



Vancouver Avian Research Centre

Research - Conservation - Education



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VANCOUVER AVIAN RESEARCH CENTRE

BANDING STATION PROTOCOL

**Above all else,
the well being of every bird
is the top priority at *all* times!**



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Vancouver Avian Research Centre – Colony Farm Banding Station

Introduction

The Vancouver Avian Research Centre (VARC) is a Registered Canadian Charity (#82118 2656 RR0001) dedicated to wild bird research, conservation and education.

It conducts year round bird monitoring and banding to identify causes of avian population change and provides public outreach and education programs to raise awareness of environmental issues particularly as they relate to breeding and migratory birds.

VARC's primary objective is to provide data and research support that will allow for the safeguarding of bird habitats to ensure their long-term survival.

1. Banding Station

VARC's main field station is located within the Wilson's Farm area of Colony Farm Regional Park (Park), Coquitlam, BC.

Situated at the confluence of the Coquitlam and Fraser Rivers, the Park protects some of the most ecologically diverse lands in the Greater Vancouver Regional District. Colony Farm is managed according to the principles of the Colony Farm Land Use Plan. The plan was initiated by the Province in 1993, approved in 1995, and in 1996 Colony Farm was transferred from the Province to Metro Vancouver to be managed as a regional park in accordance with the principles of the Land Use Plan.

Since 1995, Metro Vancouver has actively managed wildlife and integrated management areas through an adaptive management program which includes periodic mowing, removal of invasive species, and field renovation. Other habitat enhancement programs have included the creation of wetlands for amphibians, off-channel habitat for salmonids and hedgerows to support breeding and migratory birds.

Wilson's Farm is an area within the Park that was historically farmed and is important habitat for a variety of birds and other wildlife. The old fields and hedgerows provide habitat for a wide diversity of birds including locally rare and uncommon species such as Great Blue Heron (*Ardea herodias*), Northern Shrike (*Lanius excubitor*), Eastern Kingbird (*Tyrannus tyrannus*), Western Kingbird (*Tyrannus verticalis*) and Lazuli Bunting (*Passerina amoena*). The avifauna within the region is particularly rich with a total of more than 400 species of birds documented, 250 of which occur annually.

2. Bird Banding

During banding sessions, wild birds are trapped and mist-netted, identified to species, banded and measured, held for short periods and released unharmed. All banding activities are conducted under permit and according to procedures prescribed by the Bird Banding Office of the Canadian Wildlife Service (CWS). The banding station is run by at least two people, one of which is always a licensed bird bander capable of acting as Bander-in-Charge (BIC). The BIC is responsible for the daily operation of the station and for the safety and welfare of every bird. All banding operations adhere to VARC's strict protocol:

Banding is conducted 3-4 days each week during the following seasons:

- Spring migration: April 1st – May 31st (4 days each week)
- Breeding: June 1st – July 31st (3 days each week)
- Fall migration: August 1st – October 31st (4 days each week)
- Winter: November 1st – March 31st (as scheduled)

3. Banding Operations

VARC currently operates the following capture capacity at the Park:

- 38 mist nets – British Trust for Ornithology (BTO) North Ronaldsay 12-meter (m) polyester passerine nets, with the exception of two nets which are 18-m nets. The location of mist nets (Figure 2, Appendix B in [VARC yearend report](#)) is stratified as follows based on habitat conditions and capture purpose:
 - Old-field, dry habitat (main monitoring loop) – 19 nets labeled 1-13, A, B, M, 11A, T and U.
 - Old-field, wet habitat – 4 nets labeled H, J, K and L.
 - Old-field, scrub habitat – 2 nets labeled 18 and 19.
 - Deciduous woodland – 5 nets labeled C, D, E, F and G.
 - Mixed woodland – 6 nets labeled N, O, P, Q, R and S.
 - Feeder / winter – 2 nets labeled 16 and 17
- The mixed woodlands nets are being used to explore the potential role of conspecific attraction (i.e., the tendency of birds to settle in areas where members of their own species have already settled) in habitat selection by birds. VARC has designed and built a customized battery-powered, remote playback system that broadcasts bird songs from 3.00 am to 8.00 am each morning when banding operations are

underway. Attracting birds to areas where mist-nets are established will increase the probability of detecting rare or uncommon species in the Park, thereby improving our understanding of the Park's importance. As the use of playback adds a positive bias to capture rate calculations, data from these "playback" nets will not be incorporated into the long-term data set represented by the main monitoring loop.

- 1-3 hummingbird traps – custom-built remote control drop-door traps each set around a hummingbird feeder for VARC's resident and migratory hummingbird monitoring program.
- Nest boxes - VARC has installed nest boxes with dimensions appropriate for tree swallows and black-capped chickadees. In addition to providing nesting habitat, the boxes provide a simple capture opportunity in support of VARC's Radio Frequency Identification (RFID) tree swallow research program where adult tree swallows are fitted with PIT tags which then allows detailed monitoring of the timing and frequency of entry into a nest box to feed young. Such information can be used to better understand the connections between weather, food availability, and patterns of nestling growth and survival for these species.
- 1 ground trap – custom-built 2.5 x 2.5 x 2.5 m timber-framed 'J-trap' with attached capture ramp and box. Although this trap will capture many species of passerine it is specifically designed for VARC's Band-tailed Pigeon study. These birds easily escape capture in regular passerine nets.
- Raptor trap for larger raptors

This capture capacity allows for comprehensive monitoring of bird species that differ in distribution, habitat use, behavior and likelihood of capture. It also reflects the diversity of habitat types and structure present in the Park. These capture methods are consistent with those employed at numerous bird banding stations across North America.

The number and type of capture methods deployed on any banding day depends on the time of year, anticipated and actual capture rate and availability of personnel. The minimum monitoring effort consists of the main monitoring loop during spring, summer and fall seasons, and the feeder / winter nets during winter banding operations.

Banding activities are conducted from 30 minutes before sunrise and for a 5-hour period (i.e., until 5.5 hours after sunrise). Nets are checked at least every 30 minutes and net rounds timed with alarms which are reset upon return to the banding station. Situations, in which birds may be at greater risk of injury, such as with potential presence of predators or threat of rain, require that nets be checked more frequently, if not closed altogether.

4. Dates of Operation:

VARC operates a year-round banding operation:

- a) Migration seasons (April through May; August through November): During the peak spring and fall migration seasons, weather permitting, the main monitoring loop nets (see Section 3) are always deployed and we may operate at full capacity depending on capture rates and availability of personnel.
- b) Breeding season (June through July): During the breeding season, weather permitting, the main monitoring loop (See Section 3) nets are deployed and we may operate at full capacity providing possible disturbance to nesting birds and their young is avoided.
- c) Winter season (December through March): During the winter season, weather permitting, only the feeder / winter nets (see Section 3) and ground trap are operated.

5. Opening Procedures

- a) Except during the winter season, nets are opened starting at about half an hour before local sunrise.
- b) Due to the hydrology of the site and especially during winter and spring, the bottom trammels of the nets are kept high enough to prevent birds caught in the bottom shelf from sagging into wet grass or surface water.
- c) Mist net poles are positioned on rebar inserted in to wooden supports to provide a stable base for the poles and to avoid poles sinking in to marshy areas. The top trammel loops are opened to near the top of the poles, to a height of about 2.5 meters (using a stick if necessary). The vertical shelf strings are never stretched taut. We visually inspect every net at opening, and throughout the day, to ensure there is adequate pocketing along each net shelf, trammel lines are evenly spaced, and that netting is not snagged on loop ends or doubled over itself.

6. Weather Conditions

In general, nets are not operated under the following conditions:

- i. Temperatures in direct sun above 24-27° Celsius, as birds easily become overheated or hypothermic
- ii. Temperatures well below freezing

- iii. Steady rain heavier than a light mist/drizzle
- iv. Sustained strong winds or intermittent gusty winds that repeatedly blow the nets into nearby brush

7. Net Checks

- a. Net rounds are timed using digital alarms mounted on a board at the station which signal the start of each net round and are reset each time a net round is completed.
- b. Ideally, two net round teams will check nets each round. Each team is led by a Level 2D extractor (see [VARC Volunteer Levels](#)) who **must** carry a radio for two-way communication with the BIC at the station. Nets are arranged in circuits indicated on the timer board and each team is responsible for extracting birds from all nets in each circuit. Two-way communication between the net round team leader and the BIC ensures that if one team has a lot of birds or a difficult extraction, help can be immediately dispatched from the station. After all nets are cleared, the team returns directly to the banding station together to assist, where needed, in the banding and processing of birds.
- c. Net rounds are begun every 30 minutes or more frequently (every 20 minutes) depending on the weather conditions (i.e. wind, rain, heat, cold). If need be, birds not yet banded and processed from a previous round will be left in cloth bags at the banding station while a net round is made. Birds generally are not held for more than about one hour beyond the round in which they were gathered. With few exceptions birds are processed in the order in which they were caught.
- d. Net round teams are required to report changes in weather conditions (see above) throughout the day to the bander in charge (BIC) so decisions can be made about doing more frequent net checks or closing nets if necessary.
- e. Net extractors **MUST** walk the full extent of every net and check each net carefully, paying special attention to the bottom shelf. Even with nets set rather high off the ground, it is easy to pass by a bird lying still and hidden in the grass. To avoid this, net extractors should lift the bottom trammel of **every** net they check.

8. Net Extractions

- a. When approaching a net to extract birds, net extractors are instructed to always look down the length of the net or line of nets to see if one bird appears to require more immediate attention (e.g., a tongued bird or a bird caught by one leg or one wing). Always work to extract these birds first, even if it means

passing up “good” or easier birds.

- b. At VARC, we use the “body grab” method of extraction in >95% of cases and rarely need to actively disentangle feet and toes. When the net is freed from around their wings and head, most birds actually will “let go” of netting that may, at first glance, appear to be badly tangled around their feet and toes! This has proven to be (by far) the quickest, most efficient, and safest method of extraction, as is also pointed out in Ralph (2005).

In extracting birds, we are extremely careful to not unnecessarily damage or disarrange the bird’s plumage, (i.e., we take care to not bend flight feather shafts to the breaking point and are especially careful of growing pin feathers on molting birds which can cause extensive bleeding if broken). In general, we strive to extract every bird with little or no feather loss. This is simply a good practice for protecting the welfare of each bird and also because birds are frequently photographed.

- c. A trained net extractor should not spend more than about a minute extracting any bird—excessive handling, especially during net extraction, and especially when progress is not being made for freeing the bird quickly, leads to physiological stress that can weaken birds. As stated at the outset, the well being of every bird is the top priority at all times. With nets being checked at appropriately frequent intervals by well-trained net checkers, extractions ordinarily will take no more than about 10-15 seconds each. It is our experience and observation that too much time spent handling birds both during extraction and during processing (i.e., when banders are trying to determine the species, age, and sex of birds in hand; see below) are the primary sources of physiological stress for birds caught for banding purposes.

Of course, occasional birds will be much more entangled in the nets, requiring far more than the minimum amount of time to extract, so if a net extractor is having trouble extracting a bird, he or she should never hesitate to ask for help—more experienced banders are always nearby. One option is to leave the bird in the net, if this can be done safely, and go quickly for help. Walkie-talkies are always available allowing net extractors to communicate with the Bander-in-charge (BIC) at the banding station, and these naturally should be used right away to call for help. Unless real progress at an extraction is being made, it is better for the net extractor to simply wait with the bird (keeping the net slack, if necessary, but not handling the bird further) until another person arrives. Continual handling of a badly caught bird when no real progress is being made

with the extraction is stressful for that bird—again, it is **always** better to wait for a more experienced bander to take over.

As a last resort (and something that should not be necessary more than once in several hundred or more extractions and **only under the supervision of a level 2D extractor or the BIC**), it always is permissible to simply carefully cut or snip one or a few strands of a net in order to free a bird that appears to be stressing rapidly. Individuals who are having persistent difficulty in extracting birds from nets should request guidance from one of the station's principal banders in order to improve their extraction skills.

- d. Especially on busy days, recently banded birds (still with what we call "shiny" bands) that have been recaptured within the same day, or within a very few days, are released at the nets and not brought back to the banding table for repeated processing. This is especially true for still dependent locally hatched young birds (i.e., birds in full juvenal plumage and/or in active heavy first prebasic molt) and nesting adults (i.e. individuals with an active brood patch). Band numbers can be written down on a note pad at the net and written on the recapture sheet with "released at net" in the comments.
- e. Each net at each VARC station is numbered and correspondingly numbered pegs are attached to the mistnet anchor ropes. A numbered peg is attached to each bird bag and the net from which a bird is extracted is then recorded on the data sheets. In addition, red pegs are attached to bags to prioritize birds for processing (see below).

9. Bird Bags

We use medium-sized soft cloth bags to carry the birds from the nets back to the banding station for processing.

Bags are used for one or two days only and are discarded throughout the day if they become badly soiled. After the first net round of the day, whenever possible we reuse bags from previous rounds, before using new ones, so the number of bags used daily is kept to a minimum.

- a. Bags are closed with draw strings that are looped around the neck of the bag to ensure that birds do not escape while being transported back to the banding station or while waiting for processing.
- b. As mentioned above numbered clothes pegs are used to identify the exact net that each bird is extracted from and these are attached to the draw string of each bag.

- c. Red pegs are attached to bags to prioritize birds for processing. These include all insectivores, hummingbirds, breeding females with developed brood patches and dependent young.
- d. Some non-aggressive birds may be temporarily double-bagged (more than one bird per bag of the same species), for example, most warblers, goldfinches - we do not mix different species. In these cases, double bagged birds are usually separated upon return to the banding table. Many birds **are** aggressive and should NEVER be double-bagged (even temporarily), for example, chickadees, vireos and strong-billed finches.

10. At the Banding Table

- a. Banding priority is given to hummingbirds or other small birds (because of their higher per gram metabolic demand compared to larger species), recaptures, and recently fledged young and females with brood patches. The last two are always returned as soon as possible to the nets where they were extracted.
- b. Birds particularly prone to stress (e.g. Purple Finches) and very young birds (incapable of sustained flight and dependent upon parents for food) are only extracted and processed by experienced (Level D) personnel and are also given banding priority.

Any bird displaying signs of stress must immediately be taken to the BIC to follow the VARC bird field first aid protocol: <http://www.birdvancouver.com/pdf/birdfirstaid.pdf>

- c. There are always two people involved in the banding process: a Bander/Processor and a Recorder.
 - i. The Bander/Processor
 - Sorts out all recaptures and puts them in line (still in the bag) for immediate processing which is often done by trainees under supervision.
 - Is responsible for removing birds from cloth bags, selecting and attaching the proper band size to each bird, being careful to insure a good fit (e.g., correct size, "spiraled" or overlapping bands; sand down or file any sharp projections). All species are fitted with federal aluminum bands
 - Must be aware of and careful of the possibility of occasional double-bagged birds (careful not to let a remaining bird escape from the bag while the first is being banded; careful to be sure that birds are never left in bags).
 - The Bander/Processor should try to band birds in order of priority, as stated

above, generally working from small insectivores (0 and 0A size bands) up. Whenever possible, the Bander/Processor should also sort the birds by species and band all individuals of like species in sequential order so data collection, recording, and subsequent computer data entry are more efficient.

- After removing a bird for banding, the Bander/Processor should inspect each bag and discard for washing any that are heavily soiled.
- Only one bird is processed at any given time. At VARC, this job always is done under the watchful eye of the Bander-in-charge!
- The Bander/Processor is responsible for identifying the species, efficiently and accurately ageing/sexing all birds, and taking all necessary measurements, which are dictated to the Recorder. The entire processing procedure takes no more than a minute, except in cases where additional data or notes are being taken.
- First, the Processor calls out the band size (so the recorder can pull up the appropriate data sheet), identifies the species to the recorder, and then double checks the band number with the recorder (it is best to double check band numbers every time, but it is critical to do this at least every few birds and at the beginning of each data sheet). He/she also should periodically check/correct the fit of the bands and make recommendations to the Bander/Processor as needed.
- The Bander/Processor gives the data for each bird in the following order: species, age, sex, wing length, tail length, fat score, and weight, corresponding to the VARC field data sheets.
- It is also the responsibility of the Bander/Processor to carefully examine each bird for noteworthy plumage variations, molt, breeding condition, deformities, etc. and to dictate comments as appropriate to the Recorder. All adult birds in summer and early fall are examined for wing molt.

ii. The Data Recorder

- The data recorder arguably may have the most important job of all! Scribing data without error for dozens of birds in a day, often in the face of distractions of many kinds (e.g., visitors), can be a real challenge. Recording is not a spectator sport. The recorder must ensure data is recorded otherwise its scientific value is compromised. To some extent, it is the bander/processor's responsibility to also keep an eye on data being scribed by the Recorder. A good Recorder is worth his/her weight in warblers!

- The recorder must check band numbers with the bander/processor frequently (every bird is not too often!). When there is agreement about the band number, the recorder should place a small check mark at the beginning of that record line (this helps when the inevitable mistake does occur, giving a stopping point for resolving mistakes with the last band number that was “double checked” and confirmed correct).
- When more than one individual of the same species is processed in series, then ditto marks are used in the species field on the data sheet instead of rewriting the alpha code again.
- The entire nine-digit band number is written down at the beginning and end of every band string, at the top of every data sheet, and every time band series switch on a single data sheet.
- The recorder should ask for any data the processor has forgotten to announce, and it is the recorder’s responsibility to write down the weight of each bird by watching the readout from the digital scale.
- Retrap data is recorded on a laptop computer and double checked by the data recorder.

After processing, birds are promptly released.

11. Banding Data

Band number – prefix and suffix of the band recorded at the start of each data page.

- a. Species – Alpha Code is written out.
- b. Age – The most precise and accurate (95% reliable) banding age codes (i.e. HY, AHY, SY, ASY, TY, ATY) are assigned based on degree of skull pneumatization, plumage or soft part coloration, and/or wing molt limits.
- c. Sex – M or F based on physical evidence or reliable (95% confidence) plumage and/or wing length criteria, U (undetermined) is used for cases of overlap and for monomorphic species.

For both age and sex, we sometimes note “leaning towards” our age or sex determination, which translate on our banding schedules as a less precise or undetermined category. We do this when we have ~90% or greater confidence in age or sex determinations that may not be currently acceptable to the Bird Banding Lab, but which we find useful to retain in our own database – especially if the bird is retrapped at a later date and the age and/or sex can then be determined.

- d. Wing length – length of the longest primary on the unflattened folded right

wing, to the nearest half millimeter. Factors affecting the length of the primaries, which would ultimately underestimate the wing length, (e.g. wear, active molt of the feathers, or bent tips of feathers), are taken into consideration and, when appropriate, the words "worn," "bent," or "molt" are written in place of a numerical value.

- e. Fat score – rated on a scale of 0-5
- f. Body Mass – read from a digital scale tared to directly display the body mass of the bird.
- g. Additional comments: Any physical abnormalities or other optional data. Rare species and unusual or interesting characteristics are photographed both for documentation. Birds are held no longer than a couple minutes after processing for photographs.
- h. Additional Information recorded on separate data sheet for each day:
 - All personnel or visitors involved in any part of the banding process that day.
 - Number of nets operated.
 - Net hours = number of nets multiplied by number of hours nets were operated.

12. Recaptures

Birds banded or recaptured on the same day are to be released without being processed. If the extractor knows from the band number that the bird was captured that day it may be released at the net, all other recaptures will be brought back to the station for processing. Recaptures are entered into a laptop and double checked by the data recorder. Much of the same data recorded for banded birds is recorded for recaptures depending upon species.

13. Closing Procedures

- a. Nets are operated usually as long as weather allows, and depending on the catch and the availability of help (i.e., VARC stations are not "constant effort" banding stations).
- b. Nets are left on the poles each day and furled tightly closed and tied off to adjacent brush or a stick to prevent unfurling. This operation is performed on the last net round of the day.

14. Volunteers

There are many roles for both trained and untrained volunteers at VARC and getting involved is simple. All you need is enthusiasm, some time and a willingness to learn and work with others.

Trained Volunteers

VARC has developed a graduated Volunteer Level Assessment training program for all personnel including net extraction training and ongoing development of ageing and sexing skills:

- http://birdvancouver.com/pdf/volunteer_assessment.pdf

The purpose of the training program is to ensure that all visitors and volunteers are fully trained and evaluated before handling birds and that the welfare of the birds is always the top priority. All VARC personnel are also required to complete the Canadian Council on Animal Care core module and birds in research module:

Untrained Volunteers

There are a variety of tasks that require the support of dedicated volunteers that don't require any special skills or knowledge.

- Each spring and fall VARC needs able bodied volunteers to help clear net lanes in preparation for migration banding.
- Some people help by regularly filling the feeders and traps during the winter banding program.
- Others help by clearing and maintaining net lanes throughout the year
- People with carpentry skills are particularly welcome as we evolve the sites adding boardwalks and basic infrastructure.
- Capable birders are always needed to report bird sightings to the Centre's database
- Photographers are always welcome in order to help us build our photographic library for both education and research projects.
- Others simply provide moral support and coffee and tea!

If volunteering interests you please complete the volunteer sign-up sheet by clicking on the link below indicating the areas you are interested in helping in.

[Volunteer sign up form](#)

This can be emailed to us or by simply calling to discuss volunteer opportunities in more detail – See contact information below.

15. Visitation Policy

VARC operates with a wide open door policy regarding public visitation but due to the number of individual and group visits we ask that all visits be scheduled in advance. This is also to address potential liability issues in the area in which we are banding. Large group visits are typically scheduled well in advance.

When visiting the station visitors are invited to observe the banding, ask questions and take photographs and hold and release birds under the close supervision of the Bander-in-charge.

Visitors are **not** permitted to walk the net lanes, unless invited and attended by the station Bander-in-charge. Visitors often are invited to walk the net lanes during net checks, but only on a case by case basis, depending on the volume of birds being processed, the number of visitors, and weather conditions. The safety and welfare of every bird is always our top priority at all times.

Full details of site visits together with directions to the station can be found in our site visit overview brochure by clicking [here](#).

Site Visits

For more information or to schedule a visit, please [contact VARC](#).

