



Operational Protocol



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LABO COORDINATORS

Jared Wolfe, Ph.D., NABC Certified Trainer

Founder/Chief Scientific Advisor

jdwolfe@mtu.edu

Erik Johnson, Ph.D., NABC Certified Trainer

Director/Primary Bander

ErikJohnson@agcenter.lsu.edu

Daniel A. Mooney

Primary Bander

birds@birdnerds.com

Jed Pitre

Primary Bander

feralbiologist@gmail.com

We welcome you to the Louisiana Bird Observatory (LABO), a project of the Baton Rouge Audubon Society. This is a cooperative effort involving Louisiana State University's School of Renewable Natural Resources, Audubon Delta, and Woodlands Conservancy.

Our mission is to provide opportunities for science-based learning and outreach to the public while collecting and disseminating data on factors that limit bird populations in Louisiana. This volunteer-based effort in collaboration with and support from academic research institutions, state and federal agencies, and other non-profit organizations strives to better the understanding of birds and their populations to conserve and improve habitats on which birds and human communities depend.

BANDER'S CODE OF ETHICS

We encourage all banders and volunteers to be familiar with and adhere to the [Bander's Code of Ethics](#), which is central to the practice of bird banding. It makes each of us better banders, researchers, members of the ornithological community, and stewards of our natural world.

- 1. *Ensure the respect, safety, and welfare of birds and their populations, people, and the environment.***
- 2. *Design or use appropriate studies, methods, and analyses to advance a valid scientific purpose.***
- 3. *Be accountable and strive for high standards.***
- 4. *Obtain all necessary permits and permissions; understand and adhere to the conditions, responsibilities, and limitations thereof.***

Another way we approach these ethics is to consider the importance of the following three things in sequence:

- 1. Human safety**
- 2. Bird safety**
- 3. Data quality**



WHERE WE WORK

Bluebonnet Swamp Nature Center

Owned and operated by the Recreation and Park Commission for the Parish of East Baton Rouge (BREC), we have been studying birds on this 103-acre property since March 2010. Dominated by lowland hardwood forest and cypress-tupelo swamp, a visitor's center and trail system quickly get you into nature in the middle of Baton Rouge, Louisiana. This was the site where the project began and remains one of our most popular sites in which to volunteer because of its central location. We operate nets twice a month, year-round and often on weekends. There is a total of 38 net lanes, and we typically operate 25-28 on any given day.

Griffard Residence, Sunset

This 8-acre oasis has been restored with native plants by the property owners, which has provided the opportunity to study important relationships between native plants, bird diet, and bird health. We operate 18 nets at this site once a month, year-round.

Woodlands Conservancy

This non-profit land trust has secured and protected nearly 800 acres of lowland hardwood forest and is performing invasive species removal on some parcels to restore natural ecological processes. There are two parcels of land near Belle Chase, Louisiana; the Woodlands Trail tract has more than 10 miles of hiking trails and there are plans to open the recently acquired Delacroix tract for public use in the near future. Don Norman was instrumental in setting up the stations and has been coordinating the operation of nets at both tracts since December 2013. We operate nets twice a month (once at each tract), usually on weekends. There is a total of 32 net lanes, and we typically operate 10-15 nets on any given day.

LSU Burden Museum & Gardens

Owned and operated by the LSU AgCenter, this 440-acre urban park has a mix of horticultural research plots, demonstration grounds, visitors facilities, and natural areas. Louisiana's first MoSI (Monitoreo de Sobrevivencia Invernal = Monitoring Overwintering Survival) station is operated here, in alignment with this international program managed by the Institute of Bird Populations. This station is operated up to three times a month between November and March, which started in November 2025.

INTRODUCTION

Every constant-effort mist-netting station should have a Station Management Procedures document such as this. This document is designed for stations operated through the Louisiana Bird Observatory (LABO). Many years of a wide variety of experiences have gone into these procedures and every word is considered important to the operation of a bird monitoring station. Please make every effort to become very familiar with its contents. This document is intended to outline operating protocols at LABO stations, which largely follow [North American Banding Council](#) (NABC) manuals. This document is not meant to replace those established and standardized operating materials, but instead provides additional logistical details and considerations for how we operate

banding stations. Necessary minor deviations from this document may be expected depending on logistical considerations from site to site and day to day, and should be documented in the journal record at each station, and preferably written up for a permanent record.

CHAIN OF COMMAND

The Primary Bander is the logistical and organizational manager of each banding station. Primary Banders are authorized to band passerines and near-passerines for research through the USGS Bird Banding Laboratory (BBL) and the Louisiana Department of Wildlife and Fisheries (LDWF). The Primary Bander is responsible for all aspects of human and bird safety, as well as ensuring maximum data quality during collection in the field. The Primary Bander is also responsible to ensure the data are reviewed immediately after field work is completed, as well as entering the data into the LABO Banding Database in a timely manner (typically after a datasheet is completely filled out, and/or after a banding session, and/or at the end of each calendar year). Scheduling of data entry into the LABO database is dictated by the LABO directors, property managers, or the Master Bander.

There are two types of Primary Banders, from a Federal permitting standpoint.

- 1) *Master Bander* – this designation by the BBL is considered the maximum certification needed to band birds. A Master Bander is responsible for reporting their banding data back to the BBL as well as ensuring he or she has requested the appropriate number of bands of a variety of sizes in order to operation the local station.
- 2) *Subpermitted Bander* – this designation by the BBL may be thought of as an apprentice to a Master Bander, and is listed by name on the Master Bander’s BBL permit. A Subpermitted Bander (Subpermittee) is authorized to band birds independent of the Master Bander, but must report their data to the Master Bander. The frequency in which the Subpermittee reports data to the Master Bander is dictated by the Master Bander, which in turn satisfies reporting requirements by the Master Bander to the BBL.

Assistants and volunteers that support field operations are expected to follow all instructions of the Primary Bander, although we also encourage an open dialog between Primary Banders, assistants, and volunteers to ensure that nets are checked in a timely manner, that birds are processed quickly and safely, and that all aspects of the banding station run smoothly.

WHAT DATA WE COLLECT

Much of the focus of this document is on the operation of banding stations, rather than the scientific merits of data collection. We focus our efforts on two important types of bird monitoring techniques: 1) passive mist-netting, and 2) audio-visual surveys. Both types of data collection methods importantly complement each other and are designed to get around the issue of “detection bias” in bird monitoring.

EQUIPMENT AND MAINTENANCE

Equipment

Each banding kit should have an equipment checklist that includes everything that is taken into the field, including net lane clearing and maintenance tools (Appendix A). Please keep in mind that all the equipment and materials used in this program are expensive and difficult to replace. Banders should use and maintain everything gently and with respect. If any equipment is needed or requires replacement, the primary bander should be notified as soon as possible.

Bird Bags

Banders should always have multiple bird bags with them while nets are open (or being opened). With the raw/frayed edges facing out, each bag should have a 1-2" of masking tape where the capture time, net number, species code, and whether it contains an unbanded or banded bird should be written. Avoid placing more than one bird into a bag at a time (see NABC manual for the rare exceptions). After each bag is used once, it should be turned inside out and segregated from the rest of the bags. Only when absolutely necessary should a bag be used more than once. At the end of a banding period, bird bags should be laundered. Loosely fill a mesh (lingerie) washing bag with the soiled bird bags (so they don't unravel or become severely tangled together) and wash on the gentle cycle in hot water with a minimal amount of detergent and chlorine bleach and/or vinegar. Leave bags inside the washing bag for drying. After drying, reverse the bags so that the raw/frayed edges of the seams are again on the outside. Trim excess frayed or loose threads to reduce tangling on the birds. Be sure to remove damaged bags (without strings, with holes or unraveled seams) that cannot be wrapped shut, or from which a bird could escape, from the kit. Repair them if possible, or else dispose. If a suspected diseased or bleeding bird is captured, it is important to put that bag aside until it has been washed and disinfected. Also take the time to wash and disinfect your hands with the antiseptic towelettes or lotion provided in the banding kit before handling other birds or any tools and equipment. Periodically take the time to clean your hands during the banding session.

Net Repairs

Mist nets are quite expensive, but with proper handling and regular maintenance, they should last a long time. It is very important that damaged nets be repaired as soon as possible or be removed from the kit until such time they can be repaired. Damaged nets pose a danger to birds that become entangled in them. Mesh holes and broken or undone trammel lines can cause extreme tangles that unnecessarily threaten bird safety and take much longer to untangle. A description of common net repair techniques is included in this document to supplement training. Realize that nets cost about \$125-150 each, so a half-hour of repair more than pays for itself. A good rule of thumb for deciding whether a net should be repaired immediately (during a netting session) or afterward, is estimating the time necessary to complete the repair. If the repair will take about five minutes (about the time that one would spend extracting a couple birds), then repair it right away; if a longer time is necessary, then wait until after the netting session so that capture rates are not affected by net location disturbance. If banders do not have time to repair the net immediately, or sometime during the banding session, then while closing the nets, mark any damaged nets with flagging with notes written in sharpie pen indicating the size and location of the damage. Then, as soon as possible,

repair it! Primary Banders (the bander in charge) have the responsibility to make sure that net repair, instruction, and practice are a regular part of the banding effort schedule, whether during the banding session, afternoons, or on office/maintenance days.

Net Lanes

Net lanes should be cleared of vegetation to approximately one meter to either side of the net and at least one meter above the height of an open net. Given that LABO operates in conservation areas, we try to limit vegetation destruction by utilizing “natural net-lanes.” As a result, net-lanes may be relatively narrow, it is imperative that *nets are centered in each net lane*. Net lanes must be maintained throughout the year, particularly the growing season (approximately March – October). Cut back any new growth so that it does not become entangled in the net. Net lanes should be discreetly marked with flagging labeled with the station code and net number written in permanent ink. At most stations it will be necessary to set up and remove the nets for each banding session. One end of the lane should be established as the fixed end and one end as the moveable end. This allows for adjustment to accommodate variations in net length and adjusting net position within the lane.

STATION SETUP

There are two variations of station setup. Generally, one is used more appropriate for a quick-station set up (often and endearingly referred to as “guerilla banding”) or where poles can easily be shoved about 2–4” into the ground and quickly removed; this technique requires less equipment (and money), whereas the other method is used at more permanent stations or where the ground substrate is hard, rocky, or sandy, and requires more equipment and time to set up and maintain. Given the terrain and soft substrates in Louisiana, we recommend following Option 1.

- *Option 1:* you will need thin-gauge three sections of ¼” diameter nylon (3-strand twisted polypropylene) rope and two 10’ x ½” diameter conduit section poles. Fastened rope several inches from a tree trunk provides a solid “fixed end” for a net lane. This fixed end rope should be parallel with the ground, thereby creating the shortest distance possible between the tree and the pole. Mist-nets will become unstable if the length of rope between the pole and tree is longer than 3’. Once the fixed end is established, move to the opposite end (called the “floating end”) and install 2 guy lines at approximately 120° angles to the pole forming a triangle with the pole. In heavily wooded areas, these guy lines can be anchored to tree roots, large rocks, logs or trees. Importantly, if the ropes on the floating end are not anchored low to the ground nets may be unstable. We recommend using clove hitches or two half-hitches to tie all rope to poles when using this set-up methodology.
- *Option 2:* you will need two 10’ x ½” diameter conduit section poles, one 1’ x ¾” diameter PVC pipe section, three 2’ x 3/8” (or ½”) diameter steel rebar sections bent 90° at one end, three 8’ sections of ¼” diameter nylon (3-strand twisted polypropylene) rope, and two ¾” swivel snaps for each net. Install a PVC section at what will be the fixed end of the net lane. This should be placed at the end where there is the least public traffic. The PVC should be installed at a slight angle away from the direction the net is running. This will help maintain the pole in a vertical position against the tension of the opened net. At the fixed end, install one guy line directly in line with the net. Using the 3# mallet, drive the rebar into the

ground approximately 1.5 m away from the PVC at an angle facing away from the net. Tie a section of rope to the rebar and make an adjustable slipknot at the net pole end of the rope. Measure the length of the lane using an old net, a net-length section of rope, or by pacing. Install 2 guy lines at approximately 120° angles to the pole forming a triangle with the pole. The rebar stakes should be driven in at angles of 50° to 60° to the substrate, away from the net and poles at each end. If it is not possible to drive the rebar stake into the ground, as will happen at areas with a rocky substrate, the stakes must be buried, or an appropriately situated stone or tree used to anchor the guy line(s).

Net Set-Up

Using the method involving storing nets in plastic bags and one of two arrangements described above, a net can be set up in about two minutes or less. As the net lane is approached, locate and lay out the poles and guy lines at each end of the net lane. Starting at the fixed end, insert the pole through the net loops and then attach the pole to the fixed nylon cord either using two half hitches or a clove hitch (typically with three loops above and two loops below above the cord, although this may vary depending on topography). Once the first pole is tied off, walk to the other end, feeding the net out of the bag as you go, being sure to keep enough tension on the net to keep it from dragging on the ground. When you reach the moveable end of the lane, place the net on the pole and fasten the pole using two half hitches or a clove hitch. Nets made of nylon stretch out after opening and will most likely need to be tightened on the next net check. Because two people set up a net only slightly faster than one, it is much more efficient for banders to split up (rather than leap-frog) and work toward one another from opposite ends of the net array. However, factors such as a bander who is unfamiliar with net locations or a planned area search census may make other arrangements desirable. What is important is that the nets are opened as rapidly as possible and that banders at the station are in communication with one another. The plastic (grocery) net storage bag should be left at the net, bunched up and secured at one end of the net and out of sight. It is important to stash the bag so that it is not free to blow in a breeze and disturb nearby birds. Replace plastic bags as necessary.

Net-site Trails

Trails at each station must be kept cleared of hazards such as sapling stumps (trippers), holes, low branches (eye-pokers or head-knockers), loose stones or branches, and thorny vegetation. The trails should be safe to move quickly through without tripping and ducking. Banders should be aware that brushing against thorny vegetation such as blackberry or hawthorn could possibly injure a bird in a bag. Diligence in trimming new growth during the late spring and summer growing season is necessary to maintain safe conditions at netting stations. If a treefall or other event causes a trail (or net lane) blockage, notify the support staff as soon as possible so that the problem can be resolved.

RUNNING THE STATION

The Primary Bander and any assistants operating stations should have read and thoroughly understand these station management procedures, The [USDA Handbook of Field Methods for Monitoring Landbirds](#) (Ralph et al. 1993), [The North American Banders' Study Guide](#) (North

American Banding Council, 2001a), [The North American Banders' Manual for Banding Passerines and Near Passerines](#) (North American Banding Council 2001b), [The Instructor's Guide to Training Passerine Bird Banders in North America](#) (North American Banding Council 2001c), and the Introduction section (pp. 1–40) of the Identification Guide to North American Birds, Part I (Pyle 1997). Additional banding manuals for additional bird groups can be found on the [NABC website](#). The importance of the information contained in these documents cannot be stressed enough. Understanding this information will ensure consistency in station management and data collection, and will protect the health, safety, and well-being of the birds.

The objective is to operate each net for 5 hours (or 8 hours in the case of a MoSI station). Banders should be at the station 20–30 minutes prior to local sunrise (account for time it takes to walk into a station), begin opening the nets 15 minutes prior to local sunrise, and shut down so that each single net is operated the appropriate number of hours. Be sure to have cached at each banding station (or otherwise have on hand) spare equipment (poles, rope, stakes, etc.) to get every net set up promptly every session. Banders must have bird bags and hand nipper-shears on their person at the opening and throughout the banding session for early captures and minor vegetation trimming.

Before You Start

Before opening nets all banders must have scissors (for removing problem or stressed birds), bird bags, a felt tip pen or sharpie (for documenting net-site and time on bird bag) and a walkie-talkie or cell phones (to communicate with the rest of the crew).

Efficient Banding Station Setup

One of the most critical elements in station management is setting up the banding station to run efficiently, so that you minimize any stress on the birds (and you!). There are many things that banders can do to reduce confusion, and thus increase efficiency and bird safety, at a banding station. Try to place the processing table in a location that will be sheltered from the direct sun during the heat of the day, but not so shady that the lack of light in the early morning makes it difficult to make accurate assessments of plumage and skull. Having a table to work on will greatly enhance your ability to maintain order and speed. Portable tables or the tailgate of a truck could be used for processing. If the table is too small to hold all of the items, set up the essential banding tools on the table, and set up the references within easy reach of the table. The birds should be hung in a sheltered place within easy reach of the bander. You should not have to get up from the table or walk to where they are hung or to get under a light to examine skulls. This is to ensure that the birds are processed as rapidly as possible. Lay out the tools where you find them most accessible on a small towel or bird bag, and put them back in the same place when you are finished using them for easy access. Be sure to set up the scale within reach so that you do not have to get up to weigh the birds. When removing birds from bags, have a spot, away from the immediate processing area, where you pile the empty bags. This will keep the bags out of the way of the processing and reduce confusion.

Rainy Day Procedure

Do not net in steady or heavy rain. With mobile technologies, it is possible to regularly check the radar. During a passing shower, nets can be left open IF there is sufficient crew to check all nets and

remove birds the instant it begins to rain, and if radar indicates that the shower will pass in 30 minutes or less. Birds do not fly in moderate to heavy rain, but will begin flying immediately as the rain stops; thus, if you close the nets for rain, and plan to reopen, you may miss an important pulse of activity. The trade-off is clearly bird safety, and if there is any doubt, close nets and stop operations BEFORE rain begins.

If the scheduled banding session is interrupted by rain or other events, please use the following guidelines. One major objective of a constant effort station is to run each net for a specific number of hours each sampling period, starting 15 minutes prior to local sunrise. If you must close nets shy of the magic number of hours, we suggest the following, in order of priority.

1. Attempt to operate each net for the standard number of hours, within the first 7 hours following local sunrise.
2. Operate each net for at least one hour within the 2 hours following local sunrise to include the maximum capture rate.
3. If possible, operate each net for a minimum of 60% of the standard number of hours during the first 7 hours following local sunrise. For example, at a station normally operated for 5 hours, 3 hours would provide the minimum of 60%.
4. If a net or nets cannot be operated (e.g., flooding, treefall), then a temporary replacement(s) should be set up as near as possible until such time the detriment to the original net(s) is removed. Secondly, other nets should be operated for the minimum 60% of the standard number of hours during the first 7 hours following local sunrise. Every effort should be made to restore the original net array as soon as possible.
5. If you can't meet the above criteria, we suggest that you operate the nets on the next available day, during the hours missed.

Checking Nets

Several factors should be kept in mind when checking nets. Nets should be checked every 20–40 minutes depending on environmental conditions, numbers of birds, and the experience level of the personnel. Environmental conditions considered unsafe include: wind, rain, and temperature extremes (see Ralph et al. 1993). If a bird is incidentally seen in a net, it should be removed immediately. Personnel should always be in communication with each other, such as with walkie-talkies, at the station to ensure that all nets are checked in each round.

An efficient extractor should take <1 minute to extract each bird. Excess flapping, particularly with one wing free and the other constrained, should be minimized. In general, a body grasp is preferable over other methods of extraction. If the bird is excessively tangled, this may take longer, but if a bird takes more than 5 minutes to extract or if the bird appears stressed, then cut the bird out of the net or have a more experienced extractor take over (which still may require cutting the bird out). Personnel should always carry the small pair of scissors provided in the banding kits, as well as a dropper bottle of sugar water (4 parts water to 1 part sugar) to revive stressed birds. Most importantly, schedule the next net round and it can be good practice to write it down as a reminder on the journal page immediately upon returning to the banding station.

Busy Day Procedure

The purpose of a busy day procedure is to provide guidelines that clearly outline steps for a Primary Bander to consider when high volumes of birds are captured at a station. The primary concern for banders when faced with large numbers of birds is bird safety and this procedure should be implemented to avoid leaving a net unattended for more than 45 minutes and to avoid holding birds for more than one hour (or some hardy species in ideal conditions for two hours) due to a backlog. Always keep in mind and plan for the next net check to result in a lot more birds, so be pro-active in processing birds quickly, even when “ahead of the curve.” When followed, these guidelines will allow banders to efficiently and safely deal with large numbers of birds, while assuring that the most valuable data are collected accurately. Examples of the considerations taken into account by this procedure include:

- Data collected from capturing the more uncommon birds is more valuable than taking complete data on, or even banding common species; and,
- Data collected on a recaptured individual is much more valuable than data collected on newly banded individuals.

Options to consider when faced with large numbers of birds include: making more frequent net rounds, adjusting the allocation of personnel, taking minimum data (see more details in next section), and releasing birds unbanded. Specifically, we want banders to consider the following options.

- Remove birds from nets as quickly as possible, as they can remain quite comfortable in shaded bags for one hour or longer under ideal conditions (except sensitive species);
- Process sensitive species first, which include, but are not limited to, hummingbirds, kinglets, warblers, Winter Wren, and towhees;
- Take minimum data until the capture rate slows down. Be sure to maintain high quality data collection, especially of species, wing chord, weight, age, and sex determination. If necessary, release birds without banding; try to age and sex these birds, if possible, and always record them on the ‘Unbanded Birds’ datasheet.
- If too many birds are captured even by taking minimum data, then close several nets, including those with high and low capture rates, and in different habitats, if possible. No matter which nets are closed, the normal net checking route(s) should be maintained to avoid confusion about which nets have been checked.
- Try to do net rounds as quickly as possible; every 15-20 minutes is not too often, to minimize each bird’s net time and degree of entanglement.
- Use personnel effectively; two people working together can process much more than twice the number of birds than a single person, so long as one records for the other. But sometimes two banders working simultaneously with one recorder is less efficient than a single efficient bander and recorder. If it is time for another net round, and there are still birds to be processed, it is best for both people to go on the net round, rather than just one. The birds are safer and less stressed inside of the bags than hanging in the nets.
- If more than about 10 birds continue to remain in bags after one hour, close additional nets.

- Once the number of birds hanging in bags has reached about 10, then nets can be reopened. As a general rule, birds should not remain unprocessed in bags for more than one hour from the time of capture, or sometimes for up to two hours for some hardy species in ideal conditions.

DATA RECORDING AND MANAGEMENT

Data Recording

It is imperative that all appropriate datasheets (banding datasheet, daily journal, area search) are completely filled out. Some fields may get inadvertently omitted during data collection, so after each banding event, all data sheets should be checked for quality and completeness.

Daily Journal

Although fields in Daily Journals (Appendix B) seem obvious, mistakes are very common. Please completely fill out the forms and adhere to the following:

- Station name: the name of the station (e.g., Bluebonnet Swamp).
- Station code: the four-letter code for the station name (e.g., HOME).
- Date: Follow the format “DD,” “MM,” “YYYY.”
- Time open: record the time you commenced opening and the time opening was completed.
- Time closed: record the time you commenced closing and the time closing the nets was completed.
- Net site numbers: record the ID for each net opened noting any individual net locations that were not opened. Record in the notes section the reason for any nets not opened or the times nets were opened or closed if different from the general open and close times for the array.
- Total number of nets: record the total number of nets opened in the array on that date (including those that were opened late or closed early).
- Net route: record the time each net check was started for each route.
- Banders: record the complete names of all banders and recorders.
- In each of the three time intervals (open, mid, close) record: (1) Percent cloud: estimate the percent of cloud cover to the nearest 10% in each of the three intervals; (2) Precipitation: None (N); Fog (F), Mist (M), Drizzle (D), Rain (R). See Ralph et al. (1993). Include any descriptors such as light, heavy, steady or intermittent. (3) Temperature: record temperature in Fahrenheit. (4) Wind using the Beaufort scale.
- Number of visitors: Tally the number of non-volunteer visitors to the station.
- Notes: record any unusual or interesting occurrences, problems encountered, etc.
- Number of birds captured: cross check totals on back of form with a second, approximate counts from data forms.
- Other species detected: record additional bird species not captured or detected (or develop an eBird list of species detected by the group).

Banding Data Form

Be sure to completely fill out the headings on the top of each form. Lost or destroyed bands should be recorded in sequence on band sheets. Record the code ('L' for lost and 'D' for destroyed), band number, date, and location.

Sequence of Data Collection

"If you don't know what to measure next, you are doing it wrong" is our paradigm concerning rapid and accurate processing. Every bander must have the general order of processing memorized to expedite bird processing. Furthermore, banders should have codes for each field memorized (see Appendices E and F). An efficient data recorder is also imperative to be able to keep up with an efficient bird processor. The order is as follows:

1. Report species, band size and band number to the recorder. Make sure the recorder reads the band number back to the processor.
2. Cloacal protuberance and brood patch.
3. Fat. Gauge the amount of fat in the furculum, and adjust if necessary by examining the flanks.
4. Body molt. Make sure to check flanks, tail coverts, back, nape, crown, and throat.
5. Wing molt. Check by blowing at a slight angle above underwing coverts to see the base of the primaries and secondaries.
6. Wing wear. Average the last four visible primaries.
7. Wing chord (unflattened). If wing is bent, excessively worn, or the longest flight feathers are molting, do not measure wing chord and make a note briefly explaining why wing chord was not measured.
8. Weigh the bird. While the bird is being weighed, report age and sex.
9. If there is time and reason, record any other details or special notes regarding the bird (pox lesions, plumage abnormalities, extent of molt limits, etc.)
10. Photograph and release the bird.

Ideally, age-related plumage criteria should be mentally noted during all phases of processing. Adhering to this system will allow banders to process birds in 60 seconds; any faster and recorders are prone to mistakes. During fall and winter months, birds should be skulled (if necessary to confirm an uncertain age) after tarsus is measured but before they are weighed.

Certain birds should be recognized as sensitive to the capture process and processed before other birds as a priority in processing order. Banders should be very familiar with which species can be sensitive to the capture process. At stations in Louisiana, this group of birds includes hummingbirds, kinglets, Winter Wren, towhees, and any other bird that appears stressed. Other birds that should be considered as potentially sensitive include juveniles (especially of small warblers and finches), adult females with fully developed brood patches, and individuals that are continually struggling and/or screaming. The bags containing such birds must be marked with a bold note stating "priority" and other banders must be informed of the bird's status. These bagged birds should be segregated at the banding table area and brought to the attention of whoever is processing birds at the time.

After priority birds are completed, birds should be processed generally in order of their increasing size (e.g., kinglets before sparrows before thrashers, etc.). Banders should always collect and record data following the sequence on the banding data form to maximize processing efficiency. The Pyle Guides I and II serve as our primary source of aging/sexing criteria. Fluency in all aspects of nomenclature used within both guides is mandatory for all LABO banders.

Priority and Quality of Data

When time allows, record all data listed in the banding datasheet. If the banding station gets a particularly high volume of birds, then move to the “Busy Day Procedure” (see above). The most important data are species, band number, age (at least to the degree of hatching year vs. after hatching year), sex, wing chord, weight, capture time, and net location.

Recording How Aged and How Sexed

The codes for characters used in aging and sexing birds are included in each banding kit and in Appendix E. The most definitive characters should be used and recorded. As our knowledge of aging and sexing birds develops, some characters may prove to be more or less useful than we now understand them to be. If possible, use as many codes as relevant. For example, if the bird has molt limits, but also non-adult iris color and fault bar alignment, record all three indications of age (i.e., “M,E,=.”

Recording Wing and Tail Molt

Flight feather molt (which includes primaries, primary coverts, secondaries, tertials, and rectrices) should be recorded as “yes” or “no” in the data fields on the front of the form. Do not record adventitious feather loss as molt. In the notes, the extent of molt should be recorded; for example, “P1(90%) p2(40%) p3(5%).” It is only necessary to note one side of the wing if undergoing symmetrical molt. Be sure to include a note indicating if you were aware that feathers were lost during capture or processing.

Recording Feather Generations

The datasheet provides options for recording details of 11 different feather tracts. This is optional and time-consuming (thus, shouldn’t be attempted when the station is busy), but is intended to encourage banders to carefully examine each of these tracts for molt limits. This may be best filled in after the bird is released. For most birds, molt limits and feather replacement patterns are predictable and typical. For example, in eccentric patterns in which there are limits within the secondaries and primaries, it is expected that all secondary coverts, alulas, rectrices, and body feathers will have been replaced. Alternatively (or additionally), notes about the extent of molt limits can be written in the notes.

Recording Notes

Notes can be made about specific plumage characteristics and measurements taken in addition to the normal data recorded on the front of the form, for example the length of the crown patch of an Orange-crowned Warbler, or other criteria used to make age and sex determinations. Make notes as concise as possible and use the standard abbreviations found in the Pyle Guides. When referring to a figure in Pyle, record the note as ‘Pyle Fig ### = X’. We assume this is based on the 2022

(Passerines and Near-Passerines) and 2008 (Non-Passerines) guides, but note if this is not the case. Note any injuries, malformations, or deformities, especially if a status code other than N (Normal) is used. All unbanded birds should have a note explaining why the bird was released unbanded.

Bands and Band Sizes

Birds should always be banded with the best-fitting size band. Band sizes are listed in the Pyle Guides and BBL website. If in doubt, and after measuring the tarsus width, a bander determines that a size other than recommended should be used, then a note that includes minimum and maximum tarsus width (to the nearest 0.1 mm) should be recorded. Bands can be placed on either the right or left leg, whichever is handy and available. Banders must be in the habit of inspecting both legs for an existing band.

Bands that are determined to be unreadable or unsafe should be replaced (Band Code C=Changed) and the old band must be taped to a sheet of paper with the readable digits, species, station, date, and replacement band number written and saved. It is very likely that the BBL will be able to discern the original number through an etching process. When a band is changed, the OLD band is recorded on the recapture page with band code = 'R'. The NEW band is recorded on the new band sheet with the band code = 'C'. Notes referencing the matching band numbers should be recorded on both sheets. The new sheet should reference the OLD band number and the recap sheet should reference the NEW band number.

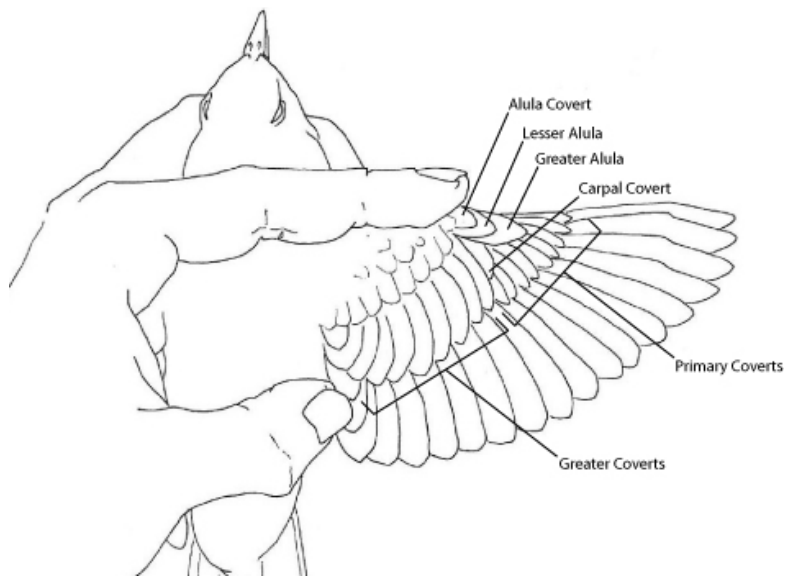
Recording Minimal Data

Under certain conditions (see Busy Day Procedure above) there may not be time to fully process each bird. In these situations, the bander at an absolute minimum must at least record the band number (if banded), species, age, sex, wing, weight, and net number of the bird. The next “level” of necessary data may include breeding condition, molt status, and tarsus. The last “level” of detail would include details of molt or molt limits, and other ancillary details. In any given situation, the need to collect minimal data will vary with numbers and experience of the banders. Just remember, the safety of the netted birds is paramount.

Importance of Age

Virtually all analyses of banding data first divide birds into age classes, usually just FCF (HY/SY) vs. DCB (AHY/ASY). The LABO stations have recently shifted to prioritizing using and teaching the WRP (Wolfe-Ryder-Pyle) system (see Pyle et al. 2022) over the calendar-based system. This requires a foundational understanding of plumages and molts, but note that there are only three primary plumages: basic (including first basic = juvenile), formative, and alternate. Understanding molt can be overwhelming at first, so recommend that all trainees become familiar and comfortable with the terminology and regularly discuss with a primary bander. It is perfectly acceptable to embrace uncertainty and utilize age codes like M-FCF, M-SPB, and UCU; it is more correct to use these codes than to incorrectly assign a specific age code when it is incorrect (e.g., calling a bird a DCB when it is actually FCF).

Bird Hold, Topography and Molt Limit Example



Yellow-rumped Warbler (below) showing retained primary coverts (except for the adventitiously replaced inner primary covert), retained lesser alula (a2) contrasts with replaced alula covert (a1) and replaced greater coverts. The molt limits shown below are typical of formative-plumaged (A-FCA) warblers.



Rare Birds

The Primary Bander should be familiar with the diagnostic characteristics of the top 30–50 species commonly captured, and they should be aware of similar, less-common species. When you capture an unfamiliar, unusual, or uncommon bird, document it and its diagnostic characters with a photograph. The bird should be held in front of a uniform background with a label with the date, location, and the last 3 digits of the band number (or photograph the banding datasheet with the pertinent information). At the very least, take a side view with the back wing flared up to show molt and upper coverts. A top and bottom view would be advantageous. If you do not have a camera, a thorough written description covering all the major plumage areas (e.g., upper parts, undertail coverts, etc.) and color of body parts (including bill and legs) should be taken. Birds that cannot be readily identified should be processed completely and photographed. The photographer's initials should be noted on the banding sheet.

Empidonax flycatchers

Identifying *Empidonax* flycatchers can be challenging, but fun! When using the *Empidonax* reference tables in Pyle (2022) note all distinguishing criteria used in identification in the banding sheet notes. It is not necessary to take all the measurements Pyle gives in his reference tables; rather, record just those characteristics that you require to arrive at an identification. We suggest this approach: if you have an educated guess about the species identification based on your experience, start out with those characteristics that separate that species from its congeners. You can stop measuring and recording when you feel confident about your decision. If you are inexperienced with the flycatchers, or you have captured a bird that refuses to fit neatly into our classification scheme, then more effort will be needed. Be prepared for waves of *Empidonax* flycatchers (and *Catharus* thrushes) and familiarize yourself in advance with the measurement techniques and special data requirements. Do not record a bird as “*Empidonax* species” or “*Catharus* species”! Each of these birds can be identified to species with the required certainty. If you know in advance exactly which characters and/or measurements are required to separate similar species, and you are overwhelmed by a wave of birds, take the minimum amount of data, and later identify each bird to species based on the data you have taken. Do not put a band on a bird you will not be able to identify! And take many photographs of any capture of these confusing identification problems.

Recognizing and Treating Stress and Other Common Injuries

All banders must be familiar with the symptoms displayed by captured birds (see NABC Banders' Study Guide). If a bird is stressed, take minimum data and release, or simply release without taking any data except for species if necessary. Be certain to release such birds at ground-level and be ready to recapture the bird if it does not fly. If a bird is stressed to the point of being unable to fly, first try gently jostling the bird or tossing the bird in the air an inch or so back into your hand. This often gets the bird's wings moving, stimulating its heart, and releasing it from shock so it flies away. If this does not work, offer the bird a drip of sugar water, then activate a hand-warmer packet (follow directions on package), place it inside a bird bag to one side of the warming box (e.g., a plastic-insulated cooler pack), and place the bird inside, but not next to the warmer. Cover the open box and set it away from the banding table in a safe, quiet place. Check on the bird after 10 minutes or so. The sugar water solution could be offered to the bird by squeezing a drop out of the dropper

and held at the bill tip, inserting the bill tip or tongue tip into the drop no more than a millimeter. A hummingbird's tongue is frayed and sponge-like, and if it can take the sugar water, it will at this point. If it takes the sugar water, it will very quickly be energized and be able to fly. If it does not, consider treating it in the warming box. Keep in mind that hummingbirds go into torpor and may do so as a reaction to shock, appearing dead, but delay treating as a potential specimen.

Wing Strain

Wing strain (described in NABC Banders' Study Guide) can occur in the net before and during extraction, and during processing. Banders can minimize this problem by following proper net check schedule procedure, using proper net extraction techniques (especially the Body Grasp extraction method), and proper Bander's Grip handling. Wing strain may be evident by one wing held noticeably lower than the other. If wing strain is suspected, prior to point of release the bird should be momentarily held in the Photographer's Hold and allowed to flap its wings. If the wings do not readily flap, move the held bird up and down within a few inches a few times (this will usually prompt a bird to flap its wings). If the bird has not yet flapped its wings, it should be placed into a bird bag and set in a safe, quiet place away from the banding table. Check on the bird after 20 minutes and attempt to release as above. Holding the bird for up to several hours may be necessary. The NABC manuals describe other, less common, injuries and treatments.

Mortalities and Euthanasia

In the course of capturing birds, and despite of every precaution being taken, some mortalities may occur. Also, while working in the field or at other times, you may encounter dead birds, or be presented with one by the public. Although these birds' demise is unfortunate, it presents an invaluable opportunity to contribute greatly needed study specimens to scientific collections and training programs, and we donate salvaged specimens to Louisiana State University Museum of Natural Sciences.

In addition, we may encounter a bird that may have experienced an injury that necessitates euthanasia. When making a decision to euthanize a bird, one should ask themselves if they believe the bird could survive in the wild without long-term pain or discomfort, or whether the bird should be taken to a local licensed wildlife rehabilitator. If the answer to either of these questions is "no", then euthanasia is likely necessary. In this case, we follow the [Ornithological Council Guidelines to the Use of Wild Birds in Research, 4th Edition](#) in considering thoracic compression as a conditionally appropriate method. This should only be done by someone trained (e.g., the primary bander). Because of the rarity in needing to perform euthanasia at our sites, this is a more feasible approach than other methods that require chemicals or additional equipment. It is also better for preserving a study skin for a scientific museum than other approaches, such as cervical dislocation, which can tear the skin.

It is essential to take preliminary actions to preserve these specimens' value; otherwise, a great life is lost a second time. Specimens must be frozen as soon as possible. If you are more than an hour or so from a freezer, keep the wrapped and bagged specimen in an ice chest or cooler (or, at the minimum, in the shade). Please keep in mind that these specimens are not of study value without the information listed below recorded on the wrapping and also on the outside of the plastic bag. To protect feather condition and shape, the bird must be rolled up in a piece of (appropriate-sized)

clean paper with each end folded over toward the center of the bird, without disturbing the rectrices and head plumage. The carcass should be arranged with the wings at resting position and the legs directed towards the tail. If possible, fill the mouth with cotton (to absorb fluids). The wrapped specimen must then be placed into a plastic bag, preferably a sealed zip-lock freezer bag. Specimens derived of netting/banding activity should be recorded as unbanded birds. Information that must be recorded for each specimen (on paper wrapping and on plastic bag): species (write out common name), age and sex (if known), date (day/month [3-letter abbr.]/year), location (include Parish), cause of death, soft part colors like iris, maxilla, mandible, tarsus, foot, and foot pads, as well as the collector's name.

Area Search Form

For better or worse, this approach has become less of a priority at our banding stations, replaced by the keeping of a group eBird list. Even so, when time and interest permits, it this should still be attempted. Be sure to completely fill out the headings on the top of each form. All birds encountered during the search are recorded. The censuser must determine whether the encounters are 'On Area' or 'Off Area', i.e., within the search area or outside of it, or flying over. If any breeding behavior is observed, the appropriate breeding status code should be recorded for that species. Be sure to include notes of any factor that may have influenced the results such as noise, weather, etc.

Checking Data Forms

It is required that the Primary Bander for the field crew check the day's data at the end of each field day when simple data recording errors may be caught and corrections can be made. Forms should be checked for completeness and correctness. Check that all boxes have been filled in and that the data are legible. Check that all notes on the back are referenced to the correct note number on the front. Ensure that the correct station and date have been recorded; check to be sure that the species and species code agree and that the how aged and sexed data agree with the age and sex designation recorded; check that the correct codes for data taken have been used and check that the weights and wing lengths are within reason for that species. Any errors found should be corrected only if there is 100% certainty of the correct information. The reviews of the data can be discussed with the entire crew as an instructional exercise and to help avoid similar errors in the future.

Visitors and External Relationships

All relevant federal, state, and local permits must be in each kit and can be referenced when discussing banding as a research tool. When visitors are encountered, banders should introduce themselves and the netting work ongoing. If an adverse situation is perceived or anticipated, the Primary Bander or support staff should be contacted and nets closed. Ninety-nine percent of encounters with the public will be very positive, and banders should take advantage of the situation to educate the public as to the work we do and how it benefits birds. Take visitors on nets rounds with two banders so that if one bird is difficult to remove, the other bander can move on ahead with the visitors. If possible or necessary, confine visits to nets to the last half of the morning, and never when there are so many birds that you consider taking minimum data. Make appropriate apologies, but under no circumstances should visitors go on net rounds alone, or when they may endanger the birds' safety.

Training

It is part of the responsibilities of the Primary Bander to instruct the assistant(s) in all the procedures and techniques involved in running the station. See also our document “What to Expect as a Volunteer” for more details. As volunteers spend more time at bird banding stations, their technical skills and knowledge will grow. Each volunteer is also unique as is their interests and goals in participating at a banding station, and they will receive training toward reaching these goals by the Primary Bander with support from other experienced banding station participants as appropriate and time allows. This process can take months or years and is truly never fully complete. Trainers are also continuously learning along their bird banding journeys.

Every participant can contribute to a banding station, but the technicality of participating can be broken down into three general categories: 1) data recording, 2) net extracting, 3) bird banding. Each of these categories is equally important in contributing to a successful bird banding station.

Data recording. Data recorders should become familiar with the codes and sequence in which data is verbally delivered from the bander. Data recorders can also help with noting data on feather envelopes and labels for blood and fecal samples (it is often helpful to have more than one person keeping track of these things at a time). The data record is not a passive passenger, but instead an engaged proof-reader and provides data validation. A skilled data recorder will be efficient, completely fill out rows of data, have legible penmanship, and proactively remind banders about data fields they may have forgotten.

Net extracting. Net extractors or “pickers” are trained in removing birds out of mist nets using a variety of grips. They are familiar with the Body Grasp, Bander’s Grip, and Photo Pose and use these grips to remove birds from nets. Net extractors should be in constant communication with the Primary Bander, and note when they are leaving on net runs. They should proactively anticipate net rounds and adjust as necessary when there are complications or issues, such as the presence of a predator, changing weather conditions, or nets in full sun.

Bird banding. Bird banders should be intimately familiar with all data field codes, the phenology of breeding and molting, molt limit patterns, and age and sex variations of the 30-50 regularly captured birds. They should strive to process birds efficiently, prioritize species for processing appropriately, and make adjustments to data collection completeness based on how many birds are waiting to be processed. Banders are not simply processing birds, they are aware of the time constraints in processing the next set of birds, including those they have not yet seen arrive at the station.

All net extractors and bird banders should have read and be familiar with [The North American Banders’ Study Guide](#) (The North American Banding Council 2001a), [The North American Banders’ Manual for Banding Passerines and Near Passerines](#) (The North American Banding Council 2001b), [The Instructor’s Guide to Training Passerine Bird Banders in North America](#) (The North American Banding Council 2001c), and [The Trainer’s Syllabus](#) (Ralph et al. 1993). Trainers should ensure that all trainees have read and understand these documents.

Closing the Nets and Leaving the Site

Be sure to remove all twigs, leaves, feathers etc. from the net before closing. This will greatly reduce the incidence of tearing nets while opening. Identify damaged nets with flagging marked with a permanent felt pen describing the extent and location of the damage. Be sure to disguise your presence as much as possible, by hiding ropes, using minimal flagging, and putting poles under brush, if they are left at a station. Wrapping and hiding the rope also keeps animals from becoming entangled. Count the bagged nets BEFORE stowing to ensure that all the nets have been taken down. Be certain that this last step is followed, as it is the only way to be certain that no nets have been forgotten at the station before leaving (without walking the entire circuit again). The poles should be hidden in a standardized location at each station. This is to ensure that people filling in for the regular crew can easily find the poles. If necessary, bring a copy of the station map with you when opening and closing to ensure that the poles are stashed in the designated locations.

SUPPLEMENTAL STUDIES

To augment the capture data at our stations, we are collecting various additional data. These data include species daily lists, area search censuses, advancing a universal age categorization system, blood sampling for mercury and disease studies, fecal sampling for diet analysis, and geolocator deployments for migration research.

Area Search Censuses

Area Search Censuses are conducted at least twice during each banding effort (see Appendix D). Basically, an observer walks a 20-minute route, noting all birds seen or heard. The person who is the best birder should conduct these, and the other banders should practice as time allows. The area search census route for each monitoring station is described on each station's Map and Location Description. The first census is done as the nets are set up. If the temperature and/or bird activity is low, wait until it warms up a bit to begin the first area search. One person starts setting up the nets and the other person walks around a circle that includes at least part (but rarely all) of the net round. After 20 minutes, the censuser (back at the start of the net round) begins to also set up nets. Then, if bird captures have slowed down by mid-morning, run a second 20-minute census if feasible. The area search census data are as important as the banding data. Be sure that at least one area search is completed each banding effort. If capture rates are slow, or extra persons are available at the station, multiple area searches should be completed. The order of routes conducted should be varied from effort to effort. Each day, the area search forms should be edited, cleaned up and placed with the other completed forms. Occasionally, the date and/or station are omitted while in the field, and this is much more easily corrected the day of area search rather than later. Be sure to fill in the species name field with a brief abbreviation of the species name for each species code. For any species that the code is unconventional or unusual, the entire name should be recorded. This is the censuser's responsibility, and the Primary Bander's responsibility to make sure that it is done.

Cycle-Based Age Classification Code

We use an improved age classification system designed to solve an aging nomenclature problem with resident tropical landbirds, but has important applications for temperate species as well. All banders must be familiar with this new age categorization system (see Appendix F).

Blood Collection for Toxin and Disease Assessment

A small blood sample (<1% body mass) is collected from some birds to measure mercury (Hg) concentrations and inspect for diseases. Blood is taken from the brachial vein and stored in a variety of ways (frozen in capillary tubes, Queen's Lysis Buffer, and smears on glass slides). It is not safe to bleed birds in adverse conditions (excessive cold or heat) or without sufficient training.

Rapid Ornithological Inventory (potential for future efforts)

The Rapid Ornithological Inventory (ROI) integrates the mist-netting, area search census, owl capture and census, and vegetation survey procedures described above in a one-time effort. The ROI is designed to augment the data collected at regular monitoring stations on a landscape scale and quickly gains a measure of the relative value of nearby habitats. The procedure includes a schedule for completing a ROI, which takes just under three days for two people, at a minimum. Field crew leaders should be consulted for map(s), ownership information (with special permit, if needed), and special equipment required.



APPENDIX A – Checklist and Inventory of Banding Equipment

Station set-up

- ☐ 10' x ½" aluminum conduit (2 per net)
- ☐ Nylon cord (1/4" – 1/2" diameter)
- ☐ Rebar (optional)
- ☐ 3# mallet (optional)
- ☐ PVC pipe (optional)
- ☐ Table(s)
- ☐ Chairs
- ☐ Clothes-line
- ☐ clothes-pins

Equipment list

- ☐ Mist-nets
- ☐ Bird bags
- ☐ Masking tape
- ☐ Loppers/vegetation trimmers
- ☐ Extra string/cord
- ☐ Extra plastic bags
- ☐ Scissors
- ☐ Fresh sugar-water (quick energy for stressed birds)
- ☐ Hand-warmer packets
- ☐ Hand sanitizer
- ☐ Sharpies
- ☐ Pencils
- ☐ Walkie-talkies
- ☐ Feather envelopes
- ☐ Camera
- ☐ Datasheets/data binder
 - Daily journal
 - Banding datasheet
 - Area search sheet
- ☐ Banding kit
 - Bands
 - Wing ruler(s) & calipers
 - Scale/pesola(s)
 - Banding pliers
 - Band removers
 - Optivisors
- ☐ Blood kit (optional)

APPENDIX B – Journal Form

FRONT



Daily Banding Journal

Station Name: _____ Station Code:

Day: Month: Year:

Net site numbers: ____ - ____ Total # of nets: ____ Time open: ____ - ____ Time closed: ____ - ____

Net Route _____: _____

Net Route _____: _____

USE FOR NETS OPENED LATE, OR CLOSED AND REOPENED DURING THE BANDING SESSION

Net site #(s): ____ Time open: ____ Time closed: ____ Time open: ____ Time closed: ____

Net site #(s): ____ Time open: ____ Time closed: ____ Time open: ____ Time closed: ____

Net site #(s): ____ Time open: ____ Time closed: ____ Time open: ____ Time closed: ____

Net site #(s): ____ Time open: ____ Time closed: ____ Time open: ____ Time closed: ____

Area search letter: ____ @ ____ by: _____; Area search letter: ____ @ ____ by: _____;

Area search letter: ____ @ ____ by: _____; Area search letter: ____ @ ____ by: _____;

Area search letter: ____ @ ____ by: _____; Area search letter: ____ @ ____ by: _____;

Banders (full name, 3-letter initials):

WEATHER	OPEN	MID	CLOSE
% Cloud Cover			
Precipitation			
Temperature (F)			
Wind/Beaufort			

Precipitation:

N = None F = Fog M = Mist D = Drizzle R = Rain S = Snow

Wind/Beaufort:

0 = calm 1 = light air 2 = leaves rustle 3 = small branches sway
4 = large branches sway

BIRDS CAPTURED	
Recaptures	
New Birds	
Unbanded	
Total Captures	
Number of Species	
Number Stressed	
Number Injured	
Number Mortalities	

Number of Visitors (running tally): _____

Notes: _____

Data entered: _____ Data checked: _____ if found: erikjohnson@agcenter.lsu.edu

BACK

Day: Month: Year: Station Code:

BIRDS CAPTURED:

	Species Code	Recaptured	Newly Banded	Unbanded
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
	TOTALS:			

BIRDS DETECTED:

[illegible]

Detection (choose one, in sequence): V = Visual, S = Song, C = Call, D = Drumming, W = Wing, F = Flyover, B = Banded

Data entered: _____ Data checked: _____ if found: erikjohnson@agcenter.lsu.edu

FRONT

DATA ENTERED

NOTES:

APPENDIX C – Banding Form

BACK

NOTE #	LEFT WING	LEFT TARSUS	NARES TO TIP	EXP CLUMEN	TAIL	ECTOS COIL (Y/N)	ECTOPARASITE COUNTS	NOTES
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

State	Station Name	Station Code	Area Letter	Month	Day	Year	Observer(s)
Obs. Initials	Temp (F)	% Cloud Cov.	Ppt.	Wind	Start Time	Duration	
						Minutes	

[illegible]

Notes: _____

WIND: 0 = still 1 = light air 2 = leaves rustle 3 = small branches sway 4 = large branches sway >4 = don't band

Data entered: _____ Data checked: _____ if found: ejohnson@audubon.org

APPENDIX E – Banding Codes

HOW SEXED

B	Brood Patch
C	Cloacal protuberance
P	Plumage
@	Egg in oviduct
Q	Measurements (e.g., quantification of any part)
L	Use in combination with 2nd code based on plumage color, Length, or extent - put in notes the measurement of C (crown), W (wing), T (tail), S (spot on feathers), or G (gorget in hummingbirds); e.g., LC, LW, etc.
E	Eye color
O	Other (e.g., behavior, copulation - put in notes)
U	Undetermined after examination
Z	Less precise sex (<95%); explain in notes
X	Not examined

HOW AGED

M	Aged by Molt limits
N	Aged by No molt limits
K	Definitive Plumage
A	Alternate
F	First cycle Plumage (Formative or First alternate)
J	Juvenile Plumage
R	Prejuvenile (1st prebasic) molt
I	Bill/mouth color or grooves on bill (hummingbirds)
E	Eye color
T	Feet or leg color
W	Feather wear
V	Feather shape
=	Fault bar alignment
S	Skull ossification
G	Gape
U	Undetermined after examination
Z	Less precise age (<95%); explain in notes
X	Not examined

CLOACAL PROTRUBERANCE

- 0 *None*; no protruberance evident
- 1 *Small*; slight distention from abdomen, cloaca slightly enlarged at the base, still narrow at the tip
- 2 *Medium*; obvious distention from abdomen, columnar shape (base and tip approximately equal diameter)
- 3 *Large*; bulbous shape (tip greater diameter than base)

BROOD PATCH

- 0 *None*; breast and upper abdomen more or less feathered
- 1 *Smooth*; loss of breast and some abdomen feathers, but area is still rather smooth and dark red; BP initiating
- 2 *Vascularized*; abdominal skin thickened (puffy) with fluid and vascularization; peak of brood patch development
- 3 *Heavy*; extreme vascularization
- 4 *Wrinkled*; abdominal skin thinning, wrinkly, and scaly; BP waning
- 5 *Molting*; pin feathers emerging on breast and abdomen

FAT

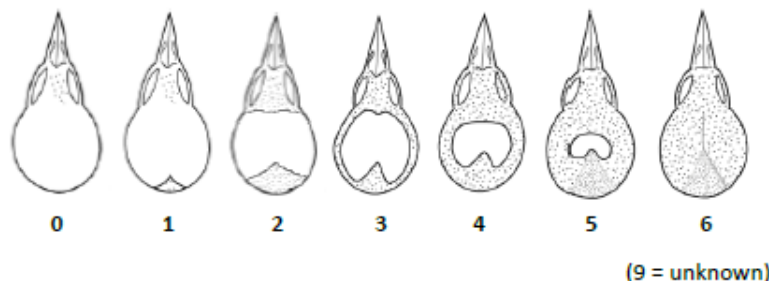
	Furculum	Abdomen/flanks
0	<i>None</i> ; concave without fat.....	No fat tissue
1	<i>Trace</i> ; concave, <5% filled.....	None or trace
2	<i>Light</i> ; concave, thin layer, 5-33% filled.....	Trace or thin layer
3	<i>Half</i> ; partially filled, 34-66% filled.....	Small patches
4	<i>Full</i> ; about level with clavicals, 67-100% filled.....	Slightly mounded
5	<i>Bulging</i> slightly over clavicals.....	Well mounded
6	<i>Greatly bulging</i> over clavicals.....	Greatly distended mound
7	<i>Excessive</i> fat pads; fat tissue continuous from furculum to abdomen; "butterball"	

PRIMARY FEATHER WEAR

- 0 *None*; feather edges perfect with entire edge light-colored, including the tips
- 1 *Slight*; feather edges slightly worn with no fraying or nicks; edges light-colored except at tips
- 2 *Light*; feather edges worn but with little fraying and few nicks
- 3 *Moderate*; considerable wear with definite fraying; nicks and chips obvious along edges
- 4 *Heavy*; feathers very heavily worn and frayed; tips often worn completely away
- 5 *Excessive*; feathers extremely ragged and torn; shafts usually exposed beyond the vane, with all tips worn completely away



SKULL



BODY MOLT (do not include adventitious replacement)

- Y *Yes*
- N *No*

FLIGHT-FEATHER MOLT (do not include adventitious replacement)

- Y *Yes*
- N *No*