

Economic Value of Ecosystem Services Supported by Dryland and Grassland Environments

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Background and Objective

Vast stretches of grasslands and drylands throughout the western U.S. are publicly managed by the Bureau of Land Management. These lands are used for a variety of traditional purposes, including energy development and livestock grazing, but also provide other valuable services to society such as habitat for wildlife, biodiversity and species richness, and outdoor recreation. However, these *ecosystem services* supported by grasslands are grossly understudied in the economics literature. The U.S. Geological Survey (USGS) and Colorado State University (CSU) are reviewing what is known about grassland ecosystem services and will then design a new economic data collection effort aimed at filling this gap. Results from this study are envisioned to assist project investment aimed at restoration, fire mitigation, invasive species control, and forage improvements for livestock and wildlife.

Overall objective: improve our understanding of the public's preferences for different management strategies and outcomes for grassland and dryland environments.

Today's objective: to engage with grasslands experts and professionals on the current state of knowledge for grassland services and to receive feedback on our proposed data collection process.

What's Needed to Measure the Value of Ecosystem Services?

We will develop a survey questionnaire to estimate willingness to pay for restoration programs that produce ecosystem services.

To develop the survey questionnaire we need to be able to accurately describe these elements.

- Which ecosystem services are supported by grasslands and drylands?
- What is affecting the production of ecosystem services?
- Which management options can be used improve or increase the production of ecosystem services?
- How do management actions work (how much of each ecosystem service will be produced)?

Examples of Ecosystem Services Supported by Drylands and Grasslands

- ✓ Livestock forage
- ✓ Wildlife forage
- ✓ Wildlife habitat
- ✓ Endangered species (plants and animals)
- ✓ Recreation: hunting, birding, wildlife viewing, hiking, biking, horseback riding, etc.
- ✓ Carbon sequestration
- ✓ Watershed protection

Some of the Issues Affecting Services in Drylands & Grasslands







- ✓ Invasive plant species
- ✓ Wildfires
- ✓ Woody encroachment of trees and shrubs into sagebrush
- ✓ Loss or deterioration of wildlife habitat and habitat fragmentation from roads and other development
- ✓ Climate change

Potential Tools for Management of Drylands and Grasslands

- ✓ Targeted or prescribed grazing – using foraging animals to manage vegetation
- ✓ Prescribed burning – using controlled fire to remove undesirable vegetation
- ✓ Vegetation treatments:
 - Manual removal of non-native, woody, or other undesirable vegetation
 - Removal of vegetation via chemical herbicides
- ✓ Planting or seeding native or other desirable vegetation

Study Approach

1. Identify important grassland and dryland services with help from ecologists and land managers
2. Survey households for demographic information, recreation experiences, knowledge of grasslands and drylands, their willingness to pay for grassland ecosystem services
3. Choice experiment with grassland attributes in survey (see example)

	Option A Intensive restoration	Option B Moderate restoration	Option C No restoration
 Acres of grasslands treated with prescribed burning	1,000	250	0
 Acres of grasslands treated with fast-growing, non-native plants	750	0	0
 Acres of grasslands treated with brush removal	750	500	0
 Acres of livestock forage in improved condition	1,000	750	-250
 Greater sage grouse leks (or nesting success)	40% increase	20% increase	10% decrease
 Mule deer population	20% increase	10% increase	20% decrease
Your household's annual cost for each of the next 10 years:	for Option A: \$300	for Option B: \$150	for Option C: \$0
1. Select Your Single <u>Most</u> Preferred Option:	Option A <input type="checkbox"/>	Option B <input type="checkbox"/>	Option C <input type="checkbox"/>
2. Select Your Single <u>Least</u> Preferred Option:	Option A <input type="checkbox"/>	Option B <input type="checkbox"/>	Option C <input type="checkbox"/>

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