

Albert Creek Bird Observatory (ACBO) Field Protocol



Ben Schonewille, Ted Murphy-Kelly & Jukka Jantunen
Society of Yukon Bird Observatories
2014 (version 3)

Table of Contents

1.0	Introduction	4
2.0	Objectives.....	4
3.0	Migration Monitoring Methods.....	6
3.1	Count Area	6
3.2	Count Period	8
3.2.1	Spring Count Timing.....	9
3.2.2	Fall Count Timing.....	10
3.3	Mist Netting	10
3.4	Operating Guidelines	11
3.4.2	Banding	14
3.4.3	Visual Migration Counts.....	14
3.4.4	Census Legs	15
3.4.5	Other Observations.....	16
3.5	Estimated Totals (ETs).....	16
3.6	Overall Coverage Codes	17
3.7	Additional Observations.....	18
3.8	Data Entry	18
3.9	Personnel	18
6.0	Vegetation Management.....	19
7.0	Literature Cited	20

List of Figures

Figure 1. Map of the Yukon, showing the location of ACBO.....	7
Figure 2. Map of Albert Creek Bird Observatory count area (marked by purple line).	8
Figure 3. ACBO mist net array.....	12

List of Tables

Table 1. Priority landbird species for monitoring at Albert Creek Bird Observatory.....	5
Table 3. ACBO mist net specifications.	11
Table 3. Observer skill levels.....	17
Table 5. Criteria for assigning daily coverage codes.....	17

1.0 Introduction

The Albert Creek Bird Observatory (ACBO) was established in the spring of 2001 by Ted Murphy-Kelly with assistance from a number of agencies including the Southeast Yukon Proper Land Use Society, Canadian Wildlife Service, Yukon Environment and the Yukon Conservation Society. The station is located along the Rancheria Loop Road near Upper Liard, approximately 15 km west of Watson Lake, YT. Over the period of 2001 to 2004, the station operated annually during spring and fall; however, the operations were not standardized. Beginning in 2005, efforts were made to standardize the monitoring efforts at the observatory and this document is intended to serve as a guide to ensure consistent monitoring in the future.

Along with the Teslin Lake Bird Observatory, ACBO is currently seeking full membership within CMMN (Canadian Migration Monitoring Network). Situated in the Liard River valley (60.062° N, 128.916° W) in the southeast Yukon, ACBO offers an ideal location to monitor the migration of birds breeding north and west of the observatory throughout the Yukon and Alaska. Migration monitoring methods at ACBO follow procedures recommended by the North American Migration Monitoring Council and are similar to methods used elsewhere (Wojnowski et al 2000, Gahbauer and Hudson 2004). This protocol provides a description of field procedures currently in practice at ACBO with the possibility of revisions to be made should additional components (e.g. owl banding, species specific monitoring using call playback) be added to the protocol in the future. It is intended that this protocol should enable personnel, even if unfamiliar with the site, to collect data that is consistent with current procedures.

2.0 Objectives

The primary objectives of Albert Creek Bird Observatory are as follows:

- Collect standardized migration monitoring data to allow for trend analysis of landbird populations in the Yukon.
- Collect baseline data on the distribution and migration timing of bird species in the southeast Yukon.
- Provide an opportunity for the public (especially students) to learn about the birdlife of the Yukon, their migration habits and ornithological data collection.

A secondary objective of the observatory is to collect data to calculate trends in populations of shorebirds, waterbirds and waterfowl based on the collection of migration monitoring data.

High priority landbird species for monitoring at Albert Creek are shown in Table 1. Species prioritization follows that of Badzinski and Francis (2000). Species shown in **red bold** are those which meet the minimum criteria in Badzinski and Francis (2000) for species trend analysis during the spring and/ or fall season; at least 10 individuals are observed on a least 5 days per year. Species shown in **bold** are additional priority species based on their regional importance at ACBO. These species are at the extreme northwestern limit of their range and ACBO is in a unique position to monitor these species in the Yukon, despite relatively low numbers encountered.

Table 1. Priority landbird species for monitoring at Albert Creek Bird Observatory (note that there are no priority ‘E’ and ‘F’ species which occur regularly at ACBO).

Priority ‘A’	Priority ‘B’	Priority ‘C’	Priority ‘D’
Alder Flycatcher	American Tree Sparrow	American Redstart	American Crow
American Pipit	Boreal Chickadee	Bank Swallow	American Robin
Bay-breasted Warbler	Bohemian Waxwing	Barn Swallow	Black-capped Chickadee
Blackpoll Warbler	Common Redpoll	Black-and-white Warbler	Belted Kingfisher
Cape May Warbler	Dark-eyed Junco	Blue-headed Vireo	Cedar Waxwing
Gray-cheeked Thrush	Fox Sparrow	Chipping Sparrow	Hermit Thrush
Lincoln’s Sparrow	Golden-crowned Sparrow	Cliff Swallow	Northern Flicker
Magnolia Warbler	Lapland Longspur	Common Nighthawk	Pine Siskin
Northern Waterthrush	Myrtle Warbler	Common Yellowthroat	Purple Finch
Orange-crowned Warbler	Northern Shrike	Dusky Flycatcher	Red-breasted Nuthatch
Savannah Sparrow	Pine Grosbeak	Hammond’s Flycatcher	Red-winged Blackbird
Swainson’s Thrush	Ruby-crowned Kinglet	Least Flycatcher	
Tennessee Warbler	Rusty Blackbird	Olive-sided Flycatcher	
Wilson’s Warbler	Swamp Sparrow	Townsend’s Warbler	
Yellow-bellied Flycatcher	Varied Thrush	Tree Swallow	
Yellow-bellied Sapsucker	White-crowned Sparrow	Violet-green Swallow	
	White-throated Sparrow	Western Tanager	
	White-winged Crossbill	Western Wood-Pewee	
		Yellow Warbler	

- A. Species with <50% of North American (Canada and USA only) breeding range covered by BBS, and <60% of their winter range in USA and Canada.
- B. Species with <50% of North American breeding range covered by BBS, but >60% of their winter range in the USA and Canada.
- C. Species with <60% of their Canadian and Alaskan breeding range (but >50% of North American range) covered by BBS, but <60% of their winter range in USA and Canada./
- D. Species with <60% of their Canadian and Alaskan breeding range (but >50% of North American range) cover by BBS, but >60% of their winter range in USA and Canada.
- E. Species with >60% of both their Canadian and North American breeding range covered by BBS, and <60% of their winter range in USA and Canada.
- F. Species with >60% of both their Canadian and North American breeding range covered by BBS, and >60% of their winter range in USA and Canada.

3.0 Migration Monitoring Methods

3.1 Count Area

Albert Creek Bird Observatory is located in the Liard River valley along the eastern margin of the Loon Lake wetland complex. The site is accessed from the Rancheria Loop Road which joins the Alaska Highway at Upper Liard, approximately 15 km west of the community of Watson Lake (Figure 1). The boundary of the count area is shown by a purple line in Figure 2. The count area is delimited by the following boundaries:

- To the south, the boundary is the crest of the steep hill on the road to the station.
- To the north, the boundary is the cart track which joins the main road approximately 500 m past the banding lab.
- To the east and west, the boundary is approximately 400 m either side of the main road.
- In addition, the count area includes a buffer of 50 m along the cart track to the east of the banding lab to the small clearing at the end of the trail.

Any birds seen or heard by observers, who are within the count area during the count period, may be included in observations contributing to the estimated total, regardless of whether the birds are within the count area. All birds on or over the marsh, whether seen by naked eye or with the assistance of optics, are countable if the observer is within the boundaries of the count area.



Figure 1. Map of the Yukon, showing the location of ACBO.



Figure 2. Map of Albert Creek Bird Observatory count area (marked by purple line).

3.2 Daily Count Period

The daily count period for the estimated totals starts 15 minutes before sunrise and is rounded back to the nearest quarter of an hour (ex – 520 sunrise rounds to 515 start). The duration of the daily mist-netting activities is, conditions permitting, 6 hours, from the opening of the first net to closing the first net (sunrise plus 6 hours) and shall begin 15 minutes after the start of the count period. The remaining time within the daily count period will include a 1 hour watch. The actual duration of the daily count period may vary on a day to day basis due to the 1 hour watch to be completed following the closure of the mist nets and the subsequent processing of birds captured during the closing net round. A daily schedule of the standard start and end times of the count period during the spring and fall season is shown in Appendix 1.

The standard count period timing may be moved later by up to 3 hours due to unfavorable weather conditions including rain/snow or cold temperatures. When this occurs, a full scale 6

hour mist netting effort is allowed. In the event that the station is opened later than the scheduled start time and is not attributed to weather, the only effort which is considered standard is that which extends up to the scheduled count period end. In these instances, a minimum of 3 hours of netting effort is required to be considered standard otherwise the entire effort for the particular day will be considered non-standard.

Some examples of how the standard/non-standard count periods are shown below using an example of May 5th; the predetermined count period for this date is 500 with the net opening and closing being 515 and 1115, respectively.

- At 500, the air temperature is 3°C and the count period starts at 500, nets opened at 515 and closed at 1115, birds are then processed, completed at 1230 and the count period ends at this time.
 - Standard Count Duration = 7.5 hrs
 - Non-Standard Count Duration = 0 hrs
 - Standard Mist Netting Effort = 6.0 hrs
 - Non-Standard Mist Netting Effort = 0 hrs
- At 500, the air temperature is -5°C and the count period start is delayed until 745 when the air temperature rises to 3°C, nets opened at 800 and closed at 1400, birds are then processed, completed at 1500 and the count period ends at this time.
 - Standard Count Duration = 7.0 hrs
 - Non-Standard Count Duration = 0 hrs
 - Standard Mist Netting Effort = 6.0 hrs
 - Non-Standard Mist Netting Effort = 0 hrs
- At 500, the air temperature is 3°C and the count period starts at 500, nets opened at 515 and closed at 1315, birds of the 1115 processed and completed at 1200. Birds captured in the 1315 net closing round completed, bird processing completed at 1400 and the count period ends at this time.
 - Standard Count Duration = 7.0 hrs
 - Non-Standard Count Duration = 2.0 hrs
 - Standard Mist Netting Effort = 6.0 hrs
 - Non-Standard Mist Netting Effort = 2.0 hrs

3.2.1 Spring Count Timing

The core timing of the standardized spring count period will be April 24 to June 7. Should additional resources be available and weather conditions favorable to allow for an extended season, the standardized protocols will be utilized to operate the observatory before and/or after the April 23 to June 7 period.

3.2.2 Fall Count Timing

The core timing of the standardized fall count period will be July 23 to September 23. Should additional resources be available and weather conditions favorable to allow for an extended season, the standardized protocols will be utilized to operate the observatory before and/or after the July 23 to September 23 period.

3.3 Mist Netting

One qualified bander must be designated as the bander-in-charge (BIC) at all times. The BIC is responsible for ensuring that mist netting and banding is conducted safely and in accordance with this protocol. In order for any capture or banding to take place, a licensed bander **must** be on site and have the Master Bander’s banding permit on hand.

The standard mist netting period extends for 6 hours starting at official sunrise (rounded back to the nearest quarter of an hour; see Appendix 1). In addition to mist netting, birds may also be captured using baited ground traps during the spring season. This is done to increase captures of sparrows and blackbirds. The effort and the resulting birds captured with the ground traps are considered non-standard and must be recorded as such on the data sheets. Because the ground traps are a non-standard method during the standard count period, birds captured in the traps do not count towards ETs. Also, due to the location of the traps (next to the banding lab) the captured birds typically do not add individuals to the DSTs unless a unique individual is captured. An example is shown below:

- Numerous white-crowned sparrows are observed around the ground traps and throughout the count area; 25 are banded from the mist nets and 15 from the ground traps. Based upon the number banded in the mist nets and general observations, the estimated total is determined to be 65. The BIC determines that all of the individuals captured in the ground traps were observed by standard observation methods and therefore, they do not add to the DST. The log sheets would be filled out as follows.

STANDARD COUNT PERIOD							NON STANDARD COUNT						TOTAL
Band	Recap	Census	VIS	Obs	Oth VIS	ET	Band MN +	Recap MN +	Band GT +	Recap GT +	Oth Vis +	Obs +	DST
25		10		40		65			15				65

3.4 Operating Guidelines

3.4.1. Mist Net Array

All mist nets used should be 30 mm, black mesh, 75d/2 ply thread, and tethered. All nets are set on guyed, 3 m high poles.

The standard mist net array for the spring and fall seasons is shown in Figure 3. Mist net specifications are detailed in Table 2. In addition to these nets, non-standard nets are allowed and must be indicated as such on all effort and species estimated total sheets. For example, nets may be useful to target specific species (such as Rusty Blackbird) or to test innovative capture techniques such as canopy nets.

Table 2. ACBO mist net specifications.

Net #	Length	Height	# of Panels	CF
1	12 m	2.75 m	4	1
2	12 m	2.75 m	4	1
3	12 m	2.75 m	4	1
4	12 m	2.75 m	4	1
5	12 m	2.75 m	4	1
21	12 m	2.75 m	4	1
22	18 m	2.75 m	4	1.5
24	12 m	2.75 m	4	1
25	12 m	2.75 m	4	1
26	18 m	2.75 m	4	1.5
6	12 m	2.75 m	4	1
7	12 m	2.75 m	4	1
8	12 m	2.75 m	4	1
9	12 m	2.75 m	4	1
23	12 m	2.75 m	4	1
10	12 m	2.75 m	4	1
11	12 m	2.75 m	4	1
12	12 m	2.75 m	4	1
13	12 m	2.75 m	4	1
14	12 m	2.75 m	4	1
27	12 m	2.75 m	4	1
15	12 m	2.75 m	4	1
16	12 m	2.75 m	4	1
17	12 m	2.75 m	4	1
18	18 m	2.75 m	4	1.5
19	12 m	2.75 m	4	1
20	12 m	2.75 m	4	1

CF = Correction Factor. To determine net hours, a 12 meter - 4 panel net is counted as 1 net and an 18 m – 4 panel net is counted as 1.5 net.

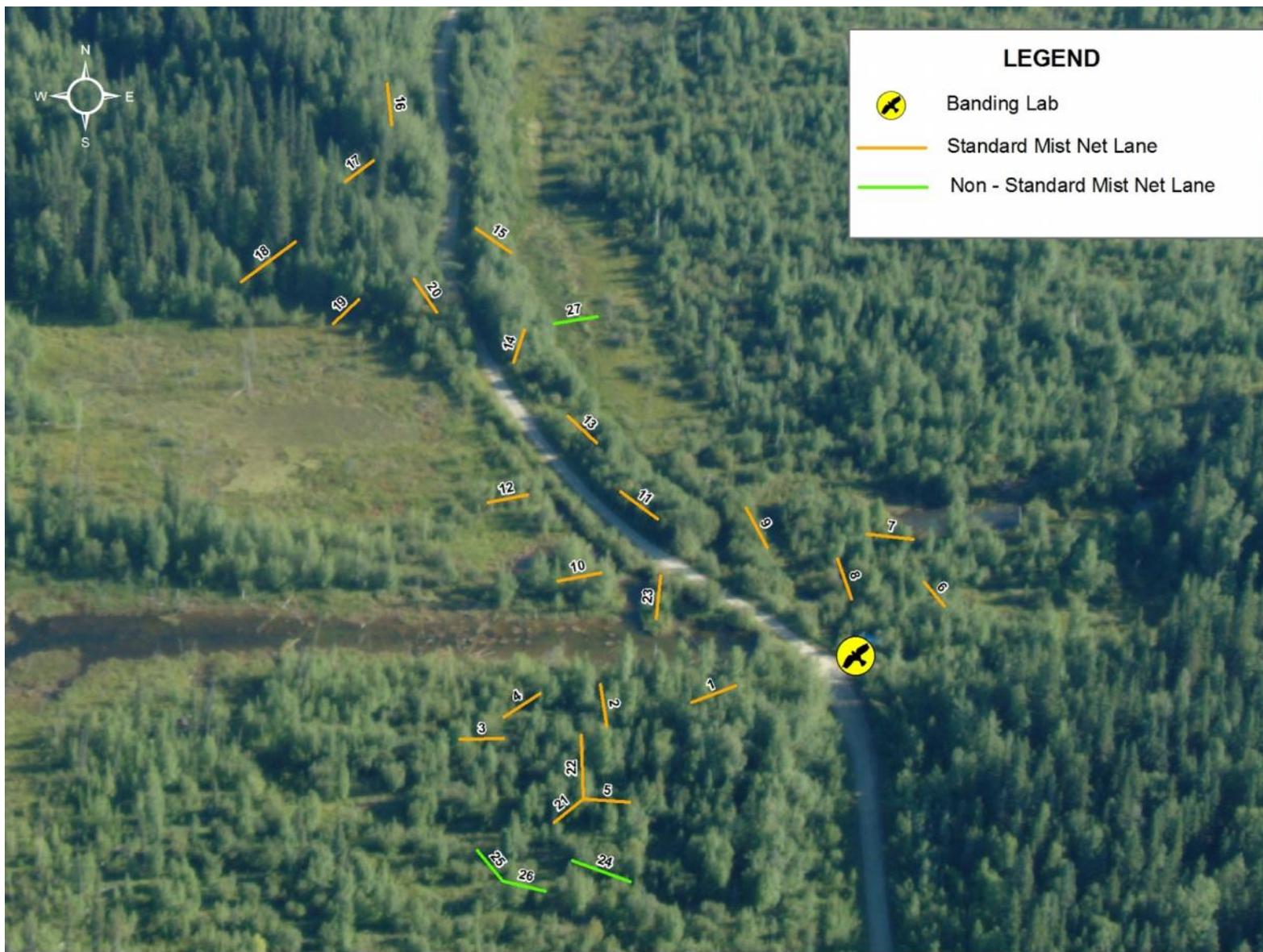


Figure 3. ACBO mist net array.

A total of 23 standard mist nets may be used on a daily basis (see Table 2). The opening and closing of nets shall be conducted in the same order each day and should progress in the following order with the nets farthest from the banding lab being opened first:

- The net loop which ends at nets 3 and 4 (start at net 3),
- The net loop which includes nets 6, 7, 8 and 9 (start at net 6),
- For the remaining nets, begin at net 15, progress around 16, 17, 18, 19, 20 loop and back along the road to the banding lab.

When opening the nets with multiple people, only two groups of net opening should be conducted simultaneously; one group should start at net 3 and the other group starting at net 15.

When closing nets at the end of the day, all nets should be closed in the same order as initially opened.

The number of nets used on a daily basis shall be determined by a number of factors including; number of qualified personnel onsite, bird activity and weather. The core group of 13 nets which shall be used on a daily basis as conditions allow include the following; 1, 2, 3, 4, 6, 7, 8, 9, 23, 10, 11, 12 and 13. Additional nets should be opened when conditions allow and should be done so at the discretion of the BIC. In the advent of unfavorable weather or a backlog of birds, all nets should be closed until the backlog of birds is processed or the weather improves. Should birds be released unbanded due to an excessive backlog of birds or other reason, the number of individuals should be recorded as “obs” on the daily log sheet. In the event that this occurs, a comment should also be made in the daily narrative as to the number and species released unbanded. In the event that birds initially banded as non-standard captures are located recaptured during standard count period, a comment shall be made in the ‘comment’ field of the recapture data sheet and the initial banding status will be changed to standard in the master database.

Only the standard nets should be operated during the standard period. Exceptions may be made in order to catch and document a rare bird or where the trapping involves non-target species (e.g. shorebirds, waterfowl) and does not affect the standard program. Birds caught during the standard period in non-standardized nets or traps (e.g. shorebird trap, by hand, etc.) must be denoted as NSB (non-standard banding) in the comments column on the banding sheets. These birds should also be included in the NSB – Band column of the log sheets.

Additional passerine netting after the normal closure time may be done at the discretion of the bander-in-charge. New bandings and recaptures outside of the standard Banding Period are denoted as NSB on the banding/recapture data sheets, respectively and entered into the NSB Band and NSB Recap columns of the daily log sheet. Any non-standard netting or trapping effort should be recorded on the daily log sheet, even if no birds are captured.

The use of bird seed within the count area is allowed only in the baited ground traps (spring only). Other means of attracting birds to the count area are not permitted with the following exception:

- Nocturnal audio-luring of owls is permitted during testing of the site for monitoring owls.

Should the above activity prove to be feasible at ACBO, future refinements to this protocol will be made.

3.4.2 Banding

All banding shall be conducted in adherence to the North American Bird Banding Manual (Gustafson et al 1997) and all aging and sexing of birds shall be made using the Identification Guide to the Identification Guide to North American Birds (Pyle 1997). Refer to Appendix 2 (field manual) for additional detail regarding the collection of banding data.

The safety of birds should be utmost importance during the mist netting and banding activities at ACBO.

Should any birds show signs of excessive stress upon extraction, they should be released immediately at the net and recorded within the “Obs” column of the daily log sheet. In the event that this occurs, a comment should also be made in the daily narrative as to the number and species released unbanded.

Data sheets to be used include the following: Original Banding Sheet, Recapture Sheet and Molt Sheet (see Appendix 3).

3.4.3 Visual Migration Counts

Currently, there is no protocol in place to conduct visual migration counts at ACBO; however, such counts may be conducted when conditions allow. In the event that watches are conducted, the duration of the counts and the primary observer shall be recorded. In the event that counts of an extended duration are conducted, the effort and birds observed should be split into one hour segments beginning/ending at the top of the hours. Any birds seen on visual counts shall be recorded in the standard “VIS” column on the log sheets.

Any incidental visual migrants observed (such as swans, geese or cranes) shall be recorded in the standard or non-standard “Oth VIS” column on the log sheet. All visual migrants recorded shall be

collected independently of other survey / banding activities at the station. In other words, any birds classified as “VIS” or “Oth VIS” cannot be recorded in other Estimated Totals categories.

To assign individual birds or flocks of birds as visual migrants (vis) , the observer is required to use reasonable judgment, however; the following guidelines will aid in making the determination.

- Any birds flying over the site without stopping shall be considered "vis" (this is typically in a northward direction in spring and southward direction in fall but may also be in other directions).
- In the case of small passerines, individuals seen moving through the vegetation at a fairly steady pace without prolonged periods of stopover shall be considered "vis".
- Birds (typically small passerines such as warblers) observed landing at the site, and leaving shortly after shall be considered "vis" despite stopping briefly.
- Any birds observed “dropping in” to the site and not leaving shortly after shall not be considered "vis".

Unidentified flycatchers, thrushes, sparrows, vireos and warblers should be recorded as such while conducting the visual counts. In the case of similar species in which a species specific identification cannot be determined, it is acceptable to record them as a combination of species. An example would be American Robin / Varied Thrush which in some instances can be difficult to identify.

3.4.4 Census Legs

To increase the collection of bird observations within the count area, a series of census legs are surveyed when adequate qualified personnel are onsite. The census routes are not given priority over the mist netting effort as incidental observations may also be collected while running the mist nets.

Each leg is intended to take 10 to 15 minutes and are to be completed within the first three hours of operation on as many days as possible. All birds counted on the census routes shall be recorded on the census field data sheet and summarized into the “Census” column of the ET sheets. Descriptions of each census leg is described below (ranked from highest to lowest priority (based upon site knowledge and habitats sampled):

- Leg #5
 - Starts at net 16 turn-off and goes north to the green flagging at the road split, and then comes back.
- Leg #3
 - Starts at the green flagging (on the right side of road as seen from the banding table) about 50 meters from the banding table. This leg follows the road to the top of the hill

and is meant to be walked both ways (there and back) in that 15 minutes. The turn around point is at double green flagging (on the right side).

- Leg #4
 - Also intended to be walked both ways and it follows the spruce forest trail. The start point is where the first big spruce trees are on the left side (not flagged) and the turn around point is at the two flags, one on each side of the trail.
- Leg #2
 - Starts at the banding table, follows the net 6, 7, 8 loop where try count the birds north of the spruce forest trail and on net 8 side of the slough. Along the trail to the gauntlet try to only count birds on that side of the main slough. It then goes to the south (left) end of 25/26. From there follow green flagging west to the marsh edge. Finish at double (or triple) flagging. This leg is little wet near the end so rubber boots are recommended.
- Leg #1
 - Starts at net 23 and follows the road to net 20, then follows the trail by nets 19, 17, 16, and finally the road back to net 15. At the start point, on your left, try to concentrate on the birds north of the main slough and, on your right, the nearby ones that are between the road and the slough on that side. Later count everything but try not to double-count near nets 20 and 15.

3.4.5 Other Observations

All birds that are observed during the count period, but are not included in the visible migration counts should be recorded in the other observations column (“Obs”) in the daily log. Opportunistic sightings of birds observed in migration flight shall also be included separately and recorded as “Oth Vis” in the daily log.

These include birds observed during net-rounds, and any other observations from within the count area outside of the visual migration watches. Other observations should be noted by the personnel onsite on the appropriate daily log sheet (Appendix 4).

3.5 Estimated Totals (ETs)

The Estimated Total (ET) is the best estimate of the number of individuals of each species detected in the count area during the standard count period. All personnel involved in the respective day’s activities shall share their observations with the BIC and help him/her to arrive at the ETs.

3.6 Overall Coverage Codes

Each day, an overall coverage code, ranging from 0 to 5, is assigned based on the actual effort during the count period (7.5 hours after sunrise) that day. The coverage code takes into consideration the number of observers and their skill levels (Table 3), as well as the overall counting and mist netting effort. The coverage codes and the criteria used to assign them, are described in Table 4. For the code to be assigned, **all the listed criteria must be met**. The aim should be to achieve Code 4 coverage as frequently as possible.

Table 3. Observer skill levels.

Class	Criteria
1	Able to identify over 90% of birds encountered.
2	Able to identify 75 to 90% of birds encountered.
3	Able to identify 50 to 75% of birds encountered.
4	Able to identify less than 50% of birds encountered.

Table 4. Criteria for assigning daily coverage codes.

Code	Coverage	Criteria
0	No coverage	
1	Casual	Casual observations and/or banding. Very limited or no visible migration count
2	Poor	At least one Class 1 or 2 observer active throughout count period; no or limited mist netting effort.
3	Fair	At least one Class 1 or 2 observer active throughout count period; mist netting may have been restricted by weather (maximum 78 corrected net hrs).
4	Good	At least one Class 1 or 2 observer active throughout count period; at least 78 corrected net hrs unless reduced due to backlog of birds.
5	Excellent	At least one Class 1 and one Class 2 or 3 observer active throughout count period; over 78 corrected net hrs unless reduced due to backlog of birds.

3.7 Additional Observations

The daily species total (DST) reflects the total number of birds of each species seen or heard in the area during the course of the entire day. The DST is determined by combining all birds encountered during the standard (Estimated Total) and non-standard monitoring data. Although not as standardized as the daily ET, the daily species total serves to record species detected outside the daily count period and also makes use of observations made later into the day by the observatory's personnel and volunteers.

3.8 Data Entry

The ACBO standard is to that all estimated total data will on an annual basis, be entered into the most current version of the CMMN's DET software. All other data will be entered in the Yukon Bird Observatories' Microsoft Excel / Access database. All applicable banding data will be provided to Environment Canada's Bird Banding Office on a yearly basis in a timely manner. Aside from data submission to Environment Canada to fulfill permit obligations, all relevant data will be provided to the Canadian Wildlife Service (Whitehorse) and the Yukon Bird Club for inclusion in seasonal bird sighting summaries, etc.

3.9 Personnel

At least two qualified people are required to obtain excellent coverage at ACBO, however; this protocol has been developed to allow for a lone qualified individual to achieve fair to good coverage during periods of favorable weather. It is understood that more than one qualified individual onsite would be the preferred option as is typically the case at other bird observatories. However, due to the relatively low number of qualified people in the Yukon, additional qualified personnel cannot be assured. Should the observatory be staffed by a lone individual, it is essential that the individual be a qualified and competent bander, and preferably also one with the identification skills to conduct migration watches.

All new personnel must familiarize themselves with the protocol. The BIC, generally the most experienced bander at the station, is responsible for overseeing all aspects of operations including trapping and data recording. Training and supervision of new personnel should be done solely by the BIC or by a person designated by him/her. All persons are expected to

participate in the routine maintenance of the station. The station manager is typically responsible for station setup/closure and data management/reporting duties.

6.0 Vegetation Management

In recent years, portions of the count area have begun to advance to a later successional state following historic disturbance of the site, primarily in the form of deciduous trees (birch, cottonwood, aspen) becoming larger. This effect is limited to a small number of net lanes and the maintenance of an early successional state is currently not feasible. The majority of the core mist nets are located in riparian habitats dominated by shrubs; these areas have seen little change since the station was started approximately 10 years previously. At this time, vegetation management at ACBO is limited to the pruning of vegetation adjacent to net lanes and the trimming of ground cover along access trails throughout the site.

To track changes in vegetation height and composition within the netting area, photographs of the net lanes have been taken in the past and from 2014 onwards, will be taken on an annual basis.

7.0 Literature Cited

- Badzinski, D.S. and C. M. Francis. 2000.** An evaluation of species coverage by the Canadian Migration Monitoring Network. Prepared by Bird Studies Canada.
- Gahbauer, M.A. and M.-A. R. Hudson. 2004 (revised 2007).** McGill Bird Observatory Field Protocol for Migration Monitoring Program.
- Gustafson, M. E., J. Hildenbrand and L. Metras. 1997.** The North American Bird Banding Manual (Electronic Version). Version 1.0
- Milko, R., L. Dickson, R. Elliot and G. Donaldson. 2003.** Wings over water: Canada's waterbird conservation plan. Prepared by Environment Canada (Canadian Wildlife Service).
- Pyle, P. 1997.** Identification Guide to North American Birds – Part 1 (*Columbidae to Ploceidae*). Slate Creek Press, Bolinas, California.
- Wojnowski, J.K., G.C. Gibson, A.E. Heagy, B.J. Rodrigues and D.J.T. Hussell. 2000.** Field Protocol for Migration Monitoring at Thunder Cape Bird Observatory. Prepared for Ontario Ministry of Natural Resources.

Appendix 1
SPRING AND FALL DAILY COUNT TIMING

Date	Sunrise	Count Period Start Time	Mist Net Open	Mist Net Close	Count Period End (Approximate)
18-Apr	609	545	600	1200	1330
19-Apr	606	545	600	1200	1330
20-Apr	603	545	600	1200	1330
21-Apr	600	545	600	1200	1330
22-Apr	558	530	545	1145	1345
23-Apr	555	530	545	1145	1345
24-Apr	552	530	545	1145	1345
25-Apr	549	530	545	1145	1345
26-Apr	546	530	545	1145	1345
27-Apr	543	515	530	1130	1330
28-Apr	540	515	530	1130	1330
29-Apr	537	515	530	1130	1330
30-Apr	535	515	530	1130	1330
01-May	532	515	530	1130	1330
02-May	530	515	530	1130	1330
03-May	526	500	515	1115	1315
04-May	524	500	515	1115	1315
05-May	521	500	515	1115	1315
06-May	519	500	515	1115	1315
07-May	516	500	515	1115	1315
08-May	514	445	500	1100	1300
09-May	512	445	500	1100	1300
10-May	510	445	500	1100	1300
11-May	507	445	500	1100	1300
12-May	504	445	500	1100	1300
13-May	501	445	500	1100	1300
14-May	459	430	445	1045	1245
15-May	457	430	445	1045	1245
16-May	455	430	445	1045	1245
17-May	452	430	445	1045	1245
18-May	449	430	445	1045	1245
19-May	447	430	445	1045	1245
20-May	445	430	445	1045	1245
21-May	443	415	430	1030	1230
22-May	441	415	430	1030	1230
23-May	439	415	430	1030	1230
24-May	437	415	430	1030	1230
25-May	435	415	430	1030	1230
26-May	433	415	430	1030	1230
27-May	431	415	430	1030	1230
28-May	429	400	415	1015	1215
29-May	427	400	415	1015	1215
30-May	425	400	415	1015	1215
31-May	424	400	415	1015	1215
01-Jun	423	400	415	1015	1215
02-Jun	421	400	415	1015	1215

Date	Sunrise	Count Period Start Time	Mist Net Open	Mist Net Close	Count Period End (Approximate)
03-Jun	420	400	415	1015	1215
04-Jun	419	400	415	1015	1215
05-Jun	417	400	415	1015	1215
06-Jun	416	400	415	1015	1215
07-Jun	415	400	415	1015	1215
08-Jun	414	345	400	1000	1200
09-Jun	413	345	400	1000	1200
10-Jun	412	345	400	1000	1200

Date	Sunrise	Count Period Start Time	Mist Net Open	Mist Net Close	Count Period End (Approximate)
23-Jul	454	430	445	1045	1215
24-Jul	456	430	445	1045	1215
25-Jul	459	430	445	1045	1215
26-Jul	501	445	500	1100	1230
27-Jul	503	445	500	1100	1230
28-Jul	505	445	500	1100	1230
29-Jul	508	445	500	1100	1230
30-Jul	510	445	500	1100	1230
31-Jul	512	445	500	1100	1230
01-Aug	515	500	515	1115	1245
02-Aug	517	500	515	1115	1245
03-Aug	519	500	515	1115	1245
04-Aug	522	500	515	1115	1245
05-Aug	524	500	515	1115	1245
06-Aug	527	500	515	1115	1245
07-Aug	529	500	515	1115	1245
08-Aug	532	515	530	1130	1300
09-Aug	534	515	530	1130	1300
10-Aug	536	515	530	1130	1300
11-Aug	539	515	530	1130	1300
12-Aug	541	515	530	1130	1300
13-Aug	544	515	530	1130	1300
14-Aug	546	530	545	1145	1315
15-Aug	549	530	545	1145	1315
16-Aug	551	530	545	1145	1315
17-Aug	553	530	545	1145	1315
18-Aug	556	530	545	1145	1315
19-Aug	558	530	545	1145	1315
20-Aug	601	545	600	1200	1330
21-Aug	603	545	600	1200	1330
22-Aug	605	545	600	1200	1330
23-Aug	608	545	600	1200	1330
24-Aug	610	545	600	1200	1330
25-Aug	613	545	600	1200	1330
26-Aug	615	600	615	1215	1345
27-Aug	617	600	615	1215	1345
28-Aug	620	600	615	1215	1345
29-Aug	622	600	615	1215	1345
30-Aug	625	600	615	1215	1345
31-Aug	627	600	615	1215	1345
01-Sep	629	600	615	1215	1345
02-Sep	632	615	630	1230	1400
03-Sep	634	615	630	1230	1400
04-Sep	636	615	630	1230	1400
05-Sep	639	615	630	1230	1400
06-Sep	641	615	630	1230	1400

Date	Sunrise	Count Period Start Time	Mist Net Open	Mist Net Close	Count Period End (Approximate)
07-Sep	644	615	630	1230	1400
08-Sep	646	630	645	1245	1415
09-Sep	648	630	645	1245	1415
10-Sep	651	630	645	1245	1415
11-Sep	653	630	645	1245	1415
12-Sep	655	630	645	1245	1415
13-Sep	658	630	645	1245	1415
14-Sep	700	645	700	1300	1430
15-Sep	702	645	700	1300	1430
16-Sep	705	645	700	1300	1430
17-Sep	707	645	700	1300	1430
18-Sep	710	645	700	1300	1430
19-Sep	712	645	700	1300	1430
20-Sep	714	645	700	1300	1430
21-Sep	717	700	715	1315	1445
22-Sep	719	700	715	1315	1445
23-Sep	721	700	715	1315	1445

Appendix 2
FIELD MANUAL

Albert Creek Bird Observatory
Field Manual

Table of Contents

1.0	Introduction	3
2.0	Data Collection.....	3
3.1	Daily Log Sheet.....	3
3.2	Banding Sheet	5
3.3	Recapture Sheet.....	8
3.4	Molt Sheet.....	8

1.0 Introduction

The purpose of this field manual is to provide the field crew members of ACBO with a guide with which to collect data during the spring and fall migration seasons. This manual will deal primarily with the daily log sheets and the banding sheets to explain how the data shall be collected and scribed onto the respective data sheets.

2.0 Data Collection

2.1 Daily Log Sheet

The personnel and visitors section shall be filled out in the field to ensure accurate times are recorded. Additionally, all times shall be recorded to the nearest 5 minute interval.

The following outlines the scoring system used to collect weather data.

Wind Direction – record as N, NE, E, SE, S, SW, W or NW prevailing wind direction

Wind Strength – shall be recorded using the Beaufort Scale as outlined in the table below

Scale	Ground Speed (km/h)	Description	Specifications
0	0 – 2	Calm	Smoke rises vertically.
1	2 – 6	Light air	Direction of wind shown by smoke drift.
2	6 – 11	Light breeze	Wind felt on face, leaves rustle.
3	10 – 19	Gentle breeze	Leaves and small twigs in constant motion.
4	19 – 30	Moderate breeze	Raises dust and loose paper, small branches moved.
5	30 - 39	Fresh breeze	Small trees in leaf begin to sway, crested wavelets form on inland waters.
6	39 - 50	Strong breeze	Large branches in motion, umbrellas used with difficulty.
7	50 - 61	Near gale	Whole trees in motion, inconvenience felt when walking into the wind.
8	61 - 74	Gale	Twigs break off of trees, generally impedes progress.
9	74 - 87	Severe gale	Slight structural damage
10	87 - 100	Storm	Rare inland, trees uprooted, considerable structural damage,

Visibility – shall be recorded using the following relative measures:

- Excellent
- Good
- Poor
- Very Poor

Cloud Cover – approximation to the nearest 10%

Temperature – measured to the nearest degree

Precipitation – shall be recorded using the following codes

0 = None	0 = None
1 = Trace rainfall	1S = Trace snowfall (few flurries)
2 = Light rainfall (drizzle)	2S = Light snow flurries
3 = Moderate, steady rainfall	3S = Moderate snowfall
4 = Heavy Rain	4S = Heavy snowfall

The daily narrative should be filled out at the end of each day's activities and may include a synopsis of the day's activities including a brief synopsis of bird migration. Also to be included are any interesting notes regarding visitors or station maintenance activities.

For the mist net data sheets, all times should be recorded as accurately as possible. For the opening and closing of nets, the time the first net was open / closed shall be recorded for all corresponding nets. This will provide an accurate count of mist net effort so long as the nets are opened and closed in the same order.

On both the visual migration watch and incidental observation data sheets, all observations should be recorded as soon as possible in the tally section. And the end of the daily count, all tallies shall be summed and recorded in the appropriate box. Upon summation of the observation data, this information can be scribed on the ET species tables along with the day's banding and recapture data. Note that all observers from each day should be involved in the estimation of the day's ET data.

2.2 Banding Sheet

The following explains the methods for data collection involving the primary banding sheet.

Banders – be sure to include the full name and initials for each bander on the respective banding sheet.

Band Numbers – take extreme care to ensure the first and last band numbers are recorded correctly on the banding sheet. At the start and finish of each page, be sure to scribe the full band number legibly.

Species – record the 4 letter code for the respective species. Should the same species follow the first scribing of the species code, then do not rewrite the codes. In such instances, a line should be written through the species box to ease later data entry. An exception to this rule is the first bird of the day (on each banding sheet) which should always be rewritten regardless of whether or not the last bird of the previous day was the same species.

Net – the net number should be recorded for all birds captured. Upon extraction from the mist nets, a number pin should be placed on the bag ties from each net. After arriving at the banding location, the birds should be processed in the order of extraction. Exceptions to this rule include the capture of large birds of species which become easily stressed such as woodpeckers and kingfishers.

Age and sex – the age and sex codes should be recorded using the following coding system.

0 = Unknown

1 = AHY

2 = HY

4 = L

5 = SY

6 = ASY

7 = TY

8 = ATY

0 = Unknown

4 = Male

5 = Female

For each bird, a code describing the method of aging and sexing should be recorded for all birds using the following codes.

1 = Plumage

2 = Skull

3 = Eye Color

4 = Wing Length

5 = Cloacal Protuberance

6 = Brood Patch

7 = Mouth/bill

8 = Culmen Length

9 = Retrice Shape

Wing – the un-flattened wing length (wing chord) should be recorded in millimeters.

Weight – the weight may be recorded in grams using a digital scale with 0.1 g increments.

Fat Score – the 7 point fat scoring system should be used with the following codes

0 = None

1 = Trace

2 = Light

3 = Half

4 = Filled

5 = Bulging

6 = Greatly Bulging

7 = Excessively Bulging

Cloacal Protuberance – should a bird have a CP, the relative size of the CP should be ranked using the following criteria.

0 = None (cloaca not enlarged)

1 = Small (cloaca somewhat enlarged and noticeably swollen, shape is such that it is widest at the base and narrowest at the tip. Care should be used with this ranking as it can be difficult to ascertain.

2 = Medium (cloaca protuberance large, diameter fully as large near the tip as at the base).

3 = Large (cloaca protuberance very large with a diameter considerably larger in the middle than at the base.

Brood Patch – similar to a CP, all brood patches should be ranked using the following codes

0 = None (no brood patch)

1 = Smooth (lower breast feathers and abdomen feathers lost, some vascularization present but overall, the area is rather smooth and dark red).

2 = Vascularized (vascularization evident, some wrinkles present and some fluid under the skin giving the area a pale, opaque, pinkish color).

3 = Heavy (vascularization extreme, thickly wrinkled and much fluid under the skin. This is the maximum extent of the brood patch and is present when the bird is incubating eggs).

4 = Wrinkled (vascularization mostly has disappeared and the fluid under the skin mostly gone. The skin retains many thin, dry looking wrinkles).

5 = Molting (vascularization and fluid buildup gone, new pin feathers present).

Moult – this space is reserved for recording basic information regarding a bird’s moult using the following codes. Note that this information is supplementary and should only be recorded when time and/or bird volume allows.

B = Body
H = Head
T = Tail
W = Wing

GC = Greater Coverts
MC = Median Coverts
LC = Lesser Coverts
A = Alula

A ranking of juvenal plumage may also be recorded in the moult section using the following codes.

3 = Full (full juvenal plumage)
2 = Greater (more than half of juvenal plumage remains, mostly appears like a juvenile)
1 = Less (less than half of juvenal plumage remains)
0.5 = no juvenal plumage remaining, but formative feathers still growing in
0 = None (no juvenal plumage)

Status- the status of each bird shall be recorded using the following codes (only some of the more common codes shown). Should consecutive birds have the same status, a line should be drawn through the status box.

300 = normal wild bird, federal numbered leg band only
301 = normal wild bird, colored leg band
500 = sick, exhausted, injured, crippled or deformed with federal numbered leg band
501 = sick, exhausted, injured, crippled or deformed with colored leg band

Date – the month and day should be recorded at the top of each banding sheet and then a line should be drawn through the date boxes for each corresponding banding record.

Time – the time should be recorded as the time each respective net round was started. On each banding sheet, the first time of each net round should be recorded with a line being recorded in the time box for each bird from the net round.

Intl – the bander’s initials should be recorded for each bird banded. Be sure that the initials match the bander’s name and initials at the top of the page. Do not rewrite the bander’s initials, rather use a line in the corresponding field, except for the first bird of each day.

Trap – record the method of capture for each bird, this should typically be MN (Mist Net). Do not rewrite the trap, rather use a line in the corresponding field, except for the first bird of each day.

Tail & PP – these measurements may be recorded in special circumstances when such data may be valuable. These fields are particularly useful in terms of the *Empidonax* flycatchers.

NSB – include a checkmark in this box for all birds banded outside of the daily count period (non standard banding).

Comments – include any additional information of interest in this field.

2.3 Recapture Sheet

The methods for data collection on the recapture sheet are similar to the original recapture sheet with the following exceptions.

- Take extreme care to accurately record the full band number for all birds, especially those which are not repeats from the current season.
 - In the case of repeats, a line may be drawn beneath the portion of the previous band number with the same digits.
- The age, sex and wing length are supplemental data on the recapture sheet.

2.4 Molt Sheet

As with the recapture sheet, take care to record the band number accurately for all birds which are molt scored. To assign molt scores for each feather, use the codes in the attached diagram which uses a scoring system of 0 (old feather) to 5 (complete new feather). Also note that the scores of the primary and secondary feathers are the priority scores.

Appendix 3
BANDING SHEETS

Appendix 4
DAILY LOG SHEETS

ALBERT CREEK BIRD OBSERVATORY

Daily Log Sheet

DATE	
------	--

DAILY COVERAGE CODE	
---------------------	--

Personnel	Initials	Code	Time	Hours Onsite	
				Standard	Non-Standard
BIC-					

Visitors	Origin	Time	Total Hours

Weather	Count Period				Synopsis
	Start	Mid	End	Dusk	
Wind Direction					
Wind Strength					
Visibility (km)					
Cloud (%)					
Temperature (°C)					
Precipitation					

Daily Count Timing					
Designated Start	Delayed Start Due To ?	Actual Start	Nets Open	Nets Close	End

Total Birds Banded	
Total Species Banded	
Total Birds Recaptured	

Total Species Band & Recap	
Total Species Detected	
SEASON BANDED TOTAL	

Rare Bird Bandings / Sightings	Bird Mortalities / Injuries

Daily Narrative (description of migration activity, visitors, station maintenance, etc)

DATE	
------	--

Net #	Net Length (m)	Standard Count Period									Non Standard Corrected Net Hrs
		Open	Close	Open	Close	Open	Close	Total Hrs	Correction Factor	Corrected Net Hrs	
1	12								1		
2	12								1		
3	12								1		
4	12								1		
5	12								1		
21	12								1		
22	18								1.5		
6	12								1		
7	12								1		
8	12								1		
9	12								1		
23	12								1		
10	12								1		
11	12								1		
12	12								1		
13	12								1		
14	12								1		
15	12								1		
16	12								1		
17	12								1		
18	18								1.5		
19	12								1		
20	12								1		
24	18								1.5		
25	12								1		
26	12								1		
27	12								1		
TOTAL											

GROUND TRAP EFFORT				** Remember to separate GT captures in ET sheets **
# OF TRAPS	OPEN	CLOSE	TOTAL TRAP HRS	

