

**Summer Field Tour:  
Utah Section of the Society for Range Management and  
Society for Ecological Restoration, Great Basin Chapter  
Ephraim, Utah, 18-20 June 2012**

A joint summer field tour of historic and contemporary restoration sites near Ephraim, Utah, was sponsored by the Utah Section of the Society for Range Management (SRM) and the Society for Ecological Restoration, Great Basin Chapter on 18-20 June 2012. Stephen Monsen, Botanist, retired from the USDA Forest Service, Rocky Mountain Research Station (RMRS) and Jason Vernon, Alison Whittaker, Danny Summers, and Samantha Shoppe of the Utah Division of Wildlife Resources (Utah DWR), Great Basin Research Center (GBRC), Ephraim, Utah, organized the event, which was attended by about 60 people.

**Monday, 18 June 2012**

Chad Harman, Chairman of the Southern Chapter of the Utah Section SRM welcomed the group at the GBRC offices on 18 June.

Great Basin Research Center Seed Warehouse and Facilities  
*Jason Vernon and Danny Summers, Utah DWR*

The meeting began with a discussion of cooperative restoration programs with multiple agencies including seed warehousing, restoration practices, equipment use, and follow-up inventories of cooperative restoration projects.

The seed warehouse currently stores approximately 500,000 lbs. of seed annually and more when needed for fires. Restoration projects are cooperatively planned and conducted with federal, state, and private organizations throughout the state.



**Danny Summers described operation of the Ephraim Seed Warehouse**

The construction and management of the seed warehouse has attained considerable support from all agencies, and has recently been expanded with funding from the USDI Bureau of Land Management (BLM) and DWR. It now provides 26,000 ft<sup>2</sup> of storage space, refrigerated storage, seed mixing, and seed testing facilities.

Through careful preplanning, the organizations select the most ecologically sound and attainable projects from candidate sites located throughout the state. Through preplanning and careful on-site examinations, adapted species are identified and attempts are made to obtain site-adapted plants to restore the native plant associations. Projects are often identified 2-3 years in advance to facilitate the acquisition of site-adapted species.

A staff of DWR scientists evaluates the initial success and long term development of seeded species at selected project locations. These studies provide important information on the success of treatment measures, seedbed ecology, species relationships, and successional processes. In addition, the effects of management strategies are monitored to aid in the management and natural recovery of project sites.

Long-term research by the DWR and the Forest Service has resulted in the development and use of site preparation and seeding equipment to effectively treat wildlife and range-related projects. DWR has acquired extensive site preparation and seeding equipment to complete most projects. The DWR also maintains an experienced staff to conduct field projects.

A key element of this cooperative program is the monitoring and careful assessment of restoration measures of all projects. Long-term as well as initial evaluations are funded and maintained by cooperating agencies.

#### East Mayfield Pinyon-Juniper Restoration Project

*Jason Vernon, Danny Summers, and Scott Walker, Utah DWR*

Jason and Danny led a discussion related to the objectives and project history of wildlife restoration projects they direct. Attention has been focused on improvement of overgrown pinyon-juniper woodlands and recovery of native understory species.

Scott described the response of seeded introduced species and the recovery of native plants over a 50-year period from a number of pinyon-juniper treatment sites in central Utah. Studies have clearly shown that introduced perennial grasses, principally crested and desert wheatgrass, intermediate wheatgrass, smooth brome, and hard fescue have completely suppressed and eliminated the presence of most native species by suppressing existing plants and preventing recruitment of seedlings. The competitive effects of the introduced species coupled with livestock and wildlife grazing has hastened the conversion process. Selection and planting of site-adapted natives is clearly advisable and ecologically important in site restoration programs.

## White Hills

*Steve Monsen (Botanist, retired USFS Rocky Mountain Research Station)*

Steve led a discussion on the recovery of native bunchgrasses and associated plants following protection from livestock grazing within pinyon-juniper communities. Perennial bunchgrasses have been able to compete and displace annual cheatgrass and control the invasion of pinyon-juniper trees if sites are protected from grazing. Of particular interest has been the invasion and ultimate occupancy of needle-and-thread grass amid stands of cheatgrass. Areas protected from grazing for 5 to 20 years have transitioned from annual grass dominance to cover of this perennial native bunchgrass. Considerable improvement of pinyon-juniper woodlands has also occurred on sites protected from grazing if some remnant understory species were initially present. A dominant cover of understory species has developed as bluebunch wheatgrass, Indian ricegrass, Sandburg bluegrass, and needle-and-thread have positively responded. Winterfat, black sagebrush, and Wyoming big sagebrush have also increased.

Comparative sites were observed in which pinyon and juniper trees were removed by chaining wherein some sites were seeded to fairway crested wheatgrass but adjacent areas were allowed to recover naturally. Sites seeded to the introduced perennial grass have not prevented tree encroachment, whereas the recovery of native bunchgrasses, winterfat, Wyoming big sagebrush rubber rabbitbrush, and a number of perennial forbs have occupied the sites and controlled tree reinvasion.



**Steve Monsen discussed recovery of native bunchgrasses at the White Hills**

### Fountain Green Nursery Sites

*Scott Jensen, RMRS and Kelly Memmott, USFS R-4 Fishlake National Forest*

Scott and Kelly provided a tour of the native plant development and seed increase research site for native forbs and grasses adapted to the Great Basin and Colorado Plateau.

### Dinner Monday Evening - SRM Sponsored Steak Fry with George Cook, Extraordinary Chef.

An evening program featured Joel Frandson, retired historian, telling tales of local history - livestock rustling and more. Greg Boothe, a local composer at Snow College, Ephraim, provided the music.



**Kelly Memmott presented at the Native forb nursery at Fountain Green**

## **Tuesday, June 19<sup>th</sup>, 2012**

### Majors Flat: Big Sagebrush Common Garden/Genecology Study

*Bryce Richardson, RMRS, Provo, Utah; Matt Germino, U.S. Geological Survey, Boise, Idaho*

Bryce discussed recently published information on the evolutionary relationships among big sagebrush subspecies (<http://www.treesearch.fs.fed.us/pubs/42420>). The group also toured one of three common gardens of big sagebrush subspecies and populations where Bryce presented the objectives and preliminary findings from this study implemented in 2010.

Matt described differences in ecophysiology and climate responses among the subspecies and among populations within each subspecies being studied in the common gardens and implications of these different responses for restoration.



Steve Monsen discussed the response of numerous species seeded in the mid-1920s and 1940s at this mountain brush study site. Two introduced species, intermediate wheatgrass and smooth brome, have dominated and invaded the plots of nearly 80 or more species and accessions planted at this location. One accession of bluebunch wheatgrass has limited the invasion by the two introduced species.

#### Willow Creek

*Carlton Moss, USFS R-4 Manti-LA Sal National Forest, Sanpete Ranger District; Steve Monsen; Val Jo Anderson, Brigham Young University*

The group observed a 60-year-old planting of intermediate wheatgrass, smooth brome, orchard grass, and timothy in a mixed stand of aspen and mountain brush communities. The introductions have displaced nearly all existing natives including perennial grasses, and forbs, as well as mountain big sagebrush, antelope bitterbrush, Woods rose, and western snowberry.

#### Great Basin Experiment Station Headquarters

*Durant McArthur, USFS Rocky Mountain Research Station Program Manager (retired); Dale Bartos, USFS Rocky Mountain Research Station, Logan, Utah*

Durant reviewed the 100-year history of the Great Basin Experiment Station.

Dale provided a review of aspen ecology and management as follows. Quaking aspen (*Populus tremuloides*) extends from Labrador on the east coast to Alaska on the north and to Mexico on the south. In the western U.S., it occurs on suitable sites of mountains and high plateaus, and in the driest climates it is mainly confined to riparian zones. Most western aspen occurs on public lands and exist either as pure clones (climax) or successional to conifer (some are replaced by sagebrush). Aspen can occur as extensive stands or as small scattered groves on our western landscapes. Generally, aspen-dominated communities are second only to riparian communities in species diversity and abundance. Aspen is a keystone species in the West and one of the best integrators of overall ecosystem health.

Because western aspen reproduces primarily by self-regeneration, the elimination (or major modification) of fire and extensive overuse of reproduction has caused many aspen dominated sites to convert to other vegetation types. For millennia, aspen communities in the West regenerated as clones with suckers arising from parent root systems that survived frequent wildfires. Vegetative reproduction in aspen requires a disturbance or die-back which changes the hormonal balance. Basically, when the tree is killed or stressed this disrupts the flow of auxin down to the root system and allows cytokines (that are produced in the roots) to stimulate suckering. Drought and disease are two major stressors that can trigger a regeneration event and are believed to have contributed substantially to the SAD (Sudden Aspen Decline) phenomenon that has been observed in certain parts of the aspen range in the last decade.



**Aspen stand at the Great Basin Experiment Station**

Sam St. Clair, Brigham Young University, Provo, Utah discussed aspen and wildlife management issues.

Diane Cote, USFS R-4, Manti-La Sal National Forest, Sanpete Ranger District, Ephraim, Utah discussed forest management programs on the Sanpete Ranger District

#### Watersheds A and B

*Allan Stevens, Snow College, Ephraim, Utah; Richard Gail and Lafe Conner, Brigham Young University, Provo, Utah*

The group inspected historical watershed and plant community restoration studies of ecological recovery processes on highly disturbed sites at upper elevations on the Wasatch Front and current studies of subalpine and tall forb communities.

Allan discussed the history of livestock grazing, damage to high elevation plant communities and establishment of the Watershed A and B by A. W. Sampson in the early 1900s to document livestock impacts on vegetation and hydrology.

Steve Monsen discussed natural recovery process over a 100-year period within the tall forb communities following damage by extensive grazing beginning as early as the 1860 and 1870s. Inspection of permanent study plots and data collected intermittently over a 90-year period indicate the recovery of individual species follows specific patterns and sequences. Plant recovery also tends to coincide with climatic events and time intervals.

Richard and Lafe discussed ongoing studies of recovery in the subalpine communities.



**Scott Walker described the history of Watershed A and B research.**

## **Wednesday, June 20, 2012**

### Upper Huntington Canyon, Manti La Sal National Forest

*Allan Huber, USFS R-4 Ashley National Forest; Jane Rushane, USFS R-4, Caribou-Targhee National Forest, Montpelier Ranger District; Matt Germino, USGS Forest and Rangeland Ecosystem Science Center, Boise, Idaho; Steve Monsen and Robert Davidson, USFS R-4, Manti-LA Sal National Forest*

This trip was to observe ecological conditions in the tall forb communities that exist near subalpine areas. In addition, problems associated with grazing disturbances, weed invasion, and restoration practices of these sites were also observed.

Allan discussed cooperative studies conducted by himself and Sheryl Goodrich, Ecologist, Ashley National Forest (retired) on the presence and impacts of pocket gophers in these high elevation plant associations. Results indicate that gophers appear more frequently amid disturbances than in more stable plant associations. The impact and relationship of these animals on the composition and presence of various species is not well defined.

Jane discussed different restoration measures implemented in Franklin Basin of the Caribou-Targhee National Forest to restore the tall forb plant associations in disturbed sites currently occupied by cluster tarweed.

Matt described the results of planting selected species in combinations representing early, mid, and late seral groupings as a means of improving establishment and development of functioning plant communities. He reviewed lessons learned from restoration of tall forb communities in subalpine meadows infested with tarweed. These experiments revealed the importance of considering seral stage along with density of seedlings in mixed-species outplantings.

Steve and Robert discussed the effects of removal of cow parsnip (*Veratrum californicum*) on site preparation and seeding practices to establish native species associated with the tall forbs communities. Extraction of cow parsnip plants to be used in a medical program has created barren sites in which the reestablishment of native species is desired. Planting trials conducted over a 4-year period demonstrated that careful site preparation to create a stable, yet uniform and firm seedbed allowed the placement of seeds of different size and shape at different but specific depths. Seed placement significantly benefited and improved seed germination and seedling emergence. In addition, separation of seeds of different species based on seed size and germination requirements greatly enhanced seedling emergence and survival. Modification of existing planting equipment and use of two planters resulted in the consistent establishment of approximately 15 different broadleaf forbs, 10 grasses, and 3 shrubs. Subsequent development of the seeded species indicated that early-developing species naturally appeared within the first 2 to 3 years. Restoration of species within this high elevation plant community was also improved by selecting site-adapted species and obtaining seed from similar communities.