

LONG POINT BIRD OBSERVATORY

MIGRATION MONITORING PROTOCOL



- 4TH EDITION -

FALL 2005



Canadian co-partner of
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**CANADIAN
MIGRATION
MONITORING
NETWORK**

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INTRODUCTION

Every year, LPBO gets many requests from people who want to volunteer a little (or a lot) of their time to our field programs at Long Point. Even if you're an "old hand," LPBO operations do change and we require all participants to read over this manual. It is essential that everyone knows how we do things and follows our routine, regardless of how they might do things at other banding stations.

LPBO personnel work closely together as a team. We all take tremendous pride and pleasure from our work here, no matter how tedious or minor — from routine maintenance, to bird banding, to data entry, to data analysis, to report writing. It's all important. All participants are encouraged to immerse themselves in all these activities, to suggest new initiatives, to point out deficiencies, and to be personally involved. LPBO is much more than banding birds — it is hard work, challenging and rewarding in all respects. Maximize your experience here by learning all there is to learn, from digging new outhouses to writing a scientific paper. In the process, you'll undoubtedly build many new friendships and learn much about people, birds, science, conservation, modern and primitive technology, and yourself.

LPBO's landbird programs centre on the monitoring of landbird populations at Long Point. Most of the program is carried out by volunteers like you. This manual has been prepared as a training and information guide to ensure accurate and efficient operation of LPBO field stations. Please follow the instructions carefully. You are collecting important scientific information, and to be of use, it must be collected and recorded in a consistent, accurate manner.

During migration, the normal day consists of getting up just before first light, beginning 6 hours of intensive banding, and running the daily census, followed by associated casual observations and supplementary censuses. However, procedure on any given day will depend upon the personnel available, weather conditions, the number of birds around, and the operational needs of the station (e.g. boat trips, maintenance, etc.). After a communal supper, evening hours are devoted to compiling the daily log and deriving Estimated Totals ("ETs") for each species of bird. It all makes for a long, but interesting, day.

THE FIELD STATIONS

LPBO operates three permanent field stations on Long Point; Bird Studies Canada's headquarters are located in Port Rowan.

The Port Rowan BSC Headquarters is an office facility and houses all the administrative staff of the organization plus various project coordinators. Computers, a photocopier, an events room, and a library are here too. An old farm house is now a regional administration office for the Nature Conservancy of Canada. Interpretive trails that meander around the adjacent grass fields and ponds offer interesting birding opportunities. LPBO staff and volunteers are always encouraged to drop by the Headquarters, meet the staff, and use the facilities during normal office hours.

The Tip field station (Area 01) is LPBO's longest-running field station (since 1960). Given its long history, the Tip is LPBO's most important station for migration monitoring. Coverage here usually takes precedence over all other stations. As the name suggests, it is situated at the tip of Long Point, on property owned by the Canadian Coast Guard and Ontario Ministry of Natural Resources. Apart from the lighthouse, LPBO owns all the buildings and rents scientific privileges for the use of the land on which we operate our programs, most of which is a Provincial Nature Reserve. The Tip is characterized by ponds and wet meadows, set among rolling sand dunes covered with a very open cottonwood savannah. The lighthouse adds to the charm. Birdwise, it is a boom or bust kind of place. It can be devoid of virtually all birdlife for several days in a row. And then suddenly, the weather shifts and you are blown away by the constant stream of migrants.

The Breakwater field station (Area 02) is the second-oldest field station (since the early 1960s). It is located about midway out on the Point and is situated on property owned by the Long Point Company. The setting is an oak — maple dune ridge with lots of grassy savannah. Buttonbush ponds are everywhere and the site is fringed by a huge marsh complex. On the whole, it is generally a much greener place than the Tip. Although still very episodic, migration here is apt to be a little more sustained on a day-to-day basis than the Tip, mainly because of increased vegetation cover and shelter. Landbird passages here are often characterized by a south-westerly movement down the ridge before continuing down the shoreline.

Established in 1983, the Old Cut field station (Area 13) is the most recent addition to LPBO's set of field stations. LPBO owns the immediate grounds and buildings, but most of our net lanes are situated on property owned by the Ministry of Natural Resources. Located at the base of the Point, Old Cut is very much a multi-functional facility. As well as being an important research and educational station, it is also literally the jumping-off point for the other stations. It is a very lush, albeit artificial, setting. On average, Old Cut bands the greatest numbers of birds per day and often has the highest landbird diversity. Just like the other stations, bird migration here can be quite phenomenal. A good spot to watch bird movements at Old Cut is from the "dike" overlooking the marsh.

Influxes of birds at Long Point depend largely on weather conditions, both current and from the preceding few days. 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, then the birds are apt to over-fly Long Point and you'll miss them. A low cloud cover (or fog) during the night often improves the birding situation on the following morning — sometimes resulting in large "groundings" or "fall-outs" of birds. Also, 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 to our south. Then as soon as the wind drops, the "dam" breaks and birds flood northward.

Patterns are similar in the fall, but the fall movement is a little more leisurely than in the spring. Not only are the influxes inclined to be less dramatic in fall, but birds are apt to hang around the stations a little longer. Fall is simply a more drawn-out migration. 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 nice, sunny days when the wind is light-moderate from the north or east.

BSC/LPBO STAFF

The Landbird Programs Coordinator and Warden are responsible for almost everything you need to be concerned about at the field stations — pretty much everything contained in this manual. Feel free to discuss anything with these people.

Other BSC staff are normally housed at the headquarters at Port Rowan. Permanent staff presently includes the President, Ontario Program Manager (all LPBO staff report to him/her), Senior Scientist, GIS Scientist, Aquatics Scientist, Bird Populations Biologist, Director of Development and Membership, Financial Controller, Facilities/Events Coordinator, Donations/Membership Coordinator, administrative staff, and several project coordinators who oversee various off-site research programs. BSC also co-sponsors the Long Point Waterfowl and Wetlands Research Fund which employs a Research Director, waterfowl scientist and manages BSC's Avian Energetics Lab. There are usually any number of other short-term employees engaged in various external projects and others (including office volunteers) who are involved in office support and data management.

Every effort should be made to introduce you to all these people. It is important that headquarters staff and field personnel maintain some sort of linkage, which is sometimes a bit of challenge, owing to the physical separation of the facilities.

WHO'S IN CHARGE?

Overseen by the Ontario Program Manager, the LPBO Landbird Programs Coordinator, Warden or a designated Bander in Charge ("BIC") are responsible for overseeing all facets of the day's migration monitoring schedule. For example, deciding how many nets/traps are to be run and for how long, and who does what and when. These people also provide training, logistics, maintenance, engage in radio calls, and generally ensure that the program is being conducted to high standards.

Sometimes the BIC is a specially appointed Volunteer Field Biologist, people are apt to rotate in and out of the position depending on the station they are posted at and with whom. Hence, the position is not entirely predictable. If you don't know who's in charge of your station, ask the Landbird Programs Coordinator or Warden. It's easy for them to forget to keep everyone informed about who's in charge where and when, due to frequent personnel switches and the rapid turnover of volunteers.

When two BICs are present at a station, they can either share the responsibility of running things, or can arrange something among themselves. If in doubt, consult the Warden or Landbird Programs Coordinator. As a simple rule of thumb, the BIC should be the most experienced person at a station. The BIC does have a certain amount of power but he/she should never be a totalitarian monster. Since the stations function best on a communal/democratic system, wherein everyone cheerfully shares **all** aspects of the workload, the BIC should not need to dish out hefty doses of authority. The BIC always pulls his/her weight in all tasks.

The normal "chain of command" at the field stations is Landbird Programs Coordinator, then Warden, and then the BIC. On occasion, other highly experienced personnel/visitors assume responsibility of a station for short durations.

HOW MIGRATION DATA ARE USED

Migration data are used in a variety of scientific studies, and should therefore be collected with care and recorded accurately. Following are brief descriptions of a few of the uses to which our data are put. A sample of publications generated from research conducted at LPBO is provided in Appendix VIII.

1. Estimated Totals (ETs), once computerized and corrected for various factors, are used to give an index of species abundance. The annual changes in these abundance indices allow us to say which species are increasing or decreasing. Because many of our migrant songbirds breed and winter in inaccessible areas where other kinds of censuses can't readily be done, our population monitoring program is particularly important.
2. The age and sex data obtained during banding can be combined with ETs to show dates of migration for each age and sex group within a species, and can be used to gauge annual productivity.
3. Our data are also used for documenting migration timing, routes, and longevity. The recovery rate for songbirds is very low. For most species, less than 1% of all birds banded are ever recovered elsewhere. Large numbers must therefore be banded before we get enough recoveries to document where these birds breed, migrate and winter, and how long they live. Although these rather simple data are crucial to management and protection of birds, they are known adequately for barely a handful of non-game species.
4. There are many things to be learned about migratory behaviour. For example, an analysis of banding data has shown that immature warblers are far more common at the Breakwater station in fall than is usual at inland banding sites. It was found that this is true for other Great Lakes coastal sites as well, except where there are lighted man-made structures. These findings led to publication of original hypotheses about different migratory behaviours in immature and adult warblers.
5. Birds have high metabolic rates, and must eat frequently to maintain health. Weight is a good measure of a bird's condition, and of the amount of fat it has stored for a migratory flight. Our banding data can be used to document weight changes according to season, or to time of day, and show how much weight birds gain while stopping over at each of Long Point's field stations during migration. Weights of birds killed at the lighthouse can even be used to estimate energy use during migration — information not obtainable in any other way.
6. Other things our data are used for include the following: using ETs in studies correlating migration to weather conditions; colour-banding in studies of behaviour and breeding biology of resident birds; studying patterns of moult; assessing existing techniques for ageing and sexing and discovering new ones; studying parasites and illnesses of birds; studying inter-area movements of birds between banding stations, and so on.

SPECIES MONITORED

While we record all species encountered each day at the stations, there are certain species that are particularly important because they may not be adequately monitored by other monitoring programs in North America. The landbird species listed in Table 1. are encountered with some regularity at at least one of the three stations.

Table 1. Landbird species adequately monitored at Long Point. Categories A-F are ranked according to priority level (A being highest). R refers to raptors; X applies to resident species.

A	B	C
Bay-breasted Warbler	American Tree Sparrow	American Redstart
Blackpoll Warbler	Dark-eyed Junco	Bank Swallow
Cape May Warbler	Fox Sparrow	Barn Swallow
Gray-cheeked Thrush	Myrtle Warbler	Black-and-white Warbler
Lincoln's Sparrow	Ruby-crowned Kinglet	Black-throated Green Warbler
Magnolia Warbler	Rusty Blackbird	Blue-headed Vireo
Northern Waterthrush	Swamp Sparrow	Canada Warbler
Savannah Sparrow	White-crowned Sparrow	Chipping Sparrow
Swainson's Thrush	White-throated Sparrow	Cliff Swallow
Tennessee Warbler	Palm Warbler	Common Nighthawk
Wilson's Warbler		Common Yellowthroat
Yellow-bellied Flycatcher		Eastern Kingbird
Yellow-bellied Sapsucker		Least Flycatcher
		Mourning Warbler
		Ovenbird
		Philadelphia Vireo
		Red-eyed Vireo
		Tree Swallow
		Warbling Vireo
		Yellow Warbler
D	E	F
American Crow	Baltimore Oriole	American Goldfinch
American Robin	Blackburnian Warbler	Brown-headed Cowbird
Black-capped Chickadee	Bobolink	Blue Jay
Belted Kingfisher	Black-throated Blue Warbler	Brown Thrasher
Brown Creeper	Chimney Swift	Eastern Bluebird
Cedar Waxwing	Chestnut-sided Warbler	Eastern Meadowlark
Common Grackle	Eastern Wood-Pewee	Field Sparrow
Downy Woodpecker	Great Crested Flycatcher	House Finch
Eastern Phoebe	Gray Catbird	Mourning Dove
European Starling	House Wren	Pine Warbler
Golden-crowned Kinglet	Indigo Bunting	Red-headed Woodpecker
Hermit Thrush	Nashville Warbler	
Horned Lark	Northern Rough-winged Swallow	
	Purple Martin	
	Rose-breasted Grosbeak	
R		X
American Kestrel	Ruby-throated Hummingbird	Carolina Wren
Cooper's Hawk	Scarlet Tanager	House Sparrow
Merlin	Veery	Northern Cardinal
Northern Harrier	Willow Flycatcher	White-breasted Nuthatch
Osprey	Wood Thrush	
Red-tailed Hawk		
Sharp-shinned Hawk		
Turkey Vulture		

1. SUMMARY OF GENERAL RULES AND POLICIES

The following is a summary of some of the most important rules, regulations and policies enforced at Long Point. They concern migration monitoring, day-to-day maintenance, boats, vehicles, radios, safety, and general behaviour. If you don't understand why we have a particular rule or policy, please ask. There really are good reasons for each one.

1.1 - MIGRATION MONITORING PROGRAM

1. Simply put, the birds' health and welfare take precedence over everything else. We proudly operate our banding operation within a well-developed ethical framework, which has been adopted by the North American Banding Council. Adhere to it! Read over the *Canadian Bander's Study Guide* and the *North American Banders' Study Guide*!
2. **Never** band a bird if the species is in doubt. When in doubt, release it! Take pictures, make notes, and consult references, other people and stations, but **never** band a bird unless you are **100%** certain that your I.D. is correct. There's nothing wrong with saying that you don't know or are unsure!
3. Likewise don't guess at a bird's age or sex; if you're not at least 95% certain; record it officially as "unknown". Still, you are given an opportunity to record your best guess on the banding sheets.
4. **Never** leave nets or traps unattended for more than 1/2 hour! At Old Cut, because it is so much in the public eye, you should attempt to make inspections every 20 minutes. You'll get plenty of exercise at Long Point...
5. **Never** leave nets unfurled and/or untied at the end of the day. At Old Cut, a twilight check of all nets is needed due to past problems with vandals re-setting nets! Report any instances of vandalism immediately to the Landbird Programs Coordinator.
6. Never put up more nets than you can safely run. If there are obviously large numbers of birds in the netting area first thing in the morning, open a few nets closest to the banding lab and see how things go, before opening the rest. Likewise, if a big day starts to develop, close the nets that are farthest away until you've got things under control. In fact, if you've got to close nets for this or any other reason, then you are advised to **close them all**, and later re-open them **all** once the situation allows for it. This will reduce bias in the netting operation.
7. If you're exceptionally bogged down, don't hesitate to remove birds from nets and release them unbanded (except for rarities and recaptures which should **always** be checked out), making sure you write down the species and numbers involved. Moreover, all birds you decide to band should be properly processed — avoid "ringing and flinging." We are **not** trying to set any kind of records here, especially if data quality and/or bird welfare are compromised.
7. When checking nets, try to remove birds that may be in some difficulty first. Any bird that is dangling by a leg, wing or tongue must obviously take precedence over any other bird.

8. The general public frequently brings us dead birds that they have picked up. There is also a very small mortality involved in any bird banding operation; whatever their source, never leave dead birds lying about. Dispose of them **immediately**, either in the freezer if they would make good study skins (with a note indicating the date, location, finder, cause of death, species) or in the garbage if they're chewed up. Always be discrete. Don't throw them in the bushes — they will be found by other people and/or attract scavengers!
9. Any birds that are injured or die during the trapping or banding operation **must** be duly noted on the casualty reporting sheet located in the front of the daily log book or banding binder. See Section 4.7. and Appendix I.
10. Never band an injured/sick bird (unless the injury is old and healed). Deal with it humanely and discretely. If survival looks promising, keep the bird in a warm, dark place for observation.
11. **Never** subject a bird to any more stress than is absolutely necessary in the performance of your duties. Handle birds with the outmost care and respect.
12. Try not to allow dogs or bicycles into the netting lanes. Politely ask visitors to secure their pets (tied to a tree) away from the net lanes. If they don't have a leash, offer them some rope. Be friendly and courteous to all pet owners at all times — they are as protective of their pets as we are of our birds! However, sometimes they insist on doing what they want despite your most polite pleas. In that case, don't make a big scene about it. Let them go ahead, but keep a close watch on things.
13. Never cut a net to extract a bird unless you have no other recourse. Always ask for assistance from a senior bander! If you're not carrying a seam-ripper or other device with you at all times, ask yourself why not!?
14. Never put traps or nets within the view of neighbours or general passers-by (e.g. no traps or nets are permitted on the west or south side of the Old Cut buildings).
15. **Never** allow the public to extract birds from mist-nets. Be polite but very firm, and notify/call upon the BIC whenever there are problems with the public. Note that sometimes, past LPBO workers arrive on site and start to extract birds unannounced (they should always introduce themselves, but often don't!). Approach mysterious helpers with a casual "Hi, I'm so and so, I work for LPBO, maybe I better help out here." Politely ask them to step aside. Then you should take over, explaining to them how important it is that only skilled people are permitted to extract and hold birds. They're usually only trying to help. Also, pay attention to any of the public's concerns. People often come rushing to tell you that yet another bird has been caught, or that one seems to be having a problem (e.g. dangling by a foot or tongue). Quickly attend to things and reassure them as best you can. Don't just shrug and nod. You should actually demonstrate to them that you take their concerns seriously, and that you are on top of things. Always immediately notify other personnel of potential "trouble-makers" (members of the public who should be "monitored" in the net lanes).
16. **Never** leave daily logs and ETs until the **next** day. They must be done daily!

17. Never leave a rare bird undescribed. Rarity report forms and a list of species requiring documentation are provided at each station. Also, don't forget to notify other on-site people immediately of your find (including BSC office staff!).
18. A Bander in Charge ("BIC") or Warden will be present at each station during migration. He/she will be responsible for over-seeing the banding operation (e.g. setting each day's banding schedule), migration monitoring, and general station upkeep.
19. Maintain/repair traps and nets on a regular basis, before they become big problems.
20. Finally, when in the field doing net checks or whatever, always wear your binoculars and carry a notepad! This is a bird **observatory**; you should be looking for **and** recording birds!

1.2 - MAINTENANCE

1. **Cardinal Rule:** Don't ever leave a field station without cleaning up your mess (including bedroom). All personnel must help with daily clean-up and other chores. All stations must be presentable daily and immaculate weekly. At best, uncooperative, chronic slackers likely won't be allowed back; nor will they receive a particularly favourable job reference if they want to use their LPBO volunteer experience on their resumes.
2. At Old Cut, don't forget to take out the garbage early on Monday mornings. Also, don't let garbage sit outside or in the garage overnight to get scattered around by animals. Garbage can be stored temporarily in the wooden bin located on the south side of the banding building. At the remote field stations, make sure that garbage is sent in to Old Cut on every boat trip.
3. Use heaters and lights only as needed — SAVE ENERGY (and MONEY)! At the same time, don't use candles except in emergencies or special occasions. Don't burn candles in your bedrooms. We've lost one field station to fire, and very nearly two...
4. Except in an emergency, volunteers and visitors must use a "calling card" to make long distance phone calls. These can be obtained locally in Port Rowan.
5. Don't tape or fasten anything to any wall without permission, unless you're prepared to repaint the room later. There are bulletin boards at each station for posting material.
6. Report any equipment breakdowns, supply deficiencies (food, bands, forms etc.), emergencies, minor problems and so on **immediately** to the Landbird Programs Coordinator or Warden.
7. In general, if something obviously needs doing, building or fixing, then please do it if you can do a good job. Improvements are always welcome, but check first with the Landbird Programs Coordinator or Warden (especially if there is a cost involved).

8. When leaving Old Cut for any duration more than a few days, store your personal items in the upstairs hall closet. Be sure to empty all dresser drawers and closets of your belongings. At the end of the year, all unclaimed items are given to charity, so don't leave anything behind.
9. Make sure that you've squared up all of your accounts with the Warden or Landbird Programs Coordinator **before** you leave.
10. **KILL all spiders, cockroaches, ants, and mice you find indoors! Take no prisoners.** If you are squeamish about this or are otherwise against such activities, simply find somebody to do battle on your behalf. As cute as you might find these critters to be, you've got no right to inflict them on our hard-won facilities, precious food stocks, or other personnel.

1.3 - GENERAL SAFETY AND SECURITY

1. **Never** leave lit candles, stoves, fires, propane lights, heaters, etc. unattended. We've already lost one cabin to fire! Smoke detectors are installed for **your** safety. While they can be a nuisance, they do absolutely no good if you unhook them.
2. **Don't** put anything on or near the heaters (not even the electric ones at Old Cut) or wood stove at the Tip — they will burn!
3. **Don't** leave out-buildings at Old Cut unlocked at night, including the banding lab, garages and work shop (which has lots of valuable tools inside). Also, lock up all buildings at Old Cut and the Tip if they're going to be left unmanned during the day. At the end of each field season, lock up the Tip and Breakwater and make sure that nothing is left out to tempt would be thieves.

1.4 - BOATING

Read the special boat operations manual provided. The following is only a summary!

1. Boats are operated by the Landbird Program Coordinator, Warden or authorised personnel. Only those with a Coast Guard Operators Card are permitted to drive LPBO boats.
2. **Never** boat in questionable weather conditions. If in doubt, don't make the trip. No boat trips are permitted at night, unless the boat is properly equipped with navigational light aids.
3. **Never** make a boat trip without notifying everyone concerned (e.g. someone at both your departure point and at every stopping point) of your travel plans and ETA. Radios at all stations must be monitored whenever a trip is underway. Let everyone know when you've arrived safely.
4. Report all boat or motor problems **immediately** to the Landbird Programs Coordinator or Warden. Naturally, these people will ensure that the motor is fixed properly and promptly!
5. **Ensure** that beached boats are properly secured (day and night); the wind can come up or change direction at any time, dragging unsecured boats out to sea.

6. **Don't** leave “valuables” unattended in the boat (this includes gas tanks, oars, and life jackets!). Apart from the fact that they tempt thieves, these items don't last long if exposed to the elements (including UV radiation); and gas tanks can explode or leak if left in full sun. Moreover, they are expensive items to replace, and your life depends on having them.
7. Always **offer assistance** to any LPBO personnel about to make a boat trip — he/she will need help loading and unloading the boat and launching it. Every boat trip is a big job. Please lend a hand. For some reason, boat trips are exceptionally tiring for everyone, most of all for the captain.
8. **Never** allow sand to enter the boat gas lines. Inspect, wash off and shake sand from gas lines prior to hook up. Inspect and wash off the tops of the gas tanks too! A few grains of sand will destroy the motor!!
9. **Never** operate any boat at full throttle! Ease up on the throttle just a tad and the motors will last much longer, and you'll save gas too.
10. Boat operators must throttle the engine down **before** shifting gears. Pretend you're driving (and caring for) an expensive engine. You are! Shifting gear from neutral when the engine is revving high **will destroy** the transmission. Throttle down!

1.5 - VEHICLES

1. Use the vehicles **only** for LPBO business. All trips in excess of 25 km radius from Old Cut must be with the consent of the Warden or Landbird Programs Coordinator. Mileage logs are provided in each vehicle and must be filled out for every trip.
2. Only drivers who are insured by BSC are permitted to use the vehicles.
3. Make regular maintenance inspections of all vehicles (oil, transmission fluid, tire pressure, etc.) at each fill up. Please treat them with respect — make them last! If you don't know how to do routine maintenance, or aren't quite sure, then ASK!
4. **Check the oil regularly!!!**
5. Obey ALL highway and traffic laws. **No speeding!!!! No drinking & driving!!!**
6. The ATV can be driven **only** by authorized personnel. A helmet **must** be worn by the driver **and** all passengers. Passengers can **only** be taken in the trailer, **never** on the ATV itself. The ATV **must not** be used for "entertainment"; it is for LPBO business **only**. It **must** travel in designated areas and existing pathways **only, never** over dunes or through vegetated zones.

1.6 - RADIOS

1. The person in charge of each station is usually responsible for radio communications. However, it is important that **everyone** receives instruction on radio use and care, for safety reasons. Instructions for radio operation are posted by each radio. If they're not, ask the Warden to draw them up!
2. Don't forget to make **both** of the scheduled radio calls daily, unless alternative arrangements have been made. During the field season, the Old Cut radio **must** be left on all day and night. If remote stations miss two calls in a row, emergency procedures will be set in motion to find out what has happened to you (unless a technical glitch is highly probable). This could involve sending out the Coast Guard. Very serious stuff.
3. Keep radio communications brief and concise, especially when transmitting from the remote stations. Remember that these remote radios run off a battery and that about 25x more power is needed to transmit than to receive, and hence is a much bigger drain on the battery. Remember too that the radios are your life-line to the outside world.

Moreover, the radios are **not** private telephones; they are **public** and our conversations are monitored by the Department of Communications to ensure that we abide by the rules. Among other things, they are **not** to be used for idle chit-chat, nor is profanity acceptable. Please don't jeopardize our broadcasting license.

4. If the battery appears to be fading at Breakwater, notify Old Cut immediately to ensure that a new one is brought out ASAP.

1.7 - GENERAL BEHAVIOUR

1. **Never** trespass on CWS or Long Point Company property. Advance notice and permission is required for all sojourns. Failure to comply will result in immediate dismissal.

At the Tip, you can venture as far west as the posted signs marking the boundary of the National Wildlife Area, but no farther without obtaining permission. At Breakwater, you can walk the length of Courtright Ridge (on an occasional basis) up to the posted signs before the Long Point Company warden's residence, but you cannot venture off of the ridge or take extended walks in any direction on the beach. From Old Cut and the Provincial Park, you are permitted to walk east into a portion of the National Wildlife Area, along the **beach area only** (not among the dunes). You are not permitted to venture farther east than the line of signs posted across the beach by the Long Point Company. In general, if the sign says "NO TRESPASS," then read and heed.

2. At the remote stations, immediately report all trespassers on CWS or LPC property to personnel at Old Cut, particularly if motorized vehicles are involved. However, leave such individuals to be dealt with by the appropriate landowner — don't take the law into your own hands. Don't "kick them off" or even tell them that you're going to report them. For one thing, sometimes they do have permission. For another, you might rile them up.

3. No tents are permitted at any station without permission from BSC's President or Ontario Program Manager.
4. Don't break **any** laws.
5. **Smoking** is not permitted inside any LPBO facility or vehicle.
6. Avoid any questionable social activities that might offend other volunteers or neighbours. For instance, don't flaunt or be excessive in otherwise acceptable behaviour (e.g. drinking).
7. Maintaining good relations with our neighbours is **essential!** Be friendly, courteous, and helpful. They're great folks!
8. At Old Cut, keep day visitors informed and made to feel welcome as much as practical. Introduce them to the "Friends of Long Point," who will provide much of what they need, besides a banding demo. Point out the sightings board for interesting sightings (update it daily!), direct them to the Visitor Centre, be friendly, and let them know about membership and items for resale (checklists, bird finding guides, T-shirts, etc.).
9. Always be courteous and kind to visitors, neighbours and each other — no matter what the circumstances. Short-term volunteers often feel "left out" when confronted with long-term personnel who have established their own routines and friendships. Special efforts are needed to make them feel at home. All complaints (from visitors, neighbours, volunteers) **must** come to the attention of the Ontario Program Manager.
10. Don't remove library or reference materials from any station without obtaining consent from the Ontario Program Manager (paperback novels and magazines excepted).
11. Field stations operate on a communal/democratic system. **Everyone** is expected to do their share of all job tasks, including meal preparation, cleanup, paperwork, and so on.
12. VIPs have a wonderful habit of dropping in at field stations completely unannounced. You're not likely to be able to distinguish them from the regular public. Hence, you simply treat all visitors as VIPs. VIPs include employees of government agencies, all of our benefactors, members of the Board, the President, all neighbours, anyone who helped construct the facilities, and indeed all past LPBO volunteers. There are **lots** of 'em!
13. Treat all local store owners and businesses with friendliness and respect. We rely heavily on their support.
14. Sorry, but **no** mammalian pets (cats, dogs, sheep) are allowed to reside at any field station without **prior** consent from the Landbird Program Coordinator, the Ontario Program Manager, and BSC President. All other pets are also subject to similar screening. Please leave your pet at home.

2. MIGRATION MONITORING FIELD OPERATIONS

2.1 - OVERVIEW OF THE MIGRATION MONITORING PROTOCOL

Daily estimated totals (ETs) are the most important of LPBO's migration data. These are the best estimates of the numbers of each species present each day, and are based on three components of the migration monitoring program: a daily **census**, daily **banding** and **other observations**. Details on each of these components appear in the following sections.

It is extremely helpful if each station's crew can establish a routine for how the day begins, is conducted and ends. Once the nets are set, at least one person should be free to conduct the census while the others start in on the banding, with occasional switching off. It is important that these activities are coordinated, though the person in charge is ultimately responsible for establishing the daily schedule.

During migration, work directed towards producing ETs takes precedence over other LPBO activities (with the occasional exception for station logistics and boat trips). A census and banding are almost always done daily, but if time is limited, the census should take priority, followed by banding, then other observations. If weather is unsuitable for banding, try to take extra walks or a second census to get a better idea of what birds are present in the area.

Personnel leaving a station (or just making a day visit) should leave records of all their observations so that those making up ETs at day's end have all the required information at hand.

2.2 - STAFFING OF THE FIELD STATIONS

While each station can gather meaningful data if only one person is present, this is not highly desirable, and generally only occurs when logistical factors, such as boat trips or personnel movements come into play. Each station is somewhat different in its personnel needs due to area of coverage and other factors. As mentioned earlier, the Tip and Breakwater stations are the longest running and, as such, have the **highest priority** for operation. In rare occasions, operations at Old Cut may well have to be sacrificed in order not to compromise the other stations' coverage.

The Tip station runs optimally with 4-5 people, given the relatively large area of coverage and longer net rounds, but can run satisfactorily with 3 people. The Warden is generally at this station, and is usually the BIC. While the Warden can do a lot of training at the Tip, especially when well staffed, the crew on the whole, should be fairly experienced.

The Breakwater station, can sleep up to six people, but rarely sees this many people as facilities can get cramped quickly. The area of coverage is much smaller than the Tip and 3 people can easily run the station optimally, although two experienced people are normally adequate. Generally, the BIC here is a qualified Volunteer Field Biologist and one or both the other volunteers have had a reasonable amount of training (at least a week) at the Tip or Old Cut stations.

The Old Cut station, likewise, has a fairly short net round and smaller area of coverage than the Tip. The migration program can be readily run by three experienced people. However, the immediate contact with the public usually means that more people are needed to ensure net rounds are done frequently and the public is dealt with. Old Cut is the mainland station, and as such, has a lot more logistical factors to contend with, such as grocery runs, or volunteer pick-ups/drop-offs. The Landbird Programs Coordinator generally works out of Old Cut, and is usually the BIC. Volunteers first arriving at LPBO generally stay at Old Cut for a short period and this is where a lot of the training is conducted. Four participants to the program is an ideal number, but the station can run well with fewer. It is not uncommon for local experienced banders to pop by for the morning's banding, unannounced. Introduce yourselves to them if they haven't already. Their assistance is quite helpful.

Because Old Cut is the jumping off point for the remote stations, it is also almost always congested. A dozen or more people may be living on site, especially during the busy spring/summer period. Privacy is impossible. Stress levels are high. But somehow, almost everyone manages to fit in and acclimatise.

2.3 - DAILY CENSUS

A census must be done every day the station is manned, even if it is raining. The census routes for each field station are shown on the accompanying maps (Figures 1, 2, 3). Copies of these maps should be posted at each field station. It is important that you stay on the standardized route.

The census should begin within 2 hours of sunrise, although weather conditions may force it to be delayed until later in the morning. (If you're alone or understaffed, get the census done early and before opening nets). If it can't be done during the prescribed time (e.g. because of a conflicting boat trip, rain), then it should be completed as soon as possible thereafter. The census should take about 1 hr (generally longer at the Tip), and should be done as a unit. For example, if it starts to rain, abort the census and start it over again when the rain stops — don't do half the census at one time and the other half later on. At Old Cut you may find that neighbours, or birders, will want to stop and talk to you while you are on census. You can either politely tell them that you are doing a standard count that requires your full attention and you should be on your way, but you'll be happy to talk to them afterwards, or you can subtract the time spent talking from your total census time. Take along binoculars (a scope is nice too at the Tip, if there are enough people to carry things) and a note pad and pencil for recording your observations. Record the date, start and finish times of census, names of census takers, and weather conditions in your notes, followed by the species by species tally (see example in Figure 4). Try to use the standard species codes or write out the species name, so that other people can read and enter the census in the log if you are absent for the ETs. Usually, all of this info is transcribed to the daily log sheets immediately after census or at the first available opportunity (rather than waiting for the evening).

On your arrival to a station, **always** enquire whether a census has been conducted (and where the records are if not already compiled in the daily log). By the same token, if you're at a remote station and waiting for the boat to come and get you, make sure that the census is done before you leave (i.e. while you're waiting), even if nets have to be temporarily closed.

Since it is the most standardized component of our protocol, the census always takes priority. Moreover, an Estimated Total **cannot** be constructed without a census!

The aim is to take a sample of the birds present in the defined station areas (see boundaries on maps) by counting all birds identified by sight and sound along the census route. Try not to count the same birds repeatedly, and don't estimate numbers of birds that were not actually seen or heard. 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.

The general rule at the Tip and Breakwater is if you can see it anywhere from within the census area, then it should be counted. At Old Cut, however, only **non-passerines** (waterfowl, herons, gulls, raptors, shorebirds, etc.) **outside** the boundary can be counted; whereas all birds occurring within the census area can be counted. If you're not sure what can be counted, ASK.

At least one person on the census should be skilled at bird identification. If you can't identify a species, do not guess. However, try to identify it as closely as possible (e.g. "dowitcher spp.", "*Empidonax* spp.", "warbler spp.", etc.). A census of the species you do know is better than no census at all, but 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 (e.g. if they were flying over too high to identify accurately).

In short, the census records should represent the total number of birds seen from the census route. Remember that the census is a **standardized** "sub-sample" of the birds in the area, and so you shouldn't take much more than an hour in trying to chase down every last bird. Very long censuses (more than 1.5 h) are to be avoided. On days when there are so many birds around that a very long census might seem necessary, limit it as best you can anyway, and then devote more time afterwards to conducting "vis migs" (see Section 2.5).

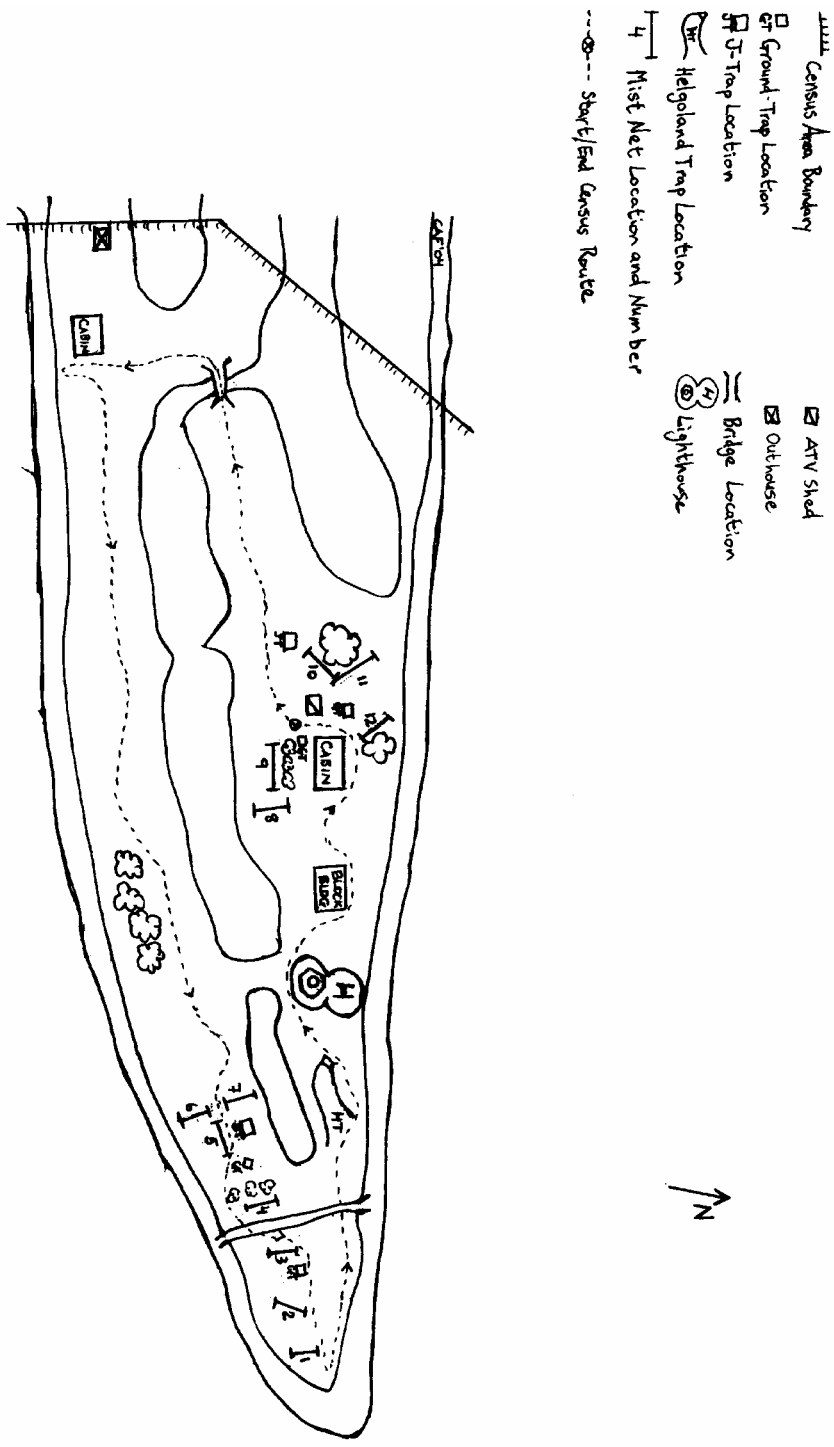


FIGURE 1. CENSUS ROUTE AND NET LOCATIONS AT THE TIP (A01).

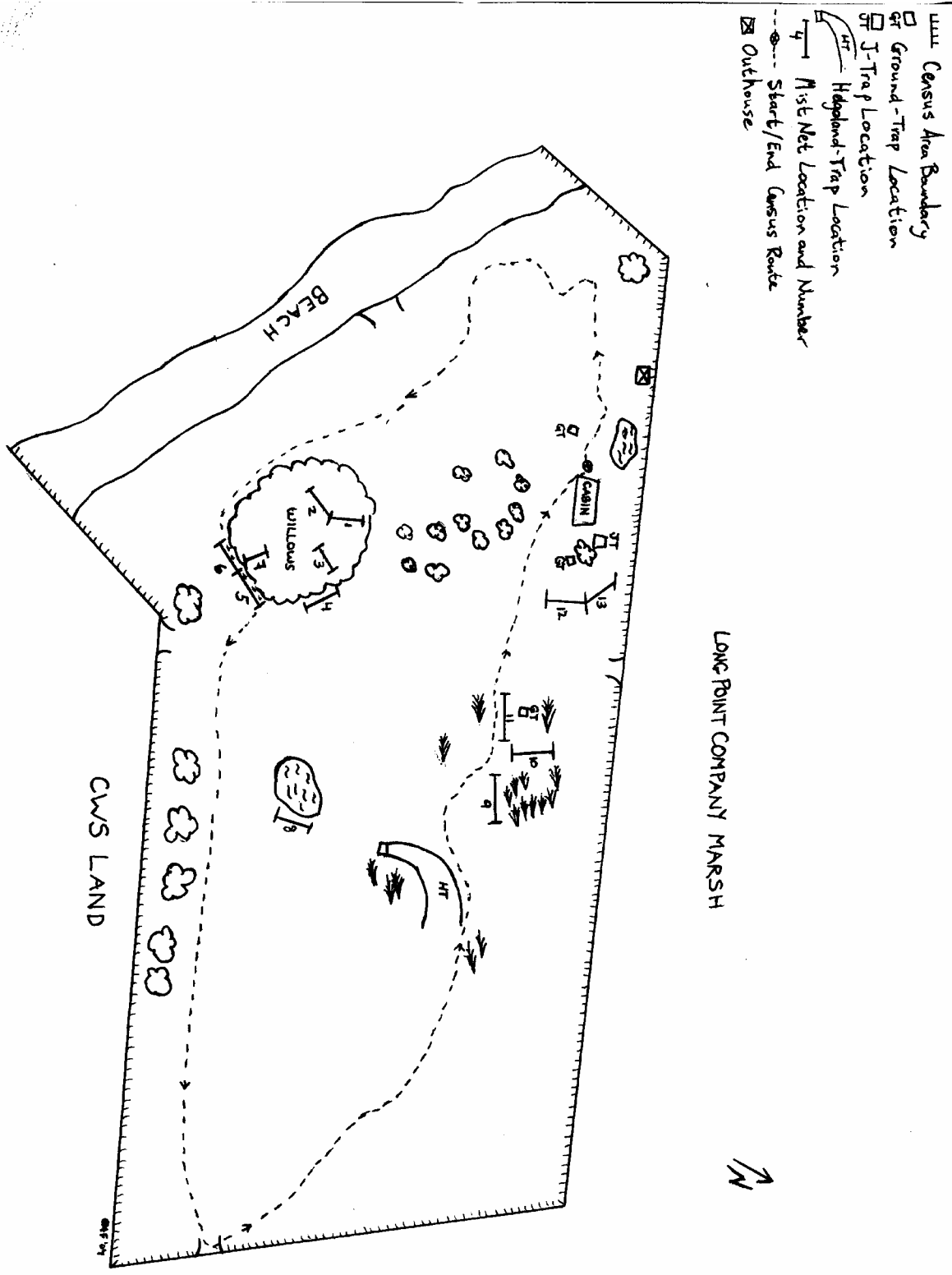


FIGURE 2. CENSUS ROUTE AND NET LOCATIONS AT BREAKWATER (A02).

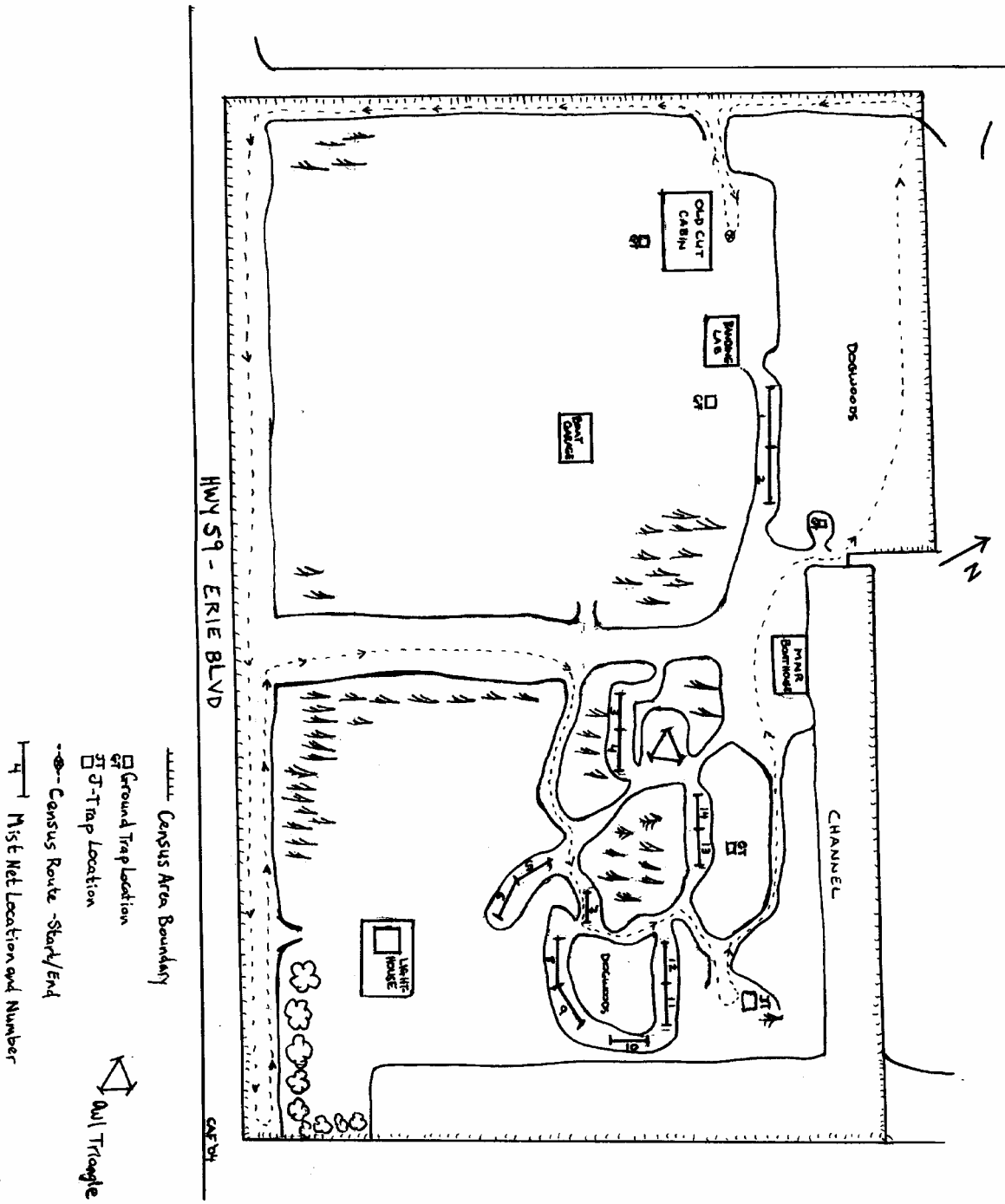


FIGURE 3. CENSUS ROUTE AND NET LOCATIONS AT OLD CUT (A13).

65 min.

Date SEPT 9 '04 Time 752-857 Weather NORTH-6 17°C

Location BREAKWATER (02) CLOUD = 10/10

Notes CENSUS

RWBL - : : (3)	NOWA - : (1)	WOODU - : (2)
MAWA - [] [] [] [] (58)	RBNU - : (2)	DCCO - [] [] (14)
RBGU - [] [] (20)	GBSA - : (1)	GBNE - : (1)
BAEA - : : (3)	MERL - : (1)	COGR - : (1)
CATE - 20 (26)	HOWR - : (2)	
HERG - 1' (6)	NRNS - : (1)	50 SPECIES
WHIM - : (1)	NAWA - L: (7)	
CAGO - : : (3)	OSFL - : (1)	
MALL - [] [] (18)	GRAA - : (1)	
BARS - [] : : +300 (14)	STBW - : : (3)	
SAND - : (2)	PUMA - : (1)	
CHSW - : (1)	MODO - : : (3)	
EUST - [] : : (14)	RCKI - : (2)	
RTHU - : : (5)	MDWA - : (1)	
BGGN - : (2)	COYE - : : (4)	
SESA - : : (4)	RBGR - : (2)	
TRES - : : (5)	TEWA - : (1)	
AMGO - 35 + 1 : : (41)	COGO - [] (9)	
AMRE - [] : : (13)	LEFL - : (2)	
EAWP - : : (4)	VEER - : (1)	
KILL - : (2)	SWTH - : (2)	
WIWA - : (1)	CDLO - : (2)	
DLBW - : (1)	LEDW - 10 (10)	

FIGURE 4. EXAMPLE OF A CENSUS FIELD SHEET.

2.4 - DAILY BANDING ROUTINE

Banding should take place daily during the migration seasons (mid March through 10 June and early August through mid November) and at other times when personnel want to do it. It should start as early in the day as possible, preferably 1/2 hr **before** sunrise. Some species disappear after the first hour or so of light, though others may not appear until later. There is often a mid morning rush of migrants, so don't give up and close; try to put a good effort in for 6 hours.

The various bird-catching methods used at LPBO are described fully in the *Canadian Bander's Study Guide* and the *North American Banders' Study Guide*. Please make sure you read these essential references and know the material before you begin banding!

Only open as many traps/nets as you can safely operate. This depends on the number of birds in the area, the number and competency of personnel, and weather conditions. The person in charge will determine how many and which nets and traps are to be opened/closed each day. Always make note of when and which nets/traps were opened and closed, those in charge often overlook this important information. It is very important to record this effort information properly in the daily logs.

2.4.1 - BIRD CATCHING EFFORT

Because of day-to-day limitations imposed by weather, bird volume, staffing, and visitor traffic, we can never operate a completely standardized bird catching operation at Long Point. Still, we try to inject as much standardization as possible into our procedures. The following provides guidance as to what the optimal/target effort should be on a daily basis for each station, if weather/bird/people circumstances permit. Please follow these guidelines, even if there are "no birds" around!

1. The idea is to catch as many birds as can be safely handled during the 6-hour "standard" period. If you can safely run all traps and all nets at the site, then do it. On days when you can't, keep in mind that the effort is focussed on making sure that we have a good representative sample of what's passing through. Because the Heligoland Traps (HTs) and nets are much less selective than the baited Jay Traps (JTs) and Ground Traps (GTs), priority should always be given to HTs and nets. This doesn't mean that you never run JTs or GTs! All it means is that the JT and GT effort should be scaled back or closed on big bird days if the JTs and GTs are interfering with running maximal nets and optimal HT runs.
2. At Areas 01 and 02, the target number of HT runs each day is 6. Depending on circumstances, on some days you might only get in 4 runs; other days you might want to do 8 or more (especially if you haven't been able to run a good netting operation owing to weather). That's OK. A "target" is something you aim for; you don't always have to hit it bang on every time.
3. The netting effort should be maximized according to the conditions of the day. Still, you must close up some or all nets if conditions force you to. What we want to discourage is the practice of opening only as many nets as you "want to". If conditions favour it (i.e. there are enough people on hand, bird volume isn't too high, weather conditions are good, there aren't a lot of visitors to deal with), then open the station's full complement of nets. Again, close down your JTs and GTs if they are causing too much of a backlog in the banding lab.

4. The target numbers of 1.25 inch (30mm) mesh nets to be operated at each station are as follows:
 Tip = 12 nets
 Breakwater = 13 nets
 Old Cut = 14 nets

Locations of nets and traps (see Figures 1-3) do not change from year to year or from season to season unless absolutely necessary (e.g. because of erosion), and even then must receive prior approval from the Landbird Programs Coordinator. At each station, each net is numbered, allowing us to track individual netting efficiency.

5. Based upon an analysis of historical effort, here are the targets we should aim for **daily** for each station regarding J-trap and Ground Trap operations:

Trap	Station	# of Traps	Spring Operation	Fall Operation
JT	01	2	10 April-21 May	15 Sept-15 Nov
GT	01	2-4	“	“
JT	02	2	“	NA
GT	02	2-4	“	NA
JT	13	1	“	1 Oct - 15 Nov
GT	13	2-4	“	“

Note that GT operation is for songbirds only (i.e. shorebird trapping is in addition to that outlined above and is regarded as "non-standard" banding; see Section 3.6).

6. On big bird days, you'll need to scale back your netting operation or preferably close it completely. However, once the backlog of birds is under control, then you should re-open as many nets as you can safely handle, and preferably all of them. Big bird days usually come in distinct waves and bird volume normally tails off after mid morning. But this doesn't mean that your trapping/netting effort should too. Try to put in a solid effort for the full 6 hours.
7. One final point concerns "additional" or "non-standard banding" (NSB). If personnel want to continue banding activity outside the prescribed 6-hour period (or open additional traps/nets) then this is quite permissible and even encouraged, when appropriate (e.g. extra training or school groups). However, it shouldn't be part of the normal procedure and must not interfere with other aspects of the program (including maintenance). NSBing should generally not occur beyond 3:00 p.m., but this is up to the Bander-in-Charge or Warden's judgement. Likewise, if you want to place an extra net or trap in order to catch a rarity or something, then, again, this is permissible but, again, shouldn't be part of the regular operation. Birds captured during NSBing must be recorded as such on the daily log sheets and banding sheets. NSB captures **are to be used** in the construction of the daily ET.

If you follow the above guidelines, you'll essentially be following what we've been doing since 1960. To the maximum practical extent, it's important that we try to maintain consistency in effort from year to year.

2.5 - OTHER OBSERVATIONS

Throughout the day (even in bad weather) you should be looking for and seeing many birds in the station area **in addition to** the ones you've **already** counted on census or captured during banding operations. It is important that the whole area is covered on foot more often than just on census — supplementary birding treks around the census area are an important part of the day's activities.

A brief count of visibly migrating birds (a "vis mig") should be done close to dawn each day to determine if there is a movement; otherwise you might miss it. Of course, some movements (e.g. hawks) may not be seen until later. In any case, on days when numbers of birds are observed actually moving through an area (i.e. they are engaged in diurnal migration), pick a good observation spot and record this passage for a fixed-period of time (e.g. 15 minutes), preferably at hourly intervals through the morning. Record the species involved, the numbers, weather conditions that might be prompting the flight, direction of the flight, and the amount of time you spent recording.

In early spring and late fall, particularly at the Tip, it is always a good idea to devote a half hour or so early in the morning to a Lake Watch. This is best done from the tip of the point and is best done with the aid of a spotting scope. Count/estimate all waterbirds observed — there may be thousands moving. It is also standard procedure to conduct lake watches at Breakwater from the picnic or beach area. Bad, on-shore weather is often a great time to conduct a Lake Watch, since it is apt to push birds near shore and bring in a rarity!

Don't rely on mental notes for these other observations. **Write them down!** If you leave before the day's records are written up, be sure to leave a copy of your records behind for those compiling the daily logs and ETs.

2.6 - DAILY ESTIMATED TOTALS (ETs)

The daily Estimated Totals (ETs) are our best estimate of the total number of each species present in the station areas each day. Although estimates, they are more realistic than banding totals or census counts alone. Because we use these data to estimate population size, they **MUST BE DONE CAREFULLY**. They should be educated estimates, not guesses.

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). Note that a census is a prerequisite for ETs; they **cannot** be derived without a census. With the exception of owls, ETs are for daylight hours only. Nocturnal observations (e.g. calling thrushes migrating at night, lighthouse kills) **must not be included**.

The ETs should be compiled after all other record-keeping for the day has been completed, and should be done with **all** personnel present. Try to arrive at a consensus. [If you have real difficulties with a decision, write the details in the log]. This job makes a pleasant after-dinner occupation, and allows everyone to catch up on what was seen during the day. It is also important training for new personnel.

How to Arrive at Estimated Totals:

1. On log sheets, first record the numbers of each species banded, retrapped, and seen on census in the appropriate spaces.
2. Next, run down the list of species, asking if anyone has any Other Observations to add. For example, the compiler calls out "Loons, grebes, cormorants, herons...?", and someone answers "I saw a Great Blue Heron this afternoon." Or call out "Robin — 8 banded, 2 retrapped, 20 censused — any additional observations?" Some judgements must be made, and these should be conservative (but not too conservative). Again, it is important to keep in mind that Other Observations ("Obs") is a **count** of birds (seen or heard) that are most likely **different** from those detected during the census and banding operations. These can include good estimates of flock size, but not extrapolations (e.g. just because you saw one cuckoo, you really have no evidence to think that there must be more around). Nor can it include repeated counts of what were probably the same birds, whether seen by you repeatedly or by someone else. Take behaviour, time of day, and any other relevant circumstances into account. Keep in mind that birds do fly from place to place, so the cuckoo that you saw at the outhouse at 0900 hrs could easily be the same one that someone else saw near the HT at 1330 hrs.
3. The daily estimated total (ET) is derived from data that appear in the columns of the daily log sheet (number banded, number retrapped, number censused, other observations). Inspect all of these numbers together, and along with all of the other participants, try to derive the best **estimate** of the number of birds that were **known** to be present in the area on that day. On days when there is very little bird traffic or for species that are uncommon or rare, the ET will often simply be a sum of the other columns. Otherwise, if you have good evidence that birds were not accounted for in the other columns, then the ET can and should be adjusted upward. For example, if there was a steady movement of hawks overhead for an hour in the afternoon and you conducted two 15-minute counts during this period, then the actual count totals would be inserted into the Obs column, while you'd add a corresponding number into the ET column to reflect the half hour period when you weren't actually out there counting the traffic.
4. The ET column cannot be less than $B+R+O$ or less than $C+O$. **Hence, you can't ET fewer birds than were observed.**
5. Do not count broods of dependent young (e.g. Canada Geese) in the ETs.

Some Helpful Hints for Deriving ETs:

1. If you are netting all day and none or very few of the birds are being caught again during the course of the day, then this is a strong indication that there are probably a lot of birds present. Conversely, if the day's repeats start accounting for a sizeable fraction of the birds being caught,

then you can assume that you are indeed banding a high percentage of the birds present in the area (i.e. new birds **are not** arriving or moving through the area).

2. ETs should be conservative, but you should not be afraid of arriving at high numbers. It is just as bad to grossly underestimate as to grossly overestimate. Remember too that the nets cover only a small portion of the sample area. They catch only a fraction of all birds present, particularly if birds are moving through the area. Don't forget that the nets do not adequately sample species that tend to forage in the tree-tops.
3. While it is important that the ETs be firmly based upon observations, and therefore reliable estimates, it is not important that a lot of time is spent arguing over whether there were 22 Dunlin or 26. It is extremely important that the ETs are reliable at least to the nearest natural logarithm (e.g. 1, 3, 10, 20, 50, 150, 400). In most cases, however, ETs should be more accurate than this.
4. It is often helpful to cross-check 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 that? Are there fewer White-throats than White-crowns today?
5. In most cases, particularly for less common birds, it will be easy to come up with ETs. Special cases are as follows:
 - a) If every time you looked out, birds were passing through the area in one direction, but you did not observe continuously, you may extrapolate from your observations to cover periods when you were not watching closely, but were aware that a sustained movement was in fact occurring. Be conservative. Remember that many birds may mill around the same area all day, rather than pass through. And consider that most species' movements peak at a certain period of the day; seldom is there ever a sustained passage. Also, keep in mind that migrating hawks and many other diurnal migrants at the Tip station may fly east off the tip over the lake for a few hundred metres and then promptly turn around and fly back west. Don't count them twice!
 - b) In the event that you saw birds you could not identify, but could classify to group (e.g. "warbler"), you could try to assign them to actual species in the ETs, based on other data. For example: there were 12 unidentified warblers on the census. Of 8 warblers banded, 6 were Bay-breasted Warblers and 2 were Blackpolls. The 12 unidentified could therefore be assumed to have been 3/4 Bay-breasted, and could appear as such in the ETs. There should be no unidentified birds (i.e. UNBI) in the ETs.

On the other hand, if you cannot comfortably assign the unknowns to a species, it is best to leave them out of the ETs entirely, since the procedure described above prejudices things towards catchable species. With warblers, you have to be especially cautious during the passage of Myrtles, since this is often a diurnal migrant that migrates through at tree-top level, while other species are being captured in your nets/traps.

Again, use your judgement. If you banded only 2 warblers and one of them was a rarity, you obviously should not assume that half the unknowns from the census were the same rare species.

Some examples follow:

Example a) If one cuckoo was seen on the census and two were seen together later on, you might have reason to assume that one of the two birds was the same individual seen singly on census. In that case, you should record **one** under other observations, and your ET should be two (not three). Likewise, if two people independently saw two cuckoos on the same day, in the same general area, you can probably safely assume that they were the same birds, and record an ET of two (not four). Get a feel for who saw what, when and where, and the circumstances. Again, don't forget that birds are not stationary creatures; they are highly mobile! So it is entirely possible that the 2 cuckoos you saw at the tip were the same as the ones seen by someone else near the cabin.

Example b) If both Blue Grosbeaks you saw were females, and the one Mary saw was a male, then you can record an ET of 3. However, if the one Mary saw was a female, then you could safely assume that it was one of the birds you saw and therefore hold the ET at 2.

In spite of the difficulties you occasionally have in coming up with ETs, you'll find you quickly get the hang of them, and your ETs will be similar to those derived independently by other observers. One of the reasons for all of the personnel being involved in deriving ETs is to encourage discussion and uniformity of approach. Ultimately though, the final judgement is up to the Warden or person in charge.

Even if you're an inexperienced birder, **please** don't excuse yourself from the ET process! It's important that everyone feels involved and contributes, so please sit in, if only to hear how the day panned out.

Last but not least, derivation of ETs is **not** a competitive process. There's sometimes a temptation to maintain that "your" birds were different from someone else's, just so that your observations can be included. Let your ego go! If you have good reason to believe that 100% of the blackbirds you saw have been accounted for by other people, keep quiet. It really isn't necessary for everyone to chime in their "other obs" as each and every species is called out. Only chime in if you can **add** anything to the total. That way ETs will go much quicker and the process will be less confused (and you'll get to bed at a reasonable hour). At the same time, don't feel that your "redundant" observations aren't appreciated. They are! They help **confirm** what took place in the field. That's important!

2.7 - STOPOVERS AND RESIDENT INDIVIDUALS

Currently, LPBO does not try to determine the stopover status of birds outside of those recaptured during the banding period. LPBO produces migration indices for over 60 species. Several species which are resident (e.g. Carolina Wren), or stopovers moving back and forth to a roost (e.g. Red-winged Blackbirds, Tree Swallows) do not have migration indices produced, but it is still important to determine ETs for all species.

3. SUPPLEMENTAL NOTES ABOUT BANDING AT LONG POINT.

Pretty much everything you need to know about banding is contained within the *Canadian Bird Bander's Study Guide* and the *North American Banders' Study Guide*. Read them. More than once! The following material is supplemental reading.

3.1 - MEASURING FAT

The amount of fat on a bird can be used as a measure of a bird's condition. During migration, bird physiology changes markedly, such that birds develop hyperphagia and put on tremendous quantities of fat. Fat is the fuel required to sustain migratory flight. A visual assessment of fat can indicate whether a particular bird has just completed a migratory flight (little or no fat) or is about to depart on one (large amount of fat). Measuring fat is also useful for gauging the condition of sick or injured birds.

Once you get the hang of it, measuring fat is an easy procedure. After banding, hold the bird in the customary grip and part the feathers a) in the hollow in front of the breast-bone (the furculum), b) under the wing, and c) at the base of the tail by blowing on them. As you blow "upward" from the top of the breast towards the head, the feathers will part along their natural tracts. You should not blow so hard as to make you faint from hyper-ventilation! Look at the amount of fat deposited beneath the skin. The fat deposits show up as distinct yellowish or orangish patches, contrasting with the red muscular areas. Consult the fat-scoring chart.

3.2 - MEASURING SKULL OSSIFICATION

Examining the skull to determine the extent of skull ossification or "pneumatization" is a reliable way to determine the age of a bird, if done properly. This process, known as "skulling" is done routinely in the fall (it can be done in the spring for some species) for nearly every single bird at LPBO.

When birds hatch, only one layer of bone is present in the skull. This single layer, when examined on a live bird gives the skull a uniform pink appearance. As the bird ages throughout the summer and fall, a second layer of bone is deposited underneath the first and the two layers become joined by bony "columns". This gives a more "bone-like" appearance to the skull; white with small specks or "stippling". A notable contrast (although difficult to see at times!) exists between areas of one or two bone layers. There is a general pattern in the deposition of the second layer of bone and the skull is scored from trace ossification to complete ossification, according to the degree of bone deposition. As mentioned above, skulling is an extremely reliable ageing method. However, it is only as good as the "skuller". Good lighting and optical help (visor loupes are present at each station) are strongly recommended! If you are unsure of a skull, don't guess; get a second opinion from a more experienced bander. Guessing, or improper ageing can have significant negative impacts on age or population analyses. If you are still unsure of the skull and the plumage offers no assistance in determining age, put it down as unknown.

3.3 - MEASURING WING CHORD

Wing chord is important in 1) making sure you have identified the bird correctly, 2) in analysis of weights, where wing chord can be used to "correct" for the bird's fat-free body weight, and 3) in

separating the sexes of some species. All wing measurements done in North America are based on the natural arc of the un-flattened wing. This is an important note to European banders, who are accustomed to measuring the flattened wing. The only exception is shorebirds, which must be measured along the flattened wing, in order to properly determine sex.

3.4 - MEASURING WEIGHT

LPBO weighs all birds in specially-made cans on an electronic balance. Pesola scales are not very useful in a large-scale banding operation, though they are used when banding occurs in the field (e.g. for the Tree Swallow project). Birds are weighed with the band on. Put the bird in the can upside down, making sure that its feet are tucked in. Weigh to the nearest 0.1 gram. Take care in fitting the appropriately sized can to the bird. Also, some species (especially cavity-nesters and Winter Wrens) are prone to escaping from cans, so keep an eye on things and do the weighing as quickly as possible, with one hand over the top of the can.

It is best to weigh the bird as the last step in the banding process so you can release the bird directly from the can. Small birds can be "dumped" out of the banding lab's release hatch, while larger birds can be released by hand. Do not try to remove a "stuck" bird from the can by pulling on its tail; you'll wind up with a handful of tail feathers. Such birds can be gently shaken down far enough in the can for you to get a bit of a grip on them. If a bird escapes before being weighed (or winged), make a note of that in the Notes column of the banding sheet (e.g. "not weighed").

Electronic Balances: Most of our triple-beam balances have been replaced by a top-pan electronic balance. The old triple-beams are kept in the banding cupboard (or under the banding bench) as a backup in case the power/batteries fail and for use when a supplementary banding lab is needed. The electronic balance is very easy to use and very quick. There are a couple of cautionary notes:

1. Unplug the unit at the end of the day. If it is battery operated, turn off when not in use.
2. The balance has a maximum capacity of 1200 grams; so don't try weighing very large birds/turtles. Don't push down on the pan to see how far it'll go!
3. Handle the balance with care and keep it clean; it is a **very delicate** and **very expensive** little system.
4. Do not make any adjustments to the balance or attempt to turn any screws unless directly authorized by the Landbird Programs Coordinator.

To tare the electronic balance, put the bird in the can and place it on the pan. Now press the tare button. Let the readout stabilize to 00.0 grams. Be patient. It often takes 2-3 seconds before it's "locked on" to zero. Remove the can (the readout will display a negative number which is the weight of the can) and release the bird through the hatch. Put the empty can back on the balance and record the weight "of the bird that's not there." It seems nuts, but it works!

Triple Beam Balances: At the start of each day, make sure that all weighing cans are clean and register as 0.0 grams on the scales (i.e. cans are "tared" for zero). If all the cans are out by the same amount, then this means that the scales must be tared. If only one or two cans are out, then the scales are OK and it is the cans which must be re-tared. It's usually because of a build up of bird turd or feathers; shake them out before adjusting the can's weight. Adjust the weight of the cans if necessary.

3.5 - RETRAPPED BIRDS

Retrapped birds fall into one of two categories: repeats (and returns) and foreign recoveries. A "repeat" is used to designate a short-time return of a bird at the original station and is used to indicate recoveries of banded birds that have apparently not left the neighbourhood since the last time they were handled (within 90 days of original banding). A "return" is used to designate a retrap from the same station more than 90 days after original banding. A "foreign recovery" refers to a bird that was originally banded elsewhere and recovered at Long Point. In all cases, except for same day repeats a retrap card is filled out (Figure 7).

Even when a captured bird is already banded, ALWAYS bring it in to be processed. Foreign recoveries are extremely rare, and you can't afford to miss them. Moreover, each day's retrap rates help derive the ETs. For all retraps, first check the banding records and the retrap cards for the day to see if the bird has already been handled once that day. If so, it can be released directly. If it is new for the day, a retrap card must be filled in. Hence, same-day repeats are released without processing, but next-day repeats are fully processed (regardless of whether or not 24 hours has elapsed). New day, new card!

Each station has an active card file for the current year. Cards in the active file are filed sequentially by increasing band number, regardless of the band size. If you can't find the card in the current year file, you might suspect that the bird was banded in a previous year (e.g. its band prefix is different from what you have been using) or that it may be a foreign recovery. If you're at Old Cut, you'll find a large card file for historical retraps in the banding lab. Cards in the historical file are organized by AOU number, and filed from highest band number (usually most recent) to lowest. If the band number string isn't in the current year's card file, you should then look in the historical file. Even if you don't find the exact number, looking here will often at least tell you whether the bird was banded at LPBO and what year it was banded (e.g. you'll find a corresponding band prefix or close number) or whether it might be a foreign recovery.

In any case, if you can locate the card, fill in the information called for. Otherwise, start a new card. On new cards, be sure to carefully DOUBLE-CHECK the band number! **Read it out loud** — backwards and forwards and have the scribe double-check the band number BEFORE processing continues. You would be surprised by how often you miss-read a number! This can have really serious consequences, so please take the extra moment to double check, particularly if your eyesight is a little fuzzy!

On old cards, the bird should be aged/sexed on the basis of what you observe, **not** on its retrap history. Repeating someone else's errors doesn't do anybody any good. If there seems to be a discrepancy, get a second or third opinion and make a brief note on the card (e.g. "definitely not a male by wing chord; obviously a female by brood patch"). After the card has been correctly filled out, put it aside with the other retraps of the day until the daily log sheets have been completed. On quieter days, original information can be recorded on the card at the time of processing; this allows the scribe to cross check the bander's measurements against the original. On busier days, it can be done at day's end. At day's end retrap cards can be filed in sequence in the active card file.

Foreign recoveries are among the most exciting events at a banding station. These can be birds that were banded at your site, but were recovered somewhere else later. Or they may have been banded elsewhere and recovered by you.

At Old Cut, members of the public often 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**). Whenever possible, double-check the band number! Unless you get the person to call the special toll free hot-line number for reporting band recoveries, all recoveries must be submitted to the Landbird Programs Coordinator, who will do it on the finders' behalf.

3.6 - SPECIALITY TRAPPING

Shorebirds: Shorebirds are usually caught with mist nets or ground traps. When mist netting, the net is strung across a mudflat, pond, or beach that shorebirds are frequenting. Often a 1 or 2-panel net is sufficient. For shorebird netting, it helps a lot if the net is faded or sandy coloured, but we usually don't have much of a choice. Shorebird nets can be moved around from day to day, hour to hour, effectively "guerrilla banding". It often helps if the birds are chased into the net.

In any case, when netting for shorebirds, you must be prepared to give the nets your full and complete attention. Shorebirds are real wimps, and they are much more prone to exhaustion, injury (including irreversible leg cramp and wing strain) and so on than almost any other kind of bird! Keep a constant eye on them and remove any birds as soon as they hit the net. Always keep the feet supported. Be especially careful removing netting from around the carpal joint. Also, make very certain that your lowest panel will not dip into the water when a bird gets caught. All shorebirds (excluding woodcock) are banded **above** the tarsal joint ("knee") to prevent mud from building up around the band and to add life to the band in marine environments.

Ground traps can also be very effective (if somewhat fiddly) for shorebirds. It is your basic ground trap, but has stiff wire "leads" which help guide the birds inside. It is used at water/shoreline interfaces. It should not be submerged so that birds get wet. It is very important to tell everyone concerned where the trap is located. As with all ground traps, don't leave shorebird traps lying about; bring them back to the cabin each day! It is also very important that the trap be monitored closely when it is set. Changing water levels and even minimal wave action will shift/dislocate the guide walls. Note also that this same trap design can also work well to catch shoreline foraging passerines (e.g. pipits).

Hawks: Many hawks are apt to be captured incidentally, especially at the Tip and especially during fall migration. Sharp-shins are by far the most common species. They are usually captured with mist nets set up in the grove of young cottonwoods at the eastern end of the census area. At this point, the hawks head east over the tip and then circle back westwards, losing altitude. You can use the larger mesh sizes here, but the nets must be checked very regularly (at least every 1/2 hr) to avoid getting **massive** tangles. You'll also be able to catch the occasional sharp-shin or kestrel in the HTs.

Owls: During the fall (October through November), a special effort is made to monitor the migration of Northern Saw-whet Owls (and the occasional Long-eared) at the Tip and Old Cut. This consists of netting the birds at night, using special lure tapes. The regular nets are often used too, but they are supplemented by a special array of owl nets.

Note: Be careful that the bottom panel of the nets is set at least 1 metre above ground, or waist height, to discourage possible predation by foxes, raccoons and opossums. Use a bird bag stuffed with other bird bags to act as a "test owl" to test the panel height. If predation becomes a problem, close up the nets for the night. Don't be afraid to trap and remove the guilty party at the earliest opportunity. Consult the Landbird Programs Coordinator on the procedure for live-trapping mammals.

Owl banding is great fun on nights when the owls are migrating. Favourable conditions generally occur when winds are NW and W, there is little or no moon, and there is a clear, cool, high-pressure system following a cold front. Sometimes this happens during the night and can provoke unexpected good owl movements.

Owl netting usually begins a half hour after sunset, and continues for at least four hours even if there is little or no owl activity. However, if owls are being caught, then the operation can proceed virtually all night long. On those nights, co-operators take 3- or 4-hour shifts through the course of the night. Needless to say, all-nighters are tiring and they usually only take place when there are sufficient personnel handy to share both the regular daytime and night-time workloads. Incidentally, day-time work takes precedence over night-time work (i.e. the daily census and ETs are much more important than owl banding).

A separate manual outlining the protocol for documenting owl migration is available to volunteers in the fall season and anyone else interested.

3.7 - LIGHTHOUSE KILLS AND ATTRACTIONS

Check the area around the base of the lighthouse at the Tip each morning (during the census is a convenient time) to see if there are any dead birds. Pick up all bodies, and bring them back to the station for identification, measuring, weighing, etc. After recording all of the information, dispose of the bodies (bury if there are a lot). Save unusual specimens for skinning by wrapping in a plastic bag, labelling with date, place and circumstances of kill, and putting into the freezer. Better yet, if you know how to prepare study skins, then skin them on the spot (and sex and age them based upon internal characters too if you can)!

Before going to bed each evening, check to see if any birds are flying around the lighthouse beam, particularly on foggy nights. Watch it for a few minutes. If there is an attraction, the birds will be quite conspicuous, since they show up as flashes of light, like tiny flashbulbs. On big nights, aim to stay up late to collect specimens. Those nights are now very rare (since the lighthouse beam was changed to a strobe in the late 1960s), and it's **IMPORTANT** not to pass them up. Collect birds as they fall after striking the lighthouse. If alive, record time of capture, band, weigh (if dry), and release. If dead, put in bag with label giving date and exact time of pickup. These will be weighed later after they are dry. Get these to a freezer as soon as possible. Samples of Blackpoll Warblers are particularly desired.

Attractions and kills occur most often in fall, on moonless nights with poor weather, especially on foggy nights. In fact, if you wake up for a night-pee, take a quick check on the weather outside and then on what may be illuminated by the lighthouse beam. If it's foggy, pay special attention.

Record the following information into the daily log (on a separate sheet if necessary):

- Date of kill
- Names(s) of people identifying and recording species.
- List of species, the number killed and if possible, the age and sex. Note how the birds were aged and sexed.
- Any other comments

An example follows:

"Sept. 26-27, 1988. Collected by E. Dunn, analysed by D. Hussell and E. Dunn. All birds aged by skulling.

26 Blackpoll Warbler: 5 AHY male, 3 AHY female, 2 AHY unknown sex, 6 HY male, 2 HY female, 8 HY unknown sex (sex by internal examination).

2 American Redstart: 2 AHY female (sexed by plumage).

Total = 28 Birds killed, 2 species. 3 more birds unidentifiable because were partially eaten, and about 5 more were inaccessible and not included in the total counted."

4. RECORD KEEPING

The data you collect must be recorded carefully to be useful. The personnel **doing** the work should **do** the records, and recording must be done at 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 LPBO's record sheets.

4.1 - LOG SHEETS

Long after your departure from LPBO, the only trace of the many (hopefully enjoyable) hours you spent here will be the log sheets and banding records. Therefore, they must be as **COMPLETE, ACCURATE, AND AS LEGIBLE** as possible. This is especially important as the data forms are scanned into a database. Any illegible character cannot be read by the computer, essentially making the scannable forms useless. Please follow the tips for completing scannable forms in Appendix VII. Completing the log should not be viewed as a chore, but rather as an integral and fun part of the day's activities. It is to be filled in at the end of each day.

The log sheets are, for the most part, self-explanatory. Page 1 should be filled in every day the station is manned (**even during the summer**), pages 2-4 when observations and/or banding are done. Descriptions for filling out the log sheets are provided below (see also the example in Figure 5).

PAGE 1:

Volunteer Effort: Under the Observers (Migration Program) header, record names of personnel **contributing** to the ETs. Record for each the number of hours they spent in the field within the census area **actively** engaged in work that would contribute to the ETs. (This should not merely be a total of

the number of hours you happened to be awake!) Also make an honest assessment of each observer's abilities re: bird identification, and code them appropriately in the space provided: 1-can identify greater than 75% of the birds that routinely occur in eastern North America; 2-can identify 50 to 75%; 3-can identify less than 50%.

Record names of non-contributing personnel (e.g. casual or short-term visitors, non-birders, children, etc.) under the header labelled "Other Station Personnel".

Weather: Record wind speed according to the Beaufort scale (posted at each station), wind direction, cloud cover (in tenths), temperatures (Celsius), precipitation (FO = fog; RA = rain; SN = snow; blank = none), and a general description of weather and unusual phenomena under the synopsis header. Weather information should be noted 4 times/day — at dawn, dusk, census, and mid day.

Traps and Extra Nets: Record the number and types of extra nets that were opened and closed, # of traps and types and # of hours of operation for each type of trapping device, as well as the number of HT runs performed at the Tip and Breakwater. If you modify your trapping effort during the day, you should fill out more of the spaces provided. For example, if you worked 5 GTs for 2 hours and then put out 6 more for the next 3 hours, then the total GT hours = $[(5 \times 2) + (6 \times 3)] = 43$ GT-hours and there was a total of 11 GTs used.

Banding Effort: Record which nets were opened and when, along with when they were closed. The Re-open and re-close columns are to be used when appropriate (e.g. weather forced the closure of nets, but let up enough so that a few nets could be re-opened). Fill in the "ditto" box for nets that had the same amount of effort.

Census: The start and end times of the census, along with the total number of minutes and observer(s) initials are recorded here.

Supplementary Census: Often during busy days, a second census in the late morning or afternoon is conducted by station personnel. It is optional but encouraged as it can help to arrive at a more representative Estimated Total. A Y (yes) or N (no) is entered in the box.

Migration Monitoring Summary: Record the summary of the days Banding, Census and ET. Note that the banding summary requires both the number of individuals as well as the number of species.

Season-To-Date Banding Total: The number of birds banded at the station so far for the season, including the day's banding total (both standard and non-standard) is entered here.

LPBO Daily Log

Day Month Year Area
 10 10 2004 01

Narrative:

Summary of Bird Migration:

Today started off slow because of wind & cold, but things sped up a bit throughout the morning - our MX nets pulled thru for us again, Yay! we banded a beautiful Savannah Sparrow - a lifer for me! Later that afternoon, after some time at the Tip, I took a wonderful walk which ended in a very "enlightening" venture out to the tippy tip of the Tip - I took advantage of its desertedness - not a gull or a cormorant there - except for some dead Ringers, a dead sanderling, & a poor lonely Greater Black-backed gull dying of botulism -- Real life, raw & out in the open - w/ a gorgeous landscape surrounding me - It reminded me of the Galapagos & the lovely island

Facilities & Site Changes/Activities: of Española... ~~etc~~ so it was an absolutely gorgeous sunset behind the lighthouse - I watched a Dunlin, some sanderlings, & a Black-bellied plover scamper around before heading back - fun stuff.

Other Remarks:

Yay Stars! I learned several new constellations tonight - *

Signature: *Jiffy Beachy*

Unusual Species						
Species Code	Species Name	Band	Rec	Cens	Obs	ET
RWBK	Rusty Blackbird			17	15	22
ECSP	Clay-Coloured Sparrow			1		1
OCWA	Orange-crowned Warbler				1	1

Old Cut Estimated # Visitors	
Old Cut Total # Visitor Groups	
Tip Total # of boats on Shore	1
Lighthouse Attraction Put details in Narrative	
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> Not Checked

Monarch Butterfly Summary	
Afternoon Census	43
Comments:	

8376440912

Species Totals

Day 10 / Month 10 / Year 2004 / Area 0.1

Species	Band	Rec.	Cens	Obs	ET	Species	Band	Rec.	Cens	Obs	ET
Common Loon				6	6	Unid. Yellowlegs					
Pied-billed Grebe						Solitary Sandpiper					
Double-cr. Cormorant			9500	15600	20000	Spotted Sandpiper					
American Bittern						Ruddy Turnstone					
Great Blue Heron			1		1	Sanderling			9		9
Green Heron						Semipalmated Sandpiper					
Tundra Swan						Least Sandpiper					
Mute Swan						Pectoral Sandpiper					
Canada Goose				2	2	Dunlin			4	1	5
Wood Duck						Short-billed Dowitcher					
Green-winged Teal						Unid. Dowitcher					
American Black Duck						Common Snipe				4	4
Mallard			3	1	4	American Woodcock				1	1
Northern Pintail						Bonaparte's Gull					
Blue-winged Teal						Ring-billed Gull			1200		1200
Gadwall						Herring Gull			10	40	50
American Wigeon						Gr. Black-backed Gull			4	1	5
Canvasback						Caspian Tern				1	1
Redhead				6	6	Common Tern					
Ring-necked Duck						Forster's Tern					
Greater Scaup			650	100	250	Black Tern					
Lesser Scaup				1	1	Rock Dove					
Unid. Scaup				18	18	Mourning Dove				6	6
White-winged Scoter						Black-billed Cuckoo					
Common Goldeneye						Yellow-billed Cuckoo					
Bufflehead						Great Horned Owl					
Common Merganser						N. Saw-whet Owl					
Red-br. Merganser						Common Nighthawk					
Unid. Merganser				40	40	Chimney Swift					
Ruddy Duck						Ruby-thr. Hummingbird					
Turkey Vulture				1	1	Belted Kingfisher				1	1
Osprey						Red-headed Wdpkr					
Northern Harrier						Yellow-bd. Sapsucker			1	3	4
Sharp-shinned Hawk				12	12	Downy Woodpecker				1	1
Cooper's Hawk						Yellow-sh. Flicker			1	2	3
Broad-winged Hawk						Eastern Wood-Pewee					
Red-tailed Hawk				1	1	Yellow-bd. Flycatcher					
American Kestrel				1	1	Alder Flycatcher					
Martin				1	1	Willow Flycatcher					
Black-bellied Plover			4		4	Trail's Flycatcher					
Semipalmated Plover						Least Flycatcher					
Killdeer						Eastern Phoebe		1	4	2	7
Greater Yellowlegs						Gr. Crested Flycatcher					
Lesser Yellowlegs						Eastern Kingbird					
Sub-total (1)						Sub-total (2)					

Day Month Year Area
 10/10/2004 01

Species Totals

6701440912

Species	Band	Rec.	Cens	Obs	ET
Purple Martin					
Tree Swallow				8	8
N. Rough-w Swallow					
Bank Swallow					
Cliff Swallow					
Barn Swallow					
Blue Jay			3	3	6
American Crow					
Black-cp. Chickadee					
Red-br. Nuthatch			1	3	4
White-br. Nuthatch				1	1
Brown Creeper	3			5	8
House Wren				2	2
Winter Wren				6	6
Carolina Wren					
Marsh Wren				5	5
Golden-cr. Kinglet	1		5	10	16
Ruby-crowned Kinglet	2		2	6	10
Blue-gray Gnatcatcher					
Veery					
Gray-cheeked Thrush				1	1
Swainson's Thrush				1	1
Hermit Thrush	1	1	4	10	16
Wood Thrush					
American Robin			3	12	15
Gray Catbird	1			1	2
Brown Thrasher					
American Pipit					
Cedar Waxwing			4	10	14
European Starling			7	5	12
Blue-headed Vireo				1	1
Warbling Vireo					
Philadelphia Vireo					
Red-eyed Vireo					
Tennessee Wa					
Nashville Wa	1			2	3
Yellow Wa					
Chestnut-sided Wa					
Magnolia Wa					
Cape May Wa				1	1
Black-thr Blue Wa					
Myrtle Wa	6		45	69	120
Black-thr Green Wa	1		1	1	3
Blackburnian Wa					
Sub-total (3)					

Species	Band	Rec.	Cens	Obs	ET
Western Palm Wa	3		2	20	25
Bay-breasted Wa					
Blackpoll Wa					
Black-and-white Wa					
American Redstart					
Ovenbird					
Northern Waterthrush	1				1
Mourning Warbler					
Common Yellowthroat				1	1
Wilson's Wa					
Canada Wa					
Scarlet Tanager					
Northern Cardinal					
Rose-br Grosbeak					
Indigo Bunting					
Eastern Towhee			1	2	3
Am Tree Sparrow					
Chipping Sparrow			2	7	9
Field Sparrow	1		1	6	8
Vesper Sparrow				1	1
Savannah Sparrow	1			2	3
Fox Sparrow					
Song Sparrow	2		2	7	11
Lincoln's Sparrow					
Swamp Sparrow	1			8	9
White-thr Sparrow	4		12	25	41
White-cr Sparrow	2		2	10	14
Slate-colored Junco	2		3	5	10
Bobolink					
Red-winged Blackbird			70	220	290
Eastern Meadowlark			1		1
Common Grackle				4	4
Brown-hd Cowbird					
Baltimore Oriole					
Purple Finch					
House Finch				7	7
Pine Siskin				31	31
American Goldfinch	13		55	122	180
House Sparrow					
Sub-total (4)					
Total #	47				
# of Species	19		35		74

FIGURE 5. EXAMPLE OF DAILY LOG SHEETS

Coverage Code: Record as per the following code definitions:

0 - **No coverage** at all birdwise. Use of this code should occur only rarely.

1 - **Casual observations and/or casual banding only** (no census or ETs). Similar to "0", but some casual observations were made within the recording area. Casual-banding might involve Tree Swallows, or a few nestlings, or educational banding at Old Cut.

2 - **Census only** (no ETs). Can occur if travel needs result in early departure from a field station, or if other activities preclude any banding or other observations.

3 - **Fair coverage**, including census and ETs (may or may not involve some banding). Inexperienced observers may use this code if they feel that some species were missed; or it may apply if experienced observers spend most of their time on activities such as construction/maintenance; or in transporting personnel.

4 - **Good coverage**, including census/ETs and 6 hr of banding (weather permitting). Observer(s) active for much of the day. This is the code most frequently used.

5 - **Excellent coverage**, including census/ETs, banding (weather permitting), and a lake watch, and/or supplementary census, and/or visible migration watch. Two or more observers active for virtually the entire day. Note that a score of "5" can't occur with just a single contributing observer.

PAGE 2:

Old Cut Estimated # of Visitors: During each day of the season, the number of visitors at Old Cut is estimated. This includes visitors to the banding lab and Visitor Centre, as well as people wandering in the wood lot.

Old Cut Total # Visitor Groups: The number of **organized** groups (school groups, field naturalist outings, etc.) visiting the Old Cut station is entered here. Do not count families as organized groups! An organized group will always have some sort of official leader.

Tip Total # of boats on Shore: The estimated total number of boats on or moored off the Tip's shore during the day.

Lighthouse Attraction: Indicate whether the lighthouse was checked for attraction. This is often done during the census. Put any details of attracted birds in the narrative, as described in a previous section.

Monarch Butterfly Summary: In fall, tens of thousands of Monarch Butterflies pass through Long Point. At the Tip and Breakwater stations, Monarchs are counted daily during a special mid-afternoon census. These results are tabulated on page 2 of the daily log sheet. Use the comment section to elaborate on other butterfly sightings or what the monarch activity was like during the entire day. Feel free to include further summary in the narrative.

Narrative: Observations of other animals, especially herps and butterflies, are to be noted in the narrative portion of the log sheets. The narrative should also note any Checklist Highlights (e.g. additions, extreme early and late records), notes on any colour-marked birds seen in the area, notes about station maintenance, personnel switches, general highlights of the day, etc. Naturally, it is most important that you also include a summary description of the kind of migration day it was in general (e.g. the progression of events, principal migrants, etc.)! Please **underline** all species names. This makes it much easier to find details of unusual/interesting species, species highlights, etc. by just skimming through the logs, without having to read all about the preparation of someone's gourmet supper! Also, record **who** observed any unusual species, so that they can be given the proper credit in our published migration summary reports. Finally, long (informative!) narratives are much more valuable than short ones, so don't be afraid to use up the space, or to append an additional sheet. At the same time, avoid blah, blah, blah or general insanity. The narrative certainly doesn't need to be terribly creative or particularly literary, but feel free to express yourself however you like!

Unusual Species: These include any species not listed on p.3 and p.4. They should be written in at the bottom of p.2 and included in all totals. Record who saw the unusual species in the narrative.

Daily Totals Sheets (pages 3 &4): The Band, Rec, Cens, Obs columns are straightforward. The sub-total rows can be used for helping with addition, but are not required. The Total # and # of Species rows are required to be filled in.

Note: There are two special cases you need to be aware of in the "Band" column. First, because we don't band hummingbirds or gnatcatchers, but do catch them, we keep track of how many were caught during the day in the Band column (as if they were banded). Another special case is owls. Because an evening's owl-banding activities can span two dates, we pool the evening's owling results in the daily logs. This makes sense since the birds in question are really part of the same night's movement.

4.2 - BANDING SHEETS AND RETRAP CARDS

During any banding operation, the following essential information **must** be recorded: band number, species, age, sex, location, and date. At LPBO, we also routinely record wing chord, weight, fat condition, time trapped and time weighed, and trapping device. Brief notes on plumage aberrations, parasites, age, infections, etc. are also recorded. Finally, for birds that are in active moult, a full description of the moult pattern is recorded on a separate card (Appendix V).

Banding sheets and retrap cards are filled in as you band. Codes are given on the back of each sheet (Figure 6). Black, ball-point pen is only acceptable on these sheets and cards. Pencil does not photocopy clearly and the ink from felt tip pens tends to run. Liquid White-out is used to correct mistakes. Print everything legibly! Right-justify all data in the spaces provided. Record the full band number at the top of the sheet and underline the prefix.

Do **not** use ditto marks on the banding sheets when information is repeated on successive data lines (they can be misinterpreted as the number "11"). Instead, denote repeated entries with a solid horizontal line (Figure 6). This **greatly** facilitates computer entry later on. On retrap cards, however, do not use ditto lines — always record everything in full.

If a partial string of bands is to be used (e.g. because it was started in the previous season), then record the first band number on the appropriate line on the banding sheet, not at the top of the sheet. Previously used bands should be indicated by filling in "Bands Previously Used" in the blank space (Figure 6).

Record lost or destroyed bands as "Band Lost" (BALO) or "Band Destroyed" (BADE) on the appropriate line for that band. The next data line must be filled out **completely** (e.g. re-enter the data as if you were starting a new sheet), with no ditto lines (Figure 6). This avoids confusion for the proofers and key-punchers, who are frequently non-birders/non-banders and can't second-guess you (again, make sure they can decipher your printing too!).

Note that the species names and 4-letter species codes used in the banding operation are not always the same as those conventionally used by birders, or in field guides, etc. Only the codes provided by the bird banding office are acceptable. These match up with the codes that are imbedded in the data entry program—Band Manager—and are also the same as those used for ET computerization. It is important that all banders use the same codes!

LPBO Field Station Banding Data Form

Bird Studies Canada
Long Point Bird Observatory

Bander: HEAVILY BEARDED MAN Initials: HBM
PETER N. PIPER Initials: PNP
STRONG MAN Initials: SAM
CHARMING FRIEND Initials: CAF

18

First Band Number:

Prefix	Suffix	Permit No.	Year
1961	87H087	101682	054

Band Size

Band Last 2 Digits	Species	Sp. Code	AGE	How Aged	Sex	How Sexed	Wing	FAULT	Weight	Status	Date		Time Weighed	Bander Initials	Area	Time Trapped	Trap		Prob. Age	Remark Code	Moult	Notes	
											Mo.	Day					Type	No.					
USED PREVIOUSLY																							
87	HERMIT THRUSH	HETH	2	10	9		953		323	300	10	26	090	HBM	3	085	0	MN	14				TICK REMOVED
88		HETH	1	21			9736		319														SMALL WINDOWS RETAINED 2.3MM
89		HETH	2	1			945		327														
90	BAND LOST	BALO																					BAND LOST
91	DOWNY WOODP.	DOWNO	2	15	1		930		286	300	11	07	092	PNP	13	085	0	MN	11				
92	WH. THR. SPARROW	WTSP	0	14	4		760		259				093			092	0	GT		1			HEAD IN PIN - UNSKULLABLE
93		WTSP	2	12	0	4	6933							SAM				0	MN	03			TAIL NARROW & TAPERED + EYE BROWN
94	BAND DESTROYED	BADE																					BAND DESTROYED
95	SONG SPARROW	SOSP	1	20	9		6276		200	300	11	15	111	SAM	13	110	0	MN	D6		P		9=DATE
96	BALTIMORE ORIOLE	BAOR	2	15	1		883		298		09	06	063	CAF	13	060	0	MN	02		DO		BAND SIZE O.K. & DATE O.K.
97	CAROLINA WREN	CARN	2	20	9		13		232				064			063	0				DO		9=1
98	LARK SPARROW	LASP					8549		300	300	11	16	102	HBM	13	095	0						DOCUMENTATION IN LPBO FILES
99	FOX SPARROW	FOSP					774		345		11	17		PNP			0				25		
100	XXXXXX					END OF SEASON											0						XXXXXX

Last Band Number:

Prefix	Suffix
1961	87H100

Datasheet: Proofed Entered

Banding Data Form Codes

Age	Sex	How Aged and Sexed	Trap Type		Moult (Active Moult)
0 Unknown	0 Unknown	1 Plumage	MN	Mist net	MX Non-standard MN
1 After hatch year	4 Male	2 Skull	HN	Hawk net	GX Non-standard GT
2 Hatch year	5 Female	3 Eye colour	GT	Ground trap	JX Non-standard JT
4 Local (nestling)		4 Wing length	JT	Jay trap	HX Non-standard HT
5 second year		5 Cloacal protuberance	HT	Heligoland trap	
6 After second year		6 Brood Patch	NB	Nest Box	
7 Third year	<i>(NOTE: Probable Age/Sex field uses same codes)</i>	7 Mouth/Bill colour	HA	Hand	
8 After third year		8 Culmen length	BW	Bow net	
		9 Other (specify in notes)	PT	Potter trap	
			OT	Other (specify in notes)	

Status	Location	
300 Normal banded bird	01 Eastern Tip of Long Point	23 Sewage Lagoons TRES grid
301 Colour banded bird	02 Breakwater	28 Rondeau Prov. Park-10 km E of Blenheim
302 Equipped with a neck collar	03 Backus Woods	43 St. Williams forest
318 Blood sample taken	11 Tip Tree Swallow grid	53 Mud Creek TRES grid
389 Equipped with radio transmitter	13 Old Cut/LP Prov. Park	09 Other (specify in notes)
500 Injured released in under 24 hours	14 S. Walsingham/Hahn Woods	
700 Injured, rehabilitated, released. Held for more than 24 hours		
685 Combination of two or more codes		

Remark Code- to be used only by data proofers

** Reserved for Custom Remark	08 Injured, held for less than 24 hrs, released healthy
DO Date sequence OK	09 Injured, held for greater than 24 hrs, rehabilitated, released healthy
01 Could not age or sex - released	21 Radio transmitter attached
02 Band size used in error, fit ok	25 Measured Leg for Correct Band Size
03 Sex not recorded	
04 Age not recorded	
07 (MSWO ONLY) Sex determined using the wing-mass DFavailable from Project Ownet	

Figure 6. Example of LPBO's banding sheet.

Do **not** rely upon codes written earlier on the banding sheet; errors are easy to make, and should not be repeated on down the banding sheet. Nearly all the information on the banding sheets is entered as numerical codes for ease of data entry. All codes are explained on the back of every banding sheet (Figure 6). Generally after a day or two, all but the most infrequently used codes are easily remembered, but ask if you're not sure! It is much better to ask if a "5" means male or female rather than make a mistake in scribing.

For "how aged", 0 (zero) is **not** an acceptable code; use 9 and specify what it means in the comments section (e.g. "9 = date" or "9 = too dark to skull"). For "status", all normal, wild birds are coded 300, unless a colour band (301) is being applied, or a blood sample (318) is being taken. Use of any other codes requires an explanation written in the comments section and a remark given in the computerised data entry. Retrapped birds should always be coded as 300 ("normal") on the retrap card, ignoring all else that preceded the recapture, unless you do something different (like add a supplementary or colour band). For example, if the bird's blood was sampled at the time of banding, then code 318 is correctly used for the original data line on the card, but code 300 is used in the subsequent recapture line (unless of course you sampled the blood again). The "Time weighed" and "Time trapped" are recorded to the nearest ten minutes. For example, if a bird was caught at 6:30 a.m. and weighed at 6:40 a.m., the times are entered as 063 and 064 in the appropriate columns. Remember, we use the 24-hour clock, so birds caught at 2:30 p.m. are recorded as 143 capture time.

Note: On the banding sheets, all NSBs are coded as such with the suffix "X" in the Trap Type column: **MX** = mist net; **HX** = heligoland; **JX** = J-trap and **GX** = ground trap (rather than MN, HT, JT, GT). **Also Note:** Since owl banding involves two calendar dates when banding continues past midnight, the banding sheets must reflect the change in dates!

Retrap cards are filled in much the same as the banding sheets. There are currently no columns for fat and skull scores on LPBO's retrap card. The fat and skull codes should be written in the blank space after each record (Figure 7). An effort should be made to fill out the original data line on the retrap cards at the end of each day. Otherwise, it becomes a major nuisance later on. It also acts as a good spot-check to see how consistent personnel are with their ageing, sexing and measuring.

Retrap Card: LONG POINT BIRD OBSERVATORY **1B** Band No. **139110328**
 Species: **White-throated Sparrow** Band Size **15**
 Permit No. **10169** Retrap code: 2 if LPBO banded, 3 if foreign banded **2** Species code **WTSP** AOU No. **5500**
 Record original banding date above titles, retrap date below. Use second lines for additional information; blank space for comments

1	15	4	64	23	43	06	05	20	92	10	50	1	J	B	0	9	S	H	T	
Fat = 1																				
1	15	4	65	24	93	00	05	22	93	07	50	1	P	N	P	0	7	4	6	T
Fat = 3																				

Age How Sex How Wing Weight Status Date Time Location Bander Time Trap
 aged sexed used used 24 26 27 29 30 32 33 37 38 40 42 47 48 50 51 52 53 55 56 58 59 60
 Mo Day Year weighed Intertile trapped

FIGURE 7. AN EXAMPLE OF LPBO'S RETRAP CARD CORRECTLY FILLED IN.

4.3 - MOULT RECORD CARDS

These are filled in for birds that are moulting. As such, most of the cards are filled out in summer and fall. There are two types of cards, one for non-passerines (blue cards) and one for passerines (white cards). A complete set of instructions for moult cards is posted in each banding lab and in Appendix V.

4.4 - NEST RECORD CARDS

These cards (Figure 8) are to be filled in for any species found breeding in the region, with the exception of Tree Swallows nesting on the swallow grids. A separate manual provides detail on what all the various codes mean. At the end of the breeding season, the cards are to be submitted to the Ontario Program Manager, who will forward them to the Ontario Nest Records Scheme. All cards are to be accredited to the nest finder's name.

Ontario Nest Records Scheme
Royal Ontario Museum, Canadian Wildlife Service, Bird Studies Canada

№ 186148

Species Code	Species Name	Observer Number	Observer Name	Year						
B R T H	Brown Thrasher	24467	Stu Mackenzie	2004						
Location (Place Name)		County/Region	Enter coordinates in UTM or lat/long							
Long Point (Tip)		N O R X	UTM Zone UTM Easting UTM Northing							
			NAD: <input type="radio"/> 27 <input checked="" type="radio"/> 83							
			<input type="radio"/> GPS <input type="radio"/> Map							
			Latitude (deg. min. sec.) Longitude (deg. min. sec.)							
Day	Month	Time (24h)	Hest Egg	Live Young	Dead Young	Crewbirds Egg	Live Young	D. Yr.	Visit Status Codes*	Comments
23	05	07:54	4						F R F N	
28	05	13:00	4						C V F N	
04	06	7:15	4						P V E Y	
11	06	16:30	0						P V	Revisited
Continued from card No.		Species if not combined		Nest Outcome		* See coding card for status and nest outcome codes.				
				E J		3946359807				

Nest Site:
Select only one code in each box to describe nest location

In	On	Under
<input checked="" type="checkbox"/> G	<input type="checkbox"/>	<input type="checkbox"/>

A - live tree J - dead veg. Q - earth
 B - bush/shrub K - floating veg. R - sand
 C - snag/stub/dead tree L - hedgerow S - gravel
 D - vines M - ditch* T - stones/rock
 E - reeds N - post/pole/tower U - cliff
 F - herbs O - building V - other
 G - grass P - bridge
 H - lichen/moss P - other human artifact

Nest Site Type: Unenclosed Hole or Crevice
 Ledge Nest Box Other bird/mammal nest

Other Details: Raft/Islet Island Over Water

Manipulation: Predator Protection
 Other Manipulation (give details in comments)

Exposure: Well Hidden Partially Hidden Exposed

Slope: Vertical Steep Gentle Flat

Direction of Slope (Aspect):
 N NE E SE S SW W NW

Nest Hole Direction:
 N NE E SE S SW W NW

Nest Height above ground/water: m

Habitat:
Describe 1st habitat (containing nest), and 2nd major habitat within 100m (if appropriate). Select habitat class and subclass, and up to 4 codes each for structure and modification (see coding card).

	Class	Sub.	Structure	Modification
1st				
2nd				

Distance from nest to nearest edge of 1st habitat:
 0-15m 15-50m 50-100m >100m

Details of plant species and any extra comments:
 Nest Site: *Mammal Grasses surrounding*

First Habitat: _____
 Second Habitat: _____

Other Comments: _____

Please return by 31 January to: ONRS - CBCB, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6

For more information visit:
www.birdsontario.org 8955359802

FIGURE 8. AN EXAMPLE OF A NEST RECORD CARD CORRECTLY FILLED IN.

4.5 -RARE BIRD DESCRIPTIONS

Rare birds are exciting to see or catch, but to be accepted as official records, they **must** be documented thoroughly. A current list of all species requiring such documentation in southern Ontario is provided in the banding lab at each station. Rare bird report forms are provided at each station. They must be used for all provincially and regionally rare species requiring documentation. Photograph the bird if possible, but **never** "collect" (i.e. kill) it. The following information should be written as soon as possible after a sighting, or while the bird is in the hand:

1. Name(s) of all the observers.
2. Date, time of day and place.
3. Give the circumstances leading to the discovery (e.g. heard first?), habitat, how long observed and with what power binoculars (if any), behaviour of bird, first impressions of identity and markings, and as much of a description as possible (see below). Do this before looking in bird guides to check your identification and before discussing it with other observers, if at all possible. Each observer should write an independent description before comparing notes. Otherwise you may be influenced to think you saw some character not actually observed.
4. Write as full a description as possible, using the following guidelines (some are unnecessary for certain birds which can be positively identified by one or a few characteristics, but it is safer to err on the side of over-documentation):
 - Size:* of body, bill, legs, wings.
 - Shape:* of bill, body, wings, legs and feet.
 - Plumage:* separate descriptions for head, throat, chest, back, wings, rump, belly, etc. Note especially eye rings, stripes, spotting, streaking, etc. If in hand, describe feathers on different parts of the body (e.g. back feathers olive with brown base and black spot in centre).

If in-hand, give complete measurements and take pictures! Write down how you measured — from what to what—as follows:

Wing: chord length, number of primaries, distance from longest primary (record which this is) to tip of every other primary.

Tail: length of inner and outer rectrix. Describe the shape of tail tip (e.g. rounded, notched).

Legs: length of tibia, tarsus and of toes with and without claws.

Bill: length from nares to tip; depth at nares.

Body: width and length of head, body length from base of tail to tip of bill.

Attach the descriptions of other observers (or summarize each on a single form), making clear who saw what, and being candid about any disagreement (whether on overall identification or on specific field marks). The idea is to write a full and honest description that'll convince anyone that your claim is indisputable. **Always** draw a very quick sketch of the bird in question, pointing out all the salient features. A picture is worth a thousand words.

5. As some rarities may actually be escaped captives, make special note of condition of feathers, feet and bill. Look for fraying, split feather shafts, excrement on feathers or legs, scaliness of legs or bill, etc. Also note degree of tameness of bird.
6. **Don't forget to inform other people** of the presence of a rare bird (before release, if captured), so that they may come to see it. If the bird has been captured, let people know that you'll be releasing it at such and such a time and at such and such a place. Also, advice may be desirable as to identification, degree of rareness, etc. Feel free to use the radio. Local birders should all be quickly called too. A list of these people should be posted by the phone at Old Cut. **However, don't forget that any bird should be held for no more than an hour before release.** Also, in all of your excitement, don't forget that the bird must not be over-handled or mistreated. Remember that the bird's health and welfare (physical and mental) are your **primary** concern and responsibility!

4.6 - MONARCH BUTTERFLY FALL CENSUSES

At the Tip and Breakwater stations (not at Old Cut), the census route is walked each afternoon during the fall in an effort to assess the volume of Monarch Butterfly migration. Follow the same route as you do for birds. This also works well as a supplementary afternoon census for birds, so don't forget your binoculars. Try to do the census between the hours of 2:00 p.m. and 5:00 p.m. Record your census total in the daily log in the space provided; make additional notes in the log if you think that you missed a large part of the day's butterfly migration during the census.

4.7 - CASUALTY REPORT FORM

Although LPBO strives to prevent all injuries and casualties we occasionally encounter situations where these unfortunate incidents occur. A record of all injuries and casualties is kept in the front of the Daily Log binder (Figure 9). Here the date, species, trap or location found, and other pertinent information is recorded. Other pertinent information includes the circumstances surrounding the incident, what course of action was taken, and so on. A thorough treatment of what to do with sick and injured birds is found in the Study Guides, as well as Appendix I. If an incident occurs, an examination of the banding operation is required in order to reduce the chances of such events reoccurring. Injury and mortality are **unacceptable** in any banding operation.

5. DATA MANAGEMENT

5.1 - COMPUTERIZATION OF LOG AND DAILY LOG AND ET DATA

LPBO uses a customized windows-based system to enter data from the daily log sheets, whereby the data are scanned. It is then painstakingly proofed, as many numbers and letters get misinterpreted by the program. PLEASE PRINT NEATLY! Please refer to Appendix VII for tips on filling in forms.

5.2 - COMPUTERIZED BANDING SCHEDULES

The Canadian Wildlife Service banding office requires that banding records be submitted to them on special forms called Banding Schedules. These schedules are generated from a custom computer program called Band Manager. Instructions are outlined in a separate manual.

Computer entry of banding data 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. Retrap and recovery data are also entered into Band Manager.

All banding sheets must be proofed, corrected and initialled by a qualified bander (usually the station's Master Permit holder) **prior** to computer entry. Several additional editing stages are carried out prior to submission of the computerized schedules. It is critical that the submissions are error free. **Also, be sure that back-up copies (on clearly labelled diskettes) are made of all banding data at the end of each day's data entry.**

5.3 - PUBLICATIONS

A migration monitoring station should view data analysis and reporting of results as an integral part of its operation. It is all too easy to become overwhelmed by data collection. But data have no real value until they are analysed. Once analysed, the results then need to be disseminated.

It is important to keep up-to-date with data computerization, migration reports, newsletters, annual reports, and so on. You may have to limit the amount of data collected in order to complete all of the required office tasks, let alone find time to engage in data analyses.

People interested in conducting research on LPBO data are strongly encouraged. However, your work should have scientific credibility. This generally requires proficiency with computer programs, statistical analyses, the literature, and preparation of formal scientific publications. Feel free to ask BSC senior staff for help/advice.

6. SITE MAINTENANCE, HABITAT MANAGEMENT AND MONITORING.

A certain amount of site maintenance and habitat management is required at all of the field stations for several reasons. Most important, changes in the habitat can alter its usage by birds, positively or negatively, and this can influence the ETs, and consequently bias the migration indices. Second, ease and safety (for both humans and birds) of day-to-day operations will be improved significantly. Making sure net lanes are clear prevents nets from getting caught in surrounding vegetation. Mowed net lanes ensure that birds in bottom panels are not “missed” or dampened by wet, tall grass. At the Tip and Breakwater in particular, mowing around the cabins and pathways, gives some distance and protection from annoying insects and potentially disease-carrying ticks. At Old Cut, the building and placement of board walks along net lanes during spring flooding will make net rounds less difficult and prevent visitors from walking too close to nets, reducing the risk of harming birds or damaging nets.

Habitat management at the Tip and Breakwater can be difficult given the effects of shoreline erosion caused by fluctuating water levels and storm events. However, certain things can be done to help keep the vegetation near nets and traps as similar as possible. The Tip is characterised by fast growing, early successional stage vegetation, such as cottonwoods. The willows around the cottage at the Tip require regular (annual) pruning to keep the tree tops near net level. The vegetation on the ridges where the Heligoland traps are located at both Breakwater and the Tip stations need pruning annually. The vegetation is supposed to decrease in height in a natural slope as the HTs are approached. The desired effect is to cause the birds to decrease their height of flight so that they can enter the mouth of the HT and be trapped.

Brush piles have historically been used along some net lanes that were placed in the open with the intention of providing cover for birds seeking shelter. The piles may be in need of seasonal maintenance, generally the addition of some slash works well.

Monitoring habitat changes at Long Point began in 1994 with measurements to be done every 3 years. Appendix III discusses habitat monitoring at LPBO.

APPENDIX I. SICK AND INJURED BIRDS

Please refer to the Study Guides for a more thorough treatment of this topic.

"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, its chances are better if left alone. Pass this information on to people who call in about an "orphan". Fledglings may be carefully placed in a tree to get them beyond the reach of predators. Contrary to popular lore, the parents can't "smell" human scent and will not desert a bird that has been handled by humans.

We often 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? There are no easy decisions to make about what steps should be taken. Decisions to employ euthanasia are always difficult, but it should be kept in mind that it is often the most humane step to take, especially when dealing with hopelessly mutilated birds. Bear in mind that most birds brought into rehab centres will be euthanized anyway if they can't be released back into the wild. We shouldn't pass birds onto rehab clinics unless survival to release looks like a realistic possibility.

If the bird appears to be reasonably healthy (e.g. stunned), keep it in a warm (very warm), dark, quiet place for at least a half hour 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 injury is old and healed or unless removing the band is likely to cause the bird more harm. Note any old injuries in the Notes section on the banding sheets. Always record the details of any new injury on the bird Casualty Report Forms supplied at each station, regardless of whether the bird was banded. These forms must be filled out for all types of injuries except feather loss.

For obvious reasons, euthanasia is always done well away from the public eye. The best method used for larger birds is to suddenly separate the spinal cord by grabbing the head and body and sharply pulling the head away. As gruesome as it sounds, if the head happens to come off in the process, rest assured that the bird died instantly, which is always the most humane objective. Or you can sharply swing the bird by its legs and bang the head hard against a tree trunk or rock. Ducks, etc., should be swung from the head, breaking the neck quickly.

For small birds, you can snap the neck as above, or place the bird in a zip lock bag and fill it with CO₂ (canisters are in Old Cut garage), or depress the sternum by squeezing hard from the sides and pressing downwards. The latter "squeeze" method (once "the" way of euthanasia of small birds) prevents breathing and at the same time stops the heart from beating. While reasonably effective, death is not instantaneous (and birds sometimes revive if you make a half-hearted attempt) and so it is no longer advocated by Animal Care Committees. If in doubt, ask an experienced person to show you exactly how to euthanize a bird.

Note: White-throated and White-crowned sparrows are prone to leg "dislocation", for no apparent reason. Usually, the leg will pop back in if you straighten it. Release the bird unbanded.

Note: Some birds 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, presumably because the wing is sensitive and the bird is favouring it. These birds should be retrieved and held in a quiet, warm (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 (i.e. as low as possible), so that it doesn't come crashing down, injuring itself more seriously.

If a limb is broken and the bird is sufficiently large, healthy and likely to respond to professional treatment, the bird can be brought to any one of the following centres, but phone ahead:

1. University of Guelph's Wild Bird Clinic; about 2 hr drive (tel: 519-824-4120; ext. 4162)
2. Ross Snider (primarily raptors) in Ingersoll; about 1 hr drive (tel: 519-485-3885)
3. Bob & Pamela White; local vets in Simcoe **may** be able to help under exceptional circumstances; about 45 min away (tel: 426-0111)
5. Owl Rehabilitation Research Foundation (specialize in owls); Kay McKeever, R.R. #1, Vineland, Ont.; about 2 hr drive (phone 416-562-5986).
6. Margaret Cunningham; waterbird specialist living near Wainfleet near Niagara; about 1.5 hr drive (tel: 905-899-1660).

APPENDIX II. THE BASIC LPBO BANDER TRAINING PROTOCOL

The following serves only as a very brief summary of our training program. It is not meant to supplant the banders' study guides! Read the Guides thoroughly, more than once!

Some people are natural-born bird-banders, while others are "all thumbs". If you happen to fall into the latter category, please try to be satisfied at learning at even a slower pace than outlined, or even helping out mostly as a scribe. Few people can learn the fine art of bird-banding in a week — many who try often wind up with a succession of heartbreaking disasters! Please take the time to develop the necessary skills.

Casual visitors and novices in general are **never** permitted to extract birds from mist-nets, hold birds or band them, without express consent of the Landbird Programs Coordinator, Warden or BIC. For example, visitors of **any** kind are **not** permitted to hold birds (this includes school groups). WE DO HANDS OFF DEMOS ONLY! However, they are welcome to watch.

Only **authorized** personnel are permitted to handle birds. Authorization comes only from the Landbird Programs Coordinator, and failing that, from the BIC or Warden.

Novices and newcomers are **not** permitted to solo at the banding operation before receiving proper training from the Landbird Programs Coordinator, Warden and/or BIC. Indeed, their activities should be closely supervised by an experienced bander. They are usually not permitted to hold, band, or extract birds without first becoming fully acquainted with the banders' study guide.

The following step-wise training procedure is a very rough guide only; some people may proceed slower or faster depending upon their talents and skills. It is more important to ascertain whether the individual has mastered each level, before she/he moves on to the next activity.

Day 1: Learn to "scribe" and watch banders in action. Learn the basics of how to set nets properly and how to close them properly, **before** handling any birds! Read over the entire Operations Manual thoroughly. And then read over the entire *Canadian Bander's Study Guide* and the *North American Banders' Study Guide* thoroughly.

Day 2: Continue to scribe and watch others in action. Try reading the band numbers on the small band sizes. If your eye-sight and/or coordination are/is bad, perhaps you should consider staying at day #1? Bird-banding takes great hand/eye coordination as well as good eyesight. Never fear though, a good **Scribe** is a wonderful asset and much appreciated! Assuming you and the trainer feel comfortable, this is the first day you'll be permitted to handle (not band) some "easy" birds using the all-important standard "banders grip". You might also be introduced to the "photographer's grip", if not today, then certainly tomorrow.

Day 3: Continue with scribing, practice holding easy birds in various grips, and watching the pros in action. Now it's time to try your skill at actually banding an "easy" bird and attempting some ageing, sexing and measuring. REMEMBER, up until now, you are not permitted to extract ANY bird from a mist-net. We'll get to all that tomorrow. Please have patience!

Day 4: You've displayed your proficiency at handling birds in various grips, and so now you're given the opportunity to have a crack at extracting some easy birds from mist nets! It's not so hard after all, but aren't you glad you got the basics down first before reaching this step?

Day 5: Like Day #4, except your trainer might have you try your hand at extracting progressively more difficult birds (**with** supervision of course!). You'll see how each bird gets tangled in slightly unique (and initially baffling) ways!

Day 6: So let's put them all together now—mist-net maintenance, recording data, holding, extracting, banding, measuring, etc. You ought to be feeling fairly confident. But not cocky! The whole process only becomes an "assembly line" after you've banded several hundred birds. Within a month or two, you'll have become a reasonably skilled bird bander.

Day 7: You should not "solo" until you've mastered all of the above and only in consultation with the person in charge. Even then, you must always seek and get help from more experienced banders whenever you run into difficulties. And be sure to stick around and watch how the difficulty is resolved, so you'll know how to handle it next time. Over the following weeks (and perhaps months) of practice, you'll suddenly find that the bird that you once thought was "absolutely impossibly" tangled in a net, will be magically extracted in a matter of a minute or two.

APPENDIX III. MONITORING HABITAT CHANGES AT LPBO FIELD STATIONS

Need:

There are several reasons why we want to monitor habitat conditions at our field stations. It will help us interpret results from the migration monitoring program. It may enable us to "correct" our migration monitoring data for habitat change; at the very least the magnitude of these changes will be measured. It will draw our attention to areas where habitat management may be appropriate. It will identify potential new netting sites if old ones become unsuitable.

Methods:

1. Field station habitats will be measured every 5 years, beginning in 1994 — the baseline year (see Promislow 1994 for detailed methods and results). The measurements are to be made within the period 15 June - 15 July.
2. At each field station, the habitats are measured at permanently marked locations, corresponding to 10 "permanent" mist-netting sites. The centres of these plots are marked with an aluminum pole, each of which is identified numerically with an aluminum tag. The centre points are located about 2 m north of the net pole in question.
3. The methodology essentially follows that of James and Shugart. A sample plot is a circle of 11.3 metres radius. Within the circle, all trees are identified and their diameters at breast height (DBHs) are measured on a scale from A-H, using a reach stick. Two transects are laid at right angles to each other, at the cardinal points, passing through the centre of the circle. Along these transects, the number of shrub stems are counted by walking along the line with outstretched arms; stems are tallied as they come into contact with the observer's arms. The transects are also cruised to determine percent canopy cover and percent leafy ground cover. This is done by looking through an ocular tube held at arm's length and taking 10 positive/negative readings along each transect (total of 20 readings). Within the circle, 6 characteristic trees are chosen to represent the average tree height; heights of these trees are then measured using a clinometer. Dominant species of shrubs and ground cover plants are identified. Finally, a density board is used to estimate foliage volume within 4 height categories. The board is positioned at each of the 4 corners of the transect and one observer takes the readings from the centre point of the circle. A representative colour photograph is also taken from each station point and kept on file.
4. Results will be assessed relative to the baseline data gathered in 1994. If need be, management options will then be recommended to the LPBO committee for consideration.
5. All reports, forms, photographs and maps from this project are kept in a file folder (labelled "Veg Plots") in the Program Manager's office at HQ.

References:

- James, C.J. and H.H. Shugart, Jr. 1970. A quantitative method of habitat description. *Audubon Field Notes* 24:727-736.
Promislow, M. 1994. The effects of vegetation cover on migrating landbirds at Long Point. University of Waterloo. 77pp.

APPENDIX IV. EDUCATION, VISITOR CENTRE AND MISCELLANEOUS

The Old Cut station is open to the public only during certain periods on certain days, or by special arrangement. Visiting hours are posted.

We endeavour to schedule group visits during weekday mornings so that they can have the benefit of our full attention for the short time that they are here. Scheduling groups on busy weekends creates problems in trying to deal with both the public and the group.

Try to schedule your shopping trips, etc. so that the station is not left unmanned during the hours when the station is advertised as being open.

At Old Cut, it is often necessary to scale back the banding operation during peak visitor periods, especially on weekends and holidays. In general, on any day we are open to the public, both the bird and the visitor situation should be gauged. If there are lots of birds and/or visitors, then the netting operation **must** be scaled back accordingly. If there are few birds and/or visitors, then a full netting operation may be continued. It will very much be a daily judgement call on the part of the person in charge; and what they decide must be followed. At times, they will decide to close any number of nets, and sometimes even the whole bunch.

The whole reason behind this is obvious—a full-blown netting operation simply cannot function efficiently or safely when there are lots of visitors. To put it bluntly, there is a much greater risk of birds being injured if there are visitors present. This is not only very hard on the birds, but is extremely bad Public Relations! Hence, attempting to operate a netting operation at capacity when visitors are present is completely unacceptable.

Remember, under no circumstances are you to sacrifice a bird's safety in the name of banding as many birds as possible. In order of priority, our banding operation puts the bird's safety first, followed by data quality, followed by "quantity". If this simple rule is followed, visitors will sense where our priorities are and things will be fine!

BANDING DEMOS FOR THE GENERAL PUBLIC

Formal banding demonstrations are conducted in the viewing area set up in the banding lab (and occasionally outside if circumstances dictate it). With few exceptions, visitors are not permitted inside the portion of the room where the banding is actually going on. The banders' entrance door must be kept closed in order to keep visitors out; direct them into the west door.

Only well-trained, experienced banders should give the demos; trainees can scribe and generally help out until they're sufficiently adept at the entire process. If no experienced bander is present, then the demo lab is **not** to be opened until one arrives. Simply put up the closed sign and explain the situation to visitors. We will ensure that an experienced bander is scheduled for each day.

Remember that LPBO gives hands-off demos only! Visitors are not permitted to handle the birds and should be discouraged from touching them. We are not a petting zoo. Emphasize that we are always sensitive to the physical and emotional health of the birds we handle. We do not put them through any more stress than is absolutely necessary. Photography of birds in the hand is fine, just as long as it doesn't get out-of-hand and keeps you away from more pressing concerns or over-stresses the bird. Keep it as brief as possible and avoid the use of flash photography.

BANDING DEMOS FOR SCHOOL GROUPS

Group visits (if they aren't too large) can be a lot of fun. They are also a very efficient way of educating a lot of people in a short time.

Groups are booked in as space and time permit. Group size is generally limited to a maximum of 30 people (split into 2 teams); 15 is a nice size to work with at one time.

Groups are typically handled for 1-2 hours (almost never longer), during which time they are invited into the Visitor Centre and given a brief introduction about Long Point, LPBO's history and mandate, the role of bird banding and migration monitoring, and trapping methods. A short slide show may also be warranted. This is usually followed by a demonstration and talk about different bird catching methods, a guided walk around the net lanes and finishes off with a banding demo. Some school groups are taken on a census as well, but this depends on what the teachers want, the number of kids involved, and time constraints of staff.

When groups are scheduled, make sure that there are not too many nets open, keeping in mind that groups take time and that you don't want to get a back-log of birds. In general, scale the netting operation back by one-half (unless there are so few birds around that it looks as if you may not get any for "show-and-tell"). Don't let visitors (especially kids) handle or touch birds, though they can photograph them while you hold them. Some people insist on poking their fingers at the bird and before you know it everyone is doing it and it really is quite upsetting to the bird. Moreover, the bird will probably bite. Again, only the most experienced banders should be doing most of the hands-on work in front of groups.

At least 2 people are required to handle a group, and 3 is nice. When taking a tour of the net lanes, politely remind the group **frequently** not to touch the nets or the birds. They should watch out that their buttons don't get caught up in the nets. Also, they should stay on the trails because of poison ivy and ticks.

The net-lane tour generally requires 2 people, unless the group is really small. An experienced person acts as the leader, does most of the talking, and does most (or all) of the bird extractions. The other person generally helps out, often bringing up the rear to make sure there are no laggards and to keep an eye on the people who inevitably get buttons caught on the nets, or poke at the birds or nets, or try to venture off by themselves. While the leader is stopped for a while at a particular net, the other person should grab the opportunity to take a quick solo dash around some upcoming nets, to make sure there are no "difficult" birds caught. Any upcoming difficulties can then be relayed quietly to the leader who might choose to avoid a particular net. If the other person can extract difficult birds quickly before reporting back to the leader, then so much the better.

"Difficult" birds include ones that are tongued, are exceedingly tangled, caught by a foot, etc. We know that they are really quite OK and are not harmed, but visitors can understandably get a different impression. The person "riding shotgun" on the net check should also be on the lookout for nets that are catching too many birds, and should start to extract the birds and/or close more nets if necessary. Again, it is important that not too many nets are open when visitors are present and to remember that visitors are going to slow you down so that you won't be able to process nearly as many birds as quickly as you could otherwise. You definitely want to avoid getting a backlog of birds.

Back in the banding lab, an experienced bander runs through the process slowly at first, gradually speeding up with each successive bird. At first, describe everything that's going on as well as interesting things about the birds themselves. The bird's safety should be stressed at all times. If you think that the actual banding demo is eating into valuable time that should normally be devoted to a net check, get someone to do a quick net run. Remember that nets must be checked a minimum of once every half hour. If you've got more than a half dozen birds on hand, speed up the operation so that by the end you are processing birds as quickly as you normally would. Point out that the routine bird is handled for about a minute before being set free! Get the visitors to time you!

WORKSHOPS

Weekend or weeklong workshops are periodically scheduled at Old Cut. These generally number no more than about 6 people. All personnel are expected to help out during these events. It's a lot of fun, but can be a little chaotic.

BIRD WALKS AND HIKES

Everyone is encouraged to lead or co-lead any of LPBO's assorted bird walks and talks.

VISITOR CENTRE

Generally, the Centre should be open as a matter of routine during the migration season from 8:00 a.m. - 4:00 p.m. The Centre may have to be closed on days and/or times when there is insufficient staffing (e.g. a boat trip is being launched). In any case, flip the open/closed sign on the door to indicate its status.

At the end of each day, check to make sure that the displays are in good order, that there are plenty of brochures out, that the room is neat, and that the bathroom is presentable and stocked with tissue for the next day's crowd. Clean the toilet on a regular basis!

The chalk sightings board on the outside display is used both by LPBO personnel and the public. Be sure to add interesting sightings to it on a daily basis and encourage visitors to record their "good" birds too. There's nothing worse than an empty or out-dated sightings board! Record the date, species, general location, and observer. Wipe the board clean every Friday afternoon and start afresh on Saturday. Make sure that there are a couple of small pieces of chalk handy. They don't last too long due to their getting lost and/or ruined by rain, so don't leave a whole bunch of them out. The full box of chalk should be left in the banding lab cupboard.

Incidentally, you should make a habit of recording visitors' interesting sightings in the daily log at Old Cut since these sightings are often lost and forgotten after they are rubbed off the chalk board. Include all pertinent details (e.g. "Joe Blow reported a Rufous Hummingbird visiting his feeder at 9 Lighthouse Crescent today, but it was gone by the time we got there"). Admittedly, there are always going to be sightings that people report that you really doubt. While this is healthy, you should not dismiss anything out of hand at Long Point. Weird and wonderful birds do happen, and complete novices are often quite capable of picking them out. Make a habit of listening to everybody's sightings (however mundane or weird) and following up on the weird ones whenever you can and as quickly as you can. There's really no harm in looking, and it does wonders for public relations!

APPENDIX V. OTHER OPERATIONAL THINGS YOU NEED TO KNOW

HOW TO HANDLE ITEMS FOR RESALE AND DONATIONS

Items for resale are on display in the LPBO Shoppe. General donations go in the little box mounted on the south wall, while The Friends of Long Point, or person in charge deals with money from sales. Only those authorised should deal with money at LPBO; if you're unsure, just ask.

Since income from sales/donations and accommodation must be tracked separately, it is important that we don't mix up the two. Fees for accommodations, training, etc. should be put in an envelope and given to the person in charge with a note explaining where the money/cheque came from (e.g. "\$30 from Joe Blow for 3 night's accommodation.>").

We take U.S. dollars on par with Canadian, so don't try to figure out exchange rates. We also don't charge sales tax. If anyone requests a receipt, a blue & white receipt book is kept in store.

People often arrive at Old Cut and drop off some material donation of some sort (e.g. a chair or a bunch of books). **Please** make sure to get the person's full name (and address and phone number) and to leave a message for the person in charge concerning the donation. We can then send the donor a thank you card.

BIRDWATCH CANADA

Everyone is encouraged to provide written, photographic and artistic material for the publication. Just ask the Ontario Program Manager for details.

LIBRARY

Feel free to use BSC's library at the headquarters on slow afternoons, during normal office hours. However, it is **NOT** a loaning library and no materials are permitted to leave the premises. If something strikes your fancy, please photocopy it (for a nominal fee). We really can't afford to lose valuable reference materials. A small non-loaning library is also maintained at Old Cut. Please return all works of non-fiction to it on a daily basis. Fiction (e.g. paperbacks) can be taken to other field stations and rotated around. Donations to the libraries are most welcome.

STUDY SKIN COLLECTION

LPBO's skin collection is housed in cabinets in the Rotary Research Lab at Old Cut. It is primarily for your use, so feel free to access it at anytime for reference purposes, either for I.D. or for artistic reference. Replace anything you remove in exactly the same spot you took it from. All skins must rest on their **backs**. Don't leave the cabinet doors open for extended periods; the moth ball fumes are not terribly pleasant and open cabinets expose the skins to insect infestations. Handle all skins with care. Skins cannot leave the premises without permission from the person in charge. If you wish to prepare more skins, consult the person in charge. We have a whole freezer full of dead birds and you are usually more than welcome to dig right in.

INDEPENDENT RESEARCH

Space permitting, LPBO always tries to open its doors to independent researchers who wish to make use of our facilities. Make them welcome! Also, all personnel are encouraged to develop and initiate their own original research. If you want to work on something, but need an idea, we've got lots!

JOB REFERRALS AND REFERENCES

Prospective employers regularly call upon the Ontario Program Manager, Landbird Coordinator, or Warden to suggest people who might be suitable for certain projects. And so they should. After all, we can steer employers to people that are well-trained and who are committed to hard work because of their volunteer stint at Long Point. LPBO's track record for helping assistants gain employment is a solid one.

Naturally, the better your performance here, the better your chances of obtaining a good referral. Some of the strongest points considered by employers (including us) are motivation, initiative, work habits, enthusiasm, ability to learn, ability to get along with others, ability to work alone, responsibility, general attitude, and maturity. In a field situation, it is obvious that "character" is every bit as important as specialized skills.

We are happy to provide potential employers and universities with honest references (written or verbal). However, such references are written only on special request from specific employers or universities and they are almost always kept confidential. Hence, written "blanket" references are seldom given directly to LPBO volunteers. At the time of your departure, feel free to bring up the topic of references. We may even find you a job!

APPENDIX VI. MOULT CARD INSTRUCTIONS

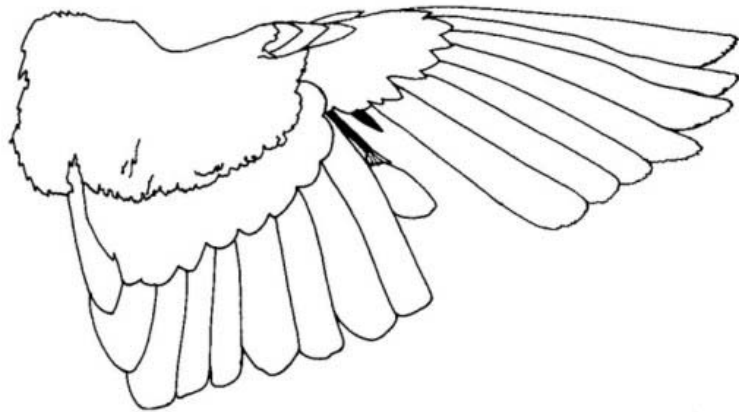
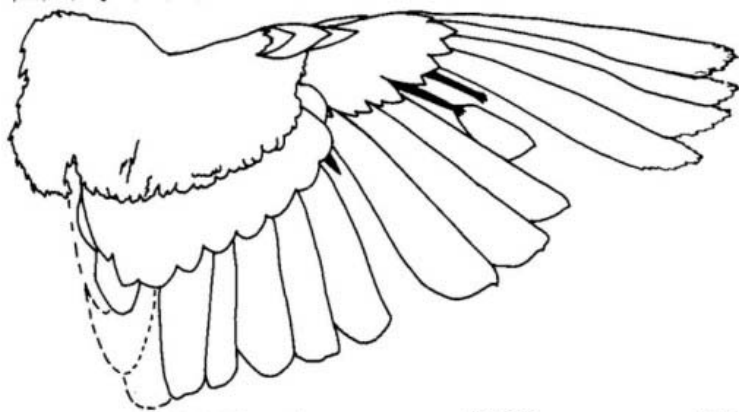


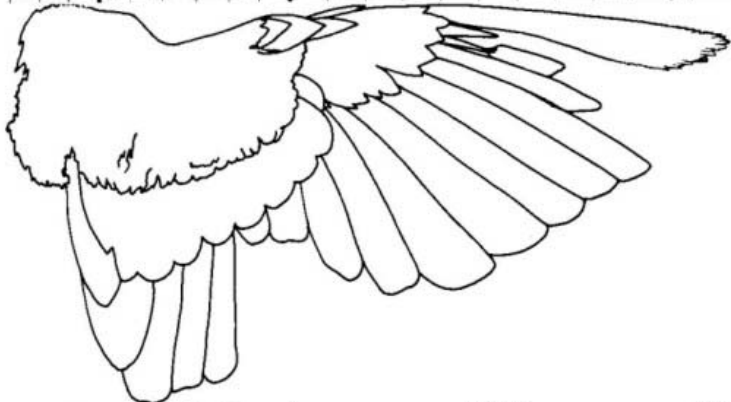
Fig. 6
A. Only the first two primaries have dropped.

TERTIALS AND SECONDARIES											PRIMARIES											L/R
43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61				
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B. Five primaries, all the tertials and the first of the secondaries have dropped.

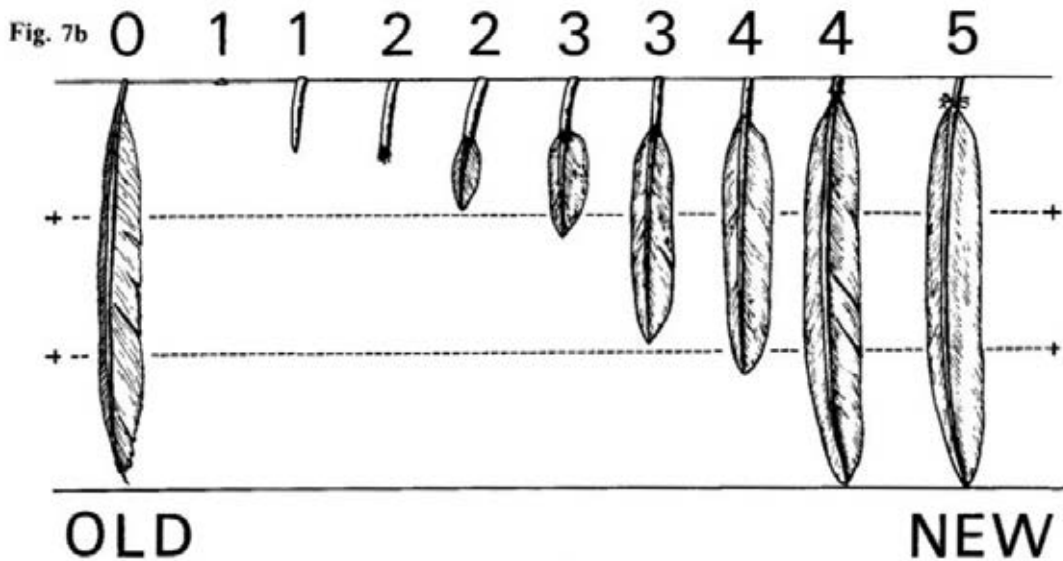
TERTIALS AND SECONDARIES											PRIMARIES											L/R
43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61				
2	3	1	0	0	0	0	0	1	5	4	4	3	2	0	0	0	0	0	R			



C. There are only two old primaries and secondaries remaining; the new tertials are fully grown.

TERTIALS AND SECONDARIES											PRIMARIES											L/R
43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61				
5	5	5	0	0	2	2	3	4	5	5	5	5	5	3	2	1	0	0	R			

Three stages in the progression of moult through the wing of a hypothetical passerine.



The feather scoring system. The dashed horizontal lines represent one third and two thirds growth. The numerical scoring system is:

- 0 Old feather remaining.
- 1 Old feather missing or new feather completely in pin.
- 2 New feather just emerging from the sheath up to one third grown.
- 3 New feather between one and two thirds grown.
- 4 New feather more than two thirds grown and with remains of waxy sheath at its base.
- 5 New feather fully developed with no trace of waxy sheath remaining at base.

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APPENDIX VII. TIPS FOR FILLING OUT SCANNABLE FORMS

Bird Studies Canada uses scannable forms for two reasons: 1) to decrease data entry time—the scanner works much quicker than a keyboarder, thus the data can be entered (and analysed) earlier; and 2) to decrease program costs—if less time is spent entering data, the cost for running the program decreases—it also provides more time for other important aspects of the program such as analysis, volunteer coordination and education. The computer program that is used is quite powerful—it can decipher most people’s printing and can discern most marks left on the pages. **However**, the scanning process will only be efficient and accurate if the information on the forms is **clear and legible**. If the data are difficult to decipher, the computer will require someone to double check its interpretation—increasing data entry time, decreasing efficiency and increasing the risk of entry error.

To ensure that data are processed efficiently and accurately, we ask you to follow these simple guidelines:

PLEASE USE BLACK PEN.

PLEASE PRINT — the scanning program cannot discern stylised writing.

For numbers and text, place one character in each box and keep within the box lines/ticks. Closing in 0's and O's helps, as does printing in block capitals.

PLEASE DO NOT WRITE OUTSIDE of the sections and boxes provided.

PLEASE DON'T USE CHECK MARKS — check marks cross into other fields and are difficult for the computer to decipher, please fill in the circles instead.

MISTAKES HAPPEN — please try to limit errors but, if they happen, don't worry about them. To correct an error written in ink, in a “choice field” (a circle) mark the error with an “**X**” and fill in the correct value. To correct an error in a “character box”, you can use correction fluid (be careful of smudges). Generally, correction fluid is the best choice for our purposes.

APPENDIX VIII. LIST OF PUBLICATIONS FROM LPBO

The following is a partial list of major papers and theses from the last several years (including manuscripts that have been submitted or are in press) that make use of Long Point data:

- Dunn, E.H., Hussell, D.J.T., Francis, C.M., and J.D. McCracken. (in press). A comparison of three count methods for monitoring songbird abundance during spring migration: banding, census and estimated totals. Submitted February 2003 to mist-net symposium (Studies in Avian Biology).
- Dunn, E.H. 2003. Recommendations for fat scoring. *North American Bird Bander* 28:58-63.
- Flinn, T. 2003. Spring warbler migration in Ontario-2002. Toronto Ornithological Club. 39 pp.
- Jones, J. and C.M. Francis. 2003. The effects of light characteristics on avian mortality at lighthouses. *Journal of Avian Biology* 34:328-333.
- Kissner, K.J., Weatherhead, P.J. and C.M. Francis. 2003. Sexual size dimorphism and timing of spring migration in birds. *Journal of Evolutionary Biology* 16:154-162.
- Dunn, E.H. 2002. A cross-Canada comparison of mass change in birds during migration stopover. *Wilson Bulletin* 114:368-379.
- Stewart, R.L.M., C.M. Francis, & C.A. Massey. 2002. Age-related differential timing of spring migration within sexes in passerines. *Wilson Bulletin* 114:264-271.
- Jones, J., Francis, C.M., Drew, M., Fuller, S. and M.W.S. Ng. 2002. Age-related differences in body mass and rates of mass gain of passerines during autumn migratory stopover. *Condor* 104:49-58.
- Dunn, E.H. 2001. Mass change during migration stopover: a comparison of species groups and sites. *Journal of Field Ornithology*. 72(3):419-432.
- Dunn, E.H. 2000. Temporal patterns of mass gain: assessing the quality of migration stopover sites for Magnolia Warblers. *Auk*, 117: 12-21.
- Brewer, A.D., A.W. Diamond, E.J. Woodsworth, B.T. Collins and E.H. Dunn . 2000. The Atlas of Canadian Bird Banding, 1921-95. Volume 1: Doves, Cuckoos and Hummingbirds through Passerines. CWS Special Publication, Ottawa, Canada.
- McCracken, J. 2000. Long Point region. Pp. 200-204 In: A Bird-finding Guide to Canada. J.C. Finlay (ed.). McClelland & Stewart Inc., Toronto.
- Dunn, E.H. 1999. An indirect estimate of mass loss in birds between capture and banding. *North American Bird Bander*. 24(3): 65-70.

- McCracken, J., Enright, L., Shepherd, Cappleman, J., and E. Dunn. 1999. The Canadian Bird Bander's Training Manual. Canadian Wildlife Service Technical Rept. Series No. 275. 114 pp.
- Shepherd, D., McCracken, J., Cappleman, J., Enright, L. and E. Dunn. 1999. The Canadian Bird Bander's Training Manual: The Instructor's Guide. Canadian Wildlife Service Rept. Series No. 276. 45 pp.
- Francis, C.M. and D.J.T. Hussell. 1998. Changes in numbers of land birds counted in migration at Long Point Bird Observatory, 1961-1997. *Bird Populations* 4: 37-66.
- Hussell, D.J.T. 1997. Monitoring migrants to detect changes in populations of birds breeding in Canada: present status and future prospects. *Monitoring bird populations; the Canadian experience. Occasional Paper 95*, Canadian Wildlife Service Ottawa.
- Montgomery, B. 1997. A study comparing acoustic counts to ground counts in the monitoring of nocturnal passerine migrants at Long Point, Ontario. Bsc. Honours Thesis, Dept. Biological Sciences, Brock University, St. Catharines, Ontario. 89pp.
- Mundy, R.P. and J.D. McCracken. 1997. Bill color as an age character in Yellow Warblers. *North American Bird Bander* 22:116-118.
- Woodrey, M.S. and C.R. Chandler. 1997. Age-related timing of migration: geographic and interspecific patterns. *Wilson Bull.* 109:52-67.