

## Chase Flights as an Index to Nest Density in Mottled Ducks<sup>1</sup>

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*Abstract:* Waterfowl nest searches are labor intensive and expensive. Development of a method to estimate number of nests without conducting nest searches would be advantageous. Mottled duck (*Anas fulvigula maculosa*) chase flights were compared with number of nest initiations to determine if a quantifiable relationship exists. Frequency of chase flights over an area was independent of the number of nests found in the area ( $P > 0.10$ ), precluding use of chase flight frequency to estimate nest density. Chase flight frequency does provide an index of breeding chronology. A highly significant relationship ( $P < 0.0001$ ) between chase flights and total flights provides an index to mottled duck density that may be used to identify changes in population size and evaluate changes in habitat use.

(Credit line—8 Helvetica to come)

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The mottled duck, a resident species of the Gulf Coast, is an important component of the waterfowl harvest in both Louisiana (Smith 1969) and Texas (Singleton 1953). The significance of this species in the harvest is heightened during years when migratory waterfowl numbers are reduced. To prevent over-exploitation, annual production estimates are essential. In other waterfowl species, such estimates are commonly derived from nesting studies (Miller and Johnson 1978). However, the nest searches conducted during such studies are both labor intensive and expensive, and may be counterproductive, because nests located by searchers are subject to a higher rate of predation

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(Sincock et al. 1964). Development of a method to estimate the number of nests without conducting nest searches would be advantageous to waterfowl managers.

The mottled duck, as well as many other dabbling ducks, participates in conspicuous aerial chases in the vicinity of the nest, termed chase flights (Hochbaum 1955, Sowls 1955, Dzubin 1957, Hori 1963, McKinney 1965, Weeks 1969, Allen 1981). This study sought to determine if a quantifiable relationship exists between these chase flights and nesting activity, so that a more efficient estimate of nest density could be developed.

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### Study Area

The study was conducted in the prairie-marsh zone of southwestern Louisiana. The area is characterized by brackish and intermediate marsh bisected by well-drained ridges. The drier ridges are usually grazed for a portion of each year and burned periodically by cattlemen to promote new growth of vegetation.

Six approximately 20-ha study areas were selected for monitoring during the study in an area where mottled ducks have historically nested. All study areas were partially bordered by a drainage canal and were grazed with an approximate stocking rate of 1 cow per 3.5 ha. Study areas differed in dominant vegetation, amount of submerged surface, and burning history (Baker 1983).

### Methods

Each of the 6 study areas was monitored for chase flight activity 4 times (2 morning and 2 evening) during each 3-week period between 1 March and 25 July during 1981 and 1982 for a total of 384 observation periods. Each observation lasted 3 hours. Morning observations began 15 minutes before sunrise; evening observations ended 15 minutes after sunset. All mottled duck flights over the study areas were recorded and classified as either chase flights or miscellaneous flights. Also recorded were the number of birds participating, whether the flight originated on the study area, and the behavior of the birds in flight.

Nest searches were conducted the last day of each 3-week segment. Nests were located by observing nesting hens leaving or returning to a nest and by conducting nest searches either on foot or by pulling a rope with bells attached at 1-m intervals stretched between 2 3-wheel motorcycles. The number of nests initiated in 3-week segments was used to correlate chase flight frequency to nesting activity.

