

**UNDERSTANDING RELATIONSHIPS BETWEEN GREATER SAGE-GROUSE
HABITAT AND POPULATION DYNAMICS IN EASTERN MONTANA TM**

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The long-term decline of greater sage grouse (*Centrocercus urophasianus*) over much of their historic range is of concern to managers of sagebrush (*Artemisia* spp.) habitats. A petition has been submitted to list the Washington population of sage grouse under the Endangered Species Act (ESA) and a range-wide listing petition is expected in the near future. That habitat quality is related to demographics of populations is a fundamental assumption of the practice of managing species via managing habitat. However, few studies explicitly acknowledge this relationship, and still fewer explicitly attempt to define this relationship on a species-specific basis. There currently is no way to reliably determine the

nature of the interaction between sage grouse population status (as indicated by estimated vital rates) and habitat condition. This research will use a combination of well-established population demography tools and state-of-the-art analysis methods to elucidate relationships between Sage-Grouse populations and habitat at 6 sites in eastern Montana. Mark-resight and radio telemetry methods will be employed to estimate vital rates of sage grouse populations. Sensitivity analysis will identify which rate(s) has the greatest influence on population growth rate (λ) under different habitat conditions. Habitat condition at each site will be assessed by several critical habitat characteristics. A regression approach will quantify the relationship between individual vital rates and each of the measured habitat characteristics. The research will provide crucial information to federal and state wildlife professionals charged with managing for sage grouse and will be of particular use in the event of a petition to list sage grouse under the ESA.