

## 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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## **ONCE A NEST HAS BEEN FOUND, HERE'S THE INFORMATION WE NEED FROM EACH ONE:**

So you found a nest.....

Please return to the lab and fill out the rudiments of a nestlog sheet, including a good description of state of the nest when you found it, the identity of the adults if you know, and precisely where it is. Joe or Eric will fill out the hatching and fledging dates, but you need to make very clear about how to find the nest and its status when found. For now, a nest does not get a number until it has eggs.

In general, please record anything of interest on the nest log - a death, a visit from a neighboring male, a copulation, the fact that the nest was watched or recorded - anything. You may also need to record the information in other logs, e.g., nestling weight sheets, but the nestlogs are where we turn to in order to piece together what happened. **Please see sample nestlog prepared by Tracey Kast on the bulletin board in the lab. And please write so that others can read your writing.**

### **1. Marking eggs, estimating hatching date**

For nests found during building and laying, we need to return daily to mark the eggs as they are laid. Please take great care not to harm the eggs. See separate set of instructions. In general, incubation ordinarily lasts 12 days, and the female ordinarily begins to incubate the night before the day the last egg is laid (sometimes sooner as the season progresses). So if egg four is laid on May 1st, we expect hatching on May 12th.

For nests found after incubation has begun, please visit them every other day in order to determine when the eggs hatch. Please note the condition of the eggs when you first find them. Are they translucent as if they have just been laid, or are they opaque, which indicates that development is underway? Or are they just about to hatch, i.e., pipped?

Beware: 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 flush easily they presumably become higher risk candidates for predation. So please don't flush female unless it's necessary (e.g., you walked a mile to the nest and it's about to pour rain). Rather, if she's on, come back later and see what's up. We should use the sign-up sheets to be sure that nests don't get visited by different people 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.

### **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 and 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 (3 or 4 or 5 junco eggs plus

cowbirds), then remove cowbird eggs. **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. 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 elevated. Keep thorough notes and enter them in the nest logs!!

### 4. Determining time of hatching and weighing and measuring young

#### *a. Prior to hatching day*

Please see separate instruction sheet from Joe. The idea here is to determine how long it takes the eggs to hatch, or, more precisely, how long after the first egg hatches does the last egg hatch? We make 'hatch checks' on the expected day of hatching, going to the nest during 4 time periods to note which eggs have hatched and enter the data on a hatch check sheet.

Traditionally, we have weighed the nestlings and measured their tarsi on DAYS 0, 3, 6 and also on fledging day. We began to skip the day 3 weighings a couple of years ago. As of now, I would like to continue monitoring the number of eggs, the number of young at hatching, and the number of young at day 0, day 3, day 6, and fledging day. If this becomes a burden we can reconsider the day 3 measurements.

#### *b. Hatching day*

On hatching day (day 0), we need to weigh the young and measure their tarsi. Weighings and measurements are done after noon. Frequently, three eggs hatch one day, and one hatches on the next day. If any eggs remain unhatched, then please mark the *young* that have hatched and return the next day to process the young that have hatched in the meantime. Marking will let you tell them apart; nail polish applied lightly will last long enough.

If there are eggs that have still not hatched 24 hours after the first egg hatches, and it is obvious that they will never hatch, bring them back to the lab and fill out an unhatched egg sheet. Eggs that were punctured and are light in weight 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.

If there is still a chance that an egg will hatch (no obvious flaws), then go back the next day (now day 2 for the earliest hatched young) and either process the last hatched young or bring the egg(s) back to the lab for processing. We need to determine whether the embryos developed so we can assess infertility and perhaps to preserve embryos for DNA. Note the return of any eggs to the lab on the nest-logs. We need someone to take responsibility for opening these eggs and deciding whether they show any signs of development.

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

c *Day 3*

On day 3, visit the nest to measure, weigh, and re-mark the young. **Always** be on the look out for definitive information about who the parents are. Bands seen? food in bill? close approach and chipping?

d. *Day 6*

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 as if there were a 3-alarm fire.

On day 6, band and bleed the young. Be sure to use unique band combinations (see lists by Eric). Collect two or three tubes of blood from each nestling. Store the blood on ice (**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! This is simply essential. If for **any** reason, you are not sure, please do not forge ahead. Write a LONG note about what went wrong and the basis for your best guess as to what is correct. As before, plan to bleed the nestlings again the next day or at fledging, if necessary.

e. *Between day 6 and fledging day*

Check the nest periodically between days 6 and 10 or 11 to determine whether it is still active (do parents chip?). 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.

For nests that will permit long watches from a car, we may organize some daylong nest watches. We will want to structure these, and Ethan would be in charge. We would like to do six of these on nests from each treatment group over the course of the summer

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

On the afternoon of day 11 (early in the spring, later 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; if possible, do it in a way that will intercept the adults as they go to the nest to feed the young. Consider the light (i.e., visibility of the net to the parents) in the early morning and make a decision about the best time to return the next day to do the catching. In other words, 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; net, poles, stakes, and hammer (if net is not already set up); fledgling scream tape and tape recorder; and a potter trap;

thermos with ice; stopwatch and bleeding equipment (needles, microhematocrit, clay sealant, critocaps, cotton); optivisor (for mature biologists);

balance, calipers, bands, if necessary, and data sheets.

(2) Begin by catching the adults.

**VERY IMPORTANT:** When you catch the male and before you do anything else, **CHECK HIS IMPLANT STATUS!!!!** Can you find the implants, how did they appear? Do it **fast**, because the next step is to bleed the birds and we need to do this ASAP.

If at all possible, catch the adults in a way that makes their plasma suitable for hormones, i.e., as they approach or leave the nest with food, rather than after disturbance by you. Bleed them as rapidly as possible and with as little disturbance as possible. Use a stop watch. Keep track **to the second** of the time of first disturbance, time when they are caught, time when bleeding begins, and time when bleeding is complete. Do not let anyone interrupt you or break your concentration.

If you catch the birds with little disturbance and can get them bled in less than 5 minutes (ideally in one minute) then we can use the blood for hormones. Even two full tubes will allow us to assay for corticosterone, and longer bleeding times are acceptable for T under certain. If you get blood for hormones, then seal tubes *well* with clay sealant, not with critocaps.

If you simply do not have time to catch the adults this way, they still need to be caught (to be weighed and to check their implant status). To catch them, grab the young (see below) and use them and (perhaps) a tape of fledgling screams to get the adults in a net. This is a less

sure-fire method of catching both adults, and the blood will not be good for hormones unless you catch them immediately, **so this is not the preferred method.**

If the adults have not been bled before, then we must get their blood for DNA, but this should have been done before fledging day.

Finally, weigh the adults.

(3) Now take the young

**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 at the nest (as before, the way a snake strikes its prey). 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.

If you still need to catch the adults, 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. 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!