



# Utah Shrubland Management

Volume 1, Spring 2013

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Welcome to the first newsletter of the Utah Shrubland Management Project!

As we develop Utah's first Ecological-Site based Shrubland Management Handbook and establish field demonstration sites, this series of newsletters will keep you up to date on project developments

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## Project Overview

In a state-wide collaboration between Utah private landowners, state range experts, and federal and university researchers, the Utah Shrubland Management Project has been developed to address questions about selecting appropriate management techniques for Utah's vital rangelands. Range managers today face numerous difficulties. In particular, shrub expansion and invasive species are causing drastic reductions in perennial forb and grass cover, while degrading the structure of rangeland ecosystems and impairing their functionality. Land managers aim to mitigate these threats, but despite regular advances in technology, site-specific characteristics make choosing the appropriate tactics a serious challenge.

To address this challenge and facilitate sustainable rangelands, this project will create two primary tools: an Ecological Site-based Shrubland Management Handbook, and a suite of field demonstration sites, to evaluate the outcomes of specific management practices on particular soil types. Research is being directed by Tom Monaco, of the USDA Agricultural Research Service and Kari Veblen at Utah State University. Private land owners, located near Park Valley, East Bear Lake, Birdseye, and Cedar Fort, are providing for the establishment of management demonstration plots within the ecological sites on their property (pg. 2). Once the project is completed, management handbooks will be distributed and field demonstration tours will be led by project staff.

## Shrubland Management Handbook and Field Tours

The Shrubland Management Handbook will be modeled after the publication, *Western Juniper Field Guide: Asking the Right Questions to Select Appropriate Management Actions*<sup>1</sup>. To create a comprehensive guidebook, our team will coalesce technical information from a variety of published sources and examine site-specific responses to past management actions on Utah rangelands, by analyzing data gathered by the Utah Division of Wildlife Resources' Range Trend Studies and Watershed Restoration Initiative that span more than 30 years.

In summer of 2015, public field tours will be conducted at each field site. At the ranch-wide scale, we will observe the effects of herbicide treatments on shrub reduction, forage production, and range seeding success. Furthermore, within each site, fenced demonstration plots will be established to 1) examine brush management techniques, including aeration and herbicide applications, and 2) assess the revegetation qualities of improved plant varieties.

<sup>1</sup> Miller, R.F., Bates, J.D., Svejcar, T.J., Pierson, F.B., and Eddleman, L.E., 2007, *Western Juniper Field Guide: Asking the Right Questions to Select Appropriate Management Actions*: U.S. Geological Survey Circular 1321, 61 p.

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## Ecological Sites

Throughout Utah, land managers often turn to traditional range practices when improving sites that have been invaded by shrubs and noxious annual grasses. However, research has shown that the same shrub reduction and seeding techniques do not benefit all sites equally; among rangelands there are vast differences in soil types, potential and existing vegetation communities, and current condition status.

This project will be applying the concept of ecological sites in assessing which practices may be the most effective and reliable for a given area. NRCS determines ecological sites based on the land's potential vegetative composition and productivity,



Overabundance of rabbitbrush

soil types, and hydrological characteristics. Each official Ecological Site Description includes a reference worksheet which allows for the rapid assessment of rangeland health. Considering specific site dynamics will aid managers in identifying appropriate and cost-effective management options. For detailed descriptions of ecological sites, see <http://esis.ec.egov.usda.gov>

## Study Locations

This project will be conducting range management demonstrations within eight ecological sites common to Utah's rangeland. Sites are organized into four geographic areas. In each area, we are partnered with a private land owner who's goal is to reduce overall dominance of a target shrub via herbicide application.

1. East of Bear Lake in northern Utah; ecological sites are Upland Stony Loam and Upland Shallow Loam. Black sagebrush and Wyoming big sagebrush are targeted for reduction with the use of tebuthiuron.
2. In Birdseye; ecological sites are Mountain Loam and Mountain Stony Loam. Rubber rabbitbrush is targeted for reduction using picloram+2,4-D.
3. Near Cedar Fort, just east of Flat Top Mountain; ecological sites are Upland Shallow Hardpan and Upland Stony Loam; broom snakeweed is targeted for reduction using DuPont™ Cimarron® Max\*.
4. Park Valley in northwestern Utah; ecological sites are Semidesert Loam and Semidesert Alkali Loam. Black greasewood is targeted for reduction using DuPont™ Escort® XP\*.

\*Any mention of DuPont products in this publication does not constitute a recommendation by U.S. Department of Agriculture or Utah State University or preference over other suitable products.

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An example of forbs that will be evaluated during field trials. Trial varieties will be planted inside enclosures at each site during Fall 2013 and Spring 2014.

## FUNDING

Funding for this project is provided by:

- USDA, Agricultural Research Service
- USDA, Natural Resources Conservation Service; Utah Conservation Innovation Grants
- Utah State University, Agricultural Experiment Station
- Contributed products and services from DuPont.



## Improved Plant Materials

To improve site-specific management guidelines, the project's field demonstration plots will compare older and newer plant materials in the context of Utah ecological sites. Within shrub reduction treatments (aeration and herbicide applications), a suite of forbs and perennial grasses will be evaluated after two years' growth based on their revegetation potential. In addition to providing livestock producers with improved forage for livestock and wildlife, successful materials will contribute to site stabilization by reducing erosion, protecting water quality, combating invasive species, and enhancing carbon sequestration.

Tremendous advances have been made in the last 30 years in the development and availability of critical plant materials. Plant materials development and testing is a major emphasis of NRCS Plant Material Centers. In addition, the USDA-ARS in Logan, Utah has a research program entirely focused on developing

genetically and ecologically improved plant materials for semi-arid rangelands and pastures in the western US. A number of traits including improved seedling emergence and seedling survival, and drought and salinity tolerance have driven the release of more than 30 new plant varieties.

On this project, we will be making comparisons between historic and improved varieties of the following: Alfalfa (*Medicago sativa*), Cicer milkvetch (*Astragalus cicer*), Sanfoin (*Onobrychis viciifolia*), Small burnet (*Sanguisorba minor*), Western yarrow (*Achillea millefolium*), Siberian wheatgrass (*Agropyron fragile*), Russian wildrye (*Psathyrostachys junceus*), Western wheatgrass (*Pascopyrum smithii*), Thick-spike wheatgrass (*Elymus lanceolatus*), Bluebunch wheatgrass (*Pseudoroegneria spicata*), Snake River wheatgrass (*Elymus wawawaiensis*), and Sandberg bluegrass (*Poa secunda*).

## Field Notes: Project Progress

Field work commenced in fall of 2012.

- At all ecological sites, exclusion fences have been built for the establishment of demonstration plots (approx. 1 acre in size) for brush management and seeding comparisons. Inside the enclosures, experimental plots will be treated and plant materials will be planted in fall 2013 and spring 2014.
- At East Bear Lake, sites were treated in fall 2012 with an aerial application of tebuthiuron. Field evaluations



Aerial application of tebuthiuron at East Bear Lake

were also conducted to assess pre-treatment vegetation conditions.

- Remaining sites will be treated with herbicide application for shrub reduction in spring, 2013.