

## Wildfire Rips Through Stansbury Study Site

On Thursday August 6, a wildfire consumed the SageSTEP Stansbury study plots located on the west side of the Stansbury Mountains on land managed by the USDA Forest Service. The Big Pole fire was started by a lightning strike and consumed most of the west-facing side of the mountains, including thousands of acres of BLM, private, and state land. The fire burned nearly 44,000 acres before it was fully contained on August 16. Additional information about the fire can be found at [www.utahfireinfo.gov/fire/west\\_desert/big\\_pole.htm](http://www.utahfireinfo.gov/fire/west_desert/big_pole.htm).

The four study plots were 12.5 acres each and were treated in 2007 with prescribed fire, mechanical

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SageSTEP dataloggers, used to collect soil moisture and temperature information, located in the tree mastication plot. Surprisingly, the dataloggers in the prescribed burn plot survived the wildfire and are operational, possibly due to the decrease in fuel load that resulted from the prescribed burn conducted in 2007.

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# Do Large Wildfires Change People's Beliefs About Fuels Treatments?

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Fire and fuels managers sometimes face public opposition to management actions that reduce the risk of catastrophic wildfire on public lands. The reason isn't that citizens want fire hazard to be high. Nor is it ignorance about how a buildup of fuels increases wildfire risk. Social scientists believe that when citizens weigh the pros and cons of fuels treatments, the immediate negative effects on scenery, recreation, wildlife or other values can be more "real" than the more hypothetical positive benefit that *might be* realized if a wildfire that will occur *at some point in the future* is less damaging than the fire that *could occur* if no action were taken.

If so, then it seems reasonable that opposition to fuels treatments—especially prescribed burning, since that tends to be most controversial—should be reduced when citizens are reminded of the real costs of wildfire. SageSTEP had a rare opportunity to test that hypothesis in the wake of a catastrophic wildfire in southwestern Utah in July 2007.

The Milford Flat fire was the largest in Utah's recorded history at more than 360,000 acres. Ignited by lightning in Beaver County, it quickly spread northeastward into Millard County. Two motorcyclists died in a collision that occurred when smoke engulfed Interstate 15, and losses to ranchers were estimated at nearly 400 head of livestock killed plus \$6.1 million in stored feed and infrastructure costs. Post-fire rehabilitation response was rapid as the Cedar City and Fillmore BLM field offices worked closely with an interagency coordinating group, Utah Partners for Conservation and Development, to stabilize and rehabilitate more than 200,000 burned acres before the start of the next fire season.

About nine months before the fire, we had surveyed citizens in Beaver and Millard counties as part of a baseline study on beliefs about wildfire hazard and fuels treatments in the Great Basin's three largest cities (Salt Lake

City, Boise, Reno) and in six counties where SageSTEP sites are located (Elko & White Pine, NV; Lake & Harney, OR; Beaver & Millard, UT). To learn how the Milford Flat fire affected wildfire risk perception and acceptability of fuels treatment options, we mailed out new versions of the survey nine months after the fire to everyone in Utah who had participated in the original study—Beaver and Millard counties as well as Salt Lake City. The latter was added because smoke from southwest Utah tends to settle in the Salt Lake valley, and because opinion in the Salt Lake metro area dominates the state political scene. We also surveyed some new respondents in Beaver County, from which relatively few surveys had been received in the original study.

To increase response rates and avoid overburdening repeat respondents, the new survey included only a subset of the original questions. We asked about perceived wildfire

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**Overall...the effects of a catastrophic wildfire on public perceptions of risk were less than anticipated.**

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risk, awareness of specific threats to Great Basin rangelands, and acceptability of fuels reduction options (prescribed fire, herbicide application, and mechanical treatments including felling, shredding,

chaining). Because previous research (Brunson and Evans 2005) had shown that an escaped prescribed burn reduced citizens' trust in federal agencies more than their basic attitudes toward prescribed fire, we repeated questions about confidence in various entities involved in fuels management. Finally we asked specific questions about smoke and damage due to the Milford Flat fire. About 45% of the original respondents completed the second survey.

We found that despite the fire, the majority of respondents who have an opinion believe Great

Basin rangelands are healthy overall (Beaver 64%, Millard 59%, Salt Lake City 62%). In fact, Salt Lake City respondents were more likely to rate the region's rangelands as healthy than they had been a year-and-a-half earlier.

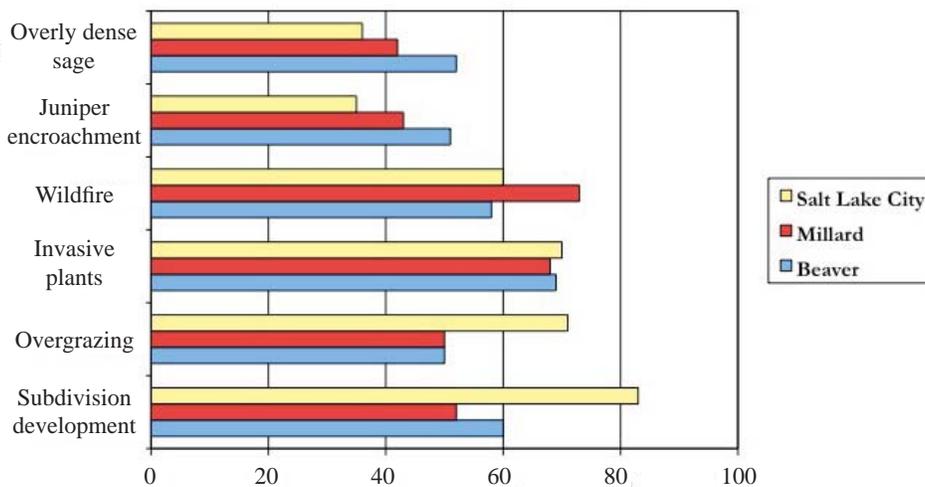
There were almost no differences in beliefs from 2006 to 2008 about the specific threats to those ecosystems. A majority in all three sites agreed that wildfire and invasive plants pose a threat to Great Basin ecosystem health (Fig. 1), but those beliefs did not change as a result of the fire. The only change in risk perception was that Salt Lake City respondents were more likely to rate overgrazing as a threat to Great Basin ecosystems in 2008 than in 2006.

The acceptability of treatment options was stable as well (Fig. 2): Salt Lake City residents were more likely to say prescribed fire is acceptable in some instances, but there was no change in acceptance of the other treatments. Millard and Beaver residents found all five options acceptable while a majority of Salt Lake City respondents believed prescribed burning, juniper cutting and shredding with a Bull Hog® are acceptable under some or all circumstances but chaining and herbicide application are not.

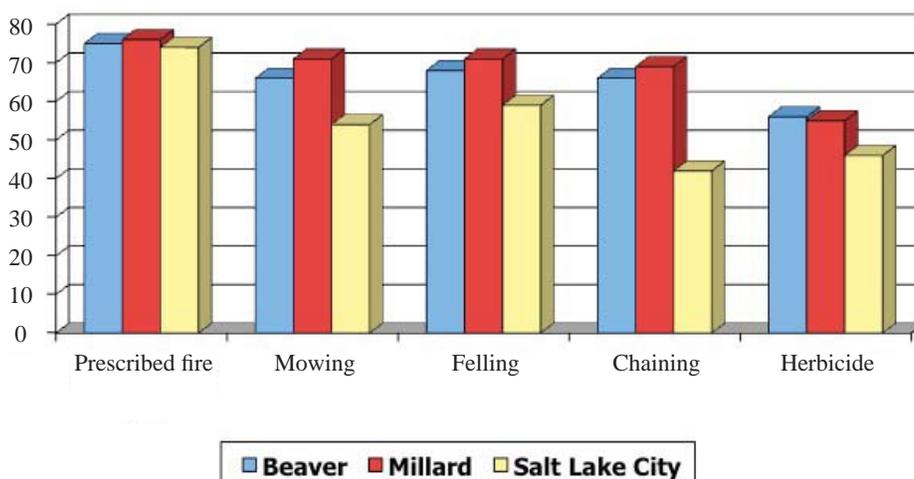
The largest changes we measured were in respondents' confidence in managers, scientists, and educators who play a role in wildfire hazard reduction and rehabilitation. We saw an increase in confidence in the BLM among Salt Lake City residents, increased confidence in state agencies in all locations, increased confidence in university and government scientists in Millard County, and increased confidence in County Extension agents in Salt Lake City. Trust in agencies' ability to use fire as a management tool was highest in Beaver County, where the Cedar City BLM office has an active prescribed burning program. Trust in their ability to use chaining was greatest in Millard County, where the Fillmore BLM has used chaining during post-fire rehabilitation.

Overall, then, the effects of a catastrophic wildfire on public perceptions of risk were less than anticipated. Respondents continued to believe Great Basin rangelands are healthy, and they were no more likely than before to see cheatgrass invasion, juniper encroachment, or even wildfire itself as a threat

**Figure 1. Percentage of 2008 respondents who perceive specific processes or conditions as threats to Great Basin rangelands.**



**Figure 2. Percentage of 2008 respondents rating fuels treatment options as acceptable in some or all circumstances.**



to ecosystem health. Nor did fire increase acceptance of fuels treatment options. Thus our hypothesis was not confirmed.

Why not? One likely factor is that many people see fire as an “act of God”—the result of random chance interacting with suitable environmental conditions. Thus the occurrence of a single wildfire may not be seen as a predictor that more fires will occur; if anything a large fire may be viewed as a once-in-a-lifetime event that *reduces* risk of future fires. A second factor may be that managers and scientists have successfully communicated the message that fire is a natural occurrence in a healthy ecosystem. We now argue that in the Great Basin an increase in wildfires results from *unnatural* conditions, but this distinction

may be lost on most citizens.

Another significant finding from this research was that when agencies respond rapidly and forcefully both during and after a wildfire, citizens gain confidence in the people involved in wildfire and fuels management. Only time will tell if this increase in trust will result in a reduction in public opposition to fuels treatments.

## References

Brunson, M.W., and J. Evans. 2005. Badly burned? Effects of an escaped prescribed burn on social acceptability of wildland fuels treatments. *Journal of Forestry* 103 (April/May): 134-138.

# SageSTEP PowerPoints Online

SageSTEP researchers give numerous presentations and field tours every year that provide information about the progress of the study before it becomes available in printed publications. When possible, these presentations are posted on our website for access by individuals who weren't able to attend the original presentation, or for those who want to review the material. When they are available, audio tracks of the presentation are included with the PowerPoint slides and these presentations can also be downloaded as MP3 Audio or iPOD Video files. Links to past presentations can be found at [www.sagestep.org/past\\_events.html](http://www.sagestep.org/past_events.html).

Presentations from two events from this summer are now available. In June, several of the SageSTEP researchers presented at the *Learning Together Nevada-Idaho Manager Workshop* held in Winnemucca, Nevada. Scientists from various disciplines reported preliminary results and other useful information to managers during the indoor session of the workshop. Presentations with audio are available at [www.sagestep.org/events/nv\\_wkshp\\_2009.html](http://www.sagestep.org/events/nv_wkshp_2009.html).

At the beginning of August, several of the SageSTEP researchers presented at the Ecological Society of America 2009 Annual Meeting as part of an Organized Oral Session entitled *Ecological Knowledge to Enhance Stewardship and Restoration of Sagebrush Steppe Communities*. Presentations covered a wide variety of topics including distribution of avian communities, soil water availability, resilience theory, and more. These presentations are available at [www.sagestep.org/events/esa\\_oos\\_2009](http://www.sagestep.org/events/esa_oos_2009).

We understand that often it is impractical for managers and others who are interested in our work to wait until information is published to start incorporating it into their decisions. We are continually looking for new ways to share information and we welcome ideas and suggestions from interested individuals.



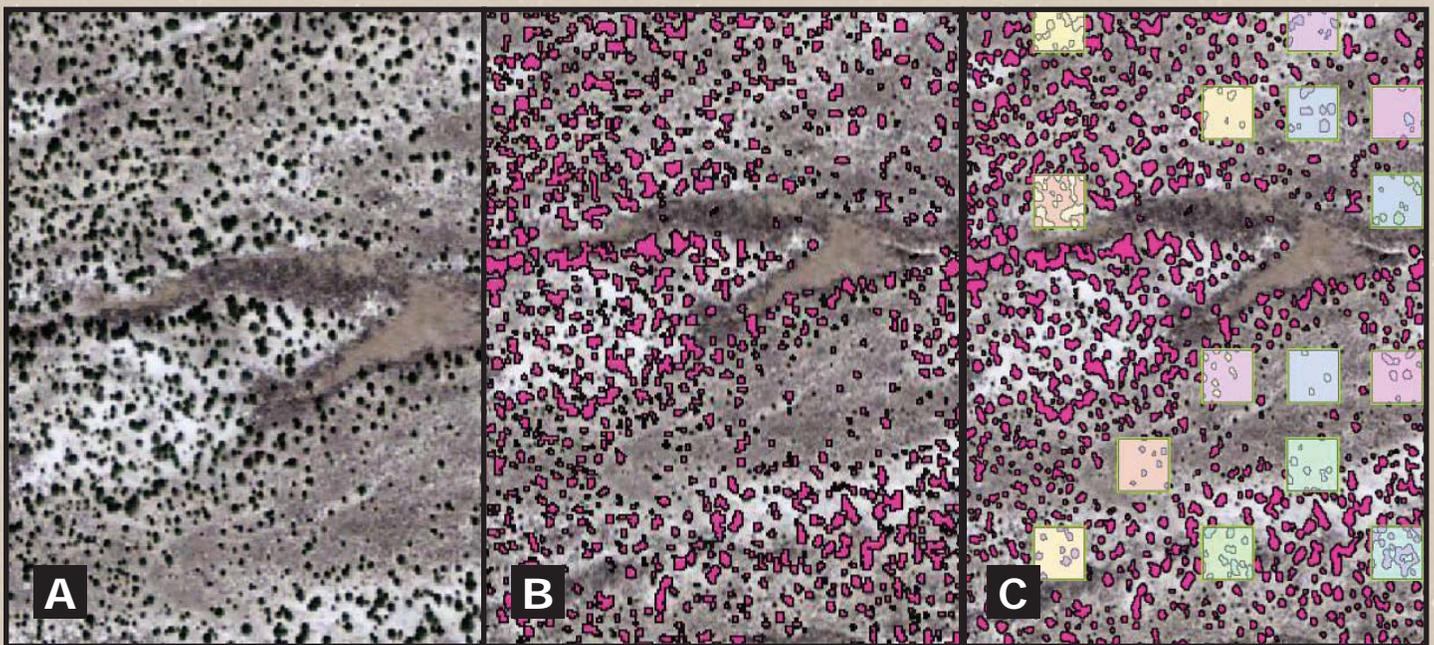
# Using Aerial Imagery to Develop Cost-Effective Rangeland Management Techniques

A new project is underway to help rangeland managers develop more cost-effective and efficient methods of rangeland assessment. Ph.D. candidate April Hulet and other researchers from Brigham Young University and the University of Idaho are quantifying the relationship between fuel loads and vegetation data acquired from remote sensing imagery (RS) and geographic information systems (GIS) with field-based measurements collected as part of the SageSTEP study. Several SageSTEP study sites in Utah, Nevada, Oregon, and California representing different phases of woodland encroachment and fuel reduction treatments are being measured. Researchers are utilizing RS/GIS technologies to develop indicators and methods for rangeland

assessment and monitoring such as tree density and canopy cover, shrub density and canopy cover, and down woody fuel material.

RS/GIS data used in this study include National Agriculture Imagery Program (NAIP) images (2006-2010) with additional imagery collected using fixed-wing manned aircrafts in June 2009. Images were collected at multiple scales using a variety of sensors and wavelength bands (color, color-infrared, hyperspectral, and synthetic aperture radar). By capturing imagery at multiple scales with several sensors, researchers are looking for thresholds at which the resolution of RS/GIS images are accurate enough to use for management purposes and whether information about finer

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Using Feature Analyst (ArcGIS extension) to estimate juniper tree cover on the Onaqui Mountain Range, Tooele Co., UT. Feature Analyst finds features based on user-specified example using color, size, shape, texture, pattern, shadow, and spatial association for feature classification. A) 1-meter NAIP imagery (2006); B) Shapefiles of juniper trees estimated by Feature Analyst; C) Overlay of SageSTEP Onaqui sub-plots. In this example, Feature Analyst over-estimated the total percent tree cover compared to ground control data by an average of 2.4%.

This study is being conducted in collaboration with SageSTEP. A collaborative project is a study outside of the core SageSTEP study that takes place on or in relation to one or more of the SageSTEP study plots. More information about current collaborative projects and how to submit proposals can be found at [www.sagestep.org/collaborative\\_projects.html](http://www.sagestep.org/collaborative_projects.html).

("Aerial Imagery" continued from **page 5**)

fuels and vegetation can be estimated from information about larger fuels and vegetation. Additionally, digital elevation data will be included to investigate how terrain shape, elevation, aspect and slope contribute to fuel loads and vegetation differences.

Image processing and statistical analyses are being conducted at the Brigham Young University Geospatial Habitat Analysis Lab. Processing techniques to analyze data include Feature Analyst (ERDAS 9.3), Feature

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**Using RS/GIS data to rapidly and accurately assess fuel loads will help managers evaluate landscapes for fire risk, plan site treatments that will help avoid catastrophic wildfire events, and improve vegetation management...**

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Extraction (ENVI 4.2), Global Mapper, and Definiens Developer (eCognition). Software that is more accessible to land managers (Feature Analyst, Feature Extraction, and Global Mapper) was chosen, as well as software that allows for more detailed analysis of multiband images (Definiens Developer). By applying a variety of image analysis methods, researchers are building multiband images to describe surface fuels and distinct classes and patterns of vegetation structure. Researchers will then develop image-processing approaches that best estimate fuel loads and vegetation attributes before and after fuel treatments in pinyon and juniper communities, specifically for use by land managers.

Using RS/GIS data to rapidly and accurately assess fuel loads will help managers evaluate

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("Wildfire" continued from **page 1**)

treatments (chainsaw cutting and tree mastication) and a control plot. Field crews had collected 2009 vegetation and fuels measurements before the fire started, however crews collecting data for the songbird study had not completed their work for the year at the Stansbury site. Researchers are planning to obtain as much information as possible regarding fire behavior and possible effects of the treatments on the wildfire in order to learn from this unexpected event.

For more information about research at the Stansbury site and photos of burned plots, visit our website at [www.sagestep.org/locations/stansbury.html](http://www.sagestep.org/locations/stansbury.html).



**High resolution imagery (0.2' pixels) of the mechanical treatments on the Onaqui Mountain Range, Tooele, Co., UT collected in June 2009. A) 3-band color; B) Infrared**

landscapes for fire risk, plan site treatments that will help avoid catastrophic wildfire events, and improve vegetation management on broad spatial scales. Rapid assessment methods will also allow managers to strategically select stands for fuel reduction treatments and predict effects on fuel loads and vegetation response following management treatments.

Results from this study should be available in the fall of 2010. Findings will be presented at scientific and professional meetings in conjunction with publications in both rangeland focused and landscape/remote sensing journals. For more information on this project email April Hulet at [huletapril@hotmail.com](mailto:huletapril@hotmail.com).

# Restoring the West Conference 2009 Will Focus on the Great Basin

The theme for this year's 'Restoring the West' Conference is the sustainability of Great Basin landscapes from peaks to valleys, with an emphasis on forest, sagebrush steppe, and riparian ecosystems. Unifying themes include the causes and consequences of historic changes in community composition and structure, the effects of ongoing climate change, the importance of the water cycle or ecohydrology, and wildlife considerations. Several of the SageSTEP researchers will be presenting at the conference on topics ranging from invasive species to fire regimes to social aspects of restoration.

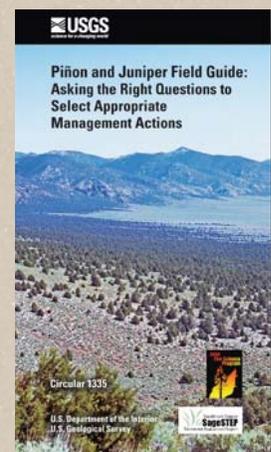
This conference will explore innovative restoration and management approaches for Great Basin landscapes in the face of climate change, rapidly growing human populations, limited water resources, increases in invasive species, and altered fire regimes. Maintaining these ecosystems and communities requires management approaches that use larger spatial scales and longer time scales than in the past and that incorporate economic and social considerations.

The conference will take place at the Eccles Conference Center on the Utah State University campus in Logan over two full days (October 27-28, 2009) and will include numerous general session speakers focusing on science and management, an interactive panel discussion, a poster session, and an evening social. More information can be found at [www.restoringthewest.org](http://www.restoringthewest.org).



## Piñon-Juniper Field Guide Copies Available

A new publication, *Piñon and Juniper Field Guide: Asking the Right Questions to Select Appropriate Management Actions*. Produced by SageSTEP and the US Geological Survey, this guide helps biologists and land managers consider how to look at expansion of woodlands and determine what questions to ask to develop a management strategy, including prescribed fire or other practices. The publication is available online at <http://pubs.usgs.gov/circ/1335/>, and hard copies can be ordered by sending an email to [summer.c.olsen@usu.edu](mailto:summer.c.olsen@usu.edu).



# Upcoming Events

**Ecologically Based Invasive Plant Management (EBIPM) Field School**  
September 16-17, 2009  
Mitchell, Oregon  
[www.ebipm.org/content/1070](http://www.ebipm.org/content/1070)

**Restoring the West Conference 2009 Peaks to Valleys: Innovative Land Management for the Great Basin**  
October 27-28, 2009  
Utah State University, Logan, Utah  
[www.restoringthewest.org/Home.cfm](http://www.restoringthewest.org/Home.cfm)

**Soil Science Society of America Footprints in the Landscape: Sustainability through Plant and Soil Sciences**  
November 1-5, 2009  
Pittsburgh, PA  
[www.acsmeetings.org](http://www.acsmeetings.org)

**Utah SRM Section 2009 Fall Meeting**  
November 5-6, 2009  
Cedar City, Utah  
[www.usu.edu/range/upcomingevents/meetings.htm](http://www.usu.edu/range/upcomingevents/meetings.htm)

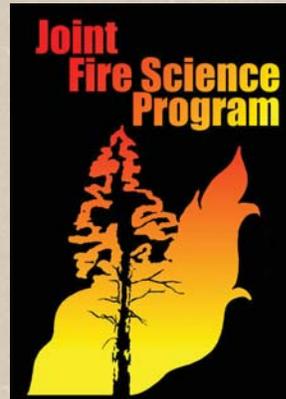
**4th International Fire Ecology and Management Congress**  
November 30-December 4, 2009  
Savannah, Georgia  
[www.fireecology.net/Congress09/Home.html](http://www.fireecology.net/Congress09/Home.html)

**63rd Annual Meeting of the Society for Range Management and the 50th Annual Meeting of the Weed Science Society of America**  
February 7-11, 2010  
Denver, Colorado  
[www.rangelands.org/events.shtml](http://www.rangelands.org/events.shtml)

## **SageSTEP is a collaborative effort among the following organizations:**

- 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:



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**[www.sagestep.org](http://www.sagestep.org)**

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