Vegetation Resilience, the Role of the Perennial Herbaceous Understory, and Intact Sagebrush

Workshop and Field Tour

24-25 May 2011

Winnemucca Convention Center

Winnemucca, NV

Sponsors:

Great Basin Science Delivery Project

University of Nevada Cooperative Extension

Nevada Partnership for Conservation and Development

Paradise Valley Weed District

DuPont

Bureau of Land Management

Ecologically-Based Invasive Plant Management

Great Basin Native Plant Selection and Increase Project

Sagebrush-Steppe Treatment and Evaluation Project

United States Forest Service

Wilbur-Ellis

We are grateful to our sponsors for making this workshop possible!

Agenda:

Tues, 24 May 2011, Winnemucca Convention Center

Registration and Project Posters
8:00-9:00 Registration and Project Posters available all day

Welcome and Introduction
9:00-9:15 Eugénie (Génie) MontBlanc, Great Basin Science Delivery Project: Welcome and introduction

Vegetation Resilience and the Role of the Perennial Herbaceous Understory
9:20-9:50 Jeanne Chambers, USDA FS Rocky Mountain Research Station: Vegetation resilience and the importance of the herbaceous understory

9:50-10:20 Pat Shaver, USDA Natural Resources Conservation Service: Vegetation monitoring and issues of scale

10:20-10:30 Discussion

Intact Sagebrush and Integrating Wildlife
10:30-11:00 Brad Schultz, University of Nevada Cooperative Extension: Defining an intact sagebrush community

11:00-11:30 Tony Wasley, Nevada Department of Wildlife: Current status of ungulates in sagebrush systems and managing for healthy populations

11:30-11:40 Discussion

Catered Lunch and Exhibit Booths
11:45-1:15 Catered Lunch and Exhibit Booths
DuPont: New herbicide product presentation

Ecologically-based Invasive Plant Management: Tools and products

Great Basin Native Plant Selection and Increase Project: Seed product booth

Sagebrush-Steppe Treatment Evaluation Project: Latest project results and tools

USDA Forest Service: Weed booth

Wilbur-Ellis: Herbicide product information

Intact Sagebrush and Integrating Wildlife (continued)

1:15-1:45 Kent McAdoo, University of Nevada Cooperative Extension: Wildlife/habitat relationships within the intact sagebrush-grass continuum

1:45-2:15 Clint McCarthy, USDA Forest Service: Managing habitats for sage-grouse: Do we need a sagebrush management decision support tool?

2:15-2:25 Discussion

Restoration

2:25-2:55 Lee Turner, Nevada Partners for Conservation and Development: Collaboration in restoration

2:55-3:25 Paul Briggs, Bureau of Land Management: "Go Big or Go Home," planning and implementing vegetation management projects at a meaningful scale

3:25-4:10 Scott Jensen, USDA FS Shrub Sciences Lab: The development and use of forb species in restoration

4:10-4:40 John Swanson, University of Nevada: Synergistic monitoring project results and management implications

4:40-4:55 Discussion

4:55-5:00 Close

Wed, 25 May 2011, Field Tour

7:45 Meet at the University of Nevada Cooperative Extension Fairgrounds, 1085 Fairgrounds Rd., 775-623-6304

8:00 Leave for field sites

Stop 1: Paradise Hill, 20 mi. north of Winnemucca: Dixie harrow fuel break

Stop 2: Orovada: Repeated burn plots

Stop 3: Orovada: Cheatgrass die-off site

Stop 4: Orovada: Old crested wheatgrass seeding diversification

Stop 5: Paradise Valley: Mowing treatments

Stop 6: East Paradise Valley: Intact sagebrush and bluegrass sites

4:00-5:00 Arrive back in Winnemucca

Presentation Abstracts:

Vegetation Resilience and the Importance of the Herbaceous Understory
Jeanne Chambers, US Forest Service, Rocky Mountain Research Station, Reno, NV

Both scientists and managers are increasingly using the concepts of ecological resilience and resistance as tools for restoring and managing disturbed ecosystems. Resistance is the ability of an

ecosystem to maintain characteristic processes despite various stressors or disturbance, while resilience is the capacity of an ecosystem to regain characteristic processes over time following stressors or disturbances. In the Great Basin, ecological resistance to non-native species often reflects the ecological amplitude of the invader or its ability to establish and persist. Ecological resilience or recovery potential typically increases over gradients of increasing available resources (water and nutrients) and net productivity. The ecological memory of an area, the severity and frequency of disturbance, and interactions among invasive species and disturbance regimes all influence ecological resistance and resilience. I illustrate these concepts based on our research with pinyon-juniper expansion and cheatgrass invasion into Great Basin ecosystems. I then discuss the use of these concepts for prioritizing management and restoration activities in these ecosystems.

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Vegetation Monitoring and Issues of Scale

Pat Shaver, USDA Natural Resource Conservation Service, Portland, OR

There are several individual agency efforts taking place to inventory, monitor and/or assess the conditions and trends of rangelands. USDA-Forest Service operates the Forest Inventory and Analysis (FIA) program that inventories the nation's forestland. USDA-Natural Resources Conservation Service operates the National Resources Inventory (NRI) on non-federal lands. The USDI-Bureau of Land Management has begun the Rapid Ecoregional Assessments. BLM and NRCS have begun a joint project using NRI protocols on both BLM administered lands and non-federal lands. Standardized methods of data

collection are needed to ensure that inventory and monitoring data are comparable from location to location and from year to year. There has been much work accomplished to instigate and initiate common data collection methods across agency and ownership boundaries. Relevant scales for national and regional inventories and assessments do not always meet operational needs of the field, but can be used to inform monitoring at the local operational scale. The ability to use ecological sites for identifying potential provides more relevant data to inform and guide local monitoring needs. Identifying what is possible at the local level using ecological site descriptions informs operational alternatives and helps to guide the decision making process.

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Defining an Intact Sagebrush Community

Brad Schultz and Kent McAdoo, University of Nevada Cooperative Extension, Winnemucca and Elko, NV

When defining an intact sagebrush community, at some level one has to ask: intact for what? There are approximately 250 or more vertebrate species that occupy the sagebrush system. At least seven are sagebrush obligate species and over 50 near obligate species. The seven obligate species, throughout the course of a year, use habitat with different structure. Only a few depend upon sagebrush dominated sites, where the perennial herbaceous component is a minor component of the community. Intactness is more than the abundance of sagebrush. Ecological organization spans many levels (organism, community, landscape, etc.) which implies increasing spatial and temporal scale. Embedded in these scales are a suite of major ecological processes that affect population, community,

ecosystem and landscape structure and function. The vegetation patch, its various attributes and how they are structured to form mosaics ultimately influences landscape intactness, structure and resilience to disturbance. Disturbance is a ubiquitous feature on the sagebrush landscapes and an intact community and landscape have to be able to recover from disturbance. Properly managed disturbance can also be used as a tool to maintain intact communities and landscapes. Ultimately, an intact sagebrush community and landscape is one that maintains the ecological processes to progress from a perennial herbaceous community to a sagebrush/perennial herbaceous community through periodic disturbance regimes. This suggests that the mere absence of sagebrush at any point in time does not imply a lack of intactness only incomplete structure at that moment. Conversely, the mere presence of sagebrush does not confer intactness, if the process needed to ensure a return to sagebrush following disturbance are absent.

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Current Status of Ungulates in Sagebrush Systems and Managing for Healthy Populations

Tony Wasley, Nevada Department of Wildlife, Reno, NV

As Nevada's sagebrush systems have been altered, Nevada's ungulate species have responded accordingly. Currently, while some ungulate species are expanding their range in response to these changes, others are undergoing a simultaneous contraction. Understanding how ungulates respond to changes in their habitat, can help us to better predict the potential effects of disturbance on ungulates at a given site. Also, by understanding the relationship between ungulates and the habitats on which they depend, we can better tailor treatments to successfully meet

the needs of the species for which we desire a benefit. Both temporal and spatial scales of disturbance as well as both intended and unintended effects will be discussed. Additionally, long-term and short-term effects of previous treatments and land management practices will be discussed by primarily examining the history of the density and distribution of mule deer, pronghorn, and elk.

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Wildlife/Habitat Relationships within the Intact Sagebrush-Grass Continuum

Kent McAdoo, University of Nevada Cooperative Extension, Elko, NV

Because habitat requirements for the many wildlife species in sagebrush-grass communities vary by species and often by season of use, the spatial and temporal variability of sagebrush habitats is a critical component in vegetation management. Ideal habitat for the suite of potential wildlife species would sustain multiple cover conditions across a landscape while shifting the location of habitat types/successional stages among variously sized patches through time. There seems to be a formally unstated assumption that the sagebrush ecosystem before Euro-American settlement was uniformly a sagebrush obligate's haven. But what about areas that became perennial grass-dominated within the temporal and spatial continuum that fire and other disturbances (e.g., aroga moth infestations) brought about on the landscape? Obviously, grass-adapted wildlife species would have thrived within these perennial herbaceous-dominated communities. Wildlife species using sagebrush habitats that have a balanced mixture of shrubs and perennial grasses include a mixture of shrub- and grass- associated species. Those that

adapt to fire-disturbed areas are species that are more functionally tied to the herbaceous component. These species, including western meadowlarks, vesper sparrows, and sagebrush voles increase as the grass component increases while shrub-dependent species decrease. When shrubs become dominant, species such as sage sparrows, Brewer's sparrows, sage thrashers, and least chipmunks increase.

The ebb and flow of grass- and shrub-associated wildlife species was likely common before Euro-American settlement, a response to the intact resilience of the sagebrush-perennial grass continuum. Recently burned areas were grass-dominated, but eventually became shrub-dominated over time. Indeed, based on faunal use records from archeological sites and wildlife sightings by early Euro-American Great Basin explorers/travelers, grass- and open-habitat adapted wildlife species were apparently more common than shrub-dependent species in some areas of the Great Basin during both prehistoric and early historic times. Obviously, wildlife species composition, distribution, and abundance was (and is) a function of plant succession, which in turn is a function of plant life forms and species, soils, geomorphology, topography, climate, and the scale, type, intensity, and frequency of the disturbance.

Actively managing to maintain resilience would create over time a mosaic of habitats (similar to pre-Euro-American settlement conditions), with multiple-aged stands of sagebrush and varying degrees of perennial herbaceous and shrub cover, providing the diversity of vegetation structure and composition required by diverse wildlife species. Vegetation treatments should be prioritized based upon the risk of crossing irreversible ecological thresholds such as cheatgrass (Bromus tectorum) domination and applied to sites where prescriptions can result in resilience of native plant communities with dynamic stability. Carefully planned and implemented on a landscape scale, active

management would disrupt fuel continuity and promote plant community resilience after inevitable wildfires.

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Managing Habitats for Sage-Grouse: Do We Need a Sagebrush Management Decision Support Tool?

Clinton McCarthy, USDA Forest Service, Ogden, UT

Greater Sage-Grouse are a candidate species for listing under the Endangered Species Act due to concerns over population declines associated with substantial adverse changes in sagebrush habitats due to natural and anthropogenic factors. The conservation and restoration of habitats important to this species requires an understanding of both sage-grouse life history traits, and the ecological processes of the sagebrush ecosystem it inhabits. In the Great Basin, conversion of sagebrush to annual grasslands resulting from wildfire, and the rapid encroachment of pinyon and juniper into sagebrush communities are viewed as two significant threats to sage-grouse habitats. Management options (including vegetation treatments) require an understanding of sage-grouse habitat relationships at both coarse and fine scales. Coarse scale evaluations would consider population level life history traits associated with landscape use of these habitats by sage-grouse at the population scale. Finer scale evaluations would consider specific life history traits associated with habitat patches important for seasonal home ranges of sage-grouse. Managers would benefit from a decision support tool that provides multi-scale context for assessing various management actions as they relate to proposed actions for conserving this species. A rich array of research over the last decade has provided considerable insight into our understanding of greater sage-grouse and sagebrush systems. Hence, we have

the appropriate tools to develop a framework to assess management options that effectively provide conservation guidance.

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Collaboration in Restoration

Lee Turner, Nevada Partners for Conservation and Development, Nevada Department of Wildlife, Reno, NV

Nevada's Partners for Conservation and Development (NPCD), is a wide-view landscape and habitat restoration initiative formed in 2009 to leverage diverse interests including: government entities, NGO's, industry, citizens, and other like-minded organizations to mitigate and improve ecological health across Nevada's diverse landscape. The major goal of the NPCD is to provide cooperative mitigation of threats to land health through effective management and restoration actions on public and private lands in Nevada. This mission and goals will be accomplished based on a grassroots or ground-up model rather than the more traditional agency sponsored top-down approach. The NPCD is using the highly successful Utah PCD as a template.

A large part of the Utah PCD's success has been via their regional teams' participation and the NPCD is forming regional teams by employing the successful model. The regional teams are composed of restoration focused staff and representatives of the NPCD, as well as other local conservation minded organizations and stakeholders that reflect the ecologic, economic, and social demographics of that region. Each team is locally led and works cooperatively to plan and implement projects. The purpose of the regional teams is to serve as

clearinghouses for coordinating and sharing participants' conservation concerns and priorities, discussing potential solutions and for cooperatively implementing conservation activities at the local level.

A second contributor to the Utah PCD's success is participation at the agency director, state legislature and state agency level. Significant funding is passed through the Utah PCD originating at the various agencies and state government.

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"Go Big or Go Home," Planning and Implementing Vegetation Management Projects at a Meaningful Scale

Paul Briggs, Bureau of Land Management, Cedar City, UT

Managing for healthy and diverse sage brush habitats is a challenge facing land management agencies throughout the west. With increasing threats from development, energy, large wildfires, and invasive species, just to name a few, it is more important than ever before that these habitats are managed pro-actively.
In addition, projects need to be planned and implemented on as large of a scale as possible in order to be effective. Many treatment methods and technologies are available and can be used to achieve objectives on a variety of sites. This presentation will illustrate various treatments in southwestern Utah designed to diversify, conserve, or restore sage brush habitats on a landscape scale.

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The Development and Use of Forb Species in Restoration
Scott Jensen, USDA Forest Service, Provo, UT

Wildland fire and subsequent rehabilitation seeding is the driving force for seed use in the Great Basin. In the last decade as the quantity of native grasses and forbs used in reseeding efforts has increased so has the interest in locally adapted plant materials. A prominent question in restoration when using natives is that of appropriate seed zones, how far or under what conditions can plant materials be moved and still be successfully used. Recent efforts in this area have resulted in the creation of provisional seed zones or working models of potentially appropriate transfer zones. By overlaying GIS data layers of historic fires and reseeding efforts with provisional seed zones we learn the vast majority of fire occurs in 4 zones and the majority of seeding occurs in 3 zones. This information is being used to prioritize plant selection work. Most of our native forbs are available in limited quantities if at all and considerably more expensive than traditional species used in seed mixes. When evaluating new species there is value in an initial screening step to determine feasibility in an agronomic setting and potential market price. The less expensive the larger market share it will fill. Numerous studies are underway evaluating methods to incorporate forb seed in reseeding efforts. Highlights from these will be presented.

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Synergistic Monitoring Project Results and Management Implications
John Swanson, Sherm Swanson, Kent McAdoo, Brad Schultz, and Gary McCuin

As part of a larger, state-wide, multi-purpose Project effort, we established and read permanent vegetation cover and related data macroplots on 50 Wyoming big sagebrush wildfire and preventative land treatment event sites across northeastern Nevada in 2010. At the workshop, we will share these data and some preliminary, possible implications. Following the now underway statistical analysis, we intend to develop and widely share our results and conclusions. We hope that this information contributes to increased knowledge in several areas, including: Simple, streamlined monitoring techniques useful for multiple-scale inference development; identification of threshold points; tools for predicting potential ecological responses associated with various events; and roles of various functional/structural groups and ecological states in event responses. In 2011, we initiated similar studies in northwestern Nevada and northeastern California Wyoming big sagebrush event sites, and hope that these studies further add to this body of knowledge.

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