

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 April 18, 1998

When and where:

We need to implant males as simultaneously *as possible*, which requires that we rotate regularly through the various sub-areas of the study area. It is not a good idea to treat all the birds on WPR and then move to the Hotel, etc.

We need to avoid over-investing in areas that appear productive early in the year but tend to dry up later. The prime area where this is true is Jungle Trail, which becomes almost unworkable because, at least in some years, the birds disappear and the nests are so difficult to find.

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

Traps will lose their effectiveness after the chipmunks emerge, and warm weather and experience with being caught will erode the effectiveness of the nets. Usually things go smoothly until 1 May, which does not leave us much time as this appears to be an early year. Once we stop processing en masse, we will need to turn to targeted catching on individual territories, especially those territories that lie between our nets.

General info on how to process birds in early spring:

We must standardize the data we collect on birds, both in terms of the variables we measure and the way we make the measurements. **As always, we need to measure wing, tail, tarsus, mass, fat class, condition, covert molt, eye color, presence or absence of a brood patch, and cloacal protuberance** (after Tuttle, length, depth, width, with calipers see below). The data sheets prompt you for some of these items, but not for all of them, so you 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). David, and Carol (and later Diane, Jennifer, and Michelle) should make conscious efforts to confirm that their methods are identical and that their data match Joe's and Eric's. So 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.

New people, PLEASE point out when you have been given conflicting instructions - this will help us recognize where we 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," because we needed 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.'

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, then that fact is noted on a bleeding sheet, but that does not relieve one from the responsibility of recording the encounter on a banding sheet. **I can't stress this one 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. Sightings should be recorded on banding sheets that contain only other sightings, not captures, and recording them is essential in the early spring and late summer. These sightings allow us to estimate rate of disappearance during the breeding season.

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. If conditions permit, (morning, able to process immediately after capture), get a hormone sample, either for T or for cort and stress. Early spring is the time of year at which we have the least information about plasma hormone levels, so early spring mornings are the time to get hormone samples.
2. Band (if necessary) and process bird to obtain all info specifically requested on the banding sheet.
3. Get measurements that will allow us to determine whether testosterone is 'costly' by assessing the initial condition of males and females.
 - (a) quantify tail white with the 'tail-white measurer.' We will attempt to do this without removing feathers, but if necessary we will pull the third rectrix on the right-half of the tail.
 - (b) describe feet for presence/absence of foot pox (get photos of interesting cases)
 - (c) describe molt (complete or evidence of suppression - get photos of interesting cases)
 - (d) measure cloacal protuberance (see instructions below)
 - (e) measure condition (see instructions below)
 - (f) record fat class
4. Bleed for DNA. [If you bled for hormones, you can spin that blood, keep the plasma for hormones, and use the packed rbc for DNA.]
5. If it 's a male, implant it.

II. All later captures

1. Consider whether capture appropriate for a hormone sample.
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. On a slow day, please try to get everything
4. **CHECK TO DETERMINE THAT THE IMPLANTS ARE PRESENT AND MARK ON THE BANDING SHEET THAT YOU SAW THE IMPLANT!** (e.g., write "implants ok"). **If the implants have come out, bring the bird back for re-implanting.** [imagine doing a two hour nest watch on a T-male who has lost his implant! It's very discouraging.]
5. When you return to the lab, **enter the capture onto the implant log sheet.** This allows us to see whether birds have moved and confirms the presence of the implant and the date of the later capture. Once nesting has begun, the capture should also be recorded on the nest log sheet.

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

1. Cloacal protuberance

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 it's 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.

Please see the notebook labelled 'Instructions' for a description of how to classify fat class in juncos. The categories are 0 to 5. This time of year, many to 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., FC = 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).

4. Molt

You will catch a few birds (maybe 5 or 6 total all of us combined) that did not molt last fall because they retained their T-implants and molt was suppressed. We need **detailed** notes on the extent of suppression and whether any individual flight feathers molted. How will recognize such a bird? You will be struck with how brown and 'ratty looking' these birds are. The feathers will be frayed. However, in some, a few of the flight feathers will have molted and those feathers will look normal. For most adults, molt will have been complete. For males that molted normally we need to say so on the banding sheet ('molt normal'), and for those that did not, we need to fill out a molt sheet. Be on the lookout for prenuptial molt of the body feathers and, if present, please note that too on the banding sheet.

Thanks everyone for the care this requires, Ellen