

2015 Annual Report



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photos unless otherwise noted

On Behalf of

The Nature Conservancy of Canada

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1. Acknowledgments

The Tatlayoko Lake Bird Observatory would like to thank the following for their support during the 2015 season and in seasons preceding. Whether laying the groundwork in previous years, pulling the strings behind the operation or volunteering at the banding station, the following people ensured that the 10th season of operation was a success:

Peter and Roma Shaughnessy
Andrew and Gail Harcombe
Chris Chutter
Laura Cardenas
Lesley Neilson
Wendy Easton
Steve Ogle

Conservation Volunteers:

Curtis Larsen
James Franssen
Alana Broomfield
Michael Simmons
Sandy Mcruer
Andrew Harcombe
Gail Harcombe
Amanda Didychuk
Alex Roberts



Laura on a busy net run by *Curtis Larsen*

Tatlayoko Lake Bird Observatory is administered and primarily funded by the Nature Conservancy of Canada.



2. Overview of season

The Tatlayoko Lake Bird Observatory's 10th season of operation started on August 3rd, 2015. Two full time and one covering staff along with nine volunteers contributed over 1000 hours towards the migration monitoring project. In 394 hours of observation, over 57 days, a total of 136 species were recorded within the census area. Twelve standard nets were used for a total of 3278 standard net hours. In addition, 2 non-standard nets and 2 large gauge (hawk) nets added 223.3 net hours during the morning banding period.

Over the course of twelve nights of Owling we had 204.3 net hours from our 7 net owl setup. We used the same setup as in the previous two years with 4 60mm mesh owl nets, 2 of our standard nets (nets 9 and 10) and one of our large gauge nets. Over this period 15 Northern Saw-whet Owls were banded and none were recaptured.

In total, 3705.6 net hours produced 1740 birds banded, 1641 of which were caught in standard nets during standard hours. This is roughly 300 birds more than were banded in 2014 and is almost right on the 9 year average (Fig. 1).

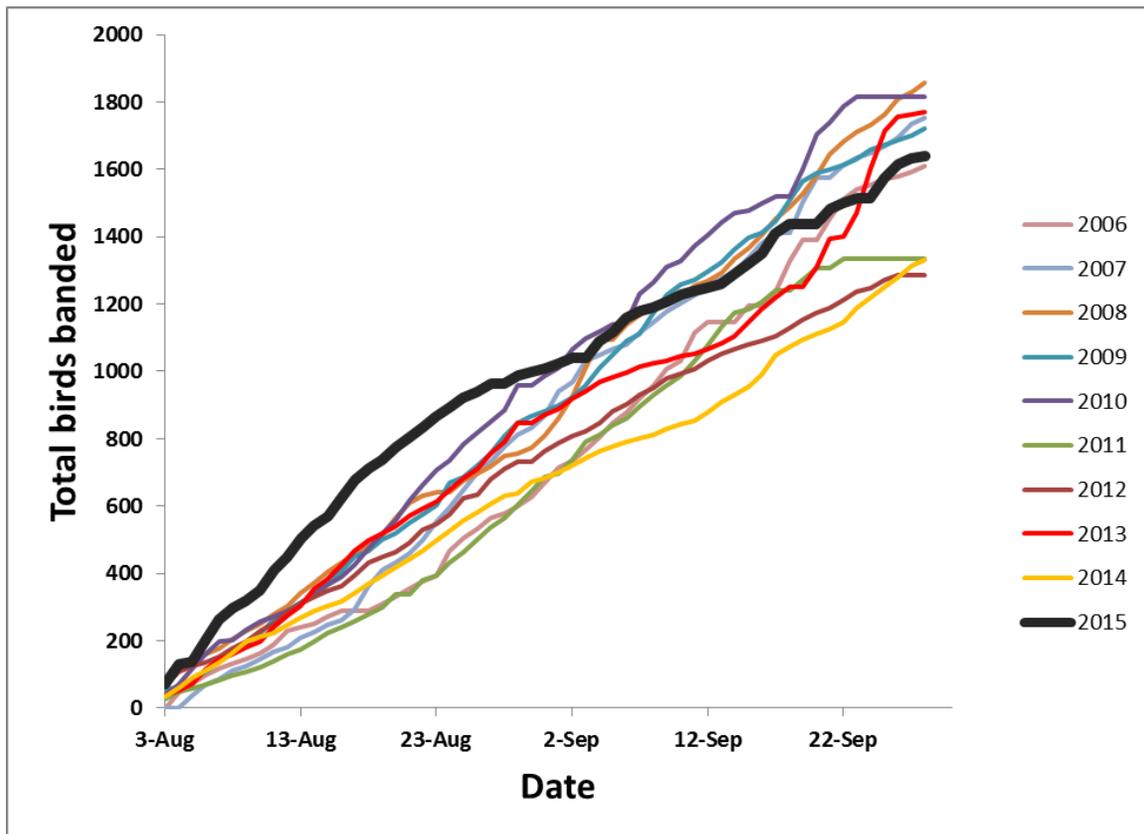


Figure 1 Inter-annual comparison of standard banding totals throughout each season

3. Introduction

The Tatlayoko Lake Bird Observatory (TLBO) has been monitoring fall migration in the Tatlayoko Valley for ten consecutive seasons since being founded in 2006 by the Nature Conservancy of Canada. In 2014 it became a full member of the Canadian Migration Monitoring Network. Nestled in a narrow valley between high mountain ranges, the location is well suited for monitoring the movement of birds on their southward migration. Bird banding is a very effective means of monitoring most small passerines and is especially useful for quiet, furtive species that are traditionally difficult to detect. However, banding has its limitations and many birds, such as raptors and waterfowl are best monitored through visual detections. To this end, three methods of detection are included for migration monitoring; banding, a daily census and observations made throughout the banding period. This ensures we record as large a range of species as possible.

These three categories are combined at the end of each day in the Daily Estimated Totals to give a final count of each species recorded that day. This is the standard approach taken by most bird observatories across Canada.

The property that hosts TLBO serves as an important stopover site for many migratory bird species. Ample standing water means high numbers of aerial insects and not surprisingly, aerial insectivores (Flycatchers, Cedar Waxwings etc.) abound.

Fruit-bearing shrubs are plentiful and include saskatoon, raspberry, red osier dogwood and the odd elderberry making it ideal for frugivorous species such as Swainson's Thrush and Cedar Waxwing. Many other species including some sparrows and warblers will also include berries in their diet during fall migration. Warbling and Red-eyed Vireos seem to rely heavily on the red osier dogwood during stopover at TLBO. The 2015 saskatoon crop was very poor but raspberry and dogwood berries made up for it, both being laden with berries.



Warbling Vireo by *Curtis Larsen*

The secluded ponds and oxbows provide ideal habitat for waterfowl during the period of their pre-basic moult (late July - August) when they cannot fly and are vulnerable to predation.

Being situated in one of only three river valleys in BC that pass through the coast range from the interior to the coast (Fig 2), conventional wisdom would dictate that this would be an important migratory route south. For many species this is no doubt the case (we have three recoveries of Northern Saw-whet Owls from Vancouver Island in 2012). However, an interesting observation that has been made over the course of the past ten seasons is that a large number of birds are visually recorded passing north over the station, presumably to find a more suitable route through the interior.

The location of the valley means that many birds that follow the coast range south on their fall migration are invariably going to be funnelled into the valley, whether they ultimately follow a coastal route or return to the interior. However in spring this funnel effect is probably largely reversed, as birds moving north up the interior side of the coast range would have little reason to jaunt south into the narrow mouth of the valley unless they breed locally.



4. Objectives

As a member of the Canadian Migration Monitoring Network (CMMN), TLBO contributes data to a continent-wide database with the goal of monitoring long-term population trends of migratory bird species across North America. With the data we collect we can monitor, assess, and demonstrate avian migration patterns and population trends over time.

Additionally, the Nature Conservancy of Canada (NCC) founded TLBO as a means of monitoring the success of their conservation efforts on several properties within the Tatlayoko Valley, including riparian habitat and wetlands used by migrating birds as breeding and stopover habitat.

TLBO also provides a means of outreach and public education. Through the NCC's Conservation Volunteer program an educational opportunity is provided for regional, national and international volunteers. We give the chance to gain hands-on skills and a basic knowledge of bird identification and life history as well as demonstrating the importance of conserving important habitat. The station is open to the public and visitors can watch the banding process and learn about bird migration.



Avery doing a banding demo for the Tatla Lake school group *by Roma Shaughnessy*

5. Study Site

The Tatlayoko Valley is located at the far western edge of the Chilcotin Plateau and is squashed between the rolling Potato Range to the East and the Niut Range to the West. The northern section of valley, where TLBO is situated, runs due north-south before zigzagging its way through the coast range out to Bute Inlet and, ultimately, to the inner passage between Vancouver Island and the mainland (Fig. 2).

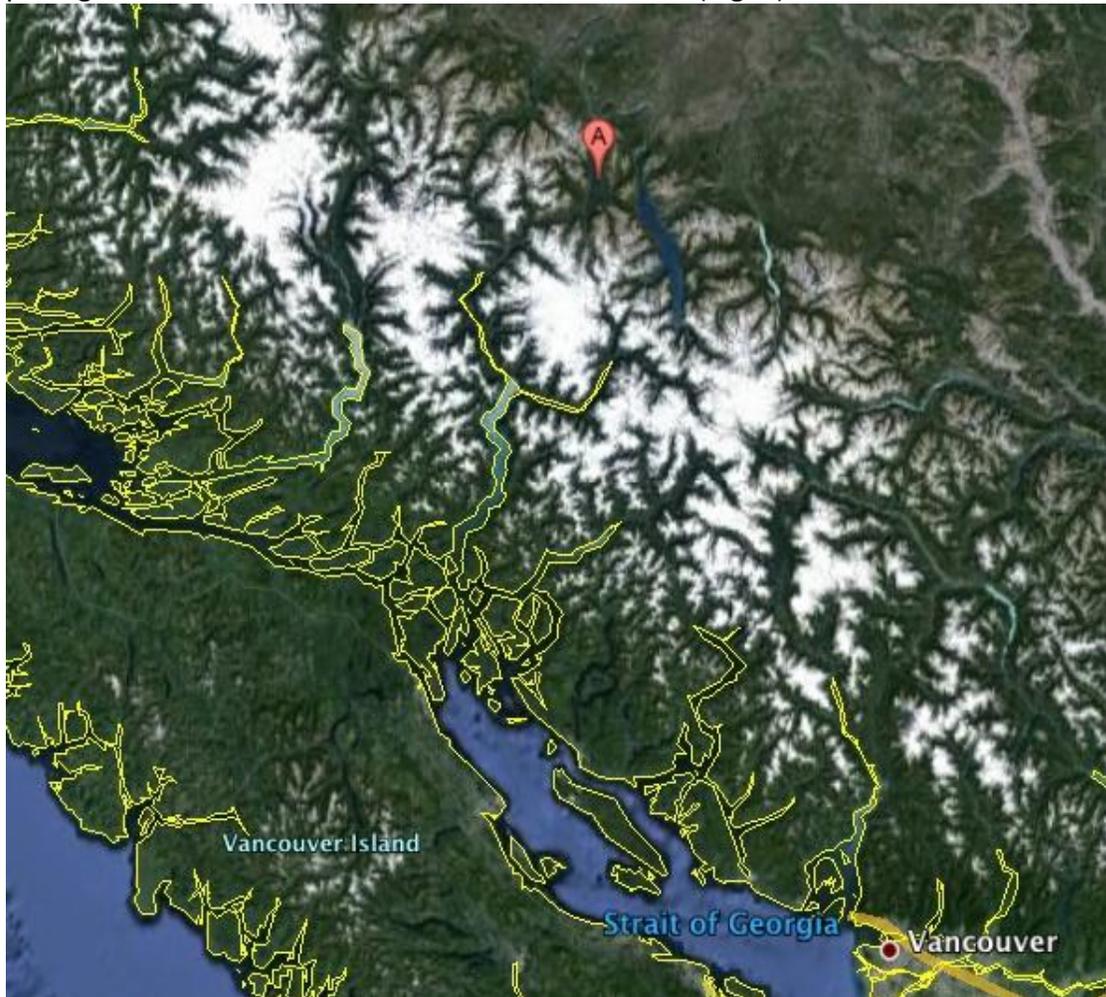


Figure 2 Satellite map of Southwestern BC showing location of TLBO

The station is located roughly 700m north of the northern end of Tatlayoko Lake [UTM 402835 5723416 (NAD83, 10U)]. Included within the roughly trapezoidal census area are a number of habitat types (Fig. 3). The south and west portions are dominated by riparian habitats with willow and alder and scattered ponds lined with sedge/grass wetlands. To the east and north the habitat is drier with copses of Trembling Aspen and disturbed/grazed fields as well as Lodgepole Pine/Douglas-fir flats. The station nets border an open field that is used for hay during the summer and grazing during winter.

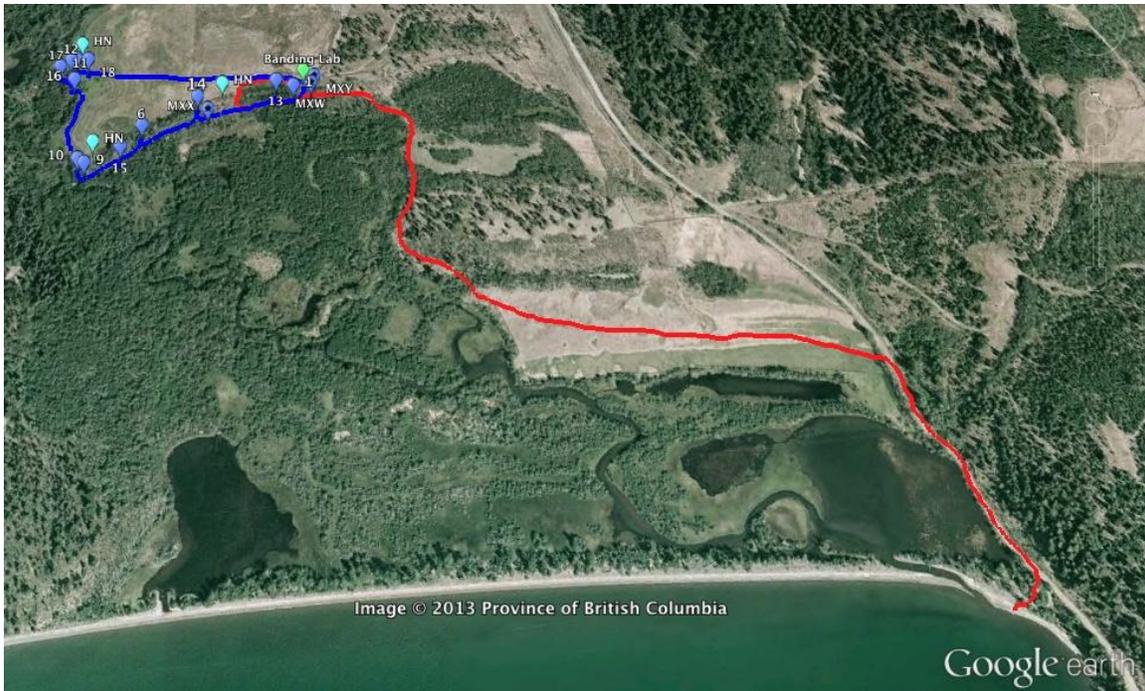


Figure 3 Satellite map of TLBO census area. Census route is marked in red, net route in blue

The net setup goes through most of these habitat types except the Lodgepole Pine/Douglas-fir flats (Fig. 4). The open habitats are also somewhat under-represented due to the impracticality of placing mist nets in such high visibility areas. However, two of the nets, 14 and 18, border the open field that is to the north of the station and do catch a few species typical of that habitat.

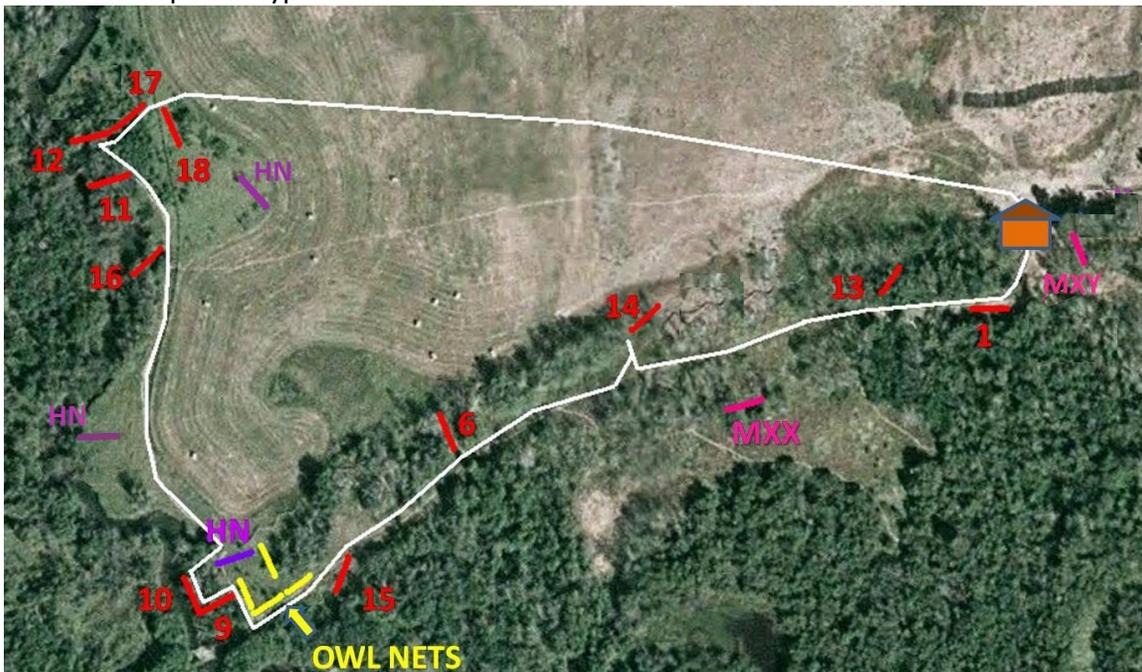


Figure 4 Satellite map of 2015 net loop with standard nets in red, non-standard passerine nets in pink, large gauge nets (HN) in purple and owl nets in yellow

6. Daily Monitoring

Each day we record birds within the census area in three different ways; Banding, a morning census, and through observations made over the course of the banding session. At the end of the day we tally these all up into a Daily Estimated Total (DET) for each species, adjusting the totals so that individuals are not counted twice. These are the most important numbers we tally as they include many species that we don't get in the nets (raptors, waterfowl, pipits etc.). The DETs can be compared over multiple seasons to assess populations on a species level or in more general terms (insectivores, boreal breeding species etc.).



Chris extracting a bird *by Curtis Larsen*

6.1. Bird Banding

The focus of most of our efforts is on the banding aspect of the migration monitoring. Between August 3 and September 28, our twelve standard nets are opened each day. Weather permitting, the nets are run for six hours, starting at sunrise. Nets are checked at regular intervals, usually every 30 minutes although sometimes every 15-20 minutes in low temperature. All birds are extracted quickly and carefully and brought back to the banding lab in breathable cotton bags.

Each un-banded bird receives an aluminum band that has a unique nine-digit number on it, issued by the United States Geological Survey (as are all bands in North America). The bird is then aged and sexed, and fat content and wing length are measured before it is finally weighed and released. Recaptures undergo the same process except for the application of the band. Recapture data is highly useful as it shows changes in a bird's condition throughout a stopover, as well as helping indicate stopover duration and illustrate site fidelity and lifespan.



A sapsucker gets released *by Roma Shaughnessy*

6.2. Census

1 Hour and 45 minutes after sunrise we complete a census along the same route each day. Barring extreme weather conditions we always complete the census in roughly one hour, even if we cannot band. As the census is as standardized as possible it provides an excellent method of monitoring visual migration throughout the season. Census takes precedence over all other monitoring and on rare occasions where we are under-staffed some or all nets are closed. The route extends from the banding lab to the NE corner of the lake, crossing all major habitats around the station (Fig 3, pg. 8)



The mouth of the Homathko River, where the census route ends

6.3. Observations

Finally, all observations made throughout the day get recorded. This is the category that is most subject to fluctuation and alone is not particularly useful as a means of monitoring. This is because these numbers are often inverse to banding and census. On busy days staff and volunteers are often too pre-occupied with banding activities to have time to gather observations whereas on slower days there is more time for general birding.



Yellow-rumped Warbler

7. Vegetation Management and Nets

Some nets pass through regenerating 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 catch rate from year to year. Only four nets require this treatment: 16, 12, 17 and 18. The last major pruning occurred in 2013 so the vegetation height was about 1-2m above the height of these nets in 2015. For net 18, the vegetation was cut down to around the same height as the top of the net in early September but the other three nets weren't fully pruned until the end of the season, in preparation for 2016. We took out many of the thickest stems and a few of the largest alders and willows and stratified the pruning to encourage new growth at varying levels within the vegetation. In addition, we pruned to net height around 5-7m back from nets 12 and 17, to increase the width of the space between bushes well over net height to decrease the likelihood of birds simply flying over the pruned area.

With the vegetation growing up so high, the catch rate of net 17 in particular was negatively affected. Net 17 was historically our most productive net and had decreased quite dramatically in productivity over the 2011-2013 seasons. In 2011 it caught 18.2% of our total catch, 2012 saw a decrease to 11.9% and even with pruning mid-way though 2013 it ended that season with just 8.2%. The positive effects of our pruning were felt in 2014 though as it rebounded back up our second most productive net with 15.3% of the season total, however with little pruning last year it dropped back down to 9.2% in 2015 (Table 1).

All standard nets retained their locations in 2015.



Net 18 after some trimming

Net	Banded	Birds/ Hr	Recaps	% time used	% of birds
16	255	0.96	49	0.78	14.8%
14	180	0.77	26	0.69	10.4%
6	171	0.65	21	0.77	9.9%
18	152	0.65	20	0.68	8.8%
1	162	0.56	39	0.85	9.4%
17	158	0.56	26	0.83	9.2%
13	106	0.38	36	0.81	6.2%
15	105	0.36	15	0.84	6.1%
11	102	0.36	30	0.84	5.9%
12	89	0.31	16	0.83	5.2%
10	82	0.29	15	0.83	4.8%
9	79	0.28	20	0.83	4.6%

Table 1 Productivity per net in 2015

8. Personnel

In 2015 Avery Bartels and Chris Chutter continued as bander-in-charge and Assistant bander respectively. Between the two of them Avery and Chris have over 13 seasons worth of experience at TLBO and have banded at stations across Canada and the western United States. Laura Cardenas, who spent two weeks at the station in 2012 returned for the first 12 days of the season, in part to cover for Avery who had to miss the first two days of the season.

Volunteers Amanda Didychuk and Alex Roberts both banded a handful of birds during their stay as both had prior bird handling experience and were keen to gain more as it pertained directly to their careers with birds (Table 2).

Table 2 Birds banded per bander in 2014

Bander	Banded	Percent	Recaps	% Processed
Chris Chutter	797	46.3	159	46.86
Avery Bartels	776	45.0	135	44.66
Laura Cardenas	129	7.5	21	7.35
Amanda Didychuk	18	1.0	2	0.98
Alex Roberts	5	0.3	0	0.25

9. Volunteers and outreach

9.1 Conservation Volunteers

The Conservation Volunteer Program had another successful season in 2015. Volunteers help out the banders in a variety of tasks from extracting birds and scribing to helping set-up mist nets, adding observations and clearing invasive weed species. There were a few last minute cancellations but overall volunteer hours were up from 2014. In total our conservation volunteers put in 403 hours of their time and, as always, were integral to the success of the season.

As per usual, we had volunteers from all walks of life. Most were from BC or Alberta but we had volunteers from as far away as New Brunswick and even England! Three were returning volunteers and one is a regular at RPBO in Victoria, all four had ample experience extracting birds. Additionally, two of our later volunteers arrived with some prior experience in handling birds which they were able to use as a base for furthering their knowledge and capabilities.



Volunteer Amanda with a Harrier

9.2 Visitors

Due to the station's remote location, the number of drop in visitors is rather low. However, in 2015 BC Nature held their annual field trip in the Tatlayoko Valley which added greatly to our visitor tally (more on their visit on pg. 28). We also had a visit from the Tatla Lake Elementary School who hadn't visited for several years. Overall we were pleasantly surprised by the number of visits. Excluding the two groups we had a total of 37 visitors account for a total of 68 visits. Taking into account the BC Nature and the school group visits we had 121 total visits.

Visits from locals were up in 2015 as the owling in particular was a hit, several individuals and families returned multiple nights to enjoy the Northern Saw-whet Owls.



Visitors enjoying a sunny net round

9.3 Blog

Once again, a blog (www.tatlayokobirds.wordpress.com) was maintained throughout the season and after each day we would post highlights, photos, quizzes and educational pieces on various aspects of our migration monitoring. We had guest blog posts from Laura Cardenas, on her second visit to TLBO, Andrew Harcombe, who oversees the project and has been a long-time returning "volunteer" and project manager Peter Shaughnessy. Otherwise the banders took turns posting.

Over the course of 57 posts we received 4712 views and 1159 visits. While most were from Canada, we also received views from 26 different countries! Over the course of the season the blog received 88 comments, many of which were from previous volunteers and visitors to the station.

10. Standard Banding

10.1. Effort and environmental conditions

In the two months of operation, we lost 4 full days of banding due to weather (high wind or precipitation) and had 19 days with five net hours or more lost. This resulted in a lower than average number of total net hours – just 3278, about 250 less than the average of 3524.5 net hours (Fig. 5).

Weather in the valley can be quite predictable in some years but 2015 was not one such year as temperatures and wind fluctuated greatly and on an almost daily basis for most of the season. From Aug. 3 – 27, high temps. were typically in the low to mid 20's. This was followed by five days of highs in the mid-upper teens before a week-long spell of even cooler weather hit where mid-day highs were consistently in the low-mid teens. September 10- 12 was back into the 20's (high of 27 Sept. 12). From then on, temperatures decreased, as expected until the end of the season with several lows of below zero first thing in the morning (Fig. 6).

Up until Aug. 20 winds remained light during the banding period. From that point on strong winds came periodically throughout the rest of the season with the only period of more than two consecutive days of strong wind being Aug. 27 – Sept. 2 (excluding Aug. 29). Over the course of the season we had six days with rain during the banding period which was more than any of the previous four seasons.

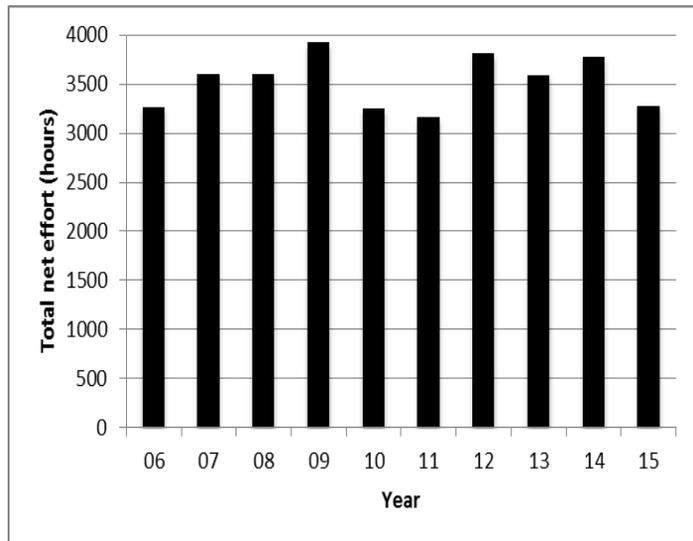


Figure 5 Total net hours by season

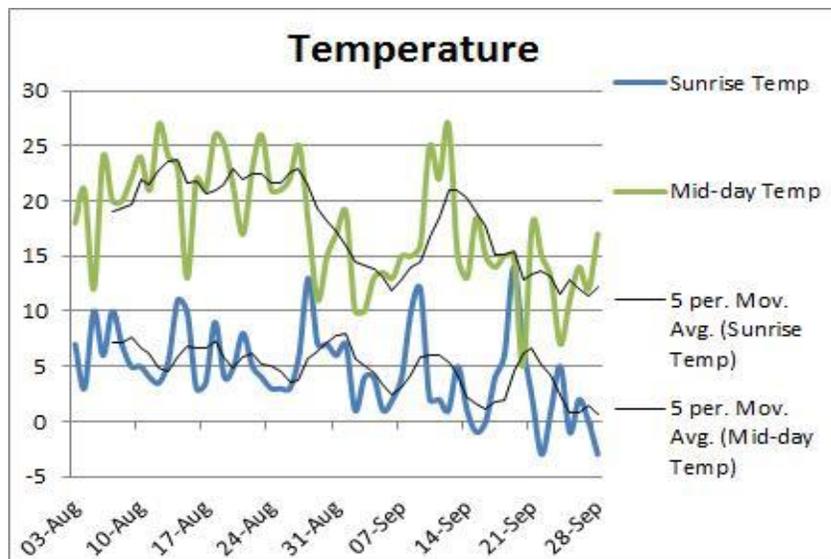


Figure 6 Temperature change over the course of the 2015 season

10.2. Banding results

A total of 1641 standard birds were banded in 2015, almost right on the 10 year average of 1621 (Fig. 8). The season got off to a flying start with 71 birds banded on the first day of operation (Fig. 7). From that point until the end of August we were on course for a record season. The pace started slowing around Aug. 20, up to which point we averaged a whopping 43 birds banded/day (and were over 200 birds above the next best year, 2008). From then on, numbers slipped and the next two weeks saw us average just 23 birds/day. In September we experienced a handful of busy days as the slow pace carried most the way through the rest of the season. Notable dates were Sept. 4-6 (114 birds banded over three days), Sept. 17 (58), 21(43), 25(62) and 26(43) (Table 3, pg. 17).

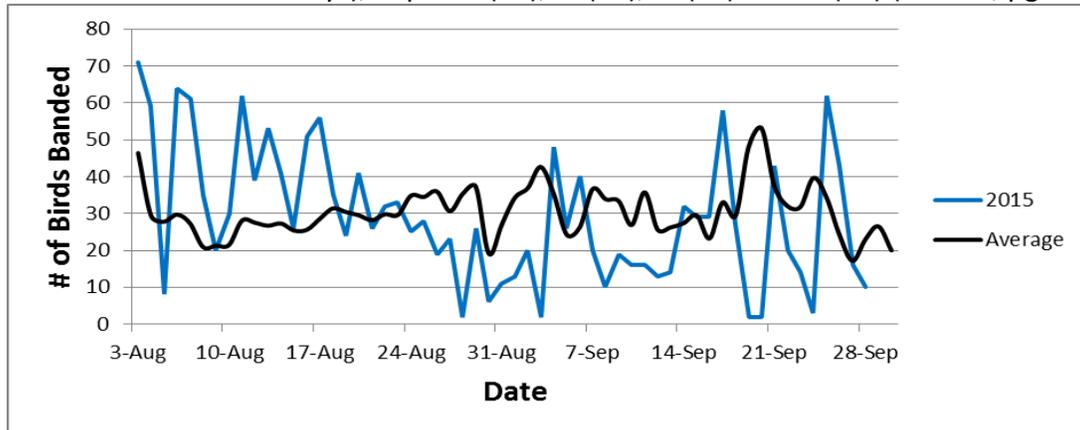


Figure 7 Number of birds banded over the course of the 2015 season vs average

Over the course of the season we banded 54 species, up slightly from the past two years; a record low of 48 in 2013, followed by 53 in 2014 (Fig. 8). An additional three species were banded by non-standard means (extra nets and Bal-chatri trap). These

were all raptors; Northern Harrier(4), Merlin (first banding record) and American Kestrel (first 3 banding records). In addition to the first banding records of Merlin and American Kestrel a Clay-colored Sparrow that hit net 16 Aug. 29 was the only first caught by standard means.

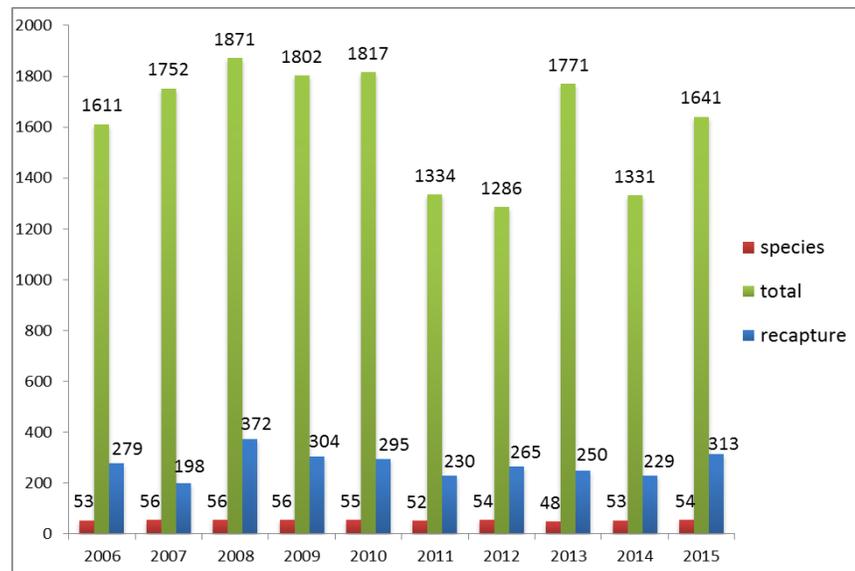


Figure 8 Inter-annual comparison of banding/recapture totals and diversity

10.2.1. Play-by-play

The early part of the season was our busiest, with five of our top six busiest days coming in the first eight days of the season (Table 3). Our catch was dominated by Swainson’s Thrush (184 banded Aug. 3 – 25) and Warbling Vireo (140 banded Aug. 3 -17) with plenty of juveniles of the former and roving flocks of hatch-years of the latter. These two species ended up being our two top catches of the season (Table 4, pg. 18). The area around the banding lab (nets 1 and 13) was particularly productive for Swainson’s Thrush and American Robin which both had record seasons. Another frugivore that broke its previous season banding record by Aug. 11(!), Western Tanager, was also prevalent during the first quarter before their numbers started diminishing later in August. Other local breeders, such as Common Yellowthroat and Song Sparrow, also seemingly had productive breeding seasons as juveniles of each frequented our nets.

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
89, 9/18	90, 9/19	85, 9/3	64, 8/24	106, 9/21	55, 9/13	51, 8/26	132, 9/24	60, 9/17	71, 8/3
82, 9/11	73, 9/1	83, 9/4	63, 9/18	81, 9/8	50, 9/3	44, 8/28	110, 9/25	40, 9/23	64, 8/6
73, 8/24	71, 8/18	70, 8/3	62, 9/8	79, 9/20	46, 9/11	42, 8/5	85, 9/21	37, 9/27	62, 8/11
63, 9/19	71, 9/20	65, 9/2	55, 8/3	72, 8/30	44, 8/30	40, 8/3	70, 9/23	36, 8/30	62, 9/25
61, 9/21	61, 9/3	63, 9/21	55, 9/19	57, 8/22	44, 9/12	37, 8/23	57, 9/20	36, 9/25	61, 8/7
59, 9/22	56, 8/23	53, 9/1	53, 9/4	54, 9/3	42, 8/31	35, 8/19	57, 8/29	34, 8/9	59, 8/4
49, 9/9	54, 8/26	53, 9/20	52, 8/28	51, 8/6	42, 9/14	34, 9/6	54, 8/14	34, 9/16	58, 9/17
49, 9/15	50, 8/19	50, 9/17	52, 9/9	50, 8/26	41, 9/2	33, 8/13	46, 8/27	33, 8/3	56, 8/17
44, 8/4	50, 8/25	49, 8/20	45, 9/15	50, 9/23	40, 8/20	32, 8/18	43, 9/26	32, 8/25	53, 8/13
43, 9/1	47, 8/28	47, 9/6	42, 8/17	47, 8/19	40, 8/22	31, 9/1	41, 8/11 and 8/16	31, 8/23	51, 8/16

Table 3 Top 10 busiest days by season (birds banded, date)

On the flip side, many of the warblers seemed to not fare so well as below average numbers of Northern Waterthrush, American Redstart, Yellow and Orange-crowned Warblers were caught. While Cedar Waxwings were around in moderate numbers, we didn’t get the flocks in our nets that we some years do ,which was somewhat surprising given the high numbers of other frugivorous species.

As August neared its end, catch rates diminished and Common Yellowthroat and Lincoln’s Sparrow took over as the top species in our nets. By this point, the early season migrants including thrushes, vireos, “Traill’s” Flycatchers, and some warblers (Redstarts, Waterthrush and MacGillivray’s Warblers) were becoming Scarce.



MacGillivray’s Warbler

Numbers of Ruby-crowned Kinglets started building around Sept. 11 and by the 15th their migration was in full swing. They were our top catch almost every day until the end of the season with a total of 149 banded (41% of our total birds banded) during the final quarter. Interestingly, unlike in 2013 when we also saw an influx of Ruby-crowned Kinglets at the end of the season, in 2015 we did not get the corresponding huge numbers of Orange-crowned (just 19 banded) and Yellow-rumped Warblers (28 banded).

The numbers of sparrows, as a group, remained consistent over the course of the season but the composition changed with White-crowned Sparrow becoming amongst the most abundant of the 10 species recorded during September. The other *Zonotrichia* we regularly record, Golden-crowned Sparrow, had a record year finishing with 14 banded (all in September). Oregon Juncos peaked late in the season, while Song and Lincoln's dropped, as expected, with just 27 of the latter banded from Sept. 15-28 (still our second highest catch for the quarter).

Species	2015	Average
Swainson's Thrush	204	111.0
Warbling Vireo	195	135.6
Ruby-crowned Kinglet	186	112.1
Common Yellowthroat	166	126.9
Lincoln's Sparrow	133	197.1
Song Sparrow	118	136.3
Yellow Warbler	63	85.7
Orange-crowned Warbler	49	91.6
Wilson's Warbler	46	61.9
Northern Waterthrush	41	45.3

Table 4 Top 10 species banded in 2015



We were pleased to band two Brown Creepers in 2015

10.3. Recaptures

Amongst the most interesting data collected at a banding station is that of the recaptures. Recaptures can be put into three different categories, same-year, inter-annual and foreign. At TLBO we have yet to catch a foreign recapture although we highly anticipate the day we do.

The variability in recapture numbers is largely tied to the breeding season in the immediate vicinity of the station. The first few weeks of August, when most of the local hatch-years have yet to depart, typically accounts for a disproportionate number of a season's total recaptures.

Band #	Species	06	07	08	09	10	11	12	13	14	15	Age
2241-38627	Swainson's Thrush											7
2261-26122	Swainson's Thrush											6
2541-61103	Swainson's Thrush											5
2690-45365	Common Yellowthroat											4
2400-77771	Alder Flycatcher											5
2490-29300	Chipping Sparrow											5
2480-54205	American Redstart											4
2480-56254	American Redstart											6
2261-26164	Swainson's Thrush											6
2261-26282	Swainson's Thrush											6
2241-37494	Swainson's Thrush											5
2241-37220	Swainson's Thrush											6
2420-34522	Orange-cr. Warbler											6

Table 5 Selection of TLBO's oldest recaptures and years they were caught. Green = hatch-year, yellow = adult. Ages given in black are known age, red minimum age.

Same-year recaptures provide an insight into many aspects of a bird's physical condition and stopover timing during migration. One of the things we can track if we catch a bird multiple times is its deposition of fat during its stopover period which is stored in preparation for the next leg of a bird's journey. Many local adults also use the area to complete their pre-basic moult after breeding.

In 2015 we had 313 recaptures of 22 species. This was well above our average of 269 recaptures and a big increase from the 229 recaptures we had in 2014. Unsurprisingly, a large portion of these were Common Yellowthroat (67), Song Sparrow (62) and Swainson's Thrush (52). All three species are common local breeders and birds of low, dense undergrowth (thereby having an increased likelihood of hitting our nets).

Of these 313 recaptures, 29 were inter-annual (Table 6, pg. 21) and several were noteworthy. TLBO had banded just 21 Chipping Sparrows over the first 9 years of



On Sept. 11 we caught this 7 year old Swainson's Thrush

operation so a 5 year old recapture of a female (with brood patch) on Aug. 3 came as a surprise. Another 5 year old (minimum, as it was originally banded as an after-hatch-year in 2011) was an Alder Flycatcher first recaptured Aug. 4 and subsequently caught twice more on Aug. 7 and 13. This individual was also recaptured Aug. 3 2014, though not at all in 2012 or 2013 (see Table 5, pg. 20 for more of TLBO's oldest recaptures). Presumably it returned to the valley each year but was breeding further away from the nets those years.

Our oldest recaptures were of two Swainson's Thrush of 6 and 7 years of age respectively. Both were banded as hatch-years making the latter the oldest known age bird on record at TLBO. Interestingly, neither was caught in any of the intervening years (Table 5, pg. 19).

Band Number		Species	Sex	Original Banding Date	Age at Banding	Recap Date (2015)	Days Since Banded	Min. age
2241	38627	Swainson's Thrush	U	11-Aug-08	HY	11-Sep	2587	7
2261	26122	Swainson's Thrush	U	10-Aug-09	HY	06-Sep	2218	6
2490	29300	Chipping Sparrow	F	07-Aug-10	HY	03-Aug	1822	5
2400	77771	Alder Flycatcher	U	03-Aug-11	AHY	04-Aug	1462	5
2541	61103	Swainson's Thrush	U	10-Sep-11	AHY	24-Aug	1444	5
2261	25438	Swainson's Thrush	U	23-Aug-12	AHY	23-Aug	1095	4
2261	25500	Swainson's Thrush	F	05-Sep-12	AHY	08-Aug	1067	4
2690	45277	Common Yellowthroat	M	08-Aug-12	HY	15-Sep	1133	3
2690	45365	Common Yellowthroat	M	19-Aug-12	HY	06-Sep	1113	3
2690	45365	Common Yellowthroat	M	19-Aug-12	HY	20-Aug	1096	3
2690	45277	Common Yellowthroat	M	08-Aug-12	HY	03-Aug	1090	3
2261	25427	Swainson's Thrush	U	21-Aug-12	HY	06-Aug	1080	3
2690	45365	Common Yellowthroat	M	19-Aug-12	HY	03-Aug	1079	3
2400	77810	Yellow Warbler	F	11-Aug-13	AHY	11-Aug	730	3
2321	26262	Red-eyed Vireo	U	25-Aug-13	AHY	07-Aug	712	3
1811	61848	Swainson's Thrush	U	14-Sep-13	AHY	10-Aug	695	3
2261	25610	Song Sparrow	U	04-Aug-13	HY	11-Aug	737	2
2480	55684	Orange-crowned Warbler	M	21-Sep-13	HY	22-Sep	731	2
2261	25622	Song Sparrow	U	06-Aug-13	HY	06-Aug	730	2
2261	25739	Swainson's Thrush	U	18-Aug-13	HY	15-Aug	727	2
2680	93784	American Redstart	F	03-Aug-14	AHY	24-Aug	386	2
2720	24239	Yellow Warbler	F	04-Aug-14	AHY	25-Aug	386	2
2720	24338	Black-capped Chickadee	U	15-Aug-14	AHY	05-Sep	386	2
2680	93784	American Redstart	F	03-Aug-14	AHY	06-Aug	368	2
2661	79022	Swainson's Thrush	U	23-Aug-14	AHY	24-Aug	366	2
2661	79048	Swainson's Thrush	U	27-Aug-14	AHY	27-Aug	365	2
2661	79045	Swainson's Thrush	U	27-Aug-14	AHY	24-Aug	362	2
2720	24327	Yellow Warbler	F	13-Aug-14	AHY	09-Aug	361	2
2591	67608	Northern Waterthrush	U	19-Aug-14	AHY	04-Aug	350	2
2680	93800	American Redstart	F	07-Aug-14	HY	11-Sep	400	1
2720	24479	Black-capped Chickadee	U	24-Aug-14	HY	27-Sep	399	1

Table 6 2015 inter-annual recaptures, ages in bold are known (banded as hatch-years)

10.4. Estimated Totals and Species Diversity

2015 saw a total of 136 species recorded in the census area, up from 131 in 2014 (Fig. 9). For the first season since TLBOs inception no new species were added to the station list although several unusual sightings occurred. Over the course of the season 20890 detections were made, well above the 2006-2014 average of 17913.

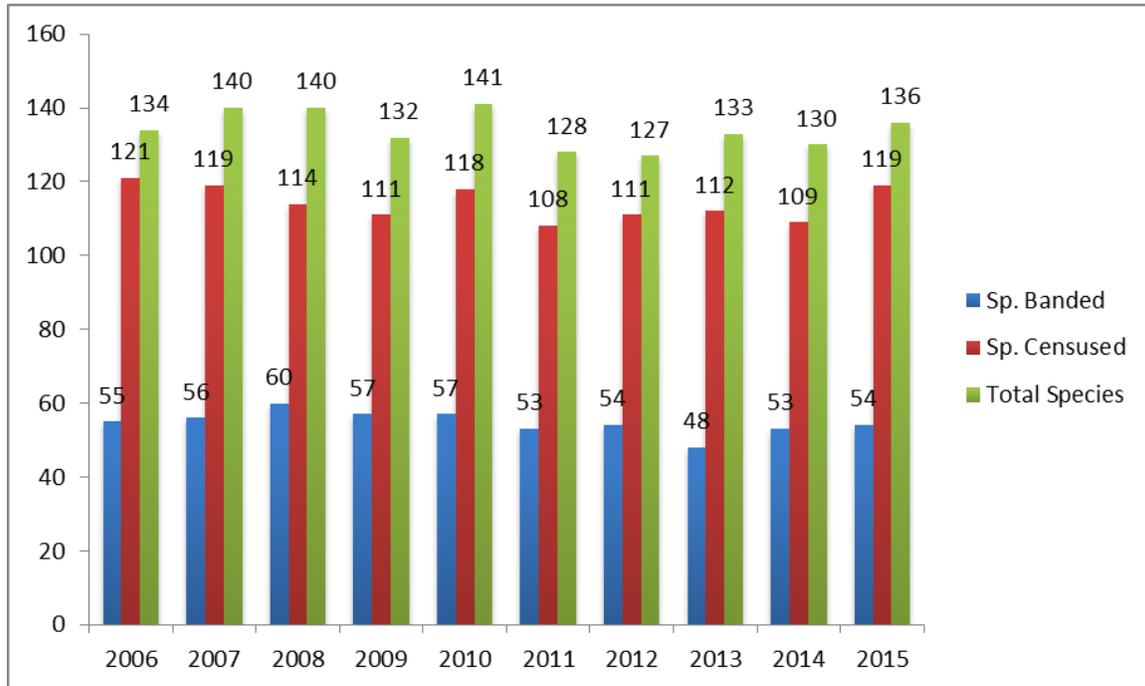


Figure 9 Comparison of species banded, censused and on DETs

Waterfowl were reasonably scarce through much of August with 10-20 Mallards, 3-4 Ring-necked Ducks and 1-2 Green-winged Teal recorded most days along with a smattering of other species. By late August we were getting our first flocks of American Wigeon which, along with lesser numbers of Mallards and Northern Shovelers accounted for a few spikes in numbers from Aug. 27 – Sept 6. Waterfowl numbers peaked in the final week of the season with American Wigeon being present on the lagoon every day of the final quarter in numbers varying from a low of 1 (Sept. 16) to a high of 50 (Sept. 20). The season high count of waterfowl occurred on Sept. 26 with 92 individuals of 10 species recorded, including 3 species of Grebe on the lake.

Raptors, on the whole, were high in 2015 as several species, including Sharp-shinned and Cooper's Hawks, Northern Harrier, Merlin and American Kestrel had record years. While August was very slow for Harriers (just 8 detections), Kestrels and Sharp-shinned Hawks were particularly high and September saw an overall increase in number of most species (Kestrels excluded, though they still had the highest Sept. totals on record). Osprey had their poorest year on record with just 21 detections and Bald Eagles were about average.

Shorebird numbers are never high at TLBO as we lack the appropriate habitat(s), however in recent years a mud-bar had formed in the lagoon near the outflow of the

Homathko river and this occasionally held the odd shorebird. In 2015 this was covered in a layer of weedy vegetation and was not longer suitable.

Thanks to a serious grasshoppers infestation in the fields on the property we had record numbers of Herring and Ring-billed Gulls, almost all juveniles. At their peak in early August over 100 individuals would come to feed in the mornings. Another beneficiary was a pair of Sandhill Cranes that were sighted on the property several times in August and a couple times were joined by up to 3 others.

Woodpeckers saw a small decrease from 2014 and as a group were down 32% from the 2006-2014 average (306/466). The only species regularly detected that did not decrease was Pileated which was right on the 9 year average of 41 observations.

As a group, aerial insectivores (Swifts, Flycatchers and Swallows) were up in 2015. Perhaps the most notable was the record total of 99 detections of Black Swift that occurred mainly around the turn of the month (high count of 45 Sept. 2). This species is listed as endangered in Canada and is one we do not record most seasons. Swallow numbers were up from 2014, and on most days in early August flocks of predominantly Violet-green, Tree and/or Barn Swallows were sighted foraging over the lagoon/lake and passing overhead. Flycatchers as a whole had a record year with 271 total detections (avg. 201/yr) with Western Wood-pewee (41) and Alder Flycatcher (110) having record numbers of detections.

Horned Larks and American Pipits started frequenting the fields around the station in late August and their numbers peaked in mid- and early September respectively. Both these species breed in open alpine habitats and their season-to-season trends often mimic each other along with another breeder of similar elevations, the White-crowned Sparrow (Fig. 10). In

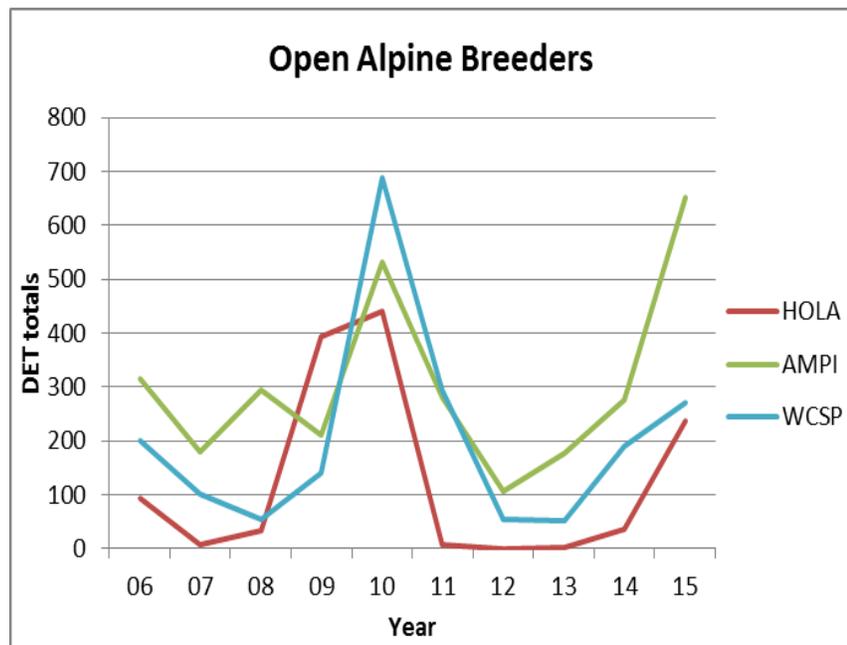


Figure 10 DET totals of three species of high elevation breeders

2015 all three saw an increase over 2014 and American Pipits had their highest year on record.

In contrast to their fellow cavity-nesters - the Woodpeckers – numbers of Chickadees and Red-breasted Nuthatch were up about a bit over last season with Red-breasted Nuthatch seeing the biggest jump (of ~30%).

Ruby-crowned Kinglets are prone to high fluctuation in numbers from year-to-year and this was a high year as this diminutive species was one of our most abundant throughout September (1411 season total). However, despite finishing with more than double the annual average their abundance did not quite reach the level of 2013 (1589 detections). Their close relatives, the Mountain Bluebirds had their second highest season on record with 108 detections; this was particularly encouraging after 4 seasons of very low numbers. Indeed it seemed a good season for virtually all the regularly occurring thrushes as the frugivorous ones, American Robin and Swainson's Thrush, also had bumper years with the latter setting a record high. The two other main frugivores at TLBO, Cedar Waxing and Western Tanager had differing success though as Waxwing numbers remained consistent with 2014 at slightly below average while Tanagers had their second best year with 101 detections (Avg. 69/yr).



Dusky Flycatcher

It was a low year for almost all the warblers with American Redstart, Orange-crowned and McGillivray's Warbler all at or close to half their 10 year average. Yellow Warblers seemed to have a poor year locally but bounced back somewhat with consistent numbers throughout September. The two species that did not fare poorly were Yellow-rumped Warblers which were very slightly above average and Common Yellowthroat which smashed the record of 661 detections set last year with a whopping 905 detections. This species seems to be doing well, at least in the subset of the population we sample, as each of the past 4 seasons this species has seen an increase.

Sparrows as a group saw a 10% decrease from last year and were slightly below average. The only species to do well it seemed were the previously mentioned White-crowned Sparrow, their cousins the Golden-crowned Sparrow and Spotted Towhees, the last of which had a record year. Meanwhile, Song Sparrows were pretty much bang on their average (626 detections) and Lincoln's, Chipping and Savannah Sparrows were about 10-15% below average. Dark-eyed Juncos were the one species to really slump in 2015 with only 159 detections, about half of their average.

Blackbirds were another group with high numbers this year as Western meadowlarks (a record 398 detections) in particular had a standout season. As with the Gulls, they were presumably attracted by the multitude of grasshoppers. Red-winged Blackbirds were pretty much right on their 9-year average with 226 detections and Rusty and Brewer's Blackbirds, though never recoded in high numbers (with the exception of 2006 when there were and incredible 418 detections of Brewer's), were well above average (excluding 2006 for Brewer's).

And finally, the nomadic finches were well up from last season although despite it being a low year. Purple Finch was the only species recorded in above averages numbers, well up from the previous two seasons. Red Crossbills were up substantially from 2014 but were still 18% below their 9-year average, while Pine Siskin and Evening Grosbeak were both well below half their average.

Species	Eted 2015	Avg. Eted 2006-2014	Difference from Avg.	% of Avg.
Western Meadowlark	398	109	289	364.8%
Horned Lark	237	68	169	346.8%
American Kestrel	212	73	139	288.7%
American Pipit	651	263	388	247.1%
American Wigeon	560	227	333	246.6%
Mountain Bluebird	108	48	60	226.6%
Ruby-crowned Kinglet	1411	625	786	225.7%
Warbling Vireo	885	463	422	191.3%
Clark's Nutcracker	413	216	197	191.3%
Common Yellowthroat	905	495	410	183.0%
Swainson's Thrush	453	273	180	166.0%
Western Tanager	101	69	32	146.4%
White-crowned Sparrow	271	197	74	137.6%
American Robin	756	654	102	115.6%
Black-capped Chickadee	613	567	46	108.2%
Mallard	456	436	20	104.5%
Yellow-rumped Warbler	2556	2476	80	103.2%
Red-winged Blackbird	226	227	-1	99.5%
Song Sparrow	626	631	-5	99.2%
Lincoln's Sparrow	493	547	-54	90.1%
Cedar Waxwing	768	858	-90	89.5%
Chipping Sparrow	235	264	-29	89.0%
Northern Waterthrush	118	134	-16	88.2%
Yellow Warbler	235	272	-37	86.5%
Red Crossbill	143	166	-23	86.1%
Savannah Sparrow	285	336	-51	84.9%
Wilson's Warbler	95	123	-28	77.4%
Hairy Woodpecker	61	100	-39	61.1%
American Redstart	106	205	-99	51.7%
Orange-crowned Warbler	116	235	-119	49.5%
Oregon Junco	159	326	-167	48.8%
Red-shafted Flicker	91	191	-100	47.8%
MacGillivray's Warbler	36	82	-46	43.8%
Red-breasted Nuthatch	58	155	-97	37.3%
Pine Siskin	533	1499	-966	35.6%
Evening Grosbeak	17	65	-48	26.1%
Canada Goose	53	533	-480	9.9%

Table 7 Increases and decreases in 2015 amongst the more abundant species at TLBO

11. Non-standard banding

As in the two preceding seasons, a few non-standard nets were used. These nets were to supplement our standard catch and the passerine nets (36 mm mesh) were kept closed on days when standard nets were busy so as to not interfere with catch rates of standard nets. A total of 82 birds were banded as non-standard (excluding Northern Saw-whet Owls) over the course of the season (Table 8) and we had 4 non-standard recaptures.

Species	Banded	Recaps
Ruby-crowned Kinglet	45	1
Yellow-rumped Warbler	12	
Golden-crowned Kinglet	5	
Northern Harrier	4	
Orange-crowned Warbler	3	
American Kestrel	3	
White-crowned Sparrow	2	
Warbling Vireo	1	
Yellow Warbler	1	
Savannah Sparrow	1	
Dusky Flycatcher	1	
Fox Sparrow	1	
Mountain Chickadee	1	
Townsend's Warbler	1	
Merlin	1	
Black-capped Chickadee	0	3
Totals	82	4

Table 8 Birds banded as non-standard



This second-year male was the first of four Northern Harriers banded in 2015

11.1 Passerine nets

Two locations for regular 36mm nets were used and retained the same locations and letter names as in the past two years; MXX and MXY. Neither net was operational in August with MXX first opened Sept. 10 followed by MXY on Sept. 12. Both nets saw little action as MXX was open for a total of only 24.1 hours and MXY just 11.5 hours. Despite their low net hours both nets were productive when open and each averaged slightly over 2 birds/hr (more than double any standard net).

Both nets retained their 2013 locations as each site remained productive and is located such that they have minimal impact on the catch rates of the standard nets. Each location will likely be productive in future years although both are in areas of regenerating aspen which will mean that eventually the vegetation will exceed optimum height and likely result in lower catch rate.

11.2 Large gauge nets

Two large gauge nets were used in 2015, retaining their locations from the end of 2014. These were located in the field to the SE of net 18, and south of Net 16 perpendicular to the Homathko River (for a map of these two nets, see Fig. 4, pg. 9). The former was erected August 18, the latter, Aug. 24. The field net (often referred to as the “Harrier net”) was opened most mornings from then on and ended up catching 4 Northern Harriers and having at least two more (that we know of) bounce out. Interestingly, three of the four of the Harriers we banded, plus one of those that bounced occurred during two consecutive days.

The day before opening the river net we watched a female Sharp-shinned Hawk cruise right through the net lane. However, this was not to be an auspicious omen as over the rest of the season it caught just one bird; a Swainson’s Thrush.

Both large gauge nets were typically opened after census though some slower mornings they were opened at regular net opening. In total the large gauge nets contributed 186 net hours (down from 708.7hrs in 2014).

While our third large gauge net was set up in September it was only used during our nighttime Owling effort.



Our “Harrier” net, well disguised with the mountain slope behind it

12. Owl banding

2015 did not prove to be a particularly good year for Northern saw-whet Owls as just 15 were banded despite an increase in effort over previous years. To compare, effort in 2013 and 2014 which were almost identical at just under %70 of that in 2015, and in those years we banded 7 and 19 (plus 1 recap) respectively. The net setup was the same as in those years, with 4 60mm “owl nets” setup in a formation resembling an "F" with the tape lure in the middle (Fig. 11). In addition we used one hawk net (100 mm mesh)

Date	Effort (hrs)	Owls Caught
21-Aug-15	2.3 (3 nets)	0
04-Sep-15	3	2
05-Sep-15	2	0
08-Sep-15	1.4	0
10-Sep-15	2.5	2
11-Sep-15	3	2
13-Sep-15	1.5	0
15-Sep-15	2.8	3
20-Sep-15	3	1
25-Sep-15	3	0
26-Sep-15	3	4
27-Sep-15	3	1

and nets 9 and 10 (36 mm mesh) set with the trammels closer together than for regular passerine banding in order to give them bigger pockets. The 60mm nets accounted for twelve of our owls, while one came from net 9 and two from the large gauge. Of the owl nets, ON1 was the most prolific, catching five, followed by ON4 which caught four.

In total, over the course of 12 nights 30.5hrs of owling was done for a total of 203 net hours (Table 9).

Table 9 Owls caught and effort per night

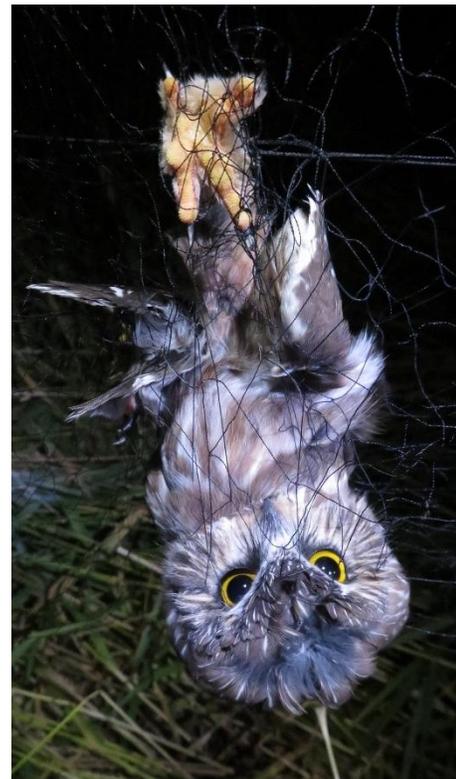
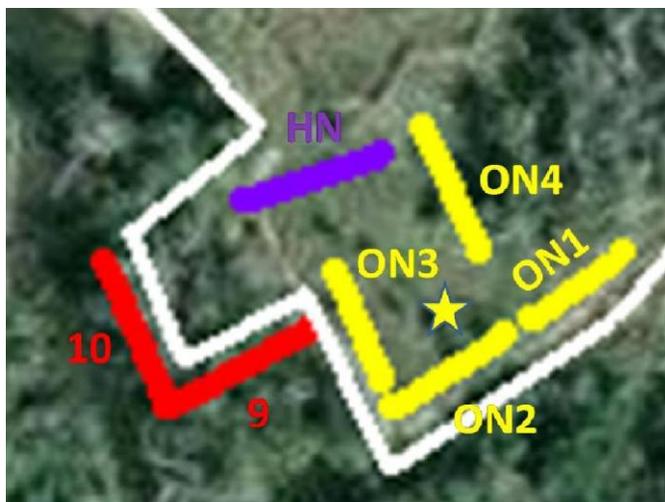


Figure 11 Map of net setup with star representing the tape lure

13. 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, (ie. frequent net checks, closing nets when a predator is seen nearby) the odd mishap is inevitable. After just a single fatality and seven injuries in 2014 we had an alarming jump of incidences this season. Half of these occurred in the first 11 days as we dealt with higher than normal volumes of birds. Of the total of 1723 birds banded, 313 recaptured and an unknown number of same-day recaptures we had four fatalities, a rate of under 1 in 500. Predation is often the most frequent cause of fatalities but accounted for just one on 2015. Of the other three fatalities, one was caused by a delayed net round and for the other two the exact causes are unknown although they were related to entanglement, exposure, extractor error or a combination thereof.

Of the 23 injuries we encountered, all were cases of wing strain. Although this can eventually be fatal to birds as it inhibits their ability to fly for a variable time period afterwards, we were encouraged in 2013 to recapture a Warbling Vireo that had been released a few days prior with wing strain. Upon recapture that bird appeared to be in normal condition and flew off fine after being processed.

14. Other Activities

As one would expect, after 9 seasons of operation there is little to change in terms of methods or protocol. For the first time we had some success with a Bal-cahtri trap that we deployed on several occasions from late August through September (we had no luck in 2013). The high numbers of American Kestrels and Merlins meant we were rarely lacking in targets and we ended up catching a Merlin (Aug. 27) and two Kestrels (Aug. 30), we also had a few more kestrels hit the trap without getting caught and a Red-tailed Hawk even took a swoop at the trap though it did not actually hit it.

Though not as successful as in 2014, we once again intermittently deployed one or two trail cameras around the net loop. One trail camera belonged to Assistant Bander Chris Chutter, the other to the NCC. While not contributing directly to the migration monitoring, it was very enlightening in terms of recording the mammals present on the property despite capturing less than in 2014.

14.1 BC Nature field trip

Every year the Federation of British Columbia Naturalists (BC Nature) organizes a multi-day field trip somewhere in the province and this year they chose the Tatlayoko Valley. The event consisted of field trips around the valley each day and presentations on various topics in the evening. The NCCs very own Peter Shaughnessy and Bander-in-charge Avery Bartels kicked off the event with talks about the work of NCC in the valley and some general information about the Bird Observatory and the importance of monitoring bird populations. Although the scheduled field trips started immediately after breakfast, on each day of the event a half dozen or so attendees would visit the station for an hour to see our operation in person. Many of the keener participants also came out for the two nights of owling we did that week.

15. Highlights

In terms of rarities, 2015 was not a standout year. However, despite not adding any new species to the station list the season had plenty of highlights (Table 10, pg. 30), most pertaining to interesting birds in the nets, in particular raptors.

On August 4th, a Greater Yellowlegs was found on census. This species is quite common through much of the province on migration but the lack of habitat on the property means we record few shorebirds, as a rule. This marked our 7th record for this species. Shortly after that, we received our first of what was to be many visits from a pair (and later up to 5 individuals) of Sandhill Cranes. As was the case with a few other species, they seemed to be attracted to the very healthy population of grasshoppers this year. A Turkey Vulture was sighted a few times from Aug. 10 – 13, presumably the same individual. Although there is no way to be sure, it seems likely that one found in early Sept. was a different individual. These represent the 2nd and 3rd station records.

While opening nets on August 15 we were surprised to hear a Veery persistently calling between nets 11 and 16. It was later heard calling on census, south of the net setup, but not relocated again after that. On Aug. 22 we were delighted to find a juv. Lewis' Woodpecker hawking grasshoppers from the fence line at the Eastern edge of the field in front of the banding lab. We were fortunate to see it almost daily up until Sept. 2, the day before a big rainstorm passed through.



Lewis' Woodpecker by *Sandy Mcruer*

Aug. 29 provided us with a first banding record, a Clay-colored Sparrow (2nd station record). This subtle beauty was pulled out of net 16 by TLBOs manager and long-time returning “volunteer” Andrew Harcome and Chris Chutter got the honours of banding it. On Sept. 7 an un-banded individual was seen briefly and photographed (poor record shots only) on opening net round near the Homathko River.

Late August and early September was perhaps the most exciting period of the season as we banded several raptors of four different species! For the first time ever we had some success with the Bal-chatri trap (after several unsuccessful attempts in 2013) and on Aug. 27 it had its first catch, a beautiful female Merlin of the coastal *suckleyi* subspecies. Within a half hour an American kestrel also hit the trap, though it didn't get caught. Three days later two Kestrels were caught by the “kestrel snag” beside the entrance road, both were determined to be hatch-year females. These captures were first banding records for both species. On the morning of Sept. 6 we caught two Northern Harriers on successive net rounds in the large gauge net at the western edge of the field. The first was a ghostly looking second-year male, while all subsequent captures

were of hatch-year males. One of these subsequent captures occurred the very next day and again a second hit the net on the next net round, this time though the latter got out before we could get to it. Strangely, on both days the birds hit at the same time! During this period of high raptor flow, we also caught two Sharp-shinned Hawks to add to the excitement.

September was rung in in style, as early on the morning of the first a flock of 17 Greater White-fronted Geese flew over heading south (3rd station record). Although there were regular reports in the first few seasons of operation, there had not been a definite report of Dusky Grouse at the station since 2010. This changed on Sept. 11 one was seen briefly, though well, in the open pine flats near the banding lab.

On Sept. 16 we had a visit from the Tatla Lake elementary school who were fortunate enough to witness the banding of both a Swamp Sparrow and a Red-breasted Sapsucker (7th banding records for both). Needless to say the latter was received with much more excitement. Another Red-breasted Sapsucker was banded on the 21st. Another highlight from the 16th was a lone Boreal Chickadee seen on the way back to the station after census. On Sept. 23 we were fortunate enough to catch one as well. Although this was the 9th banding record, 7 of those came in 2008.

As the season wound down it still held a couple surprises for us. On the 26th two Western Grebes were present at the north end of the lake, just the 2nd station record. And finally, on the penultimate day of the season the first bird that we banded was a Wilson's Snipe. These ungainly birds occasionally frequent the wet margins along the river and indeed this was no exception as it was extracted from net 9, about 2m from the shoreline.

And with that, we wrap up another excellent season at TLBO.

Gr. White-fronted Goose	Sept. 1: flock of 17 flying southward over station, 3 rd station record
Dusky Grouse	Sept. 11: Single along entrance road, first record since 2010
Western Grebe	Sept. 26: 2 individuals on lake, 2nd station record
Turkey Vulture	Aug.10-13, Sept. 8: Aug records same individual. 2-3rd station record
Northern Harrier	Sept 6,7 & 21:2-5th banding records (all non-standard)
Sandhill Crane	Aug. 8-25: regular, 2-5 individuals. Only 2 prev. station records
Greater Yellowlegs	Aug. 4: 7th station record
Wilson's Snipe	Set. 27: 2nd banding record
Lewis' Woodpecker	Aug. 22 - Sep. 2: 3rd station record, seen almost daily
Red-Breasted Sapsucker	Sept. 16 & 21: singles banded each day (7-8th banding records)
American Kestrel	Aug. 30 & Sept. 21: 1-3rd banding records (all non-standard)
Merlin	Aug. 27: 1st banding record (non-standard)
Boreal Chickadee	Sept. 23: 9th banding record (7 from 2008), one censused Sept. 16
Veery	Aug. 15: 2nd station record, heard calling along Homathko
Clay-colored Sparrow	Aug. 29: 1st banding record
Swamp Sparrow	Sept. 16: 7th banding record

Table 10 2015 highlights. First banding records in colour (non-standard= yellow, standard=orange)

2015 Highlights



Appendix 1 2015 standard banding totals in taxonomic order

Species	Banded	Recaps		
Sharp-shinned Hawk	7	0	Chipping Sparrow	4 1
Wilson's Snipe	1	0	Savannah Sparrow	27 0
Red-breasted Sapsucker	2	0	Vesper Sparrow	5 0
Red-naped Sapsucker	2	0	Fox Sparrow	5 2
Downy Woodpecker	2	1	Song Sparrow	118 62
Hairy Woodpecker	2	0	Lincoln's Sparrow	133 17
Western Wood-pewee	1	0	Swamp Sparrow	1 0
Pacific-slope Flycatcher	1	0	Oregon Junco	13 0
Willow Flycatcher	22	5	White-crowned Sparrow	36 2
Alder Flycatcher	14	12	Golden-crowned Sparrow	14 1
Traill's Flycatcher	3	0	Western Tanager	21 4
Least Flycatcher	2	0	Lazuli Bunting	1 0
Hammond's Flycatcher	13	0	Red-winged Blackbird	1 0
Dusky Flycatcher	10	0	Purple Finch	9 0
Cassin's Vireo	1	0	Pine Siskin	4 0
Warbling Vireo	195	12		
Red-eyed Vireo	19	6	TOTAL	1641 317
Mountain Chickadee	3	0		
Black-capped Chickadee	21	15		
Boreal Chickadee	1	0		
Red-breasted Nuthatch	3	0		
Brown Creeper	2	0		
Pacific Wren	1	0		
Golden-crowned Kinglet	17	0		
Ruby-crowned Kinglet	186	8		
Hermit Thrush	10	0		
Swainson's Thrush	204	52		
American Robin	35	0		
Cedar Waxwing	11	0		
Northern Waterthrush	41	12		
Orange-crowned Warbler	49	5		
MacGillivray's Warbler	13	4		
Common Yellowthroat	166	67		
American Redstart	29	10		
Yellow Warbler	63	15		
Yellow-rumped Warbler	38	0		
Townsend's Warbler	2	0		
Wilson's Warbler	46	4		
Spotted Towhee	10	0		
Clay-colored Sparrow	1	0		

Appendix 2: TLBO 2015 season DET and banding list in taxonomical order

Species	2015 DET	Avg. DET 2006-2014	Banded 2015	Avg. banded 2006-2014
Gr. White-fronted Goose	17	1.9	0	0
Canada Goose	53	484.9	0	0
Snow Goose	0	3	0	0
Wood Duck	17	6.2	0	0
Mallard	456	438.3	0	0
Gadwall	0	3.8	0	0
Northern Pintail	93	21.6	0	0
American Wigeon	560	260.4	0	0
Eurasian Wigeon	0	0.1	0	0
Blue-winged Teal	7	3.8	0	0
Cinnamon Teal	0	0.7	0	0
Northern Shoveler	68	22.6	0	0
Green-winged Teal	91	61.1	0	0
Redhead	0	0.1	0	0
Ring-necked Duck	129	81.8	0	0
Greater Scaup	0	0.1	0	0
Lesser Scaup	0	4.2	0	0
Surf Scoter	0	0.2	0	0
Barrow's Goldeneye	4	6.8	0	0
Common Goldeneye	4	5.5	0	0
Bufflehead	23	4.3	0	0
Hooded Merganser	20	11.5	0	0
Common Merganser	8	35.1	0	0
Red-breasted Merganser	0	0.4	0	0
Dusky Grouse	1	7.4	0	0
Ruffed Grouse	195	148.6	0	0
Common Loon	49	42.4	0	0
Horned Grebe	2	2.2	0	0
Red-necked Grebe	24	7.8	0	0
Western Grebe	2	0.3	0	0
Pied-billed Grebe	31	17.8	0	0
American Bittern	0	0.5	0	0
Great Blue Heron	31	22.4	0	0

Turkey Vulture	4	0.5	0	0
Northern Harrier	64	32.8	0	0.1
Osprey	21	46.6	0	0
Sharp-shinned Hawk	110	64	7	4.3
Cooper's Hawk	20	10	0	0
Northern Goshawk	4	4.7	0	0
Red-tailed Hawk	11	9.1	0	0
Golden Eagle	0	0.2	0	0
Bald Eagle	31	23.3	0	0
American Coot	0	0.2	0	0
Sandhill Crane	24	2.7	0	0
Virginia Rail	0	1.3	0	0
Sora	12	6.4	0	0
Killdeer	2	5.4	0	0
Greater Yellowlegs	1	0.7	0	0
Lesser Yellowlegs	0	0.1	0	0
Solitary Sandpiper	5	1.9	0	0
Spotted Sandpiper	44	59.1	0	0
Long-billed Curlew	0	0.1	0	0
Western Sandpiper	0	0.3	0	0
Least Sandpiper	2	2.6	0	0
Long-billed Dowitcher	0	0.1	0	0
Wilson's Snipe	11	7.3	1	0.1
Wilson's Phalarope	0	0.5	0	0
Red-necked Phalarope	0	1.1	0	0
Bonaparte's Gull	0	1.8	0	0
Mew Gull	0	0.2	0	0
Ring-billed Gull	68	10.2	0	0
California Gull	0	5	0	0
Herring Gull	315	47.4	0	0
Common Tern	0	0.3	0	0
Long-tailed Jaeger	0	0.3	0	0
Mourning Dove	0	1.6	0	0
Eurasian collared-Dove	3	1.7	0	0
Great Horned Owl	3	2.3	0	0
Barred Owl	0	0.2	0	0
Northern Saw-whet Owl	1	3.1	0	0

Northern Pygmy-Owl	0	2.3	0	0
Black Swift	99	21.2	0	0
Vaux's Swift	2	1.3	0	0
Calliope Hummingbird	0	1.5	0	0
Rufous Hummingbird	2	21.9	0	0.1
Belted Kingfisher	64	75.5	0	0.2
Lewis' Woodpecker	11	1.4	0	0
Red-breasted Sapsucker	5	3.5	2	0.8
Red-naped Sapsucker	37	47	2	2.6
Downy Woodpecker	70	79	2	3.8
Hairy Woodpecker	61	95.9	2	4.9
Three-toed Woodpecker	1	2.1	0	0
Black-backed Woodpecker	0	1.4	0	0
Red-shafted Flicker	91	180.6	0	1.6
Pileated Woodpecker	41	41.3	0	0
Peregrine Falcon	7	1.7	0	0
Prairie Falcon	0	0.1	0	0
Gyrfalcon	0	0.2	0	0
American Kestrel	212	87.3	0	0
Merlin	46	31.7	0	0
Olive-sided Flycatcher	20	13.5	0	0.7
Western Wood-pewee	41	21.6	1	1.9
Pacific-slope Flycatcher	1	4	1	3.3
Yellow-bellied Flycatcher	0	0.1	0	0.1
Willow Flycatcher	26	13.5	22	9.6
Alder Flycatcher	110	62.1	14	15.1
Traill's Flycatcher	4	9.6	3	5.4
Least Flycatcher	6	15	2	4.2
Hammond's Flycatcher	22	16.7	13	8.9
Dusky Flycatcher	46	58.8	10	11.3
Say's Phoebe	0	0.1	0	0
Eastern Kingbird	0	0.8	0	0
Northern Shrike	1	0.8	0	0
Cassin's Vireo	16	18.3	1	1.6
Warbling Vireo	885	504.8	195	135.6
Red-eyed Vireo	52	60.6	19	9.4
Steller's Jay	11	9.6	0	0.3

Blue Jay	0	0.2	0	0
Clark's Nutcracker	413	235.6	0	0
Gray Jay	4	4.9	0	0
Common Raven	54	90	0	0
American Crow	1928	1315.2	0	0.1
Horned Lark	237	85.2	0	0
Tree Swallow	34	16.1	0	0
Violet-green Swallow	67	65.1	0	0
Bank Swallow	0	3.4	0	0
N. Rough-winged Swallow	10	31.7	0	0
Cliff Swallow	1	2.1	0	0
Barn Swallow	58	59.9	0	0
Mountain Chickadee	84	85.2	3	2.9
Black-capped Chickadee	613	571.4	21	23.2
Chestnut-backed Chickadee	0	0.8	0	0
Boreal Chickadee	2	2.5	1	0.9
Red-breasted Nuthatch	58	145.6	3	6
Brown Creeper	3	3.7	2	1.4
House Wren	0	0.1	0	0
Pacific Wren	12	6.9	1	1.1
Marsh Wren	3	5.1	0	0.8
Golden-crowned Kinglet	66	64.5	17	9.4
Ruby-crowned Kinglet	1411	703.8	186	112.1
Townsend's Solitaire	6	7.7	0	0.1
Mountain Bluebird	108	53.7	0	0
Western Bluebird	0	0.3	0	0
Veery	1	0.2	0	0.1
Hermit Thrush	16	19.2	10	11.2
Swainson's Thrush	453	290.9	204	111
American Robin	756	664.2	35	10.8
Varied Thrush	11	28	0	1.8
Gray Catbird	0	1.4	0	0.2
European Starling	1	55.1	0	0
American Pipit	651	302.2	0	0
Bohemian Waxwing	1	6.2	0	0
Cedar Waxwing	768	849.1	11	17.6
Lapland Longspur	0	0.5	0	0

Northern Waterthrush	118	132.2	41	45.3
Black-and-white Warbler	0	0.3	0	0.1
Orange-crowned Warbler	116	222.7	49	91.6
Tennessee Warbler	0	0.8	0	0.3
Nashville Warbler	0	1.6	0	0.8
MacGillivray's Warbler	36	77.6	13	35.7
Common Yellowthroat	905	535.6	166	126.9
American Redstart	106	195.2	29	54.4
Magnolia Warbler	0	0.8	0	0.6
Yellow Warbler	235	268.1	63	85.7
Blackpoll Warbler	0	0.5	0	0.6
Western Palm Warbler	0	0.1	0	0.1
Yellow-rumped Warbler	2556	2484.4	38	99.4
Black-throated Gray Warbler	0	0.1	0	0.1
Townsend's Warbler	8	19.9	2	4.2
Wilson's Warbler	95	120	46	61.9
Spotted Towhee	73	42.4	10	1.2
Clay-colored Sparrow	2	0.5	1	0
Chipping Sparrow	235	261.1	4	2.3
Savannah Sparrow	285	330.7	27	20.9
Vesper Sparrow	34	53	5	2.8
Fox Sparrow	15	13.3	5	5
Song Sparrow	626	630.6	118	136.3
Lincoln's Sparrow	493	541.5	133	197.1
Swamp Sparrow	1	0.9	1	0.7
Oregon Junco	159	309.4	13	36.2
White-crowned Sparrow	271	204.4	36	34.1
Golden-crowned Sparrow	38	20.8	14	4.1
White-throated Sparrow	3	6.3	0	1.6
Western Tanager	101	72.2	21	5
Lazuli Bunting	4	16.9	1	6.3
Indigo Bunting	0	0.1	0	0.1
Brewer's Blackbird	15	49	0	0
Rusty Blackbird	11	4.3	0	0
Red-winged Blackbird	226	227	1	3.1
Yellow-headed Blackbird	0	0.7	0	0
Brown-headed Cowbird	21	10.1	0	0.3

Western Meadowlark	398	138	0	0
Bullock's Oriole	0	0.3	0	0
Pine Grosbeak	0	5.2	0	0
Evening Grosbeak	17	60.4	0	0
Purple Finch	84	52.1	9	4.4
Cassin's Finch	0	0.5	0	0
Red Crossbill	143	163.7	0	0.2
White-winged Crossbill	2	63.5	0	0.2
Pine Siskin	533	1402.3	4	17.2
TOTAL	20 890	17 913	1641	1621