

# AGE AND SEX DETERMINATION IN ANNA'S HUMMINGBIRD BY MEANS OF TAIL PATTERN

SHIRLEY WELLS, deceased

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While banding Anna's Hummingbirds (*Calypte anna*) on the Palos Verdes Peninsula, southern California, between 1970 and 1976 (Wells et al. 1978), Wells noted three predominant color patterns on the outermost rectrices of the birds handled (Figure 1). By pulling the outermost rectrix on one side of fledglings and then subsequently recapturing these marked individuals and noting the shape, color, and pattern of the regrown rectrices, she confirmed that these patterns were age- and sex-specific. This method of sexing may be applied to nestlings as well as fledglings and adults. We describe these differences for banders and population biologists interested in sex ratios or life tables to enable them to determine the sex and age of Anna's Hummingbirds. Our confirming data are based on an examination of 121 specimens in the collections of the California Academy of Sciences (CAS), San Francisco, California, and the Museum of Vertebrate Zoology (MVZ), Berkeley, California. These included 79 females and 42 males.

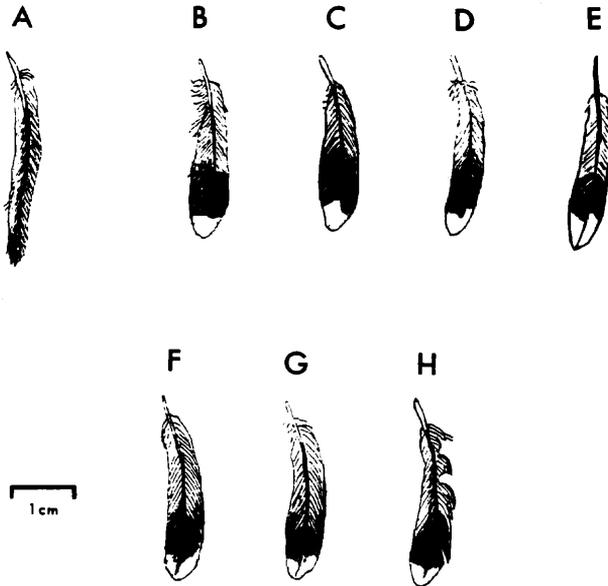


Figure 1. Outermost rectrices of three age classes of Anna's Hummingbirds. A, adult male; B-E, adult or immature females; F-H, immature males.

## NOTES

Understanding the timing and sequence of molts is important in any age and sex determination by plumage. Williamson (1956) found that all Anna's Hummingbirds, both adults and juveniles, have one complete molt each year. An individual's post-juvenile molt lasts 4 to 6 months. An adult's annual molt requires about 3 months. Complete periods of molt are as follows: juvenile females, April to January; juvenile males, May to February; adult males, early June to January; adult females, May to at least October. The outer rectrices tend to be molted late in the sequence of feather tracts, after the central rectrices are nearly or fully grown. Adults molt outer rectrices from July to October. Juveniles molt outer rectrices from July to perhaps January.

We noted, as did Williamson (1956), that the distinctive outermost rectrix (Figure 1A) and full gorget of adult males easily distinguish them from the other age and sex classes. Therefore, we don't consider them further here. Williamson (1956) and Baltosser (1987) also noted that immature males and females in fresh plumage can be distinguished from adult females by the form of the secondaries, which are rounded in immatures (Figure 2A) but are obtusely pointed centrally and incised on each side of the rachis in adult females (Figure 2B). This method is sometimes difficult to use, notably when the feather tips are worn.

Williamson also noted that the tail is a useful criterion to separate adult females from immatures prior to their post-juvenile molt. The outermost two rectrices in immature males are similar to those of females in being tricolored, with a greenish or grayish basal zone, a black subterminal band, and a white distal zone. He pointed out that females have more white than males but did not comment on how adult and immature females could be distinguished. Baltosser (1987) noted that the outermost rectrices of immature males differ from those of females in that males have black rachises that bisect the white rectrix tips whereas the distal portions of females' rectrices are all white. During our banding we encountered several females with black rachises. However, Baltosser's criteria are still useful if used in conjunction with other characters, as developed below.

In some females the boundary between the white tip and the black subterminal band runs almost straight across the feather, that is, it is perpendicular to the rachis (Figure 1B). More commonly there is a white notch intruding into the middle of the subterminal band where the rachis and small portions of one or both vanes are devoid of melanin (Figure 1C). On some females, the white notch projects inward on only one vane (Figure 1D). Occasional females have a short projection of the black rachis into the white rectrix tip, but not enough to bisect this tip. Very rarely a female has a black rachis that actually bisects the white tip (Figure 1E). All but one of the 79 specimens marked female on the label possessed one of these tail patterns. The exceptional individual had red feathers growing into the crown and was thus an immature male misidentified as a female.

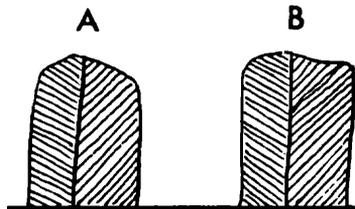


Figure 2. Secondary feather tips of Anna's Hummingbirds. A, immature; B, adult.

## NOTES

Immature males' outermost tail feathers differ from those of nearly all females in that the rachis is black, extending well out into the white rectrix tip, so that a black line bisects this white tip (Figure 1F-H). Moreover, the subterminal band forms a black chevron where it narrows into the black rachis, with the chevron's apex pointing distally toward the rectrix tip. This black chevron is absent from the rectrices of females. The black chevron may be angled acutely (Figure 1F), moderately (Figure 1G), or quite obtusely (Figure 1H), but, in combination with the black rachis bisecting the white tip, it is diagnostic of a male. Baltosser (1987) described and illustrated the black rachis but did not comment on the inverted chevron. All but seven of 42 specimens marked "male" on the label had both the black chevron and black rachis bisecting the rectrix tip. These seven exceptions (CAS 14302, 18977, and 46005; MVZ 52207, 145598, 158804, and 168423) we believe to have been missexed. Six of the seven have no or very slight corrugation of the bill, indicating they are adults (Ortiz-Crespo 1972, Baltosser 1987). The seventh, CAS 46005, appears to have moderate bill corrugation, but it also has unworn secondaries clearly of the adult shape. None of these specimens has any iridescent red feathers in the crown, on the auriculars, or on the lower corner of the gorget, suggesting that all seven were in fact missexed adult females. All seven exceptional "males" had outermost rectrix patterns entirely typical of what we've found in adult females, not intermediate or ambiguous in any way. Adult females often have a large patch of iridescent red feathers on the center of the throat that may have caused some collectors to assume they were immature males.

Three known females handled during the banding studies had a black rachis bisecting the white tip, as found in immature males, but were lacking the black chevron. These rectrices were pulled and are in the collection of the California Academy of Sciences. Wells noted uncorrugated bills on two of them at the time the rectrices were pulled. These two birds still exhibited adult female plumage (absence of gorget) the following year. The third was an adult when first captured and, when captured two years later, still had no gorget.

In summary, immature males can be distinguished from both age classes of females by the black chevron narrowing into the black rachis that bisects the white rectrix tip. Conversely, females (both adult and immature) usually have a white rachis and always have a white notch intruding into the black subterminal band. The adult males' outermost rectrix is narrow and lacks the broad white tip. These same characteristics may be used to age and sex the related Costa's Hummingbird (*C. costae*, P. Pyle pers. comm.).

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