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Eastern Subspecies of the Loggerhead Shrike: The Need for Measurements of Live Birds

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Numbers of the Loggerhead Shrike (*Lanius ludovicianus*) are declining across the continent but faster in some parts of the range than in others (Robbins, Bystrak, and Geissler 1986). While populations seem healthy in California and the southeast, the Loggerhead Shrike is on the state endangered species lists of New York, Michigan, and Wisconsin and has "threatened" or "watch" status in other midwestern states. New England no longer supports any breeding populations. The precipitous decline of Loggerhead Shrikes in the northeastern United States has led to some discussion of placing the northeastern subspecies on the federal endangered species list, as an endangered subspecies. Two familiar examples of species that include federally listed subspecies are the Bald Eagle and the Peregrine Falcon. While the Southern Bald Eagle (*Haliaeetus leucocephalus leucocephalus*) and the American Peregrine Falcon (*Falco peregrinus anatum*) are protected under the Endangered Species Act, other populations of these species in the United States are not considered endangered. (The Arctic Peregrine Falcon, *F. p. tundrius*, has been removed from endangered status but is still considered a threatened subspecies.) Before a proposal to protect a subspecies of the Loggerhead Shrike could be considered seriously, it is important to know whether a well-defined subspecies exists in the northeast and, if so, how it can be differentiated from the other subspecies of Loggerhead Shrike.

The most recent taxonomic work on the Loggerhead Shrike was done by Miller in 1931. He described 11 subspecies, three of which occur in the eastern half of North America, where the greatest losses have occurred. *Lanius ludovicianus ludovicianus* is the resident population breeding from Florida and eastern Louisiana north to Virginia and Arkansas. *L. l. migrans* is the migratory race that once bred in New England and still breeds in Ontario and New York, west to the Dakotas, and south to the range of *ludovicianus*. Miller (1931) describes fairly broad hybrid zones where *migrans* meets *ludovicianus* and the most western of these three subspecies, *L. l. eximiorides*. *Eximiorides* breeds from the Prairie provinces south through Texas. All three subspecies appear to mix on the wintering grounds (Burnside 1987).

Miller (1931) defined these subspecies on the basis of overall color patterns and linear measurements. The statistical significance of these measurements was never evaluated. The linear measurements included wing length, tail length, tarsometatarsus (or more briefly, tarsus) length, bill length, bill depth, bill width, extent of white on primaries and on rectrices, length of middle toe, and length of hind toe. Most of these individual measurements overlap so greatly between subspecies that use of a single character would not be sufficient to consistently classify museum skins to the correct subspecies. The presentation of Miller's data in his 1931 monograph does not allow discriminant analyses that could identify appropriate combinations of characters to use for subspecies classification. I performed t-tests for the ten linear measurements of museum specimens of adult male shrikes presented in Miller's monograph. Nine of these characters differed significantly between at least two of the three eastern subspecies. Only wing length differed significantly between all three.

Miller (1931) identified morphological characters that are probably useful in the classification of shrikes. Because of shrinkage and stretching that occurs when birds are preserved as museum specimens, and differences in the way measurements must be taken on stiff skins, measurements obtained from museum specimens are not directly comparable to those taken on live birds. To classify correctly a bird that is captured, measured, and released, we need a system based on measurements taken on live birds. Measurements from a series of shrikes across a broad geographic range would allow identification of a northeastern subspecies or demonstrate the existence of extensive clinal variation in the Loggerhead Shrike.

Some studies have used the wing length to tail length ratio suggested by Palmer (1898) and accepted by Miller (1931) as a means of differentiating *migrans* from *ludovicianus* in the field (Novak pers. comm., Siegel 1980). Miller's method of obtaining these ratios results in a value without statistical meaning. Rather than taking the ratio for each individual in the sample and averaging these ratios for all of the individuals within a subspecies, for each subspecies

Miller simply summed all the measurements of wing length and divided this figure by the sum of all of the tail lengths. Obviously, he did not present a standard deviation for this statistic. Males of *L. l. ludovicianus* had a ratio of 0.943:1, *migrans* had 1.001:1, and *exubitorides* had 0.999:1. Small amounts of variation within a subspecies would make this character difficult to use.

My own measurements of wing to tail length ratios from 37 Loggerhead Shrikes breeding in southwestern North Dakota, within the range Miller defined for *exubitorides*, and beyond the hybrid zone with *migrans*, range from 0.895 to 1.044, with a mean of 0.984 and a standard deviation 0.033. Less than a third of the individuals had wing to tail length ratios closer to the value Miller (1931) presented for *exubitorides* than to the values for the other two subspecies.

The wing to tail length ratio could be a useful taxonomic character if used in combination with other characters that appeared to differ between subspecies in Miller's sample. This should suggest the importance of taking these measurements on any Loggerhead Shrikes captured in eastern North America as well as the value in contributing existing data for use in an overall taxonomic analysis.

The following data should be taken for every Loggerhead Shrike handled, in order of decreasing importance: sex (by cloacal protuberance or brood patch, if present), locality, date, whether breeding or migrating (if known), wing chord, tail length, length of hind toe, bill length, bill width, bill depth, amount of white on primaries (see below), amount of white on rectrices, tarsus length, length of middle toe, weight. It is not necessary to obtain all the above data from every bird. While complete data would be most desirable, some measurements would be more useful than none.

Standard techniques for taking measurements on live birds have been published by Baldwin, Oberholser, and Worley (1931). The unflattened wing chord should be taken preferably using a wing chord measure with a metal stop at one end. Tarsal length may also be taken with a wing chord ruler, resting the stop at the ankle joint and measuring to the base of the middle toe (the distal edge of the last scale which completely encircles the dorsal surface of the foot). If calipers are not available, tail length may be measured on the dorsal surface with a wing chord ruler from the distal end of the uropygial gland to the tip of the longest rectrix (Figure 1). Note should be made if this method is employed. Preferably, tail length should be taken on the ventral surface with calipers, one point being inserted between the two middle rectices where their bases emerge from the skin, the other reaching to the tip of the longest rectrix when the tail is closed (Figure 2).

Figure 1. Measurement of tail length (dorsil view) using a wing chord measure.

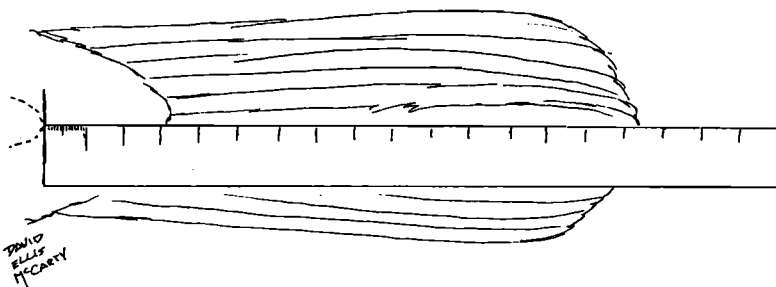
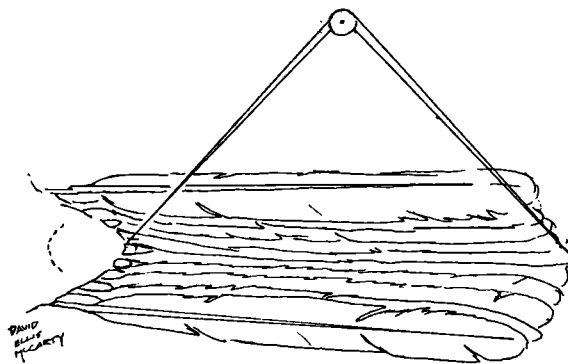
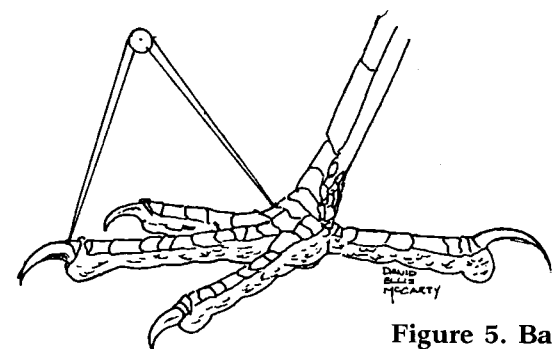


Figure 2. Measurement of tail length (ventral view) using calipers.



The rest of the measurements must be taken with calipers. Length of hind toe should be measured from the point where the upper edge joins the tarsus to the proximal end of the claw. Length of middle toe can be taken in the same fashion (Figure 3). Bill length should be measured after Strong (1901) from the anterior margin of the nostril to the tip of the upper mandible. Bill depth should be measured as the height of the bill at the nostrils, one point of the calipers on the culmen at the anterior end of the nostrils, the other on the lower edge of the lower mandible. Bill width should also be taken at the nostril, placing the points of the calipers on the outside edges of the bill opposite the anterior end of the nostrils. The extent of white on primaries is determined by measuring from the distal edge of the basal white area to the wrist (Figure 4). To measure the amount of white on the rectrices, take the greatest length of the white spot on the inner web of the distal end of the outer rectrix. If the distal white spot merges completely with the basal white spot on the rectrix, make a note and do not attempt to measure the distal white spot. The length of spots on the feathers should be taken to show the actual linear distance parallel to the shaft of the feather, not the chord of the length of the area (Figure 5). The measurement should be taken in a straight line from opposite one end of the spot to a point opposite the other end. Measurements of tail and wing spots are useful only if measurements of tail and wing length have been taken on the same bird.

Figure 3. Measurement of toe length.



Banders should adhere to this system of measurement as closely as possible. Where it is not possible, data should be reported with detailed descriptions of the methods used. The errors that will result from using measurements collected by numerous individuals will not be entirely detrimental. Rather, if certain characters are shown to be useful for separating the subspecies despite the variance known to exist in the measurements, we will know they can be used by a variety of people in the field.

Shrikes are relatively easy to trap using live bait, especially when insect abundances are low. Some techniques are described by Berger and Mueller (1959), Lohrer (1974, modified Potter traps), Erickson and Hoppe (1979), and Kridelbaugh (1982, further modifications on Potter traps). Banders in those states where the Loggerhead Shrike is endangered or threatened should obtain the appropriate permits before attempting to catch and handle these birds. Where shrikes are more abundant, amateur banders could contribute much useful data by starting even a small trapping program. The most useful information would include data from 20 to 25 individuals from the same locality. Taking and reporting the data described above could be a cooperative effort among banders that would answer a question important for the conservation of a declining species.

Figure 4. Measurement of extent of white spot on primaries.

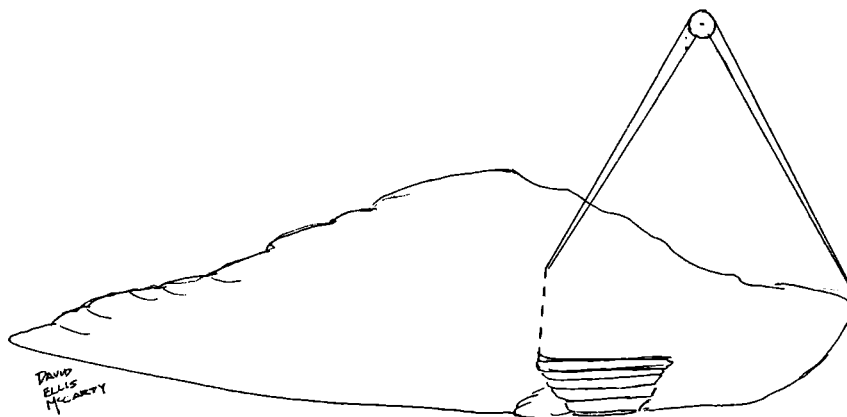
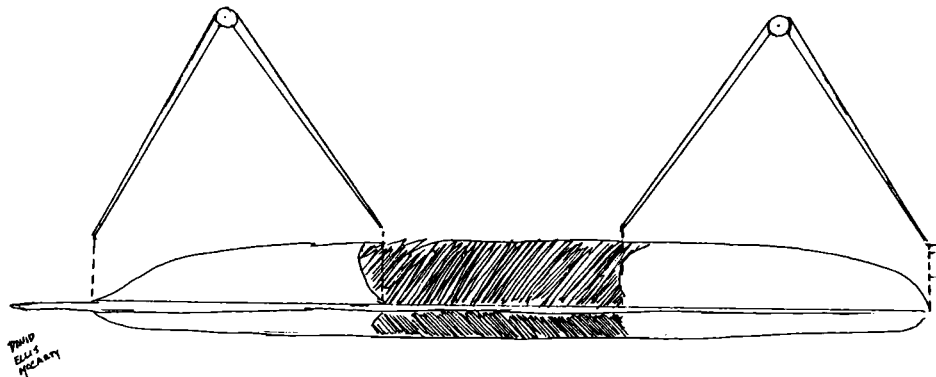


Figure 5. Basal and distal tail spots on rectrix of Loggerhead Shrike.



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A Significant Return and Recovery of a Snowy Owl

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This winter, 1986-87, marks my 23rd year of banding Snowy Owls (*Nyctea scandiaca*) at Kennedy Airport, New York. During this time I have banded 36 owls and have had only one return and two recoveries.

In December 1974 I had my first retrap of a banded bird, #568-15079. This bird was originally banded as a HY-F on 23 November 1972, a mere 760 meters from point of recapture. (See Follen and Luepke, 1980, IBBA 52; No. 4)

This same bird was recovered again in January 1979 at Victoriaville, Quebec, Canada. Personal communication with the Quebec Ministry of Tourism, Fish and Game, disclosed the following: It had been caught in a #3 Victor trap, part of a trap line set out to capture fox or coyote. The trapper kept the bird for nearly a month, feeding her bits of fox and coyote before notifying the Provincial agency. Two agents were dispatched to claim the bird. She appeared in fair condition despite injuries to a wing and a foot. Nonetheless, the bird died in transit back to Victoriaville. This bird was seven years old when it died.