Big Sagebrush Community Restoration in Utah: Lessons Learned

Danny Summers and Jason Vernon
Utah Division of Wildlife Resources
Great Basin Research Center

• Interagency facility maintained in Ephraim since 1955

• Programs
  – Research
    • Habitat Improvement
    • Plant materials
  – Rangeland seed warehouse
  – Habitat monitoring
Restoring Rangeland Resources

- A. Perry Plummer
- Donald R. Christensen
- Stephen B. Monsen
  - 1968
  - out of print
Restoring Rangeland Resources

- Stephen B. Monsen
- Richard Stevens
- Nancy L. Shaw

http://www.fs.fed.us/rm/pubs/rmrs_gtr136.html
Sagebrush Seed Storage

- Cold storage to maintain viability (35-38°F)
- Dehumidification (10-15%)
Seed Quality and Identification

• Federal and State certification standards
• Certified vs. non-certified
• Source Identified
• Failing to use the plants adapted to the eco-type can result in poor seeding success.
Special Seed Needs

Mountain big sagebrush—Source Identified—Southwest Washington County

This collection must be Source Identified through the Utah Crop Improvement Association as low elevation Mountain Big Sagebrush.
Purity

- Purity can effect how the seed is planted.
  - Low purity can stop flow, especially in airplanes
- UDWR standard 30% pure minimum
- PLS 24% minimum
Project Planning

• Advanced proactive restoration project planning allows for seed purchasing of site adapted seed.
  – Utah Watershed Restoration Initiative

• Buying early and in larger quantities generally brings lower prices.
  – Identifying needs for seed early through the project planning process allows for this.
Seedbed Preparation & Seeding

• Removal of competition
• Fall & winter
  – Seed on top of snow
• Recommended Seeding rates 0.1 – 0.25 lb.pls/ac
• Depth: Surface – 3mm deep
• Surface compaction can help
Seedbed Preparation and Controlling Competition

• Fire
  – Fire Rehabilitation
  – Prescribed fire
    • burning off undesirable weeds prior to seeding

• Herbicides
  – Plateau
  – Roundup
Seedbed Preparation Equipment

- Bullhog (Masticator/Shredder)
- Chain
- Pipe harrow
- Aerator
- Drill
Seeding Equipment

Rangeland Drill

Truax Rough Rider Drill

Pulled Tubes to Broadcast Seed
Broadcasters
Swain Fire 2000 – Fillmore, UT
Deer Winter Range Sagebrush was Key Species to Restore Chained, then Aerially Applied Seed
Swain Fire - Fillmore, Utah
Burned 2000  Photo 2002

NON-CHAINED AREA
Low diversity
Dominated by annuals
Lack of litter

CHAINED AREA
Plant diversity
Shrubs, forbs, grasses
Litter

500 Sagebrush seedlings per acre
5894 Sagebrush seedling per acre
Current Efforts

Utah’s Watershed Restoration Initiative

Utah Partners for Conservation & Development

- Utah Department of Natural Resources
- Bureau of Land Management
- Utah State University Extension Service
- USDA Natural Resources Conservation Service
- Utah Association of Conservation Districts
- U.S. Fish and Wildlife Service
- U.S. Farm Services Agency
- U.S. Forest Service
- Utah Department of Environmental Quality
- Utah Roadside Landscape Association
- U.S. Bureau of Reclamation
- National Park Service
- Utah School and Institutional Trust Lands
- Utah Division of Wildlife Resources
- Utah Division of Forestry, Fire and State Lands
- Utah Division of Parks and Recreation
- Utah Department of Agriculture and Food
Monitoring Projects

- 2004-2009
  - ~100 projects
  - 56 monitoring seeded sage sites statewide

- Data
  - Pre-treatment
  - Post-treatment
    - 3-4 years
Successful Seeding Treatments

• Pinyon Juniper Removal
• Fire Rehab Chaining
• Grass Diversification (herbicides)
• Harrowing
Santaquin Chaining 2010

20 – 800 plants/acre
Bullhog/Masticator
0 – 2900 plants/acre
Goslin Mountain Bullwhog 2010

300 – 880 plants/acre
Roller Chopper
Wildcat Roller Chopper 2005

Wildcat Push
16R-16 7/2/05
O FWD
Fire Rehabilitation using Chaining
Big Cedar Cove 2011
Milford Flat Fire 2007

320 plants/acre
Buckskin Fire 2008

1220 plants/acre
Spray and Drill
Little Donkey 2007

80-6440 plants/acre
Harrow

• Plateau to control cheatgrass
Brush Creek Dixie 2010

4420 – 5100 plants/acre
Projects to enhance sagebrush without seeding
McCook Ridge Chaining 1988
McCook Ridge Chaining 2000
McCook Ridge Chaining 2005
Bullhog Retreatment
140 - 540 plants/acre
Seeding without seed bed preparation
Conclusions

- Control competition
- Prepare seedbed
- Precipitation
New Glenwood Research Project

- Drill
- Chain
- Plateau herbicide
- Disking or burning
- Wheel Packer
Wheel Packer
Thank You