

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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PROCESSING BIRDS IN EARLY SPRING
Updated March 25 2010

When and where to catch and bleed

Goal: to obtain measures of response to GnRH challenge from adults throughout the study area at more or less the same time (HTL, JT, STN, WVS, WPR (to beyond stream crossing), WVN (to Warspur). Avoid over-investing in areas that appear productive early in the year but tend to dry up later on (e.g., Jungle Trail, far end WVN).

Our nets and traps are placed in traditional sites, which tend to be productive and allow us to compare samples across years. **It is important to keep a detailed and up-to-date record of net hours and trap hours**, to provide an index of the effort expended.

Traps lose their effectiveness after the chipmunks emerge; warm weather and experience with being caught erode the effectiveness of the nets. Usually things go smoothly until 1 May. This year we will begin ca. 14 April and will come to a close ca. 15 May

General info on how to process birds in early spring:

We standardize our data in terms of the variables we measure and the way we make the measurements. **As always, we need to measure mass, wing, tail, tarsus, and tail white, as well as fat class, condition, and presence or absence of a brood patch** (full/partial/absent) **and cloacal protuberance** (small, medium, large, see diagram near blackboard in lab). The data sheets do not prompt you for fat, condition, injuries, targeting, or cloacal protuberance, so you will need to stay alert to be sure that you have collected all these data.

As always, decisions need to be made regarding each bird's sex (M, F) and age (N; J; A,Y; A,O). Eric Snajdr (and Zig and Val before that) used to be our gold standard and everyone would compare their determinations, methods, and measurements to Eric's. Things are a bit more challenging now. Dustin has been here the longest so he overlapped the most with Eric, has handled the most birds, and should be quite reliable re determinations of age based on plumage, eye color, etc. Eric and Dawn trained Kristal, so she is equally reliable. At first you should measure one another's' birds, calibrate an object of known mass against one another's pesola balances, fat class the same bird independently, etc. This will take a little while, so please keep at it, and continue to calibrate yourself against other people. This is also why it's important to be able to tell from the banding sheets who took the measurements.

New people, PLEASE point out when you have been given conflicting instructions - this will help us recognize where we are differ among ourselves and allow us to clarify.

Each time you handle a bird, you need to note whether you have done anything to harm it. If you think you have done something that makes it unlikely that the bird will be caught again - to take an extreme example, broken its heel - you **must** indicate this on the banding sheet at the time of capture. These decisions are very much harder to make later.

If we go out to catch a particular bird "on purpose = targeted," e.g., because we need to bleed it or to know its mass at nest-leaving, or whatever, then we must make a note to that effect. This is so we can eliminate such birds from the sample when we later analyze data for seasonally varying population structure. Birds we set out to catch on purpose cannot be treated as 'caught at random' for models that are used to estimate survival. This point has been lost in translation. This is not a crisis because we use the models primarily on data collected during the early season and late season censuses. Nevertheless, it is

still good practice to note which birds were targeted.

Please put newly captured (previously unbanded birds) and recaptured birds on separate banding sheets. This hugely simplifies the task of reporting our activities to the banding office. It also makes it easier to enter the data into the computer and to check for errors.

It is also important to record **ALL** encounters with birds on the banding sheets, even if the encounter is recorded in some other way. That is, if a bird is bled for hormones, then that fact is noted on a hormone blood sheet, but that does not relieve you of the responsibility of recording the encounter on a banding sheet. **I can't stress this enough.**

Sightings are one of the most difficult categories to deal with. Some birds may be sighted in early spring and never seen again; others are seen on a near daily basis and we grow weary of recording the fact. Then the bird disappears and no one knows when we last saw him. Sightings should be recorded on banding sheets that contain only other sightings, not captures, and recording them is most essential in the early spring and in the late summer.

Most important regarding sightings is to know whether a bird was present in the spring or late summer. Sightings also allow us to estimate rate of disappearance during the breeding season tho this is less precise and of lesser importance.

Once our cheat sheets have been created it will be far easier to confirm the presence/absence of a bird through a sighting. When you do, please record it on a sighting sheet so we can keep track of mid-season disappearances or inefficiencies in our capture methods.

Sightings should have some statement regarding how certain the observer was about the identity of the bird seen, e.g., "perfect view of bands in excellent light," or "certain of left foot, but the red of the right foot could have been orange," etc.

Specific data to collect:

I. First capture of spring

1. Band (if necessary) and process bird fully and as quickly as possible to obtain all info requested on the banding sheet plus condition, fat class, clo pro/brood patch or injury. If you have things you want to discuss wait til after the challenge.
2. Measure tarsus to nearest 0.1 mm, mass to the nearest 0.1 g.
3. Take measurements that will allow us to determine whether testosterone as measured by T in response to GnRH is 'costly' by assessing the initial condition of males and females.
 - (a) Note presence of foot pox (which foot, which digit)
 - (b) Measure condition (see instructions below)
 - (c) Record fat class
 - (d) Quantify tail white
4. Bleed for GnRH challenge and DNA.
5. Poke for preen oil (still under discussion, Kristal), measure bill (Dustin), measure digit ratios (Kristal)

II. *All later captures*

1. Consider whether capture appropriate for a hormone sample (e.g., GnRH challenge for egg females).
2. Process bird on a recapture sheet. You can re-measure everything as time permits, which will allow us to compare our measurements. But even if time is short, for each capture you **MUST** write down date, location, and both the band number *and* the colors. With intermediate amounts of time, the next most important measures are body mass and a fat class. If there is time, please try to get everything.

III. *Detailed instructions for measuring clo pro, fat class, condition, molt and pox*

1. Cloacal protuberance (no longer measuring in this way, but are retaining the instructions for another year except to note large, medium, small)

This is the area around the opening to the cloaca (the vent) that becomes swollen in male birds in the breeding season and serves as a storage site for sperm. In some species, the size of the cloacal protuberance corresponds to the size of the sperm reserve. The CP is dome-shaped in juncos (rather like a tower) and the posterior end is more swollen than the anterior. It has feathers on the tip, making its height difficult to estimate.

Hold the bird in your left hand and use your thumb and forefinger to hold the feet (toes) together and up and away from the clo pro. You will need to blow on the feathers to see and perhaps use your little finger to hold the tail still. The calipers should be set so as to glide up and down the side of the CP - not so loose as to be misleading, not so tight as to squeeze.

Use your calipers to determine the width (side-to-side dimension), and the depth (or length)(anterior to posterior, also known as front to back, head to tail, cranial to caudal) and height. Then please use your mm rule on the anterior side of the cp to measure its height. Make your best attempt to get the height of the tissue, not the feathers. Record these measurements in mm on your banding sheets under Comments, and in the order width, depth, and height, e.g. CP = 4.5 x 5.5 x 6.0.

2. Fat class

Birds store fat as fuel in various regions of the body, most predictably in the furculum and the abdomen. When fat class is carefully recorded it corresponds closely to body mass, and in conjunction with body mass, it can be used to say whether birds have large or small energy stores.

The categories are 0 to 5. This time of year, most birds are 1s and 2s. They are fattest in winter, least fat in summer. Females are sometimes hard to classify this time of year because their abdominal regions are filling with yolk. Still it is important to attempt to quantify fat.

Look to the furculum and see if it is entirely unlined with fat (0) has a little fat (1), has fat that makes the depression shallow (2), fills the furculum so as to be level or flush with the surrounding bone and muscle (3). The abdomen should correspond to the furculum, because these two areas of the body tend to deposit fat in tandem. No fat on the abdomen so that it is dark and almost sunken (0), a little fat so that you see streaks of cream-colored fat and the appearance is not truly sunken (1), fat covering most of the abdomen, but not to the point that it is flush with the base of the rib cage or the pectoral muscle (2), abdominal region covered with sufficient fat to make that region flush with the pectoral muscle. Record this measure in the column entitled body mass as follows, e.g., F = 2.

3. Condition

This measure is an effort to quantify the degree of development of the pectoral (breast) muscle and is thought to be a measure of physical fitness. It is used at banding stations in Europe a lot, but less frequently in North America. The idea is to attempt to picture the shape of the muscle in cross section. Is it highly developed so as to rounded and protruding and thus convex in profile, or does it slope steeply from the keel in a straight line, or is it even wasted so that the appearance is concave? These are the extremes, and variation among individuals may not be large, particularly at this time of year. Most males, at least, are probably rounded and convex. But it only takes a second to look and decide. Later in the season females may take on a straight-sided appearance. See the diagram pasted to the blackboard.

So please record under comments under C or 'cond' as convex and protruding with a dent only for the keel (3), round but no indentation for the keel (2), flat sided (1), concave (0). Use pluses and minuses as necessary; see diagram on blackboard.

4. Pox (in 2002 and beyond, we are measuring presence/absence only according to which foot and which toe)

Check out rim of blackboard for a diagram of a "junco" foot. Roman numerals signify toe **number with the hallux or "thumb" being number 1 and the inside toe being number four**. The point of articulation between the toes and the tarso-metatarsus is always considered joint zero. Toe 1 has only 1 additional joint, toes 2 and 3 have 3 joints and toe 4 has 2 joints.

We rate pox condition as either active (A) or inactive (I). Active pox is red and tender looking, the bird will probably favor the foot if active pox is touched. In the worst case, pox oozes or produces scabs. Inactive pox, for our purposes, is white, smooth, and sometimes swollen but not sensitive to the touch. Please note NP for no pox on the capture sheet or pox for pox. If you write pox, please note which foot and which toe, but you don't need to bother with which joints.

Note added in 2010: These methods have varied over time. Of primary importance this year is to note pox/no pox, and if there is pox, is it active/not active. Of lesser importance is to note which toes, so do this only if there is time.