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Patuxent Wildlife Research Center

Estimation of Density and Abundance of Biological Populations on National Parks and Wildlife Refuges Through Distance Sampling

The Challenge: Assessing the status and trends of populations of biological organisms is an important management goal and a recurrent theme in USGS research. Often, the most basic question of "how many are there?" remains elusive, thus making management decisions more difficult. Patuxent Wildlife Research Center has long been a leader in abundance estimation methodology. This study continues a long-term commitment of technical support for the use of distance sampling for wildlife population abundance estimation in our National Parks and Wildlife Refuges.

The Science: Along with encounter rate and cluster size, distance sampling allows for the estimation of the probability of detection, a major confounding factor in most ad-hoc wildlife abundance surveys. Whether for overabundant deer in parks or endangered butterflies in refuges, distance sampling and detection rates have improved our ability to accurately assess population size, the primary driver of management actions.

The Future: Distance sampling data are being used to estimate abundance of the endangered Karner blue butterfly on US Fish & Wildlife Service Refuges to better guide recovery planning. In addition, PWRC scientists are assisting the West Virginia Department of Natural Resources in their efforts to implement distance sampling methods and analyses for state-wide deer population management. Future plans include researching the effects of biased transect placement on density estimation, and modeling effective strip half-width from features of the environment.

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