



February 2008

Post Fire Revegetation in the Arid West Five New Projects Funded in 2007

Background

Vegetation composition and dynamics in the western US have changed substantially over the last 150 years. Native bunchgrass communities and abundance have declined. Sagebrush has shifted to older 'decadent' structures. Pinyon pine and juniper have increased in density and distribution.

Cheatgrass, red brome, and other non-native annual grasses are a major threat to many vegetation types in the West, particularly in vegetation types that historically have longer fire-return intervals. These annual grasses create a continuous layer of fuel that is susceptible to burning every year. They prevent perennial grass and shrub establishment following disturbances from fire. They often form monoculture stands preventing restoration of native habitats. Pastureage and wildlife habitat are degraded.

The cycle of wildfire, annual weed invasion, and subsequent increased fire frequency and severity has altered millions of acres of western grasslands and shrublands, disrupted ecosystem function, increased the size and intensity of wildfires, and reduced plant and animal diversity. The effective management of post-fire landscapes in arid lands is constrained by a lack of information, recommendations, and protocols to restore these arid ecosystems.

JFSP Research on Arid Lands

In 2007 managers voiced an urgent need focused on reestablishment of native vegetation after fires on arid lands. Proposals were sought for projects to investigate survival and establishment rates plus methodology and techniques to reestablish sagebrush, bunch grasses, and other native vegetation in arid lands in the interior western United States such as the Great Basin, Mojave and Sonoran Deserts. Critical elements were to develop, test, validate, and demonstrate cost effective methods to reestablish native vegetation.

As a result of the 2007 JFSP solicitation, the Governing Board selected five research projects investing over \$1.6 million. Recently, the Associated Press and many newspapers ran stories on "The Black Fingers of Death" which focused attention on promising new research funded by the JFSP as project 07-1-3-10 and is listed as the second project below --*Annual Brome Biocontrol After Wildfire Using a Native Fungal Seed Pathogen.*"

Our 2007 project selections feature an array of approaches from herbicides and native soil fungus to discovery of annual species to compete with nonnative weeds throughout the arid west.

In the following tables you may 'ctrl-click' on the Project ID to view the proposal abstract.

New for 2007

Project ID	Project Title
07-1-2-04	Evaluating the Effectiveness of Landscape Scale Seeding and Herbicide Use on the Kolob Fire.
07-1-3-10	Annual Brome Biocontrol after Wildfire Using a Native Fungal Seed Pathogen
07-1-3-12	Equipment and Strategies to Enhance the Post-wildfire Establishment and Persistence of Great Basin Native Plants
07-1-3-18	Using native annual plant species to suppress weedy invasive species in post-fire habitats
07-1-3-24	Revegetating burned arid lands: identifying successful native species using trait and competition analysis

The JFSP is not the only research group focused on the Great Basin with Forest Service and Geological Survey scientists pursuing a wide array of research projects as well as University faculty, graduate students, and the Great Basin Cooperative Eco-Systems Study Unit. The JFSP has completed 23 projects with 15 projects in progress.

SageSTEP

The **Sagebrush Steppe Treatment Evaluation Project** is a 5-year study that will explore ways to restore sagebrush communities. Land management options, including prescribed fire, mechanical thinning of shrubs and trees, and herbicide application will help land managers learn how to reduce the potential for wildfire and restore healthy and diverse native plant communities. The project is fully interdisciplinary, with ecological, economic, and social components. Results of this project will provide resource managers with improved information to make restoration management decisions with reduced risk and uncertainty. The JFSP investment in this project is \$13 million and the latest information can be found on the web at: <http://www.sagestep.org/>

The SageStep socio-political research team recently posted preliminary results that agency leadership should be aware of:

"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.

The full article can be found at:

http://www.sagestep.org/pdfs/newsletter/SageSTEP_News_Issue_3.pdf

Arid Lands Completed Projects

Project ID	Project Title
01B-3-3-06	Interactions of Burn Season and Ecological Condition on Ecosystem Response to Fire in the Mountain Big Sagebrush Communities: Information Necessary for Restoration and Postfire Rehabilitation
03-2-3-11	Quantification of Runoff and Erosion on Semi-Arid Grasslands Following Wildfire
03-2-3-13	The Effects of Soil Properties, Fuel Characteristics, and Vegetation Recovery on Post-Fire Watershed Hydrology and Sediment Yield in Chaparral Steeplands
00-1-1-03	Changing Fire Regimes, Increased Fuel Loads, and Invasive Species: Effects on Sagebrush Steppe and Pinyon-Juniper Ecosystems
00-2-15	A Demonstration Area on Ecosystem Response to Watershed-Scale Burns in Great Basin Pinyon-Juniper Woodlands
00-2-32	Fire Effects and Fuels Management in Blackbrush Shrublands of the Mojave Desert
01-1-3-19	Effects of Fuels-Reduction and Exotic Plant Removal on Vertebrates, Vegetation, and Water Resources in Southwestern Riparian Ecosystems
01B-3-3-01	Effects of Fire and Rehabilitation Seeding on Sage Grouse Habitat in the Pinyon-juniper Zone
03-1-4-21	Designing an Experiment to Evaluate Effects of Fire and Fire Surrogate Treatments in the Sagebrush Biome
03-3-2-07	Fire Effects on Yuma Clapper Rails and California Black Rails on the Lower Colorado River
01B-3-3-24	Development of a Methodology for Building a Long-term Fire History in Great Basin Valley Landscapes
01C-3-3-22	Fire Regimes and Forest Structure of Utah and Eastern Nevada: A Multi-scale History from Tree Rings
00-1-2-01	Spatial Interactions Among Fuels, Wildfire, and Invasive Plants
00-1-2-04	Fire and Invasive Annual Grasses in Western Ecosystems
00-1-2-09	Invasive Plant and Fire Interactions: Use of the Fire Effects Information System to Provide Information for Managers
01-3-2-12	Weed Invasions Following Fire in Southwestern Colorado: Long-term Effectiveness of Mitigation Treatments and Future Predictions
01-S-05	Proceedings of the Workshop on Fire and Invasive Species
01B-3-2-07	Management of Fuel Loading in the Shrub-steppe
01B-3-2-08	Pre-Fire Fuel Manipulation Impacts on Alien Plant Invasion of Wildlands
01C-3-3-13	Effectiveness of Postfire Seeding to Reduce Cheatgrass (<i>Bromus tectorum</i>) Growth and Reproduction in Recently Burned Sagebrush Steppe
06-S-01	The Use of Fire as a Tool for Managing Invasive Weeds (Workshop and Proceedings)
00-2-29	Fire Application to Saltcedar-Dominated Riparian Areas: Ecosystem Response, Prescription Development, and Hazardous Fuels Reduction
03-3-3-58	Effects of Fuel Management Treatments in Pinyon Juniper Vegetation at a Site on the Colorado Plateau

Projects In Progress

Project ID	Project Title
01-3-3-34	Effects of Fire on Biological Soil Crusts and Their Subsequent Recovery at the Great Basin Pinyon-Juniper Demonstration Area
05-S-08	A Regional Experiment to Evaluate Effects of Fire and Fire Surrogate Treatments in the Sagebrush Biome (SageSTEP)
06-3-1-17	Historic Fire Frequency in Mountain Big Sagebrush Communities of the Eastern Great Basin and Colorado Plateau: A Comparison of Estimates Based Upon Proxy Fire Scar Records and Predictions Derived from Post-Fire Succession Rates.
06-3-1-27	Fire Regimes of Montana Grasslands of the Valles Caldera National Preserve, New Mexico
04-4-1-08	Publication of Literature Synthesis Entitled "Effects of Fire on Nonnative Invasive Plants" as 6th Volume in the General Technical Report "Wildland Fire in Ecosystems" (Rainbow Series)
05-2-1-13	Evaluate Treatments to Reduce Hazardous Fine Fuels Created by Non-Native Plants in Zion Canyon.
05-2-1-17	Evaluating Postfire Seeding Treatments Designed to Suppress Cheatgrass (<i>Bromus Tectorum</i>) in Ponderosa Pine Forests on the Colorado Plateau.
05-2-1-18	Reducing Wildfire Risk by Integration of Prescribed Burning and Biological Control of Invasive Saltcedar (<i>Tamarix</i> spp).
05-2-1-05	Management Options to Control Exotic Invasive Plant Species in Association with Fuel Reduction Treatments in Wildland Urban Interface.
06-1-2-03	Invasive Species Response to Fire and Post-Fire Rehabilitation Following the 2005 School Fire, Umatilla National Forest
06 -1-2-02	Fire Effects on Seedbanks and Vegetation in the Eastern Mojave Desert: Implications for Postfire Management
04-2-1-77	Using Cattle as Fuel Reduction Agents and Perennial Grass Stands in Northern Nevada.
05-2-1-08	Evaluating the Effects of Pinyon Juniper Thinning Treatments at a Wildland/Urban Interface
05-2-1-87	Effect of Brush Mastication on the Belowground Mycorrhizal Community in a Mixed Hardwood Chaparral.
05-2-1-98	Effects of Fuels/Fire Risk Reduction Treatments Using Hydro-Mow or Thinning on Pinyon-Juniper Ecosystem Components Within the Wildland-Urban-Interface.

On The Horizon

The JFSP will publish a 12-page ***Fire Science Digest*** focused on the Great Basin and the fire-invasives-fire cycle in the spring of 2008. In addition, the numerous completed projects may lend themselves to a summarization of our knowledge about fire and invasives in arid lands. This could be followed with science delivery seminars throughout the Great Basin, Mojave, Sonoran, and Chihuahua ecosystems at a JFSP *Roadshow* conference.