



## Orchard Experimental Restoration Site Field Workshop Summary

28 June 2011, Orchard Experimental Site, Ada Co., ID

**Overview:** The Great Basin Science Delivery Project (<http://greatbasin.wr.usgs.gov/gbrmp/ScienceDelivery.aspx>) and the BLM's Great Basin Restoration Initiative (<http://www.blm.gov/id/st/en/prog/gbri.html>) sponsored a field workshop at the Orchard Experimental Restoration Site, between Boise and Mountain Home, ID on Tuesday 28 June 2011. We discussed the Orchard Experimental Site, experimental plantings, cheatgrass die-off, and sagebrush establishment. Forty people participated.

### Presentations:

#### Introductions and overview of the Orchard Experimental Restoration Site, Mike Pellant

The Orchard Experimental Restoration Site is 240 acres of BLM land surrounded by private land, and was set aside in 1988 to evaluate and select fire resistant and native plants. The site has since been used for experimental plantings and studies by several universities, the USDA Rocky Mountain Research Station, and the Natural Resource Conservation Service Plant Materials Program. It is available for additional restoration related research by anyone interested in conducting these types of studies (contact Mike Pellant, [mpellant@blm.gov](mailto:mpellant@blm.gov)).

#### Great Basin Science Delivery Project, Génie MontBlanc

The Great Basin Science Delivery Project is part of the Joint Fire Science Program's Knowledge Exchange Consortia and helps foster better information sharing between fire and resource land managers and researchers to answer management questions about fire, fuels, and vegetation management. We recently finished our winter '10/'11 webinar series and our first vegetation resilience workshop. We are currently in the process of producing two syntheses on 1) Resistance, Resilience, Environmental Gradients, and Vegetation Response to Fire, and 2) Fire Effects on Soils, Biological Crust, and Hydrology in Great Basin Communities. Please email us with general or technical questions, contact needs, or webinar and workshop ideas: [emb@cabnr.unr.edu](mailto:emb@cabnr.unr.edu).

#### Rocky Mountain Research Station experimental plantings, Nancy Shaw

- Thurber needlegrass is expensive, limited in supply, and difficult to establish by seed, but once it is established it can compete well with cheatgrass. Planting in late fall, which promotes overwinter stratification and minimizes predation, can improve germination.
- Russian wildrye tends to persist better through the drought years than crested wheatgrass in these arid environments. However, Russian wildrye is more difficult to establish than crested wheatgrass. Several new releases of Russian wildrye may have a better establishment than some of the older varieties.



- Fifty three sources of Snake River wheatgrass and bluebunch wheatgrass were established in 1989-90 in a replicated study. Several Snake River wheatgrasses and the Anatone bluebunch wheatgrass were the highest rated survivors and have recruited into cheatgrass surrounding the plots. Several tour participants stated they had better success establishing the Secar Snake River Wheatgrass than the bluebunch wheatgrass in the lower precipitation zones.
- Several exotic yarrows were tested with native yarrow sources. The native western yarrow has established well in many seedings. The low-growing exotic yarrows show good potential to exclude cheatgrass in most years and may be a good plant in high cheatgrass and wildfire areas as a greenstripping species.
- The spring of 2011 was unusually cool and wet and cheatgrass was more abundant in competitive grass seedings than in a normal year. It was noted that, in competition with cheatgrass, some forbs are easier to establish as seedlings while other forbs compete better when they are mature (<http://www.treesearch.fs.fed.us/pubs/34016>).
- A small trial of forage kochia was also established here in 1989-90. The release, Immigrant forage kochia, performed well compared to the other sources. Mike commented that forage kochia is a great competitor with cheatgrass but can also spread into disturbed or burned areas. Therefore, an evaluation of the potential outcomes of planting forage kochia should be conducted prior to its use. It is without question the best fire resistant species for fuelbreaks (greenstrips) and can be grazed in the fall and winter.
- Handouts provided by Nancy Shaw can be found at: [http://greatbasin.wr.usgs.gov/gbrmp/SD\\_webcast.aspx](http://greatbasin.wr.usgs.gov/gbrmp/SD_webcast.aspx).
- More information on the Great Basin Native Plant Selection and Increase Project can be found at: <http://www.fs.fed.us/rm/boise/research/shrub/GBNPSIP/GBNPSIPAnnualReports.shtm>.



Cheatgrass (left) and bur buttercup (right) at Orchard site. Weedy forbs are becoming more abundant on rangelands formerly dominated by cheatgrass due to cheatgrass die-off and other factors.

### Cheatgrass die-off and plant community, Don Major

- Declines in cheatgrass abundance, including temporary absence of cheatgrass, have historically occurred due to dry springs during consecutive years. However, we are noticing large areas of die-off in the northern Great Basin that are not attributable to the weather.
- We don't yet know whether the cause of the die-off can be attributed to pathogens, soil chemistry, insects, cutworms, or a combination. We are working with the USGS to utilize satellite imagery to map die-off areas in the Northern Great Basin. The BLM is partially funding a USFS Rocky Mountain Research Station led research project addressing the cause of the die-off.
- Several partners are evaluating the potential for restoration of die-off areas with desirable species. We have to be careful about spreading pathogens with large scale restoration projects.
- Bur buttercup, mustard species, and Russian thistle growing in areas previously dominated by cheatgrass can be an indicator of die-off. Please report any die-off areas to Don Major ([dmajor@blm.gov](mailto:dmajor@blm.gov)) as that will assist in determining the scope and annual variation in the die-off.
- Air quality due to soil erosion is a problem on some sites in the Winnemucca area.



Successful bluebunch wheatgrass establishment in cheatgrass dominated rangeland.



### NRCS Display Nursery, Loren St. John

- The Aberdeen Plant Materials Center established the display nursery to observe plant species for restoration use.
- The site was prescription-burned in 2002, treated with glyphosate and 2,4-D herbicide in 2003/2004, and seeded in Fall 2004.
- Two events that effected plant establishment were below normal springtime precipitation in the establishment year (2005) and an infestation of black grass bugs which was detrimental to the survival of the introduced grass species.
- In general, don't mix natives with introduced species in your seed mixes because you will eventually end up with all introduced species (native species don't have strong competitive abilities at the seedling stage).
- 'Critana' thickspike wheatgrass is best used for critical area stabilization and 'Bannock' thickspike wheatgrass is better if you are interested in increased forage production.
- Use only 1 -2 lbs of slender wheatgrass in a mix because it establishes quickly and provides cover for slower establishing species. Heavier seeding rates will outcompete other seed mix components.
- If you can establish bluebunch wheatgrass and /or Snake River wheatgrass they CAN compete well. 'Goldar' bluebunch wheatgrass is not well adapted to areas receiving less than 12 inches annual precipitation. Anatone bluebunch wheatgrass is better adapted to drier areas (receive 10 -12 inches annual precipitation) than the other bluebunch wheatgrass releases. The Jim Creek source of bluebunch has done really well in the display nursery.
- Tetra Great Basin wildrye and 'Trailhead' basin wildrye tend to perform better than 'Magnar' on drier sites.
- The Orchard site is too dry for western wheatgrass to persist.
- The establishment and/or survival rates of several native shrubs and forbs were low, and could be due in part to the droughty conditions during the first growing season.
- Planted yarrow can become a dominant species in some higher elevations/precipitation zones, but at lower elevations you can use local "Eagle Yarrow" at low rates (0.05 pounds PLS/ac.) in your mix.
- Row spacing can dictate plant performance, especially for Russian wildrye. Typical row spacing is 12 inches but Russian wildrye tends to prefer wider (18 inch) row spacing. It's a great competitor once established and is an excellent species for greenstripping applications.
- Crested and Siberian wheatgrass have gone out of favor mostly because of the monoculture seeding practices of the past. These species are excellent for spring grazing use to take grazing pressure off native range use in the spring. 'Vavilov II' is a new release of Siberian wheatgrass and has better establishment and persistence than older releases of this species.
- 'Nordan' crested wheatgrass has good drought tolerance but is not as palatable as 'Ephraim'. 'Hycrest II' combines the drought tolerance of Nordan and the palatability of Ephraim.
- Without site preparation, never use natives in areas heavily infested with cheatgrass or medusahead. Native rangeland species are difficult to establish. In areas infested with cheatgrass or medusahead, first consideration should be given to controlling competition by good seedbed preparation and establishing aggressive introduced species. Over time as the weed seedbank is reduced, then native species may be able to be reintroduced to the site.
- Presentation handout can be found at: [http://greatbasin.wr.usgs.gov/gbrmp/SD\\_webcast.aspx](http://greatbasin.wr.usgs.gov/gbrmp/SD_webcast.aspx).
- More information about the Aberdeen Plant Materials Center can be found at: <http://plant-materials.nrcs.usda.gov/idpmc/>.



### **Big Sagebrush Study, Bryce Richardson, USDA Forest Service Rocky Mountain Research Station**

- The RMRS is examining adaptive variation using 56 seed sources located across the range of big sagebrush.
- The Orchard site is one of three common garden plots. The other plots are in Utah.
- We are looking at genetics, growth responses (i.e., height, diameters and crown area), and physiological response to climate factors.
- The common garden is being conducted in conjunction with a molecular genetic study.
- This study will help us develop appropriate seeds for different zones.
- There are cultural techniques to improve Wyoming big sagebrush and antelope bitterbrush seed production.
- Wyomingensis and other tetraploids are usually better adapted to drier and warmer conditions, thus these subspecies will likely become increasingly important for restoration under climate change.
- **Comment from Alan Sands (Idaho Department of Fish and Game):** In a past sagebrush study north of Glens Ferry, a non-local seed source had the best success seven years after establishment of planted sagebrush seedlings, but after 20 years the local source big sagebrush had 100% survival and were very vigorous. Take home message: Plant local sources of sagebrush!

### **Snotel Weather Station, Loren St. John**

- NRCS manages Snotel weather stations throughout the Western states that provide real time access to daily temperature, precipitation, snow depth, and snow-water equivalent data.
- There is a Snotel weather station at the Orchard Experimental area that has been recording a wide range of weather and soil conditions since 1989 (see precipitation bar chart in Nancy Shaw's presentation material).
- Data and general information about Snotel weather stations are available on the NRCS website: <http://www.wcc.nrcs.usda.gov/snow/>.

### **Sagebrush recovery after Fall 1989 prescribed fire, Mike Pellant**

- A twenty acre prescribed fire was implemented in September 1989 to study the importance of inoculating sagebrush seedlings before planting them. Precipitation the year following the treatments was 12.5 inches annual precipitation. The results showed that there was enough mycorrhizae in the burned area that inoculating sagebrush seedling roots was not necessary.
- Native grasses and forbs were present in the burned sagebrush stand at the time of the wildfire but 22 years after the fire the area is dominated by cheatgrass. There has been very little recruitment of sagebrush back into this area even though it is surrounded by unburned sagebrush.
- There was sagebrush mortality near the burn this year due in large part to the heavy grasshopper densities last summer.

For more information or updates about future field workshops, please email Génie MontBlanc at [emb@cabnr.unr.edu](mailto:emb@cabnr.unr.edu) to join our mailing list. Thank you!