

Western Ecological Research Center

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Identification of California Clapper Rail Sex

The identification of sex in bird species provides species managers with important insights in sex-based behavior differences and allows for assessments of depredation risk, and interactions between and within species. However, a bird's sex is difficult to determine through visual observation of similar-plumaged males and females. More invasive techniques, such as blood collection, are often required to determine their sex. This research identifies three body measurements that are easily obtained from California clapper rails (*Rallus longirostris obsoletus*) that accurately predict an individual's sex. USGS scientists Cory Overton, Michael Casazza, Dr. John Takekawa, and University of California, Davis, Master's student Tobias Rohmer evaluated seven easily obtained measurements from California clapper rails in San Francisco Bay. Use of three of these measurements provided the greatest discrimination of sex for individuals genetically



Measuring the length of the culmen, or upper ridge of the bill, of a California clapper rail. The flat wing length was also measured, as well as the length of the tarso-metatarsus, or leg section between the foot and knee (the leg band in the photo rings the tarso-metatarsus). The combination of these three measured traits determined this bird to be a male. Photo by USGS.

Management Implications:

- Three easily measured morphological traits allow for accurate assessment of sex in California clapper rails with a minimal handling time.
- Traits used to assess sex are not generally considered to vary within or between years once adulthood is reached.
- Selected traits are measurable on both live and dead birds (providing wings, legs and culmen are intact), allowing for an assessment of sex bias in behavior or depredation rates.

identified from blood samples. Their findings are published in a recent issue of *The North American Bird Bander*.

The California clapper rail is the largest of eight subspecies in the United States. It is a non-migratory subspecies found only in tidal and brackish marshes of the San Francisco Bay estuary. Like all three West Coast subspecies, the California clapper rail is listed as endangered at both the state and federal levels.

The combination of culmen length, tarso-metatarsus (tarsal) length, and flat wing length provided the greatest power to distinguish sex in California clapper rails captured at four marshes in South San Francisco Bay using a discriminate function analysis (DFA). Four additional measurements were considered: bird mass, wing chord length, mid-toe length, and tail length. Male clapper rails were 6 to 22% larger than females for individual measurements. Relative to the three selected variables, within sex variation was generally higher for variables not included in the final DFA model.

Overton, C. T., M. L. Casazza, J. T. Takekawa, T. M. Rohmer. 2009. Sexing California Clapper Rails Using Morphological Measurements. North American Bird Bander 34(2):58-64.