

## Ketterson / Nolan Research Group Collection

This document is part of a collection that serves two purposes. First it is a public archive for data and documents resulting from evolutionary, ecological, and behavioral research conducted by the Ketterson-Nolan research group. The focus of the research is an abundant North American songbird, the dark-eyed junco, *Junco hyemalis*, and the primary sources of support have been the National Science Foundation and Indiana University. The research was conducted in collaboration with numerous colleagues and students, and the objective of this site is to preserve not only the published products of the research, but also to document the organization and people that led to the published findings. Second it is a repository for the works of Val Nolan Jr., who studied songbirds in addition to the junco: in particular the prairie warbler, *Dendroica discolor*. This site was originally compiled and organized by Eric Snajdr, Nicole Gerlach, and Ellen Ketterson.

### Context Statement

This document was generated as part of a long-term biological research project on a songbird, the dark-eyed junco, conducted by the Ketterson/Nolan research group at Indiana University. For more information, please see IUScholarWorks (<https://scholarworks.iu.edu/dspace/handle/2022/7911>).

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**NEST.2010**  
(last revised, March 12, 2010)  
**see bleeding day 3**

So you found a nest.....(Congratulations!)

When you return to the lab, please fill out a nest log sheet, including a good description of state of the nest when you found it, the identity of the adults, and *precisely* where it is. Kristal or Dustin (later Sarah or Matt) will fill in the expected hatching and fledging dates, but you need to be very clear about the status of the nest when it was found and how to find it again. *A nest does not get a number until at least one of the adults has been identified, but it does get a nest log sheet to help keep track of its progress.* If you think an adult may be associated with a nest, state the nature of the evidence in the nest log sheet and leave it to Kristal or Dustin to give it a nest number <sup>1</sup>

Now and later you will need to record the state of the nest when you visit (stage of building, number of eggs, whether eggs look fresh or well incubated, how many nestlings, whether eggs gone and nest disturbed by predator, etc.) and anything else of interest (a death, a visit from a neighboring male, a copulation, the fact that the nest was filmed or recorded, **anything at all**).

You will also need to record some of this same information in other logs, e.g., nestling weight sheets, but the nestlogs are where we turn in order to piece together what really happened to the birds, so they need to be complete.

**Please see sample nestlog on the bulletin board in the lab for examples of what to record. Please include details – you should consider the nest log as the *key* narrative of each nest’s history. Also, please write so that others can read your writing (essential)**

- For nests found during building, return every other day to determine when laying begins and ends so we can have accurate estimates of clutch size and hatching day.
- For nests found during laying, return daily to mark eggs during laying. Use a sharpie (see separate instructions under eggs, sex & independence). Be very, very careful not to harm the eggs.
- After the clutch is complete, visit every 3<sup>rd</sup> day and note whether the female is on the nest. If she is off the nest, always note the number of eggs. For nests found with eggs, visit every other day.
- For nests found after laying complete, visit every other day to get the best possible estimate of hatching day.
- After the eggs hatch, what you do will depend on the age of the nestlings, see below.

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<sup>1</sup> The kinds of evidence they will weigh include chipping, singing in the area, partial band IDs, behavior, so if the situation suggests that staying will yield an ID, e.g. eggs are warm, then stay. If an ID is not likely (eggs cold, being laid), then keep searching.

**Please take great care when working with nests** It's important not to impart your scent to the nests, eggs or young. To minimize nest predation, rub your hands in moist soil or ferns before touching eggs or young.

Also we need to keep disturbance to a minimum. We don't want females to start flushing too readily because our visits have been too frequent. If they do, they presumably become higher risk candidates for predation. So please don't flush a female unless it's necessary. Rather, if she's on, come back later and see what's up (females incubate roughly 70% of the time) or do what Eric Snajdr always called a **soft flush**. Briefly approach from the back and flush with some vegetation in a way that is 'natural' for the female. Ask Dustin or Kristal to demonstrate.<sup>2</sup>

Please use the sign-up sheets to be sure that nests are not visited by more than one person on the same day. If someone else signed up to check the status of a nest, then leave it alone. **If you agreed to check the status, be sure that you do it.**

### 1. Estimating hatching date

Incubation typically lasts 12 days, and the female typically begins to incubate the night before the day the last egg is laid (sometimes sooner as the season progresses). So, for example, if egg 4 is laid on May 1st, we expect hatching on May 12th. In a particularly cold spring incubation can run longer, but incubation is rarely (never?) less than 12 days. For most studies we conduct, it is important that we know hatching day. Estimates need to be as accurate as possible.

For nests found after incubation has begun, one of the more experienced researchers (D, K or A) will note the condition of the eggs when first found. Are they translucent as if they have just been laid, or are they opaque indicating that development is underway? Or are they just about to hatch, i.e., pipped? This will help one of these people to estimate when they might hatch.

### 2. Parasitism rate

We want to know the rate of parasitism and how it varies annually and seasonally. We also don't want to have cowbird hatchlings in our nests. If a nest found during laying has a cowbird egg in it, leave it until after the clutch is complete. If you were to remove it earlier, you might cause the female to desert. When the clutch is complete, collect the cowbird egg and return it to the lab. Kristal will show you how to record and freeze it. **Make careful notes and be sure to record in the nestlogs what you did.**

### 3. Determining nest fates

If a nest has failed, please note the circumstances in the nest log. Was the nest lining torn out? Was the bottom smooth and unmussed? Were there any feces in the nest? Look around the nest very carefully. Do you see feathers from the female? Do you see bits of shell, partly eaten babies or color bands? Look carefully to see what you can see. Look beyond the nest itself, under it if it is

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<sup>2</sup> Whether to flush or wait depends on how essential it is to get information now and whether you have the opportunity to return. The values you are trying to achieve are minimal flushing, knowing who the adults are, and efficient use of your time, but the overriding value is to interfere as little as possible. If you flush, you need to record in nest log.

elevated. If you find dead babies or mother, return them to lab and freeze for later extraction of DNA. Keep thorough notes and enter them in the nest logs!!

Another possibility is that a female will abandon a nest after an encounter with us or with a predator. If after 3 nest checks, the eggs or young are cold and debris has begun to accumulate in the nest, we conclude that the nest has been abandoned. Enter 'abandoned' in the nest log, and add why you made that conclusion.

4. **Determining time of hatching and weighing and measuring young** (minimum data required for each nest is number hatched at day 0, number at day 6 + blood for DNA, and number fledged)

a. *Hatching day (day 0)*

On hatching day (day 0), we need to count the number of young, weigh them, and measure their tarsi. As this stage of development tarsus should be measure with ruler not calipers. Weighings and measurements are done in the afternoon. Each young should be marked so it can be identified later. Take scissors and clip feathers to distinguish young. Clip head or back or both, or neither. If there are 5 young use a sharpie to mark toes.

Enter on nest log that young have been weighed, and fill out a nestling weight sheet. Nests should be aged according to the majority of nestlings in the nest. If three hatch on Tuesday and one hatches on Wednesday, then Tuesday is day 0. If two hatch one day and two hatch the next, call day 0 (for the nest) the day that the first two hatched. Nests should be aged by their status in the PM.

Frequently, three eggs hatch one day, and one hatches on the next day. If any eggs remain unhatched on hatching day, then return the next day to process the young that have hatched in the meantime. If there is still an unhatched egg but you think there is a chance that an egg will hatch (no obvious flaws, obviously developed), then go back the next day (maybe day 2 for the earliest hatched young, see below) and either process the last hatched young or bring the egg(s) back to the lab for processing.

~~For eggs where it is obvious that they will never hatch, bring them back to the lab and fill out an "Unhatched Egg" sheet. Note the return of any eggs to the lab on the nest logs.~~

~~Eggs that were punctured (by us or by the birds) and are light in weight and will never hatch. The same is true of eggs that are out of balance because they have dried out (eggs like this roll in circles on a flat surface). Eggs that remain translucent never developed and can be brought back. Eggs that fail during development are often dark looking. We are very interested in evidence of this kind of infertility, so as always keep complete notes and enter findings in nest logs.~~

~~For eggs that develop but never hatch, we may also preserve embryos for DNA. Kristal will open these eggs and decide whether they show any signs of development under the microscope.~~

c. *Day 3*

On day 3 count, weigh, and measure young (again using ruler to measure tarsus). **Collect 1 tube of blood.** Note which young is which by the feather clips, and associate the measurements and the blood with the individual.

Return to lab, process blood, fill out nestling weight sheets, and enter data in nest log.

**Always** be on the look out for definitive information about who the parents are. Bands seen? food in bill? close approach and chipping? Nests with unknown adults are not worth much, and it's easy to forget about this and lose opportunities.

d. *Day 6 (traditional day of band and bleed)*

If by day 6, you are not sure who the parents are, ***watch the nest until both adults have fed the young and their bands have been identified.*** We simply cannot have nests in which we have blood from young but are not sure who the parents are. If you find that one of the parents has still not been bled, alert the crew and make this a TOP priority. If the nest fails there is no way ever to be sure who are parents are.

On day 6, band and bleed the young. Be sure to use unique band combinations (see prepared lists). Collect two tubes of blood from each nestling, an A tube and a B tube. Measure mass, wing and tarsus (with calipers not a ruler). Also take toe prints. Note which young is which, i.e., which feather clipped young measured on day 6 becomes which color banded individual.

Prepare the tubes in advance if you are collecting only DNA, store the blood on ice if you are saving the plasma (**don't let it freeze!**) and be **sure** not to mix up any samples. If you are not **SURE** whose blood is in a particular microhematocrit tube, please do not guess. It would be **MUCH** better to take a single sample from the bird the next day.

Return to lab to process blood samples. **AGAIN, BE SURE TO KEEP STRAIGHT WHO IS WHO!** If necessary, plan to bleed the nestlings again the next day or at fledging (recalling that the nest might fail).

Record data on nestling weight sheets and nest logs and DNA sheets.

**Warning: do not attempt to handle the young after day 7 – they will fledge prematurely and probably not survive.**

e. *Day 9 conduct a quick passing check, QPC*

On day 9, check the nest to determine whether it is still active (do parents chip? do they have food? do you see them feeding? going to and from nest? if you can see the nestlings estimate the number of nestlings present.). **Remember, do not touch the young or go too close to the nest after day 7 or you may cause premature fledging and the young are likely to die!** Simply check it out. Don't harass the adults.

f. *Fledging day minus one (DAY 11)*

On the afternoon of day 11 (early in the spring, later in summer, i.e., post ~15 June go on day 10), go to the nest and attempt to count the young. If you are in doubt about the age of the young, please be conservative and go on what you think is day 10. **Do not touch the young.** If it is a nest where you simply cannot see (way back in the roots of a treefall, but sometimes a flashlight helps), then simply note whether the nest is active (e.g., parent with food chipping at you). Then state in the nest log that there was no way to be certain of the number of nestlings without risking early fledging.

Assess the situation for catching the young and the adults the next day. Set up a net (or nets) (it helps to have 2 people to do this) and do it in a way that will intercept the adults – or at least the female - as she goes to the nest to feed the young. Consider the light (i.e., visibility of the net to the parents) in the early morning and observe behavior because the adults typically use the same path to and from the nest. Then make a decision about the best time to return the next day to do the catching. E.g., given the lighting or the traffic on the road, is this one where you need to get there at dawn if you are to be successful?

g. *Fledging day* (not before DAY 12, later in the year this will be moved up to day 11)

(1) When to go and what to take:

Go in the morning and take the following items: Bird bucket or bag; net, poles, stakes, and hammer (if net is not already set up); cooler with ice, bleeding kit, fledgling scream tape and tape recorder; and a potter trap; Balance, calipers, bands, if necessary, and data sheets

(2) Begin by catching the adults or by grabbing the young, the circumstances vary

In the past we needed to bleed adults for hormones, so we always caught the adults in a net first before we took the young. *This year IF the adults have already been bled for DNA, then we will not bleed them on fledging day. BUT BE SURE* there is a DNA blood sample for each adult.

If you need to catch the adults and are unable to do that by intercepting them - usually much the best way to do it - and they still need to be caught (e.g., to be weighed, to determine the band number, to get their blood for DNA), then you can sometimes catch them by using the young. To do this, grab the young (see below) and place them in a trap beneath the net. Then use a tape of fledgling screams placed next to the trap to get the adults in the net.

(3) Now take the young and process (mass, ID, tarsus with calipers, wing and tail) and, if it applies, use them to catch the adults.

**THE COUNT OF THE YOUNG IS EXTREMELY IMPORTANT.** You also need to weigh them and measure their tarsi.

Be extremely alert when you go for the young, or some will slip past you, and you will spend lots of time tracking them down. Have a container ready. Approach the nest slowly with your hands in front of you. Extend one or both slowly until you are in a position **to strike like a snake at the nest.** When ready, strike with your open hand and cover the nest cavity so that no young can get out. Close your hands over the young and nest. In other words, grab the young and the nest as a unit. Have a back-up person if possible. Put all the young in the same bird bucket (with their

parents if you have already caught the parents because parents remain calmer if they are with the young).

After the young are processed, ordinarily you put them back in or near the nest. They won't stay, but the parents will know where to look for them. Various people will have ideas about how best to do this (centrifugal force, baseball caps, striped maple leaves, etc.)

If you still need to catch the adults, and you don't have a trap, then put the bucket with young beneath the net. The young will call and the adults should fly into the net immediately. Treat adults as above. If you don't catch them right away, try using the tape. Keep track of time and conditions.

If the adults finally prove too wary to be caught, then process the young. If after having processed them you still need to capture the adults, then you can use the young to catch the adults (see above). Put them in one cell of a potter trap and place vegetation around the trap so the only way the parents can get to the young is by entering the cell adjacent to the young. Put the trap near the net. Hope; and don't let the young get hurt or too hungry. **Congratulations to you and to the juncos - they are launched!**