SageSTEP News

Sagebrush Steppe Treatment Evaluation Project

Issue 3, Spring 2007

New SageSTEP Study Sites Added for 2007 Field Season

SageSTEP researchers are pleased to announce the addition of one new site and one proposed site to the SageSTEP network for the 2007 field season (see map on p. 2). Both sites are part of the study of sagebrush communities threatened by cheatgrass invasion. This study is looking at how fuels treatments (prescribed fire, mechanical thinning, and herbicide application) affect these communities and what amount of native perennial bunchgrasses needs to be present in the understory in order for managers to improve land health without risking invasion of exotic annual grasses, such as cheatgrass, and having to conduct expensive restoration, such as reseeding of native grasses.

Securing appropriate sites for this part of the study has been difficult because there are not a lot of areas of sufficient size that are both healthy (i.e. have a strong and diverse native perennial bunchgrass understory) *and* experiencing some level of cheatgrass invasion. Additionally, because SageSTEP treatments involve the removal of sagebrush, many managers are hesitant to participate for fear of a complete cheatgrass invasion. Researchers and managers are hopeful that the results of this study will provide information that will help managers decide which areas can be safely treated without the need for additional follow-up restoration and whether the response depends on the type of fuels treatment.

("New Sites" continued on **page 2**)

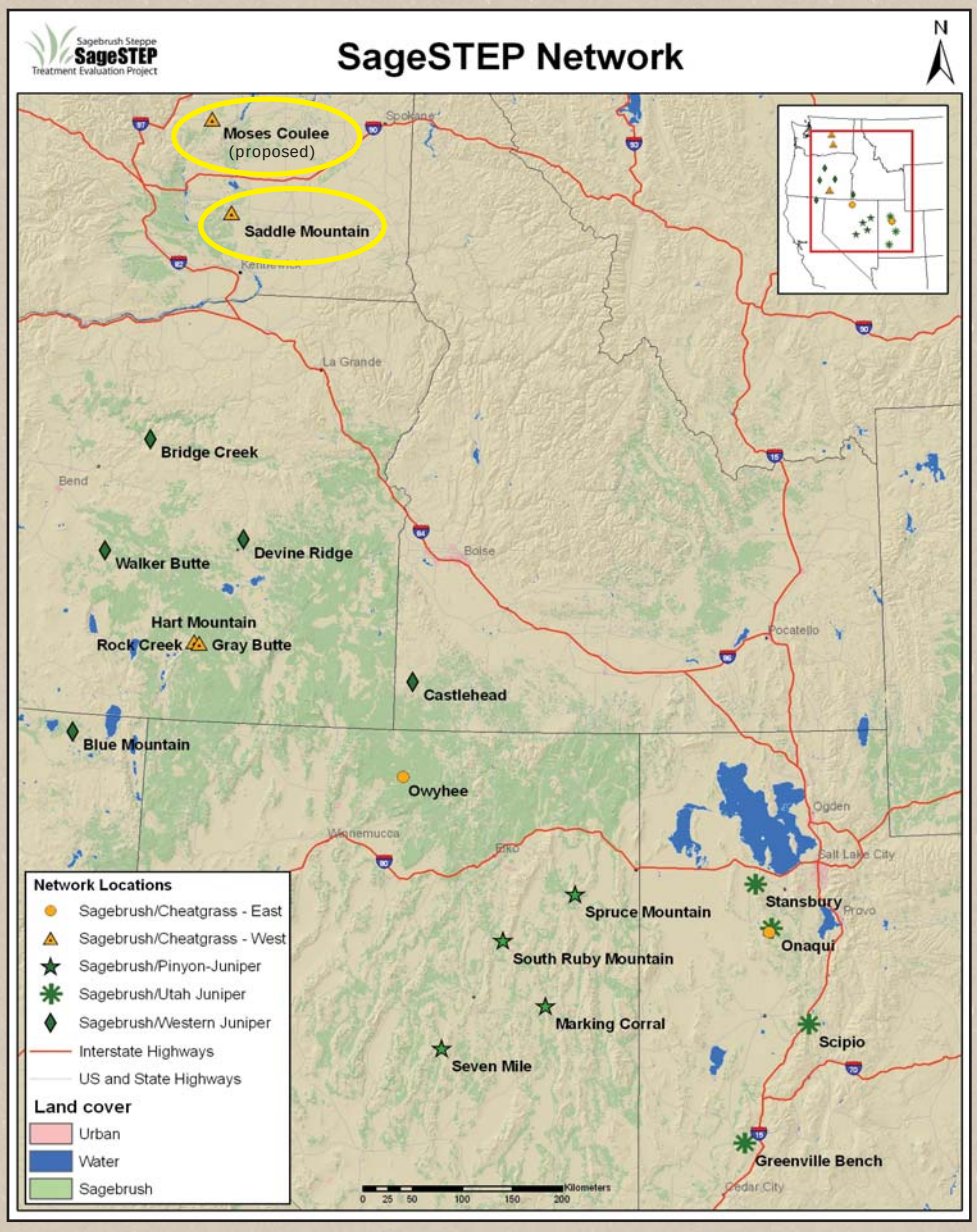
Cheatgrass moving into a disturbed sagebrush community.

In this issue:

Please send questions or comments on this newsletter to summer.c.olsen@usu.edu.

Sagebrush Steppe SageSTEP Treatment Evaluation Project

www.sagestep.org



SageSTEP Network Map: Locations of all SageSTEP study sites as of April 2007 (new and proposed sites are circled in yellow).

Typical landscape view of a study plot at a sagebrush/cheatgrass site

("New Sites" continued from **page 1**)

The new and proposed sites are located in central Washington and are part of the SageSTEP sagebrush/cheatgrass west region. Saddle Mountain is a new site on U.S. Bureau of Reclamation lands north-northwest of the Columbia River in Grant County, and Moses Coulee is a proposed site on the Moses Coulee Preserve owned by The Nature Conservancy. Treatments on the Saddle Mountain site will be carried out by the U.S. Fish and Wildlife service who manage similar lands in the region and who are concerned with the potential loss of wildlife habitat from future fires. Details on the application of treatments on the Moses Coulee site are still being negotiated.

Fuels treatments at these sites are planned for this fall, and post-treatment data collection will begin in the summer of 2008. Researchers are excited to have these important additions to the SageSTEP network and appreciate the efforts everyone involved in making this happen.

For more information about these and other SageSTEP sites, including site location maps, go to www.sagestep.org/locations.html and click on the site name.

Socio-political Team Offers Preliminary Findings

The SageSTEP socio-political team has completed its first phase of data-gathering and can now offer preliminary results of our work on factors that affect public acceptance of treatments to restore Great Basin sagebrush ecosystems.

Any land management option can be controversial. Even if science suggests that an action can benefit the land, resistance from citizens' groups can make it difficult to take such actions wherever they might be beneficial. Therefore we gathered information that can help managers understand perceptions of key stakeholders and the general public regarding sagebrush ecosystem management and restoration.

The first round of socio-political research had two components. We mailed surveys to randomly selected households in six different parts of the Great Basin: the cities of Boise, Reno, and Salt Lake City, and rural areas in Elko and White Pine counties, Nevada; Lake and Harney counties, Oregon; and Beaver and Millard counties, Utah. Responses were received from 1,345 persons. Meanwhile, in a concurrent study we conducted and qualitatively analyzed results of 31 interviews with members of key stakeholder groups and with land managers themselves.

The surveys found that overall, Great Basin citizens believe their region's environment is moderately healthy. However, they do recognize threats to sagebrush ecosystems, especially from development, invasive species, OHVs, impacts to riparian systems, overgrazing, and wildfire. Public acceptance is high for managing rangeland conditions via prescribed fire, grazing, thinning, or mowing but less so with herbicides.

However, responses indicated citizens are not convinced that federal agencies are able to implement these practices successfully. They are skeptical of some information provided by agencies, believe local agency personnel are handicapped by national constraints, and feel local priorities should receive more consideration in decision-making than they do. Numerous differences were found between beliefs of urban and rural residents, most notably regarding perceived threats to rangelands; opinions about the proper balance between environmental and economic priorities; emphasis that should be given to local priorities; and levels of understanding of issues and conditions.

A summary of results of the citizen surveys can be found on the SageSTEP website at http://www.sagestep.org/progress/social.html.

The key informant interviews revealed similar themes. We spoke with active participants in range management and policy activities in four categories: recreationists, ranching and livestock industry; environmental groups; and education/extension. We also interviewed some public land managers to see if their perceptions matched those of citizen stakeholders.

Great Basin residents tend to prefer prescribed fire as a management treatment as proposed to herbicide use.

Again, we found high recognition among the stakeholder groups of threats to sagebrush ecosystems and solid support for the concept of sagebrush steppe restoration in principle. Most interviewees see a place for any restoration method in the manager's "toolkit" though a few expressed misgivings about herbicide and mechanical shredding ("Bullhog") treatments. But again, interviewees clearly expressed concerns about the capacity of the land management agencies to make it happen. Among the issues raised by interviewees were concerns about: levels of funding available, ability to keep pace with increasing wildfire and invasion processes, interference from political forces both in constituency groups and in Washington, D.C., and agency willingness to incorporate local knowledge and concerns into planning for restoration treatments.

Agency respondents indicated many of the same feelings about threats to sagebrush ecosystems and potential impediments to successful restoration, although they expressed greater confidence in the management agencies' ability to achieve restoration goals. Another difference between managers'

("Sociopolitical Findings" continued on **page 5**)

SageSTEP Economics Research

Benefits to Society of Ecosystem Services: The SageSTEP Project Contribution to Theory and Methods for Measuring Ecosystem Values in the Great Basin

SageSTEP economists are working to identify and measure benefits to society from the reduction in the risk of conversion of Great Basin sagebrush ecosystems threatened by invasion of non-native plants and woodland encroachment. The management treatments being tested in SageSTEP are intended to reduce the risk of conversion, and costs of implementing treatments can be compared to the benefits that are generated. The economics study includes components that capture ranch level and regional economic impacts to society that can be estimated using associated market-valued prices, as well as components that measure non-market ecosystem values that accrue to members of society within and beyond the boundaries of the Great Basin.

Part of the economics study is looking at goods and services produced by ecosystems that do not have a dollar value.

Ecosystems can be viewed as assets that produce "goods and services" that are important to society. Great Basin ecosystem services include clean air and water, wildlife and wildlife habitat, livestock forage, hunting and other recreation opportunities, and scenic beauty. We may not pay a market-valued price for these services directly as we use them, but when they are compromised, society bears economic costs. For example, the costs to society of increased wildfires associated with degraded Great Basin sagebrush ecosystems relative to healthy ecosystems are measurable in terms of the costs of fighting fire, replacing fire damaged infrastructure, higher incidence of respiratory problems, and reduced recreational opportunities.

Many impacts to ecosystem goods and services can be valued in dollar units either directly or indirectly. For example, costs of decreased air quality from wildfires is measurable from the statistical increase in the probability of respiratory incidents multiplied by the health cost of treatment. However, there are many environmental impacts that are not so easily measured with this type of data. These non-market environmental values include the benefits to society of preserving endangered species, protecting cultural heritage features of the landscape, and preserving ecological integrity for the enjoyment of future generations, and their value to society is measured using non-market valuation.

Environmental economists have developed methods over the last 50 years to measure non-market environmental values in order to provide a mechanism to incorporate these into economic and political decision-making. Non-market values are classified into categories that describe how they affect welfare of individuals in society including consumptive use values, non-consumptive use values, non-use existence values, and option values.

A full accounting of the net benefits of land management treatments to society must include both market and non-market values. One part of SageSTEP's economic component is to measure non-market values associated with Great Basin environmental values which are affected by ecosystem changes. This research is contributing to the advancement of the basic science of non-market valuation. One of these advancements is in modeling how uncertainty over long-term outcomes (i.e. whether or not the investment in treatments has prevented ecosystem losses) affects people's willingness to make the investment.

Another advancement is in characterizing goods and services in bundles associated with different ecological phases. This approach is useful where multiple goods and services are produced jointly and where it is difficult for people to attempt to separate their values for individual environmental attributes. It also allows for development of bionomic models (economic models that use biological simulation models to predict how goods and services are generated) that optimize net benefits over choices of land use actions.

A third advancement is the development of unit-specific "benefits measures" in relation to the

("Economics Research" continued on **page 5**)

("Economics Research" continued from **page 4**)

economic optimization models being developed in other parts of the economics study. One of these is the livestock sector optimization model (more details below). A second is a model in which benefits and costs to several sectors (including livestock) are considered simultaneously at the social planning level for deciding where and when to apply treatments.

SageSTEP economic research includes the first comprehensive ecosystem valuation project associated with the Great Basin to date. We anticipate that the results will have implications far beyond the SageSTEP alone. Because so little work has been done to quantify environmental values in the Great Basin, the work is being conducted in a way so as to be generalized to other applications in which similar valuations are desirable.

The SageSTEP economics team includes Kim Rollins and Tom Harris of the University of Nevada, Reno (krollins@cabnr.unr.edu, harris@cabnr.unr.edu) John Tanaka of Oregon State (john.tanaka@oregonstate.edu), Neil Rimbey of the University of Idaho (nrimbey@uidaho.edu), and their research assistants.

Modeling Economic Impacts on Ranching

Cattle grazing near one of the SageSTEP sagebrush/cheatgrass study sites.

SageSTEP economists John Tanaka, Neil Rimbey, and research assistant Ana Maher are developing models to evaluate the economic impacts of the SageSTEP treatments on ranches. Their approach has been to model the within-year management of the ecosystem and the biological and business aspects of the ranch and use the ending point of one year as the starting point for the next year. This model can run for any number of years in order to evaluate long-term changes in profit.

The first step in the modeling process is to define the operation being modeled. This includes adapting ranch economic budgets (i.e., costs and returns) and typical production practices (i.e., herd and pasture management) to each region of the project. Second is testing the model to ensure that it behaves properly. Once the model responds logically, management practices can be varied within the model in order to determine the resulting impact.

Two kinds of information can be derived from this modeling approach: 1) information for the producer regarding the impact that public land management and policy changes can have on their operation and potential alternatives for them to consider as they adapt to those changes; 2) information for public land managers about the impact of various ecological scenarios on their users.

The ranch models being developed can potentially answer other questions as well. One issue is how livestock management should or could change as different environmental values become apparent. If environmental responses to the SageSTEP treatments are defined and either market or non-market values can be placed on those responses, then this model should be able to account for how that affects the resource allocations within the ranch operation. Economists would also like to be able to incorporate various sources of risk into the model, including risks associated with cattle prices, rainfall, and the increase in fire frequency that occurs with the crossing of important ecological thresholds.

("Sociopolitical Findings" continued from **page 3**)

and stakeholders' views pertained to the scale of management action, with stakeholders preferring smaller "targeted" treatments while managers advocate larger landscape-scale projects. This suggests that if citizens first see success in treatments to local problem areas, they may be more likely to support broad-scale applications.

The socio-political team consists of scientists Mark Brunson of Utah State University (Mark.Brunson@usu.edu), who led the interview study, and Bruce Shindler of Oregon State (Bruce.Shindler@oregonstate.edu), who directed the public survey, along with doctoral research assistants Ryan Gordon at Oregon State and Jennifer Peterson at Utah State.

SageSTEP Manager Workshops

This spring and summer, SageSTEP researchers and managers at our partner offices will get together for the first annual SageSTEP Manager Workshops to share ideas and information about the progress of the project. The focus of this year's workshops will be "Lessons Learned". Objectives of the workshops include the following:

- Examine our experience of working together and see what we have learned about our respective operating procedures and what is needed for a smooth interchange.
- Consider the progress of the SageSTEP experiment so far—what has been done by whom, what remains to be done, and who can help.
- Discuss what we have learned scientifically from siting the experiment, the baseline data collection, and initial installation.
- Discuss what the various participants would like to gain from this collaboration and how the experiments and their results can be made most useful to us individually and collectively.

SageSTEP researchers and federal employees on a field tour of the Devine Ridge woodland site in fall 2006.

Each workshop will include a half-day session at a cooperating BLM field office for presentations and discussions and a half-day field trip to one of the SageSTEP sites where treatments have been implemented. BLM and Forest Service personnel, the research team, permittees, and other interested parties are invited. We hope to make these workshops an annual event where researchers and managers can share information. For more information about these workshops contact Nora_Devoe@nv.blm.gov.

Utah SageSTEP Manager Workshop
April 24-25, 2007
BLM Salt Lake Field Office and Onaqui Research Site

Nevada SageSTEP Manager Workshop
July 16-17, 2007
Bristlecone Convention Center, Ely, NV, and Marking Corral Research Site

Nevada and Idaho BLM Spring Fire Meetings

SageSTEP researchers also look forward to presenting at the Nevada and Idaho Bureau of Land Management Spring Fire Meetings.

Nevada Meeting Presentation

When: April 19, 2007, 1:30-2:00pm

Where: Winnemucca Conference Center

Presenters: Robin Tausch & Travis Miller, SageSTEP update focusing on Nevada woodland sites

Idaho Meeting Presentation

When: April 20, 2007, 9:00-10:00am

Where: BLM Idaho State Office, Boise, ID

Presenter: Steve Knick, SageSTEP overview and update

Recent and Upcoming Events

Watch for members of the SageSTEP research team presenting at the following upcoming meetings:

Eastern Nevada Landscape Coalition Annual Summer Workshop
Ely, NV, June 15-16, 2007
www.envlc.org

Owyhee Watershed Council Meeting
Marsing, Idaho,
Summer 2007 (date TBA)

Restoring the West Conference 2007
Sagebrush Steppe Restoration
Utah State University, Logan, UT, Sept. 18-20, 2007
www.restoringthewest.org/

2007 Society for Ecological Restoration Northwest Chapter and Pacific Northwest Society of Wetland Scientists Joint Conference
Yakima, WA, September 25-28, 2007
www.ser.org/sernw/conference_07.asp

You may have also spotted members of the SageSTEP research team presenting at the Society for Range Management 2007 Annual Meeting in Reno in February, the 2nd Fire Behavior and Fuels Conference in Florida in March, or last week at the Joint Annual Meeting of the Oregon & Washington Chapters of The Wildlife Society in Pendelton, Oregon.

SageSTEP is a collaborative effort among the following agencies and universities:

- Brigham Young University
- Oregon State University
- University of Idaho
- University of Nevada, Reno
- Utah State University
- Bureau of Land Management
- Bureau of Reclamation
- USDA Forest Service
- USDA Agricultural Research Service
- US Geological Survey
- US Fish & Wildlife Service
- The Nature Conservancy

Funded by:

Joint Fire Science Program

For more information and updates, visit our website:

www.sagestep.org