

# Tatlayoko Lake Bird Observatory

## 2022 Annual Report



**Prepared by Sachi Snively**

*On behalf of the Tatlayoko Field Station Society*

*and the Canadian Wildlife Service*



*\*Photos by Sachi Snively unless otherwise stated\**

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## 1. Introduction

The Tatlayoko Lake Bird Observatory (TLBO) conducts annual migration monitoring of birds in the West Chilcotin region of British Columbia during the months of August and September. The project is conducted on the Tatlayoko Lake Ranch property, owned by the Nature Conservancy of Canada who initiated and ran the project from 2006 to 2015. In 2017 BC Spaces for Nature took over operation of the TLBO and ran it until 2019. The 2020 season saw the project jointly overseen by BC Spaces for Nature and a new local organization, the Tatlayoko Field Station Society (TFSS). In 2021 the TFSS took over the project in full with the aim of being the long-term home of the TLBO and continued to run the project in 2022. With a strong connection to the TLBO among the board of directors and members of the TFSS this puts the TLBO in a secure position moving forward for the foreseeable future. Meanwhile, the TLBO provides a flagship project for the TFSS in their efforts to open a field station and encourage research within the Tatlayoko Valley and region at large.

The TLBO is located at the north end of Tatlayoko Lake with the banding lab and net lanes sitting roughly 700m north of the lakeshore. Standard monitoring is conducted daily and consists of 6.5 hours of observational birds counts, 6 hours of mist-netting and banding along with a 1-hour census. At the end of each session a Daily Estimated Total is tallied for each species recorded that day based on these three count methods. The banding and Daily Estimated Totals will be elaborated on in this report.

The TLBO is a member of the Canadian Migration Monitoring Network (CMMN). Along with the 25+ other member stations, data collected at the TLBO is submitted to the CMMN for long-term population analysis and is made publicly available on the NatureCounts website (<https://www.birdscanada.org/birdmon/default/main.jsp>). All bird banding data is submitted to the US Geological Survey, who issues all bird bands in North America, and the Bird Banding Office at Environment and Climate Change Canada.

## 2. Acknowledgments

In 2022 the TLBO was largely funded by the Canadian Wildlife Service (CWS) which is a section of Environment and Climate Change Canada (ECCC). We are very grateful to Wendy Easton, Tara Imlay and Daniel Yip of CWS (Delta) for their ongoing support of this project. This year's funding was applied for by their office(s). The Birds Canada Birdathon fundraiser was once again a success thanks to many generous individuals who contributed to our team, "The Wandering Tatlers". The Cariboo Regional District and the Tolko Log Hauler's fund also provided generous contributions. Several private and in-kind donations were made to the TLBO, with special thanks to Jörg and Hannalore Fischer, Charlie and Ruth Travers, John Snively, Otter Books, Calypso Environmental Services, Barry Lancaster, Ara and Susan Elmajian, Peter and Roma Shaughnessy, Hana Kamea, Eileen Dell and Avocet Tours. As ever, we are grateful to Nature Conservancy of Canada for their ongoing support of the project in granting access to the Tatlayoko Lake Ranch property and the use of existing infrastructure and equipment.

The Tatlayoko Field Station Society (TFSS) and Avery Bartels worked together to implement the 2022 project as was done in 2021 with full management of the TLBO program now fully shifted to the TFSS for the second season running. The local community continues to engage and help with the TLBO in a variety of ways. We are deeply grateful for all of the support from the TFSS personnel, local community members and volunteers in 2022:

### Local Community

Avery Bartels, Peter and Roma Shaughnessy, Fritz and Sally Mueller, Sandra McGirr and Sandy Hart, Mike Smialowski, Hana Kamea, Charlie and Ruth Travers, Sabina and Troy Harris, Andrew Harcombe, Steve Ogle and Chris Chutter.

### Volunteers

Adam and Stephen Ross, Bethany-Lynn Walsh, Katerina Coveny, Jim Sims, Courtney Jones, Jodi Armstrong, Robyn and Marcus Dell, Mae Frank and Max Gerhardt.



### 3. Season Overview

The TLBO's 16<sup>th</sup> season ran from August 3 to September 28, 2022. Two full time staff contributed over 680 hours with volunteers adding a further 235 for a total of over 915 hours towards the daytime migration monitoring project. In 383 hours of observation, over 57 days, a total of 138 species were recorded within the census area, which is two species above the long-term average. Twelve standard nets were used for a total of 3006 standard net hours, providing us with 885 birds banded and 103 recaptures. In addition, three large gauge (hawk) nets and three 2-panel nets (the "pipit fence") in the north field added 187.3 non-standard net hours during the morning banding period. Non-standard banding produced a further four birds banded.

Over the course of 14 nights of owling (including Sept. 30 and excluding one night where we abandoned after half an hour due to rain) we had 238.25 net hours from our standard seven-net owl setup. We used the same setup as in the previous three years with five 60mm owl nets and two of our standard songbird nets (Nets 9 and 10) though these latter two were left closed on the first seven nights due to wind and falling leaves. Over this period, we banded 56 Northern Saw-whet Owls. The results of our October owl banding program can be found on page 27.

In total, 3431.55 net hours produced 945 birds banded, 885 of which were caught by standard nets during standard hours. This was a stark decrease from the norm as it is a new season low which sits well below the 15-season average of 1577 birds banded (Fig. 1)

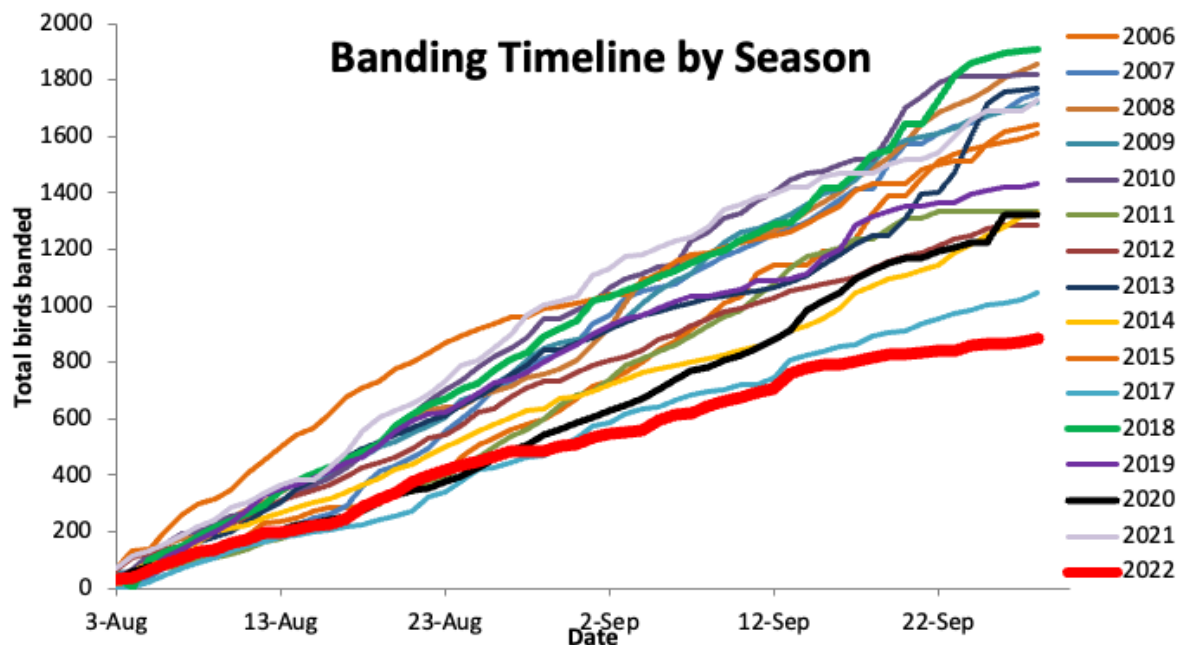


Figure 1 Banding timeline by season

## 4. Vegetation Management and Nets

### 4.1 Vegetation Management

As net locations were originally picked to cover a selection of habitat types some nets pass through regenerating riparian habitat, dominated by willow and alder. To keep habitat conditions standard across years, it is necessary to do some pruning in order to maintain similar vegetation height. This helps ensure the consistency of a net's capture rate from year to year. There are only five nets that regularly receive this treatment: 6, 16, 12, 17 and 19 (18 was retired after the 2021 season, see section 11.1, page 29). Upon arrival this year it was apparent that our fairly extensive pruning efforts in the past few seasons had been successful in maintaining a good vegetation height for the 2022 season.

The vegetation on the west side of Net 6 that had grown up to well above the height of the net by 2018 was pruned back at the end of that season and required just the removal of a few ambitious saplings as we set up the net this year (much like the past two seasons). A basic trim of any encroaching vegetation from the winter snow was performed opportunistically at all nets. Despite the aggressive trimming around the 12/17 net lane at the end of the 2021 season several hours were spent



Net 17 in August, after pruning at the beginning of 2022

topping the new growth in order to bring the height of the vegetation down to match that of the nets. A willow near the junction of the two nets was left untrimmed due to the presence of an active Cedar Waxwing nest. The rest of the nets received little to no trimming until the end of the season.

After the season ended, pruning was conducted at nets 13, 16, 6, 19 and 12/17. The former received very little attention except the removal of an overhanging willow branch on the southwest quadrant of the net. Net 16 received little attention as well with the removal of only the tallest suckers along with three larger alder trunks to continue to make space for younger growth. Net 6 also received a similarly quick trim with only the tallest suckers on the west being removed as in years past. Small stems under or near 19 were removed to keep the net lane clear for next year. The final two nets, 12/17 received a more comprehensive pruning as a selection of older trunks were removed to make room for the new growth that has come up as

a result of previous years' pruning. Further, vegetation was topped to maintain net height on both the north and south sides of 12/17. In addition to pruning around the nets we have continued to maintain an open corridor by cutting the willows that have been sprouting up in the field southwest of the Harrier Net. This season we cleared the cottonwood and aspen saplings that have sprouted up along the path since 2020 between the banding lab and net 6, as well as in the small clearings south of net 14.

#### 4.2 Net Productivity

Our most productive net, as is often the case, was Net 14 despite being used just 46.6% of the time (due mainly to wind exposure). In 2021 it was much more successful than this season at capturing mixed flocks as they foraged along the edge of the field in the regenerating aspens, as the final tally was only 188 birds which accounted for 13.3% of the total. Sparrows, namely Chipping, made up the bulk of its catch as it caught 11 of our 15 in total.

The fates of nets 12 and 17 are intrinsically tied. A lack of pruning in back-to-back seasons (both 2016 and 2017) produced very low capture rates in 2018 which have seen an overall increase in subsequent years. This illustrates the importance of vegetation management in net lanes like these as maintaining healthy vegetation at net height appears to maintain or increase capture rates. Net 17 often outperforms 12 by a small margin and this season was no different with 17 enjoying the second highest number of birds banded (114) versus 12 which was in the of the middle of the pack at 65. The vegetation both north and south of net 17 is more or less continuous as it borders the fence line whilst 12 has a bend in the Homathko 10-15 metres north which seems to make for less of a foraging corridor for migrating birds.

Since 2018 net 16 has seen a consistent decline in capture rates which no doubt stems from the increased growth of willow stands to the east. Where this net once bisected the border of vegetation and the field this new growth creates a corridor for birds to pass just east of the net. Since 2018 its percent of total catch has decreased annually as follows: 15.4% (2018), 14.3% (2019), 10.7% (2020), 7.2% (2021) and 10.3% in 2022. It is hard to explain this 3% increase which perhaps could be in part due to increased topping of the alders to the south of this net along

Table 1 Birds banded per net in 2022

Net	Banded	Birds /Hr	Recaps	% Time used	% Total catch
14	118	0.80	9	46.6%	13.3%
17	114	0.47	9	75.9%	12.9%
6	93	0.39	10	77.3%	10.5%
16	91	0.41	6	70.0%	10.3%
13	75	0.34	15	77.9%	8.5%
15	73	0.30	10	81.1%	8.2%
12	65	0.26	3	75.6%	7.3%
1	64	0.29	13	76.2%	7.2%
9	57	0.24	11	80.6%	6.4%
11	56	0.24	6	76.8%	6.3%
19	45	0.24	5	60.5%	5.1%
10	34	0.16	6	80.3%	3.8%

with small shifts in avian migratory behaviour namely, the use of the Homathko by migrating Yellow-rumped Warblers.

Nets 9, 10, 11 and 19 (new this year) were our least productive this season which is most likely due to the high vegetation levels around them. These first three have traditionally enjoyed our lowest percent of the total captures for many seasons now whilst net 19’s location is new and has some regenerating willows to the west which perhaps even as soon as next season will provide more cover and perhaps increase capture rates.

## 5. Staff and Volunteers

The 2022 season saw Sachi Snively take over from Avery Bartels as Bander-in-charge for his 1<sup>st</sup> season at the helm and 5<sup>th</sup> overall. Sachiko Schott joined the TLBO team this season and ably filled the Assistant Bander position with her many years of experience at multiple bird observatories east of the Rocky Mountains. Census was shared between the banders, alternating days to coincide with who was on blog duty that day.

Filling the volunteer roster proved especially challenging this season which coupled with several cancellations lead to a season with several large gaps where no volunteers were present. These included, from August 3-7<sup>th</sup>, August 18 - September 4<sup>th</sup> and September 19-20<sup>th</sup>. A local and friend of the station Jim Sims volunteered on three separate occasions, August 8<sup>th</sup> and 10<sup>th</sup> during regular songbird banding and September 18<sup>th</sup> for owl banding. Over the course of the season almost all of our volunteers were what we would call “short-term”, staying for one week or less which is contrary to 2018 and 2019 but the same as in 2021 (excluding 2020 when we had no volunteers due to Covid-19). Just one volunteer, Katerina, was what we would consider “long-term”, staying 12 days. Courtney, meanwhile, did return for two volunteer stints the first of which was for two days in the third week of September and then again for the second week of our owl banding extension in October. A timeline of our “regular season” volunteers this season can be found in Figure 2. Overall, our volunteers contributed 235 hours of effort to our standard program.

**Table 2 Birds banded per bander in 2022**

<b>Bander</b>	<b>Banded</b>	<b>Recaps</b>	<b>% Processed</b>
Sachi	424	50	48%
Sachiko	417	44	47%
Adam	32	3	4%
Katerina	7	1	0.8%
Jodi	3	1	0.4%
Bethany	1	3	0.4%
Courtney	1	1	0.2%

The second season of the October owl banding project required additional volunteers to join Sachiko. Marcus and Robyn were present from October 1<sup>st</sup> to the 7<sup>th</sup> whilst Mae (returning from last season) helped out from 7<sup>th</sup> to the 15<sup>th</sup>. Courtney (returning) and Max volunteered



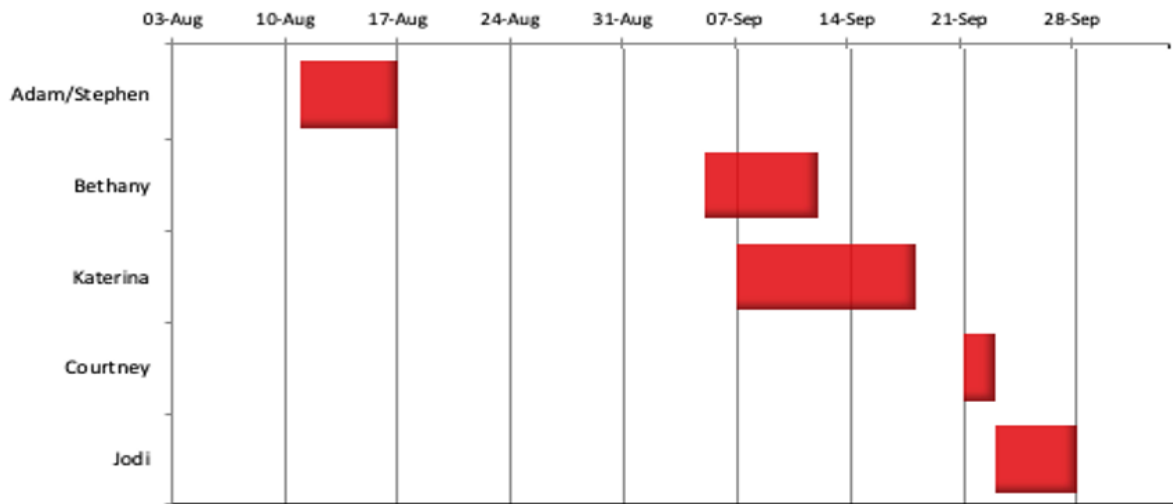


Figure 2 Timeline of our volunteers in 2022

from the 7<sup>th</sup> to the 9<sup>th</sup> with Courtney returning again for the last two nights of the season (14<sup>th</sup> and 15<sup>th</sup>). Volunteers contributed a further 103 hours to the TLBO in October.

## 6. Outreach

Bird banding operations provide an excellent setting to engage the public in nature and conservation. The experience of seeing birds up close and learning from knowledgeable staff can have a profound impact on people of all ages but especially the younger generations. With this in mind we try our best to encourage locals, visitors to the valley and school groups to visit the station during our banding season.

### 6.1 Visitors

Unlike past seasons this year saw a fairly steady stream of visitors as we would average a visit every three days with the groups ranging from one to eight individuals. This could be in part be due to the new sign that was affixed to the main gate that provides access from the Tatlayoko Lake Road (see section 11.3, page 30). The regular season owling was less well attended than in past seasons as we would log 20 visitors spread out over four of the 14 nights that we operated up until the end of September.

We were pleased to host the Tatla Lake School group again this season. Their visit came on the 15<sup>th</sup> of September with four adults and 23 students in attendance. We continued to use the same strategy as in years past as the students were split into two groups and were given a tour of the net loop as well as being able to witness the banding of a couple rounds worth of birds. The Tatla school ended up staying for a few hours and many of the students were very keen to continue watching and asking questions. At the end of our banding session Sachi spent some

time with the younger group answering questions and providing more insight into the different groups of birds and their feeding habits. It was a relatively quiet day yet the students did get to see several birds of which the highlight had to be Yellow-rumped Warblers (a.k.a. “Butter Butts”) which they all had remembered from last season!

Our standard monitoring and owling accounted for 101 separate visits from 85 individuals. Meanwhile, the October Owl Banding pilot accounted for a further 22 visits from 16 individuals over the course of four nights.

## **6.2 Blog**

In 2022 we kept up the daily blog posting as we have every season since 2009 ([www.tatlayokobirds.wordpress.com](http://www.tatlayokobirds.wordpress.com)). After each day we would post highlights, photos and educational pieces on various aspects of our migration monitoring. The banders took turns posting throughout the season and it was nice to have a fresh voice, namely that of Sachiko as well as a guest blog by Katerina that focussed on the wonderful world of Lichens.

Over the course of 57 posts during the months of August and September we received 1629 views and 518 visits. The number of views and visits was our lowest since 2016 (the season that the TLBO did not operate). These numbers do not include our 53 followers who receive our blog post directly to their email inbox. As with the past few years, the highest daily views and visits came after posts onto social media namely, to Sachi’s Facebook page. The most popular post was the season opener titled “A Tale of Two Sachi’s”.

While most views were from Canada, we also received views from a further 41 different countries! Over the course of the season the blog received 57 comments which is up from last season’s 49.

Further posts in October resulted in 367 views, 143 visits and 2 comments for the month.

## 7. Standard Monitoring

### 7.1 Effort and Environmental Conditions

The trend toward increased unpredictability and relative severity of the weather patterns and systems in the valley continued this season which mirrors the conditions of the previous two. Much of August and early September were unseasonably warm. After dealing with wind and then rain in the first two days the weather settled into a calm spell with mainly clear skies that would last for the first 10 days. August was overly windy with only a handful of spells of strong unrelenting winds which caused periodic net closures (namely 14 and 19) in addition to two full day closures on the 28<sup>th</sup> and 29<sup>th</sup>. As is often the norm, September would prove more volatile as we would lose one more full day to wind on the 23<sup>rd</sup>. Rain on the other hand was rather infrequent unlike the past four years, but much like the “normal” long-term trends for the valley as we would only experience rain on three different days (August 4<sup>th</sup>, 13<sup>th</sup> and September 16<sup>th</sup>).

The season started off quite cool with midday temperatures in the mid-teens until finally cresting 20 degrees (Celsius) by the 6<sup>th</sup> of August. This became typical as we would enjoy a relatively warm spell for the valley with a week of over 20 degrees at closing followed by a few days in the high teens and then another “warm” spell lasting 12 days. These stretches of warm days punctuated by a few cooler ones would continue until mid-September when we had

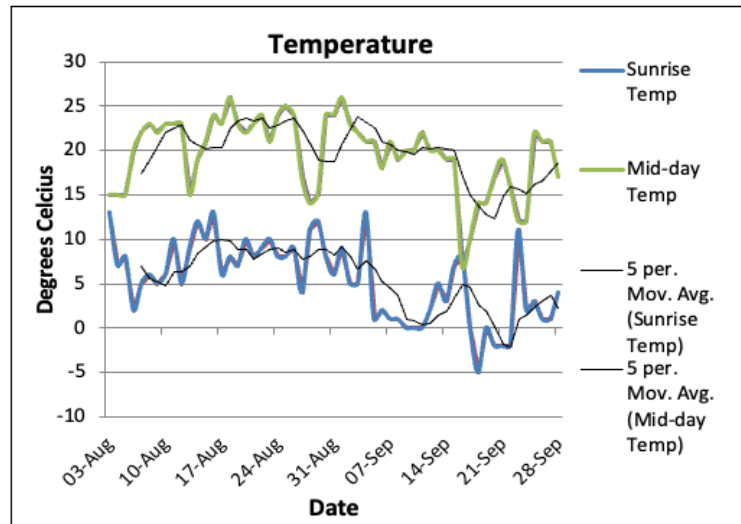


Figure 3 Temperatures over the course of the 2022 season

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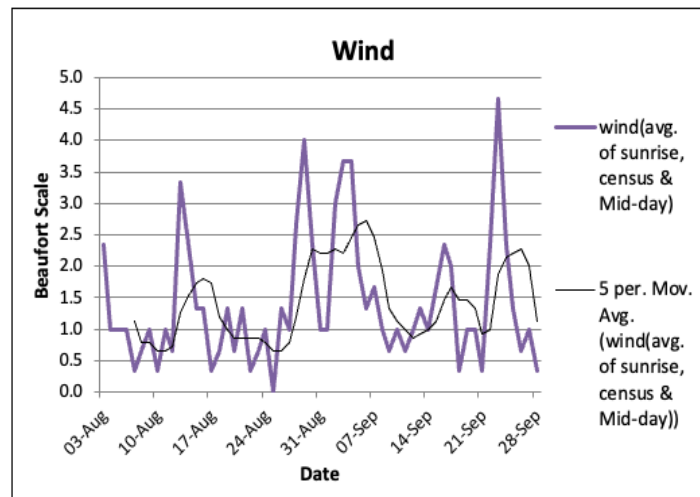


Figure 4 Wind over the course of the 2022 season

a stretch of colder weather with nearly a week (September 17-22) where our starting temperature was zero degrees or lower (Fig. 3, page 10). Unlike 2021, we never reached 30 degrees with our warmest days being August 18<sup>th</sup> and September 1<sup>st</sup> both at 26°C. In total we would have five days when the temperature read 0 degrees at opening (all in September) and four that were sub-zero with the coldest morning of the season occurring on September 18<sup>th</sup> at -5°C.

The wind is always the most challenging environmental factor that we face when banding birds. It did not prove to be much of a hindrance for the majority of August as our net hours were relatively high at 80% of the total. Late August saw two days where we remained closed due to a strong southerly that wouldn't abate. September would prove much more challenging as there wasn't a single day where we achieved full net hours (72 hours). As was the case last season the wind would pick up mid to late morning which would result in net closers. A new challenge this season was the increase in the relative strength of the north wind which also contributed to lost net hours. To put this in perspective, in September we only achieved 66% of the total possible net hours much of which was due to wind except for the cold spell (September 18-22) where we lost half of each morning's effort due to sub-zero temperatures (Fig. 4, page 10).

In total, we had four days with no banding (Aug. 28, 29, Sept. 16 and 23) and a further day with less than 10 net hours due to weather (Sept. 4). This is just above the average for full days lost due to weather as we typically average 2-3 total days without banding per season. Where the story gets interesting is that last season there were nine days where 12 or more net hours were lost while in 2022 this total was 20. The slow incremental loss of net hours throughout the season due either to wind or cold starts all culminated in the lowest season total for net hours with 3006 versus the 15-season average of 3502 (Fig. 5).

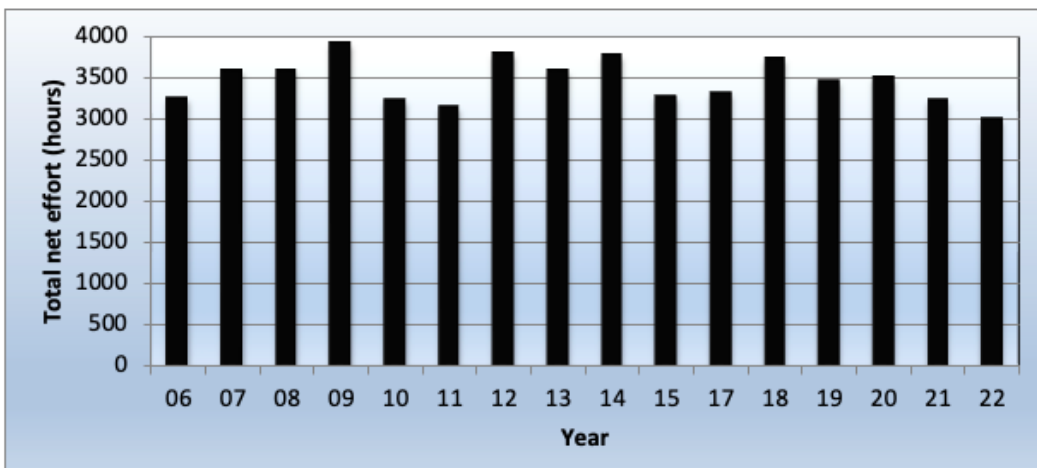


Figure 5 Net hours per year

## 7.2 Banding Results

A total of 885 birds were banded as part of our standard program in 2022, a marked decrease after last season (Fig. 6, page 12). The 885 birds were comprised of 50 species, which is three below the 15-year average. Even with these low numbers, no non-standard songbird nets were used meaning we banded just four birds by non-standard means. These included two species not banded by standard means.

The season got off to a below average start with 29 and 11 birds banded respectively on the first two days (Fig. 7, page 13). The month of August only saw two days where banding totals were above average namely, August 18<sup>th</sup> (39 birds banded) and 21<sup>st</sup> (37 birds banded). This is not very typical as often there will be much higher spikes with days where we will band far above the average. Unlike last season high days were in the 20's with three days where we had our nets open but banded less than 10 birds. By month's end we had banded a record low of 511 birds versus last season's record high of 1032.

After such a slow month we expected September to be an improvement. Sadly, September would prove to be even slower as we would go on to band a total of 374 birds over the course of the month. We would only band over 20 birds in a day four times throughout the month, the first of which was on the 1<sup>st</sup> (22), the second on the 5<sup>th</sup> (34), the third on the 8<sup>th</sup> (27) with our busiest day of the season on the 13<sup>th</sup> with 52 birds banded! Our busiest period of the season typically falls between September 18 – 25 which coincided with the cold snap from the 17<sup>th</sup>-22<sup>nd</sup> and then a day of no banding on the 23<sup>rd</sup> due to wind. Overall, the trend this season was

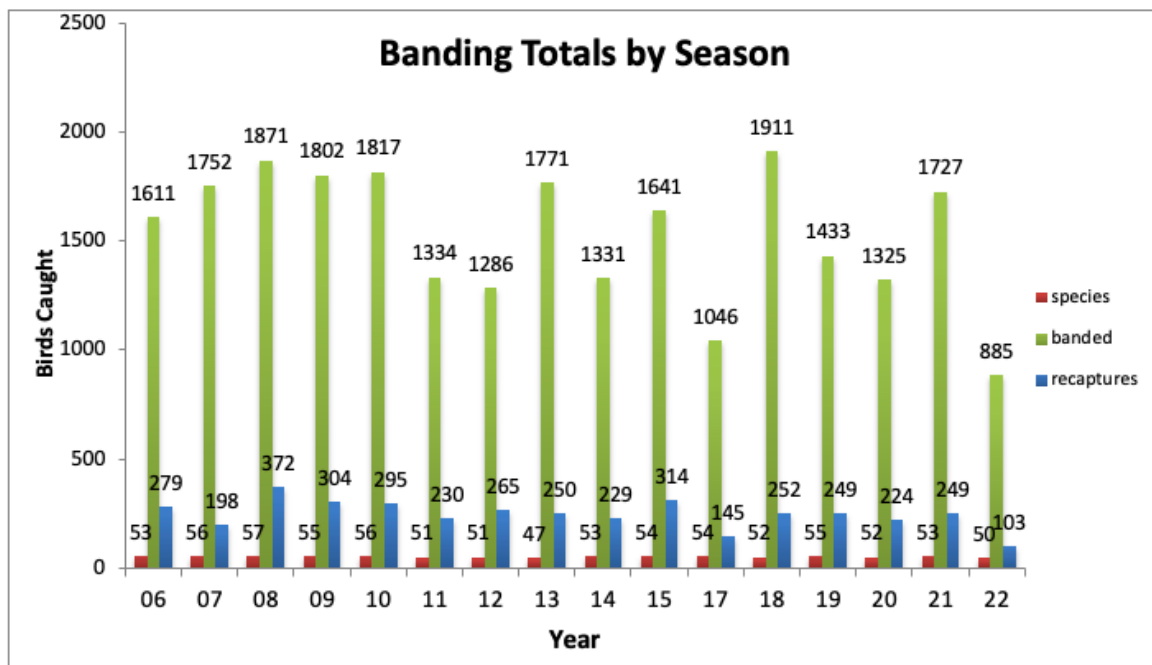


Figure 6 Banding and recapture totals by season

that of a gradual decline with consistently low numbers of birds banded in the month of August which was then surpassed by September's even lower totals.

As in 2018, 2019 and 2021, there were large numbers of Swainson's Thrush around daily through most of August and into the middle of September as we would band 213 which is our fourth highest total overall. This could perhaps be in part due to the bumper berry crop as bears were also frequent in and around the nets where berries could be found. After banner seasons for both American Redstarts and Yellow Warblers last year, this season saw a marked decrease in the numbers of individuals of both species in our nets. These two species recorded their fourth lowest banding totals of all time with Yellow Warblers at 49 which was 64% of average (111 in 2021) and American Redstarts at 37, 69% of average (104 in 2021). Northern Waterthrush appeared to be the only Warbler species that had a successful season as they would log their fourth best total at 54 banded. Over the past 15 seasons banding numbers for this species have stayed quite constant in comparison to the other members of the Warbler group save for their two lowest seasons, 2014 (22 banded) and 2017 (18 banded). Orange-crowned Warbler (36 banded, 3<sup>rd</sup> lowest total), Wilson's Warbler (20 banded, lowest total) and MacGillivray's Warbler (20 banded, tied for the 2<sup>nd</sup> lowest total) were all caught in nearly record low numbers. Song Sparrows (fourth highest species banded this season) which in the past have found our nets with some frequency set a record low with only 57 birds banded (38% of average) which is nearly 100 birds below our 15-season average. In a broader context this is

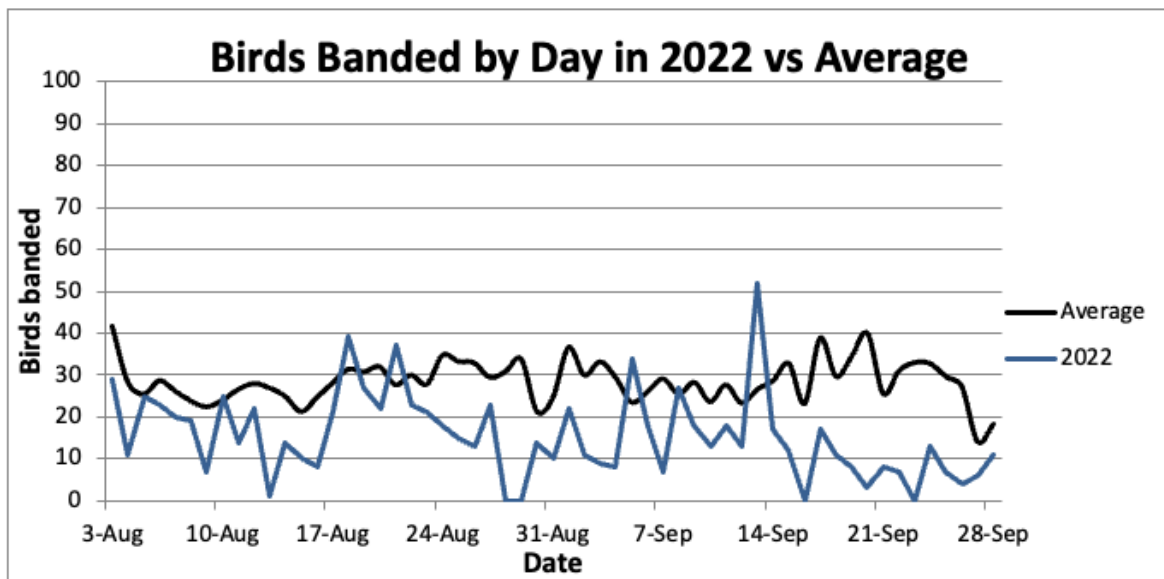


Figure 7 Birds banded per day in 2022 vs average

only the third time in 16 seasons that we have banded under 100 individuals of this species behind 2013 (98) and 2007 (67). After a record setting season for Warbling Vireos, we only banded 70 (our 3<sup>rd</sup> lowest total) versus 294 last season.

With the shift of the season in late August we often see a shift in species composition as early migrants have peaked (American Redstart and Northern Waterthrush) and Common Yellowthroats and Lincoln’s Sparrows start taking a larger share of our banding totals. However, this year much like 2021 saw low numbers for both species as totals for each set new record lows. At just 25 banded, Common Yellowthroats shattered last season’s record low of 55 which is far below the next lowest season total of 78. Meanwhile, for Lincoln’s Sparrow the 64 banded was also the lowest total of all time behind 2013 (88) and 2021 (95). The record low numbers of these three species (Song Sparrow, Common Yellowthroat and Lincoln’s Sparrow) played a large role in the stark deficit in our September banding totals. Our hopes for the late migrant species Ruby-crowned Kinglet to pick up the slack in our banding totals were dashed as we would band our second lowest total of 30 behind 2017 (22) which is just 24% of the average. While large numbers of Yellow-rumped Warblers were around, they were mostly staying away from our net lanes with September 13<sup>th</sup> being the only exception when we banded 18 of them for a season total of 42.

**Table 3 The 15 most banded species in 2022**

Species	2022	Average banded 06-21	% Of Average
Swainson's Thrush	213	142.6	149%
Warbling Vireo	70	151.4	46%
Lincoln's Sparrow	64	185.6	34%
Song Sparrow	57	151.3	38%
Northern Waterthrush	54	44.3	122%
Yellow Warbler	49	76.9	64%
American Redstart	37	53.9	69%
Orange-crowned Warbler	36	86.4	42%
Ruby-crowned Kinglet	30	124	24%
Common Yellowthroat	25	120.1	21%
"Audubon's" YR Warbler	24	62.6	38%
Wilson's Warbler	20	56.1	36%
MacGillivray's Warbler	20	31.3	64%
American Robin	19	11.9	160%
Savannah Sparrow	18	27.4	66%

In addition, Flycatchers as a group were way below average. In total we banded just 13, which is less than a quarter of the annual average of 54.2 for this family as a whole. For Dusky (4 banded) Willow (3 banded), Pacific-slope (2 banded), Alder (1 banded), Traill’s (1 banded) and Least Flycatcher (1 banded) 2022 was the second lowest season total on record at the TLBO while Hammond’s Flycatcher with 1 banded, set a new season low.

A full list of banding totals for the 2022 season can be found in Appendix A (page 38).

### 7.3 Recaptures

In 2022 we had 103 standard recaptures of 86 unique individuals comprised of 18 species. Much like our banding totals this tally is 40% of our average of 257 recaptures per season.

Swainson’s Thrush also dominated the season’s recapture chart with 31 in total which accounts for 30% of all birds recaptured, closely followed by Song Sparrow with 27 (26% of the total) which traditionally is one of our most highly recaptured species. Northern Waterthrush was our third most recaptured species at nine followed closely by Yellow Warbler with eight whilst Warbling Vireos and American Redstarts tied for our 5<sup>th</sup> most prevalent recaptured species at four apiece. These low recapture ratios are a good indicator of just how much turnover there can be in a single count area. Species like Swainson’s Thrush who will often stop over and refuel on dogwood berries tend to be recaptured at most only once per individual, generally after a week of foraging, whilst the high number of Song Sparrow recaptures often are due to the same individuals being caught time and time again.

**Table 4 Inter-annual recaptures in 2022**

Band Number	Species	Sex	Age at Banding	Original Banding Date	Recapture Date	Days Since banded	Minimum Age
2261-25427	Swainson's Thrush	M	HY	2012-08-21	2022-09-07	3669	10
2521-63987	Red-eyed Vireo	U	AHY	2017-08-05	2022-08-06	1827	6+
2661-83114	Swainson's Thrush	U	AHY	2017-09-06	2022-09-18	1838	6+
2730-73999	Warbling Vireo	U	ASY	2018-05-28	2022-08-04	1529	6+
2771-57176	Song Sparrow	U	HY	2018-08-05	2022-08-08	1464	4
2691-76054	Swainson's Thrush	U	HY	2018-08-21	2022-09-11	1482	4
2691-76136	Swainson's Thrush	F	HY	2018-08-29	2022-08-06	1438	4
2691-76129	Swainson's Thrush	U	HY	2018-08-29	2022-09-15	1478	4
2951-23916	Song Sparrow	F	SY	2020-08-07	2022-08-19	742	3+
2790-58986	American Redstart	F	AHY	2020-08-24	2022-08-03	709	3+
2981-21186	Swainson's Thrush	U	AHY	2021-08-12	2022-08-07	360	2+

Every year we have a number of inter-annual recaptures and this season was no different with 11 (Table 4). Of these, the oldest was a Swainson’s Thrush that was originally banded as a hatch-year in 2012 making it 10 years old! This represents our oldest longevity record for this species and only two years shy of the oldest on record (12+ years old). Three species tied for the next oldest namely, a Red-eyed Vireo and a Swainson’s Thrush both banded as after-hatch-years in 2017 (minimum of 6 years old) along with a Warbling Vireo in breeding condition who was first banded in the spring of 2018 as an after-second-year (6+ years old) by Barry Lancaster during his spring banding at the station. We caught four different birds whom were first banded as hatch-years in 2018 namely, three Swainson’s Thrush and one Song Sparrow making all of these individuals four years old. A female American Redstart first banded as an after-hatch-year in 2020 (3+ years old) and a female Song Sparrow first banded in the same year as a second-year making her three years old were also notable recaptures. Our final inter-annual recapture was a Swainson’s Thrush who was banded as an after-hatch-year last season making it two years old at minimum.



Unlike last season we currently have had no recoveries of our birds elsewhere nor have we had any foreign recaptures besides Barry’s Warbling Vireo mentioned above.

Our Northern Saw-whet Owl extension program had three recaptures which brings our grand total to five (an inter-annual in 2014 and a same-season in 2019). All three of the recaptures this year were first banded by us, two of which were same-season with the third being an inter-annual. The first was banded on September 21, 2022 and recaptured on October 7<sup>th</sup> of the same year. The second appears to have hung around in the vicinity of the station for a much shorter timeframe as it was first banded on October 8, 2022 and then recaptured three days later on the 11<sup>th</sup>. Last and arguably the most interesting recapture was a second-year female with an atypical moult pattern who we first banded on September 12, 2021 and recaptured on October 14, 2022. This is only our second inter-annual recapture in the 10 seasons that the Northern Saw-whet Owl program has been operating. Unlike last season on the day of the submission of this report we have not yet had a recapture of one of our owls by another station.

### 7.4 Estimated Totals and Diversity

The 2022 season saw a moderate drop in species diversity as we recorded 138 species in the census area, which is two above the long-term average of 136 (Fig. 8) and the first time that we have registered below 140 since 2017. As in the previous two years, we added a modest count of two new species to the TLBO list, Baird’s Sandpiper and Rose-breasted Grosbeak.

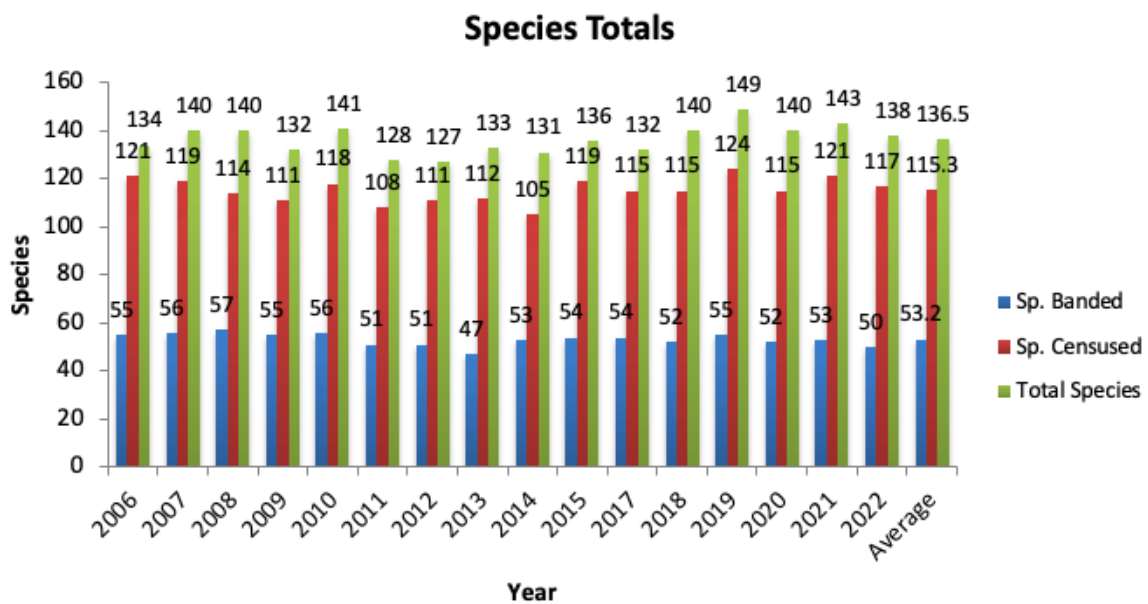


Figure 8 Species detected through banding, census and the total

These new additions are elaborated upon in Table 10 (page. 36) in the “Highlights” section of

this report. The TLBO species list now sits at 208 species detected during diurnal monitoring +1 (a Long-eared Owl seen in 2018 during owl banding). Over the course of the season 26 948 detections were made, 24% higher than the 2006-2021 average of 20 362. This represents the third highest total detections in a single season though a disclaimer should be added on two fronts. These are that pre-2018 the coverage of the census area in terms of making observations was less than the past five seasons and that counts of the more abundant species were almost certainly more conservative. A full list of detections for each species can be found in Appendix B (page 39). A list of the commonest species recorded at the TLBO and their numbers in 2022 vs average can be found in Table 5, page 22.

On the waterfowl front, numbers were down from the mean but up from the past three seasons with detections being 92% of the 2006-2021 average. This is an increase on last season which was 88% whilst the two previous both saw overall waterfowl numbers at 82% of the average. One species that has a strong influence on the waterfowl numbers are Canada Geese. The bulk of many seasons' totals of this species tends to principally be made up of a single flock that is detected on a daily basis for much of the early part of August. This year there were detections for a few days running in both early August and early September but there was no sustained period of detections making for a total of just 75 (20% of average) which is down from last season. This was the fifth successive year of low counts for this species suggesting either that they are spending less time in our census area or that they are breeding less frequently in the valley as a whole. On the flip side, Ring-necked Duck (246 detections), Green-winged Teal (218 detections), Northern Shoveler (33 detections), Blue-winged Teal (new record at 36 detections), Wood Duck (21 detections) and Hooded Merganser (12 detections) were all above average. Mallard, our most common waterfowl at 512 detections, were 105% of the mean, up from 69% last season.

Meanwhile, American Wigeon at 129 detections, Northern Pintail at 4 detections and Barrow's Goldeneye at 1 detection, were each significantly below average. Grebes as a group were well above average which was mostly in part due to the continued presence of a Pied-billed grebe (82% above average) on the lagoon from the third week of August through till the end of September.

Common Loons were just above average while Great Blue Heron detections were down at 81% of the mean.

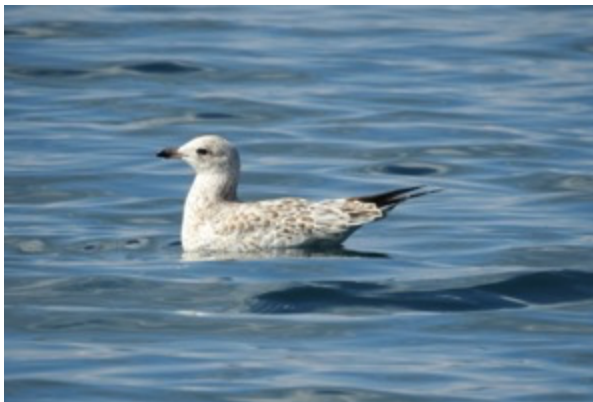


Red-tailed Hawks with 15 detections were above average

Overall, it was just above an average year for raptors as a group as we ended the season with 393 total detections, which is a significant drop from last season at 503 but still just above the 15-season average of 346.6. The regular species to have below average numbers were Northern Harrier (27 detections, 43% of average) and Sharp-shinned Hawk (67 detections, 97% of average). This is the second consecutive season where we have had low detections of Northern Harriers whilst Sharp-shinned Hawks had an above average season on the banding front. Turkey Vulture (4 detections), Coopers Hawk (26 detections), Northern Goshawk (6 detections) and Red-tailed Hawk (15 detections) were all well above average with the first two more than doubling their annual average. For the second season running American Kestrel was our most detected raptor with 115 detections (36% above average), followed by Sharp-shinned Hawk with 67 detections (97% of average) and Osprey with 57 detections (12% above average). A local Osprey pair which we were unable to confirm breeding success for, likely accounted for virtually all of our detections of this species throughout the season.

Shorebird numbers are never high at the TLBO and this year was no different as the final tally came in at just below our long-term average (91% of average). There are three species that are detected with any sort of regularity namely, Killdeer, Spotted Sandpiper and Wilson's Snipe. The former had its second highest detection rate of all time at 19 (164% above average) whilst Spotted Sandpiper, with 44 detections (75% of average) and Wilson's Snipe with 4 detections (45% of average) both had low years. This would indicate that perhaps only a single pair of Spotted Sandpipers bred locally and likely no Wilson's Snipe on the property.

Gulls are another group that we tend to infrequently encounter at the TLBO. Based on our 15-seasons of monitoring Herring Gulls tend to typically account for over 2/3 of our gull detections, but for the second season running they bucked the trend with only 18 detections (one less than 2021) which was the worst season on record at 47% of the average. Of the other two Gull species that we encountered, Bonaparte's Gulls had a record season for detections with 10 (426% above average) setting a new high count when a flock of six were seen on August



Ring-billed Gulls were scarce with only three detections

7<sup>th</sup>. Like Herring Gulls our third gull species Ring-billed Gull with three detections was only 33% of average. Since 2015 we've had regular Sandhill Crane sightings in our census area as at least one pair has seemingly spent the summer in the vicinity. This year we had a record 65 detections which is only 20 shy of our cumulative detection total of 85, usually of four individuals (five on one occasion) which were comprised of two adults and two young. As is often the case with this species there are

numerous instances (not recorded in our data), sometimes daily, when we heard them calling from well outside our census area. This higher detection rate is very encouraging as it would suggest that the local pair bred successfully!

Rufous Hummingbird detections at 17 and Belted Kingfisher at 59 were both below average. All of our regularly occurring woodpecker species were above their respective averages with Downy Woodpecker the only outlier with 54 detections which is 73% of average. Pileated Woodpecker detection numbers were nearly identical to last season with 94 (92 in 2021) which is far above the average of 53.3. As is usual, it is likely that almost all detections of this species pertain to the same few individuals that are resident in the area.

Aerial insectivores, including Swifts, Flycatchers and Swallows often see similar trends as a group in a given year and while 2020 was a bumper year for all, this season, much like 2021, was a little more varied. Flycatchers in particular showed mixed numbers with four species being above average and the remaining five below, making for an overall below average tally for the family (187 detections, 82% of the average). The species that had stronger than average showings included, Dusky Flycatcher (94 detections, 27% above average), Pacific-slope Flycatcher (5 detections, 22% above average), Hammond's Flycatcher (21 detections, 17% above average) and Olive-sided Flycatcher (17 detections, 5% above average). There appeared



Species at risk, Olive-sided Flycatcher were just above average

to be two Dusky Flycatcher family groups one of which almost certainly nested in the willows just south of net 14. Meanwhile, the "Traill's" Flycatcher complex were below average with just 4 detections of Willow (average of 12), 27 of Alder (average of 60) and 6 "Traill's" (average of 12). Least Flycatchers are always detected in very low numbers but Western Woodpeewees often are somewhat more numerous yet both of these species fared poorly as we would detect only 5 Least (average of 12) and 8 Woodpeewees (average of 21).

Swallows had a strong season, for the third year running. The 378 detections were 62% above our 15-season average of 233. Northern Rough-winged and Barn Swallow were the only two species registering below average numbers at just 22 detections (average of 29) and 8 (average of 46) respectively. We have noted a marked decline in Barn Swallow numbers, starting in 2017 since which time the average has been just 19 detections while up until 2015

the average was 60. Tree Swallows, with 19 detections were 50% above average while Cliff Swallows, one of our more infrequent species, with three detections was very close to the average. Violet-green Swallows were 116% above average at 176 detections (third highest season total after 2020, and 2021). Black Swifts were detected on three occasions (August 3-5) with the 4<sup>th</sup> setting a new TLBO high count of 110 individuals in one continuous flock for a total of 131 for the season which is 346% above the average of 30.

Unlike 2021 Warbling Vireo detections were down with nearly 900 less than the past season at 494 (84% of the average). Both Cassin's and Red-eyed Vireos fared far better with 67 (272% above average) and 103 (64% above average) detections respectively. The common corvids all finished above their respective averages with Clark's Nutcrackers enjoying their second highest season total at 590 detections (behind 2020's 604) which is 117% above average. Notably August 28<sup>th</sup> logged a new high count for American Crows with a flock of 400 that was no doubt drawn to the north field by the bumper grasshopper crop.



The station's emblem, Clark's Nutcracker had their second-best season

For the seventh successive season American Pipit numbers were high. The 1065 detections (113% above average) were up from the previous three seasons and is now our second-best total behind the record setting year of 2018 (1306 detections). Meanwhile, another high elevation breeder that prefers open habitats, the Horned Lark, at 51 detections was well below our average of 82 but more in step with 2019 and 2020's detection rates.

As in the past two seasons, our two resident Chickadee species had opposing numbers. Black-capped Chickadees were down from 2021 with 460 detections which is only 80% of the average. Meanwhile, Mountain Chickadees had a record season (for the third year running) with an outstanding 432 observations being 277% above the average as well as a new single season high. For the latter, increased coverage of the conifers northeast of the banding lab since 2017 has seen a marked rise in detections of this species. That being said, in 2022 they were also regularly seen around the banding lab, the pine flats along the census route and in the conifers along the road, opposite the south end of the airstrip. As with the last species, Red-

breasted Nuthatches had a stellar year. This is perhaps unsurprising as they share a preference for coniferous forests. The 309 detections were only 19 shy of 2021's record 328 and 75% above average.

Ruby-crowned Kinglets are prone to large fluctuations in numbers from year-to-year but this was an only slightly above average season with 866 detections, compared to the average of 816. Meanwhile, Golden-crowned Kinglets were slightly down with 52 detections compared with the average of 66.

Thrushes had consecutive bumper years in 2018 and 2019 before mostly returning to average numbers in 2020 before another productive year in 2021. This season many species once again had exceptional numbers with all but two finishing above average. American Robins had their second-best season of all time with 1115 detections which is 59% above average.

Swainson's Thrush with 606 detections was down from last season but still 52% above the average while

Townsend's Solitaire detections saw a sharp fall from last year's record of 61 to 19 this season which is 45% above average.

Mountain Bluebird detections were also markedly down from last season with 77

detections (211 in 2021) which was still 25% above

the average. Varied Thrush and Hermit Thrush were the only two species to have below average numbers the former with 40 (85% of the average) and Hermit with 6 (24% of the average) and our second lowest total behind 2012 (3 detections). The relative abundance of many of the Thrush species could be in part due to the successful berry crop, mainly Red Osier Dogwood along with saskatoon, currants and raspberry, in and around the station which also drew in other frugivores like Cedar Waxwing (1387 detections, 49% above average) and Western Tanager (117, 33% above average). For the former it was the second highest season tally of all time.



American Robin enjoyed its second highest detection rate of all time with 1115

This season had mixed results with five of our nine more commonly occurring warbler species detected in above average numbers whilst the remaining four were below average. For the second year running Northern Waterthrush posted record numbers with this season's tally of 242 (77% above average) setting a new single season high. After last season's boom, detections of Yellow Warbler (416, 51% above average) and American Redstart (278, 24% above average) were down from last season but still enjoyed well above average totals. MacGillivray's Warbler stayed steady with 113 detections, 35% above average which is a 5% increase on last season. As ever, the most detected warbler this season was Yellow-rumped Warbler with 5422 detections being the 3<sup>rd</sup> highest on record and 54% above average. This total was helped by two big days of movement in September by this species where we detected 798 individuals during four hours of monitoring on the 23<sup>rd</sup> and 565 during a full monitoring period on the 28<sup>th</sup>. Three of the four warbler species that had below average number of detections this season were, Wilson's Warbler (121), Orange-crowned Warbler (192) and Townsend's Warbler (21), all marginally below their respective averages at 89%, 82% and 82% of average. Last season recorded low numbers of Common Yellowthroats which had another

Table 5 The most detected species in 2022 as compared to average

Species	2022	Avg. 06-21	% of Average
European Starling	255	40.5	630%
Black Swift	131	29.4	446%
Mountain Chickadee	432	114.7	377%
Red-winged Blackbird	776	250.7	310%
Ring-necked Duck	246	80.2	307%
Vesper Sparrow	164	57.2	287%
Oregon Junco	1055	373.7	282%
Spotted Towhee	133	55.5	240%
Evening Grosbeak	220	93.9	234%
Clark's Nutcracker	590	271.8	217%
Violet-green Swallow	176	81.6	216%
American Pipit	1065	499.1	213%
Savannah Sparrow	974	457.5	213%
Chipping Sparrow	703	331.9	212%
American Green-winged Teal	218	114	191%
Western Meadowlark	293	161.7	181%
Northern Waterthrush	242	136.9	177%
Red-breasted Nuthatch	309	176.7	175%
Yellow-rumped Warbler	5422	3141.6	173%
Red-eyed Vireo	103	62.9	164%
American Robin	1115	699.6	159%
Ruffed Grouse	236	148.2	159%
Swainson's Thrush	606	397.7	152%
Yellow Warbler	416	275.4	151%
Cedar Waxwing	1387	932.9	149%
Hairy Woodpecker	131	91.2	144%
American Kestrel	115	84.7	136%
MacGillivray's Warbler	113	83.7	135%
Western Tanager	117	88	133%
Common Raven	126	98.7	128%
American Redstart	278	224.1	124%
American Crow	1458	1181.3	123%
Northern Flicker	243	210.3	116%
Ruby-crowned Kinglet	866	816.2	106%
Mallard	512	485.8	105%
Song Sparrow	802	807.5	99%
Wilson's Warbler	121	136.7	89%
Warbling Vireo	494	588.3	84%
Orange-crowned Warbler	192	233	82%
Black-capped Chickadee	460	573.1	80%
Red Crossbill	111	142	78%
Lincoln's Sparrow	399	620.9	64%
American Wigeon	129	223.1	58%

disastrous season breaking 2011's record low of 359 detections with 311 being just 57% of the average. This marked decrease in numbers of this species of warbler was also mirrored in our banding totals.

After three seasons of consistently high numbers, most sparrows were again above average in 2022, the notable exceptions being Lincoln's Sparrow (399 detections, 64% of average), Fox Sparrow (6 detections, 34% of average), White-crowned Sparrow (84 detections, 33% of average) and Golden-crowned Sparrow (6 detections, 26% of average). For Lincoln's and White-crowned Sparrow this was their lowest season totals since 2013. After a banner year in 2021

Song Sparrow numbers were much lower this season with 802 detections which was marginally below average. On the flip side, Vesper Sparrow with 164 detections (187% above average), "Oregon" Dark-eyed Junco with 1055 detections (182% above average) and Spotted Towhee with 133 detections (140% above average) all set new single season records. The high detection rates of both Vesper Sparrow and Spotted Towhee in all likelihood were



Lincoln's Sparrow numbers were again low this season with 399 detections

due to high breeding success of several pairs in and around the station which were encountered daily from fledging on through to migration. There were three days in September, the 22<sup>nd</sup> (105 detections), the 27<sup>th</sup> (144 detections) and the 28<sup>th</sup> (143 detections) where we had large movements of "Oregon" Dark-eyed Juncos in which we detected more than 100 individuals. Sparrows of open habitats namely Savannah and Chipping both appeared to have strong breeding seasons as they registered their second highest seasonal counts of all time with 974 (113% above average) and 703 (112% above average).

Red-winged Blackbird numbers set a new single-season record with 776 detections which is 210% above the average. This was no doubt helped by a flock of a minimum of 30 individuals that was seen regularly from the outset through till the third week of August, peaking at 108 individuals on August 10<sup>th</sup>. This species continued to be detected with some regularity albeit in ever dwindling numbers for the remainder of the season. Western Meadowlarks, with 293 detections (81% above average) had their second-best season on record behind 2015 (398)



which is encouraging after two low seasons. Brewer’s Blackbird is not a commonly detected species on the property even though they can be found breeding locally in the valley in large numbers. This season marks the second highest with 27 detections behind 2006 (418 detections) which is due to a single flock of 25 which was present on the opening day plus a few individuals who were identified amidst the Red-winged Blackbird flock during the season.

Last but never least, Finches are always irruptive so it is no surprise that there were mixed results of our regularly occurring species. Evening Grosbeak had another successful breeding season as we detected a total of 220 (134% above average). Purple Finch detections were up from last season with 76 (52% above the mean). Cassin’s Finches were again noted semi-regularly for the third season running with 8 detections. Prior to 2020 there were just eight detections in total, however this species could have easily been mistaken for Purple Finches. Both Red and White-winged Crossbills recorded their second lowest season totals on record with 111 (78% of average) and 8 (13% of average) respectively. Cone crops, chiefly those of the spruce family, were abundant this season which likely had the effect of spreading out individuals of these two highly irruptive species. Pine Siskin detections were less than half the average with 626 (43% of average).

## 8. Non-Standard Banding

Non-standard banding activities were fairly limited again in 2022 as no non-standard songbird nets were used. The three large gauge “Hawk Nets”, HN4, HN7 and HN9, retained

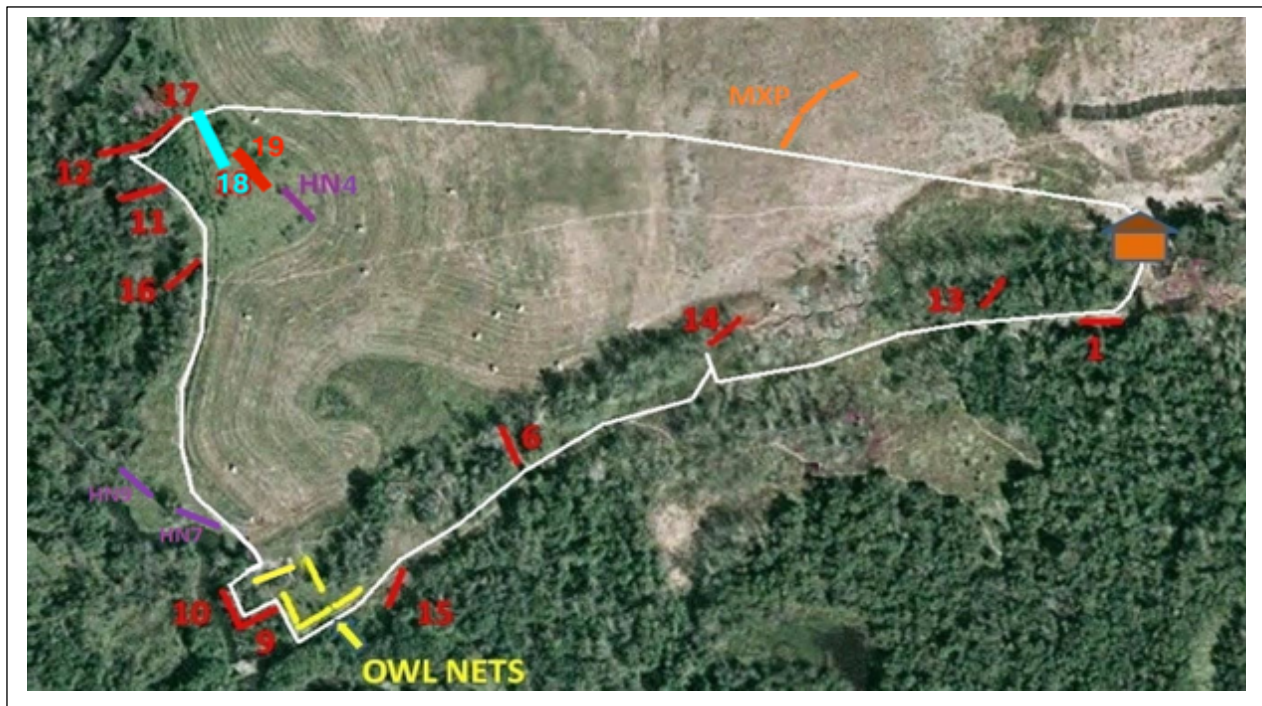


Figure 9 The net setup in 2022 including non-standard nets

their locations from previous years and these accounted for three birds banded (Fig. 9, page 24). HN4 caught a lone Northern Harrier, whilst HN9 was the most productive catching a Sharp-shinned Hawk, Cooper’s Hawk and a Green-winged Teal (which was not banded due to the lack of the proper band type). The “Hawk Nets” were used most days, wind permitting, though were often closed during the census period.

The “Pipit fence” constructed from three consecutive two panel nets didn’t get many opportunities this season, despite being available for nearly 20 days during September. In all it was opened on 11 different days and caught only a single Savannah Sparrow. The bal-chatri was also not used this season due to a lack of mouse trapping success.

**Table 6 Nonstandard birds banded during October**

Species	Banded	Recaps
"Oregon" Dark-eyed Junco	5	
Ruby-crowned Kinglet	3	
Golden-crowned Kinglet	1	
"Audubon's" Yellow-rumped Warbler	1	
Lincoln's Sparrow	1	
Varied Thrush	1	
Black-capped Chickadee		2

With the extension of the Northern Saw-whet Owl banding program into the first two weeks of October songbird nets 1, 13, 14, 6, 9 and 10 along with hawk nets 7 and 9 were left in place in order to be available for nonstandard day time songbird banding which was carried out on a purely opportunistic basis. Songbird banding occurred on the 30<sup>th</sup> of September as well as on nine of the 15 days in October (1<sup>st</sup>, 2<sup>nd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, 6<sup>th</sup>, 8<sup>th</sup>, 11<sup>th</sup> and 13<sup>th</sup>) with eight of the nine running for two hours and one for three hours. During these nine sessions 12 birds were banded comprised of six species and two recaptures of a single species (Table 6). The most banded species was “Oregon” Dark-eyed Junco with five followed by Ruby-crowned Kinglet with three.

## 9. Owl Banding

### 9.1 September Owl Banding (Regular Season)

With a generous grant from the Cariboo Regional District, we were able to replace our 5-year-old speaker that had begun to fail last season with a new one in 2022. With last season being busy on the owl front despite the inclement weather we expected this season to be somewhat more subdued. Unlike last season our owl monitoring was not unduly hampered by the usual poor weather in September as our opening night was on the 5<sup>th</sup>. Four of the first six sessions were cut short in three cases due to wind while another was abandoned after thirty minutes due to rain. Nets 9 and 10 were not used in the first eight sessions due to the prevalence of leaves and light wind. Overall, we would end up conducting 14 owl sessions, plus the single attempt where we had to close after half an hour due to rain (Table 7, page 26). On 10 of those

14 nights, we ran the full 3 hours ending with what is perhaps our best owling effort on record with 39.75 total hours of effort (240.75 net hours) for September.

We enjoyed a spell of unseasonably calm weather where we had a run of 15 consecutive nights of owling which began on September 25<sup>th</sup> and ran until the 9<sup>th</sup> of October. All in all, the weather was surprisingly cooperative at night with respect to wind and rain during much of September. Temperatures were higher than is often ideal but that said we captured at least one owl per night with our biggest night coming on September 30<sup>th</sup> with 13. We averaged 3.7 owls banded per night with five nights exceeding the mean namely, September 23<sup>rd</sup> (5 owls), September 26<sup>th</sup> (6 owls), September 27<sup>th</sup> (4 owls), September 29<sup>th</sup> (7 owls) and September 30<sup>th</sup> (13 owls) for a total of 56 owls which is our third highest season to date. (Fig. 10).

Table 7 September Owling totals

Date	Effort (hrs)	Owls Banded
05-Sep	2.5	2
08-Sep	1.5	3
09-Sep	3	1
13-Sep	3	2
14-Sep	0.5	0
17-Sep	2.25	3
18-Sep	3	2
21-Sep	3	3
23-Sep	3	5
25-Sep	3	2
26-Sep	3	6
27-Sep	3	4
28-Sep	3	3
29-Sep	3	7
30-Sep	3	13
<b>Total</b>	<b>39.75</b>	<b>56</b>

The general trend is that in big owl years we see a low adult/young ratio and like last year this year was an exception with eight adults which represented 14% of our catch (17% in 2021) in September, while low, is much higher than expected when compared with our previous big years (8% in 2017 and 5% in 2019).

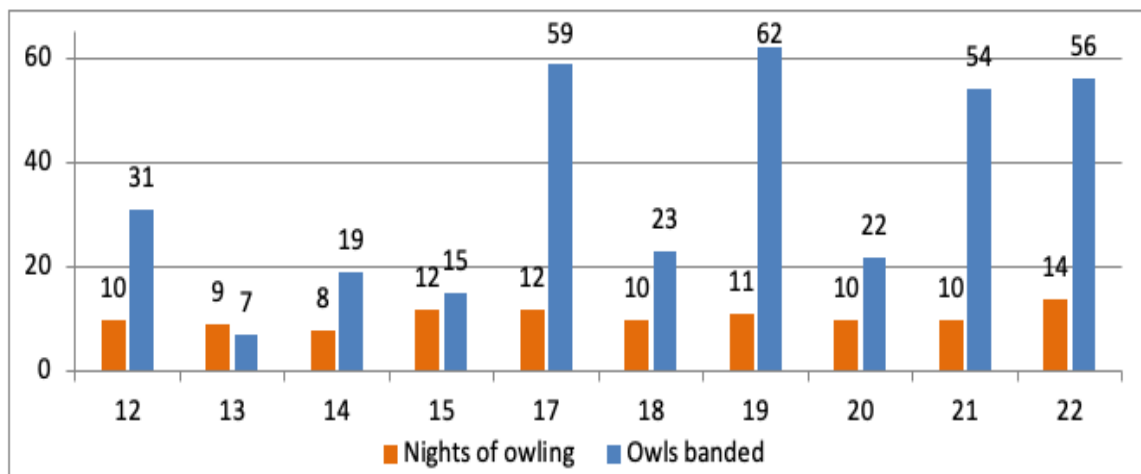


Figure 10 Effort and owls banded per year during September “the regular season”

## 9.2 October Owl Banding Extension

With the success of the pilot program last season, it was decided to incorporate the October two week extension into the TLBO's standard monitoring protocol. Sachiko stayed on to run the program this year and was joined by volunteers for the entire period. Unlike last season the weather was very mild and cooperative as we were able to operate on 14 of the 15 nights compared to only six in 2021. The same seven-net setup, along with our newly purchased speaker were used for a total of 40 hours of effort (269.25 net hours). There were only two nights (October 6<sup>th</sup> and 14<sup>th</sup>) where less than three hours of monitoring was conducted due to weather, mainly wind, and two nights where the monitoring continued beyond the standard 3-hour period due to the continued presence of owls. The standard seven net set up was used during 12 of the 14 nights.

Table 8 Owls banded in October

Date	Effort (hrs)	Owls Banded	Owls Recaptured
01-Oct	3	3	
02-Oct	3	5	
03-Oct	3	4	
04-Oct	3	2	
05-Oct	3	3	
06-Oct	1.75	1	
07-Oct	3	3	1
08-Oct	3	2	
09-Oct	3	3	
11-Oct	3	4	1
12-Oct	3.75	6	
13-Oct	3.5	3	
14-Oct	1		1
15-Oct	3	3	
<b>Total</b>	<b>40</b>	<b>42</b>	<b>3</b>

With this exceptional amount of effort 42 owls were banded for an average of 3.2 per night which is marginally down from the average of 3.7 during September. Of the 42 owls, 39 were hatch-years with the remaining three being adults. Captures of adults during October were half that of those in September as they comprised only 7% of our catch. The 2022 October owling season did however see our highest number of recaptures with three as before this season we had only recaptured two owls (both our own). We caught two owls that we had first banded in 2022 along with a second-year female that we had first banded in 2021 (see section 7.3, page 16).

## 9.3 Owl Banding Overview

In all we banded a total of 98 Northern Saw-whet Owls and three recaptures during 28 nights of monitoring (excluding the one night that we had to abandon) for an average of 3.6 owls per night. Unsurprisingly, hatch-year birds made up the bulk with 89 banded (88% of the total) whilst we captured 12 adults (12% of the total). Ages of the adult owls included, one after-hatch-year, eight second-years (including the inter-annual recapture), one after-second-

year and two third-years. After a big breeding year in 2021 we would expect second-years to make up the majority of our adult captures and this was the case in 2022.



Volunteer Katerina releasing a Northern Saw-whet Owl, Photo: Patrice Gordon

## 10. Injuries and Fatalities

An unfortunate consequence of mist-netting birds is that there is the occasional injury and even fatality. While measures are taken to prevent casualties and injuries, (i.e., highly skilled staff, frequent net checks, monitoring nets when a predator is seen nearby etc.) the odd mishap is inevitable. In 2022 we had a below average number of injuries which was more than half that of 2021. It should be noted that we handled less than half the number of birds as well so the injury rate was not all that different over the past three seasons with 0.56% in 2020, 1.05% in 2021 and 0.81% in 2022. Of the total of 999 birds banded, 108 recaptured and an unknown number of same-day recaptures we had a single fatality and nine injuries. The only fatality was a predation event of a Swainson's Thrush by a Sharp-shinned Hawk in net 15.

The nine injuries included five incidences of wing strain, two superficial wounds to moulting feathers on the underside of wings, a small cut to the neck of a MacGillivray's Warbler (likely self-inflicted) and a superficial laceration to the leg of a Swainson's Thrush. Most years we will subsequently catch one or two of our previously injured birds that had recovered. In 2022 this was the case with one of our Song Sparrows that was released with wing strain at banding and subsequently caught 10 days later without any sign of injury.

We also notice other old injuries, maladies and deformities occasionally on birds and record these as well. This season we did not note any cases of avian pox unlike past seasons. Three old healed leg injuries (mainly to the tarsus) were noted along with one bill deformity on a Ruby-crowned Kinglet

## **11. New in 2022**

### **11.1 Equipment Upgrades and New Net Location**

With a generous grant from the Cariboo Regional District (CRD), we were able to make some much needed upgrades to vital equipment in 2022. The first and most important was the purchase of a new laptop computer that could run the Windows operating system to replace our MacBook that is over 10-years-old. Second, we purchased a newer version of the speaker that we use for owl banding which was 5-years old and had begun to fail at the end of last season, staying with the same brand (Escape) for consistency.



Net 19, new in 2022, replacing net 18

The western fence line of the north field was replaced over the winter of 2021-2022 and as a consequence the new orientation bisected our net 18 location. We retired that net and created a new location just south and east of the old one trying as best as we could to mirror its orientation in order to continue to sample the same habitat. This new net is labelled "Net 19" and has the coordinates (NAD 83, 10U; Easting: 402544, Northing: 5723448).

### **11.2 CMMN Habitat Monitoring Protocol**

In 2022 we incorporated a habitat monitoring component into our protocol as a requirement of our membership with the Canadian Migration Monitoring Network (CMMN). This new monitoring consists of annual photographic documentation of all of the net lanes

(photos from both net poles) so as to best reflect the surrounding vegetation as well as at 14 standardized points along the census route (photos taken in each cardinal direction for each point, n=4). Broader habitat assessments will be conducted every five years. In 2022 we executed our first set of annual photographs both for each of the 12 standard songbird nets (24 photos) and the 14 census route points (56 photos).

### **11.3 New Signs and Donation Box**

In 2022 two new signs, one at the main gate and another which was affixed to the western wall outside the banding lab above a new donation box were erected. The new signs included information such as the web addresses for both the TFSS and TLBO blog sites along with “suggested” donation amounts per visit. The old TLBO sign at the main gate has seen better days and the addition of the new sign no doubt increased awareness of the existence of the observatory which likely had the same effect on the number of visitors this season. Nearly all of the visitors made at least the minimum suggested donation whilst many went above and beyond. We are very grateful for all those generous contributions to the project.

## **12. Research Collaborations**

This year saw a decrease from last season in the research collaborations that the TLBO took part in. As in 2021, we collected Louse Flies for a researcher at University of Guelph. This season we started collecting tail feather samples from a suite of species for two projects (Aerial Insectivores and Boreal Breeders) conducted by the Canadian Wildlife Service (CWS) under the umbrella of Environment and Climate Change Canada (ECCC).

### **12.1 Louse Fly Samples**

Throughout the season we collected Louse Flies (aka Flat Flies) when encountered on birds. While we attempted to catch all that we noticed we likely only collected around 75% of these. It was a decent year for flat flies overall as we collected 64 samples from 13 avian species. Another factor in the marked increase in our collection of samples is in large part due to the expertise and focus of Sachiko who collected the lion’s share of the Louse Fly samples. These samples were sent to Taxonomic Specialist Valerie Levesque-Beaudin, M.Sc. at the University of Guelph. If her project continues next year, we will continue to collect Louse Flies for her again.

### **12.2 Tail Feather Collection for CWS (ECCC)**

This season we participated in a project that is run by the Canadian Wildlife Service where the TLBO along with other Canadian bird observatories collected tail feather samples from a suite of species. Half the project targeted aerial insectivore species, who as the name suggests, specialize in capturing insects. Due to the low volume of this group at the TLBO we only

collected samples from Alder Flycatcher and Traill’s Flycatcher. This group of species has declined by nearly 59% in Canada since 1970 and have also seen marked decreases at the TLBO over the 16 seasons of monitoring. The second part of this study focused on boreal breeders as many of the water sources in the vast boreal forest, which acts both as a songbird nursery and the lungs of North American, are being contaminated by aerial pollutants. The boreal breeders that we sampled included, Red-eyed Vireo, Swainson’s Thrush, Song Sparrow, Lincoln’s Sparrow, Northern Waterthrush, American Redstart, Common Yellowthroat and both subspecies of Yellow-rumped Warbler (Audubon’s and Myrtle). The aim is to measure the concentrations of heavy metal pollutants as well as nutrients, along with the use of isotope analysis for better understanding migratory connectivity and DNA for genetic variation of Canada-wide populations. In all, we collected a total of 159 samples (2 feathers per sample) from 10 separate species.

### 12.3 Northern Saw-whet Owl MOTUS Update

During this past winter Mike Smialowski took on the tremendous task of creating an internet link between the sensorhome at the MOTUS tower on Skinner Ridge and his house in order to automate the data upload portion of our data collection. This is a huge step forward as previously the site had to be accessed manually which requires a rugged 4WD vehicle and a hike with the added challenges of software quirks and volatile environmental conditions.

Since the submission of last season’s report, we have had four detections of the Northern Saw-whet Owls that we tagged last season (Table 9). The first detection was of an owl (tag 439) that we tagged on September 30<sup>th</sup>, 2021 which was then detected by the Stump Lake tower south of Kamloops on October 12<sup>th</sup>, 2021. The second detection was of an owl (tag 446) that we tagged on the 27<sup>th</sup> of September, 2021 and was subsequently picked up by the tower on Protection Island just east of Nanaimo, BC on the 12<sup>th</sup> of October, 2021 and each subsequent day until the 15<sup>th</sup> of that same month. The third detection was an owl (tag 443) first tagged on

**Table 9 New MOTUS detections of our owls since the 2021 report**

Tag	Age at Banding	Tag Deployed	Dates Detected (new detections)	Tower Location
439	Hatch-year	09/30/2021	October 12th, 2021	Stump Lake, BC
443	After-second-year	09/27/2021	November 9th and 10th, 2021	Merritt and Douglas Lake, BC
444	Second-year	09/24/2021	September 4th, 2022	Skinner Ridge Tatlayoko, BC
446	Hatch-year	09/27/2021	October 12-15, 2021	Protection Island, BC

the 27<sup>th</sup> of September, 2021 and then subsequently detected by a Tower in Merritt BC on the 9<sup>th</sup> of November, 2021 and then at a nearby tower at Douglas Lake on the next day. The final detection was at our own tower on Skinner Ridge on September 4<sup>th</sup>, 2022! This owl (tag 444)



was first tagged on the 24<sup>th</sup> of September, 2021 and subsequently picked up by our tower for the next two days as it stayed in the valley before departing.

### 13. Highlights

As in the previous two seasons, we added two new species to the TLBO list, which now stands at 208 species (+1 Long-eared Owl detected during owl banding in 2018). The first new species of the season came on September 11<sup>th</sup> when during a rather quiet census Sachiko spotted a Baird's Sandpiper on a sandbar in one of the small ponds west of the south field. She was able to note enough details just before it flew off calling. We didn't even have to wait a week before adding our second and last new species of the season which came on September 17<sup>th</sup>. During a net round just before 8:00am we came across the TLBO's first ever Rose-breasted Grosbeak in net 14! This hatch-year female represents both the first banding and detection record at the TLBO and caused quite a stir amongst those present. Though not strictly a new species addition, on September 7<sup>th</sup> while returning from census, Sachiko found a freshly deceased Flammulated Owl. This is the first record of this species both in our census area and in the valley. There is a possibility that this owl was a casualty of the Avian Influenza that has been taking a toll on larger avian species, mainly raptors, this year. The specimen was given to the Wildlife branch of the Provincial Government who have sent it off for testing. Historically there have never been any targeted surveys for Flammulated owls in the West Chilcotin and this record will undoubtedly spur a series of surveys next spring. Flammulated Owls are known to breed along the Fraser River (eastern portion of the Chilcotin Plateau), so it remains to be seen if there is a population in the west that has to this point gone hitherto undetected.



The Flammulated Owl

While the Rose-breasted Grosbeak was the only new species addition to our banding list this season we still had several notable captures. This started early on when we caught a hatch-year female Varied Thrush on August 5<sup>th</sup>. This is our first August capture and 24<sup>th</sup> overall, in 16 seasons of operation as we tend to capture this species most years at the end of September. A capture of a young bird this early suggests that perhaps this species bred much closer to the property than they have in the past. The very next day we captured a hatch-year Brown-headed

Cowbird which are rather scarce in the valley for this represents only the 5<sup>th</sup> banding record at the TLBO. We were unable to ascertain the species of the host parents even though a young Cowbird (possibly the same individual) was observed intermittently throughout the rest of August. On August 26<sup>th</sup> we captured our first Mountain Chickadee since 2018. Despite being present every day we do not capture many individuals of this enigmatic species as this represented the TLBO's 34<sup>th</sup> banding record.

Unlike last year we caught only one of our locally scarce warbler species this season. This occurred on September 9<sup>th</sup> when we banded the TLBO's 9<sup>th</sup> Magnolia Warbler. Unlike past seasons this would be our only detection of this beautiful boreal breeder. After sighting a Mourning Dove on the 14<sup>th</sup> and 15<sup>th</sup> of September we banded the TLBO's 2<sup>nd</sup> (1<sup>st</sup> standard record) of this species on the 17<sup>th</sup>. On September 13<sup>th</sup> we caught our second Green-winged Teal in hawk net 9. Due to a lack of proper bands for waterfowl we aged, sexed and then subsequently released this beautiful duck back into the Homathko unbanded. On the final day of standard songbird monitoring (September 28<sup>th</sup>) we caught our first and only Red-shafted Flicker of the season in net 14 which is the 16<sup>th</sup> record overall and only the second since 2013.

On the raptor front, it was an overall poor season for Northern Harriers with low numbers detected. However, we did still manage to catch a lone hatch-year in the "Harrier Net" (HN4) on August 25<sup>th</sup> (15<sup>th</sup> banding record). Sharp-shinned Hawks were plentiful in our nets for we banded a total of nine which is the second-best season on record next to 2018 when we banded 11. Last but certainly not least and definitely one of the major highlights of the banding season was when we caught a hatch-year Cooper's Hawk in hawk net 9 on September 7<sup>th</sup>! This is only our third banding record of an individual of this big and powerful species at the TLBO.

On our opening day (August 3<sup>rd</sup>), we had our only sighting of a Calliope Hummingbird in the south field during census. This is the 24<sup>th</sup> detection of this fairly uncommon species at the TLBO. A sighting of a Nashville Warbler on August 11<sup>th</sup> during census along the road north of the lagoon was our next exciting observation of 2022. We would have a second and final sighting (35<sup>th</sup> record) of this relatively uncommon warbler on the 27<sup>th</sup> of August which mirrors our average of 2.2 detections per season. On the 23<sup>rd</sup> whilst on census, Sachi encountered a Veery along the western verge of the south field. This is the TLBO's 5<sup>th</sup> detection of this uncommon thrush species and our 3<sup>rd</sup> in four years. During a windy day where we were unable to open nets, Sachi sighted an adult Golden Eagle (6<sup>th</sup> record during standard banding) as it soared overhead northwards with the wind on August 28<sup>th</sup>. Of these six records this is our fourth sighting in August whilst the remaining two have come late in September.

Moving into September, the 5<sup>th</sup> record of a Common Tern came on the 3<sup>rd</sup> as Sachiko sighted a lone immature flying out on the lake at the end of census. Ten days later whilst walking back across the north field after a net round we detected a Lapland Longspur (13<sup>th</sup> record) which is an often-scarce and easily overlooked species at the TLBO. The Next day Katerina spotted our first Mourning Dove of the season as it was perched in an aspen along the south fence line of the north field. Presumably the bird stuck around as we would have detections of this species the following day (15<sup>th</sup>) and then again on the 17<sup>th</sup> quickly followed by a capture that same day in net 14. Late September is often the best time for unusual species to show up and this was again the case in 2022. On the 22<sup>nd</sup> during a sub-zero temperature morning an immature Northern Shrike (10<sup>th</sup> record) was noted along the eastern edge of the north field as it attempted to make a meal out of the American Pipit flock. It was sighted intermittently during the course of the day until finally we all saw it capture a prey item just before we departed. That same morning whilst on the way back



Immature Northern Shrike during a cold morning

from census Sachi detected two members of the “Slate-colored” Dark-eyed Junco group which were amidst a large migrating Junco flock on the way back from census. This is the TLBO’s second record of a “Slate-colored” Junco as the first was a banding record in late 2020. The final exciting sighting of the season came on the last day of standard monitoring (28<sup>th</sup>) when Sachi first heard, then sighted a Swamp Sparrow amidst a mixed flock of “Oregon” Dark-eyed Juncos, Yellow-rumped Warblers (of both subspecies) and Ruby-crowned Kinglets at the entrance to the south field on census. While I was working on data submissions Sachiko did some non-standard banding (which is not part of our monitoring protocol but worth including) on September 30<sup>th</sup>. During that time, she sighted our first Rusty Blackbirds of the season as a trio flew overhead uttering their harsh “*chek*” calls. On the same day we had our second Northern Shrike sighting.

We set some single day high counts for species this season as well. On the second day of monitoring (August 4<sup>th</sup>) a weather system provided us with a concentrated swallow movement that included single day record numbers for Violet-green Swallows (140) and Black Swifts (110). Of less interest but no less significant was a large flock of 70 European Starlings which was also a new high-count record of this species for the station on the same day. On August 7<sup>th</sup> while on

census Sachi set a new high count for Bonaparte's Gulls as a flock of six were sighted near the lake. Three days later on the 10<sup>th</sup> we would log our largest number for Red-winged Blackbirds of all time when a single flock of 108 was seen by Sachiko on census! American Crows tend to stick together in the Tatlayoko Valley so it not abnormal to see a hundred or so at a time. On August 28<sup>th</sup> however we witnessed a flock of 400 as it flew northwards (a new high-count record). On the final day of August, we set a new high-count record for Greater Yellowlegs as a group of six was detected as they flew over the station whilst calling.



A lone Bonaparte's Gull on the lagoon

In September we didn't set any new high-count records for any species of note, but we did however have a few good days of visual migration. September 23<sup>rd</sup> was the first of these as the weather was too poor to open any nets which gave us the opportunity to focus on visual observations. While Sachiko was on census, I spent the hour observing Yellow-rumped Warbler migration by the hawk nets along the Homathko and logged roughly 500 individuals of this species in an hour. The final tally

after four hours of monitoring was 798 Yellow-rumped Warblers, although it should be noted that only birds travelling south were counted. On September 27<sup>th</sup> we had our largest day of Dark-eyed Junco movement as we would count 144 individuals over the course of monitoring. We would have one final big movement on September 28<sup>th</sup> as we would log our second highest totals for the season of both Yellow-rumped Warbler (565 individuals) and Dark-eyed Junco (143 individuals). Though not strictly important these high counts, especially the final two species are of interest as it gives a much more complete perspective of the marvel that is migration.

With Sachiko staying on for an extra two weeks to do the owl banding extension we were interested to see what the birding in October 2022 would be like. The highlight of October came on the 1<sup>st</sup> when Sachiko spotted a Prairie Falcon as it perched atop the "Kestrel Snag". This is the second record of this species at the TLBO with the first coming in late August of 2014. On October 5<sup>th</sup> during owl banding the crew heard our first Barred Owl of the season. Northern Shrikes would become more common as an individual was sighted on the 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> of October.

Table 10 Highlights from the 2022 season; birds highlighted in yellow are 1st banding records, in red 1st station records

Species	Details
Calliope Hummingbird	Single bird observed in the south field during census on Aug. 3rd (24th TLBO record)
Varied Thrush	One HY/F banded on Aug. 5th, 1st Aug. banding record (24th banding record)
Brown-headed Cowbird	One HY banded on Aug. 6th (5th banding record).
Nashville Warbler	Single birds observed on Aug. 11th and 27th down along the road near the lagoon
Veery	Single bird observed west of the south field on Aug. 23 (5th TLBO record)
Northern Harrier	One HY/M banded on Aug. 25th (15th banding record)
Mountain Chickadee	One HY banded on Aug. 26th, first since 2018 (34th banding record)
Golden Eagle	One adult observed above the north field on Aug. 28th (6th TLBO record)
Common Tern	Immature seen out on the lake on Sept. 3rd (5th TLBO record)
Flammulated Owl	Found dead on the way back from census on Sept. 7th
Cooper's Hawk	One HY/M banded on Sept. 7th (3rd banding record)
Magnolia Warbler	One HY banded on Sept. 9th (9th banding record)
Baird's Sandpiper	One observed on a sandbar west of the S. field on census on Sept. 11th (1st TLBO record)
Green-winged Teal	One AHY/F caught in HN9 on Sept. 13th, released unbanded (2nd capture at TLBO)
Lapland Longspur	A single bird heard out in the north field on Sept. 13th (13th TLBO record)
Mourning Dove	Single bird obs. around net 14 on Sept. 14, 15 and 17, banded on 17th (2nd banding)
Rose-breasted Grosbeak	One HY/F banded on Sept. 17th (1st TLBO record for both banding and the station!)
Northern Shrike	Immature seen over the north field on Sept. 22nd (10th TLBO record), again on Oct. 6-8th
"Slate-colored" Junco	Two females observed in a flock of the "Oregon" ssp on Sept. 22 (2nd TLBO record)
Red-shafted Flicker	One HY/M banded on Sept. 28th (16th banding record)
Rusty Blackbird	Three birds observed during non-standard banding on Sept. 30th
Prairie Falcon	One observed on the "Kestrel Snag" on Oct. 1st, second sighting since 2014
Barred Owl	Heard during NSW0 monitoring on Oct. 5th.

# Highlights 2022



Figure 10 Banding highlights of 2022, top to bottom: Northern Harrier, Cooper's Hawk, Magnolia Warbler, Mourning Dove and Rose-breasted Grosbeak

Appendix A Banding and recapture totals from 2022

Species	Band	Recap
Sharp-shinned Hawk	8	0
Mourning Dove	1	0
Red-naped Sapsucker	4	0
Downy Woodpecker	1	0
Hairy Woodpecker	4	0
Red-shafted Flicker	1	0
Pacific-slope Flycatcher	2	0
Willow Flycatcher	3	0
Alder Flycatcher	1	0
Least Flycatcher	1	0
Hammond's Flycatcher	1	0
Dusky Flycatcher	4	0
Cassin's Vireo	1	0
Warbling Vireo	70	4
Red-eyed Vireo	5	2
Mountain Chickadee	1	0
Black-capped Chickadee	8	3
Red-breasted Nuthatch	1	0
Golden-crowned Kinglet	3	0
Ruby-crowned Kinglet	30	0
Hermit Thrush	5	0
Swainson's Thrush	213	31
American Robin	19	0
Varied Thrush	1	0
Cedar Waxwing	5	2
Northern Waterthrush	54	9
Orange-crowned Warbler	36	2
MacGillivray's Warbler	20	1
Common Yellowthroat	25	2
American Redstart	37	4
Magnolia Warbler	1	0
Yellow Warbler	49	8
Yellow-rumped Warbler	41	0
Townsend's Warbler	2	0
Wilson's Warbler	20	1
Spotted Towhee	3	1

Species	Band	Recap
Chipping Sparrow	15	0
Savannah Sparrow	18	0
Vesper Sparrow	6	1
Fox Sparrow	6	0
Song Sparrow	57	27
Lincoln's Sparrow	64	3
Oregon Junco	15	0
White-crowned Sparrow	12	1
Golden-crowned Sparrow	1	0
Western Tanager	4	0
Brown-headed Cowbird	1	0
Purple Finch	1	0
Pine Siskin	2	0
Rose-breasted Grosbeak	1	0
Trail's Flycatcher	1	1
<b>Totals</b>	<b>885</b>	<b>103</b>

Appendix B Daily Estimated Totals (DET) and Banding totals in 2022 compared to average, in taxonomical order

Species	DET	Avg. DET 2006-21	Band	Avg. Banded 2006- 21
Greater White-fronted Goose	0	8.7	0	0
Canada Goose	75	383.9	0	0
Snow Goose	0	3.1	0	0
Wood Duck	21	5.8	0	0
Mallard	512	485.8	0	0
Gadwall	0	2.7	0	0
Northern Pintail	4	25.9	0	0
American Wigeon	129	223.1	0	0
Eurasian Wigeon	0	0.1	0	0
Blue-winged Teal	36	4.3	0	0
Cinnamon Teal	0	0.5	0	0
Northern Shoveler	33	25.4	0	0
American Green-winged Teal	218	114.0	0	0
Redhead	0	0.1	0	0
Ring-necked Duck	246	80.2	0	0
Greater Scaup	0	0.1	0	0
Lesser Scaup	0	3.7	0	0
Surf Scoter	0	0.1	0	0
Barrow's Goldeneye	1	9.3	0	0
Common Goldeneye	2	3.7	0	0
Bufflehead	3	3.3	0	0
Hooded Merganser	12	9.7	0	0
Common Merganser	24	35.8	0	0
Red-breasted Merganser	0	0.3	0	0
Dusky Grouse	0	5.4	0	0
Ruffed Grouse	236	148.2	0	0
Common Loon	47	46.9	0	0
Horned Grebe	9	2.7	0	0
Red-necked Grebe	5	14.1	0	0
Western Grebe	0	0.3	0	0
Pied-billed Grebe	30	16.5	0	0
American White Pelican	0	0.2	0	0
American Bittern	0	0.5	0	0
Great Blue Heron	23	28.5	0	0
Turkey Vulture	4	1.6	0	0
Northern Harrier	27	42.7	0	0.1



<b>Species</b>	<b>DET</b>	<b>Avg. DET 2006-21</b>	<b>Band</b>	<b>Avg. Banded 2006- 21</b>
Osprey	57	50.8	0	0
Sharp-shinned Hawk	67	69.2	8	5.9
Cooper's Hawk	26	11.9	0	0.1
Northern Goshawk	6	3.9	0	0.0
Broad-winged Hawk	0	0.1	0	0.0
Red-tailed Hawk	15	12.0	0	0.0
Golden Eagle	1	0.3	0	0.0
Bald Eagle	30	28.6	0	0.0
American Coot	0	0.2	0	0.0
Sandhill Crane	65	5.7	0	0.0
Virginia Rail	0	1.1	0	0.0
Sora	1	5.5	0	0.1
Semipalmated Plover	0	0.1	0	0.0
Killdeer	19	7.2	0	0.0
Greater Yellowlegs	7	1.1	0	0.0
Lesser Yellowlegs	0	0.2	0	0.0
Solitary Sandpiper	1	2.3	0	0.0
Spotted Sandpiper	44	58.9	0	0.0
Upland Sandpiper	0	0.2	0	0.0
Long-billed Curlew	0	0.1	0	0.0
Western Sandpiper	0	0.3	0	0.0
Baird's Sandpiper	1	0.1	0	0.0
Least Sandpiper	0	2.2	0	0.0
Pectoral Sandpiper	0	0.1	0	0.0
Long-billed Dowitcher	0	0.3	0	0.0
Wilson's Snipe	4	8.9	0	0.2
Wilson's Phalarope	0	0.3	0	0.0
Red-necked Phalarope	0	1.1	0	0.0
Red Phalarope	0	0.1	0	0.0
Sabine's Gull	0	0.2	0	0.0
Bonaparte's Gull	10	1.9	0	0.0
Mew Gull	0	0.4	0	0.0
Ring-billed Gull	3	9.1	0	0.0
California Gull	0	5.5	0	0.0
Herring Gull	18	38.3	0	0.0
Caspian Tern	0	0.1	0	0.0
Common Tern	1	0.3	0	0.0

<b>Species</b>	<b>DET</b>	<b>Avg. DET 2006-21</b>	<b>Band</b>	<b>Avg. Banded 2006- 21</b>
Long-tailed Jaeger	0	0.3	0	0.0
Parasitic Jaeger	0	0.2	0	0.0
Mourning Dove	3	1.2	1	0.0
Eurasian collared-Dove	2	2.3	0	0.0
Great Horned Owl	2	3.1	0	0.0
Barred Owl	0	0.4	0	0.0
Northern Saw-whet Owl	0	5.9	0	0.1
Northern Pygmy-Owl	8	5.5	0	0.1
Black Swift	131	29.4	0	0.0
Vaux's Swift	7	1.3	0	0.0
Calliope Hummingbird	1	1.5	0	0.0
Rufous Hummingbird	17	22.6	0	0.0
Belted Kingfisher	59	83.0	0	0.3
Lewis' Woodpecker	0	1.4	0	0.0
Red-breasted Sapsucker	2	3.0	0	0.6
Red-naped Sapsucker	53	41.7	4	2.0
Downy Woodpecker	54	73.7	1	3.6
Hairy Woodpecker	131	91.2	4	3.6
Three-toed Woodpecker	3	2.6	0	0.0
Black-backed Woodpecker	0	1.2	0	0.0
Northern Flicker	243	210.3	0	0.1
Pileated Woodpecker	94	53.3	0	0.1
Peregrine Falcon	2	1.4	0	0.0
Prairie Falcon	0	0.1	0	0.0
Gyrfalcon	0	0.1	0	0.0
American Kestrel	115	84.7	0	0.5
Merlin	43	39.1	0	0.3
Olive-sided Flycatcher	17	16.2	0	0.5
Western Wood-pewee	8	21.1	0	1.5
Pacific-slope Flycatcher	5	4.1	2	3.3
Yellow-bellied Flycatcher	0	0.1	0	0.1
Willow Flycatcher	4	11.6	3	9.3
Alder Flycatcher	27	59.7	1	10.9
Least Flycatcher	5	12.1	1	3.3
Hammond's Flycatcher	21	17.9	1	8.1
Dusky Flycatcher	94	74.0	4	11.2
Say's Phoebe	0	0.1	0	0.0

<b>Species</b>	<b>DET</b>	<b>Avg. DET 2006-21</b>	<b>Band</b>	<b>Avg. Banded 2006- 21</b>
Eastern Kingbird	0	0.7	0	0.0
Northern Shrike	1	0.6	0	0.0
Cassin's Vireo	67	18.0	1	1.6
Warbling Vireo	494	588.3	70	151.4
Red-eyed Vireo	103	62.9	5	8.9
Steller's Jay	9	12.3	0	0.4
Blue Jay	0	0.3	0	0.0
Clark's Nutcracker	590	271.8	0	0.1
Gray Jay	3	4.9	0	0.1
Common Raven	126	98.7	0	0.0
American Crow	1458	1181.3	0	0.1
Horned Lark	51	81.9	0	0.0
Tree Swallow	19	12.7	0	0.0
Violet-green Swallow	176	81.6	0	0.0
Bank Swallow	0	4.1	0	0.0
N. Rough-winged Swallow	22	28.9	0	0.0
Cliff Swallow	3	2.3	0	0.0
Barn Swallow	8	46.1	0	0.0
Mountain Chickadee	432	114.7	1	2.2
Black-capped Chickadee	460	573.1	8	20.4
Chestnut-backed Chickadee	0	1.3	0	0.1
Boreal Chickadee	0	1.9	0	0.6
Red-breasted Nuthatch	309	176.7	1	4.6
Brown Creeper	1	5.1	0	1.7
House Wren	0	0.2	0	0.1
Pacific Wren	8	8.0	0	1.5
Marsh Wren	0	3.5	0	0.5
American Dipper	0	0.1	0	0.0
Golden-crowned Kinglet	52	66.1	3	9.1
Ruby-crowned Kinglet	866	816.2	30	124.0
Townsend's Solitaire	19	13.1	0	0.1
Mountain Bluebird	77	61.7	0	0.0
Western Bluebird	0	0.2	0	0.0
Veery	1	0.3	0	0.2
Gray-cheeked Thrush	0	0.1	0	0.1
Hermit Thrush	6	25.1	5	12.3
Swainson's Thrush	606	397.7	213	142.6

<b>Species</b>	<b>DET</b>	<b>Avg. DET 2006-21</b>	<b>Band</b>	<b>Avg. Banded 2006- 21</b>
American Robin	1115	699.6	19	11.9
Varied Thrush	40	47.1	1	1.5
Gray Catbird	1	2.4	0	0.3
European Starling	255	40.5	0	0.0
American Pipit	1065	499.1	0	0.0
Bohemian Waxwing	0	4.9	0	0.0
Cedar Waxwing	1387	932.9	5	17.3
Lapland Longspur	1	0.8	0	0.0
Northern Waterthrush	242	139.6	54	44.3
Black and White Warbler	0	0.2	0	0.1
Orange-crowned Warbler	192	233.0	36	86.4
Tennessee Warbler	0	0.7	0	0.3
Nashville Warbler	2	2.2	0	0.8
MacGillivray's Warbler	113	83.7	20	31.3
Common Yellowthroat	311	546.6	25	120.1
American Redstart	278	224.1	37	53.9
Magnolia Warbler	1	1.0	1	0.5
Yellow Warbler	416	275.4	49	76.9
Blackpoll Warbler	0	0.9	0	0.5
Western Palm Warbler	0	0.1	0	0.1
Yellow-rumped Warbler	5422	3141.6	41	95.2
Black-throated Gray Warbler	0	0.1	0	0.1
Townsend's Warbler	21	25.5	2	4.3
Wilson's Warbler	121	136.7	20	56.1
Spotted Towhee	133	55.5	3	2.4
Clay-colored Sparrow	0	1.0	0	0.4
Chipping Sparrow	703	331.9	15	3.3
Brewer's Sparrow	0	0.1	0	0.1
Savannah Sparrow	974	457.5	18	27.4
Le Conte's Sparrow	0	0.1	0	0.0
Vesper Sparrow	164	57.2	6	3.4
Lark Sparrow	0	0.1	0	0.0
American Tree Sparrow	0	0.1	0	0.0
Fox Sparrow	6	17.5	6	6.4
Song Sparrow	802	807.5	57	151.3
Lincoln's Sparrow	399	620.9	64	185.6
Swamp Sparrow	1	1.0	0	0.6

<b>Species</b>	<b>DET</b>	<b>Avg. DET 2006-21</b>	<b>Band</b>	<b>Avg. Banded 2006- 21</b>
Oregon Junco	1055	373.7	15	31.7
White-crowned Sparrow	84	253.5	12	35.7
Golden-crowned Sparrow	6	23.5	1	5.1
White-throated Sparrow	4	10.1	0	1.5
Western Tanager	117	88.0	4	7.5
Lazuli Bunting	3	12.9	0	4.4
Indigo Bunting	0	0.1	0	0.1
Brewer's Blackbird	27	32.7	0	0.0
Rusty Blackbird	0	3.5	0	0.0
Red-winged Blackbird	776	250.7	0	2.2
Yellow-headed Blackbird	0	1.1	0	0.0
Brown-headed Cowbird	8	9.7	1	0.3
Western Meadowlark	293	161.7	0	0.0
Bullock's Oriole	0	0.2	0	0.0
Pine Grosbeak	0	3.5	0	0.0
Evening Grosbeak	220	93.9	0	0.3
Purple Finch	76	49.9	1	4.4
Cassin's Finch	8	2.4	0	0.0
Red Crossbill	111	142.0	0	0.1
White-winged Crossbill	8	60.7	0	0.1
Pine Siskin	626	1452.7	2	12.5
American Goldfinch	0	0.1	0	0.0
Rose-breasted Grosbeak	1	0.1	1	0.0
Black-headed Grosbeak	0	0.1	0	0.0
Unidentified Goose	0	2.0	0	0.0
Unidentified Duck	41	37.9	0	0.0
Unidentified Dabbler	0	1.7	0	0.0
Unidentified Accipiter	2	1.1	0	0.0
Unidentified Shorebird	5	4.9	0	0.0
Unidentified Gull	19	26.9	0	0.0
Unidentified Hummingbird	0	1.2	0	0.0
Hybrid Sapsucker	0	0.2	0	0.2
Flicker Intergrade	4	3.1	0	0.9
Red-shafted Flicker	7	4.0	1	1.0
Yellow-shafted Flicker	0	8.1	0	0.1
Unidentified Empidonax	5	8.8	0	0.0
Traill's Flycatcher	6	12.4	1	5.2

<b>Species</b>	<b>DET</b>	<b>Avg. DET 2006-21</b>	<b>Band</b>	<b>Avg. Banded 2006- 21</b>
Unidentified Swallow	70	10.7	0	0.0
Unidentified Warbler	3	8.3	0	0.0
Slate-colored Junco	2	0.1	0	0.1
Unidentified Sparrow	2	4.9	0	0.0
Unidentified Blackbird	2	4.3	0	0.0
Unidentified Finch	1	3.3	0	0.0
<b>Totals</b>	<b>26948</b>	<b>20365.0</b>	<b>885</b>	<b>1644</b>