PRINCE EDWARD POINT BIRD OBSERVATORY

MIGRATION MONITORING PROTOCOL

Last updated January 2023

(REVISION UNDERWAY IN 2025)

TABLE OF CONTENTS

1. GENERAL INFORMATION

PEPtBO Contact Information

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PEPtBO's Mission

Prince Edward Point Bird Observatory (PEPtBO) is a registered charity with a mandate to monitor, report on, and promote analysis of bird migration and to act as official caretaker of the Prince Edward County South Shore Important Birding and Biodiversity Area (IBA).

PEPtBO's Vision

In our vision, we contribute to bird populations that are resilient and robust, and a natural world that is sustainable for future generations. Birds matter to the healthy survival of the planet. What we learn from migrating birds can support biodiversity and the ecosystems that sustain us, but birds are facing accelerating threats, particularly through migration. We need to act quickly and collectively to protect birds and the places they need while we still can. The scientific data PEPtBO collects contributes to local, national and international action to protect and manage key habitat and to reduce threats along migratory pathways. Our advocacy and educational programs encourage avian conservation action and support for nature. We support the future by acting now.

PEPtBO's Guiding Principles

1. Birds help us understand the living world. We believe that transforming science to action will contribute to the long-term survival of birds and the overall health of our ecosystems and environment.
2. We put birds first. The Banders Code of Ethics, which details our practice, guides us and our commitment to bird safety at all times.
3. We believe that connecting people to the joy of birds through education and hands-on exposure will ignite a lifelong passion for nature, leading to support for environmental conservation and a new generation of advocates.
4. As stewards of the Prince Edward County South Shore Important Birding and Diversity Area (IBA), we recognize our responsibility to respect and protect the abundant and diverse wildlife residing there.
5. We recognize that working in partnership with other conservation organizations and all levels of government will further our goals and increase our impact.
6. We are led through the passion, knowledge, skills, and experience of volunteers, and are committed to providing appropriate recruitment with ongoing training, support, and recognition.

7. We are committed to inclusiveness in all that we do and will work to improve representation, tolerance and opportunity benefitting all racialized groups, Indigenous Peoples, LGBTQ+ communities, genders, and persons of differing abilities.
8. We use our resources and manage our organization effectively, efficiently, and with fiscal responsibility and strategic intent.

About the Observatory

PEPtBO began operating the spring migration program with permission from Canadian Wildlife Service (CWS) in the Prince Edward Point National Wildlife Area (NWA) in 1995 and added fall monitoring in 2001.It is overseen by a volunteer Board of Directors, which oversees staffing and permit requirements (Appendix 1). Seasonal staff run the daily program described in the document, and are responsible for training volunteers (Appendix 2) and welcoming visitors (Appendix 3).

The residential building leased from CWS is called the Van Cott Cottage. It was the banding lab until September 2001, when a new banding lab was constructed from an existing shed. The Observatory runs solely on solar power (with a generator as a backup) to provide electricity and heat to the living quarters. A new banding lab was constructed by CWS in 2019 and banding operations were moved into the new facility in August.

Situated along the northern shore of Lake Ontario, the area around the Observatory is important for staging to both spring and fall migrants, encompassing of a variety of habitats including a large scrub/savannah region with a mixed forest cover surrounding all sides of the harbour. In the spring, several low-lying areas of the woods form a seasonal swamp that attracts amphibians, reptiles, waterfowl, and a variety of flying insects, of which many passerines feed upon. The vegetation is a mix of Eastern White Cedar, Eastern Red Cedar, and deciduous trees (dominated by Hop Hornbeam, Oak, Ash, Shagbark Hickory, and European Buckthorn,) surrounded by small scrub (predominantly Dogwood, Juniper, Viburnum, Poplar and Chokecherry). This scrub mix has spread into adjacent old fields that now have only small pockets of grassland.

Other nearby areas of high bird concentration include Traverse Point located 1 kilometre (km) north of the Observatory, and the lighthouse area on the other side of the harbour.

Influxes of birds at Prince Edward Point depend largely on weather conditions. In spring, influxes generally occur when the wind is moderate from the south and there is a warm front effectively pushing birds northwards. However, if the nights are clear, birds are apt to overfly the Observatory. A low cloud cover (or fog) during the night often improves the birding situation on the following morning — sometimes resulting in a large "fallout" of birds. Strong, cold winds from the north, which are sustained for several days in the spring, can effectively halt migration to the point where birds may "pile up" in regions south of us. Then as soon as the wind drops, the "dam" breaks and birds flood northward.

Patterns are similar in the fall, but the fall movement can provide higher daily numbers than in the spring. Concentrations of passerines are at their highest from mid-September to mid-October. Influxes are triggered by cold fronts from the north, again effectively pushing birds' southwards. Hawk movements can be quite impressive in the fall and are strongest on sunny days when the wind is slight or moderate from the northwest.

PEPtBO participation in the Canadian Migration Monitoring Network

PEPtBO is a member of a Canada-wide network of independently operated bird observatories that collect high quality and consistent data through standard daily operations. Data are archived and analyzed by Birds Canada and made available to researchers through its NatureCounts website. Results are used widely in research publications, and long-term trends in abundance are updated biennially. CMMN trends for boreal-breeding species are especially valuable because migration monitoring is the only national-scale survey that samples birds from all across their remote breeding range.

The key requirement of the Trend Monitoring Program is that data be collected using standard methods to ensure that changes in annual bird numbers represent actual change in the number of birds present – *not* changes in methods or levels of effort. All personnel and volunteers must understand how data are to be collected and how important it is to adhere to the procedures detailed in this document.

Any unavoidable changes in protocol, or interruptions of data collection lasting more than a week, must be recorded in section 8.0.

2. OVERVIEW OF THE MIGRATION MONITORING PROGRAM

PEPtBO's migration monitoring runs in spring from April 10 - May 31 and in fall from August 15 - October 31. It consists of 6 hours of standardized banding, census, and other observations within a specified Count Area (Figure 1). At the end of the day these data are combined into a composite 'Estimated Total' (ET): the best estimate possible of the total number of birds actually detected during the standard 6-hour coverage period. Birds observed during the remainder of the day, and from other parts of the NWA, are added to ETs to generate a total species list for the wider area.

A minimum of three people are required to run the standardized monitoring: A Bander-in-Charge (BIC), a second bander, and at least one other to assist with extracting/scribing/census. More than four workers is preferable to allow for extra extractors and a scribe for the bander(s).

See Appendix 4 for instructions on opening and closing the observatory each season.

3. CENSUS

A census is taken every day during migration unless there is a weather event that directly interferes with the use of optics or stops the majority of bird activity (e.g., extreme wind, torrential rain, thunderstorm). If any work at all can be done, census should take priority over banding.

Census begins at the top of the path noted by the wooden cedar fence post before the junction to the road (Figure 1). From there the census takers walk down the central path towards the banding lab. Once passed the banding lab census takers go across the road to the path that directly links to the waterfront. Once at the waterfront a good scan of the lake is required with approximately 5-10 minutes depending on bird activity. Census takers should make sure to take pause anywhere bird activity seems dynamic and ensure a 5-10 minute window for the waterfront observations. A map of the standardized census route (Figure 1) is also posted in the banding lab. Census takers must stay on the standardized route but can count anything detectable from the path, regardless of distance. Do not count birds hanging in nets, but do count others in the netting area, making note

of numbers that may well end up being duplicated in daily banding totals. (Probable duplicates will be removed from daily Estimated Totals that are constructed at the end of the day; see section 6).

Figure 1. Count Area (white) and census route (yellow). All boundaries indicate limits to stepping out of the count area, which is permitted only to confirm the identification of a bird detected from within the boundaries. (see Table A in Appendix 4).

The BIC and/or Volunteer Coordinator will create a schedule of census takers to make sure that the position is covered each day. Having a designated volunteer for this job even if they only come for that period takes pressure off the BIC, and rotating the census among observers helps ensure that average skill levels remain consistent across years. Volunteers must be capable of identifying at least 90% of bird species present by sight and sound in order to conduct the census.

The census begins at net opening and is expected to last roughly 30 minutes. If the census cannot be done during the prescribed time, then complete it as soon as possible thereafter and record the actual start time in the daily logs. Use binoculars and take notes as you go. Using the eBird mobile app is a good option. Record the date, start and finish times, names of census taker, and weather conditions (temperature, Beaufort wind, and percent cloud cover) at the end of the census, followed by the species tally. This information is transcribed to the daily log sheets (see section 7) immediately after the census or at the first available opportunity thereafter. The aim is to take a sample of the birds present in the defined observation area by counting all birds identified by sight and sound along the census route. For good estimation of large numbers (e.g., gull flocks), count birds

in a section of the flock, then extrapolate by counting the number of similarly sized sections. Seek agreement among observers. It is recommended (but not required) that census data be submitted to eBird. They are considered normal timed travelling counts.

If you cannot identify a species, do not guess. However, try to identify it as closely as possible (e.g., "dowitcher spp.", "*Empidonax* spp."). Write a note in the comment section of the log sheet if you feel you missed a large proportion of the birds because of exceptional circumstances. The census records should represent the total number of birds identified by sight or sound from the census route. The census is a standardized "sub-sample" of the birds in the area and you must stick to the time limit and route.

4. BANDING

A bird's health and welfare take precedence over everything else. PEPtBO adheres to the North American Banding Council (NABC) code of practice described in the *North American Banders' Study Guide* and other NABC manuals, which can be found at: http://www.nabanding.net/. **Please read this essential reference!** No unsupervised members of the public should be allowed into the net lanes during the 6 hour banding period. Pay attention to any of the public's concerns about the welfare of birds in the nets. Quickly attend to things and reassure them as best you can.

4.1 Opening nets and traps

Nets and traps are arrayed as shown in Figures 2, 3 and 4. (See Appendix 4 for exact coordinates.)

Weather permitting, the nets will be opened daily at sunrise and remain open for 6 hours, even if there are "no birds" around. If it seems too windy to net, go out and check each individual net, as many are sheltered and can be safely opened. Nets can be temporarily closed due to weather, a lingering predator, damage, or excessive capture rates that risk bird safety. Winds from the north and east are most likely to incur the closing of standard nets. Strong winds from any direction may require closing of the BOBO nets during fall migration. (These nets are closed after 4 hours in any case, in part because of increased exposure to wind gusts and sun). In the case of a net that is damaged to the point it cannot be safely used, it should be immediately repaired if possible and replaced if it cannot be fixed. If nets need to be closed, make sure that the time each net closed is recorded in the net-log file.

The usual order of opening should be to open the nets first starting with the first ones encountered walking out from the lab and working your way out to net lane 8. In the fall the Bobolink nets are opened at the same time as the standard nets by sending one person with the broadcasting equipment to that side of the property (see Appendix 4). Equipment for broadcasting Bobolink calls is turned on when the nets are opened. The traps are then opened by the volunteers after they finish opening nets.

The Jay Trap and ground traps should be kept baited and run during the same hours as the nets and checked on the same intervals. Ground traps should be baited with cracked corn for ground traps 3 to 6; while traps 1 and 2 should be baited with sunflower seeds. The J-trap is baited with cracked corn on the ground and sunflower seeds on the platforms.

Table 1: Summary of the PEPtBO trap types (with accompanying net gauge), quantity of traps, and periods of required operation.

Trap Type	Number	Spring	Fall
Passerine net (30 mm)	19	Apr 10 – May 31	Aug 15 – Oct 31
Non-standard monitoring nets (30mm)	5	Apr 10 – May 31	Aug 15 – Oct 31
Nocturnal owl net (60 mm)	10	Closed	Sep 20 – Oct 31
Nocturnal Owl net (100mm)	2	Closed	Sep 20 – Oct 31
J-Trap	1	Apr 10 – May 31	Aug 15 – Oct 31
Ground Trap	6	Apr 10 – May 31	Aug 15 – Oct 31
Bobolink net (30 mm)	6	Closed	Aug 15 – Sep 10

Figure 2. Net array (see Table A in Appendix 4). Blue lines indicate nets used only in fall for nocturnal netting of owls. Yellow lines indicate non-standard nets for current special project (section 4.5)

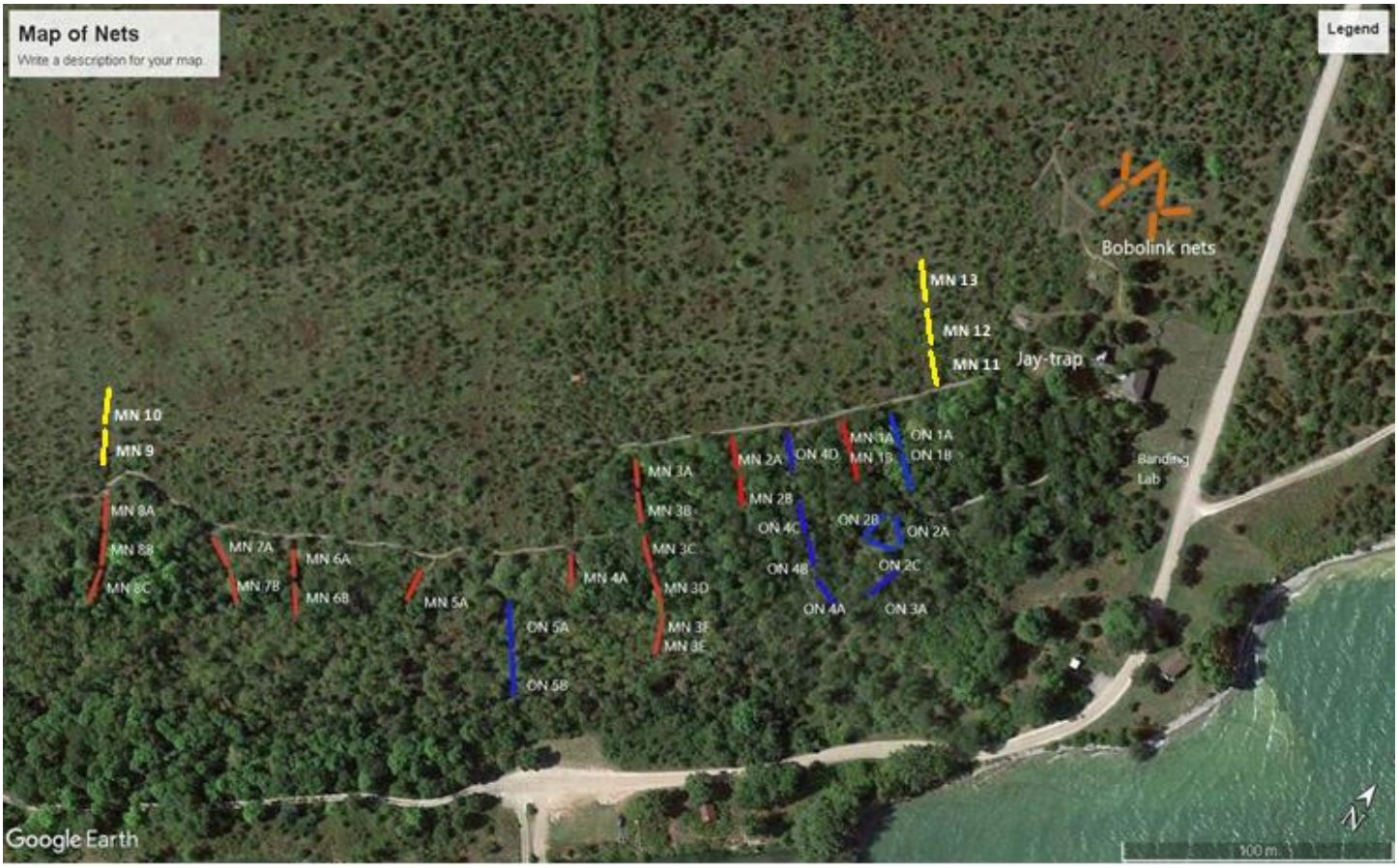
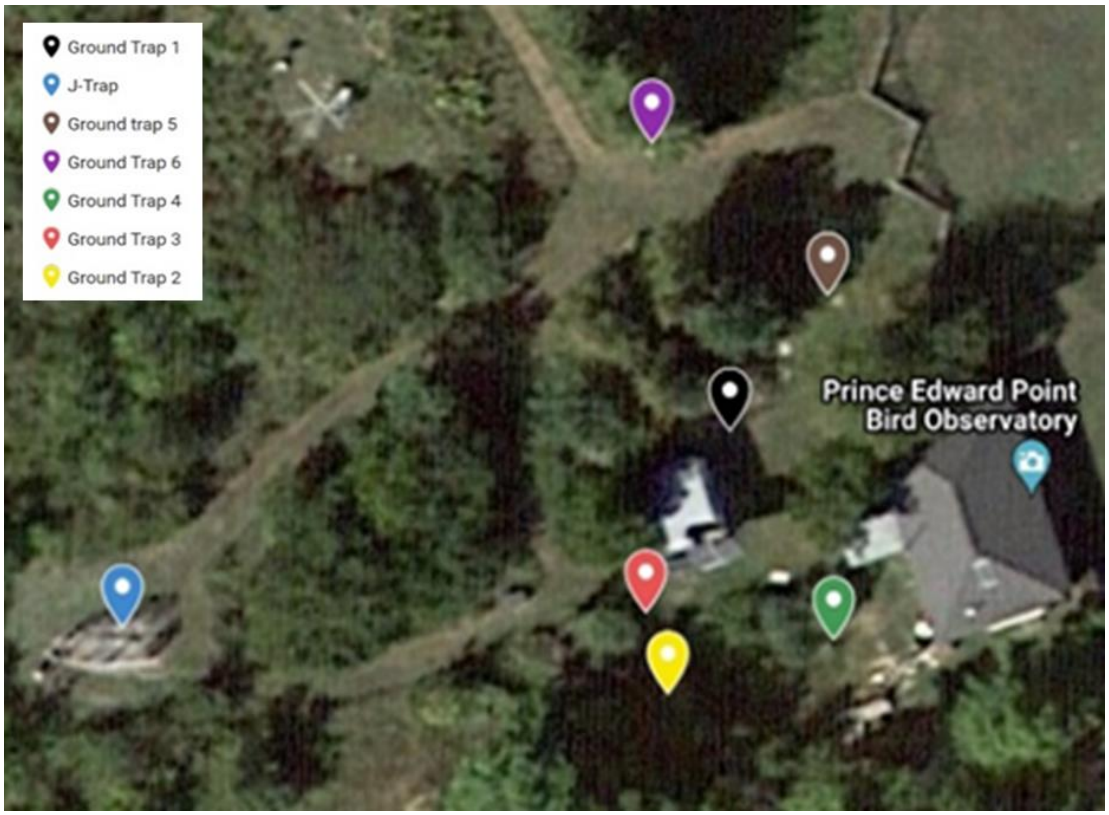


Figure 3. Bobolink net locations (see Table A in Appendix 4).

Figure 4. Ground Trap Locations (see Table A in Appendix 4).



4.2 Checking Traps

All nets and traps are checked at 30-min intervals, but modifications can be made to suit high volume or predator presence. Be sure to keep close watch on the traps for the presence of predators such as rodents. Make sure to check trap condition regularly for snags and malfunctions.

Bobolink nets are usually closed after 4 hours of banding, but at the discretion of the BIC these nets may remain in use for the final two hours of the standard netting period. Any birds captured in these nets during extended hours must be recorded as non-standard banding (NSB).

Immediately report any unauthorized person in the net lanes to the BIC.

Clean bird bags are kept in the bin in the banding lab. Bags are used once then flipped and shaken out then re-used once more before being washed. Any loose threads on either side of the bird bags must be trimmed immediately. Clean bags are taken around the nets in satchels which can hold about 60 bird bags. Volunteers should always fill the satchels when doing net checks, even on quiet days.

Keep the banding benches clear of binoculars, cameras, coats, hats, etc. Volunteers can store items in the cupboard or bench in the volunteer section of the lab. Do not leave valuables unattended in the banding lab when on a net run.

Birds should be extracted in order of low to high in the net and small to large. Any bird that is dangling by a leg, wing, or tongue should take precedence over others. The BIC and extractors always carry radios for communication and emergencies. and are handed out first thing in the morning. Call the BIC to check out any bird too entangled for you to extract. The BIC will make the final ruling on whether cutting the net will be necessary, and if so, who will be allowed to do it. Because Bobolink is a listed species and are also fragile birds, it is recommended that only experienced extractors and banders handle them.

The J-trap is operated by approaching the trap and pushing the birds to the far end and then pulling on the string near the door, which opens up a way into the box. The string is then gently released to close off the box area. Go around the outside and extract the birds through the flaps on the side of the box.

Birds are placed in a clean cloth bag, one per bag, and a lane number/ground trap clip is attached to the bag. The numbered clips should be returned to nets during a subsequent net round. Carry bags directly to the lab. Avoid swinging bags or hitting vegetation.

At the end of the banding session all nets should be furled, and any damage reported immediately to the BIC. The BIC or designate will visit each net lane to double-check that all nets have been closed. Ground traps should be flipped over for birds to have access to the seed without getting trapped. Clip open the door of the J trap so that birds can come and go and get used to feeding there.

Sweep the banding lab and the clean benches of droppings/feathers after each day's banding. Wipe down the benches at the end of the banding session with disinfectant towels from the cupboard. Shake out bags before taking into town for laundering with fragrance-free detergent and a small amount of bleach to sterilize the bags. Throw out badly soiled bags.

4.3 Dealing with exceptional numbers

No captured birds should be held for more than 45 minutes. If a backlog is developing, take steps to avoid having to release birds unbanded. Start by recording less data, first dropping extra notes, then the fat score, then weight, and lastly wing chord. On occasion you may have to close some (even all) nets temporarily. Non-standard nets and those furthest from the station should be closed first if the volume of birds is too high. Once the backlog of birds is under control, then you should re-open only as many nets as you can safely handle. The birds on big bird days usually come in distinct waves and the bird volume normally tapers off after late morning; however, this should be an extremely rare event. Keep note of which nets were closed and for how long, as this must be recorded in daily logs.

If there are still too many birds they can be released unbanded, but record the number of each species that were let go.

4.4 Northern Saw-whet Owl Banding

During the fall, a special effort is made to monitor the migration of Northern Saw-whet Owls on all nights with suitable weather, if possible with at least two people experienced with owl banding. This consists of netting the birds night, using a playback lure (appendix 4) and a special array of 10 60mm owl nets and 2 100mm nets. The bottom panel of the net is set at least 5 ft off the ground so that an owl hanging in the bottom panel is at least 2 ft. off the ground; this discourages predation by raccoons and skunks and stops the bird getting tangled in leaves. Use a bird bag stuffed with other bird bags to act as a "test owl" to test the panel height.

Catches from 5 to 80 individuals can be made most nights and occasionally up to 140. Favourable conditions for owl netting are clear, cool, nights with winds between NW and W, often resulting from a high-pressure system following a cold front.

Owl netting begins one hour after sunset and continues for a four-hour standard period. Net checks should be made at least every 30-40 minutes unless a Barred Owl is in the area and causing problems. In that case check every 20 minutes or less, returning to 30 minutes if the Barred Owl is captured. Owls that are banded need to be released in safe locations, particularly when a Barred Owl is in the area. A safe release box is placed across the street from the Van Cott Cottage in which the owl can sit safely until ready to take off. If predation becomes a problem, close the nets for the night.

Banding can continue past the 4 hr standard period for training, research or educational purposes and birds captured after the standard 4hr period are to be recorded as non-standard. All owls banded in standard 4 hour period are considered as observations in the day the session began and included in the ET along with any observations. Birds captured and observed after are recorded as non-standard and recorded in other obs for the date the session began.

All owl banding results should be added to the daily logs for the same day as the start date and end date regardless of bird capture time.

4.5 Non-standard Banding

Non-standard banding within the Count Area during the 6-hr netting period is strongly discouraged. It is only justifiable as a temporary measure for specific research purposes (or very rarely, to capture a specific bird). Non-standard banding must not interrupt or interfere with normal standardized operations.

Bobolink nets are normally closed after 4 hours, but may remain open, with continued broadcast, for some or all of the remaining 2 hours of the standard banding period for training or research purposes. All birds (any species) captured during extended operation must be recorded as NSB.

Starting in 2021, five nonstandard nets were placed just north of the standard nets (Figure 1), for a study of the effect of vegetation growth on capture rate for sparrows. These nets should be operated identically to standard nets, but all birds captured in them must be recorded as NSB.

4.6. Recording data

Never subject a bird to more stress than is necessary in the performance of your duties. Handle birds with the utmost care and respect. Do not treat them as pets.

Only band a bird if the species is confirmed. When in doubt, take pictures, make notes, consult references, other people and/or banding stations. If you still are not sure, release it unbanded.

Always describe and photograph a rare bird. Rarity report forms and a list of species requiring documentation are provided at the Observatory.

Do not guess at a bird's age or sex; if uncertain, record it as ‘unknown’, which is entered as in PEPtBOs digital data system.

Fat and wing chord are measured according to the standard in the identification guide to North American birds part 1 by Peter Pyle.

Mass is measured while the bird is still in the bag. The large plug-in scale should have a basket of some type placed on top of it usually a plastic of cardboard container. The bag containing the bird is placed into the basket and then the bander must zero the scale, press the TARE button, and when the scale reads zero remove the bird from the bag and place the empty bag back in the basket on the scale. The scale will now display the mass of the bird. This method reduces the contact the birds will have with the same surfaces there by reducing disease transmission. Additionally, this method also reduces the number of missed mass measurements as the value will remain on the scale as long as the same bag is on the scale and is not lost when the bird is released.

4.7. Recaptured Birds

Recaptured birds fall into one of two categories: Recaps (and returns) and foreign recoveries. The term "Recap" is used to designate a bird that was banded in recent days, or even the same day at the same station, and is used to indicate banded birds that are hanging around or breeding locally. The term "Recap" is also used to designate a Recap from the same station in a different season, or one that is recaptured here every spring.

A "foreign recovery" refers to a bird that was originally banded elsewhere and recovered at PEPtBO or vice versa. In all cases, except for same day Recaps, the bird is treated like a new bird – the band number is taken, and it is re-measured/weighed before being released. Even when a captured bird is already banded, ALWAYS bring it in to be processed. Foreign recoveries are extremely rare. Each time a foreign recovery occurs, it must be documented in the foreign recovery Excel file.

For all Recaps, first check the banding records and the Recap sheet for the day to see if the bird has already been handled that day. If so, it can be released directly. If it is new for the day, the Recap sheet must be filled in.

There is a sheet on the wall of the banding lab with all the band sequences used by PEPtBO. If the band number is not on that sheet it may be a foreign recovery.

On old birds, the bird should be aged & sexed based on what you observe, not on the state of the band or by its number. If you are not sure, get a second or third opinion. You can also make a brief note on the sheet (e.g., not a male by wing chord, obviously a female by brood patch).

Foreign recoveries are among the most exciting events at a banding station. From among the thousands of birds that we handle each year, we get only a handful of birds that are already carrying a band from elsewhere. Northern Saw-whet Owls are the exception, and we can catch annually 10-20 individuals of this species that were banded elsewhere.

At times, members of the public may bring in dead, banded birds, or report them to us. Get all the pertinent details of these recoveries (species, age, sex, band number, when and where the bird was found, how it died, and the name and address of the person who reported it). If possible, double-check the band number. The BIC or Observatory permit holder can submit the band record to the Bird Band Lab (BBL) or provide this information to the finder.

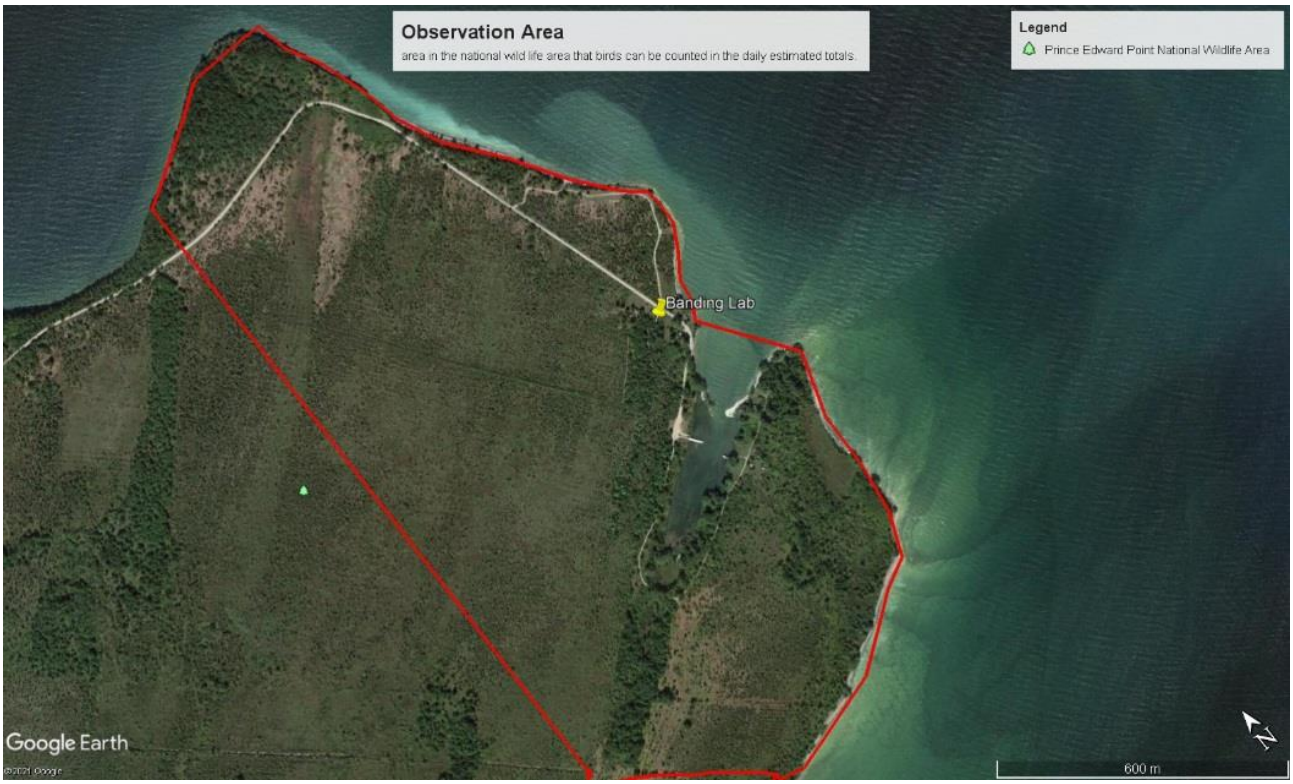
5. OBSERVATIONS

Throughout the standard banding hours (even in bad weather) all staff on duty should look for and count birds in addition to the ones you counted on census or captured during banding operations. Birds must be detected from within the Count Area (Figure 1), but can be counted as far beyond boundaries as they can be identified, including with binoculars or spotting scope. It is important to try to cover the whole area on foot more often than just on census — supplementary birding treks around the Count Area are an important part of the day's activities, contributing to the daily Estimated Total during the monitoring period. It is important that these observations are recorded throughout the morning and reminding each member of the crew to keep their own list each morning is a good idea. Again, the eBird app is a good tool for recording these data. All observers should use their personal account to record observations they saw and then use those lists to contribute to the Obs portion of the banding morning.

On mornings when large numbers of birds are moving steadily through the area, try to find time for 10 or 15 minutes to record the species and numbers involved. In early spring and late fall there may be thousands of waterbirds moving over the lake. Any notes taken on weather conditions that might be prompting the flight, direction of the flight, and the amount of time spent recording should be entered in the daily logs as narrative.

Non-standard Observations (NSO)
These are observations of birds detected within in Count Area (Figure 1) *after* the 6-hr standard netting hours, plus observations at any time of day within the portion of the NWA (Figure 5) exclusive of the Standard Count Area shown in Figure 1. All observations are made along the roads, shore-line or the paths created by CWS and PEPtBO. Observations of birds detected more than 600m beyond the 90 degree bend heading out of the Wildlife Area should not be counted. All NSOs are excluded from ETs, but are included in Daily Species Totals (Section 6.2).

Figure 5. Portion of the Prince Edward Point National Wildlife Area within which Additional Observations can be recorded. Note that birds detected within the Count Area (Figure 1) during the standard 6-hr netting period are recorded separately from those detected later in the day (see text).



6. ESTIMATED TOTALS

The ETs are our best estimate of the total number of each species observed from within the Count Area, during the 6-hr standard netting period only. Because they are based on standard daily effort, they are of particular value for population trend analysis, and must be done carefully. They should be educated estimates of what was *actually detected*; with no guessing or extrapolation to include birds that were not actually observed.

The ETs should be recorded every day during the migration season and for any other day on which reasonably representative observations were made (a census plus several hours of observation and/or banding). For an adequate coverage code for the day (a code of 2 or more in Table 2) the census is a prerequisite.

Table 2. Coverage codes and the associated definitions.

Code	Criteria
0	No coverage
1	No census or ET. Some Obs
2	Census. Possibly some Obs or non-standard banding
3	Census and ET. At least 1 class 1 observer present for 7 hours and some banding (<50% of 6 hour banding period)
4	Census, ETs, at least 2 class 1 observers + 50-100% of standard banding effort. 1 class 1 observer must be present for 7 hours.
5	Census, ETs at least 3 class 1 observers + 100% of standard banding effort. 2 class 1 observers must be present for 7 hours.

The ETs should be compiled after all other record keeping for the day has been completed and should be done with all personnel there on that day. Try to arrive at a consensus. It is also an important part of training for new personnel.

How to Arrive at Estimated Totals:

1. In the CMMN estimated total excel file, first record the numbers of each species banded, recaptured, and seen on census in the appropriate columns. Census should be entered immediately at the conclusion of the census.

2. Next, fill in the 'Obs' and 'NSOs' columns (Obs being birds recorded from within the Count Areas during the 6-hour banding period only). Run down the list of species, asking if anyone has any Obs or NSOs to add. For example, the compiler calls out "Loons, grebes, cormorants, herons?", and someone answers, "I saw a Great Blue Heron this afternoon" (i.e., a NSO). Or call out "Robin — 8 banded, 2 recaptured, 20 on census — any additional observations?" Some judgements must be made, as numbers will always be inexact, especially when flock sizes have to be estimated. Make an effort to omit probable duplicate observations (the same birds seen by different people).

3. The ET is derived from data that appear in the columns of the daily log sheet for the standard 6-hr period:
- Newly banded birds
- Recaptures
- Census
- Observations (not including the NSO, nestlings, and broods of dependent young such as goslings)

Inspect all of these numbers together, discussing among all of the other participants to omit probable duplication among count methods, to derive the best estimate of the number of birds that were known to be present (actually detected) in the area during that standard 6-hr coverage period.

Helpful Hints for Deriving ETs:

1. While it is important that the ETs be firmly based upon observations, and therefore reliable estimates, do not argue over whether there were 22 Dunlin or 26. It is sufficient if the ETs are reliable to the nearest natural grouping (e.g., 1, 3, 10, 20, 50, 150, 400).

2. It is often helpful to crosscheck the day's ET for a particular species against those derived for other species for the same day as well as those derived for previous days. Such comparisons can be quite useful for fine-tuning your ETs so that they reflect your general impressions about relative bird numbers. For example, you should ask yourself whether there are more White-throated Sparrows today than there were yesterday, or the day before. However, this should affect fine-tuning only, and should not be used to add or subtract from the day's records so it fits better with a previous day's ETs.

3. ETs should be as accurate as possible both regarding numbers and the identification of species. If birds cannot be reliably identified they should be recorded to the nearest degree of certainty they can be classified too. This is particularly applicable for large flocks of blackbirds (recorded as Blackbird sp.) or distant flocks of diving ducks (e.g., unidentified diving duck sp.). It is best to avoid assuming the identity in such instances.

6.2 Daily Species Totals

The DST is of particular interest to PEPtBO, and includes all observations within area outlined in Figure 5 during the entire day. The DST is constructed by adding ET, NSO from any time of day, and any NSB, including from owl-banding (added to records once the night's results are known).

7. RECORD KEEPING AND DATA MANAGEMENT

Data collection must be accurate to be useful. The personnel doing the work should do the records, and recording must be done by the end of each day. If left until later, or for others to do from your notes, the ETs are of dubious value. The following sections describe how to fill in PEPtBO's data files. (See examples in Appendix 7).

7.1 Daily Logs

Records must be as COMPLETE and ACCURATE as possible, as they are the source of information used by researchers for studies of migration timing, stopover ecology, population trends and other scientific work. Completing the logs is an integral part of the day's activities and must be filled in at the end of each day. PEPtBO has now moved to a digital data logging system using an Excel file for recording all daily log data and observations and a second file for recording banding data.

Daily Log File

This file is used for recording the weather conditions at the start of banding, census and at the end of banding. Fill out the start time, the temperature as measured on the outside thermometer. Record the wind direction by using the flag in the front yard as a reference. Assess the wind strength on the Beaufort scale and finally the percent cloud cover. Be consistent and mark down the census start and end time, be sure to add the initials of the observer for that census. There is also a column for the end of monitoring time which can be used to record when other observations beyond the 6-hour standard period have finished. This is also the file where the Coverage Code for each day should be recorded at the end of each day (see table 2). The same file also has a sheet for recording this same set of information for the Owl banding.

CMMN Daily Estimated Reporting Sheet

PEPtBO is using this file to record and compile all annual information. This program is used to log all daily data including weather and individual net hours. Entries are made daily by the BIC or BIC designate and is best done at the end of the day when everyone can help and contribute their sightings to the observation's sections. Each season has its own copy of this Excel file, with everything backed up on the computer and Google Drive.

The sheet in the data file labelled "data_entry_form" is the important sheet for daily data entry. At the top of this page has three boxes each for reporting different sets of important information. The first box is for that day's date, time of net opening and closing and the staff and volunteers present on that date. The second box at the top of the page is for recording the effort (hours open and start and end time) for each of the net types (i.e. passerine, owl), the Jay-trap and Bobolink nets. This is also where the effort data is recorded. The number of hours volunteers contribute are also recorded here. The rest of the sheet is dedicated to the recording of all the data that makes up the ETs, with the list of common species along the left side, 6 columns follow the species list for each day's totals for: banding, Recaps, census, observations, non-standard observations and non-standard banding. The totals from these are automatically added together in the column with the heading ET_auto, as is often the case and there is overlap in the birds counted in each of these five columns the adjacent column titled ET_manual can be used to manually override the totals. All of the data entered in this form is compiled on two sheets in this same Excel file, the sheet labelled "det_data" compiles the estimated totals and the sheet labelled "effort_data" compiles all of the net hours and other effort data entered at the top of the data entry form sheet.

7.2 Banding Data

All banding data as of 2020 is now entered directly into the PEPtBO banding data Excel file. This file is a modified version of the Long-point bird Excel spreadsheet with specific modifications for PEPtBO. The file is set up so that each band size has its own sheet in the file. Band numbers should be entered ahead of banding into the appropriate column. All other data to be collected has a labelled column heading and all these fields should be filed for each bird banded. The file has several Macros running in the background to make sure errors do not occur during the transcribing process (e.g., wing length, mass errors). Data recorded in this sheet is in the following order; Bander, band number, Alpha code, age, how aged, sex, how sexed, wing length, fat score, skull, Body mass, Status, date, capture time (net run), Net number, Weighing time, station, disposition, probable age, probable sex and comments.

7.3 Submission of banding data to the Bird Banding Lab

The Bird Banding Office (BBO) in Ottawa requires that banding records are submitted to them as an electronic banding schedule. PEPtBO currently uses the program called BANDIT as a means of recording its yearly information and sending the data to the BBO. Entries are usually performed by the BIC or designate, in coordination with the Observatory permit holder. Back-up copies of the clean dataset should be stored on the PEPtBO laptop and Google Drive. The banding schedules are generated from BANDIT, the instructions for which are outlined in a separate manual. As with log data, computer entry of banding schedules should be done by trained personnel. If each bander does some, the job is not too onerous. Everyone is expected to help out with this important task. Recap and recovery data can be entered on modified versions of the same program.

8. CHANGES OR INTERRUPTIONS IN STANDARDIZED DATA COLLECTION

Important interruptions to operations should be recorded here, such as flooding or lack of personnel that reduced effort for periods of a week or more. Also to be recorded are any permanent changes to data collection methods. Although operational changes are sometimes necessary (as when a netting location is destroyed), changes in data collection are not to be made unless absolutely necessary, and must first be discussed with CMMN advisors.

8.1 Instructions for record keeping

If any standardized operational change or interruption occurs, enter details into the table below, underneath 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 below.

Date	Description of change and justification (if applicable)
2007	Census route moved to current path. In earlier years the census included a variety of additional loops that passed north of current route and/or returned along Traverse Lane.
2008	Bobolink nets were added to fall program.
2020	No spring coverage due to covid. In fall of this year *only*, census route was extended to include return along Traverse Lane.
2021	Census route change of last year reversed; returned to path shown in Figure 1.
2021	Six hawk nets were removed from the standard array. About 20 Sharp-shinned Hawk were being captured each year, and only trivial numbers of other species. Annual captures of Sharp-shinned Hawks in banding totals will show a sudden drop, but trends based on ETs should be unaffected because the vast majority of Sharp-shins are recorded visually.
2021	Five new nets added (Figure 1) to study whether habitat succession has caused decline in grassland-shrub species such as sparrows. Captured birds are NSB, so will not affect ETs for standard coverage period, but will increase DSTs.

APPENDIX 1. Permits and Staffing

Permits

The volunteer Board of Directors hires a Bander in Charge (BIC) and when funding permits, an Assistant Bander-in-Charge (ABIC) to run the banding and migration monitoring programs, supervise and train volunteers, and manage data collection.

The PEPtBO Banding, Research, and Training Committee (BRT) usually arranges for 1 or 2 qualified interns for part or all of each season. Many volunteers help with scribing, extraction, and banding. The BIC and ABIC have responsibility for the implementation of this protocol and safety of the birds. A Facilities Manager is responsible for maintenance of the grounds and cottage.

PEPtBO requires a minimum of four types of permits to operate and all permits need to be posted in the banding lab. The Observatory permit holder, usually a board member, coordinates the permitting.

1. PEPtBO needs a permit from CWS to operate the Observatory within the NWA; this permit usually lasts 3 years.
2. An Observatory banding permit (#10633) is required from the BBO and is valid for three years. Banding data is submitted each November, following the banding year.
3. The BIC, ABIC, or other designate(s) also require sub-permits under the Observatory banding permit. Sub-permits are only given to banders who can effectively operation the Observatory as a BIC.
4. A permit is required for banding raptors. This is obtained from the Ministry of Natural Resources and Forestry (MNRF) office in Kingston and must be renewed annually. A summary giving the totals of each species and the numbers banded is sent in to the MNRF at the end of the fall season.
5. A provincial permit from MNRF is no longer needed to band Bobolinks (a species at risk). Nonetheless, the permit holder should confirm this each year to ensure permitting requirements have not changed.
6. If PEPtBO does any research at the Observatory for other researchers we need a copy of their permits before any research is conducted or the PEPtBO permits need to be updated.
7. If any research is being conducted at the Observatory by a University, an animal care approval may be required and should be posted in the banding lab.
8. Students or researchers wanting PEPtBO to collect data on their behalf need to approach the BRT with the request before the season begins. Any research being done within the NWA (e.g., nest searching,

MAPS) other than what we normally do, must first be cleared with CWS.

APPENDIX 2. Bander Training Protocol

PEPtBO is a busy station with a high volume of birds. The ABIC and interns are expected to arrive with banding experience. Training for new banders is conducted at the discretion of the BIC, BIC designate, or the Observatory permit holder, and only when it does not interfere with regular banding operations. Only authorized personnel are permitted to handle birds. Authorization comes only from the BIC, BIC designate, or the Observatory permit holder. Novices and newcomers are always closely supervised. They are usually not permitted to hold, band, or extract birds without first becoming fully acquainted with the NABC bander's study guide.

The following procedure is a typical sample of how training can proceed. Any training is left to the BIC and ABIC or Station Permit holder and proceeds based on the needs and capabilities of volunteers and visiting banders.

Day 1: Learn to scribe and watch banders in action. Learn the basics of how to set up nets and how to close them properly. Read both the Protocol and the NABC Bander's Study Guide.
Day 2: Continue to scribe and observe. Try reading the band numbers on the small band sizes. If you and the trainer feel comfortable, this is the first day you could be allowed to handle some "easy" birds using the standard "bander's grip" and the "photographer's grip".
Day 3: Continue with scribing, practicing holding easy birds in various grips, and observing the banders. Under supervision try banding an "easy" bird, and attempt some aging, sexing, and measuring.
Day 4: Introduction to extracting some easy birds from mist nets.
Day 5: Like Day #4, except your trainer might have you try your hand at extracting progressively more difficult birds.
Day 6: Put all the skills together - mist-net maintenance, recording data, holding, extracting, banding, measuring, etc.
Day 7: You should not "solo" until you have mastered all of the above, and only in consultation with the BIC, BIC designate, or the Observatory permit holder. Always seek and get help from more experienced banders whenever you run into difficulties. Be sure to watch how any difficulty is resolved, so you will know how to handle it next time.

Volunteer Rating System

PEPtBO uses a volunteer rating system to help the BIC and Volunteer Coordinator manage volunteers. The following is general guidance on expectation by level.

- A+ - (Expert) Excellent extractor, does not require supervision and can perform training in extraction for other volunteers (extract 5000 – 10000 birds)
- A – (Advanced) Great extractor and can perform 99% of most extractions without supervision (2000 – 5000) of majority of species including raptors
- B - (Good) Good extractor and can perform 90% of extractions but not comfortable with certain species such as raptors, woodpeckers, larger/smaller birds. Can be relied upon to run the net lanes with option to radio back for help (1000 – 2000).
- C - (Novice) Has one or two seasons of extraction experience (500-1000) but requires supervision when doing net lane runs. Confident with most passerine species.

- D - (Beginner) First season or infrequent volunteer to the station. Just starting to learn techniques and further training is required to gain experience. Needs to begin handling different birds for release when working as scribe to gain confidence.

All volunteers without exceptions should have a radio when separated from BIC or ABIC to ensure all personnel can be communicated with on all matters related to the net run. Other forms of communications are recommended since communication is key in running a smooth operation.

APPENDIX 3. Visitors and School Groups

Visitors
PEPtBO is open to the public during our daily operations. A greeter (usually a volunteer) is designated each day to welcome visitors and introduce the Observatory. The washroom inside the Van Cott cottage is only for resident staff. Volunteers should use the washroom behind the banding lab. Public washrooms (with change tables) are located 200 m past the Observatory towards the boat ramp. Visitors need to pack out their own garbage. During peak periods, if there are many birds, the banding operation takes priority; thus, the BIC or ABIC will have to coordinate with visitors as necessary. The safety of the birds and the ability of the banding staff to process them efficiently should be relayed to visitors. On busy days, it may not be possible to do more than greet and welcome visitors. Visitors (including school groups) are never permitted to extract birds from mist-nets, hold birds, or band them, without the express consent of the BIC or ABIC.

Banding Demos for the General Public
Formal banding demonstrations are conducted at the banding lab through the large window. No visitors are allowed in the banding lab. Only the BIC or BIC designate should demonstrate bird banding. If it is a busy day then simply explain the situation to visitors and tell them the birds must come first. Visitors are not permitted to handle the birds and should be discouraged from touching them. Photography of birds in the hand is fine, just keep it brief. Do not subject the bird to undo stress.

Banding Demos for School Groups
PEPtBO hires educators through the NatureHood program to run educational visits for school groups. The calendar in the banding lab will show the days they are scheduled. Banders and Banding Assistants are not responsible for the programs, but you may be asked to explain some of your work or talk about a bird you are banding.

At the discretion of the BIC other groups may book a visit to the Observatory. The Volunteer Coordinator also needs to arrange for extra volunteers to help with guided tours. Do not let visitors (especially kids) handle or touch birds, though they can photograph them while you hold them. The most experienced banders should be doing most of the hands-on work in front of groups. Two people are recommended for any tour that visits the net lanes. An experienced person acts as the leader while the other person brings up the rear. Visitors should not enter the net lanes. Back in the banding lab, an experienced bander runs through the process. The bird's safety should be stressed at all times. Completing net checks (at least every 30 minutes) and processing birds efficiently take priority over demonstrations.

APPENDIX 4. Setting up and Closing Seasonal Operations

PEPtBO has permission from CWS to clear vegetation in order to maintain the habitat, particularly in the grassland areas (Bobolink nets) of the Observatory. CWS should be notified of areas with Dog-strangling Vine

and Buckthorn. Basic vegetation management is required immediately below and adjacent to all nets. In addition, for a standardized migration monitoring program, vegetation around the net lanes must be kept at the same general height over time. Net lanes must be cleared before the start of the banding season. This trimming must be maintained over the course of the season for bird safety and to help maintain the nets.

A4.1. Nets

The nets are labeled MN for passerine nets, ON for owl nets, with net "A" always being the one nearer the old field, (the northern most net) through "F" (the southernmost net). See Table A for exact placement.

The nets are set up a day or two before the official start of the season. The poles are all stored in the storage area above the door of the old banding lab. It is easiest to take the nets and 1/2" poles out in a wheelbarrow and dropped off at the net lanes as you go. When you get to net lane 8, begin setting up the nets and work your way back.

Clear net lanes as needed to ensure nets will not snag on vegetation. Start the net setup by pacing out the nets and placing the poles and nets at roughly the ends of each net. Unwrap the guy rope from the bushes and set them out ready for attaching to the poles. The nets will have shrunk a bit over the winter/summer so the ropes may not be in the right place at the start of each season (up to 4 ft from the poles).

The poles in the middle of the net lanes are all top guyed, as are the poles where you walk in. The poles at the far end of a net run may be either top guyed or middle guyed. The poles are usually placed on the ground with the ropes at the top providing enough downward pressure to keep the poles from "kicking". There are stakes in the shed that can be hammered into the ground if needed. Hammer the stakes into the ground using the over pipe so the ends do not get hammered flat. Place the pole placed over the stake with the stake going 3-4inches into the pole. Any guy line that people have to go under must be flagged with flagging tape. Do not place the guys at neck/throat height.

Where two nets meet, the poles have to be tied together at about 4 feet high (with 2 net loops below and 4 above) and again at the tops to prevent the poles from bending while under tension. When the nets have been erected, they are "tied" at the beginning middle and end of each net to prevent it from opening during wind storms. It is important to verify the nets on particularly windy days to ensure it hasn't opened.

Numbered net pegs are used to identify each individual net - 20 pegs are used per net and are placed 5 at each side at each end of each net except at the far end of net lanes. Flag the positions of all the pegs sites with orange flagging tape.

A few days before the start of owl banding (sep 20th) an additional ten 60 mm nets and two100 mm nets are also set up, labeled as Owl nets and put up in the same way. Owl nets use the thicker black poles and are connected to make 15' poles. All the owl nets are raised and lowered using ropes and pulleys with the bottom panel being 5' off the ground when set to allow for sag when birds are in them. The tops of the owl nets use pieces of wood to help keep them apart so the ropes do not tangle.

Furling sticks for opening and closing the nets are stored in the banding lab or shed during the off seasons and left at the nets during the spring and fall seasons, one furling stick is hung from every mist net pole. The BOBO nets have their own furling sticks.

When the nets have been erected, put out signs on various trees asking the public to keep away from the nets and traps. The passerine nets are labeled “no public access to the nets” and are roped off from the public at the paths.

When taking down the nets at the end of the season, make sure they are dry, then put them into large clean plastic bags ready for the next season. Label each net with the correct tag. Ropes should be taken down each year to reduce how often they need to be replaced. Roll the ropes up labeling them with masking tape and then place each set of ropes for a given net in its own bag and label that bag.

A4.2. Traps
Leave the main part of the J-trap up all year but take down the J-trap box and store it in the banding lab or shed in the off-season. Clip open the door. At the start of the season, reattach the box.

A4.3. Broadcast equipment
The broadcasting system used is a Foxpro speaker with multiple settings for various species (BOBO and NSWO). The speaker is always set at level 20 for the volume and the direction directly upwards so as to broadcast evenly into the sky in all direction.

The BOBO location has a small wooden box on site set in the middle of the net array whereas the NSWO location has a small shelf set in the middle section of the 3 net triangle of nets 3 to 5.

If the call is to stop working for whatever reason a Bluetooth speaker and phone or sound playing device should be available and prepared with the recordings available from the PEPtBO google drive where the NSWO and BOBO calls are stored.

The soundtrack should be played for the standard 4 hrs in all cases at net opening (sunrise for BOBO, 1hr after sunset for NSWO), and will continue to be played as long as nets are open even during periods of non-standard banding

A4.4. The Banding Lab
All banding is carried out in the banding lab. During the season the banding computer is kept in the banding lab on the bench next to the release window. The computer should be backed up and turned off after each day’s work. This ensures that the excel data sheets all work properly the next day when opened.

The wall behind the birds waiting to be banded, has a list of banding totals on it. Update this after each banding season. The wall must also carry copies of ALL the permits necessary to accomplish the work being done for that year.

Banding equipment is kept on the bench top (e.g., rulers, band opening pliers, large banding pliers, leg gauges, weighing scales, cones). The smaller pliers (0A – 1A) are kept on the soft rubber pad to minimize the chance the pins can get bent.

Do a net inventory at the end of each season. There is a sheet for recording the status of the nets that are in use. Record the condition and make recommendations for reuse or replacement. Nets are usually ordered from Avinet at the end of each year. Keep a record of which nets have been replaced on the back of the first days log in each of the seasons.

Nets should be mended (broken side or shelf strings) as soon as possible and not left.

All bands are kept in the labeled drawers in the banding lab. Band ordering should occur each fall after a band inventory is completed.

Appendix 5. Habitat Assessment and Documentation

Table A. Coordinates for locations of key migration monitoring components.

Net/Trap	Code	Mesh Gage (mm)	Length (m)	Number of Panel	Latitude	Longitude
Mist Net 1A	MN1A	30	12	5	43 56’19.29	76 51’43.14
Mist Net 1B	MN1B	30	12	5	43 56’19.76	76 51’43.76
Mist Net 2A	MN2A	30	12	5	43 56’19.42	76 51’44.70
Mist Net 2B	MN2B	30	12	5	43 56’19.02	76 51’44.06
Mist Net 3A	MN3A	30	12	5	43 56’18.63	76 51’45.80
Mist Net 3B	MN3B	30	12	5	43 56’18.41	76 51’45.18
Mist Net 3C	MN3C	30	12	5	43 56’18.09	76 51’44.68
Mist Net 3D	MN3D	30	12	5	43 56’17.54	76 51’44.06
Mist Net 3E	MN3E	30	12	5	43 56’17.30	76 51’43.72
Mist Net 3F	MN3F	30	12	5	43 56’16.99	76 51’43.24
Mist Net 4A	MN4A	30	12	5	43 56’17.08	76 51’46.00
Mist Net 5A	MN5A	30	12	5	43 56’15.96	76 51’48.00
Mist Net 6A	MN6A	30	12	5	43 56’15.29	76 51’49.82
Mist Net 6B	MN6B	30	12	5	43 56’15.07	76 51’49.56
Mist Net 7A	MN7A	30	12	5	43 56’14.81	76 51’51.02
Mist Net 7B	MN7B	30	12	5	43 56’14.68	76 51’52.70
Mist Net 8A	MN8A	30	12	5	43 56’14.43	76 51’52.84
Mist Net 8B	MN8B	30	12	5	43 56’14.16	76 51’52.63
Mist Net 8C	MN8C	30	12	5	43 56’13.84	76 51’52.27
Mist Net 9	MN9	30	12	5	43 56'14.8	76 51'53.2
Mist Net 10	MN10	30	12	5	43 56’15.2	76 51’53.5
Mist Net 11	MN11	30	12	5	43 56’20.9	76 51’43.4
Mist Net 12	MN12	30	12	5	43 56'21.3	76 51'44.0
Mist Net 13	MN13	30	12	5	43 56'21.6	76 51'44.3
Owl Net 1	ON1A	60	12	4	43 56’20.60	76 51’43.06
Owl Net 2	ON1B	60	12	4	43 56’20.27	76 51’42.65
Owl Net 3	ON2A	60	12	4	43 56’19.64	76 51’41.91
Owl Net 4	ON2B	60	12	4	43 56’19.78	76 51’41.59
Owl Net 5	ON2C	60	12	4	43 56’19.81	76 51’41.31
Owl Net 6	ON3A	60	12	4	43 56’19.41	76 51’41.08
Owl Net 10	ON4A	60	12	4	43 56’19.09	76 51’41.52
Owl Net 9	ON4B	60	12	4	43 56’19.36	76 51’42.06
Owl Net 8	ON4C	60	12	4	43 56’19.61	76 51’42.47

Owl Net 7	ON4D	60	12	4	43 56’20.10	76 51’43.36
Owl Net SN1	ON5A	100	12	8	43 56’16.08	76 51’46.39
Owl Net SN2	ON5B	100	12	8	43 56’15.71	76 51’45.89
Jay Trap	JT	-	-	-	43 56’22.47	76 51’42.39
Bobolink Net 1	BOBO1	30	12	5	43 56’24.15	76 51’41.52
Bobolink Net 2	BOBO2	30	12	5	43 56’24.61	76 51’41.22
Bobolink Net 3	BOBO3	30	12	5	43 56’24.72	76 51’41.85
Bobolink Net 4	BOBO4	30	12	5	43 56’24.74	76 51’42.08
Bobolink Net 5	BOBO5	30	12	5	43 56’24.95	76 51’42.16
Bobolink Net 6	BOBO6	30	12	5	43 56’24.60	76 51’42.43
Ground Trap 1	GT1	-	-	-	43 56' 22.9	76 51' 41.0
Ground Trap 2	GT2	-	-	-	43 56'22.2	76 51'41.0
Ground Trap 3	GT3	-	-	-	43 56'22.5	76 51'41.4
Ground Trap 4	GT4	-	-	-	43 56'22.5	76 51'40.7
Ground Trap 5	GT5	-	-	-	43 56'23.0	76 51'40.8
Ground Trap 6	GT6	-	-	-	43 56'23.3	76 51’41.1
Census Start	-	-	-	-	43 56'10.2	76 51'57.3
Census End	-	-	-	-	43 56'22.2	76 51'39.0

A5.1 Photographic records

Photographs of the vegetation surrounding each net were taken in late summer 2009 to serve as a reference point for future years. The object is to ensure that habitat is kept to the extent possible at similar stages in the future. Photos should be taken every 2 years from the beginning and end of each net lane (Table A), starting in 2022. The pictures should be taken before the start of Fall banding when the foliage is in full form.

Additional photos will be taken from the locations described in Table A of the traps facing the direction in which birds are removed and of the jay trap as if entering it through the door. The photos should reflect the vegetation status around the traps. Photographs will be repeated sooner if drastic changes have occurred at any of these sites

When the image files are downloaded, rename them to define the location and date. The file name for each photo should follow this convention: ‘[DD] [MONTH] [YEAR] – [LOCATION NAME] - PEPTBO’, e.g., a photograph taken on October 16th, 2025 from the A end of Net 1 would be labelled ’16 Oct 2025 – Net 1A – PEPTBO’. The names for the locations photographed along the census route are provided in Table A.

Each set of photos from a given year should all be kept in one folder named ‘Site photos [YEAR] PEPTBO’. A copy of this folder is to be saved to the PEPTBO laptop and on PEPTBO’s external hard drive, and another copy is to be sent to Birds Canada along with the data submission for the year.

A5.2. Assessment of habitat structure

A formal habitat assessment following the MAPS protocol will be carried out once every 5 years beginning in 2022, and whenever there has been a significant change to the Count Area. Habitat assessments are to be carried out in July (ideally, or in mid-June, depending on staff availability), between the spring and fall migration monitoring season.

Hard copies of ‘Monitoring Avian Productivity and Survivorship (MAPS) Habitat Structure Assessment (HAS) Protocol’ and all relevant data sheets are to be kept at the PEPTBO banding station. Please refer to these materials for detailed instructions each time an assessment is undertaken. Two habitat patches will be assessed in 2022, however, it is important to remember to NOT base the current year’s habitat assessment on the results of past assessments. Each time assessment is repeated, the area must be carefully considered anew. Addition of new habitat types will require new maps.

Figure 5. Potential areas for habitat assessment in 2022.

Once the habitats have been defined and delineated (e.g., Figure 5), complete a PEPTBO Habitat Structure Assessment (HSA) Form for each of the defined habitats. The habitat assessment results are to be saved in a folder labelled ‘Habitat assessment [YEAR] PEPTBO’. Within that folder, save the habitat photographs (labelled according to the conventions above) and scanned copies of the PEPTBO Habitat Structure Assessment Form (HSA). Each habitat will have its own HSA form: save each one as ‘Habitat Structure Assessment form [YEAR] [HABITAT DESIGNATION] PEPTBO, e.g. for the dominant habitat in 2022, the file name will be ‘Habitat Structure Assessment form 2022 A PEPTBO’.

A copy of the habitat assessment folder is to be saved on the PEPTBO various electronic. Another copy will be submitted to Birds Canada along with year-end submission of bird data.

APPENDIX 6. Sick and Injured Birds

If an injured or stressed birds appears as if it will survive, follow the instructions below. Additional information can be found in the NABC Study Guide.

In most cases birds can be released after being kept in a warm, dark place for observation for a few hours. If a bird dies, discretely bring it to the BIC. The BIC will either immediately place it in the freezer (e.g., if it will make a good study skin, with a note indicating the date, location, finder, cause of death, species) or dispose of it safely. At the end of each day, the BIC will discuss the reasons for a bird mortality or injury and discuss with banders and volunteers courses of mitigation to prevent further incidents

"Orphaned" birds should simply be left alone, unless they are faced with imminent destruction. Parents will care for many birds on the ground, so unless you are sure the young bird is abandoned (often a young bird is not fed for an hour or two, sometimes longer), its chances are better if left alone. Pass this information on to people who contact the Observatory about an "orphan". Fledglings may be carefully placed in a tree to get them beyond the reach of predators. Contrary to popular lore, parents cannot "smell" human scent and will not desert a bird that has been handled by humans.

We sometimes encounter (or are brought) sick and injured birds. Evaluate the bird's condition and determine a likely prognosis. Is it likely to die? Is it just stunned or suffering wing strain? Is a limb broken? Decisions to euthanize a bird are always difficult, but it should be kept in mind that euthanization is often the most humane step to take, especially when dealing with hopelessly mutilated birds. Refer bird to rehab clinics (such as Sandy Pines) if survival to release looks like a realistic possibility. If the bird appears to be reasonably healthy (e.g., stunned), keep it in a very warm, dark, quiet place for at least 30 minutes, and periodically monitor its condition. Wing-strained and stunned birds often make amazing recoveries under such circumstances.

Injured or sick birds should not be intentionally released with a band, unless the bird is likely to recover successfully, the injury is old and healed, or unless removing the band is likely to cause the bird more harm. Note any old injuries as ‘Additional Information’ on the banding sheets and be sure to enter all injuries with a status code of 500. Always record the details of any new injury on the bird casualty forms supplied at the station, regardless of whether the bird was banded. These forms must be filled out for all types of injuries due to banding, except feather loss.

If euthanasia is necessary, it should be done well away from the public eye. The BIC or rehab facility is responsible for this decision. Euthanasia should follow guidance from the American Veterinary Medical Association (AVMA). Cervical dislocation is the recommended method of euthanization.

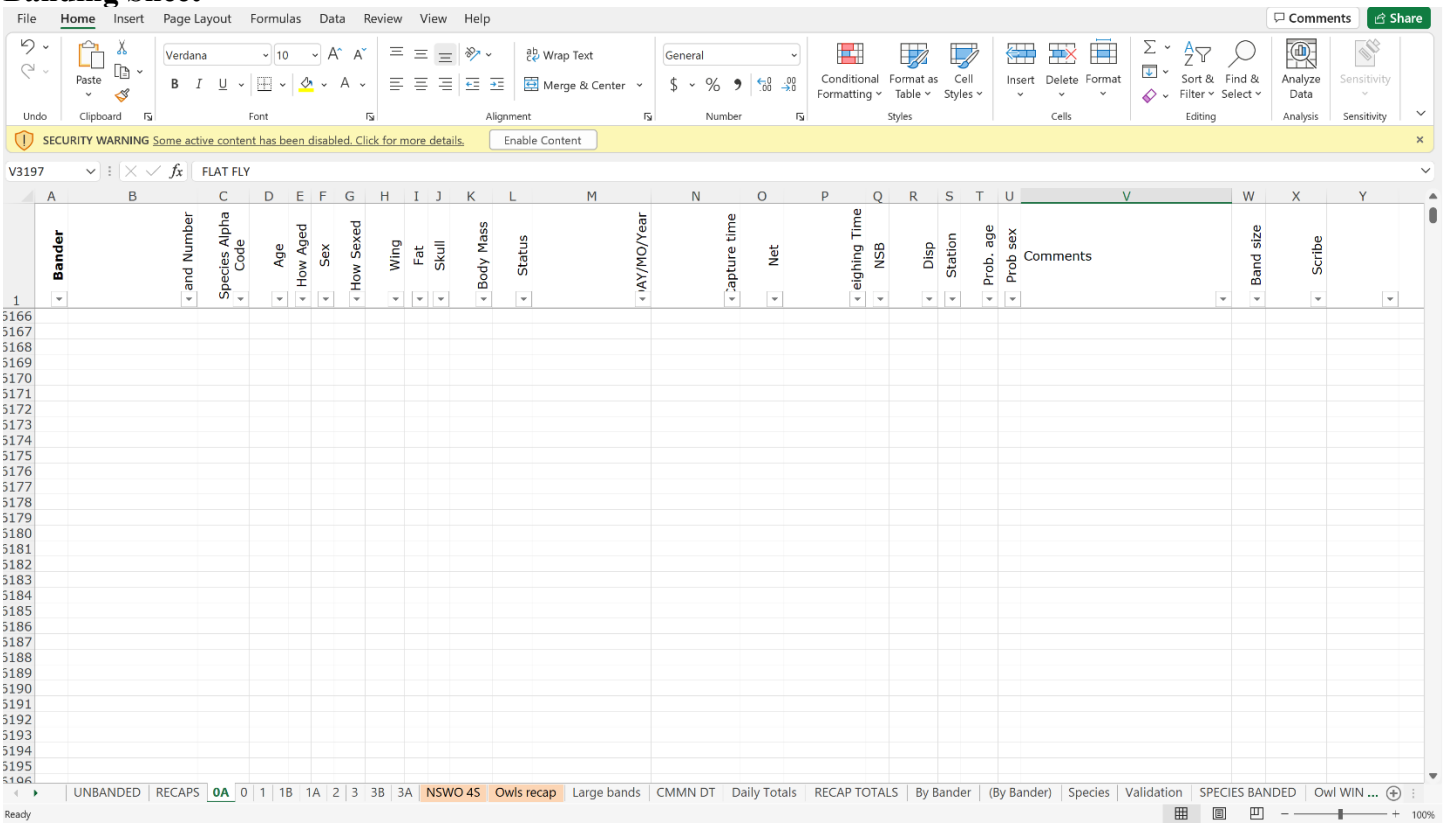
Note: the banding lab should have at least two hospital boxes with bird bags as a soft bedding to use for birds that need to be held while they recover in situations where they do not fly immediately.

Note: White-throated Sparrows are prone to leg "dislocation" for no apparent reason. Usually, the leg will pop back in if you straighten it. Band the bird on the opposite leg and make a note. Use some masking tape to hold the joint in place when releasing it. The tape will drop off in a few days.

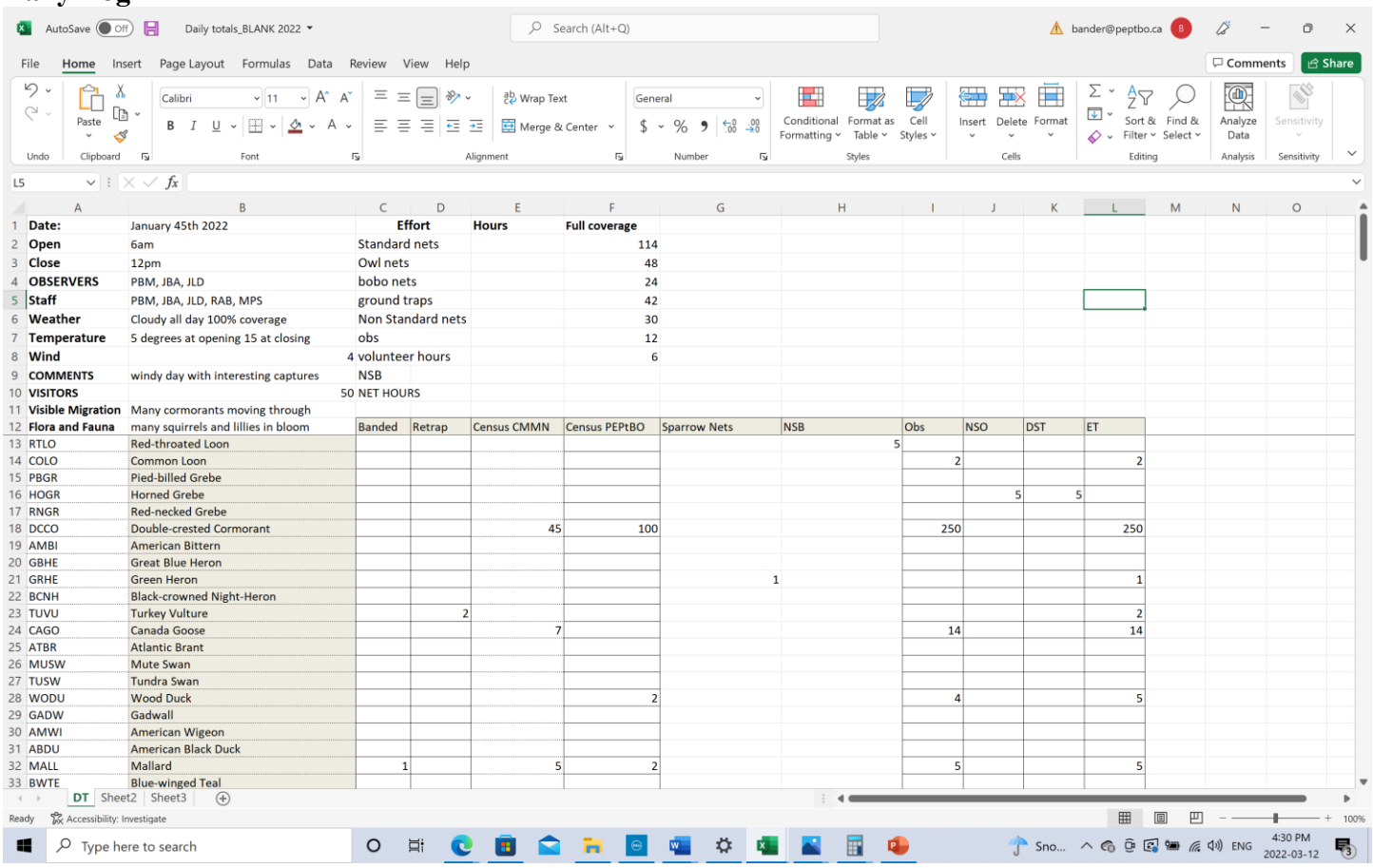
Note: Some bird's experience "wing strain" due to the netting operation. In this condition, one wing is slightly bruised or strained. The bird may or may not let it droop a bit or favour it. In any case, the bird will not fly more than a couple of feet. These birds should be retrieved and held in a quiet, very warm, dark place up to an hour or more, (depending on fat level) before being released. The condition is seldom serious, and nearly always corrects itself fairly quickly. Always hand release any bird suspected of having wing strain from ground level, so that it does not come crashing down and injuring itself more seriously. Several species are prone to fractures of the furculum (e.g., flycatchers) these injuries are usually referred to as wing strain but are not and the birds will not recover unless they are given extended care from a rehab facility. If this is not an option these birds should be euthanized if they cannot fly after 3 hours of being housed in a safe quiet space.

APPENDIX 7. Sample Forms

Banding Sheet



Daily Log



1	**Date:**	January 45th 2022		**Effort**		**Hours**	**Full coverage**						
2	**Open**	6am		Standard nets			114						
3	**Close**	12pm		Owl nets			48						
4	**OBSERVERS**	PBM, JBA, JLD		bobo nets			24						
5	**Staff**	PBM, JBA, JLD, RAB, MPS		ground traps			42						
6	**Weather**	Cloudy all day 100% coverage		Non Standard nets			30						
7	**Temperature**	5 degrees at opening 15 at closing		obs			12						
8	**Wind**		4	volunteer hours			6						
9	**COMMENTS**	windy day with interesting captures		NSB									
10	**VISITORS**		50	NET HOURS									
11	**Visible Migration**	Many cormorants moving through											
12	**Flora and Fauna**	many squirrels and lillies in bloom	Banded	Retrap	Census CMMN	Census PEPtBO	Sparrow Nets	NSB	Obs	NSO	DST	ET		
13	RTLO	Red-throated Loon						5						
14	COLO	Common Loon							2			2		
15	PBGR	Pied-billed Grebe												
16	HOGR	Horned Grebe								5	5			
17	RNGR	Red-necked Grebe												
18	DCCO	Double-crested Cormorant			45	100			250			250		
19	AMBI	American Bittern												
20	GBHE	Great Blue Heron												
21	GRHE	Green Heron					1					1		
22	BCNH	Black-crowned Night-Heron												
23	TUVU	Turkey Vulture		2								2		
24	CAGO	Canada Goose			7				14			14		
25	ATBR	Atlantic Brant												
26	MUSW	Mute Swan												
27	TUSW	Tundra Swan												
28	WODU	Wood Duck				2			4			5		
29	GADW	Gadwall												
30	AMWI	American Wigeon												
31	ABDU	American Black Duck												
32	MALL	Mallard	1		5	2			5			5		
33	BWTE	Blue-winged Teal												