Urban Native Greens Nest Monitoring

Standard Operating Procedures (SOPs)

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SOP Outline

These SOPs are organized into three sections, each of which require a different set of permits and permissions:

1) Nest Monitoring
2) Nestling Data Collection
3) Banding Adults

Nest Monitoring SOP

All nest monitors should review Cornell's NestWatch Code of Conduct and take the certification quiz: https://nestwatch.org/learn/how-to-nestwatch/code-of-conduct/.

See also Cornell's NestWatch Manual for a more in-depth review of nest monitoring: https://nestwatch.org/wp-content/uploads/2020/01/NestWatch_manual_20191106.pdf

Authorizations required

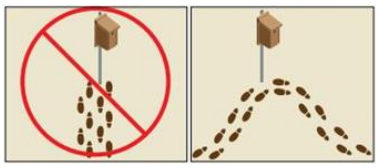
No special permits or authorizations are required to monitor nests, although Best Practices should always be followed (see above).

Materials needed

Datasheet and pencil (or internet-connected mobile device).

Frequency and approach

Nests should not be disturbed more than twice a week (i.e., check 3-4 days) in PROW, CARW, and CACH. For PUMA, check nests about every 4-5 days during egg laying, and then about once a week (i.e., 5-7 days) after that. Nests that are not predator guarded should be approached from a different angle each time, and the path should not be backtracked (see figure below).



Predator-guarded nests should be evaluated on each visit to ensure that no branches are within 4 feet of the box, and that the predator-guard is mounted and working properly.

Data collection

All nest monitoring data should be entered into the Urban Native Greens FieldScope platform (urbannativegreens.fieldscope.org).

Add new station – All nest sites will get a unique "station code" that references the site name plus the nest identifier. For example, box #10 at Bluebonnet Swamp will be coded "Bluebonnet Swamp – 10." This station code will include the location (latitude and longitude), the box type (6" wood boards, 4" wood boards, Tupperware container, etc.), cavity entrance size, whether it is predator guarded or not, habitat within 100 m, and landscape type. Importantly, if any of these variables change, a new station code should be created. "Natural" nests of focal species that don't involve a nest box should be coded as Site + Year + Natural Nest #, e.g., "Bluebonnet Swamp – 2024NN1."

The latitude and longitude can be manually entered or by using the button from your mobile device but note that the page must be refreshed in order for that button to be accurate, sometimes several times to allow for your mobile device GPS to "catch up" to your current location.

Nest visit data – Upon each visit, enter the:

1) Visit date
2) Nest status
    a. Inactive – No nest material or new activity since the last nest visit.
    b. In construction – Nest building evidence is apparent.
    c. Complete – Nest building is finished; may or may not have eggs or nestlings.
    d. Fledged – The appropriate number of days have passed for nestlings to have fledged (see Appendix A). There should be recent fecal matter in the nest cup. There may or may not be begging calls detected nearby. Be sure to remove old nestling material from boxes.
    e. Failed – Eggs or nestlings disappeared before the expected fledge date (see Appendix A); the nest material itself may or may not be damaged. Be sure to remove old nestling material from boxes.
3) Species – This can be blank until it is confirmed which species is nest building. CACH, CARW, and PROW all start with similar looking nest bases, but eventually diverge. CACH line their nest with very fine, often pale tan material. PROW often line their nest with cypress needles. CARW use a lot of large dead leaves.
4) Number of eggs, nestlings, and fledglings. These data are required. If there is uncertainty, add a note.
5) Failure cause
    a. Predator – The nest may or may not be disturbed. Usually mammalian predators, such as raccoons, will leave a nest in disarray, whereas a snake will leave the nest material undisturbed.
    b. Abandoned – This is usually apparent when there eggs are present but cold and no parental activity is observed in the area. It may also occur during the nestling stage,

where dead nestlings will be in the nest. At the egg stage, it may require multiple visits to confirm abandonment.

   c. Take-over – Other members of the same species or a different species may take over the nest, usually by building material on top of the old eggs. This may be hard to distinguish from abandonment, but use this option when the last nest visit indicated activity, and the subsequent visit is a sudden change in occupancy.
   d. Other – Describe in notes.
   e. Unknown – When the cause of failure cannot be determined.

6) Adult band combo – At some sites, adults may be color-banded, and we want to be able to associate those individuals with their nest. All possible 1-color and 2-color combinations are available in the dropdown menu. The coding follows the pattern of "left leg colors : right leg colors", for example "KX:G" = Left Black over Silver, Right Green. There will be an alpha-numeric code on PUMA black bands – please add this code into the notes. There is also an option for when the adult is known to be unbanded. Leave this field blank if unknown.
   a. R = Red
   b. O = Orange
   c. Y = Yellow
   d. G = Green
   e. K = Black
   f. W = White
   g. X = silver/metal
7) Nestling data – This is only relevant for those permitted to handle nestlings (see Fecal Collection SOP, below).
8) Notes – this may include information about the age of nestlings, parental behavior, cause of failure, or other things observed at the nest.

It is also possible to add photos, audio, video, and other relevant documents to each entry. Photos especially may be helpful to document unusual activity.

We currently do not have data fields specific to Brown-headed Cowbird (BHCO) parasitism. Where necessary, note relevant BHCO activity (e.g., number of eggs, nestlings, or fledglings) in the notes section, and reserve the existing fields for data involving the host. Also note that BHCO is a native species and is therefore protected by the Migratory Bird Treaty Act, which means that we are not authorized to remove or destroy eggs or nestlings. Boxes with cavity entrances 1.25 inches in diameter should eliminate cowbird use, while still allowing for focal species to utilize those boxes.

<u>Data entry</u>

Data may be recorded on datasheets in the field or directly entered into FieldScope using a handheld mobile device connected to the internet. If collecting data on a datasheet, enter those data into FieldScope *before* the next site visit.

Nestling Data Collection SOP

Authorizations required

No authorizations are required to collect fecal samples; however, a USFWS permit or BBL banding permit is required to handle nestlings, which substantially increases the likelihood of a nestling providing a fecal sample. Erik Johnson holds a Master USFWS permit, and volunteers can be trained to handle nestlings and receive subpermit authorization. Bird banders who hold a BBL and state permit with the authorization to "hand capture" and/or "trap at nest boxes" may also handle (and band) nestlings.

Materials needed

Datasheet and pencil (or internet-connected mobile device). Fecal sample kit (Appendix B), electronic scale (0.1 g accuracy).

Weighing nestlings

Nestlings should be weighed at least twice during development. For PROW, the ideal times are between days 2 and 4 and again between days 5 and 8. For CACH, and CARW, the ideal times are between days 2 and 5 and again between days 6 and 10. Nestlings and nest boxes should not be handled or disturbed within 2-3 days of fledging for these three species. For PUMA, the ideal nestling weights are between days 3 and 11 and again between days 12 and 22. Because they are colony nesters, extra precautions are needed to not disturb adjacent nests that may be close to fledging. Banders may opt to band nestlings during the second weighing window.

To enter the data in FieldScope, open the "Nestling Data" field when submitting nest observation data, and enter each nestling's data one at a time (click "Save & add another for each additional nestling). Number nestlings starting with 1 or record the band number here. Record the weight in grams using an electronic scale, and compare each individual nestling's development against reference photos to estimate the age with 1/2-day increments. Record whether a fecal sample is collected – "unknown" in this field means that at least one nestling provided a fecal sample, but it cannot be assigned to an individual nestling.

Fecal collection

If multiple nestlings each provide a fecal sample, use a different vial for each. Collect the fecal sack using tweezers, place on scrap paper, and remove as much of the white part (uric acid) from the brown part (with a disposable toothpick), then place the brown part into the ethanol-filled vial. Clean the tweezers with a 10% bleach solution between each use. Label the vial with the species code, nest number, nestling number, and date (please spell the month, e.g., "Mar", and use the full year, e.g., "2024"). Place a strip of Scotch tape over the label.

Note that nestlings within the same nest are considered pseudoreplicates, so if time is limiting, we prefer fecal sacks from many different nests rather than multiple fecal sacks from different nestlings within the same nest.

Adult Banding SOP

Authorizations required

Bird banders who hold a BBL and state permit with the authorization to "hand net" and/or "trap at nest boxes" may band incubating birds at nest sites, and those with the authorization to "use mist nets" and/or "audio lures" may band free-flying birds. Feather and blood sampling each require additional authorizations on the BBL permit.

While banding birds at and around nests, it is important to understand the risks of nest abandonment. For guidance on the timing and techniques for banding adults and nestlings, please review the NABC Nest Box Manual: Section One, plus chickadees (page 17), PROW (page 22), and PUMA (page 22): https://nabanding.net/wp-content/uploads/2021/07/Nestbox-Manual-2014.pdf

Banders should also be familiar with:

- NABC Passerine Manual: https://nabanding.net/wp-content/uploads/2021/07/Passerine-Manual-2001.pdf
- NABC Bander's Study Guide: https://nabanding.net/wp-content/uploads/2021/07/Banders-Study-Guide-2001.pdf
- Pages 1-38 of the 1997 Pyle Guide (or pages 1-40 of the 2022 Pyle Guide)
- LABO species accounts for local aging and sexing criteria for PROW, CACH, and CARW, and the Pyle species account for PUMA.

Methods

Place the captured bird in a cloth or brown paper bird bag and prepare the banding kit. For birds that are FCF (First Cycle Formative) or old, follow the color banding scheme for that species and site. The minimum data collected for each bird should also include: age, sex, unflattened wing cord (1/2 mm increments), tarsus (0.1 mm increments), fat score, weight (using electronic scale with 0.1-g accuracy), breeding status (CP/BP), and location (nest box # or lat/long).

Feather sample

For each bird, collect an outer right tail feather (R6) and place in a coin envelope. Do not lick the envelope to close it. Label the envelope with five things: species, site, band number, "R6", and date (spell out the month, e.g., "Mar"). If the R6 is missing or molting, do not collect it or another feather.

Fecal collection

If the adult poops in the bag, remove as much of the white part (uric acid) from the brown part (with a disposable toothpick), and scrape the brown part of the sample into the ethanol-filled vial. Use one vial per capture (a sample from the same bird caught on a different occasion should be placed in a different vial). Label the vial with the band number, species code, and date (please spell the month, e.g., "Mar", and use the full year, e.g., "2023"). Place a strip of Scotch tape over the label. Turn the bag inside out and clean it with a 10% bleach solution between uses or use disposable brown paper bags.

Blood sample

The brachial vein is first cleaned with an alcohol wipe, and then lightly covered with petroleum jelly (optional; Erik Johnson finds that it helps pool the blood to more easily collect). The needle should puncture only the top of the vein at an angle close to parallel to the vein itself, and the needle is then removed slowly from the puncture site. Blood can then be collected with the capillary tube, until it is between ¼ and ¾ full; less than ¼ full should be noted on the banding datasheet. Using some light pressure, the same alcohol wipe and/or cotton ball should be applied to the puncture site while holding the wing in a closed position. After about 15-30 seconds, use a new piece of wipe or cotton ball, and after about 10 seconds check to make sure the bleeding has stopped. Repeat as needed until the wound is sealed. Blow the blood from the capillary tube into the Queen's Lysis Buffer using a small air bulb. Label the vial with the band number, species code, and date (please spell the month, e.g., "Mar", and use the full year, e.g., "2023").

Data entry

For those with access to the LABO database, submit banding data there. Otherwise, maintain your own banding digital datasheet, which should be shared at the end of each season with Erik Johnson and Jeff Roth.

Submitting fecal, blood, and/or feather samples

These biological samples can be shipped at the end of each nesting season to:

Attn: Jeff Roth
School of Renewable Natural Resources
Louisiana State University AgCenter
Baton Rouge, LA 70803

Appendix A. Nest phenology of four focal species.

Species	Band Size	Number of eggs	Incubation	Nestlings
PROW	0	3-6	12-14 days	11 days
CARW	1B	3-5	13-18 days	13 days
CACH	0A	4-6	12-13 days	12 days
PUMA	1D, 1A	3-6	15-18 days	28-29 days

Appendix B. Fecal sample kit materials.

- Toothpicks
- Tweezers
- Scrap paper
- 95% ethanol-filled vials
- Labels
- Pencil
- Scotch tape

- Vial storage box
- 10% bleach solution