

# Sagebrush Steppe Climate Change Vulnerability Assessment



## Brief for Resource Managers

### Introduction: Climate Change Vulnerability Assessment in Sagebrush Steppe

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Public land management agencies are under increasing pressure to consider climate change impacts in their land-use planning process. As a first step, many agencies are conducting vulnerability assessments to identify the components of an ecosystem, or conservation targets, most at-risk from climate change. Vulnerability assessment is the first step towards a climate change adaptation plan.

Because the ecological impacts of climate change are so uncertain, and are studied with sophisticated models, a successful vulnerability assessment requires managers and researchers to work together. Traditionally, this kind of research-management collaboration has been hard to achieve. However, climate change vulnerability assessments offer a unique opportunity to bridge the communication gap separating managers and researchers: The problem is urgent enough to interest managers and conceptually challenging enough to interest researchers.

The need for a vulnerability assessment is particularly urgent in the sagebrush steppe, which covers over 250,000 km<sup>2</sup> in the western U.S. (Fig. 1), of which 70% is managed by federal agencies, and provides critical habitat for over 350 species. One of these species is the

#### Management Implications

- Vulnerability assessment is a first step towards climate change adaptation.
- Our goals were to train graduate students and to provide land managers with scientific information about the ecological impacts of climate change in sagebrush steppe.

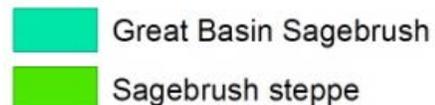


Fig. 1. Potential natural vegetation of the Intermountain West showing sagebrush dominated vegetation (based on Kuchler 1964).

Greater sage-grouse, a candidate species for listing under the Endangered Species Act. Sage-grouse conservation could impact land use activities from livestock grazing to recreation to energy development across the entire region. While annual plant invasions and altered fire regimes are the greatest current threats to sagebrush habitat and obligate species such as sage-grouse, climate change may exacerbate these management challenges and create new ones.

The project that generated the fact sheets on this website, funded by the National Science Foundation, focused on both graduate training and the science needs of land management agencies. We had three goals:

1. Train graduate students to conduct climate change vulnerability assessments.
2. Improve students' understanding of land managers' needs and increase students' capacity to collaborate effectively with land managers.
3. Provide land managers with relevant scientific information about climate change impacts on sagebrush steppe ecosystems.

Our training goals distinguish our project from commissioned vulnerability assessments. On one hand, because we relied on “volunteer” labor, we could not conduct a truly comprehensive assessment. On the other hand, the participation of researchers with a variety of skills enabled us to compare the results of a diverse set of models. This integrative approach is the greatest strength of our project.

**Most relevant references:**

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