Science Symposium: Post-fire Revegetation in Oregon's Sage Steppe

Salem, Oregon
June 3, 2008

Fire is an important and unavoidable reality of the shrub steppe landscape in eastern Oregon. After a wildfire, land managers may question what kind of restoration action can or should be undertaken on a particular site and what techniques are successful and cost effective. In the past, many revegetation projects have failed or were unnecessary because the native community could recover on its own. Data on seeding success rates and the factors that influence the outcome of re-seeding are lacking. This symposium was designed to present the state of our knowledge on post fire vegetation recovery in Oregon shrub steppe systems and the success of seeding in various settings. Topics addressed included characteristics of the communities to be restored, results of past seeding treatments, native versus non-native seeding, invasive annual grasses and other weeds, and the pre-fire data necessary for restoration planning.

The speakers at the symposium were research leaders in the region. Land managers from Federal and State agencies, conservation organizations and Tribes attended and brought their questions and concerns regarding post-fire management. The topic of post-fire management is a large one and we hope this will be the first in a series of fire-focused symposia with future sessions addressing other aspects of fire-affected sagebrush landscape such as grazing management, erosion, and wildlife.

The symposium was sponsored by the Sagebrush Cooperative including the Bureau of Land Management, Eastern Oregon Agricultural Research Center, the Natural Resource Conservation Service, Oregon Department of Fish and Wildlife, Oregon Watershed Enhancement Board, Oregon Habitat Joint Ventures, and The Nature Conservancy.

Attendees

Defenders of Wildlife, Oregon Habitat Joint Ventures, USFS, BLM, NCRS, Warm Springs Pine Creek Conservation Area, ODFW, TNC, Wildlife Land Trust, Native Seed Network Institute for Applied Ecology, BPA

Presentations and available abstracts

Weeds after fire: Managing annual grasses
Roger Sheley, ARS Burns, OR

Sage steppe vegetation communities: What is the goal for recovery? Under what conditions will the existing community recover without rehabilitation?
Chad Boyd, Kirk Davies and John Bates, ARS Burns, OR.

Plant Materials Development in a Restoration Context
Tom Jones, USDA-ARS Forage and Range Research Lab and Utah State University, Logan, UT

A comprehensive approach to plant materials research and development encompasses a diverse set of disciplines including botany, seed science, genetics, ecophysiology, ecological restoration, and range improvement. To be successful, plant materials must be able to perform in challenging wildland environments as well as in the seed production environment. To better service native plant materials needs, the Association of Official Seed Certifying Agencies (AOSCA) has developed the pre-variety germplasm (PVG) seed certification system to complement the traditional cultivar approach to plant material development. Pre-variety germplasm encompasses source-identified, selected, and tested "classes" of materials (based on increasing levels of testing) and natural and manipulated "tracks" (based on the absence or presence of genetic manipulation, e.g., artificial selection, hybridization, or bulking).

Another innovation is the Restoration Gene Pool (RGP) concept, a systematic approach to choosing plant materials for restoration by considering a sequential series of alternatives ranging from most preferred (primary RGP) to the least preferred (quaternary RGP.

The high cost of native seeds often limits their use. High seed-yielding materials with fewer processing difficulties are more likely to be accepted by seed growers, and their lower production costs translate into lower seed prices for the end-user. A comprehensive approach to plant materials may entail any or all of the above approaches depending on the circumstances of the particular species being considered. Such circumstances may include the mating system of the species, the demands of the dominant customers, the market niches of previously existing plant materials, and the particular factors that typically limit species success on the restoration site or in the seed production environment.

Establishing desirable species after fire
Jeremy James, ARS Burns, OR

Reseeding disturbed or weed-infested rangeland with desirable species has been a common practice for well over a half century. Despite this extensive experience, the probability of successfully establishing seeded species remains low. The probability of establishing native bunchgrasses, for example, is less than 25%. This low success rate,

combined with the high per acre cost of reseeding and the large areas treated, results in the loss of tens of millions of dollars each year on failed reseedings. This estimate does not include the loss in forage and increased invasion risk associated with failed reseedings.

The need to improve revegetation success has been recognized for decades, but we continue to have a poor understanding of seedling establishment. Our knowledge gaps make it difficult to determine if weather, site, equipment, plant materials, or weed competition caused any given failure.

The USDA-ARS in Burns, OR has initiated a cooperative program among range scientists, private landowners, and public land managers, that coordinates data collection and monitoring across multiple revegetation projects. This cooperative effort is inexpensive to implement and is a powerful approach allowing us to gain insight into factors limiting establishment. The success of this program, however, is linked to the degree of involvement by stakeholders in the region.

We are looking for additional collaborators that will have seeding projects later in the year, or in coming years and would like to work with us. To participate, call Jeremy James at (541) 573-8911, or Tony Svejcar at (541) 573-8901.

Emergency Stabilization & Rehabilitation (ES&R) Monitoring - Methods and Findings

Troy Wirth and David Pyke, USGS – Forest and Rangeland Ecosystem Science Center
Corvallis, Oregon 97331

In 2005, the BLM funded the USGS Forest and Rangeland Ecosystem Science Center to determine a method for monitoring success of Emergency Stabilization and Rehabilitation (ES&R) treatments. We conducted a review of existing federal monitoring publications and monitored selected fire rehabilitation efforts from 2005-2008 in Oregon and Idaho. USGS used a monitoring program that incorporated six elements to monitor ES&R projects in sagebrush ecosystems. These elements included 1) quantitative objectives, 2) stratification of the treatment area into monitoring units, 3) random sampling, 4) control plots, 5) evaluation of data quality, and 6) simple statistical analysis using graphical techniques and t-tests.

Quantitative techniques should include line-point intercept, density, and basal gap intercepts designed to monitor rangeland health. Density is the most important parameter for assessing seeding success in the first three years after treatment. The determination of treatment success is simplified by separating density data into seeded versus unseeded categories. When pre-fire data is unavailable, the first year of monitoring can be used to establish a baseline for change in successive years. Seeded plants have negligible effects on cover in the first year and can usually be separated for

the purposes of density. Therefore, density of (pre-fire) adult plants can be compared in years one and three to determine the change due to seeding, especially when control plots are not established. Analyses utilizing graphical techniques and simple t-tests can be used to determine statistical differences between the seeded treatment density and control density.