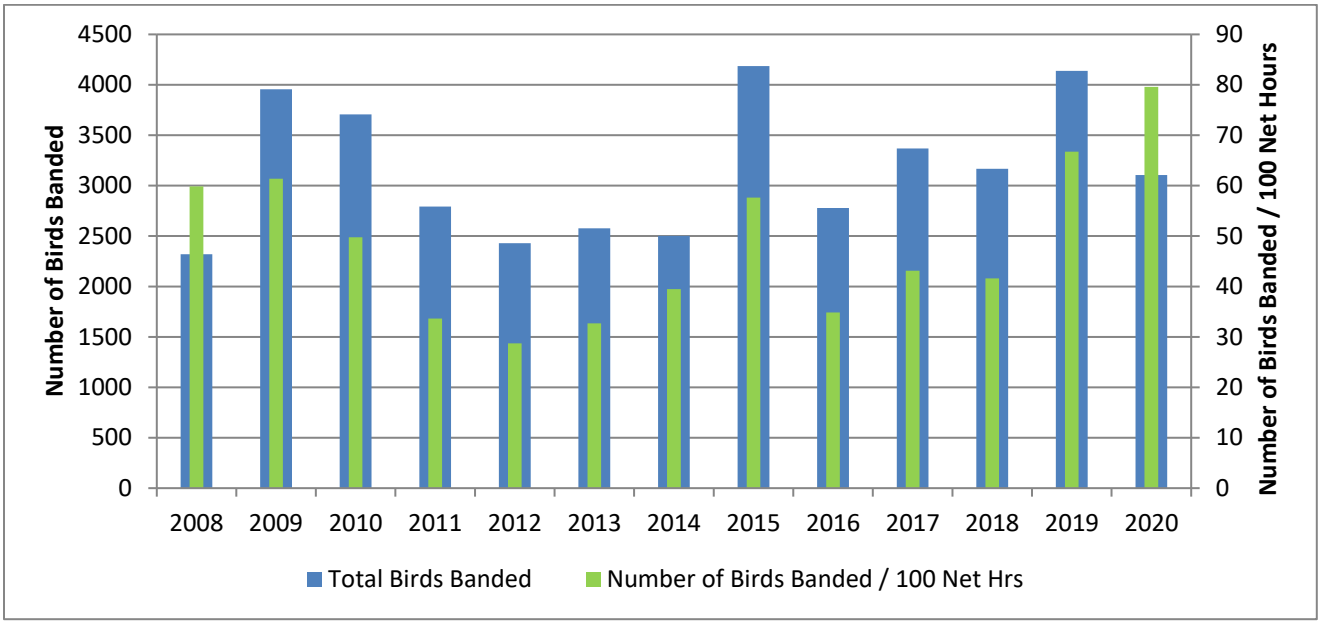

Figure 3. Summary of birds banded during the fall from 2008 to 2020.

3.3 Visual Migration Counts

The visual migration counts provide a method of estimating relative numbers of individuals in migration 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 2020 season, visual migration counts (standard & nonstandard) were conducted for 448.2 hours (Figure 4). Non-standard count effort was limited to less than one hour during 2020. The amount of counting effort during 2020 was relatively high and this is directly related to the reduced mist netting effort through much of September.

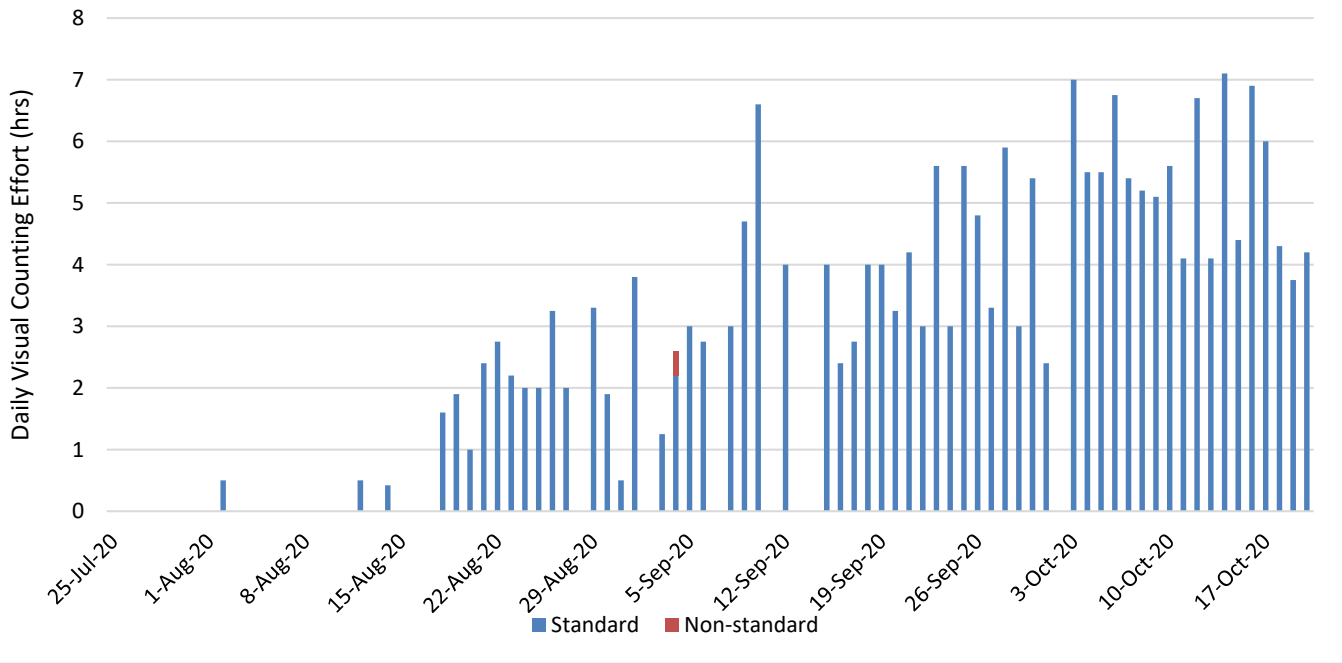

Figure 4. Visual counting effort, in hours each day, over the duration of the 2020 season.

A total of 32,989 birds were observed during the 2020 visual migration counts with waterfowl accounting for the largest proportion of the birds observed (Table 5). Compared to previous years, the number of birds observed during 2020 was relatively low for all species groups, particularly the waterbirds/shorebirds and passerines.

Table 5. Summary of birds observed on the visual migration counts from 2009 to 2020.

Year	Total Birds Observed					TOTAL BIRDS OBSERVED / HR	Visual Counting Effort (hrs)
	Waterbirds & shorebirds	Waterfowl	Raptors	Passerines	ALL SPECIES		
2009	4,927	8,219	1,612	11,000	25,758	201	128.1
2010	3,491	22,258	1,710	16,277	43,736	188	232.4
2011	1,072	31,548	3,680	37,951	74,251	218	340.6
2012	1,583	35,044	1,977	21,408	60,012	169	354.8
2013	2,166	7,852	2,466	28,839	41,323	147	280.9
2014	721	28,556	2,300	23,397	54,974	197	279.0
2015	3,878	22,560	4,211	11,797	42,446	218	194.6
2016	1,043	14,885	1,946	20,182	38,056	204	186.7
2017	436	9,497	980	13,626	24,539	87	235.6
2018	1,103	11,689	1,268	2,386	16,443	138	119.5
2019	1,690	30,544	2,095	15,705	50,034	248	201.6
2020	767	21,238	1,253	9,731	32,989	74	448.2
2009-2019 Average	1,877	18,858	2,074	17,116	39,925	176	223

3.4 Lake Counts

The lake counts provide monitoring data for various species of shorebirds, loons, grebes, waterfowl, and gulls/terns/ jaegers. Twelve 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.

The majority of loons and grebes counted at the observatory are observed on the lake counts and this was once again the case during 2020 with a total of 312 loons and 345 grebes (Table 6). 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 6). 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 8 species of gulls/terns/jaegers were observed on the 2020 lake counts.

Table 6. Summary of shorebirds (left), waterbirds (middle) and waterfowl (right) observed on the lake counts during 2020. 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	81	Greater White-fronted Goose	5
Killdeer	1	Common Loon	122	Canada Goose	121
Sanderling	1	Red-throated Loon	108	Trumpeter Swan	14
Least Sandpiper	4	Red-necked Grebe	263	*Unidentified Swan*	7
Upland Sandpiper	2	Horned Grebe	82	Mallard	62
Pectoral Sandpiper	10	Mew Gull	88	Green-winged Teal	31
Red-necked Phalarope	3	Herring Gull	1,781	Northern Pintail	8
Red Phalarope	1	Thayer's Gull	109	American Wigeon	7
Spotted Sandpiper	53	Glaucous Gull	13	Surf Scoter	227
Solitary Sandpiper	6	Sabine's Gull	7	White-winged Scoter	4
		Bonaparte's Gull	26	Lesser Scaup	57
		Arctic Tern	43	*Unidentified Scaup*	3
		Parasitic Jaeger	3	Common Goldeneye	36
		Unidentified Jager	1	*Unidentified Goldeneye*	3
		Unidentified Gull	2	Harlequin Duck	2
				Long-tailed Duck	1
				Common Merganser	668
				Red-breasted Merganser	224
				Unidentified Merganser	2
TOTAL	**87**	**TOTAL**	**2,729**	**TOTAL**	**1,482**

3.5 Visitors and Volunteers

Visitors and volunteers are normally a large component of TLBO's operation; however, both were minimized during 2020 due to the COVID-19 pandemic. Despite this, we were still able to attract local volunteers to assist with the observatory's operation. A total of 439 volunteer hours were tallied during the fall of 2020 and were represented primarily with Whitehorse based volunteers. While this amount of volunteer hours is the lowest since 2011, this is directly related to the inability to attract a long-term volunteer from outside of the Yukon.

4.0 Conclusion

The results from the operation of the Teslin Lake Bird Observatory in 2020 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 thirteen 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 refine species trends first prepared during 2019 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.

Due to the COVID-19 pandemic, the observatory did not advertise to the public. However, throughout growing network of volunteers, it was possible to adequately schedule volunteers to assist with day to day operations of the observatory. It is hoped that in future years, we will again be able to be more open and continue to attract visitors to the site.

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	2018	2019	2020	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Bean Goose										✓											-	-	-
Greater White-fronted Goose	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Snow Goose					✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Cackling Goose												✓							✓		-	-	-
Canada Goose	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Trumpeter Swan	✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Tundra Swan			✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Bewick's Tundra Swan										✓	✓										-	-	-
Gadwall	✓						✓								✓						-	-	-
American Wigeon	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Mallard	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Blue-winged Teal							✓														-	-	-
Northern Shoveler	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Northern Pintail	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
American Green-winged Teal	✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	-	-	-
Canvasback								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Redhead									✓	✓				✓	✓						-	-	-
Ring-necked Duck	✓						✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Greater Scaup								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Lesser Scaup							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Harlequin Duck							✓	✓		✓	✓	✓	✓	✓		✓			✓	✓	-	-	-
Surf Scoter	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
White-winged Scoter	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Long-tailed Duck							✓			✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	-	-	-
Bufflehead	✓				✓					✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	-	-	-
Common Goldeneye	✓		✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Barrow's Goldeneye							✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		-	-	-
Hooded Merganser									✓	✓		✓				✓					-	-	-
Common Merganser	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Red-breasted Merganser	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Ruffed Grouse	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Spruce Grouse	✓						✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	-	-	-
Red-throated Loon	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Pacific Loon								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Common Loon	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Yellow-billed Loon										✓	✓	✓		✓		✓	✓				-	-	-
Horned Grebe								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Red-necked Grebe	✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Western Grebe											✓						✓				-	-	-
Double-crested Cormorant							✓														-	-	-
Great Blue Heron																✓					-	-	-
Turkey Vulture														✓							-	-	-
Osprey	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Golden Eagle							✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	-	-	-
Northern Harrier	✓		✓		✓		1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	✓	1	1	2
Sharp Shinned hawk	✓		✓		2		1	10	23	14	7	13	6	14	25	10	12	10	7	3	3	154	157
Northern Goshawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Bald Eagle	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Swainson's Hawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Red-tailed Hawk			✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Rough-legged Hawk							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Sora																			✓				
Sandhill Crane								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Black-bellied Plover											✓			✓							-	-	-
American Golden-Plover							✓			✓	✓		✓		✓	✓	✓				-	-	-
Semipalmated Plover	✓				✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Killdeer	✓		✓		✓		✓			✓	✓					✓				✓	-	-	-
Upland Sandpiper													✓		✓					✓	-	-	-
Black Turnstone												✓			✓						-	-	-
Stilt Sandpiper													✓								-	-	-
Sanderling								✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	-	-	-
Baird's Sandpiper							✓	✓	✓		✓		✓		✓		✓		✓		-	-	-
Least Sandpiper					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	1	✓	✓	✓	✓	-	1	1
Pectoral Sandpiper					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Semipalmated Sandpiper								✓	✓	✓	✓	✓	✓		✓	✓		✓			-	-	-
Western Sandpiper											✓					✓	✓				-	-	-
Surfbird																		✓			-	-	-
Short-billed Dowitcher							✓								✓						-	-	-
Long-billed Dowitcher								✓	✓	✓	✓	✓		✓	✓	✓	✓				-	-	-
Wilson's Snipe	✓		✓		✓		1	1	1	✓	✓	✓	✓	1	✓	1	✓	2	✓	✓	1	6	7
Red-necked Phalarope									✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Red Phalarope																✓				✓	-	-	-
Spotted Sandpiper	1		2		1		1	✓	✓	1	2	✓	1	✓	✓	1	✓	✓	1	✓	5	6	11
Solitary Sandpiper	✓		✓	2	✓		✓	2	5	1	3	3	2	1	3	✓	✓	✓	1	✓	-	23	23
Wandering Tattler										✓											-	-	-
Greater Yellowlegs			✓		✓		✓		✓		✓		✓					✓			-	-	-
Lesser Yellowlegs	✓		✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		-	-	-

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Parasitic Jaeger								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Long-tailed Jaeger													✓								-	-	-
Black-legged Kittiwake										✓				✓							-	-	-
Sabine's Gull								✓	✓	✓	✓	✓		✓		✓	✓		✓	✓	-	-	-
Bonaparte's Gull	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Little Gull										✓	✓										-	-	-
Mew Gull	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Ring-billed Gull																	✓				-	-	-
California Gull										✓		✓					✓				-	-	-
Herring Gull	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Thayer's Gull								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Iceland Gull																✓			✓		-	-	-
Glaucous-winged Gull										✓	✓										-	-	-
Glaucous Gull								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Arctic Tern	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Great Horned Owl								✓	✓	✓	✓			✓	✓	✓	✓		✓	✓	-	-	-
Northern Hawk Owl									✓	✓	✓	✓	✓	✓		✓		✓	✓		-	-	-
Short-eared Owl			✓							✓	✓	✓							✓		-	-	-
Boreal Owl											4			40	✓	5					-	49	49
Northern Saw-whet Owl														2							-	2	2
Common Nighthawk								✓	✓	✓	✓		✓	✓	✓		✓		✓	✓	-	-	-
Pacific Swift										✓											-	-	-
Rufous Hummingbird					✓											✓	✓	✓			-	-	-
Belted Kingfisher	✓		✓	8	✓		✓	8	6	5	6	6	2	9	6	4	3	3	1	6	-	73	73
Yellow-bellied Sapsucker	2		2		2		1		✓		3	1	1							✓	7	5	12
Downy Woodpecker	✓		✓					2	1	3	7			1	1	✓	✓	4	2	1	4	26	30
Hairy Woodpecker	2		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	✓	2	2	4
Three-toed Woodpecker	✓							✓	✓	✓	✓	✓	1	✓	✓	✓	1	1	✓	✓	-	3	3
Black-backed Woodpecker								✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	-	-	-
Northern Flicker	1		✓		1		✓	✓	✓	1	1	✓	3	✓	✓	3	1	✓	✓	✓	2	9	11
Pileated Woodpecker	✓																				-	-	-
American Kestrel	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Merlin					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	2	3	✓	-	7	7
Gyrfalcon									✓	✓		✓		✓	✓			✓	✓	✓	-	-	-
Peregrine Falcon					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Olive-sided Flycatcher	✓		11		✓		6		✓	✓	1	✓	✓	✓	2	✓	✓	✓			17	3	20
Western Wood-pewee	3		2		2		✓	3	6	5	10	3	4	4	4	✓	1	6	4	✓	7	50	57
Yellow-bellied Flycatcher	2	2	1		1			9	8	11	7	9	11	3	11	16	14	10	12	7	4	130	134
Alder Flycatcher	17	9	41	18	10	5	9	811	631	620	637	827	770	506	1058	498	548	358	918	1143	77	9715	9792

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Least Flycatcher	3		4		3		2	2	1	3	10	3	6	2	4	7	2	2	✓	1	12	43	55
Hammond's Flycatcher	7		5		11		18	6	12	17	28	7	12	8	21	19	10	20	30	16	41	206	247
Dusky Flycatcher	2				2			1	6	3	6	3	3	4	2		4	6	3	3	4	44	48
Western Flycatcher												1				1					-	2	2
Eastern Phoebe			1																		1	-	1
Say's Phoebe			2		2		1	1	1	1	✓	✓	✓	✓	2	2	✓	✓	✓	1	5	8	13
Western Kingbird																	✓				-	-	-
Northern Shrike	✓								✓	1	1	1	1	1	✓	1	2	1	1	1	-	11	11
Warbling Vireo	13		1	4	✓		1	9	10	19	17	15	48	12	10	24	19	17	10	15	15	246	261
Philadelphia Vireo																		1	1		-	2	2
Canada Jay	5		✓		1		✓		5	4	✓	✓	✓	1	1	✓	✓	4	4	1	6	20	26
Steller's Jay											✓									✓	-	-	-
Black-billed Magpie					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	4	1	✓	✓	-	5	5
Clark's Nutcracker																	✓						
Common Raven	✓		✓		✓		✓	✓	1	1	✓	✓	✓	✓	1	✓	✓	✓	✓	✓	-	3	3
Horned Lark			3		✓		✓		✓	✓							✓	✓	✓		3	-	3
Northern Rough-winged Swallow																✓							
Tree Swallow	5		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		5	-	5
Violet-green Swallow	✓		✓		✓		✓	✓		✓	✓	✓			✓	✓	✓	✓	✓		-	-	-
Bank Swallow	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Barn Swallow	✓		✓		✓			✓	1	✓	✓	✓	✓	✓		✓	✓	✓	✓		-	1	1
Cliff Swallow	✓		✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Black-capped Chickadee	✓	4	4	3	2		2	57	26	22	92	65	31	16	31	24	95	55	110	19	8	705	713
Mountain Chickadee							2	15	11		2	1	✓		4		1	2	1	✓	2	37	39
Chestnut-backed Chickadee								1			✓										-	1	1
Boreal Chickadee	2		3		2		8	138	831	✓	233	142	23	3	131	40	473	234	17	25	15	2525	2540
Hybrid Chickadee			1					1													1	1	2
Red-breasted Nuthatch	✓				✓		1	3	2	2	5	12	6	3	9	3	4	4	5	3	1	61	62
Brown Creeper											✓										-	-	-
Winter Wren	1										✓			1							1	1	2
American Dipper														✓							-	-	-
Golden-crowned Kinglet		1					✓		10	2	1	3	1		2	3	4	7	5	4	-	43	43
Ruby-crowned Kinglet	25	7	51	3	27		72	29	175	109	86	134	125	69	284	89	114	150	192	54	175	1770	1945
Mountain Bluebird	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
Townsend's Solitaire								✓	1	✓	1	1	✓	✓	✓	2	✓	✓	✓	✓	-	5	5
Gray-cheeked Thrush	4	2	2		5		1	1	2	8	2	4	2	10	11	8	4	30	9	4	12	97	109
Swainson's Thrush	99	7	39	10	48		21	19	49	53	85	41	55	49	68	82	26	102	122	58	207	826	1033
Hermit Thrush	1		1		✓		1	1	7	12	12	3	2	1	8	7	2	14	8		3	77	80
American Robin	27	1	36	5	17		4	✓	27	9	11	✓	4	9	3	✓	1	16	25	8	84	119	203

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Gray Catbird																				1		1	1
Varied Thrush	✓		1		2		✓	3	12	5	2	2	5	3	2	✓	5	5	2	3	3	49	52
European Starling							✓														-	-	-
American Pipit	✓		2		✓		1	1	3	✓	2	✓	2	✓	6	2	✓	✓	✓	2	3	18	21
Bohemian Waxwing	✓		40		✓		23	✓	✓	✓	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	63	1	64
Cedar Waxwing									✓	2			8	✓			✓			✓	-	10	10
Lapland Longspur	✓		✓		✓		5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1	✓	✓	5	1	6
Smith's Longspur									✓				✓				✓				-	-	-
Snow Bunting										✓	✓	✓	✓	✓			✓	✓	✓	✓	-	-	-
Rustic Bunting																			✓		-	-	-
Northern Waterthrush	4	1	14	10	11		4	46	53	54	42	47	46	48	53	34	34	47	58	45	33	665	698
Black-and-white Warbler															1				1		-	2	2
Tennessee Warbler	4		4		6		2		9	40	4	1	1	1	8	13	17	16	8	1	16	127	143
Orange-crowned Warbler	16	6	26	1	47		61	101	180	271	57	88	124	149	331	364	176	235	243	55	150	2616	2766
Nashville Warbler								1				1									-	2	2
MacGillivary's Warbler	1		1					1	3	2		1	1								2	8	10
Common Yellowthroat	1		17	4	11	6	21	66	113	70	72	45	65	82	89	57	59	81	146	74	50	1110	1160
American Redstart			6	4	1			10	43	30	39	21	33	25	47	15	23	28	22	19	7	387	394
Cape May Warbler							1					1									1	1	2
Magnolia Warbler	1							1			✓	1	1				1				1	4	5
Blackburnian Warbler															1						-	1	1
Yellow Warbler	10	6	50	19	37	3	31	486	325	471	310	225	333	504	556	449	163	266	655	404	128	5441	5569
Blackpoll Warbler	3	2	21	4	10		5	47	107	194	58	87	87	61	99	134	71	95	96	35	39	1272	1311
Yellow-rumped Warbler							1	1													1	1	2
Yellow-rumped Warbler (Myrtle)	60	3	63	5	29		78	49	284	673	142	195	163	178	311	286	654	478	379	138	230	4416	4646
Yellow-rumped Warbler (Audubon's)										✓	1										-	1	1
Townsend's Warbler			✓				1	✓	8	10	6	6	7	10	2	2	16	10	8	9	1	94	95
Wilson's Warbler	116	8	54	5	63		151	113	161	177	133	134	122	164	386	172	68	164	245	81	384	2273	2657
American-tree Sparrow	220		13	1	72		41	19	54	21	77	17	19	22	137	20	27	88	45	5	346	640	986
Chipping Sparrow	28		4	1	6		3	6	24	18	28	17	20	15	29	31	38	18	50	34	41	330	371
Brewer's Sparrow				1					1		2						1	3	1		-	9	9
Fox Sparrow	106		3		17		26	11	28	28	17	6	7	17	42	10	13	99	15	3	152	296	448
Dark-eyed Junco					9		31	11	✓	✓	✓	✓			2						40	13	53
Dark-eyed Junco (Slate-colored)	165	12	139	5	135		224	182	582	420	331	116	341	140	209	229	443	348	384	139	663	4231	4894
White-crowned Sparrow	86	3	13		579		311	1	33	36	34	22	16	15	23	15	20	31	24	15	989	319	1307
Golden-crowned Sparrow	1				16		9						1	1	2			✓		1	26	5	31
White-throated Sparrow			✓		1													1			1	1	2
Savannah Sparrow	11	2	2	2	24		10	14	18	18	23	25	18	17	55	17	12	25	48	16	47	310	357
Song Sparrow										1						1			1		-	3	3

SPECIES	2005		2006		2007		2008		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	SPRING TOTAL	FALL TOTAL	ALL TIME TOTAL
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall	Fall			
Lincoln's Sparrow	9	1	6		39		21	5	16	15	27	9	9	9	65	13	14	54	39	11	75	341	416
Swamp Sparrow										1									2		-	3	3
Western Tanager			1						1		✓	✓						✓			1	1	2
Red-winged Blackbird	✓		1		1		✓		✓		✓	✓	✓			✓		✓	✓	✓	2	-	2
Rusty Blackbird	19		3		2	1	✓	11	30	20	16	9	14	10	18	6	14	3	17	1	24	170	194
Brown-headed Cowbird	1		✓		✓		✓			✓	1		✓	2	1			✓			1	4	5
Pine Grosbeak			2					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	2	-	2
Purple Finch	27		3		6		1	✓	✓	10	1	2	1	3	✓	✓	✓	3	1	2	37	23	60
Red Crossbill	3						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	3	-	3
White-winged Crossbill			5					2	2	100	1	2	5	2	✓	46	✓	✓	62	✓	5	222	227
Common Redpoll	✓		107		1		22	✓	6	1	75	47	✓	1	8	3	2	4	3	1	130	151	281
Hoary Redpoll					3						2			✓					1		3	3	6
Pine Siskin	28		1				✓	1	1	91	10	3	8	303	1	3	151	2	87	4	29	665	692
Evening Grosbeak														✓							-	-	-
TOTAL SPECIES BANDED	**43**	**18**	**48**	**21**	**43**	**4**	**45**	**48**	**53**	**52**	**57**	**51**	**51**	**48**	**51**	**51**	**47**	**52**	**55**	**44**	**70**	**90**	**96**
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**	**3,167**	**4,138**	**2,471**	**4,461**	**43,355**	**47,832**

Appendix B – Daily Species Total Summary

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Greater White-fronted Goose	12-Aug	19	6546	14-Oct	3120	22-Aug
Snow Goose	25-Sep	9	881	19-Oct	281	14-Oct
Canada Goose	31-Jul	28	681	11-Oct	210	10-Sep
Unidentified Goose	4-Sep	6	242	6-Oct	68	6-Oct
Trumpeter Swan	20-Sep	19	962	20-Oct	524	16-Oct
Tundra Swan	21-Sep	10	10599	20-Oct	6839	16-Oct
Unidentified Swan	20-Sep	14	1445	19-Oct	853	16-Oct
American Wigeon	14-Aug	23	275	16-Oct	65	29-Aug
American Green-winged Teal	4-Aug	13	64	12-Oct	12	06-Oct
Mallard	2-Aug	33	286	16-Oct	44	30-Sep
Northern Shoveler	14-Aug	8	75	30-Sep	25	25-Aug
Northern Pintail	27-Jul	25	111	16-Oct	20	17-Aug
Canvasback	7-Oct	1	46	-	46	07-Oct
Ring-necked Duck	16-Aug	6	15	07-Oct	6	22-Sep
Greater Scaup	6-Sep	3	7	16-Oct	3	16-Oct
Lesser Scaup	4-Sep	18	245	07-Oct	47	06-Sep
Unidentified Scaup	22-Aug	2	7	16-Oct	4	16-Oct
Surf Scoter	5-Aug	22	332	14-Oct	60	05-Aug
White-winged Scoter	20-Aug	6	57	11-Oct	38	30-Sep
Bufflehead	26-Sep	5	2	19-Oct	3	26-Sep
Harlequin Duck	2-Oct	1	2	-	2	02-Oct
Long-tailed Duck	17-Oct	1	1	-	1	17-Oct
Common Goldeneye	1-Sep	16	58	20-Oct	13	14-Oct
Unidentified Goldeneye	6-Sep	3	7	14-Oct	4	14-Oct
Common Merganser	29-Jul	51	795	20-Oct	103	04-Sep
Red-breasted Merganser	29-Jul	42	251	19-Oct	27	23-Aug
Unidentified Merganser	27-Jul	4	24	14-Oct	11	14-Oct
Unidentified Duck	18-Aug	6	114	16-Oct	63	16-Oct
Ruffed Grouse	29-Jul	38	45	13-Oct	4	17-Sep

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Spruce Grouse	12-Oct	1	1	-	1	12-Oct
Red-throated Loon	31-Jul	37	124	10-Oct	17	18-Sep
Pacific Loon	27-Jul	31	498	16-Oct	380	27-Sep
Common Loon	29-Jul	40	137	14-Oct	21	08-Sep
Unidentified Loon	31-Aug	13	31	16-Oct	7	8-Sep
Horned Grebe	26-Sep	36	84	13-Oct	9	01-Oct
Red-necked Grebe	27-Jul	64	267	20-Oct	22	04-Sep
Osprey	21-Aug	23	45	16-Oct	10	25-Sep
Golden Eagle	25-Sep	18	138	20-Oct	19	06-Oct
Bald Eagle	27-Jul	68	190	20-Oct	23	16-Oct
Unidentified Eagle	28-Sep	1	1	-	1	28-Sep
Northern Harrier	18-Aug	49	215	17-Oct	46	10-Sep
Sharp-shinned Hawk	27-Jul	53	320	20-Oct	52	10-Sep
Northern Goshawk	19-Aug	25	52	17-Oct	9	16-Oct
Swainson's Hawk	22-Aug	7	20	10-Sep	9	24-Aug
Red-tailed Hawk	19-Aug	3	3	10-Sep	1	all days
Red-tailed Hawk (Harlan's)	23-Aug	38	237	17-Oct	30	25-Sep
Rough-legged Hawk	25-Sep	18	88	16-Oct	15	06-Oct
Unidentified Buteo	28-Sep	4	5	16-Oct	2	30-Sep
Sandhill Crane	10-Sep	7	160	16-Oct	77	11-Sep
Killdeer	30-Aug	1	1	-	1	30-Aug
Semipalmated Plover	29-Jul	6	8	27-Aug	3	21-Aug
Sanderling	8-Sep	1	1	-	1	08-Sep
Least Sandpiper	30-Jul	4	5	08-Aug	2	07-Aug
Pectoral Sandpiper	12-Sep	2	11	25-Sep	10	12-Sep
Unidentified Peep	14-Aug	1	2	-	2	14-Aug
Wilson's Snipe	17-Aug	20	23	13-Oct	2	03-Oct
Red-necked Phalarope	7-Aug	3	3	27-Aug	1	all days
Red Phalarope	19-Sep	1	1	-	1	19-Sep

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Spotted Sandpiper	27-Jul	31	53	05-Sep	4	7/14-Aug
Solitary Sandpiper	4-Aug	4	6	23-Aug	2	17/23-Aug
Upland Sandpiper	14-Aug	2	2	29-Aug	1	both days
Unidentified Shorebird	23-Aug	1	1	-	1	23-Aug
Parasitic Jaeger	29-Aug	3	3	18-Sep	1	all days
Unidentified Jaeger	19-Aug	1	1	-	1	19-Aug
Bonaparte's Gull	27-Jul	9	26	22-Aug	8	03-Aug
Sabine's Gull	29-Aug	6	8	29-Sep	2	29/30-Aug
Mew Gull	27-Jul	36	26	06-Sep	5	many days
Herring Gull	27-Jul	67	26	18-Oct	120	02-Aug
Thayer's Gull	22-Aug	41	26	20-Oct	45	23-Sep
Glaucous Gull	25-Sep	13	26	17-Oct	1	all days
Arctic Tern	27-Jul	13	26	30-Aug	7	06-Aug
Unidentified Gull	27-Aug	3	26	17-Oct	5	27-Aug
Great Horned Owl	9-Aug	1	2	-	2	09-Aug
Common Nighthawk	31-Aug	1	1	-	1	31-Aug
Belted Kingfisher	27-Jul	41	26	11-Oct	2	many days
Yellow-bellied Sapsucker	4-Sep	1	26	-	1	04-Sep
Downy Woodpecker	5-Aug	7	26	05-Oct	1	all days
Hairy Woodpecker	23-Aug	8	26	14-Oct	1	all days
American Three-toed Woodpecker	03-Sep	12	26	16-Oct	3	20-Sep
Black-backed Woodpecker	1-Oct	1	26	-	1	01-Oct
Northern Flicker	1-Sep	2	26	06-Sep	1	both days
American Kestrel	8-Aug	30	26	07-Oct	24	11-Sep
Merlin	8-Aug	25	26	16-Oct	14	10-Sep
Gyrfalcon	7-Oct	1	1	-	1	07-Oct
Peregrine Falcon	22-Aug	12	26	22-Sep	7	10-Sep
Western Wood-Pewee	24-Aug	3	26	09-Sep	1	all days
Yellow-bellied Flycatcher	8-Aug	6	26	26-Aug	2	17-Aug

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Alder Flycatcher	27-Jul	36	26	09-Sep	145	24-Aug
Least Flycatcher	4-Aug	1	26	-	1	04-Aug
Hammond's Flycatcher	27-Jul	14	26	01-Sep	3	03-Aug
Dusky Flycatcher	11-Aug	3	26	25-Aug	1	all days
Say's Phoebe	18-Aug	4	26	31-Aug	2	18-Aug
Unidentified Flycatcher	18-Aug	2	26	3-Sep	2	18-Aug
Northern Shrike	16-Sep	3	26	29-Sep	1	all days
Warbling Vireo	30-Jul	12	26	23-Aug	5	30-Jul
Canada Jay	4-Sep	6	26	20-Oct	3	20-Oct
Steller's Jay	3-Oct	3	26	09-Oct	2	03-Oct
Black-billed Magpie	11-Sep	29	26	20-Oct	4	many days
Common Raven	27-Jul	77	26	20-Oct	16	06-Sep
Bank Swallow	31-Jul	13	26	04-Sep	180	18-Aug
Cliff Swallow	30-Aug	1	26	-	1	30-Aug
Unidentified Swallow	27-Jul	10	26	26-Aug	119	19-Aug
Black-capped Chickadee	27-Jul	70	26	20-Oct	9	19-Sep
Mountain Chickadee	16-Sep	3	26	05-Oct	1	all days
Boreal Chickadee	14-Aug	31	26	17-Oct	11	15-Sep
Red-breasted Nuthatch	31-Jul	22	26	14-Oct	7	20-Sep
Golden-crowned Kinglet	30-Jul	5	26	27-Aug	3	30-Jul
Ruby-crowned Kinglet	27-Jul	45	26	20-Oct	9	04-Sep
Mountain Bluebird	16-Oct	2	26	20-Oct	2	20-Oct
Townsend's Solitaire	26-Aug	13	26	20-Sep	7	26-Aug
Gray-cheeked Thrush	23-Aug	4	26	05-Sep	2	05-Sep
Swainson's Thrush	27-Jul	29	26	16-Sep	11	23/29-Aug
American Robin	27-Jul	57	893	20-Oct	117	25-Sep
Gray Catbird	16-Sep	1	1	-	1	16-Sep
Varied Thrush	23-Aug	34	791	16-Oct	332	01-Sep
Unidentified Large Thrush	1-Sep	18	348	8-Oct	79	10-Sep

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
American Pipit	20-Aug	33	284	16-Oct	145	01-Sep
Bohemian Waxwing	2-Aug	13	205	20-Oct	59	11-Sep
Cedar Waxwing	27-Jul	9	19	13-Sep	5	06-Sep
Unidentified Waxwing	3-Aug	2	2	21-Aug	1	both days
Lapland Longspur	27-Aug	21	50	16-Oct	8	07-Oct
Snow Bunting	4-Oct	5	37	19-Oct	19	19-Oct
Northern Waterthrush	27-Jul	27	69	30-Aug	16	17-Aug
Tennessee Warbler	11-Aug	1	1	-	1	11-Aug
Orange-crowned Warbler	7-Aug	26	78	07-Oct	11	26-Aug
Common Yellowthroat	2-Aug	37	103	20-Oct	12	26-Aug
American Redstart	27-Jul	20	53	15-Oct	8	02-Aug
Yellow Warbler	27-Jul	38	584	24-Sep	120	17-Aug
Blackpoll Warbler	27-Jul	27	56	01-Oct	5	24-Aug
Yellow-rumped Warbler (Myrtle)	27-Jul	72	1286	19-Oct	370	1-Sep
Townsend's Warbler	31-Jul	7	14	19-Aug	4	08-Aug
Wilson's Warbler	27-Jul	40	102	16-Oct	12	17-Aug
Unidentified Warbler	29-Jul	14	85	16-Oct	20	1-Sep
American Tree Sparrow	24-Aug	28	43	20-Oct	3	16-Sep
Chipping Sparrow	27-Jul	16	41	05-Sep	11	08-Aug
Fox Sparrow	25-Aug	14	18	26-Sep	2	many days
Dark-eyed Junco (Slate-colored)	27-Jul	72	512	20-Oct	36	04-Sep
White-crowned Sparrow	30-Jul	20	34	10-Oct	5	31-Aug
Golden-crowned Sparrow	28-Aug	1	1	-	1	28-Aug
Savannah Sparrow	31-Jul	28	45	07-Oct	5	04-Sep
Lincoln's Sparrow	12-Aug	13	16	18-Oct	3	17-Aug
Unidentified Sparrow						
Rusty Blackbird	3-Aug	46	236	19-Oct	36	23-Sep
Red-winged Blackbird	30-Jul	2	2	18-Aug	1	both days
Unidentified Blackbird	19-Aug	1	1	-	1	19-Aug

Species	First Date	ALL OBS		Last Date	HIGH COUNT	
		# of Days	Bird Days		#	Date
Pine Grosbeak	12-Sep	17	49	20-Oct	16	12-Oct
Purple Finch	27-Jul	9	14	09-Sep	3	27-Jul
White-winged Crossbill	27-Jul	34	175	16-Oct	50	30-Jul
Red Crossbill	18-Aug	1	1	-	1	18-Aug
Common Redpoll	27-Jul	29	1044	20-Oct	480	10-Oct
Pine Siskin	27-Jul	61	1390	18-Oct	192	04-Oct
Unidentified Small Finch	10-Sep	19	438	19-Oct	115	26-Sep
Unidentified Finch	8-Oct	1	50	-	50	8-Oct
Unidentified Passerine	12-Aug	49	2948	16-Oct	499	1-Sep