

## Teslin Lake Bird Observatory Final Report 2009



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The 2009 operation of the Teslin Lake Bird Observatory was made possible due to support and financial contributions from the following organizations.



Yukon Fish and Wildlife  
Enhancement Trust



Environment  
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**EDI ENVIRONMENTAL DYNAMICS INC.**  
*Natural Resource Consultants*

Cover Photos (all taken by Jukka Jantunen):  
First Row (L to R): Alder Flycatcher, Boreal Chickadee  
Second Row (L to R): Varied Thrush, MacGillivray's Warbler  
Third Row (L to R): American Redstart, Brewer's Sparrow

## EXECUTIVE SUMMARY

The Teslin Lake Bird Observatory completed its fifth consecutive year of operation, including the second full scale operation of the fall migration season. The observatory operated for 58 days between July 30 and October 4. A total of 3,956 birds on 53 species were banded and 139 species were encountered. Due to the implementation of a field protocol, the observatory collected standardized migration monitoring data through the use of a number of methods including mist netting/banding, set location point counts, visual migration counts and incidental observations. The observatory was successful in monitoring the fall migration of numerous bird species including waterbirds, waterfowl, shorebirds, raptors and songbirds. Relatively common Yukon bird species including Alder Flycatcher, Yellow Warbler, Yellow-rumped Warbler and Dark-eyed Junco were once again banded in high numbers. Over the long term, it is envisioned that population trend analysis will be completed for such species. Operation of the observatory continues to collect valuable data on rare and uncommon Yukon bird species including Parasitic Jaeger, Yellow-bellied Flycatcher, Townsend's Warbler, American Redstart and MacGillivray's Warbler. The geographic location of the observatory allows for species to be monitored which are not well monitored at more southern bird observatories. The irruptions of Boreal Chickadee observed during the 2008 and 2009 fall seasons are an excellent example of the observatory's ability to monitor a diverse group of bird species. The observatory also continues to participate in add on studies including a color banding/feather collection project on Rusty Blackbird, a COSEWIC species of Special Concern. The educational capacity of the observatory is very important and the 2009 season involved a record number of visitors to the study site including three school groups.

## ACKNOWLEDGEMENTS

First and foremost, the author would like to thank Jukka Jantunen who was the primary Bander In Charge during the 2009 season. Jukka's excellent bird identification skills undoubtedly increased the quality of the data collected at the observatory during 2008. In addition, the majority of the high quality photos included in this report were taken by Jukka. Other people who assisted with the Bander In Charge duties included Ted Murphy-Kelly, Jillian Johnston, Sergio Marrocoli (long term volunteer) and Tami Hamilton (Canadian Wildlife Service / volunteer) also assisted extensively with day to day operation of the observatory including a very large proportion of the point counts and data scribing. Data entry, management and analysis were completed by Ben Schonewille. Report preparation was carried out by Ben Schonewille with editorial assistance from Jukka Jantunen and Ted Murphy-Kelly. Also not unnoticed are the other volunteers who visited this year and helped out with day to day operations at the observatory. Also, the long list of funders to this project deserve a big thank you for continuing to support this project and allowing us to begin to strive towards maximizing the monitoring taking place. To the staff of Environment Yukon, particularly Cameron Eckert, thank you for providing logistical help and sharing a wealth of bird knowledge. Also thank you to the staff of the Canadian Wildlife Service particularly Pam Sinclair.

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## 1.0 Introduction

The Teslin Lake Bird Observatory operated only during the fall migration season in 2009. The observatory completed its fifth year of operation thanks to financial support from several government and non-government agencies including Environment Yukon, Teslin Renewable Resources Council, Yukon Fish and Wildlife Enhancement Trust Fund, Yukon Bird Club, Ducks Unlimited Canada, Lotteries Yukon, EDI Environmental Dynamics Inc., Yukon Bird Club and the Shell Environment Fund.

The goals of the Teslin Lake Bird Observatory are to:

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

The observatory serves as a method of carrying out research on birds which is shared through an international database. This is due to the possibility of a banded bird being recaptured across international borders. Many of the birds banded at Teslin Lake are highly migratory, spending the winter months as far south as Central and South America. In addition to the potential knowledge regarding band recoveries, the observatory also serves to continue gathering baseline data of birds (and their migration) in the Teslin region, and the Yukon as a whole. Due to the large landmass of the territory, and the relatively few advanced birders in the Yukon, there is still a great deal to be learnt regarding the bird life of the Yukon. The observatory serves as a highly valuable research and monitoring project to better understand the distribution of many of the Yukon's bird species, many of which are considered uncommon or rare.

The observatory also plays a role in education as a place where the public, volunteers and students can take part in a unique, community based research project. Across the Yukon (and the world), there are numerous people who have an interest in birds; however, many find it a daunting task to learn the various species. For such people, a visit to the observatory can be extremely rewarding as they often have the opportunity to view a wide variety of bird species up close. Many of these species are very difficult to observe naturally; however, through the use of mist nets, the highly trained individuals working at the observatory's have the ability to identify these species.

## 2.0 Methods

The methods for the operation of the bird observatory follow the Teslin Lake Bird Observatory Field Protocol and Manual (Schonewille 2009). A brief summary of the field protocol is described in the following section; however, for a detailed description refer to the aforementioned document.

The primary method utilized to monitor the movement of birds through the study site is the use of mist nets for the purpose of capturing and banding birds. The observatory operates with 23 standard mist nets (Figure 1). All nets are 30 mm mesh and 12 m in length, with the exception of nets 21, 24 and R which are 18 m in length. The standard mist netting effort begins at official sunrise and continues for 6 hours. The full mist netting effort is achieved only on days when adequate personnel are present onsite and weather conditions are favorable. If this is not possible, the effort is reduced in the number of nets operated rather than reducing the duration of effort.

To supplement the banding data, visual migration counts are conducted on all days of operation. All watches are conducted from a set location (Figure 1) and involve scanning the sky to observe and count all birds flying over the site. The protocol states that as a minimum, 10 minutes of watch shall be conducted per hour (6 hours) following by a 1 hour watch at the end of the mist netting period. These values are considered a minimum and on most days of operation, the visual count effort is substantially more. Where the visual migration counts aim to monitor diurnal migrating species such as raptors, other nocturnal migrants such as most warblers, sparrows and thrush can be difficult to identify during visual counts. For this reason, 10 point count stations (Figure 1) were established within the count area and sampled each day in a randomized order (5 minute counts). Although a full census is not possible due to personnel constraints, investigations were also completed to carry out a small number of short census routes within the count area. Incidental observations are also collected on an opportunistic manner while conducting other tasks at the observatory.

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

### 2.1 Study Site

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

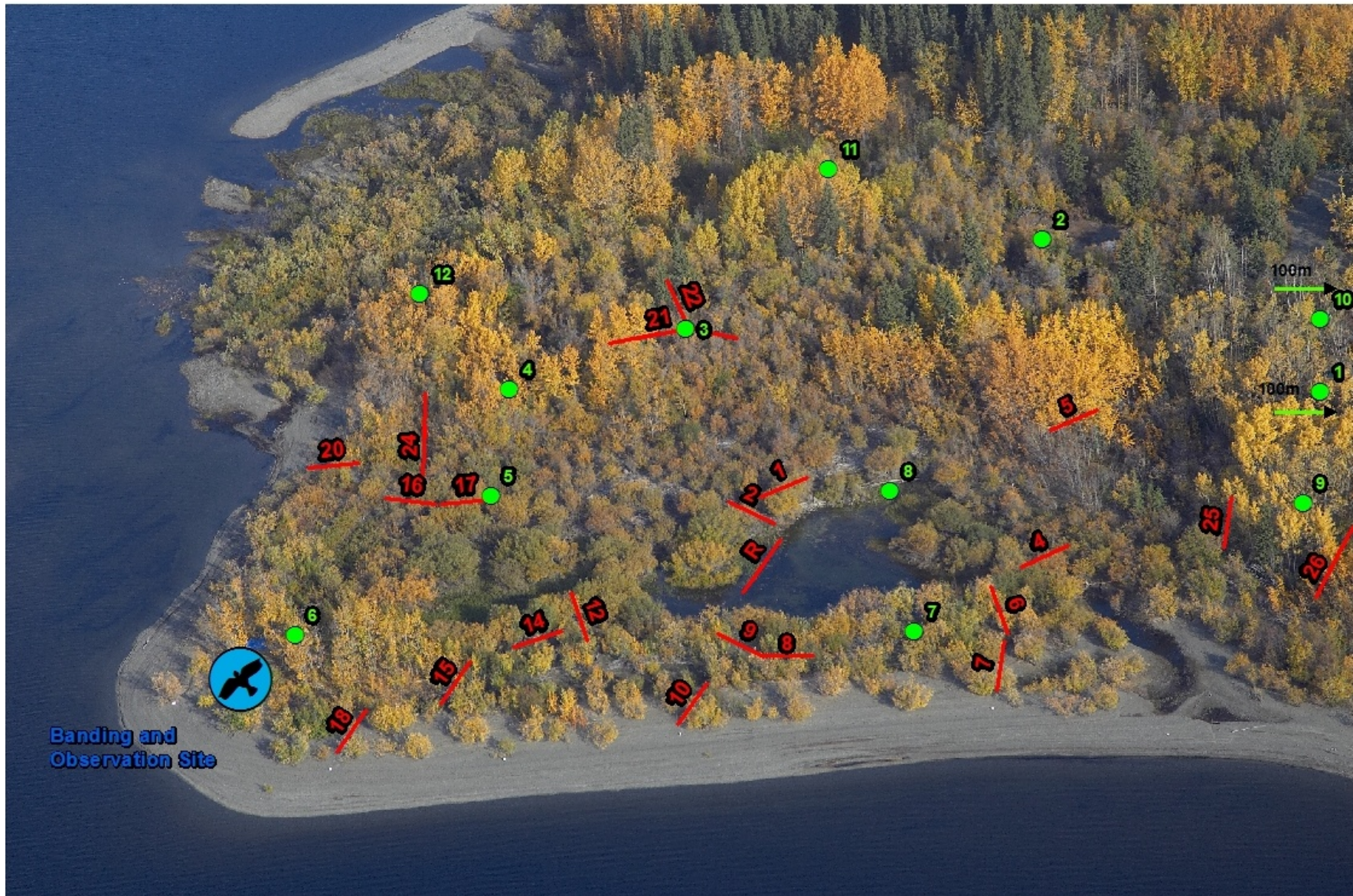


Figure 1. Overview of study area.



### 3.0 Results & Discussion

A total of 3,956 birds of 53 species were banded during 2009 as summarized in Table 1 – 2. The all time total number of birds banded at Teslin Lake is now 10,886 birds of 80 species/forms and 165 species/forms have been observed (Appendix 1). Each component of the 2009 data is summarized and presented in the following subsections; however, a detailed account of the 2009 estimated total data is shown in Appendix 2.

Note that unless otherwise stated, the results presented in this report combine both standard and non-standardized data. The standardized data shall be utilized over the long term for the purposes of conducting species trend analysis.

**Table 1.** Summary statistics of the 2009 fall season.

Period	Start Date	End Date	# of Days Operated	Species Banded	Birds Banded	Net Hours	Birds Banded / 100 Net Hrs	Migration Watching Effort (hrs)	Species Observed
Set Up	30 Jul	-	1	15	34	59	57.63	0	-
Week 1	1 Aug	7 Aug	7	31	274	677	40.47	10.1	52
Week 2	8 Aug	14 Aug	7	32	497	569	87.35	10.4	84
Week 3	15 Aug	21 Aug	6	30	307	493	62.27	12.4	83
Week 4	22 Aug	28 Aug	6	27	676	623	108.51	8.7	88
Week 5	29 Aug	4 Sep	6	33	842	856	98.36	10.0	87
Week 6	5 Sep	11 Sep	6	27	473	683	59.25	14.8	89
Week 7	12 Sep	18 Sep	6	24	319	867	36.79	14.2	75
Week 8	19 Sep	25 Sep	6	19	321	814	39.43	15.8	76
Week 9	26 Sep	4 Oct	8	22	247	806	30.65	31.8	78
TOTAL	30 Jul	4 Oct	58	53	3956	6,445	61.38	128.2	139

Table 2. Birds banded during the fall of 2009.

Common Name	Latin Name	Birds Banded		Common Name	Latin Name	Birds Banded	
		#	/ 100 net Hrs			#	/ 100 net Hrs
Sharp-shinned Hawk	<i>Accipiter striatus</i>	23	0.357	American Pipit	<i>Anthus rubescens</i>	3	0.047
Solitary Sandpiper	<i>Tringa solitaria</i>	5	0.078	Tennessee Warbler	<i>Vermivora peregrine</i>	9	0.140
Wilson's Snipe	<i>Gallinago delicata</i>	1	0.016	Orange-crowned Warbler	<i>Vermivora celata</i>	180	2.793
Belted Kingfisher	<i>Ceryle alcyon</i>	6	0.093	Yellow Warbler	<i>Dendroica petechia</i>	325	5.043
Downy Woodpecker	<i>Picoides pubescens</i>	1	0.016	Yellow-rumped Warbler	<i>Dendroica coronata</i>	284	4.407
Western Wood-Pewee	<i>Contopus sordidulus</i>	6	0.093	Townsend's Warbler	<i>Dendroica townsendii</i>	8	0.124
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	8	0.124	Blackpoll Warbler	<i>Dendroica striata</i>	107	1.660
Alder Flycatcher	<i>Empidonax alnorum</i>	631	9.791	American Redstart	<i>Setophaga ruticilla</i>	43	0.667
Least Flycatcher	<i>Empidonax minimus</i>	1	0.016	Northern Waterthrush	<i>Seiurus noveboracensis</i>	53	0.822
Hammond's Flycatcher	<i>Empidonax hammondii</i>	12	0.186	MacGillivray's Warbler	<i>Oporornis tolmiei</i>	3	0.047
Dusky Flycatcher	<i>Empidonax oberholseri</i>	6	0.093	Common Yellowthroat	<i>Geothlypis trichas</i>	113	1.753
Say's Phoebe	<i>Sayornis saya</i>	1	0.016	Wilson's Warbler	<i>Wilsonia pusilla</i>	161	2.498
Warbling Vireo	<i>Vireo gilvus</i>	10	0.155	Western Tanager	<i>Piranga ludoviciana</i>	1	0.016
Gray Jay	<i>Perisoreus canadensis</i>	5	0.078	American Tree Sparrow	<i>Spizella arborea</i>	54	0.838
Common Raven	<i>Corvus corax</i>	1	0.016	Chipping Sparrow	<i>Spizella passerine</i>	24	0.372
Barn Swallow	<i>Hirundo rustica</i>	1	0.016	Brewer's Sparrow	<i>Spizella breweri</i>	1	0.016
Black-capped Chickadee	<i>Poecile atricapillus</i>	26	0.403	Savannah Sparrow	<i>Passerculus sandwichensis</i>	18	0.279
Mountain Chickadee	<i>Poecile gambeli</i>	11	0.171	Fox Sparrow	<i>Passerella iliaca</i>	28	0.434
Boreal Chickadee	<i>Poecile hudsonicus</i>	831	12.894	Lincoln's Sparrow	<i>Melospiza lincolni</i>	16	0.248
Red-breasted Nuthatch	<i>Sitta canadensis</i>	2	0.031	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	33	0.512
Golden-crowned Kinglet	<i>Regulus satrapa</i>	10	0.155	Dark-eyed Junco	<i>Junco hyemalis</i>	582	9.030
Ruby-crowned Kinglet	<i>Regulus calendula</i>	175	2.715	Rusty Blackbird	<i>Euphagus carolinus</i>	30	0.465
Townsend's Solitaire	<i>Myadestes townsendi</i>	1	0.016	White-winged Crossbill	<i>Loxia leucoptera</i>	2	0.031
Gray-cheeked Thrush	<i>Catharus minimus</i>	2	0.031	Common Redpoll	<i>Carduelis flammea</i>	6	0.093
Swainson's Thrush	<i>Catharus ustulatus</i>	49	0.760	Pine Siskin	<i>Carduelis pinus</i>	1	0.016
Hermit Thrush	<i>Catharus guttatus</i>	7	0.109	TOTAL INDIVIDUALS BANDED		3956	61.38
American Robin	<i>Turdus migratorius</i>	27	0.419	TOTAL SPECIES BANDED		53	-
Varied Thrush	<i>Isoreus naevius</i>	12	0.186				

Many of the species banded in high numbers during 2009 were also banded in relatively high numbers during 2008 (Table 3). One exception was Yellow-rumped Warbler which was banded in much higher numbers during 2009 than 2008. The banding data collected during 2009 shows a very high proportion of hatch year (HY) birds banded. Many species show a similar proportion of hatch year birds between 2009 and 2008; however, additional operation of the observatory will allow for further comparisons of age proportions over time.

**Table 3.** Top 25 species banded by age ratio during the fall of 2009 and 2008.

Species	2009			2008		
	Fall Season Rank	# Banded	% HY Banded	Fall Season Rank	# Banded	% HY Banded
Boreal Chickadee	1	831	99	4	138	100
Alder Flycatcher	2	631	75	1	811	80
Dark-eyed Junco	3	582	81	3	182	51
Yellow Warbler	4	325	72	2	486	61
Yellow-rumped Warbler	5	284	86	9	49	80
Orange-crowned Warbler	6	180	81	6	101	87
Ruby-crowned Kinglet	7	175	97	12	29	97
Wilson's Warbler	8	151	91	5	113	81
Common Yellowthroat	9	113	88	7	66	68
Blackpoll Warbler	10	107	90	10	47	96
American Tree Sparrow	11	54	94	T – 13	19	63
Northern Waterthrush	12	53	98	11	46	84
Swainson's Thrush	13	49	94	T – 13	19	100
American Redstart	14	43	79	T – 17	10	60
White-crowned Sparrow	15	33	94	T – 24	1	100
Rusty Blackbird	16	30	100	T – 16	11	100
Fox Sparrow	17	28	93	T – 16	11	82
American Robin	18	27	96	NA	0	NA
Black-capped Chickadee	19	26	100	8	57	98
Chipping Sparrow	20	24	100	T – 20	6	83
Sharp-shinned Hawk	21	23	96	T – 17	10	90
Savannah Sparrow	22	18	83	15	14	100
Lincoln's Sparrow	23	16	94	21	5	100
Hammond's Flycatcher	T – 24	12	100	T – 20	6	100
Varied Thrush	T – 24	12	100	T – 22	3	66

A substantial peak in the number of birds banded was noted during the final 2 weeks of August (Figure 2). A wide diversity of species were banded during this time; however, high numbers of Alder Flycatcher and Yellow Warbler were a driving factor in this spike. The first two weeks of September also saw relatively high numbers of birds banded. This time period constituted a transition between early and late season migrants; however, high numbers of Boreal Chickadee banded during this period resulted in a prolonged period of high capture rates.

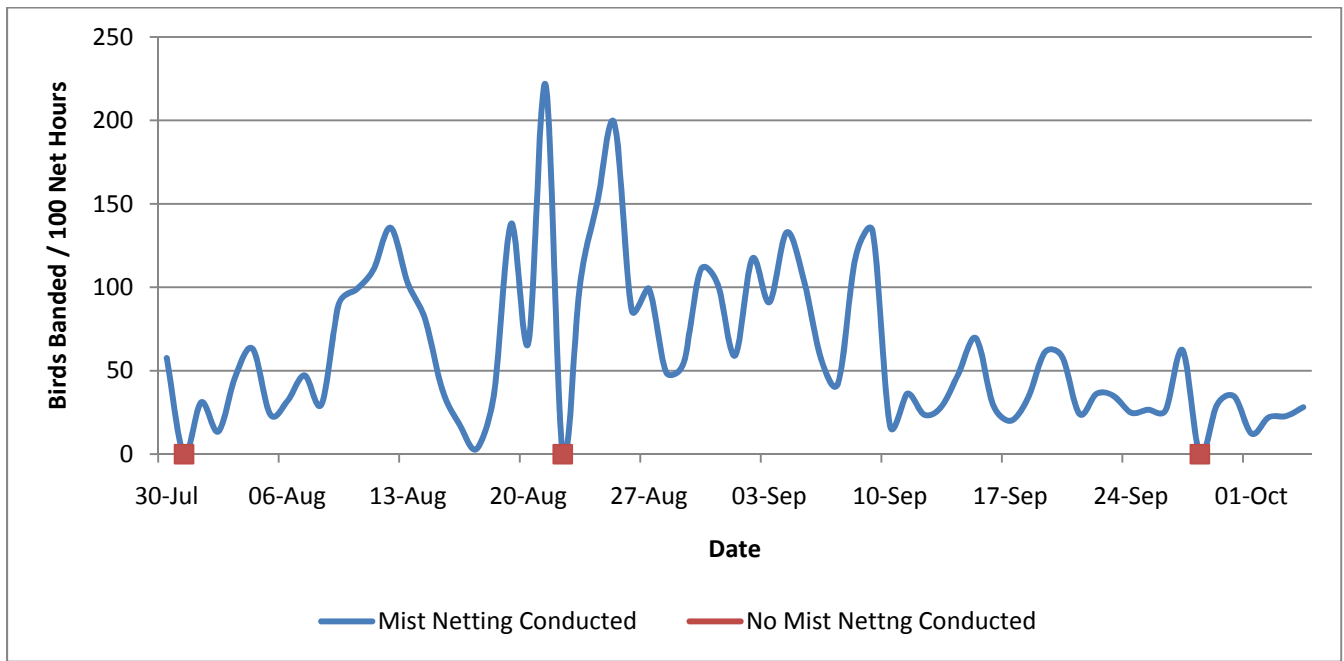


Figure 2. Summary of birds banded per 100 net hours during the fall of 2009.

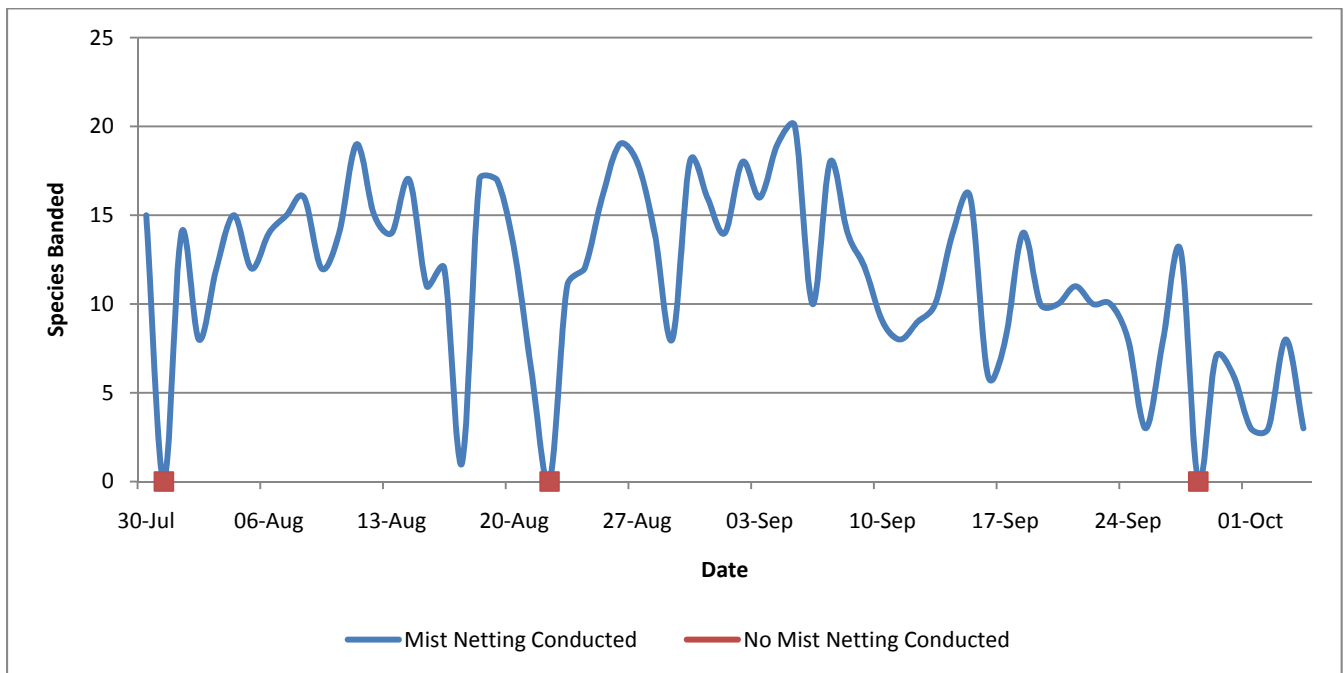


Figure 3. Summary of species banded during the fall of 2009.

The productivity of the standard mist nets suggest that the many birds are funneled along the lakeshore and the optimal vegetation height in this area led to the highest capture rates in mist nets 7, 10, 18 and 20 (Figure 4). Note that a portion of the mist nets placed away from the lakeshore and in taller vegetation (nets 5, 21 – 26) may lack high capture rates; however, these nets capture species not typically seen on the lakeshore such as Swainson’s Thrush and Varied Thrush.

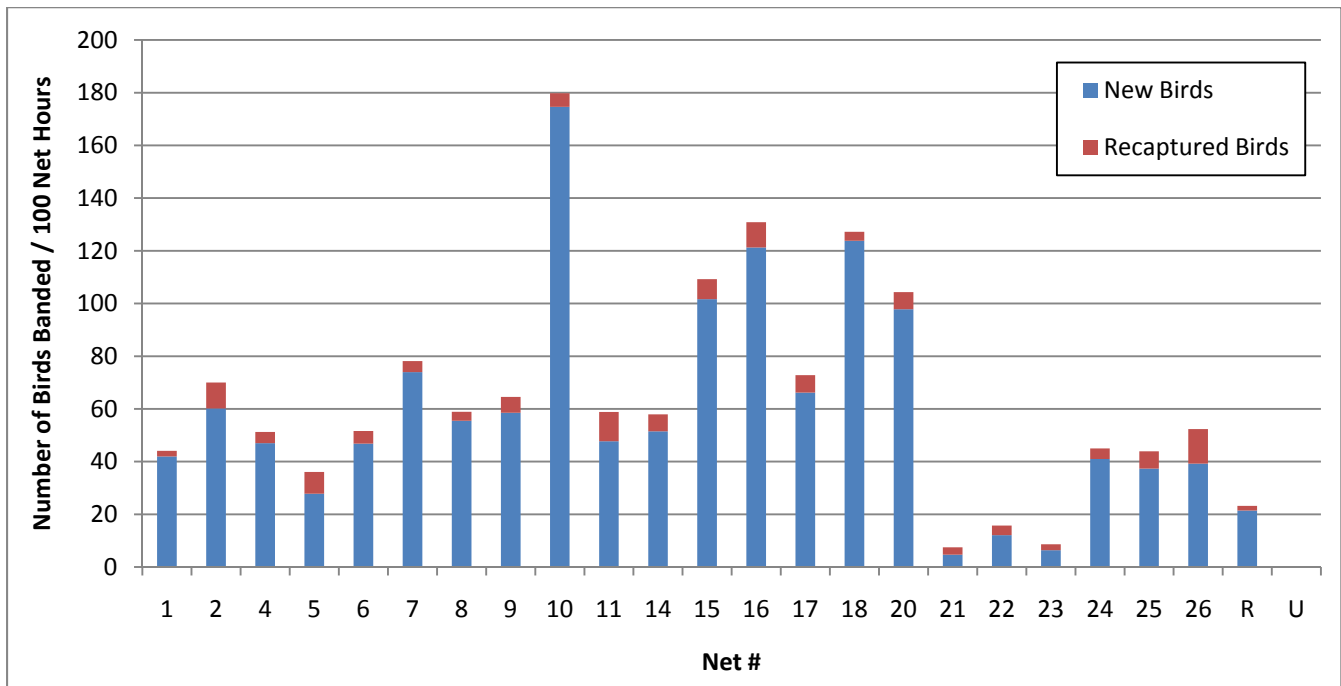


Figure 4. Number of birds banded per mist net during the fall of 2009.

### 3.1 Migration Synopsis

Using the various observation methods at the observatory, it is possible to obtain a detailed migration synopsis for a number of species observed in large enough numbers. This is accomplished by separating the various observation methods described below. Note that the daily observer effort (for the primary observer) and the daily visual counting effort are also shown on each figure.

- Banded
  - New birds banded on each day
- Recaptures
  - Previously banded birds captured (not including birds from the same day)
- Visual Migrants
  - Birds seen passing through the count area (not including birds which linger in the area)
  - Includes individuals observed inside and outside the visual migration watches
- Point Counts
  - Birds observed/heard on the point counts only
- Other Observations
  - All birds observed outside of the above categories

Note that the migration synopsis figures combine all standard / non standard data in each figure. For a detailed breakdown of standard and non standard observation data, refer to Appendix 3. An example migration synopsis figure is shown for Boreal Chickadee (Figure 5).

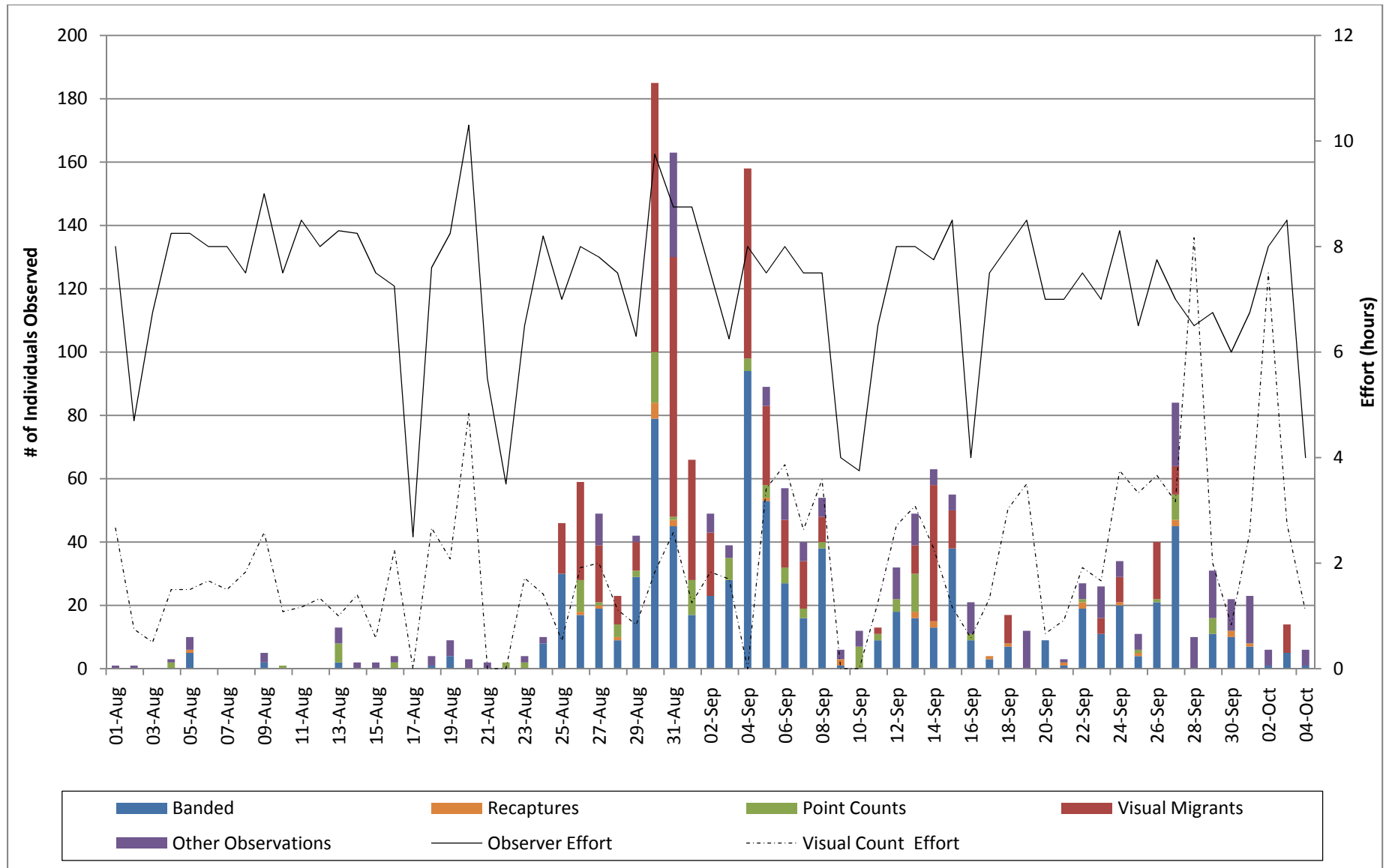


Figure 5. Boreal Chickadee migration synopsis.

Additional migration synopsis figures are presented in Appendix 4 for the following species;

- Red-throated Loon
- Pacific Loon
- Common Loon
- Red-necked Grebe
- Greater White-fronted Goose
- Northern Pintail
- Osprey
- Northern Harrier
- Sharp-shinned Hawk
- Red-tailed Hawk
- Golden Eagle
- American Kestrel
- Bonaparte’s Gull
- Herring Gull
- Thayer’s Gull
- Arctic Tern
- Alder Flycatcher
- Bank Swallow
- Barn Swallow
- Black-capped Chickadee
- Boreal Chickadee
- Ruby-crowned Kinglet
- Swainson’s Thrush
- American Robin
- Varied Thrush
- American Pipit
- Bohemian Waxwing
- Orange-crowned Warbler
- Yellow Warbler
- Yellow-rumped Warbler
- Blackpoll Warbler
- American Redstart
- Northern Waterthrush
- Common Yellowthroat
- Wilson’s Warbler
- American Tree Sparrow
- Chipping Sparrow
- Savannah Sparrow
- Dark-eyed Junco
- Rusty Blackbird
- White-winged Crossbill

### 3.1.1 Differential Migration Timing

For species with an adequate sample size of hatch year and after hatch year birds banded, it is possible to view the migration timing of some species by age. For most species, it is typical to see a peak in the migration of adult (AHY) birds later than that of young (HY) birds. An example of this pattern is shown by Figure 6 (Orange-crowned Warbler differential migration timing). Note that the Y axis on this figure shows a 3 day running average for the number of individuals banded. This method averages the migration timing to reduce day to day variability and make the pattern more apparent.

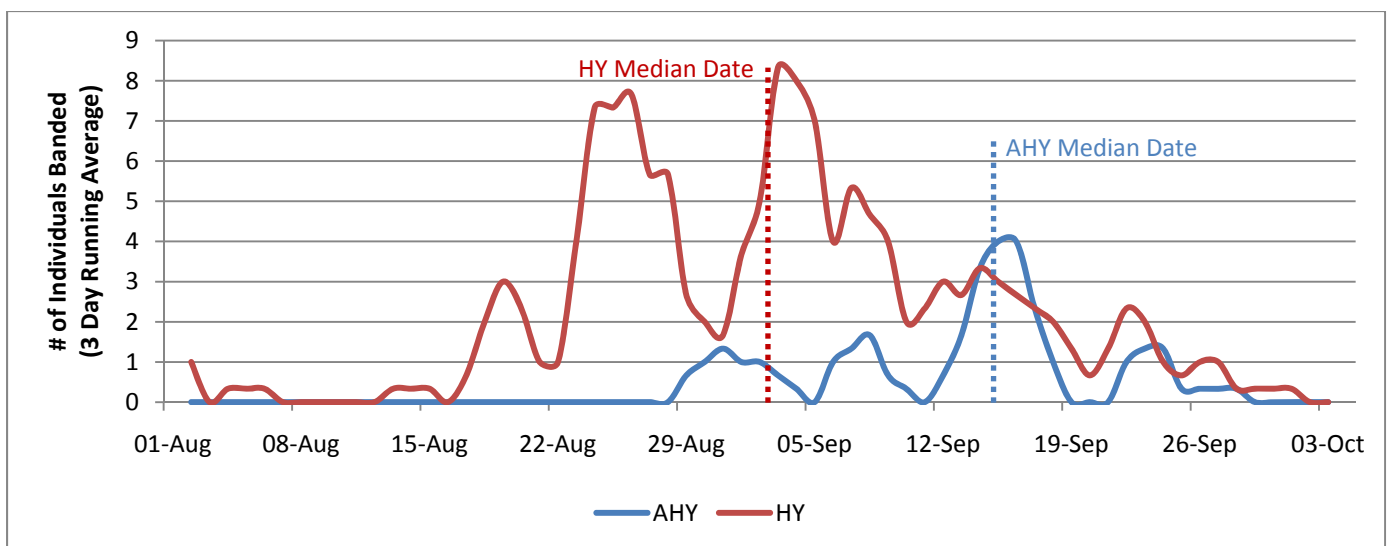


Figure 6. Orange-crowned Warbler differential migration timing (vertical dashed lines indicate median banding dates by age).

An exception to this pattern are the flycatchers for which the adult (AHY) migration peaks before that of the juvenile (HY) birds as shown by Figure 7 (Alder Flycatcher differential migration timing). Flycatchers (and some other species) differ in this pattern due to a different molt timing pattern in adult birds. At TLBO, most species moult on their breeding grounds and therefore the adults migrate later. This is due to a need to balance the energy needs of breeding, moult and migration. Flycatchers moult on the wintering grounds and therefore the adults are able to migrate soon after the completion of breeding (*ie*, earlier than hatch year birds).

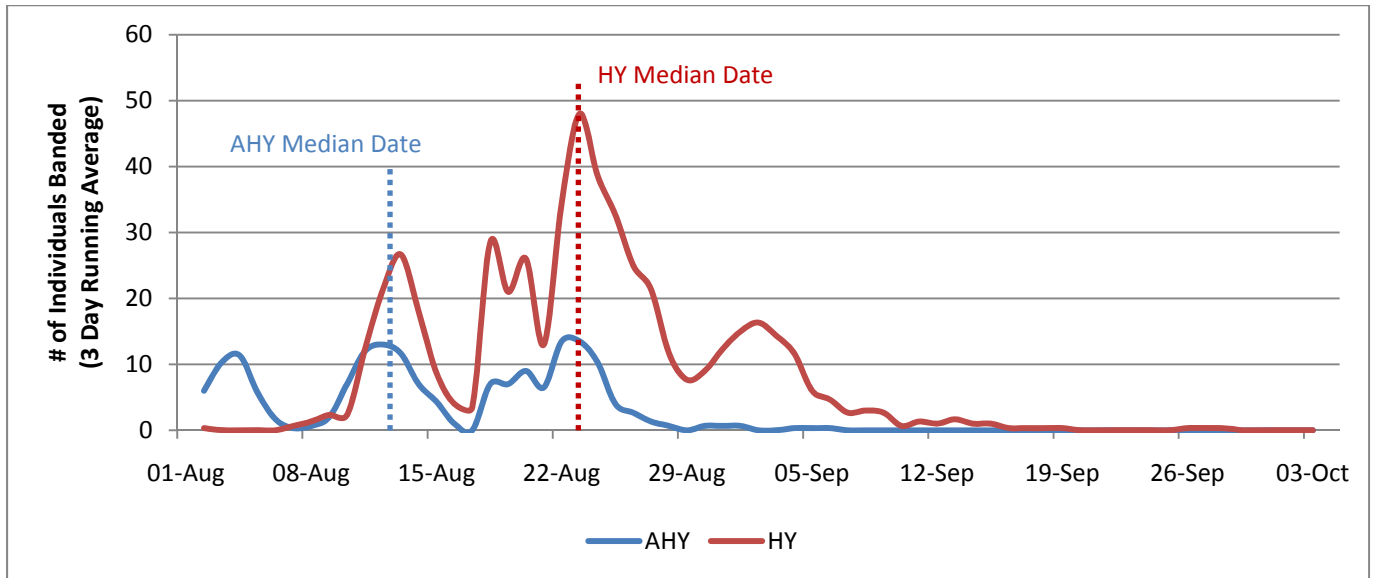


Figure 7. Alder Flycatcher differential migration timing (vertical dashed lines indicate median banding dates by age).

Note that additional differential migration figures are presented in Appendix 5 for the following species;

- Alder Flycatcher
- Orange-crowned Warbler
- Yellow Warbler
- Yellow-rumped “Myrtle” Warbler
- Blackpoll Warbler
- Common Yellowthroat
- Wilson’s Warbler
- Dark-eyed Junco

### 3.2 Band Recoveries / Returns

This fall, the observatory had its first foreign band recovery. An AHY-M Yellow Warbler recaptured on September 9<sup>th</sup> was determined to be a foreign band and was found to have been banded in Texas on May 12, 2009.

In addition, an Alder Flycatcher banded as a HY-U at Teslin Lake on August 25<sup>th</sup>, 2008 was recovered (found dead) on June 12<sup>th</sup>, 2009 in southwest Saskatchewan approximately 20km southeast of Swift Current, SK.

At some bird observatories with high densities of breeding birds, it is not uncommon to have numerous band returns from previous years. At Teslin Lake, only small numbers of band returns have been noted in past years and the 2009 fall season was no exception. Only three band returns were noted this fall season (Table 4).



**Table 4.** Summary of band returns during the fall 2009 season.

Species	Band Number	Banded		Recaptured	
		Date	Age – Sex	Date	Age – Sex
American Robin	1232-25927	7-May-08	ASY-U	1-Aug-09	ASY
Black-capped Chickadee	2400-70951	26-Apr-06	AHY-U	26-Aug-09	ASY
Black-capped Chickadee	2430-38543	29-Apr-07	AHY-U	9-Sep-09	ASY

A very small proportion (5.5%) of all birds banded during the fall 2009 season were recaptured within the same season (Table 5, Appendix 6). These results show that during the fall season, the study site is not utilized as a stopover site for a very high number of birds. For the purposes of migration monitoring, this is a desirable situation as there is less potential for double counting birds on consecutive days.

**Table 5.** Summary of band repeats during the fall 2009 season.

Species	# of Individuals Recaptured	% or 2009 Original Bandings	Maximum # of Days From Original Banding	Minimum # of Days From Original Banding	Median # of Days From Original Banding	Average # of Days From Original Banding
Alder Flycatcher	5	0.8	5	1	3	2.8
American Redstart	9	20.9	33	1	4	7.3
American Tree Sparrow	4	7.4	2	1	1.5	1.5
Black-capped Chickadee	3	11.5	59	3	-	-
Blackpoll Warbler	5	4.7	8	1	3	3.4
Boreal Chickadee	15	1.8	62	1	2	10.9
Chipping Sparrow	2	8.3	6	1	-	-
Common Yellowthroat	7	6.2	9	1	7	5.1
Downy Woodpecker	1	100.0	22	-	-	-
Fox Sparrow	3	10.7	4	1	-	-
Golden-crowned Kinglet	2	20.0	2	2	-	-
Gray Jay	1	20.0	31	-	-	-
MacGillvray's Warbler	2	66.7	3	3	-	-
Northern Waterthrush	14	26.4	12	1	4	4
Orange-crowned Warbler	7	3.9	12	1	3	3.7
Ruby-crowned Kinglet	6	3.4	25	1	2	5.8
Rusty Blackbird	1	3.3	1	-	-	-
Dark-eyed Junco	69	11.9	27	1	3	5.4
Swainson's Thrush	5	10.2	11	1	1	3.4
Tennessee Warbler	2	22.2	6	1	-	-
Warbling Vireo	1	10.0	1	-	-	-
White-crowned Sparrow	1	3.0	1	-	-	-
Wilson's Warbler	11	6.8	5	1	1	2.1
Yellow Warbler	25	7.7	20	1	2	3.6
Yellow-rumped Warbler	20	7.0	11	1	4.5	5
TOTAL	221	5.6	-	-	-	-

### 3.3 *Point Counts*

The point counts completed during the fall 2009 season were very successful in boosting the bird observation data collection. By spreading the count locations throughout much of the count area (and outside the mist netting area) a wider diversity of habitats were surveyed regularly. A total of 399 point counts were completed during the season. As a result of these counts, 1,972 birds of 60 species were observed (Table 6). A portion of these birds were likely observed (and banded) using other methods; however, efforts are used by the observatory personnel to reduce double counting during the estimated total and daily species total calculation.

Table 6. Summary of point count observations.

Species	Total Individuals	# of Days Recorded	# of Counts	Species	Total Individuals	# of Days Recorded	# of Counts
Red-throated Loon	1	1	1	Golden-crowned Kinglet	3	2	3
Common Loon	9	5	6	Ruby-crowned Kinglet	29	16	23
Red-necked Grebe	6	4	4	Swainson's Thrush	36	17	32
American Green-winged Teal	1	1	1	American Robin	36	15	23
Red-breasted Merganser	14	1	1	Varied Thrush	12	10	12
Bald Eagle	4	4	3	American Pipit	2	2	2
Sharp-shinned Hawk	6	6	6	Bohemian Waxwing	2	2	2
Merlin	2	2	2	Cedar Waxwing	18	7	11
Ruffed Grouse	10	7	10	Tennessee Warbler	1	1	1
Lesser Yellowlegs	1	1	1	Orange-crowned Warbler	61	19	35
Solitary Sandpiper	19	8	14	Yellow Warbler	202	29	104
Spotted Sandpiper	5	4	4	Yellow-rumped Warbler	262	35	147
Least Sandpiper	2	1	1	Townsend's Warbler	3	2	2
Mew Gull	6	3	6	Blackpoll Warbler	41	18	33
Belted Kingfisher	62	23	53	American Redstart	30	14	20
Herring Gull	64	20	45	Northern Waterthrush	24	12	19
Northern Flicker	11	7	10	Common Yellowthroat	46	17	33
Western Wood-Pewee	3	3	3	Wilson's Warbler	44	21	34
Arctic Tern	51	7	14	American Tree Sparrow	6	4	5
Alder Flycatcher	18	9	15	Chipping Sparrow	14	7	12
Hammond's Flycatcher	1	1	1	Savannah Sparrow	3	3	3
Warbling Vireo	10	2	7	Fox Sparrow	7	3	4
Gray Jay	37	16	32	Lincoln's Sparrow	2	2	2
Black-billed Magpie	4	3	4	White-crowned Sparrow	9	7	8
Common Raven	110	36	94	Dark-eyed Junco	260	41	131
Barn Swallow	68	4	13	Rusty Blackbird	25	8	12
Black-capped Chickadee	105	23	61	Pine Grosbeak	4	1	2
Mountain Chickadee	1	1	1	Purple Finch	7	5	4
Boreal Chickadee	139	28	68	Pine Siskin	5	4	4
Red-breasted Nuthatch	4	3	4	White-winged Crossbill	4	2	3

### 3.4 Molt Scoring

As supplementary information, data was collected on the stage of molt for a portion of the birds banded. Although information on the preformative molt (amount of juvenile plumage remaining) was collected for juvenile (HY) birds, a particular emphasis was placed upon collecting wing molt scores for molting adult (AHY) individuals. Using methodology in Ginn and Melville (1983), each primary and secondary flight feather was assigned a rank of zero (old feather remaining) to five (new feather fully grown).

A total of 82 molt scores were obtained from 15 species. This data is useful to investigate the changes in molt score over time as shown by the following figure for Yellow-rumped Warbler (Figure 8). Note that only two individuals were molt score on more than one occasion; 1 Swainson’s Thrush and 1 Yellow Warbler (Figure 9).

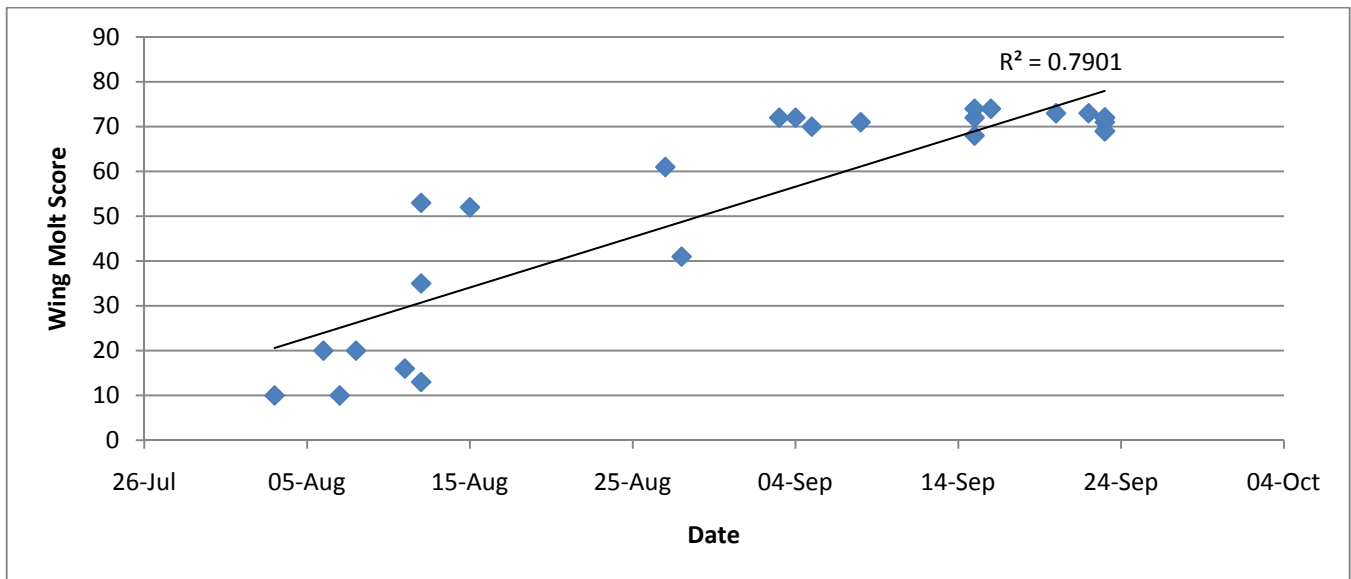


Figure 8. Yellow-rumped Warbler molt scores over time (primary and secondary feathers only).

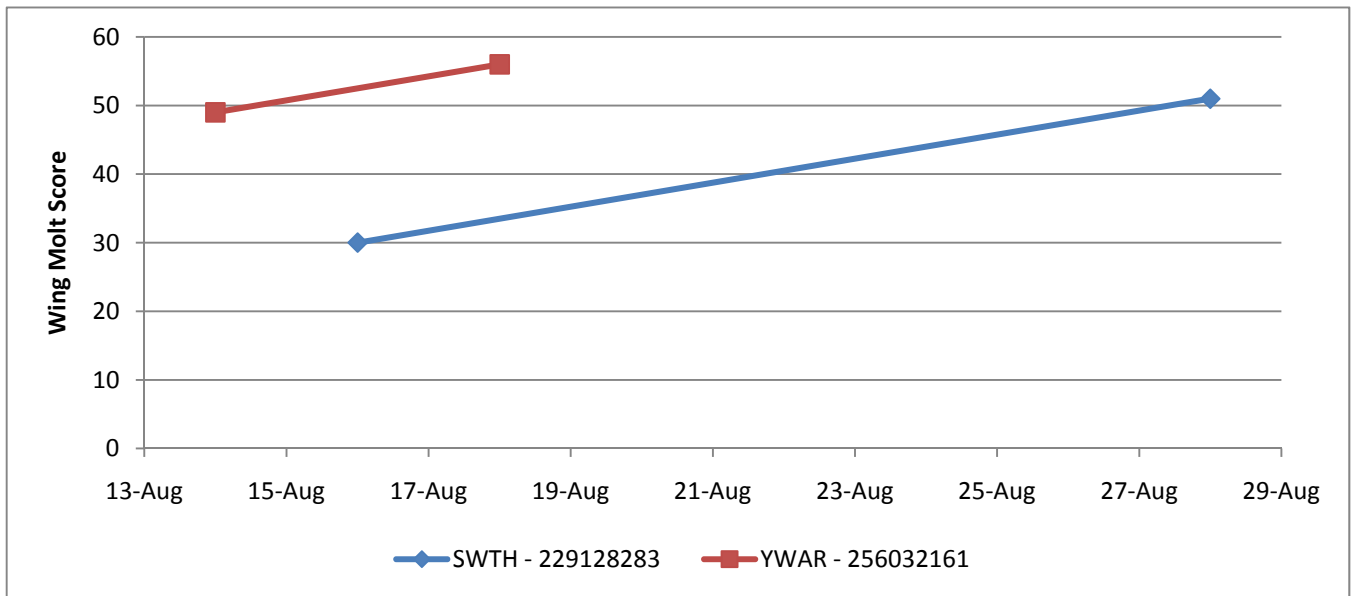


Figure 9. Molt scores over time for select individuals (primary and secondary feathers only).

### 3.5 Visual Migration Counts

The visual migration counts provide a means to observe numerous species not typically observed using other methods. The counts are especially useful in observing raptors in migration and also serve as a means for observing waterfowl and waterbirds on Teslin Lake. Note that birds seen during the migration counts which are not in migration are considered “other observations”. A detailed account of the visual migration count data can be found in Appendix 3 and 4. The following photos show some of the species observed during the visual migration counts.



**Photo 1.** Red-throated Loon (left) and Horned Grebes (right), Teslin Lake Bird Observatory (Photo: Jukka Jantunen).



**Photo 2.** Red-necked Grebe (left) and Red-breasted Mergansers, Teslin Lake Bird Observatory (Photo: Jukka Jantunen).



**Photo 3.** Greater White-fronted Geese (left) and Arctic Tern (right), Teslin Lake Bird Observatory (Photo: Jukka Jantunen).



**Photo 4.** Rough-legged Hawk (left) and Harlan's Red-tailed Hawk (right), Teslin Lake Bird Observatory (Photo: Jukka Jantunen).



**Photo 5.** Sandhill Cranes (left) and Tundra Swans (right), Teslin Lake Bird Observatory (Photo: Jukka Jantunen).

### 3.4 *Interesting & Notable Captures / Observations*

As is the case in all years, the vast majority of birds banded and observed at Teslin Lake in 2009 were species which are common and widespread north and west of the study site. The Teslin Lake site appears to have low numbers of breeding birds, possibly due to the seasonal flooding which occurs due to rapid spring snowmelt. The observatory captures a very diverse grouping of bird species; however, there is a notable difference in species captured during the spring and fall seasons. Results to date suggest that the sparrows are more common during the spring with flycatchers and warblers present in higher numbers during the fall season. The section below outlines a number of interesting and/or notable captures and sightings from the 2009 fall season.

#### **Redhead**

A first for the observatory, three Redhead were observed on Teslin Lake on September 24.

#### **Hooded Merganser**

A first for the observatory, a single Hooded Merganser was observed in migration with a flock of 5 Common Mergansers on August 28.

#### **Swainson's Hawk**

When the observatory began conducting visual migration counts during the spring and fall of 2008, small numbers of Swainson's Hawks were observed. During the fall of 2009, a total of 21 individuals were observed in migration between August 20 and September 5. The high count for this species was 13 individuals (including 6 in one migrating kettle) on September 5.

Including data up to 1998, the *Birds of the Yukon* contains less than 30 records to date for this species (Sinclair et al. 2003). There are relatively few records of birds in migration from the southern Yukon and breeding is suspected in the north central Yukon (Peel River Watershed, Eagle Plains); however, this has not yet been confirmed (Sinclair et al. 2003). Migration watching data from Whitehorse also yielded small numbers of Swainson's Hawks (Jantunen pers. Comm.) during 2001 (1), 2002 (10), and 2003 (1). There is also a single record from the Albert Creek Bird Observatory on September 16, 2007 (Schonewille and Murphy-Kelly 2007).

The data collected to date suggest that this species may be more common in the Yukon than initially thought. The record of 13 individuals on September is the largest record to date for the species. It is hoped that the future operation of the observatory will assist with gaining further knowledge of this species in the Yukon.

## *Gyr Falcon*

A new species for the observatory, a single juvenile Gyr Falcon was observed in migration on September 6.



Photo 6. Gyr Falcon, Teslin Lake Bird Observatory, September 6<sup>th</sup> 2009 (Photo: Jukka Jantunen).

## *Wandering Tattler*

An exciting observation, a single Wandering Tattler observed on the lakeshore on August 20 was a first for the observatory and the first record of a juvenile on migration in the territory.



Photo 7. Wandering Tattler, Teslin Lake Bird Observatory, August 20<sup>th</sup> 2009 (Photo: Jukka Jantunen).

## *Upland Sandpiper*

A new species for the observatory, a single Upland Sandpiper was observed on August 10.

## *Sanderling*

An infrequently observed shorebird at the observatory, this species was observed on August 13 (3 individuals) and August 22 (1 individual)



### *Parasitic Jaeger*

First observed at the observatory during the fall of 2008 (28 days from August 7 to September 24; high count of 8 on September 6, a total of 72 bird days). This species was once again observed during 2009; however, the number of individuals observed was much lower. This year, the species was encountered on 11 days from August 24 to September 25 with a high count of 3 on August 30 and a total of 16 bird days. As was the case during 2008, the individuals observed during 2009 were a mixture migrant of visual migrants and ‘observed’ individuals.

This species is most often encountered in northern Yukon, where it is a breeding species on the North Slope (Sinclair et al. 2003). There are few documented records of the species from the large lakes in the southern Yukon and the data collected at the observatory has illustrated that the species may be a more common fall migrant through the southern Yukon than previously thought.

### *Thayer’s Gull*

Observed on 2 days during 2008 (single birds on September 17 and 20), this species was observed in much higher numbers during 2009 (18 days from August 29 to October 4; high count of 14 individuals on September 13). A total of 63 bird days were recorded in 2009.

This species is a breeding species throughout the Arctic; however, fall migrants have been documented in the southern Yukon including Teslin Lake/Nisutlin Bay (Sinclair et al. 2003). The observation of a number of individuals in migration during the fall of 2009 have begun to increase the knowledge of migration timing of this species in the southern Yukon.

### *Glaucous Gull*

Also observed during the fall of 2008, during 2009 single individuals were encountered on August 1 and 29.

### *Sabine’s Gull*

Similar to Parasitic Jaeger, this species was first observed during the fall of 2008 (3 days from August 8 to September 4; high count of 2 on September 2). For 2009, the species was observed on 2 days (August 27 and 29; 2 on each day).

### *Yellow-bellied Flycatcher*

This species is one of the uncommon *Empidonax* flycatchers encountered at the observatory; however, it is typically seen on an annual basis (Table 7). For 2009, the only species encountered were those which were banded. A total of eight HY individuals were banded between August 4 and 23.

**Table 7.** Yellow-bellied Flycatchers banded to date at TLBO.

Season	2005	2006	2007	2008		2009
	Spring	Spring	Spring	Spring	Fall	Fall
Number Banded	2	1	1	0	9	8
% of <i>Empidonax</i> Flycatchers Banded	6.7	2.0	3.9	0	1.1	1.2

Including data up to 1999, the Birds of the Yukon (Sinclair et al. 2003) considers this species as rare to accidental in the southern Yukon. However, when considered in combination with the Albert Creek Bird Observatory, the TLBO's data suggests that this species is likely more common in the Yukon than previously determined.



**Photo 8.** Yellow-bellied Flycatcher, Teslin Lake Bird Observatory, August 8<sup>th</sup> 2009 (Photo: Jukka Jantunen).

### *Least Flycatcher*

Encountered infrequently at the observatory, a single HY individual was banded during 2009 (30 Jul). One additional individual was observed on August 11.

### *Dusky Flycatcher*

The least common *Empidonax* flycatcher at the observatory, a record high 6 individuals were banded during 2009 from August 8 to 28. In the Yukon, this species is typically encountered only on its breeding grounds in subalpine areas of the southern Yukon (Sinclair et al. 2003). The ability to capture this species during migration has increased the level of understanding in terms of the migration timing for this species.



Photo 9. Dusky Flycatcher, Teslin Lake Bird Observatory, August 8<sup>th</sup> 2009 (Photo: Jukka Jantunen).

### *Golden-crowned Kinglet*

In past years, this species has been encountered in very low numbers. Early during the 2009 season, small numbers were once again observed; however, there was a notable influx of individuals during late September. A total of 10 individuals were banded (all hatch year) and the species was encountered on 9 days from August 3 to September 27.



Photo 10. Golden-crowned Kinglets, Teslin Lake Bird Observatory, September 20<sup>th</sup> 2009 (Photo: Jukka Jantunen).

### *Townsend's Solitaire*

The observatory's first Townsend's Solitaire was banded on September 5. A record number of individuals were also observed at the site this fall (16 days from August 25 to October 2; high count of 6 individuals on 3 days from August 26 to September 5) and a total of 40 bird days. Although not uncommon or rare in the Yukon, this species is not common at the observatory due to a lack of suitable habitat within the count area.



**Photo 11.** Townsend's Solitaire, Teslin Lake Bird Observatory, September 5<sup>th</sup> 2009 (Photo: Jukka Jantunen).

### *Cedar Waxwing*

An additional new species for the observatory, Cedar Waxwings were observed (but not banded) on 16 days from August 13 to September 6 with a high count of 17 individuals on August 18 and 19. A mixture of adult and juvenile plumaged birds were observed suggesting that the species may have bred nearby during the summer months.



**Photo 12.** Adult (left) and juvenile (right) plumaged Cedar Waxwings, Teslin Lake Bird Observatory, September 5<sup>th</sup> 2009 (Photo: Jukka Jantunen).

### *Townsend's Warbler*

A record high 8 individuals were banded this fall season (all hatch year). The species was observed on 11 days from August 6 to September 11 with a high count of 2 individuals on August 22 and a total of 12 bird days.

In the southern Yukon, this species is considered rare during spring, summer and fall when it is most often encountered during the breeding season (Sinclair et al. 2003). There are few records during fall migration and any documented records of the species during migration are notable.



**Photo 13.** Townsend's Warbler, Teslin Lake Bird Observatory, August 28<sup>th</sup> 2009 (Photo: Jukka Jantunen).

### *American Redstart*

American Redstart has been observed annually at the observatory; however, the number encountered during the fall 2009 season was impressive. A total of 43 individuals were banded (81% hatch year) and the species was observed on 27 days from July 30 to September 19 with a high count of 9 on August 6 and a total of 105 bird days.

Although there are numerous summer records of the species across the southern Yukon, this species is most common in the territory's southeast (Sinclair et al. 2003). Although there are a small number of existing records for the Teslin area, the numbers of individuals banded/observed during the 2008/2009 fall seasons were much higher than expected. It is likely that the count area serves as a highly suitable feeding and stopover site for this species; however, it appears likely as though the species may breed more extensively in the Yukon than previously thought.



**Photo 14.** Hatch year male (left) and adult male (right) American Redstarts, Teslin Lake Bird Observatory, August 2009 (Photo: Jukka Jantunen).

### *MacGillivray's Warbler*

MacGillivray's Warbler is a species encountered in very low numbers on an annual basis at the observatory. The three hatch year individuals banded this fall brought the all time banding total for the observatory to 6 individuals. During 2009, this species was encountered on 4 days from August 5<sup>th</sup> to 11<sup>th</sup>, with single individuals observed on all days.

Perhaps the Yukon's rarest warbler, this species is known only from the extreme southern Yukon from Upper Liard west to Dezadeash Lake (Sinclair et al. 2003). The small number of records for this species in the territory means that any documented record is valuable.



Photo 15. Hatch year MacGillivray's Warbler, Teslin Lake Bird Observatory, August 5<sup>th</sup>, 2009 (Photo: Jukka Jantunen).

### *Western Tanager*

The second record for the observatory, a hatch year Western Tanager was banded on August 11<sup>th</sup>. The previous record was an adult female banded on June 4<sup>th</sup>, 2006.

This species reaches the extreme northwestern portion of its breeding range where it is encountered annually at the Albert Creek Bird Observatory near Upper Liard (Sinclair et al. 2003, Schonewille and Murphy-Kelly 2008). Although there are a small number of records from the Teslin area, any documented record of the species is notable.



Photo 16. Hatch year Western Tanager, Teslin Lake Bird Observatory, August 11<sup>th</sup>, 2009 (Photo: Jukka Jantunen).

### *Brewer's Sparrow*

A single hatch year Brewer's "Timberline" Sparrow was banded on August 26<sup>th</sup>. This constituted the second record of this species for the observatory; an additional hatch year individual was banded on September 3<sup>rd</sup>, 2006. Similar to a number of other Yukon bird species, Brewer's Sparrow is typically only encountered at its high elevation breeding grounds in the southcentral and southwest Yukon (Sinclair et al. 2003). To date the observatory has documented two individuals and has thus increased the level of understanding of fall migration timing for this species.



Photo 17. Hatch year Brewer's "Timberline" Sparrow, Teslin Lake Bird Observatory, August 26<sup>th</sup>, 2009 (Photo: Jukka Jantunen).

### *Smith's Longspur*

A first for the observatory, a single individual was observed on August 27<sup>th</sup>.

#### **3.2.1 Chickadee Movements**

During the fall 2009 season, high numbers of chickadees were once again banded and observed in migration. Typically, chickadees are considered year round residents (*i.e.* – they don't migrate); however, they have been known to stage southward irruptions elsewhere. These are the first documented irruptions in the Yukon and were noticed at locations aside from TLBO as well. However, it was the TLBO observations that alerted observers elsewhere in southern Yukon to this phenomenon. The reasons for such irruptions are unclear, but it is presumed to be caused by food shortages or exceptionally productive breeding seasons. The majority of chickadees banded were Boreal Chickadees; a total of 831 were banded during 2009 and the sum of the daily species totals was 1,612. Nearly all individuals captured were juvenile (HY) birds with only 1 adult (AHY) individual banded.



**Photo 18.** Boreal Chickadee (left) and Black-capped Chickadee (right), Teslin Lake Bird Observatory, August 2009 (Photo: Jukka Jantunen).

In addition to the common Yukon chickadee species, Mountain Chickadees were once again encountered during the fall of 2009. A total of 11 individuals were banded (all hatch year) and the species was noted on 8 days from September 5<sup>th</sup> to 27<sup>th</sup> with a high count of 10 individuals on September 19<sup>th</sup>.



**Photo 19.** Mountain Chickadees, Teslin Lake Bird Observatory, September 2009 (Photo: Jukka Jantunen).

### 3.2.2 Woodpecker Movements

Similar to the chickadees, some species of resident woodpecker have been known to stage irruptions. Although the number of individuals observed was not very high, there was evidence of an irruption by Black-backed, American Three-toed and Hairy Woodpeckers (Table 8). Note that a small amount (9.0 hrs) of call playback was conducted at mist nets (5, 21, 22 and 23) during late August using American Three-toed and Black-backed Woodpecker calls; however, no woodpeckers were captured using this technique.

**Table 8.** Summary of woodpecker observations.

Species	First Date Recorded	Last Date Recorded	# of Days Recorded	High Count	# of Visual Migrants Observed
American Three-toed Woodpecker	August 19 <sup>th</sup>	October 3 <sup>rd</sup>	12	2 on Sept 3 <sup>rd</sup> /8 <sup>th</sup>	8
Black-backed Woodpecker	August 13 <sup>th</sup>	September 28 <sup>th</sup>	7	1 on all days	3
Hairy Woodpecker	August 31 <sup>st</sup>	October 1 <sup>st</sup>	6	1 on all days	3



### 3.4 *Rusty Blackbirds*

As part of an ongoing project in co-operation with Pam Sinclair (CWS-Whitehorse) and the Albert Creek Bird Observatory, all Rusty Blackbirds captured were fitted with color bands (light blue) in addition to the regular numbered leg band. The rationale for color banding individuals is to potentially increase re-sightings of banded individuals.

Additionally, a feather was collected from each Rusty Blackbird captured. Feather samples will be analyzed for stable isotopes in an effort to make linkages between breeding and wintering grounds used by this species. Samples collected will be used as reference samples for researchers elsewhere to allow for a more accurate determination of the origin of birds on the wintering grounds. A portion of the feather samples may also be used for genetic and contaminant studies. During the fall of 2009, 30 individuals were banded (17 hatch year males, 13 hatch year females).



**Photo 20.** Hatch year female Rusty Blackbird eating a snail, Teslin Lake Bird Observatory, September 2009 (Photo: Jukka Jantunen).

### 3.5 *Species at Risk / Conservation Concern*

The observatory serves as a valuable data source for bird species at risk and of conservation concern. The geographic location of the observatory allows for monitoring of bird species within the northwestern Boreal Forest which may not be monitored sufficiently by other methods such as the Breeding Bird Survey. Table 9 summarizes the species at risk/conservation concern encountered at the observatory during the fall of 2009. Note that additional data on these species can be found in other components of this report; Interesting and Notable Captures/Observations (Section 3.4), Appendix 3 (Observation Data Summary) and Appendix 4 (Migration Synopsis Figures).

**Table 9.** Summary of bird species at risk/conservation concern encountered during the fall of 2009.

Common Name	Yukon General Status (CESCC 2006)	COSEWIC Status (COSEWIC 2009)	COSEWIC Priority for Assessment (COSEWIC 2009)	# Days Recorded	# Banded	# of Bird Days
Common Loon	Sensitive			43	0	107
Horned Grebe		Special Concern		13	0	42
Trumpeter Swan	Sensitive			2	0	4
Tundra Swan	Sensitive			7	0	1766
American Wigeon	Sensitive			13	0	101
Northern Pintail	Sensitive			16	0	244
Redhead	Sensitive			1	0	3
Greater Scaup			Low	6	0	34
Lesser Scaup	Sensitive		Low	11	0	387
Surf Scoter	Sensitive			11	0	54
White-winged Scoter	Sensitive			8	0	37
Hooded Merganser	Sensitive			1	0	1
Osprey	Sensitive			19	0	50
Swainson's Hawk	Sensitive			3	0	21
Golden Eagle	Sensitive			13	0	109
American Kestrel	May Be At Risk		Mid	26	0	85
Peregrine Falcon	Sensitive	Special Concern		20	0	34
Greater Yellowlegs	Sensitive			1	0	1
Lesser Yellowlegs	Sensitive			2	0	2
Wandering Tattler	Sensitive			1	0	1
Semipalmated Sandpiper	Sensitive			5	0	17
Long-billed Dowitcher	Sensitive			3	0	3
Red-necked Phalarope	Sensitive		High	3	0	3
Parasitic Jaeger	Sensitive			11	0	16
Sabine's Gull	Sensitive			2	0	4
Common Nighthawk		Threatened		2	0	2
Belted Kingfisher			Mid	46	6	82
Olive-sided Flycatcher	Sensitive	Threatened		6	0	7
Northern Shrike	Sensitive			4	0	7
Bank Swallow			Mid	10	0	42
Mountain Chickadee	Sensitive			7	11	24
Boreal Chickadee			Low	57	831	1612
Golden-crowned Kinglet	Sensitive			9	10	21
Mountain Bluebird	Sensitive			3	0	6
Townsend's Warbler	Sensitive			11	8	12
American Redstart	Sensitive			27	43	105
Western Tanager	May Be At Risk			1	1	1
Brewer's Sparrow	Sensitive			1	1	1
Smith's Longspur	Sensitive			1	0	1
Rusty Blackbird	Sensitive	Special Concern		46	30	684

### 3.5 Owl Banding

To date, a large scale owl banding test project has not been completed at the observatory. Building upon a minimal effort during the fall of 2008, a very limited amount of effort (8.25 hours) was completed in late August using Boreal Owl and Northern Saw-whet Owl call playback. Although no owls were banded, additional testing will be required in the future to determine the feasibility of this add on component to the observatory's operation.

### 3.6 Visitors and Volunteers

Once again the observatory hosted numerous visitors and volunteers. For the first time since the observatory's inception, adequate personnel was available on nearly all days of operation. This was largely due to the commitment of a long term volunteer banding assistant (Sergio Marrocoli) who spent the majority of the season onsite. Table 10 shows the number of hours spent at the observatory by visitors, volunteers and paid workers. Visitors were defined as those people who visited the observatory (often for a short time) and did not take part in activities at the observatory. Volunteers were those people which took part in the operation of the observatory (often extensively) without being financially compensated. Paid hours were spent by individuals being paid to be at the observatory. This category includes the Bander In Charge (Jukka Jantunen, Jillian Johnston) and individuals paid by other organizations (Yukon Government, Canadian Wildlife Service, etc). Note that the values shown for "paid hours" only include those spent at the observatory and do not include the extensive amount of data entry, data analysis, report writing and other communication of the observatory's results.

**Table 10.** Hours spent at the bird observatory by visitors, volunteers and paid individuals.

Observers				Visitors	
Paid		Volunteer		# of Individuals	Hours
# of Individuals	Hours	# of Individuals	Hours		
5	843.2	14	542.8	79	260.8

## 4.0 Conclusion

The results from this season's operation have continued to add to the knowledge of numerous aspects of bird biology in the Yukon, including: species distribution, migration timing and local productivity. The location of the study site has proven to be a very effective location for monitoring bird migration. The primary reason for this is the close proximity of the site to Teslin Lake. As the lake is a very large body of water which runs in a north/south direction, it acts as a funnel for migrant birds. Most migrating birds are tentative to cross the lake and many birds are funneled along the lakeshore and passed directly through the study site. On numerous occasions, flocks of migrating birds have been observed moving along the lakeshore and thus have yielded some very impressive banding and observation totals at the observatory.

The results gathered this season also suggest a previous assumption that few birds stopover at the study site for extended periods of time. The majority of birds simply pass through the site while in migration and this is supported by the very low proportion of band repeats throughout the season. For the purposes of effective migration monitoring, this is a desirable situation as it is clear that most birds observed and banded truly are migrants.

The educational capacity of the observatory was again increased during 2009. The observatory has been successful in attracting groups of students to the observatory to learn about birds and bird migration. During 2009, a Y2C2 (Yukon Youth Conservation Corps) and two visiting school groups from Whitehorse visited the observatory. On all occasions, the visiting school groups were given an introduction to birds, their migration and methods used for ornithological data collection.

During 2009, the observatory completed its second consecutive fall season and the first season using the formalized monitoring protocol developed during early 2009. The results collected this season further reinforce the higher potential to monitor bird migration during the fall season rather than the spring. The primary long term goal of the observatory is to continue migration monitoring and collect data to facilitate the calculation of long term population trends. Although a very high diversity of bird species were observed at the observatory, it is likely that not all species are suitable candidates for trend analysis. This may be due to an overall lack in the sample size of observations/bandings or incomplete migration season coverage. This would likely be an issue for late migrating species such as Golden Eagle and Tundra Swan. As such, the key species for monitoring are those which are relatively common and have the majority of their migration covered by the observatory's monitoring season. Results collected to date suggest that the observatory has a high potential for monitoring a wide diversity of species including waterbirds, raptors and songbirds. Waterfowl and shorebirds have yet to be observed in relatively high numbers; however, there appears to be potential for monitoring a limited number of these species.

The fall banding data collected to date illustrates the value of the observatory's operation for monitoring boreal bird species. For example, the chickadee irruption observed during 2008 and 2009 present a unique opportunity to monitor species which are drastically under represented at other bird observatories in North America.

## 5.0 Recommendations

For 2010, it is hoped that financial support can be secured to once again operate the observatory at full capacity (*ie*-daily coverage) during the fall migration season. If possible, it would be beneficial to begin the fall season on July 23<sup>rd</sup> to remain consistent with the Albert Creek Bird Observatory and hopefully better monitor any local breeding birds and species which are relatively early fall migrants. Should adequate funding be available, the spring season would also be operated. Should the spring season be operated, it would be beneficial to conduct additional visual migration watches beginning in mid April with banding commencing during the last week of April or first week of May. On an administrative level, insights from the 2009 season will be incorporated into the draft field protocol developed in early 2009.

## 6.0 References

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### Personal Communications

Jukka Jantunen. Personal communication with the author via email, December 2009.

**APPENDIX 1 –ALL TIME BANDING TOTALS / SPECIES CHECKLIST**

**APPENDIX 2 –ESTIMATED TOTAL SUMMARY CHARTS**



**APPENDIX 3 – OBSERVATION DATA SUMAMRY**

**APPENDIX 4 – MIGRATION SYNOPSIS FIGURES**

**APPENDIX 5 – DIFFERENTIAL MIGRATION TIMING FIGURES**

**APPENDIX 6 – BAND REPEAT DATA**