Iona Island Bird Observatory Protocol

April 2012

Written by Mike Boyd

WildResearch

2258 Oxford St, Vancouver BC, V5L 1S

Table of Contents

Introduction

Bird populations across North America have been declining, resulting in many listed as species of conservation concern. Monitoring bird populations to identify species declines has been made successful by long-term programs such as the Canadian Migration Monitoring Network, and Breeding Bird Survey. Monitoring programs such as these identify population trends for many species and direct conservation concern where appropriate. Creating programs that monitor bird populations throughout the year can help identify the season where declines are originating.

Protocol Purpose

The purpose of the Iona Island Bird Observatory (IIBO) Protocol is to standardize observatory operations so that avian monitoring can be conducted in a safe, efficient, and consistent manner. All staff and volunteers participating in IIBO monitoring activities are required to read this protocol prior to participating to ensure bird and volunteer safety, and that data is collected in a consistent and efficient manner.

Observatory Objectives

In British Columbia there are 108 species of birds that are listed as of conservation concern provincially or federally, however, accessibility impedes monitoring across much of the province. Standardized monitoring of birds during migration can be used to examine populations that cannot be tracked on their breeding or wintering grounds. The Iona Island Bird Observatory (IIBO), located in Iona Beach Regional Park, Richmond, BC, is ideally situated to monitor migratory species on the Pacific flyway migratory route. Additionally, the temperate winter conditions across southwestern British Columbia allow many species to overwinter and breed at IIBO that would normally be found further south. The primary objective of IIBO is to monitor bird species that breed, migrate through, and winter on the Pacific coast of British Columbia.

Monitoring programs that track bird populations require trained biologists. IIBO strives to train biologists in bird identification, banding and monitoring so that programs at IIBO are conducted effectively, and biologists can transfer their skills to other projects around the world. IIBO welcomes anyone who is interested in bird banding and monitoring to volunteer and receive training.

An informed and concerned public is essential to ensure that conservation problems are identified and public drive identifies and implements solutions identified. IIBO, located within the Greater Vancouver area with 2.3 million people living within it, represents an opportunity to educate the public about birds and avian conservation.

Caveat

This is a working document and parts of it may change in time, however, only with the expressed consent of the Board of Directors of WildResearch.

Observatory Location

IIBO is located in Metro Vancouver, British Columbia in Iona Beach Regional Park near the Vancouver International Airport (Figure 1).

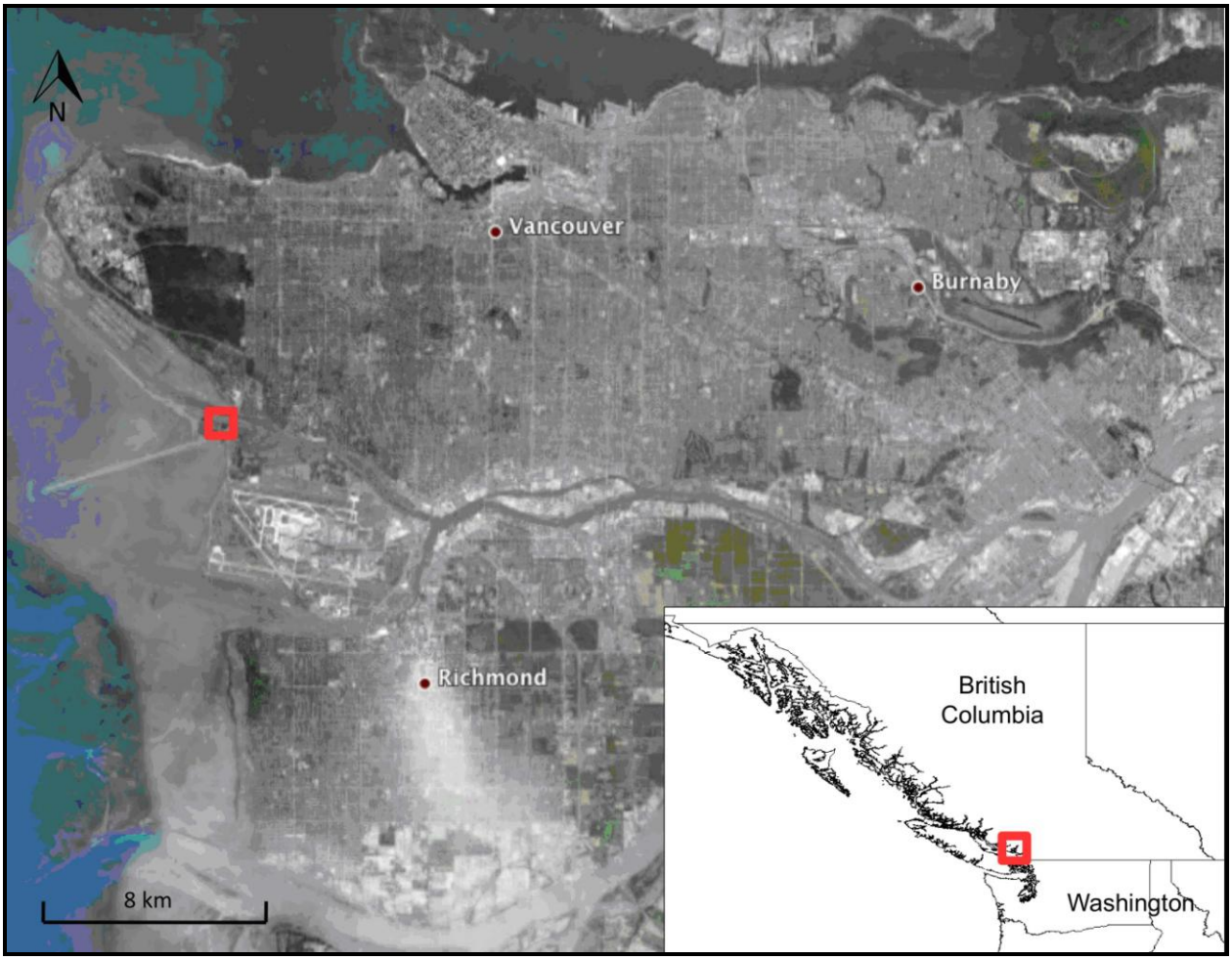

Figure 1. Location of the Iona Island Bird Observatory.

Programs

Four standardized core programs operate at IIBO (Table 1), however, additional banding and other research programs may operate at IIBO periodically. The dates and coverage represent potential start and end dates and coverage for each program, however, later start dates and earlier end dates may occur. The core dates for the Spring Migration Monitoring Program are from April 15 – May 31, and for the Fall Migration Monitoring Program from August 10 – September 15. Coverage should strive for to achieve the amounts summarized in Table 1, however, weather and other factors may result in a lower level of coverage.

Table 1. Potential start and end dates for core IIBO programs.

Program	Start Date	End Date	Target Coverage Amount
Winter Songbird Monitoring Program (WSMP)	November 1	March 31	Min. 3 Full Days per Month
Spring Migration Monitoring Program (SMMP)	April 1	May 31	Daily
Breeding Bird Monitoring Program (BBMP)	June 1	July 31	One Full Day Every 10 Days
Fall Migration Monitoring Program (FMMP)	August 1	October 31	Daily

Staffing

A minimum of two staff, including one experienced bander, must be present to run IIBO during any of the monitoring days involving bird banding. Monitoring involving point counts or observations requires only one person to be present. During all bird banding operations, a Bander-in-Charge (BIC) with a valid master or sub bird banding permit must be present at all times and is responsible for ensuring adherence to this protocol. Additional volunteers should be present to ensure that programs operate efficiently. Volunteers of all levels of experience are welcomed at IIBO, as one of the observatory goals is to provide training in bird identification, banding, and monitoring. There is no maximum number of volunteers that may be present at IIBO, however, the number of volunteers, especially new or inexperienced may be limited to ensure that programs operate effectively and volunteers optimize their learning experience.

Volunteer Training

People of all skill levels are welcome to volunteer at IIBO. Volunteers new to banding will receive comprehensive training to provide them with the skills in bird identification, bird banding, and techniques used to monitor birds. Volunteers must read the monitoring protocol and the North American Banders Study Guide prior to their first day of volunteering. Volunteers should also familiarize themselves with the commonly detected birds at IIBO to help facilitate their training. It is recommended that when volunteers visit IIBO they should bring binoculars, sturdy boots (either hiking or rubber), warm clothing, and a **peanut free** snack.

The abilities of all volunteers will be assessed during their first visit to IIBO by the BIC according to our Volunteer Ranking System (below). All volunteers will need to demonstrate their bird handling, banding, and extraction abilities to the BIC prior to taking part in each of those activities.

First time volunteers will have the general and day's activities explained at the start of the day and will receive a tour from the BIC or an experienced volunteer. Volunteers new to banding will start their training by watching other volunteers prior to proceeding with hands-on training. Hands-on training starts with learning bird handling and measurement techniques. Once volunteers have demonstrated competence with these techniques they will proceed to processing (banding and assessing the age and

sex) their first bird. The BIC will directly guide the volunteer through their first few birds processed, until the BIC feels that the volunteer is competent to learn under the guidance of other volunteers and with the BIC nearby. Learning the skills to accurately assess the age and sex of birds takes a considerable amount of experience, and one of the best ways to learn it is to volunteer on a regular basis.

Once a volunteer has shown competency with bird banding and handling they will then be trained to extract. Training will begin with the BIC, and can continue with an advanced volunteer once adequate skills are demonstrated. Volunteers extracting birds at IIBO utilize both the photographers and banders grip methods (NABC 2000). Volunteers are typically trained first in using the photographers grip method, followed by the banders grip method, however, this may vary depending on the bird. Knowledge of both grips is ultimately the best for volunteers, as the degree of entanglement of each bird will vary, and the 'better' method to use will depend on the unique situation.

It cannot be understated that the health and safety of the birds captured are the top priority at IIBO. During the training process volunteers should expect that some to many of the birds they attempt to extract will not be completed and after a period of time the bird should be passed over to a more experienced extractor. After the BIC has decided that the volunteer is competent with extraction they may be left alone to extract birds and ultimately given the responsibility to lead net checks.

In addition to training in bird banding, volunteers will also receive training in bird identification and monitoring methods. Training in identification will be done where time permits, allowing volunteers to become skilled in their identification of the birds detected at IIBO.

Volunteer Ranking System

At IIBO we categorize our volunteers into four categories: BIC, Advanced Trainee, Intermediate Trainee, and New Trainee (Table 2). Within each of these categories volunteers are ranked according to their banding, extracting, and supervisory abilities. Volunteers may request at any point in their training to be re-evaluated if they feel they are ready to move to the next level. The BIC may also move volunteers up to the next level when they feel the volunteer has the appropriate skills.

Table 2. Banding, extraction, and supervision categories for each volunteer level at IIBO.

Volunteer Level	Banding	Extraction	Supervision
New Volunteer	B1	N/A	N/A
Intermediate Volunteer	B2/B3	E1/E2	N/A
Advanced Volunteer	B4	E3	N/A
BIC	B4	E4	S1

Categories

Visitor (V)

Any guests to the station with no or unknown banding/bird handling ability. Not allowed to hold birds, extract or band unless closely supervised by BIC (i.e. holding their first bird for release etc.).

Banding

Bander Trainee (B1):

A volunteer that is new to bird handling and banding. The volunteer has not handled (m)any birds and must have direct supervision with handling from BIC.

New Bander (B2):

A volunteer that is comfortable handling birds, and may band birds supervised by the BIC or B4 volunteer. Species, age, sex, and measurements should be checked for every bird.

Intermediate Bander (B3):

Volunteers who have banded a number of birds of multiple species, and are comfortable with bird handling and banding. They can reliably identify expected species, age and sex birds, and take accurate measurements. They are allowed to band with minimal supervision but not independently, their ageing, sexing and measurements should be periodically checked.

Advanced Bander (B4):

A volunteer who is a competent bander and can band unsupervised. They have banded a large number of birds, and can accurately identify all expected species (and know techniques for identifying unknown species), age/sex virtually all birds and take all expected measurements. They should be competent with skulling, taking additional measurements (e.g., tarsus, bill length/width), and using alternate grips. They are well versed in banding ethics, banding terminology and IIBO protocols.

Extraction

Extractor Trainee (E1):

A volunteer that is comfortable handling birds, but has not extracted (m)any birds and must have direct supervision for extraction from BIC.

New Extractor (E2):

A volunteer that has received training in extraction and is comfortable with and understands the process, but needs the BIC or an E3 volunteer to be nearby during extraction.

Advanced Extractor (E3):

A volunteer able to extract most birds, unsupervised and can lead net rounds.

Supervisors

Bander-in-Charge (S1):

Volunteers who are both B4/E3 and follow all station protocols. BICs are able to operate IIBO independently and have a master or sub-bird banding permit. BICs should be competent at training new volunteers with banding and extraction and possess sound judgment and reasoning to make tough decisions independently. Complete familiarity with data recording and accuracy is required. The BIC is responsible for any problems that arise at IIBO under their supervision.

Daily Operations

Net Operation

Mist-net Size
All mist-nets used at IIBO are 30 or 32 mm that are 12 m long.

Net Locations
There are 14 mist-nets used at IIBO, nets are located mostly around the woodlot at the northeast corner of the park, but also between the two large ponds in the centre of the park (Figure 2).

Figure 2. Mist-net locations at IIBO.

Net Setup
The following steps should be followed when setting up a net:

1. Place 60 cm length of rebar on pole-boards approximately 20 cm from the top to prevent the net poles from sinking into the ground.
2. Hammer rebar 40 cm into the ground.

3. Hammer stakes (painted white with the net number written on them) into the ground at a 45° angle away from the net, approximately 1-1.3 m from each mist-net pole.
4. Place mist-net poles and rope each end of the mist-net lane.
5. Ensure all mist-net loops are in the right order.
6. Place the mist-net pole through loop, with loop marked with a different colour placed on top, and the pole then placed onto the rebar.
7. Tie the opposite ends of a single strand of thick rope to each stake and tie the middle of the rope to the mist-net pole, with four mist-net loops above it and two below it.
8. Slowly walk the mist-net down the mist-net lane to the opposite end, while ensuring that none of the mist-net touches the ground.
9. Once at the far end, follow steps 5-7 again, but ensuring that the mist-net is not twisted prior to placing it on to the mist-net pole.

Standard Net Opening

Nets are to be opened at approximately 30 minutes prior to sunrise (defined at Vancouver International Airport). If nets are not already in place, then setup should begin at a time to ensure that nets will be open at 30 minutes before sunrise. If nets are already in place, net ties in slip-knots located along the net need to be undone prior to opening. Blue net sticks should be used to open nets, with the bottom trammel line approximately 30-40 cm above the ground, and each successive trammel line approximately 30-40 cm apart, which should leave the top trammel line near the top of the net pole. Care should be taken when opening to not cause stress or tension on the side trammel lines to ensure their long-term stability. The mist-net loops (which are attached to the trammel lines) should be moved upwards or downwards in a step-wise manner to avoid causing tension.

Standard Net Closing

Nets will remain open for six hours and be closed at 5.5 hours after sunrise. Volunteers will close nets in approximately the same order they were opened. If nets are to remain in place they should be completed furled and tied. To close a net for furling the entire net should be collapsed around the rope using a net stick, with the exception of the top pocket, which should remain open approximately 30-40 cm above the closed net. Furling involves looping the net in a clock-wise or counter-clock-wise direction into the top pocket as the top trammel line is closed, until all of the loose netting is tightly tucked into the top pocket. This ensures that opening nets on the next morning involves only opening the nets not unfurling them. Once the net has been furled, three ties, one at either and another in the middle, should be attached to the net using a slip-knot, with the longest strand is the one used to untie the knot.

Non-standard Net Opening/Closing

Nets may need to be opened or closed at a time different than the official opening or closing. This may be due to a variety of factors, including weather, bird safety, or other factors determined by the BIC. Weather factors that may influence a delayed net opening or early closing include: precipitation, wind, and temperature. Nets should be closed if: precipitation causes birds to become wet in the nets, if the wind causes the nets to blow open to the point where bird safety is at risk, and temperatures that are either below -3°C or above 25°C. If inclement conditions change over the course of the morning to allow for the re-opening (or closing) of nets, then the BIC may decide to do so at their discretion.

Net Checks

Nets should be checked every 30 minutes, or sooner if conditions necessitate, and all nets must be checked. If net checks cannot be completed within a 30 minute period then nets should be closed in a manner that allows for checks to take place within that period.

Extraction

Extractors

Only volunteers who have been given permission by the BIC may extract birds out of the nets. Typically these individuals have been trained in bird handling and have been supervised by the BIC with at least one extraction to assess their abilities prior to being given permission.

Net Checks

Net checks must be conducted every 30 minutes or sooner if conditions necessitate and all nets must be checked. At least one experienced volunteer (see Volunteer Rating section) must be on each net check. Additional volunteers are recommended depending on the volume of birds. Nets should preferably be checked in the following order: 3, 14, 2, 1, 4, 5, 15, 13, 12, 11, 6, 7, 8, 9, and 10. If water levels prevent net 15 from opening the following order should be followed: 3, 14, 2, 1, 4, 5, 11, 12, 13, 6, 7, 8, 9, and 10. If enough volunteers are present volunteers may split up at the beginning of the net round and meet in the middle of the net check. Volunteers must ensure that the other group is met and that no nets are left unchecked. If volunteers are able to extract on their own they may be left behind at a net to finish extracting a bird, while the rest of the group continues on the net check.

Walkie-talkies or radios should be used by volunteers to communicate with each other or the BIC regarding net checks and any difficulty they might have with an extraction. At least one radio should accompany each group when conducting a net check, if a volunteer is left behind at a net they should have a radio. The BIC and if possible the banding table should also have a radio each. Volunteers should refrain from using inappropriate language and keep talking to a minimum when using the radios.

Volunteers should ensure that they have enough bird bags for the potential volume of birds on a net check. It is always better to bring more bags than having to return for more bags while on a net check.

Extraction

Prior to any extraction, the extractor should determine which side of the net the bird is caught and proceed to extract from that side of the net. If a bird is higher than chest level the mist-net should be pulled down using the blue net stick until the bird is at chest level to facilitate assessment of how the bird is caught and prevent the extractor's arms from tiring. Always ensure that when the extraction is finished that the net is returned to its original height.

When extracting birds out of the net volunteers may use either the photographer's or bander's grip methods. Alternate grips may be used only in unusual cases such as with hummingbirds, raptors, or other large birds. Typically new extractors are trained in photographers grip prior to learning bander's grip due to ease in learning extraction. Both methods can be valid and useful depending on how each bird is caught, and generally the bander's grip technique is faster. A quick summary of both methods is provided below, however, please refer to the North America Bander's Study Guide (2001) for further details.

Extracting using photographer's grip involves holding the bird by the legs and removing the netting from the legs first. Following the legs one or both wings may be de-tangled and last the head. Helpful tips to remember are: when removing the mist-net from the toes to straighten the toes at the same time as

pulling the net off of them; check on the underside, of a bird's wings to determine where the mist-net is caught; and when removing the mist-net from the head to pull from the back of the head forwards.

When using bander's grip first determine if there is any netting between you and the birds back, if there is no netting in the way place the bird directly into a bander's grip. If there is netting in the way, place your fingers under the netting and around the birds back and under its wings so it is in a modified bander's grip and begin to remove the bird from the net so a wing is free. Begin removing the net from the wing and move to either the head or other wing next, before finally removing the opposite. In most cases birds will let go of the net with their feet once the mist-net has been removed from the body, but if not the netting may be removed from the legs/toes at his point. Keep in mind is that every bird is caught different and the above method may have to be modified.

Once the bird is free of the net, put it into a bander's grip and place the bird into a bird bag. Do not place a bird into a bag using the photographer's grip as this can increase the chance for injury. When placing the bird into the bag, use the opposite hand to hold the bag tight around your wrist and after letting the bird go slowly remove your hand from your bag and close the bag with your other hand. Pull the draw-string on the bag tight, loop it around the top of the bag and under itself before pulling it tight. Always ensure when doing this that the bird is not present at the top of the bag. When finished placing the bird in the bag, place the draw-string loop around your wrist or place it on a carabineer. Do not place a bag in your pocket, on a branch, or any other location when on a net check. If the bags with birds are causing problems with other extractions, pass them onto another person if possible.

If at any point the extractor notices the bird becoming stressed, or if they have been attempting to extract the same bird for an extended period of time, or if they are not making any progress, contact the senior person on the net check or the BIC. **An important part of learning extraction is knowing when to pass the bird off to a more experienced person.** If an experienced person is not around, use the radio to contact someone and have them send that person to come and see you.

Only in rare cases should the mist-net be cut to remove a bird, this determination is left to the BIC and usually happens when there are concerns about the bird's health and safety. Typically in these cases only one or two strands of the mist-net should need to be cut, and typically over the back or wing. Experienced extractors are encouraged to carry an extraction tool, either a seam ripper or a small crochet hook to assist with these situations.

Storing Birds

After the net check birds should be returned to the banding table for processing. Birds in bags should be placed first on a hook on the 'banding wheel', and if it fills up or has birds from the previous net check birds should be placed on carabineers attached by rope to the side of the banding shelter.

Banding

Banders

Only volunteers who have been given permission by the BIC may band birds at IIBO. Typically these individuals have been trained in bird handling and banding, and have been supervised by the BIC banding at least one bird to assess abilities prior to being given permission.

Banding

Ensuring the health and safety of all birds captured is the number one priority at IIBO. Only birds that are healthy and for which the BIC has permission to band may be banded at the station. Typically this means that hummingbirds, Rock Pigeons, and pheasants/grouse caught cannot be banded. All banders

should strive to minimize the handling time for each bird, by processing birds on a first-in first-out basis, with birds kept for no more than one hour after the start of the net check they were extracted on. Exceptions to this may be made by the BIC, and priority may be shifted to smaller, easily stressed, or recently fledged birds. In addition, young recently fledged birds, depending on the age, should be released near the net where they were caught. Birds that appear to be stressed, suffering from wing strain or any other health concerns can be placed back into a bird bag for a period up to a few hours. At this point the BIC can decide whether the bird should be released or taken to a qualified wildlife rehabilitation facility.

Banding Data

For each bird banded the following data should be recorded: band number, species, age, how aged, sex, how sexed, wing length, fat, skull, weight, capture time, date, net number, bander, and any relevant comments. If many birds are waiting to be banded certain data fields can be dropped (ie. wing, fat, weight), however the band number, species, age, and sex of each bird banded must be recorded. Banding data is to be recorded electronically onto the station laptop, however, if the laptop cannot be used banding data should be recorded into the banding binder.

Each band that is made contains a unique eight or nine digit band number (four digits for the prefix and five for the suffix, ie. 1234-12345) that is used to identify the bird that is banded. There are 22 sizes of bands (not including hummingbird bands) that are currently used in North American banding, although only six are used on a regular basis at IIBO (0A, 0, 1, 1B, 1A, and 2). Most bands that are used at IIBO are butt-end bands, however, lock-on bands may occasionally be used for raptors or owls. Bands typically come in strings of 100, with a label on each package identifying the band size and the numbered series inside. Bands in current use are kept in small labelled containers that can be fastened to the table during the banding session, and are otherwise kept in the banding toolbox. New bands are kept in a folder in the banding toolbox, and when new bands are needed the next 100 series should be used.

When using the banding binder and banding sheets the following is applicable. Each data sheet is designed to be used for either one band size or recaptures and can contain data for 25 birds. At the top of each page is a space for the whole band number of the first band to appear on the page. The first band on each page is typically 01, 26, 51, and 76. If another number is the first to appear on a page then the data for it and subsequent bands should be shift down accordingly to ensure that the next page will start at one of the above numbers.

Band Number

For each bird banded the last two digits of the suffix should be recorded.

Species

A four letter species code is required for each bird banded, or if a band is lost or has to be destroyed, BALO or BADE must be used accordingly. The species codes to be used are those accepted by the Bird Banding Office (do not use provincial bird codes), if in doubt about a bird code check with the BIC or the Identification Guide to North American Birds before writing it down.

Age

The age of the bird captured should be written following the numerical code system (Table 3).

Table 3. Numeric age classes and descriptions for birds.

Numeric Age Class	Alpha Translation	Description
0	Unknown	A bird of an unknown age, and may only be used after the breeding season and December 31st.
4	Local	A young bird incapable of sustained flight, ie. local to the banding area.
2	Hatch-year	A bird hatched in the calendar year it was banded.
1	After hatch-year	A bird hatched before the calendar year it was banded.
5	Second-year	A bird known to have hatched in the previous calendar year in which it was banded.
6	After second-year	A bird known to have hatched in an earlier year than the year prior to the year it was banded, ie. hatched 2009 and in banded 2011
7	Third-year	A bird known to have hatched in the calendar year two years prior to the year it was banded.
8	After third-year	A bird known to have hatched prior to two years prior to the year of banding, now in at least its fourth calendar year of life

How Aged

The codes to be used for how a bird was aged found in Table 4.

Table 4. Alpha codes representing how to age or sex birds banded.

Ageing Code	Alpha Translation	Description
P	Plumage	The plumage of a bird indicating a particular age, ie. primary cover shape/wear, molt limits, tail shape.
L	Molt Limit	The presence of a molt limit within a feather tract or between adjacent feather tracts. If used the molt data section must be filled in.
J	Juvenile Plumage	The presence of juvenile body plumage.
S	Skull	The degree of skull pneumatisation.
E	Eye Colour	The colour of the iris.
I	Bill/Mouth Colour	The internal or external appearance of the bill, including the presence of a gape in extremely young birds.
M	Molt	Active molt, indicated by pin feathers or missing feathers in a symmetrical pattern.
C	Cloacal Protuberance	The presence of a cloacal protuberance in adults.
B	Brood Patch	The presence of a brood patch in adults.
W	Wing Length	The length of the wing.
O	Other	Any other ageing technique used.

Sex

The sex of the bird banded: male, female or unknown, using the respective codes M, F, or U.

How Sexed

Codes for how a bird was sexed are found in Table 4.

Molt Limits

When the presence of a molt limit is detected use the codes listed in Table 5.

Table 5. Alpha codes for molt limits in birds.

Molt Limit Code	Area of Molt Limit
G	Within Greater Coverts
R	Within Primary Coverts
A	Within Alulas
C	Between Carpal Covert and Greater Coverts
P	Within Primaries
S	Within Secondaries

Wing Length

The length of the unflattened wing. When taking the wing length leave the wing in a natural position and slide the rule in under the wing and use the length of the longest flight feather as the wing length in millimetres. If the feather lies between two millimetres, round up or down to the nearest millimetre.

Fat

The amount of fat on the bird as measured by gaging the amount of fat present in the furculum, and if necessary, under the wing and around the cloaca (Table 6). Fat is measured by blowing apart the feathers on the breast, and if necessary under the wing and the cloaca. The skin on a bird is transparent leaving the fat and muscle visible, and they are indicated by either a orange-cream colour or purple-red colour respectively.

Table 6. Numeric codes for fat level in birds.

Fat Level	Description
0	No fat present in the furculum.
1	A slight amount of fat present in the furculum, <5% filled. Typically only a hint of fat either on the bottom or sides, formerly known as Trace.
2	Typically the bottom of the furculum is filled with fat, approximately 5-33% of the furculum is filled.
3	Typically the furculum is half filled, but it may vary from 33-80% filled.
4	Typically the furculum is completely filled, but it may vary from 80-100% filled.
5	The furculum is bulging with fat, but little fat under the wings or around the cloaca.
6	The furculum is bulging with fat, as are the area under the wings and around the cloaca.
7	Fat connects between the furculum, under the wings and to the cloaca, essentially the entire body is covered in a layer of fat.

Skull

This category describes the amount of skull pneumatisation. When a bird first hatches it has two layers of skull, but they are not connected. Over the course of its first year the two layers become connected in a following a regular pattern. The transparent nature of bird's skin, allows the bander to part the feathers on a bird's head and examine the amount of pneumatisation. The colour when the two layers

are not connected typically appears pink in colour, and when they are connected they appear whitish with white stippling representing the connections between the two layers. The amount of pneumatisation is measured on a seven class system (Table 7).

Table 7. Number codes for skull pneumatisation levels in birds.

Skull Pneumatisation Level	Description
0	No second layer of ossification.
1	Typically a small open triangle of ossification at the back of the skull.
2	The triangle at the back of the skull is completely ossified.
3	A line of ossification extends from the back of the skull to the eyes.
4	The line up the centre begins to fill in, and from the sides, leaving large 'windows'.
5	Most of the skull is ossified, with only one or two small 'windows' present near the front of the skull.
6	Completely ossified.

Bird Weight

The weight of the bird as determined by placing a bird in a weighing tube and onto a tared scale. Two methods can be used to place a bird into a weighing tube: 1) Using bander's grip, place the birds head into the tube and gently slide the bird into the tube, releasing your grip as it slides in; 2) Using bander's and photographer's grip place the birds head into the tube and gently slide the bird into the tube and releasing it first from bander's grip then from photographer's grip. Ensure that the bird's wings are not caught on the edge of the tube.

After weighing the bird is typically released. To properly release the bird, tip the weighing tube upside down either on the banding table or a hand and if necessary gently shake the tube until the bird comes out. If the bird does not easily slide out, two methods can be employed: 1) remove the cap of the tube and push the bird through overtop of a hand or the table; 2) gently pull on the tail and/or wing feathers until the bird has become loose and will fall out of the tube. The latter technique may also be used if the bird needs to be further examined or photos are needed. The tail should not pulled to remove the bird from the weighting tube as the tail feathers may 'shed'.

Capture Time

The time of the net run when the bird was extracted. The time should be rounded to the nearest 10 minute block using the 24 hour clock, e.g. A net run at 9:45am should read 9:50 when recorded.

Date

The date the bird was banded: the two digit day followed by the two digits for the month.

Net

The net from which the bird was extracted.

Bander

The three letter code used for each bander, typically the first letter from the first, middle and last names of a person. If a person does not have a middle name the second letter from either the first or last name may be used. Care must be used to ensure that no duplication occurs between people.

Comments

Any comments necessary for the banding record, such as cloacal protuberance, brood patch, health concerns, or colour bands (read top to bottom and the bird's left to right, using the colours: B-blue, G-green, R-red, Y-yellow, and S-silver or metal).

Additional Data

Several other areas on the banding sheet may need to be filled out depending on the bird, ie. colour bands, brood patch.

Recaptures

All banded birds that are captured should be brought back to the banding table for processing. If the bird has already been banded or processed that day it should be released as quickly as possible, either at the net or at the table. A radio may be used at the net to ask volunteers at the banding table to determine if a banded bird has already been processed. Data recorded for recaptures is the same as for the initial banding , with the addition of recording the band number in the Comment section of the data sheet.

Unbanded Birds

If a bird escapes before it is banded, or for birds that cannot be banded, data should be recorded on the Unbanded page. Record as much of the information as possible, but it is expected that some to many of the data categories will be empty.

Point Counts

Using a standardized point count system to monitor bird abundance, diversity, habitat use, and migration timing can provide information on a variety of birds that are typically not caught in mist-nets. Combining the use of a standardized point count system with a standardized mist-netting operation provides a well-rounded system to monitor the birds present at IIBO. Six point count stations (Figure 3) have been established in a variety of the habitats found at IIBO to achieve these goals.

Figure 3. Point count station locations for monitoring birds at IIBO.

Point counts should be conducted on each day of monitoring IIBO, in descending order (station 1 through 6). Care should be taken to ensure point counts are conducted at the exact same location every time. The first two counts should be conducted at one hour after sunrise, the following two at an hour and a half after sunrise and the last two at two hours after sunrise. Counts last five minutes and the surveyor should use a stop watch to ensure that the count length is accurate. The following information should be recorded for each point count: point count number, time started, time ended, and surveyor. For each detection (heard or seen) record the species (full species name or AOU species code), number of individuals, and if the bird detected was further than 100 m away (denoted by a "+") or flying (denoted by a "F"). Counts may be delayed by up to 30 minutes either due to high volume of birds while banding or inclement weather. Only surveyors who are familiar by sight and sound with >90% of the expected species at IIBO can conduct point counts. It should be noted that this system is most effective when the protocols are followed exactly, and volunteers should not view it as a competition.

Observations

Volunteers should strive to record all of their bird observations (species and individuals) within the monitoring period (30 minutes before sunrise until 6.5 hours after sunrise) and count area (Figure 4) during each day of monitoring at IIBO. Care should be used to ensure birds are not double-counted, by employing a conservative counting method. All observations are valid and necessary for obtaining an accurate total of the birds present at IIBO (i.e. every volunteer should have at least some bird observations at the end of each monitoring period).

Figure 4. Count area for bird observations at IIBO.

Daily Log

The Daily Log requires several sections to be filled out for every day of operation:

- The full name, three letter code, and number of field hours for each volunteer
- The opening and closing times for each of the nets and their total open hours
- Start time and total number of birds seen on each point count
- Tallies of banded birds and recaptures for each species
- Total species and number of birds banded and recaptured

Weather data is collected on an hourly basis at the Vancouver International Airport, and this data is to be considered most accurate, although additional weather details may be recorded where appropriate in the comments category. Additional comments regarding IIBO, birds seen or captured, or other pertinent information may be recorded in the Comments section.

Daily Estimated Total

The daily estimated total (DET) is an estimate of the total number of birds present at IIBO during each day of monitoring. The total is derived from the total number of birds captured, detected during point counts and observed over the course of the monitoring period, and the final tally for each species must not exceed the sum of the categories. All categories of data are integrated to arrive at the best possible estimate of the number of individuals for each species on a given day. Efforts should be made to ensure that the estimate is conservative and birds are not double-counted.

Literature Cited

North American Banding Council (NABC) 2001. The North American Banders' Study Guide. Point Reyes Station, CA.