

**HABITAT USE AND HOME RANGE OF AMERICAN BITTERNS (*BOTAURUS LENTIGINOSUS*) AND MONITORING OF INCONSPICUOUS MARSH BIRDS  
IN NORTHWEST MINNESOTA**

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**ABSTRACT**

Information on habitat use of the American Bittern (*Botaurus lentiginosus*) and a statistically valid survey design for monitoring changes in populations of inconspicuous marsh birds, which include American and Least Bitterns (*Ixobrychus exilis*), Pied-billed Grebes (*Podilymbus podiceps*), Sora (*Porzana carolina*), and Virginia Rails (*Rallus limicola*) is needed to inform conservation and management actions. My research, from 1999 – 2002, examined breeding habitat use and home range of American Bitterns. Also, I used pilot survey data to guide design options to meet objectives for monitoring marsh bird occupancy rates in association with habitat changes. Nest sites of American Bitterns in wetlands ( $n = 47$ ) and grasslands ( $n = 33$ ) were positively associated with percent dead vegetation cover and density and negatively associated with vegetation height. Foraging sites of American Bitterns were negatively associated with distance to small water openings and vegetation height. Daily survival rate was 0.96 (95% CI 0.930 – 0.979) and nest survival rate of American Bitterns was 0.35 (95% CI = 0.15 – 0.58). The average core home range size (50%) was 18.08 ha ( $\pm 6.38$ ) and the 95% home range was 109.28 ha ( $\pm 38.47$ ) using the fixed-kernel estimator. Results from occupancy analyses of pilot data and evaluation of a set of *a priori* candidate models provide the needed guidance for reliable marsh bird monitoring programs.