

**A Method of Determining the Sex of Captured Black-capped Chickadees.**—In studying the behavior and social organization of the Black-capped Chickadee (*Parus atricapillus*), we found it important to know the sex of the birds being observed. Previous investigators have relied upon courtship behavior or the roles of the sexes in incubation; the alternative involves sacrifice of the individual for examination of the gonads or a laparotomy.

A flash of insight led us to examine the shape and extent of the cap and bib as being subtly indicative of the sex of captive individuals in this species. We noted that the bibs of birds judged to be males were broader and not well defined at the posterior margin (Fig. 1). The bibs of females narrow perceptibly beneath the beak, and the posterior margin is abrupt. The black cap of the male is rather pointed posteriorly in contrast to the truncate margin in the female (Fig. 2). The tentative designations of the sexes in the captives were subsequently confirmed by observations of their behavior.

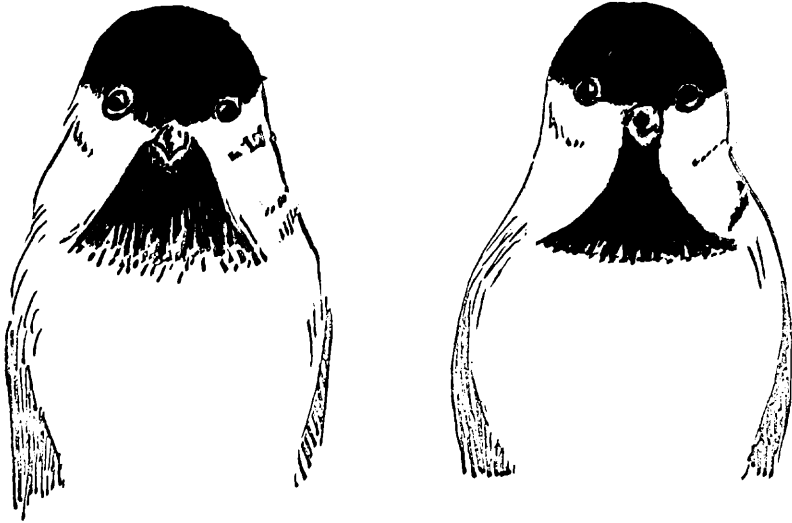


FIGURE 1. Bibs of Black-capped Chickadees, male (left) and female (right).



FIGURE 2. Caps of Black-capped Chickadees, male (left) and female (right).

This visual comparison method of sex determination was confirmed by the examination of 21 study skins for which sex was indicated on the label. We achieved 100 per cent accuracy in our predictions, and extended this method to determination of the sexes in 20 specimens of the Mountain Chickadee (*Parus gambeli*) at Utah State University. Twelve study skins of the Marsh Tit (*Parus palustris*), and 9 of the Willow Tit (*Parus montanus*) from a collection at the University of Manchester, England, were examined and successfully segregated by this method. However, cap configuration was the best indicator of sex on the study skins of the Marsh Tit.

With practice in observation and comparison of bib and cap configuration, a high degree of accuracy can be obtained in detecting the sex of individuals in this species.

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**An improved patagial streamer for waterfowl.**—A study was initiated on Rockefeller Refuge, Grand Chenier, Louisiana, on breeding behavior of the Mottled Duck (*Anas fulvigula*) in coastal marshes. It became necessary during the study to recognize individual ducks. The patagial tags developed by Anderson (*J. Wildl. Manag.*, 27: 284-288, 1963) and Hester (*Bird-Banding*, 34: 213-217, 1963) appeared to be the most suitable of the various marking techniques, but their tags seemed capable of impeding flight. The marker to be used in this study had to be highly visible and durable.

Investigation was begun in November 1966 to develop a patagial streamer and evaluate its use. A plastic-coated nylon flagging material (Safety Flagg Company of America, Pawtucket, R. I.) was selected for its bright colors, flexibility, and durability. The flagging was cut into 11-inch lengths and positioned as shown in Figure 1. The end of the large end of the streamer was placed 1/2-inch over the posterior edge of the speculum. The narrow end of the streamer was wrapped over the leading edge of the wing, brought between the 9th and 10th secondaries, and stapled to the large end on the dorsal side of the wing. The streamer was then permanently attached one inch anterior to the elbow (Fig. 1) by stitching through the streamer and patagium with nylon dental floss and a leather awl. This stitch was knotted on the ventral side of the wing. The narrow end of the streamer was then sewn to the large end of the dorsal side of the wing and knotted. The ends of the knots were melted and fused to prevent them from loosening.

Care was taken when sewing through the patagium to avoid injuring the *tensor accessorius* muscle and the blood vessel in the leading edge of the wing. The knot of this stitch was tied loosely to allow blood circulation in the stitched area. After the technique was refined, one man could process seven wings in 30 minutes.

Thirty penned ducks were marked, and streamers were intact and visible 395 days after marking. Twenty wild ducks were marked, and streamers were intact 120 days after marking. Wear occurred largely on the narrow dorsal strip, leaving the large dorsal end nearly undamaged. No infections or hindrance to flight, pair formation, or nesting were detected. Marked individuals were easily recognized in flight without the aid of binoculars at distances of 300 yds. Marked ducks were easily distinguished while in water (Fig. 2) and during observations from aircraft.