FIELD PROTOCOL FOR THE

SPRING MIGRATION MONITORING PROGRAM

INNIS POINT BIRD OBSERVATORY

Innis Point Bird Observatory

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Contents

1. Introduction

Innis Point Bird Observatory (IPBO) is located at the west end of the city of Ottawa, along the Ottawa River, near Shirley's Bay, in Ontario, Canada (just 16 km west of Parliament). The address is 6th Line Rd and Cameron Harvey Dr., Ottawa, Ontario and the coordinates are 45°23'14.7"N 75°53'42.1"W. The site is restricted access Department of National Defense (DND) land that forms part of the Connaught Range and Primary Training Centre (CRPTC) (see Appendix A). IPBO members access with permission through a locked gate at the intersection of Cameron Harvey Drive and Sixth Line Road. All members may access only through prior arrangement with the IPBO.

IPBO began in 1982 and operates through most of the year. The Spring Migration Monitoring Program (SMMP) is one of just several programs IPBO runs. A standardized SMMP has been conducted since 1997.

The aim of SMMP is to contribute data useful for documenting regional-level change in abundance of migrant species. Such trends are especially valuable for boreal-breeding species that are not well-monitored by other surveys.

Trends are useful only if based on standardized data, collected consistently from day to day and year to year. It is important to follow this Procotol, which describes how SMMP data should be collected (based on Hussell and Ralph 1996).

The Spring Migration Monitoring Program consists of standardized banding, a standardized census, general observations of birds and, for each species the calculation of a standardized Estimated Daily Total (EDT).

EDT data are archived with the CMMN of Birds Canada; banding data are submitted to and archived with the CWS Bird Banding Office as well as with Birds Canada.

2. Staffing

SMMP at IPBO requires at least three Class 1 observers to run the full program (Table 1); at least one of these must be a licensed bander and capable of acting as the Bander-in-Charge (BIC). The permit or sub-permit of the BIC must be present and displayed on site at all times.

Volunteers not essential to the banding program at any particular moment are encouraged to make more or less continuous observations in the count area (see Section 4 and Figure 1).

If insufficient staff are available on a particular day to run the full protocol (i.e., to run all net groups plus the census), the top priority is the census, followed by as many net groups as possible, with general observations being the lowest priority. If the BIC is the only person available and qualified to conduct the census, then nets must be temporarily closed for the duration of the census and all birds captured prior to the census must be processed prior to commencing the census. An exception may be made if an appropriately experienced extractor and/or bander is present who

can maintain net checks in the absence of the BIC. When rain or high winds make banding impossible, staff should spend more time making general observations.

Volunteers should be assigned responsibilities commensurate with their skills, knowledge and experience. The BIC should be provided with a list of all volunteers that may assist with the SMMP each year and should refer to this in assigning tasks. The list should be updated as needed. Training to bring individuals up to required skill levels should largely be done outside the SMMP, although specific training opportunities that do not interfere with the protocol are likely to arise during the program and should be capitalized on. Larger groups of visitors unfamiliar with banding or the Innis Point protocol should be scheduled only when sufficient experienced staff are available to show them the site and explain the banding and monitoring program without any detriment to ongoing work. If a group is already onsite and there is a large influx of birds, the group must be asked to stand aside if needed, to ensure data collection and bird safety are not compromised.

Depending on the given year, an intern may be available for an uninterrupted period of the season. The intern will shadow the BIC in all aspects of the SMMP; the intern should be given priority in terms of opportunities for training, whenever protocol operations permit this.

Table 1. Definitions for observer class

Observer class	Description
1	Can correctly identify 75% or more of species likely to be encountered at Innis Point (about 165 species}, based on a good view for 5-10 seconds, without recourse to a field guide
2	Can correctly identify 25%-75% of species likely to be encountered at Innis Point (from 55 to 165 species), based on a good view for 5-10 seconds
3	All other active observers

3. SMMP Dates

The standard coverage period 24 April to 7 June each year. Unavoidable changes of start or end date longer than a week should be documented in Section 8.

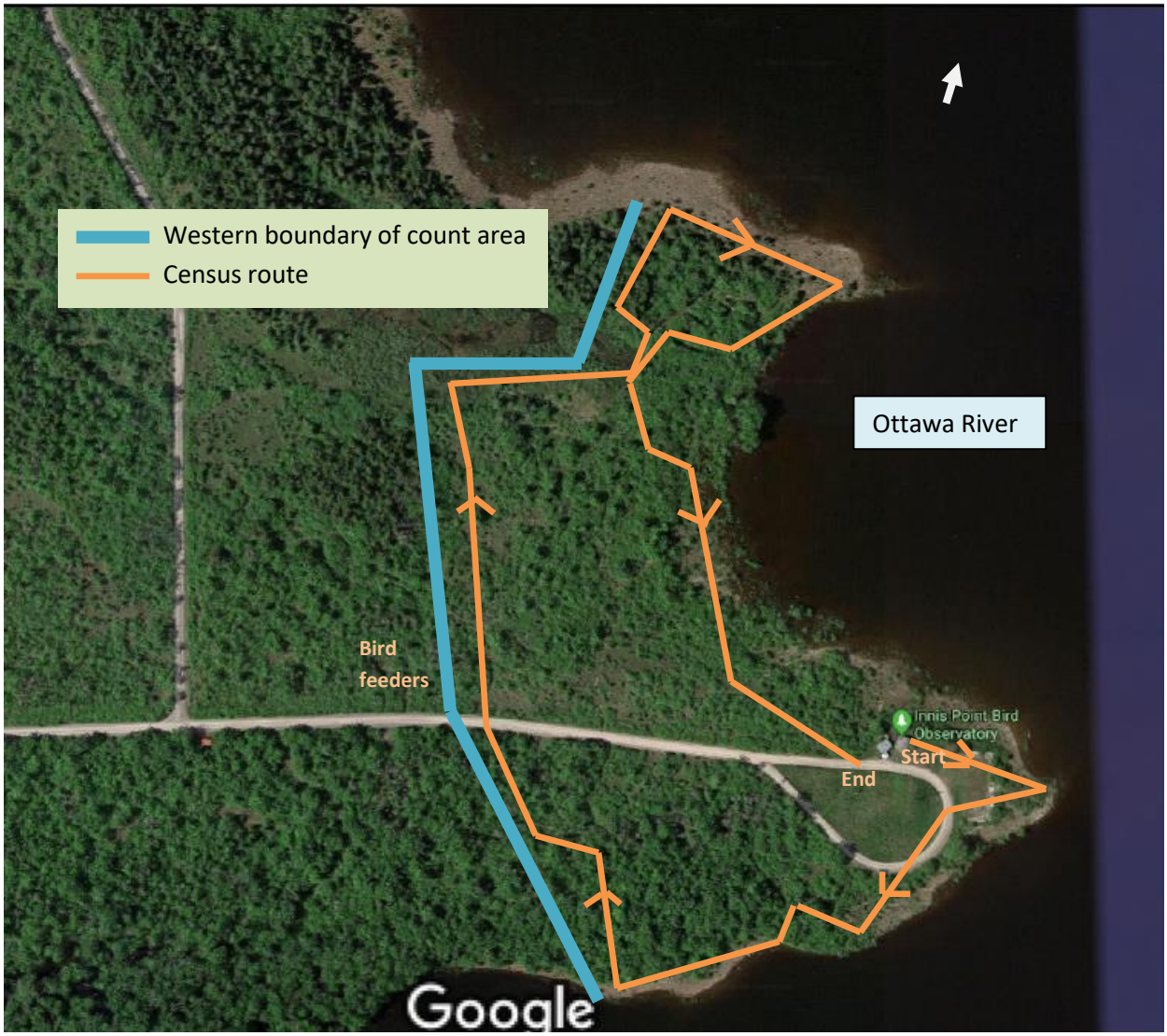

Figure 1. Overview of the Innis Point Bird Observatory site indicating the boundary of the count area (blue line) and the census route (orange line). Table 2 presents a list of GPS coordinates for key features in the count area.

Table 2. GPS coordinates for key features in the IPBO count area and along the census route (to be added in 2022)

Location	UTM coordinates
Main building	
Bird feeders	
Census start	
Census end	

4. Count Area

The count area consists of most of the "lower" area of Innis Point, an area of roughly 5 ha (see Figure 1). As indicated in Figure 1, the count area is bounded on the north, east and southeast by the Ottawa River, on the south by a line running diagonally from the South Bay towards Road South, and on the west by a line running from between the bird feeder area and from there to a point slightly west of the Swamp net line (see Table 2).

For the purposes of the Census, General Observations and EDTs, any and all birds visible or audible to an observer who is within this area may be counted whether the bird is inside or outside the zone (and no matter how far outside the zone the bird is). On the other hand, if an observer is outside the count area, no birds detected as being either inside or outside the zone are countable.

5. Daily Count Period

The daily count period begins 30 minutes before sunrise and concludes 7 hours later, i.e. 6 1/2 hours after sunrise. Weather permitting, nets start to be opened as soon as the count period begins and start to be closed 6 hours later. In other words, the closing net round normally begins 5 1/2 hours after sunrise or 1 hour before the end of the count period. Nets are normally closed in the same order in which they were opened.

Table 3. Summary of key events during the Count Period, in relation to sunrise

Event	Timing relative to sunrise	Example: 26 April	Example: 31 May
Count period begins	1/2 hour before sunrise (rounded to nearest 5 minutes)	5:30	4:50
Nets start to be opened	same as above	5:30	4:50
Sunrise		5:59	5:18
Census starts	1 hour after sunrise	7:00	6:20
Census ends	2 hours after sunrise	8:00	7:20
Nets start to be closed	5 1/2 hours after sunrise	11:30	10:50
Count period ends	6 1/2 hours after sunrise	12:30	11:50

The tally of Estimated Daily Totals cannot begin until all birds captured in the closing net round have been processed and released. In some cases, all birds may have been processed up to a half hour before the end of the count period. Ordinarily, the extra time available should be used for general observations. However, when just a few minutes remain before the end of the count

period, the start of the EDT tally may begin. When this occurs, any additional General Observations made before the count period ends should be added to the EDT sheet.

The standardized census (Section 7) begins one hour after sunrise, i.e., 1 1/2 hours after the count period begins.

An "extended banding period" applies when weather or other factors prevent banding throughout the first 6 hours, but weather is okay for banding during the last hour of the count period (when nets would ordinarily be closed). In this case, nets may be left open for the last hour of the count period. More precisely, the amount of additional banding that may take place is the lesser of (1) the time lost or (2) one hour.

Since general observations are being made during the last hour of the count period in any case, any birds detected during the "extended banding period" are of course part of the Estimated Daily Totals. However, no birds detected after the count period ends may be included in EDTs. This refers in particular to the case when banding and the count period end simultaneously and staff actually closing nets outside the count period may be seeing additional birds.

6. Census

In the event that the full program cannot be done on a given day, completion of the census is the highest priority. It can be done in all weather, and provides the most consistent long-term daily index of birds present in the count area each day. The census takes 60 minutes and follows a fixed route. The census starts 1 hour after sunrise (i.e., 1 1/2 hours after the count period begins) The start of the census may be delayed by up to one hour if required by weather, or in order to process captured birds safely. The census should be completed all at once (i.e., it is better to close nets for an hour if required to avoid interruption), but in case of emergency interruption, the census can be resumed from the place it was halted as soon as possible, with start and end times of each portion noted on the daily log sheet.

The censuser must take along binoculars and a notebook and pencil to record observations. A spotting scope is not to be used on the census: distant water birds can readily be checked with a scope during General Observations. The censuser should record observations as he or she proceeds, keeping them clearly separate from General Observations made during other parts of the day. It is advisable that the census results be entered onto the EDT sheet as soon as the census is complete. The census should be done by a Class 1 observer (see Table 1). Observers should be rotated among available personnel (BIC or volunteer), so the same person is not doing the census every day. If the BIC is the only qualified person available on a given day, the BIC must do the census. In order to do so, either:

1) the nets must be closed temporarily, in advance of the census start time, or

2) the nets may be left open only if there is a volunteer available who is capable of monitoring the nets (i.e. experienced in extraction and handling and processing any birds that need immediate attention).

If additional volunteers are interested, particularly those who are not class 1 observers, a second person may join in the census, but one is fully adequate and more than three is probably counterproductive.

The census route begins just outside the banding station (see Figure 1 and Table 2) and proceeds clockwise. Markers (coloured flagging) show where the census route runs. When the water level of the River is especially high, the portion of the route from Swamp onwards may have to move inland as far as is required to allow passage on foot (rubber boot depth).

The censusser should focus mainly on landbirds: he or she should spend no more than about 10 minutes checking the river for ducks, shorebirds etc. On a given day, the censusser may spend more time than usual at spots on the route that are "busy" that day, but to compensate he or she must spend less time at other spots. All parts of the route must be given at least some attention, and the full length of the route must be covered within one hour.

The censusser counts anything detected from the route, whether the bird is inside or outside the count area. He/she may step off the path up to 10 metres to see a bird more clearly, may retrace his or her steps up to 10 metres for the same reason and may "pish" to attract birds. However, the use of any recorded sounds or other devices of any sort is forbidden. Pishing in the immediate vicinity of open mist nets (i.e., within about 10 metres) is also prohibited.

7. Netting

There are 24 nets in 10 net line locations (Figure 2 and Table 4). Unless warranted by exceptional circumstances (e.g. flooding), all nets in a group should be opened and closed at the same time.

All nets are 4-shelf, tethered, black, polyester nets with 30 mm mesh of 75 denier and 2 ply, deployed to a height of about 2.5 metres. All nets are 12 metres in length, except that the 3 outermost Swamp nets and Middle Swamp are 9 metres. All nets have generous "pockets".

Figure 2. Closer view of IPBO showing net lane locations. Abbreviations for net lanes are as follows: SH = shore; OP = Outer Point; NP = Inner Point; FL= Flicker; PR = Parallel Road; RS = Road South; OR = Oak Ridge; SW = Swamp; MS = Middle Swamp; SE = Swamp East. Table 4 presents a list of GPS coordinates for each net.

Table 4. GPS coordinates for nets at IPBO (to be added in 2022).

Net name	Net code	Point	UTM coordinates
Shore	SH	a	
		b	
Outer Point	OP	a	
		b	
Inner Point	NP	a	
		b	
		c	
Flicker	FL	a	
		b	
Parallel Road		a	
		b	
Road South	RS	a	
		b	
Oak Ridge	OR	a	
		b	
		c	
		d	
Swamp West	SW	a	
		b	
		c	
		d	
Middle Swamp	MS	a	
		b	
Swamp East	SE	a	
		b	

Opening and closing times must be recorded on the log sheet on the basis of each net line (for a sample log sheet, see Appendix B). Times should also be recorded on the chalkboard in the banding lab as nets are opened and closed (including temporary closures and reopenings). The serves as a safeguard to ensure that nets have not been inadvertently left open. Captures are recorded in the data sheets by specific net line. Cloth pegs marked with net line initials are available for keeping track of bags brought back during busy periods.

In the unusual event that some nets must be closed temporarily or not opened at all due to weather or flooding, the Bander-in-Charge should select at random which group(s) will be operated. This avoids introducing a bias in coverage that favours either the most productive nets or those easiest to monitor. Weather conditions that warrant keeping nets closed include temperatures below 0°C when a net is damp or wind causing the net to billow excessively. For example, SH and OP nets are exposed on the water and frequently must be closed due to wind. OR nets are often flooded mid-season.

Nets are checked every 30 minutes. on slow capture days with average weather (neither hot nor cold, no precipitation, calm winds). On a typical net round with at least 3 personnel, one person might visit

the close nets (nets closer to the banding building, up to and including nets RS and PR), while the other checks the far nets (OR and the Swamp area); the third person should go to whichever net area has recently proven busiest. A bird in net RS should never be removed and carried to the far nets by the person headed there.

During the SMMP period, no other mist nets, and no ground traps, are used inside the Count Area. No artificial food sources are provided for any species inside the zone during the SMMP. This includes the Bird Feeder area, which is stocked only outside of the SMMP period.

Banding

Processing Birds Captured for Banding

The information routinely obtained for each bird captured during SMMP is indicated below. The standard identification reference for most species is Pyle (1997), supplemented for non-passerines not covered in Pyle by North American Bird Banding Techniques. Data routinely recorded for all newly-banded birds, returns and foreign recoveries include:

- Band number
- Species
- Age and how aged
- Sex and how sexed
- (Unflattened) wing chord
- Weight
- Initials of person recording data
- Initials of bander
- Time of banding (not capture or release, if different), rounded down to the nearest 10 minutes
- Date
- Location (two-letter code for net line)
- In the "Comments" column, any additional relevant information (e.g., feather loss not attributable to moult)

Banders will routinely check for CP and BP, and attempt to age (SY vs. ASY, etc.) where possible. Any flight feather moult should be recorded, though this will apply to few species in spring. Skulling is optional and would normally be resorted to only when time is available and other ageing criteria are conflicting or uncertain.

In addition, if time permits, at the discretion of the BIC, the following information may be recorded. However, this supplementary information should not be recorded if routinely doing so would require other elements of the protocol to be scaled back:

- presence and extent of fat (0-7 scale based on Ralph et al. 1993);

- presence and nature of parasites;
- any other information of interest.

Data for newly banded birds are recorded in one binder while data for recaptures and foreign recoveries is recorded in a separate binder. Band numbers for all return captures and foreign recoveries must be confirmed by a second individual.

Repeats are birds previously encountered during the SMMP (or within the past 3 months); only the date of recapture is recorded, unless one or more of the following apply, in which case a complete set of data is taken and recorded in the "Returns" binder:

- new information on sex or age is available (e.g., appearance of BP or CP on recapture);
- the bander believes ageing or sexing or any other data collected previously was in error;
- additional supplementary information is available.

Birds that are recaptured for a second or additional time on the same day are released without any additional data being collected, unless the bander wishes to correct or supplement data taken earlier.

1. Bird Safety

Bird safety is a top priority at all times. Every effort is to be made that operations are designed to ensure the safety and welfare of birds by minimizing the risk of stress and injury. The Bander's Code of Ethics can be viewed at:

https://www.canada.ca/en/environment-climate-change/services/bird-banding/resources-banders-researchers/permit-holders-instructions.html#toc0

Birds captured in mist-net for processing are kept in clean cloth bags, one per bag. Bags should be carried so as to minimize disturbance to the bird inside (away from vegetation, minimal swinging motion, larger birds apart from smaller birds etc.). After a net check, all captured, bagged birds are placed on the labelled hooks (according to net lane where captured) in the building. Similarly, larger, active birds should be hung so they are not able to disturb adjacent birds. Any birds needing more immediate attention (e.g. smaller birds that cannot thermoregulate as well in a confined space or a bird with an injury) should be pointed out to the BIC.

The maximum time a bird should spend awaiting banding and processing, starting from the time of extraction to the time of removal from the bag, should ideally be no more than 30 minutes, and never more than 60 min. Any birds kept that long should be released unbanded (keeping track of numbers of each species). However, steps should be taken to prevent a large backlog from building up. In cases where large numbers are captured at once, some birds may need to be processed with minimal information recorded (minimally, species and band number, but preferably wing chord and weight as well). Temporary closure of some nets may also be required.

If a bird injury occurs, the condition of the bird should be immediately assessed by the BIC. If the injury is minor (e.g. cut tongue, wing strain), the individual should be placed in a bird bag in a quiet place, without further processing, for a short period (e.g. 10-15 minutes). It should then be rechecked and released if possible. If an injured individual does not recover in this time (e.g., one with persistent wing strain), it should be taken to the Wild Bird ·Care Centre, 734 Moodie Drive, Nepean, Ont. (just south of the main Stony Swamp parking lot). The phone number at the Centre is (613) 828-2849. Follow up on the individual is possible by phoning the Centre. If an injury is serious enough to warrant immediate euthanasia (e.g. serious open wounds sustained in a predator attack), the primary preferred method for smaller birds is manual cervical dislocation

The injury must be fully documented on the Daily Log Sheet (see Appendix B). In the event of a mortality, all details surrounding the incident should also be recorded on the Daily Log Sheet.

2. Human Safety and Emergencies

Human safety is another key priority. Details relating to access and arrangements with the Range Control office in charge of the site are given in Appendix A. The phone number for Range Control is posted in the building by the door. Any emergency situation should be reported to Range Control immediately. Any instructions provided by them must be adhered to. Non-emergency situations can be reported to Bill Petrie. His contact information is also posted in the building.

There are radio devices that can be used for communication among the staff present on any given day. These are to be kept charging when not in use.

3. General Observations

"General Observations" refers to observations of birds in the count area that occur apart from banding and outside the census itself. The General Observations tally is independent of either banding or the census. All birds detected during general observations should be recorded, even if they may have been counted also during banding or on census; likely overlaps will be sorted out during wrap-up at the end of the coverage period.

Staff are encouraged to make more or less continuous observations throughout the count period. More observations can and should be made when banding is slower, and when extra observers are available. Additional observations are especially important when rain or wind preclude banding. Conversely, when banding is very busy, there may be limited time for general observations.

"Pishing" may be used to attract birds for observation. However, as with the census, no recorded sounds or other devices may be used and there should be no pishing within about l 0 metres of open mist nets.

Staff should take advantage of the clipboard inside the banding building or the chalkboard to record miscellaneous observations during the course of the day. This is particularly important if the observer does not carry a notebook during the count period, or is likely to leave the site before the Estimated

Daily Totals are tallied. Records left on the clipboard should indicate the approximate time and general location of the sightings, and anything notable about them that will make it easier for staff to arrive at accurate EDTs. Any observations made outside the count area should be clearly marked as such, since these may appear on the daily log sheet, but will not be part of the EDTs. Since observers will normally remain inside the count area during the count period, outside observations will be primarily those made by people coming in from outside Innis Point at the start of the count period.

Do not immediately post any observation of a rarity to any social media forum. Because of the restricted nature of access to the site, it is unwise to broadcast the location of a rarity that may attract unacceptable approaches to the DND/PSPC requesting access to IPBO. Sightings of rare or unusual species can be broadly publicized only after the bird is known to have left the area.

4. Estimated Daily Totals (EDT)

Estimated daily totals are tallied by all present at the end of the daily count period. As one of the key sets of data captured by the SMMP, EDTs must be done in a consistent manner according to the protocol. A sample EDT record sheet is provided in Appendix C.

The EDT, as for Census and General Observations, includes any and all birds visible or audible to an observer who is within the Count Area boundaries (Figure 1). Any observations made while observer is outside the count area may be recorded in the appropriate section of the daily log, but will not be included in EDTs.

The EDT coordinator will often be the BIC, or at least an experienced individual appointed by the BIC. To facilitate a smooth EDT tally, the totals of newly banded birds, repeats and returns, and the results of the census, should already have been entered on the EDT sheet before the tally begins. Otherwise, they must be entered on the EDT sheet during the tally itself. Note that, for purposes of the EDT, the figures for banding, repeats and returns may be considered as a group (i.e., there is no possible duplication among the three). The rare occurrence of a foreign recovery should be recorded on the EDT sheet as a return, with an asterisk pointing to an explanatory footnote.

Everyone should be present for the EDT. One of the reasons for having all involved is to encourage discussion and uniformity of approach. To help avoid any duplication of census observations with banding and general observations, it is highly desirable that the censusser be available for the EDT compilation. As noted earlier, observers leaving the station before the EDT tally should record their observations on the clipboard for inclusion under General Observations.

Starting with the first species on the EDT list, the EDT coordinator asks for general observations. Anyone present who saw or (reliably) heard individuals of the named species from the count area during the count period will state the maximum number of individuals they detected. At this stage, birds detected by banding or on the census are ignored. Other persons detecting this species join in with their reports. Where more than one individual observed the species, a brief discussion focuses on the time, location, direction of movement (and if relevant, the behaviour) of the birds detected, in order to arrive at a consensus estimate of the unduplicated total of the number of birds observed during the count period.

Size of flocks that were not counted carefully should be estimated. In general, estimates should be conservative, but not too conservative. Do not include birds known or suspected to have been in the area but not actually detected.

After consensus is reached, the coordinator may read aloud the figures (if any) for individuals banded, repeats, returns and detected on the census. Whenever a species is detected by more than one method (i.e., through more than just netting, or census or general observations), discussion among all observers will sort out the best collective estimate as to the number of different individuals involved. The resulting figure, the Estimated Daily Total for that species, is recorded in the EDT column.

While the EDT tally may sound time-consuming, volunteers quickly get used to providing information in an efficient and complete manner, so that the average EDT tally need take only about 10- 15 minutes.

The EDT figure for a species cannot exceed the sum of general observations, banding and census. However, the EDT will often be less than the sum of those figures, in order to avoid double counting.

Note that the last column on the sheet is KSR, or Known Stopover/Resident. This column is not required, but represents additional information that can allow stopover or resident individuals to be deducted from totals for subsequent analyses. Only individuals judged to be residents or stopovers with at least 80% certainty are recorded as such.

Example of EDT for one species

The EDT coordinator calls "Yellow Warbler". Anyone who detected Yellow Warblers during general observations (i.e., excluding birds seen from banding or on the census) report the maximum number they detected. Joe says that he saw 30, Nancy reports 20 and Gerald 5. A discussion of the time, place, and movement of these birds results in agreement that there were likely 40 warblers involved. The total of General Observations is thus 40. The coordinator reports that 3 were banded, there was 1 repeat and 10 were seen on the census. The coordinator, or the persons who extracted or banded the warblers note that the 3 warblers banded were at Swamp East, whereas no other Yellow Warblers were observed in the Swamp area today. The repeat Yellow Warbler from Inner Point, however, was likely one of the pair which Nancy and Joe both saw there. Gerald the censuser decides that 5 of those he saw were likely not among those referred to during either General Observations or banding. Hence, the consensus EDT figure for Yellow Warblers is 48 (40+3+5).

5. Coverage Codes

Recording an accurate coverage code facilitates subsequent analysis of the data; this information is recorded on the daily log (see Appendix B). Each day, the objective is to achieve the highest coverage code possible given weather conditions.

The coverage code applies only to the count period as a whole, including the "extended banding period" referred to earlier. The coverage code is not affected by any banding or observations made outside the count period.

Actual coverage codes are recorded according to the guidelines in Table 5. See Table 1 for observer class definitions.

Table 5. Coverage codes

Code	Term	Description
	None	No bird coverage at all during the count period.
	Casual	No census or EDT. Some non-standard banding during the count period.
2	Poor	Census and EDT, minimal banding if any. One or more of the following apply: (1) Only 1 Class 1 observer (not necessarily a bander) who is active throughout count period. (2) Observation period incomplete (i.e., less than the count period specified in the protocol). (3) Less than 50% banding coverage due to weather and/or lack of competent personnel (i.e. only 1 or 2 competent individuals).
3	Fair	Census and EDT, incomplete banding if any. Either or both of the following apply: (1) Only 2 Class 1 observers active throughout count period. (2) Banding coverage restricted by weather to 50%-75% of full coverage (except that a reduction below this range is acceptable if due to excessive capture rate).
4	Good	Census, EDT and at least 3 Class 1 observers active throughout count period. Banding coverage restricted by weather to between 75% and 95% of full coverage (except that a reduction below this range is acceptable if due to excessive capture rate).
5	Excellent	Census and EDT. At least 3 Class 1 observers active throughout count period. Banding coverage at least 95% of full period (except that a reduction below 95% is acceptable if due to excessive capture rate).

To distinguish coverage lost due to weather from that lost due to understaffing, record also the "Maximum Coverage Code" that would have been attained if fully trained staff and Class l observers had been available. The actual code for a day cannot, of course, exceed the maximum code for that day.

Actual and Maximum Coverage Codes -- Example 1

There is full banding coverage today, the census and EDTs are completed, but there are only 2 Class l observers and 1 Class 2 observer on hand. The actual coverage code is 3; the maximum coverage code (if unlimited staff were available) is 5.

Example 2

All the nets were shut down after 2 hours today due to rain, and could not be re-opened. There were 3 Class 1 observers on hand all day. The census was run, there were lots of general observations and the EDT was calculated. The actual coverage code is 2. The maximum coverage code is also 2.

6. Daily Log Sheet

The SMMP Daily Log Sheet (Appendix B) must be filled out every day. The data must be collected and recorded carefully to be of any use. Completing the log should not be viewed as a chore, but as an integral part of the day's activities.

The BIC must ensure that the daily log is filled out completely. However, it is the responsibility of everyone on site to provide information for the log, and to record it as the day progresses and time permits. The log sheet should be completed at the end of the count period, though when there is any monitoring activity beyond the count period further information should be added to the log later in the day. Staff leaving the site before the end of the count period may use the clipboard for general observations and to record miscellaneous items to be added to the daily log.

Among other details, the daily log records:

- date
- times of net openings and closings
- actual and maximum coverage codes
- staff present (including for what time periods)
- hours of active general observations by each staff member (excluding time concentrating on extractions and actual banding, and excluding the census time for the censusser),
- the names of the BIC and censusser(s),
- unusual occurrences
- early and late records
- evidence of migration
- casualties
- notes about station maintenance
- military activity in Area 7
- personnel changes
- general highlights of the day; and
- any additional relevant information.

To help determine the coverage code, the daily log records the observer class (Table 1) for all staff present who are actively engaged in the monitoring program for at least part of the day. Each person determines to what class he or she belongs. The observer class refers solely to "birding" skills, not banding skills.

It is particularly important that any departure from the normal SMMP protocol, and its cause(s), be recorded on the log. In general, an informative narrative of the day's events is much more valuable than a minimal, uninformative one.

Weather Data

Key weather information should be recorded three times each day: at the end of the opening round (or, if nets are not opened immediately, at the time the opening round would normally end), at the beginning of the census and at the end of the closing round. The key variables are temperature, wind direction, wind strength (according to the Beaufort scale; see Table 6), percentage of cloud cover,

visibility and any precipitation (including whether it was intermittent or continuous, heavy or light etc.). There should also be a general summary of the weather during the count period and preceding 12 hours.

If the weather has made it necessary to deviate from the protocol, the log must describe precisely why, how and for how long.

The height of the river is measured in metres as the horizontal distance from the surveyor's mark (located on the rocks just east of the Shore net line) to the nearest part of the river, along a line parallel to the axis of the Shore net. The measurement will be positive if the river is below the surveyor's mark and negative if the river is above the mark.

Table 6. The Beaufort Wind Scale

Force No.	Description	Signs	K.P.H.	M.P.H.
0	calm	Smoke rises.	0-2	0-1
	light air	Smoke drifts but no wind-vane movement	3-5	1-3
2	slight breeze	Wind felt on face; leaves rustle.	6-11	3-7
3	gentle breeze	Leaves and twigs in constant motion; wind extends a light flag.	12-20	7-12
4	moderate breeze	Dust and loose paper are raised; small branches are moved.	21-29	12-18
5	fresh breeze	Small trees in leaf begin to sway.	30-39	18-24
6	strong breeze	Large branches in motion; whistling in wires.	40-50	24-31
7	high wind	Whole tree in motion.	51-61	31-38

Records management

All daily count data must be entered by the BIC or a person designated by the BIC into CMMN's DET software and submitted to Birds Canada for analyses and archiving. In addition, a folder of any habitat assessment photos taken that year should be submitted. If there were any additions to Section 8 of this protocol, a copy of that section must be submitted.

Banding records are entered into BandIT by the BIC or a person designated by the BIC. All IPBO banding records are submitted at year end to the Banding Office of the Canadian Wildlife Service.

7. Habitat

Monitoring vegetation changes and documenting site conditions generate important background information on bird-habitat associations and habitat changes that may alter the numbers and species of birds present within the count area. Beginning in 2021, IPBO will implement standardized habitat assessments that follows the requirements set out by the CMMN for participation in the Trend

Monitoring Program (TMP). These assessments will be modelled on the Monitoring Avian Productivity and Survivorship (MAPS) habitat assessment protocol.

Habitat monitoring, including photographic records of site conditions, should be carried out once every five years, beginning in 2021. To simplify the schedule for monitoring, the first period will be only 4 years, with the second assessment taking place in 2025. Photographs will be repeated sooner if drastic changes have occurred to the Count Area.

Photographs of the vegetation

Photographs of the vegetation surrounding each SMMP net line and specific points along the census route will be taken in the first week of May. Two photographs are to be taken at each net line, one from each end and directed along the length of the nets; the objective is to capture the habitat surrounding each net lane. For nets with an arrangement that is not a single orientation (e.g. Oak Ridge), each orientation must be photographed separately.

The locations from which to take the photographs that are necessary for habitat assessment are based on the UTM coordinates for each mist-net given in Table 3. To take each photograph, standing facing the length of the net line (or section of net line in the case of NP, OR or SW), step away from the net pole approximately 2 metres, then aim the camera in the required direction to take the photograph. Because some net lanes are longer (e.g. NP or SW), it is not always possible to get the entire net lane in frame, but as much of the net as possible should be in the photograph.

The photo files are to be named using the following convention:

- All file names start with the letters IPBO, followed by
- Net name (two letter code); orientations (based on which end of the net lane) defined as a-d (see Figure 2 and Table 3)
- Date of photograph in the format DDMMYYYY.

An example is IPBO_ORa_02052019.

For the habitat assessment to be as detailed and accurate as possible, several other photographs should be taken in the count area: one of the lawn in front of the banding station, taken from the doorway of the building, as well as several along the daily census route, at the locations indicated in Table 2. Census route photographs are taken at the coordinates in Table 2 while face forward as if proceeding on the census route. The names for these photo follows the convention above, replacing the three letter code for net location with the words "lawn", or "census-start", "census-a" (as per Figures 1 and 2) etc.

Each set of photos from a given year should all be kept in one folder named "IPBO site photos [YEAR]". A copy of this folder is to be sent to info@ipbo.ca, and another copy is to be sent to Birds Canada along with the data submission for the year.

Habitat assessments

A formal habitat assessment following the MAPS protocol will be carried out once every 5 years beginning in 2022, with the exception of the first period which will be only 3 years to align to the decades. An additional assessment should be performed whenever there has been a significant change to the count area. Habitat assessments are to be carried out in June, after the completion of the SMMP.

The habitat in IPBO's Count Area has minimal slope, and is located on a riparian zone along the Ottawa River. There are no ridges, and therefore no aspect. The habitat in the Count Area has not been logged or experienced other major disturbances in the time since IPBO began migration monitoring in 1997; it is occasionally subjected to some minor management from Public Works/Department of National Defence, who maintain the access roads and site in general. It is poorly-drained, and experiences variable flooding in the spring. In the spring of 2019, most of the netting area was covered with water from April until migration monitoring ended for the season at the end of June.

A new station map depicting the exact location of the mist nets, trails and banding station, as well as the census route, should be prepared each year that a habitat assessment is carried out. The Google Earth image can serve as the basis for this map. The map should clearly outline the different habitat types within the count area. A habitat type must make up 2.5 ha of area to be considered separately from other types, and currently the mixed semi-open shrub and short tree habitat is the only sort meeting this criterion. Nonetheless, habitat assessments must not be based on the results of a past assessment: each time, the area must be carefully considered anew.

Once the habitats have been defined and delineated, a Habitat Structure Assessment (HSA) Form is completed for each habitat. This form is based on the MAPS HAS form H1, but some of the sections on that form specific to MAPS stations and have been adapted. This form includes descriptions of permanent or semi-permanent non-vegetative features (specifically, the gravel road). Copies of 'Monitoring Avian Productivity and Survivorship (MAPS) Habitat Structure Assessment (HAS) Protocol: describing vertical and horizontal spatial habitat patterns at MAPS stations' (Dr. Philip Nott, Dr. David F. Desante, and Nicole Michel, The Institute for Bird Populations, 2003) and the relevant data sheets will be kept with the hard copy of this study protocol at IPBO. They are also available at: https://www.birdpop.org/pages/mapsDataForms.php. Please refer to these materials for instructions on how to properly complete the datasheet.

The habitat assessment results are to be saved in a folder labelled "IPBO Habitat assessment [YEAR]". Within that folder, save the habitat photographs (labelled according to the conventions above) and scanned copies of the Habitat Structure Assessment Form (HSA). Each habitat will have its own HSA form: save each one as "IPBO Habitat Structure Assessment form [YEAR] habitat [HABITAT DESIGNATION]", e.g. for the dominant habitat in 2021, the file name will be 'IPBO Habitat Structure Assessment form 2021 habitat A".

A copy of the habitat assessment folder is to be sent to info@ipbo.ca. Another copy will be submitted to Birds Canada along with year-end submission of bird data.

Habitat maintenance

Ongoing habitat maintenance should be carried out as needed in the netting area prior to the spring migration monitoring season and in the fall (prior to saw-whet owl banding).

Around the nets, vegetation should be trimmed back approximately two or three feet from the nets, to the height of the nets (just over 2.6 m). In strong winds, the nets should be able to billow straight out without catching on any twigs, branches, or leaves.

8. Record of changes or major interruptions in standardized data collection

Changes or interruptions to operations should be recorded here if they are likely to have affected the consistency of the long-term data set. The purpose is to alert researchers to issues that may affect the appropriate use and interpretation of the data set. Examples include change in dates or daily hours of coverage, or gaps of a week or more in coverage (e.g. due to lack of personnel or site access).

Instructions for record keeping

If any standardized operational change or notable interruption occurs, enter details into the table below under any previous entries. Refer to parts of the text that were changed (e.g. section number, altered locations on a map, new GPS points). Revise the 'latest version' date on page 1 of this protocol. If changes have been made to the protocol other than adding to the table below, submit a copy of the entire revised protocol to Birds Canada along with year-end data submission; otherwise, send only a copy of the table.

Date	Description of change and justification (if applicable)
2019	No spring migration monitoring due to flooding
2020	No spring migration monitoring due to COVID
2021	No spring migration monitoring due to COVID

9. References

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Hussell, David J.T. and C. John Ralph. 1996. *Recommended methods for monitoring bird populations by counting and capture of migrants. Report for the Intensive Sites Technical Committee of the Migration Monitoring Council.* [online.] Available at http://www.rsl.psw.fs.fed.us/pif/migmon.html. [1996, February 15].

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McCracken, J .D., D.J .T. Hussell and E.H. Dunn. 1993. *A manual for monitoring bird migration. Long Point Bird Observatory*. Port Rowan, Ontario.

Murphy, B. 1997. *Analysis of 15 years of spring migration monitoring data at Innis Point, 1982-1996*. Unpublished manuscript, Innis Point Bird Observatory, Kanata, Ontario.

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Ralph, C. J., G. R. Geupel, P. Pyle, T. E. Martin, and D. F. DeSante. 1993. Handbook of field methods for monitoring landbirds. USDA Gen. Tech. Rep. PSW-144. USDA Forest Service, Pacific Southwest Research Station, Albany, CA.

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APPENDICES

Appendix A. Access to the Monitoring Site

The Innis Point Bird Observatory (IPBO) is situated in access-controlled "Areas 6 and 7" of Department of National Defense (DND) lands that form part of the Connaught Range and Primary Training Centre (CRPTC).

The DND grants IPBO members access to Areas 6 & 7 on the understanding that, among other things, IPBO will respect and maintain the security of areas at all times.

IPBO staff with permission to sign out keys from CRPTC must take all necessary steps to preserve and enhance good relations with the DND. In particular, IPBO staff must:

- Ensure that the main gate is locked at all times unless an authorized IPBO keyholder is stationed there temporarily to control access, or an appropriate DND official at the gate explicitly states that the gate should be left open;
- Report suspicious activity or apparent breaches of security to the relevant authorities. The appropriate phone numbers are posted in the main banding building;
- Adhere to such additional conditions as the DND may specify from time to time;
- Deal considerately with CRC and other authorized users of Areas 6 & 7;
- Be considerate of the needs of DND personnel on site, while ensuring that the integrity of the SMMP and the study site are protected
- This includes recognizing that not all DND visitors to the site may be aware of the presence of the bird observatory;
- Ensure that any visitors to the bird observatory respect these norms;
- Generally, avoid any activity or behaviour that would tend to bring IPBO into disrepute.

The IPBO arrangement with the DND is entirely distinct from agreements between the DND and the Ottawa Field-Naturalists Club (OFNC) and the Ottawa Duck Club regarding access for those groups to other portions of CRPTC property.

Appendix B. Sample Daily Log Sheet

Innis Point Bird Observatory
Spring Migration Monitoring Program
Daily Banding Log

DOW Mon | Day 21 | Mon May | Year 2018

Day Number 28

Gate Opening	4:45
Actual Coverage Code	5
Maximum Coverage Code	5

	Start	Stop
Count Period	04:55	11:55
Census	06:25	07:25

BIC	DOT
Census by	FB & JMN
Daily Log by	DOT

Observers	Begin Time	End Time	Hours Observing (excluding census)	Class
GB	04:55	11:55	4	1
FB	↓	↓	4	1
LB			4	1
JMN			2	3
DOT			1	1
CMB	8:30	11:00	3	2

	Species	Individuals
Banded	15	34
Repeats	12	14
Returns	6	6
Census	37	
Gen. Obs.	59	
EDT	66	
SMMP Cumulative Totals		
Banded	63	1040
Returns	17	51
EDT	143	

Visitors and Others:

Complete Net Line Openings and Closings

Net Group	Net Line	Time Opened	Time Closed
A	SH - Shore (2)	5:05	11:20
	OP - Outer Point (2)	5:10	11:15
B	NP - Inner Point (4)	↓	11:10
	FL - Flicker (2)	↓	11:15
	RS - Road South (1)	5:15	11:05
C	PR - Parallel Road (2)	5:05	11:30
	OR - Oak Ridge (3)	5:10	11:20
D	SW - Swamp (4)	5:15	11:00
	MS - Middle Swamp (2)	5:20	11:10
	SE - Swamp East (2)	5:20	11:15

Partial Net Line Closings and Reopenings ☑ None

Net Group	Net Line		Time Closed	Time Reopened
B (max 2)	NP - Inner Point (1)			
	RS - Road South (1)			
D (max 2)	SW - Swamp (1)			
	MS - Middle Swamp (2)			
	SE - Swamp East (1)			

Net Groups Randomly Selected? ☐ No ☐ Yes

Deviations from Protocol:

Daily Banding Log

DOW	Day	Mon	Year	Day Number
Mon	21	May	2018	28

Weather Summary:

Still need the tuque at 5:00 then really nice morning.

	End of Usual Opening Round	Beginning of Census	End of Count Period
Time	5:20	6:25	7:25
Wind Direction	ϕ	W	W
Wind Strength	ϕ	1	1
Cloud Cover %	10	ϕ	ϕ
Temp. (°C)	8	10	12
Precipitation	ϕ	ϕ	ϕ

Distance (m) of River east (+) or west (-) of marker: 1,5m.

Station Notes

Narrative: a new volunteer (yonet) come for the 1st time, she get prepare before coming (reading protocols and other documents I had shared on the FB page ☺)

Bird Migration: Flock of Warblers (YEWA, MYWA, MAWA ...)
CEDW are quite rare now.
1 EWCS.

Newly-arrived and Unusual Species:

Station Management: Boardwalk improvements (CHB & family, FB, GB)

Birds Outside Count Zone: Eastern Kingbird

Military Activity:

Other Flora and Fauna: Raccoon, deers

Injuries and Casualties: EAPH couldn't fly away (right wing injured)
CHB brought it to the Bird Sanctuary

Activity Outside Count Period:

Appendix C. Sample EDT Log Sheet

Innis Point Bird Observatory - Spring Migration Monitoring Program
Estimated Daily Totals

1 of 2

DOW	DAY	MONTH	YEAR	DAY #
Mon	21	May	2018	28

CENSUS BY: FB

EDT Recorded by: DoT

COUNT PERIOD: Start: 4:55 Stop: 11:55

Species	Obs	Cens	Bnd	Rep	Ret	EDT	KSR
Red-throated Loon							
Common Loon	2					2	
Pied-billed Grebe	1	1				1	
Horned Grebe							
Red-necked Grebe							
Double-crested Cormorant	8					8	
American Bittern	1					1	
Least Bittern							
Great Blue Heron	5					5	
Green Heron							
Black-crowned Night Heron	2					2	
Brant							
Canada Goose	15	10				20	
Snow Goose							
Wood Duck							
American Green-winged Teal							
American Black Duck							
Mallard	8	3				8	
Northern Pintail							
Blue-winged Teal							
Northern Shoveler							
Gadwall							
American Wigeon							
Canvasback							
Redhead							
Ring-necked Duck							
Greater Scaup							
Lesser Scaup	4	2				4	
scaup species							
Long-tailed Duck							
Black Scoter							
Surf Scoter							
White-winged Scoter							
Common Goldeneye							
Barrow's Goldeneye							
Bufflehead							
Hooded Merganser	2					2	
Common Merganser							
Red-breasted Merganser							
merganser species							
Turkey Vulture	1					1	
Osprey	4					4	
Bald Eagle							
Golden Eagle							
Northern Harrier							
Sharp-shinned Hawk							
Cooper's Hawk							
Northern Goshawk							
accipiter species							
Red-shouldered Hawk							
Broad-winged Hawk							
Red-tailed Hawk							
Rough-legged Hawk							
buteo species							
American Kestrel							
Merlin		1				1	
Peregrine Falcon							
Gyrfalcon							
falcon species							
Gray Partridge							
Ring-necked Pheasant							
Wild Turkey	5					5	
Sub-total							

Species	Obs	Cens	Bnd	Rep	Ret	EDT	KSR
Ruffed Grouse							
Virginia Rail							
Common Moorhen							
American Coot							
Sora							
Black-bellied Plover							
Semipalmated Plover							
Killdeer							
Greater Yellowlegs							
Lesser Yellowlegs							
Solitary Sandpiper							
Spotted Sandpiper	5	1		1		5	
Upland Sandpiper							
Ruddy Turnstone							
Red Knot							
Semipalmated Sandpiper							
Least Sandpiper	5					5	
Dunlin							
Short-Billed Dowitcher							
Common Snipe							
American Woodcock							
Bonaparte's Gull							
Ring-billed Gull	8	4				8	
Herring Gull	2					2	
Glaucous Gull							
Great Black-backed Gull							
gull species							
Caspian Tern							
Common Tern	2	1				2	
Arctic Tern							
Black Tern							
Rock Dove							
Mourning Dove	1					1	
Black-billed Cuckoo							
Eastern Screech-Owl							
Great Horned Owl							
Long-eared Owl							
Barred Owl							
Snowy Owl							
Great Gray Owl							
Northern Saw-whet Owl							
Common Nighthawk							
Whip-poor-will							
Chimney Swift							
Ruby-thr. Hummingbird							
Belted Kingfisher	2					2	
Red-headed Woodpecker							
Red-bellied Woodpecker							
Yellow-bellied Sapsucker							
Downy Woodpecker	4	2		2		4	
Hairy Woodpecker							
Three-toed Woodpecker							
Bl.-backed Woodpecker							
Yellow-shafted Flicker	5	3				5	
Pileated Woodpecker							
Eastern Wood-Pewee							
Yellow-bel. Flycatcher							
Alder Flycatcher							
Traill's Flycatcher			1			1	
Willow Flycatcher							
Least Flycatcher							
empidonax species							
Sub-total							

Innis Point Bird Observatory - Spring Migration Monitoring Program
Estimated Daily Totals

DOW	DAY	MONTH	YEAR	DAY #	OBSERVERS FOR EDT
Mon	21	May	2018	28	

Banding Data Computerized	
EDT Sheet Computerized	

Species	Obs	Cens	Bnd	Rep	Ret	EDT	KSR
Eastern Phoebe	1		1			2	
Great Crested Flycatcher	8	2	2		1	8	
Eastern Kingbird							
Olive-sided Flycatcher							
Horned Lark							
Purple Martin							
Tree Swallow	4	4				4	
Nor. Rough-winged Swallow							
Bank Swallow							
Cliff Swallow							
Barn Swallow	1	1				2	
Gray Jay							
Blue Jay	30				1	30	
American Crow	6					6	
Common Raven	4					4	
Black-capped Chickadee	10	5				10	
Boreal Chickadee							
Red-breasted Nuthatch							
White-breasted Nuthatch							
Brown Creeper							
House Wren	2	1				3	
Winter Wren							
Golden-crowned Kinglet							
Ruby-crowned Kinglet							
Blue-gray Gnatcatcher							
Eastern Bluebird							
Veery	2	1	1	1	1	4	
Bicknell's Thrush							
Gray-cheeked Thrush							
Swainson's Thrush							
Hermit Thrush							
Wood Thrush	1					1	
American Robin	4	1				4	
Gray Catbird	6	3	2	1		8	
Northern Mockingbird							
Brown Thrasher	6	3	1	1		6	
American Pipit							
Bohemian Waxwing							
Cedar Waxwing	6	12				15	
Northern Shrike							
European Starling	3					3	
Blue-headed Vireo							
Warbling Vireo							
Philadelphia Vireo							
Red-eyed Vireo		2				2	
Golden-winged Warbler							
Brewster's Warbler							
Tennessee Warbler	5		4			6	
Orange-crowned Warbler							
Nashville Warbler	1					1	
Northern Parula							
Yellow Warbler	12	6	3	2	1	15	
Chestnut-sided Warbler	6	4	2	1	1	8	
Magnolia Warbler		1	1			1	
Cape May Warbler							
Black-throated Blue Warbler	1					1	
Myrtle Warbler	3	2	6	1		10	
Black-throated Green Warb.							
Blackburnian Warbler							
Pine Warbler							
Sub-total							

Species	Obs	Cens	Bnd	Rep	Ret	EDT	KSR
Western Palm Warbler							
Yellow Palm Warbler							
Bay-breasted Warbler							
Blackpoll Warbler							
Black-and-white Warbler	6	3				8	
American Redstart	4	3	6	1		12	
Ovenbird							
Northern Waterthrush		2		1		3	
Connecticut Warbler							
Mourning Warbler							
Common Yellowthroat	1	2	1			4	
Wilson's Warbler	1	2				3	
Canada Warbler							
Scarlet Tanager	1					1	
Northern Cardinal	1					1	
Rose-breasted Grosbeak	1					1	
Indigo Bunting							
Eastern Towhee							
American Tree Sparrow							
Chipping Sparrow							
Clay-colored Sparrow							
Field Sparrow		1				1	
Vesper Sparrow							
Savannah Sparrow							
Fox Sparrow							
Song Sparrow	10	8		1		15	
Lincoln's Sparrow							
Grasshopper Sparrow							
Swamp Sparrow		1				1	
White-throated Sparrow	2	2		1	1	4	
Eastern White-crowned Sp.	1		1			1	
Gambel's White-crowned Sp.							
Slate-colored Junco							
Lapland Longspur							
Snow Bunting							
Bobolink							
Red-winged Blackbird	20	8	2			20	
Eastern Meadowlark							
Rusty Blackbird							
Common Grackle	5	12				15	
Brown-headed Cowbird	2					2	
Orchard Oriole							
Baltimore Oriole	5					5	
Pine Grosbeak							
Purple Finch							
House Finch							
Red Crossbill							
White-winged Crossbill							
Common Redpoll							
Hoary Redpoll							
Pine Siskin							
American Goldfinch	2	1				3	
Evening Grosbeak							
House Sparrow							
Sub-total							
TOTAL			34	14	6		
NUMBER OF SPECIES	59	37	15	12	6	66	