Planting Methods and Sage Grouse Habitat

Calvin Strom Research Scientist
Wyoming Reclamation and Restoration Center
Soil variability across the landscape. Different plants favor different soil types and depths.
This landscape requires extensive soil mapping to prevent mixing of unsuitable subsoil with topsoil.
When re-contouring these islands should be reconstructed. Plant shrubs on higher ground to take advantage of prevailing winds to disperse seed. These islands should be mapped and stripped separate from the saltbush community to prevent elevation of EC which restricts sagebrush establishment.
Stripping no more than 10 cm maintains native seed bank stripping to 30 cm reduces seedbank threefold, Leaving trash in topsoil pile
Major Disturbance transforms the landscape .. It alters soil chemical and physical properties, depth across the site, mixes subsoil with topsoil. Recreates a homogenized topsoil at a uniform depth. Most of the variables influencing restoration success are related to texture and nutrient content. Research has demonstrated that most ecosystems contain variable depths of topsoil, and certain plants occur in certain areas. Topsoil depth effects plant community composition and diversity.

Lawrence et al (1967) soil exposed from retreating glaciers have characteristics that make it difficult for plants to establish. Pioneer species that establish moderate the harsh attributes and add organic soil over the hardpan, and reduce wind effects it is then that spruce seedlings appear. Research in Australia recommends ripping to 80 cm after topsoil is re-spread and does not reduce seedling recruitment—— Meeting Notes [3/17/14 13:49] ——
Mid July soil temperature in SW Wyoming measured 89.6 at 10cm, 77 @ 30cm and 71.6 at 50cm.
Leaving woody debris on surface creates micro-climes.
Plant annual cover crop, which reduces surface soil temperature & evaporation rate. Provides shade for seedlings and reduces herbivory.
Rocky mountain bee plant trapping snow on seeded site, increases soil moisture, reduces wind and water erosion
4 foot high snow fence is ineffective snow piles to height of fence and approximately fifty feet wide leaving bare ground beyond. Fence height should be no higher than the tallest shrub that was present on the site and strategically placed to provide snow cover across the site.
Note no shrubs no snow, burned site
Drill seeding. Timing is October good time for dormant seeding. Seeds germinated in December and seedlings did not emerge until March and were subject to freeze thaw and moisture levels as low as summer drought. This research demonstrates that seed emergence is the bottleneck, not germination. Can we design seed mixes to overcome this bottleneck? Or change seeding dates?
Pitting

Micro-catchments, designed to capture moisture.
Illustration of micro-catchments intercepting snow.
Note the smooth surface in the background
Diamond imprinter used on this site. Soil was too dry to make stable imprints. Note flat surface, increases wind erosion. Need woody debris or artificial shrub silhouettes to slow wind and create micro-climes and deposition of wind blown soil and traps snow increasing spring moisture.
Surface treatment

Creation of a rough surface and leaving woody debris on the surface
Research has shown that seeding high rates of perennial grasses may slow or inhibit shrub establishment. Seed mixes need to be designed to reduce competition to allow shrub establishment. Removing or reducing rhizomatous wheatgrasses?
Broadcast works well on rough surfaces that have litter, cracks, and crevices which protect the seed from wind and collects water from precipitation events.
Planting Container Shrubs

Plant seedlings to the same depth as they are in the container, the root collar should not be covered. Bare root seedlings it is harder to differentiate the location of root collar, crews should be trained to identify the root collar. When planting bare root stock care should be taken to not expose roots to elements, research has shown that as little as ten minutes on a clear warm day can harm or kill them. Keep the roots protected. It is also recommended to spread loose dry soil and litter around the base.
Questions
References