

## **\*\*Modeling the Effects of Habitat, Livestock Grazing, and Climate on Greater Sage Grouse Population Dynamics in Central Montana**

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Access to quality habitat is a key driver of population dynamics for many wildlife species. To direct habitat conservation efforts and to determine if these efforts are successful, habitat models should be linked with population models at local scales. This project addresses this need by providing information about relationships among greater sage-grouse habitat, livestock grazing, and demographic rates in central Montana. This work is based on a collaborative, decade-long effort among multiple resource agencies and private landowners in central Montana. It is led by Montana Fish, Wildlife & Parks and the University of Montana, and data collection is nearly complete. First, we will establish the habitat components that sage-grouse select at each life stage in a local population. We will include both livestock grazing and climate variables that affect greater sage-grouse habitat. Second, we will use a population model to relate habitat components to demographic rates that are known to influence greater sage-grouse population dynamics. We will examine these relationships during multiple life stages and across spatial scales. We will also examine the relationship between demographic rates and lek-based abundance estimates to evaluate lek counts as an indicator of population health. Our effort will identify components of the sagebrush steppe ecosystem in central Montana that are important to the persistence of sage-grouse in this region, and how livestock grazing affects these components. Our findings will be used to evaluate and update sage-grouse habitat conservation strategies and management plans in central Montana.