

***GBILM Pilot Prospectus:  
Investigating Questions to Assess & Monitor the Ecosystem Drivers of  
Land Treatments***

**Assessment of Land Treatments to Understand Vegetation and Wildlife Habitat Trajectories in the Great Basin**

In the Great Basin, state and federal land management agencies actively manipulate vegetation for purposes of livestock forage, wildlife habitat, invasive plant control, fuel reduction, post-fire stabilization and rehabilitation, and other needs. The spatial scale of land treatments vary from several acres to several thousand acres, but cumulatively represent a considerable portion of grassland and shrubland communities, particularly in the sagebrush biome. Federal mandates (e.g., FLPMA, NEPA) require land managers to evaluate and monitor the effects of their actions, including land treatments. Additionally, such monitoring informs future actions through adaptive management principles. However, few guidelines exist for collection of standardized monitoring data (e.g., methods, sample sizes, frequency and extent of sampling) and these data have not been used to understand the influence of land treatments on vegetation and habitat trajectories at broad spatial scales. This information is needed to justify land treatment practices, improve implementation and monitoring of land treatments, evaluate the cumulative effects of land treatments on plant communities, wildlife habitats and habitat connectivity, and predict future conditions of vegetation and wildlife habitats across the Great Basin.

This project is designed to assess the spatial characteristics (location, size, shape, landscape configuration), treatment characteristics (type of treatment, seed mixtures, application), and monitoring approaches of different land treatments to provide the foundation for developing monitoring strategies to determine the trends in vegetation and wildlife habitat conditions in the Great Basin. Monitoring data will ultimately guide adaptive land management for maintaining or improving wildlife habitats for sustainable populations.

**Key Management Question Addressed by this Project**

Are different land treatments moving vegetation communities toward desired conditions and how are these land treatments cumulatively influencing vegetation and wildlife habitats in the Great Basin?

How and where can land managers use land treatments for multiple objectives, including maintaining and restoring wildlife habitat and associated wildlife?

**Associated Questions**

1. What land treatments have been conducted across the Great Basin since the 1950s?
2. What are the characteristics of these treatments, such as goals, when implemented, seed mixtures, applications, monitoring, etc?

3. Where are the treatments placed on the landscape?
4. How does the location, size, shape, and landscape configuration of land treatments influence wildlife habitat quantity, quality, and connectivity?
5. What changes in land treatment monitoring practices are needed to improve evaluation of treatment success and to assess trends in vegetation and habitat conditions into the future?
6. How can land treatment monitoring be used to understand effects of climate change and anthropogenic stressors in the Great Basin?

### **Project Approach**

#### Phase 1: Assessment (Questions 1-3)

- a. Create a database suitable for storing relevant treatment information. This database will be designed to encourage addition of new treatments each year and to be useful to managers for tracking treatments.
- b. Acquire and compile existing data on land treatments for the Great Basin from 1950 to present.
- c. Describe spatial patterns at multiple scales by producing simple maps illustrating general land treatment type and year of implementation.

#### Phase 2: Prediction (Questions 4)

- a. Develop analysis tools and analyze data from phase 1 to develop predictive models that estimate effects of land treatments at various scales on wildlife habitats, particularly for sage grouse and other high profile species.
- b. Coordinate and integrate these analyses with those being conducted for fire and invasive interactions across the Great Basin to assess cumulative effects and interactions on habitats.

#### Phase 3: Future Monitoring (Questions 5-6)

- a. Develop guidelines and strategies for monitoring land treatments in the future.
- b. Evaluate monitoring findings against predictions to refine/modify models and provide information on vegetation trends in the Great Basin.

### **Expected Products**

Spatial data linked to treatment information in an accessible database, maps of land treatments across broad areas of the Great Basin, a white paper on monitoring approaches in the Sagebrush Biome as a result of monitoring workshop, and a manuscript evaluating the effects of land treatments on sagebrush habitat connectivity.

### **Project Milestones**

<b>Month/Year</b>	<b>Milestone</b>
Jan 2007	Identify project personnel
Feb 2007	Develop study plan
Mar 2007	Design and create database
Mar – Aug 2007	Acquire and compile data; complete phase 1
Sep 2007	Conduct analyses for phase 2
Oct 2007 – Mar 2008	Interpret results of phase 2, develop initial manuscript

Mar – Jul 2008	Host workshop on monitoring strategies for the Sagebrush Biome, develop white paper from this workshop
Aug – Sep 2008	Complete final products (maps, manuscripts, management recommendations)

### **Data Requirements**

- a. Land treatment data including location, objectives, seed mixture, and application. Consultation with range managers will be needed for historic land treatments.
- b. Treatment monitoring information, including method, sample size, frequency and extent of sampling, existence of permanent plot markers, and data availability/storage.
- c. Spatial data, including polygons of treatment areas. Some treatment perimeters will be digitized from existing maps, others may need to be generated in the field.
- d. General landscape data, such as vegetation cover maps, digital elevation models, and fire perimeters are available through SAGEMAP
- e. Wildlife data are available from SAGEMAP and other sources.

### **Research Team**

- Lead PI: David Pilliod (FRESC)
- Advisory PIs: Dave Pyke (FRESC), Steve Knick (FRESC), Mark Miller (SBSC)

### **Coordination with Other Similar Research and Monitoring Efforts**

- This project will be extended to the entire sagebrush biome outside of the Great Basin through funding from the USGS Sagebrush Ecosystem Coordinated Research Project
- Coordinate with other database efforts, such as the Emergency Stabilization and Rehabilitation database (Pyke-FRESC), Sage Grouse Population database (Finn-FRESC), and Range Improvements Database (BLM)
- Coordinate with Habitat Assessment Framework for Sage Grouse (Commons-Kemner – IDFG/WAFWA)
- Coordinate with other monitoring efforts, such as Great Basin Restoration Initiative (Pellant – BLM) and National Park Service Inventory and Monitoring Network