

## Forest and Rangeland Ecosystem Science Center

# Research Brief for Resource Managers

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## Integrating Weed Control and Restoration of Great Basin Rangelands

A major problem confronting the Great Basin is the loss of native rangelands. There are a number of causes, of which some are more speculative or controversial than others, but two factors are acknowledged almost universally to be implicated. First is the invasion of exotic weeds such as cheatgrass (*Bromus tectorum*), and second is wildfire.

### Vicious Cycle

A common scenario is for a fire to occur, and secondarily, cheatgrass invades. A vicious cycle is then in place in which cheatgrass provides continuous fine fuels that feed subsequent fires, destroying more native rangelands and further facilitating the spread of exotic weeds. Another scenario begins with a cheatgrass invasion, followed by fire, and continuing in the same vicious cycle. Either way, there is little potential at present for disruption of the cycle and a return to a native community of plants and animals. Furthermore, the landscape in which this occurs becomes susceptible to the invasion of secondary weeds such as knapweed (*Centaurea* sp.), yellow starthistle (*Centaurea solstitialis*), and medusahead (*Taeniatherum caput-medusae*).

To break the cycle, it is essential to figure out how to control cheatgrass. Competitiveness and prolific seed production allow cheatgrass to invade both disturbed and intact native communities and to dominate after wildfire. Thus, efforts to control cheatgrass need to focus on these biological characteristics, while simultaneously restoring native plants on Great Basin rangelands.



Representation of the cycle in which native rangeland (top) burns or is invaded by cheatgrass, and converts to a cheatgrass-dominated grassland (right). A cycle is then perpetuated involving fire and cheatgrass.

### Research to Address the Issue

Naturally the devil is in the details, and figuring out how to control cheatgrass is difficult. The U.S. Geological Survey (USGS) and a variety of agency and university partners have designed an integrated study to begin to unravel the details. The partners are from various affected states and have agreed to combine expertise and share resources in an interdisciplinary effort involving research, education, and extension. The

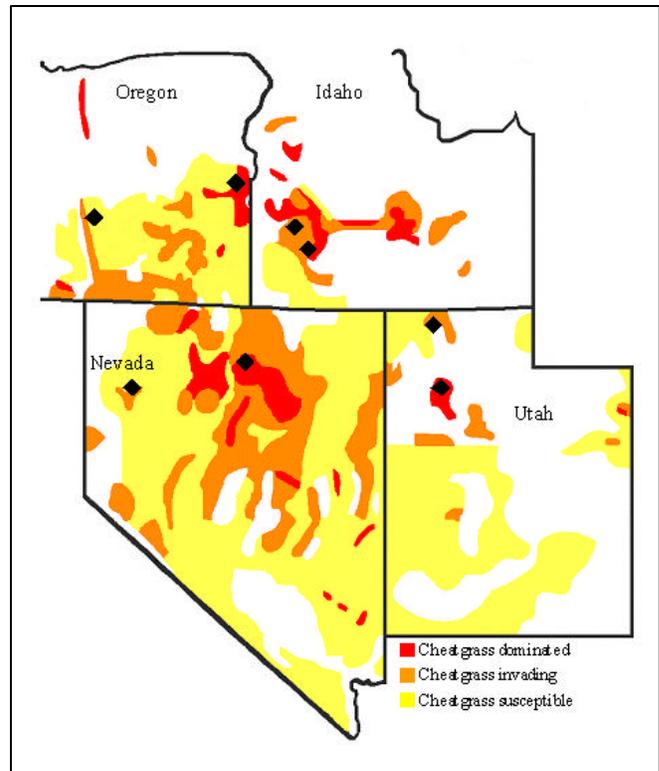
#### Partners

University of Nevada, Reno and Nevada Agricultural Experiment Station (lead institutions)  
U.S. Department of the Interior, Geological Survey, Forest and Rangeland Ecosystem Science Center  
U.S. Department of the Interior, Bureau of Land Management, Idaho, Nevada, Oregon and Utah State Offices  
U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station  
U.S. Department of Agriculture, Agricultural Research Service Oregon State University  
U.S. Department of Agriculture, Natural Resources Conservation Service, Plant Materials Centers  
Utah State University

common goal is to identify concepts and management strategies to control the spreading dominance of cheatgrass and other weeds on Great Basin rangelands and to restore native species and increase biodiversity. Five specific objectives will be accomplished toward this goal.

## Research Objectives

1. Conduct a series of common experiments across the Great Basin that test management techniques for controlling cheatgrass and other weeds, establishing native plant communities, and restoring ecosystem structure and function while reducing the cost of restoration.
2. Provide an ecological understanding of why restoration techniques either succeed or fail.
3. Develop conceptual and economic bases for choosing appropriate management techniques.
4. Use partnerships among governmental agencies, universities, cooperative extension services, and land managers to convey knowledge to ranchers and other professionals.
5. Use partnerships with educators to increase student and public awareness of invasive species issues and to develop educational tools that convey solutions to invasive species and native plant restoration problems.



The geographic context of the research includes the western states of Oregon, Idaho, Nevada, and Utah.

## Management Benefits

Techniques that will control cheatgrass, as well as secondary noxious weeds.

Cost savings for fire-fighting efforts and post-fire rehabilitation efforts.

Reduced loss of native habitat, which ultimately benefits all native plants and animals, for example sage grouse and golden eagles.

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Check the Web for additional information about the USGS Forest and Rangeland Ecosystem Science Center at <http://fresc.usgs.gov/>.