

SWCA

Restoring Big Sagebrush Islands with Wildling Plantings and Microtopography to Enhance Sage-Grouse Habitat

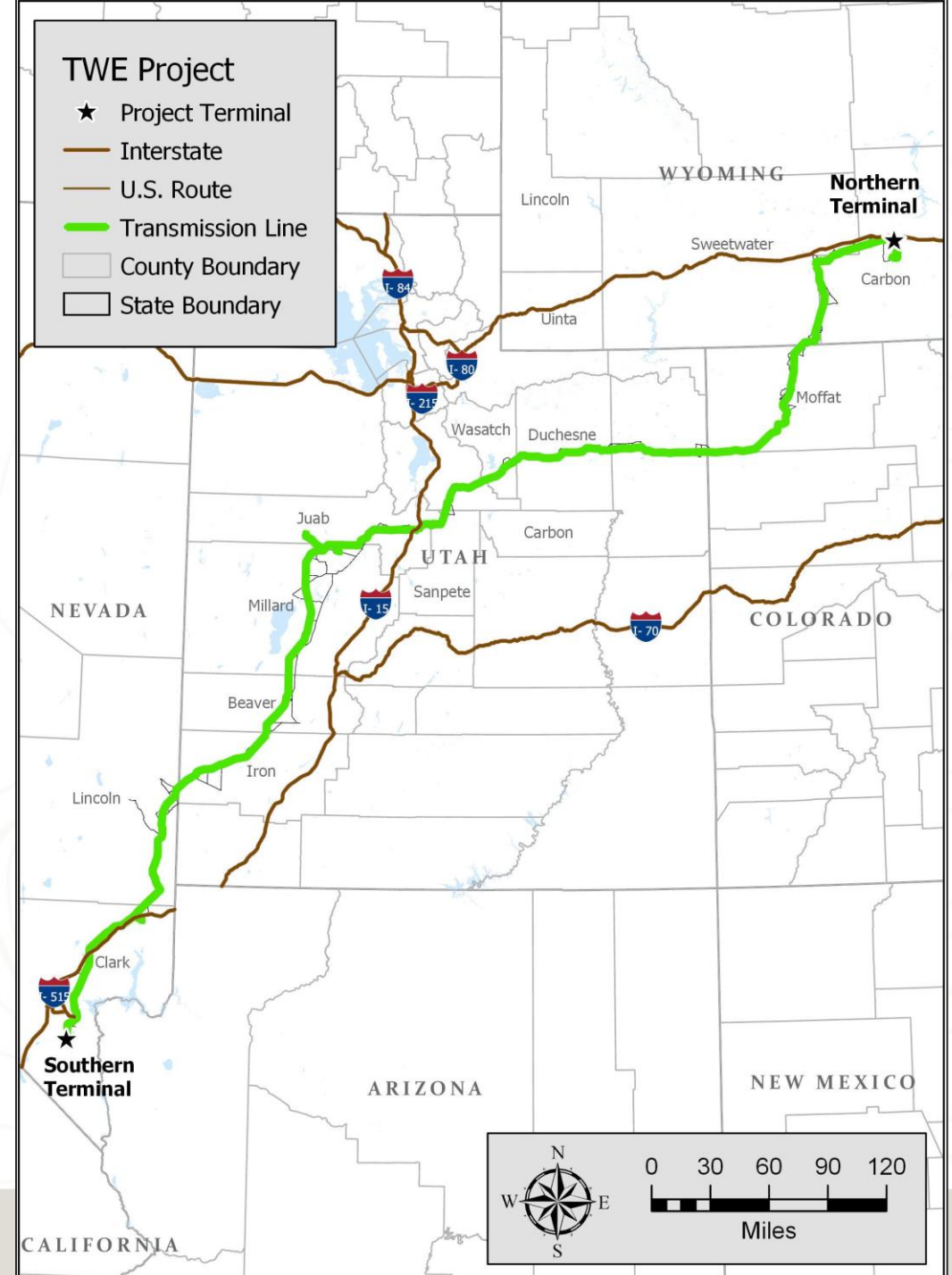


ASRS 2026 Annual Meeting – Laramie, WY
TransWest Express Transmission Project
June 2026



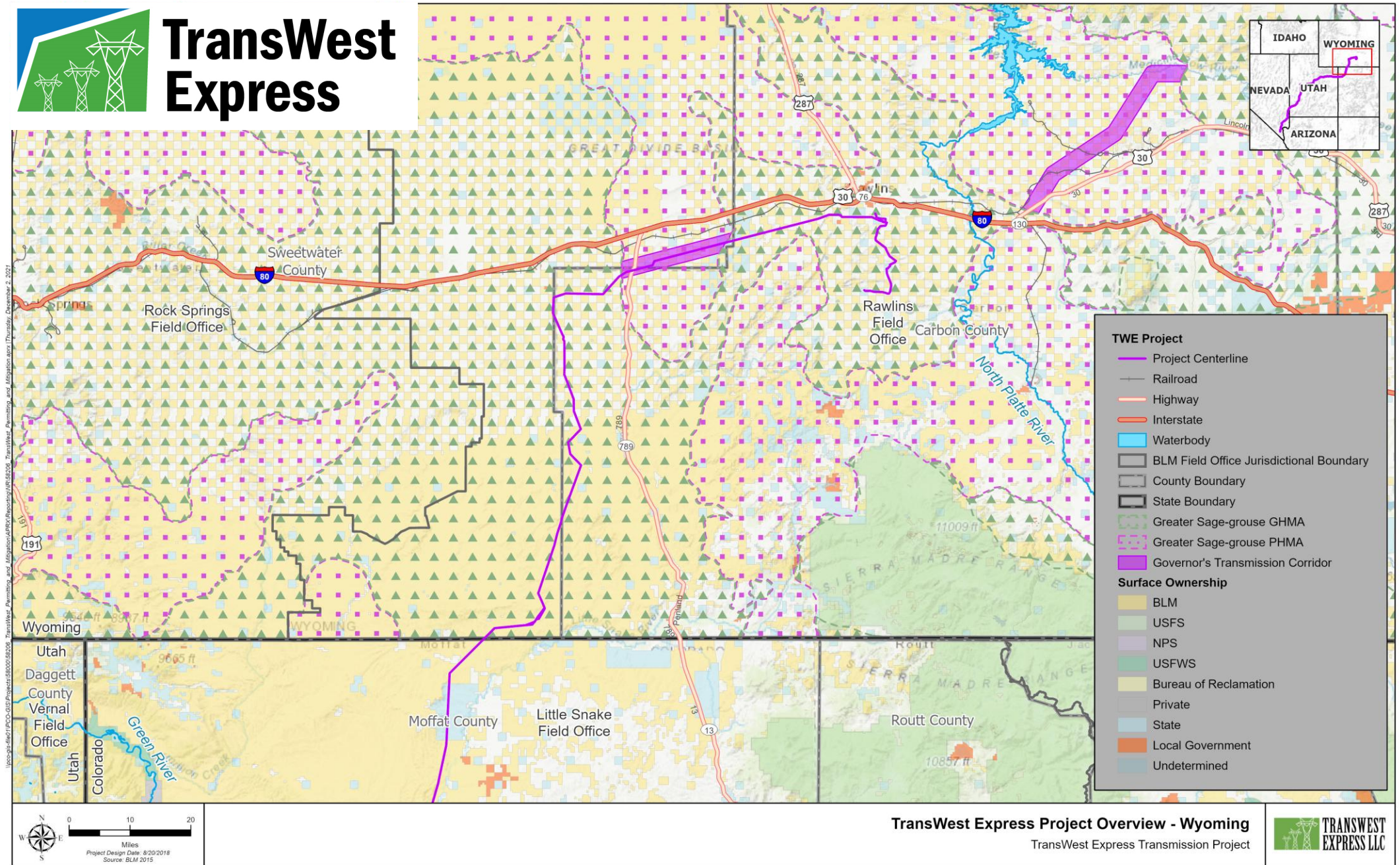
TransWest Express

- High-kV Transmission Line
- 732 Miles
 - Wyoming
 - Colorado
 - Utah
 - Nevada
- Jurisdictions
 - 10 BLM Field Offices
 - 2 National Forests
- Greater Sage-grouse Habitat



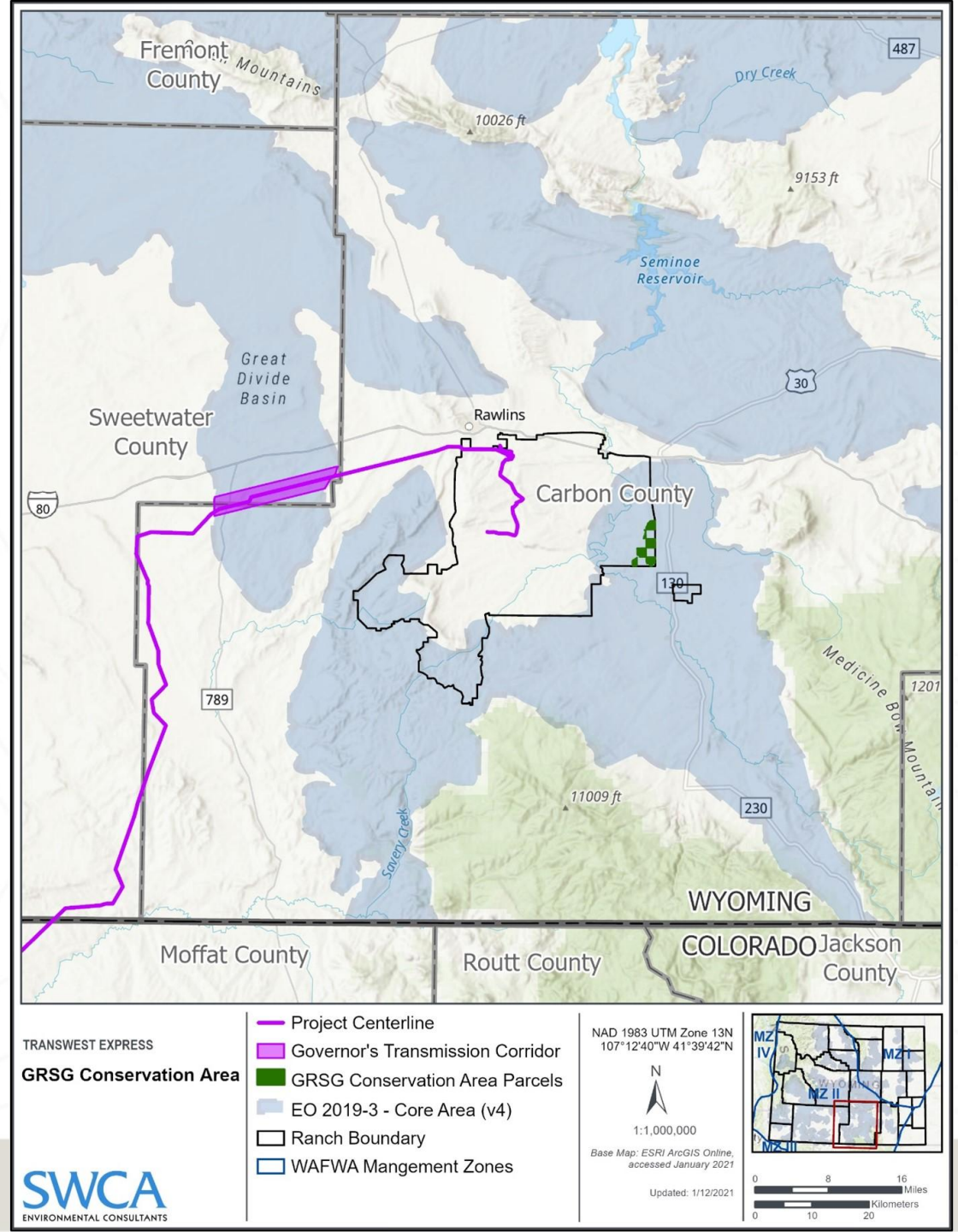


TransWest Express



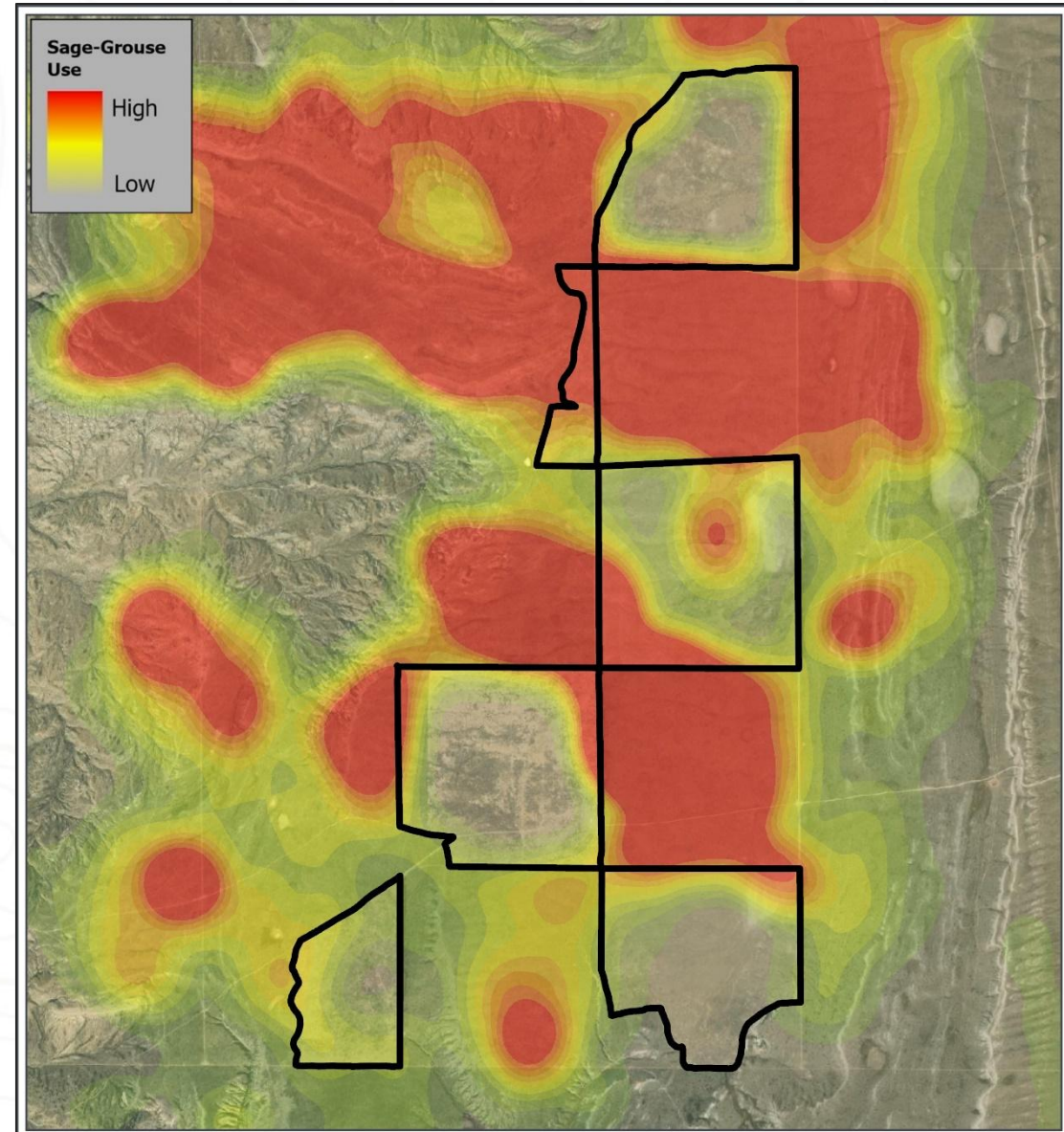
Project Setting & Mitigation Need

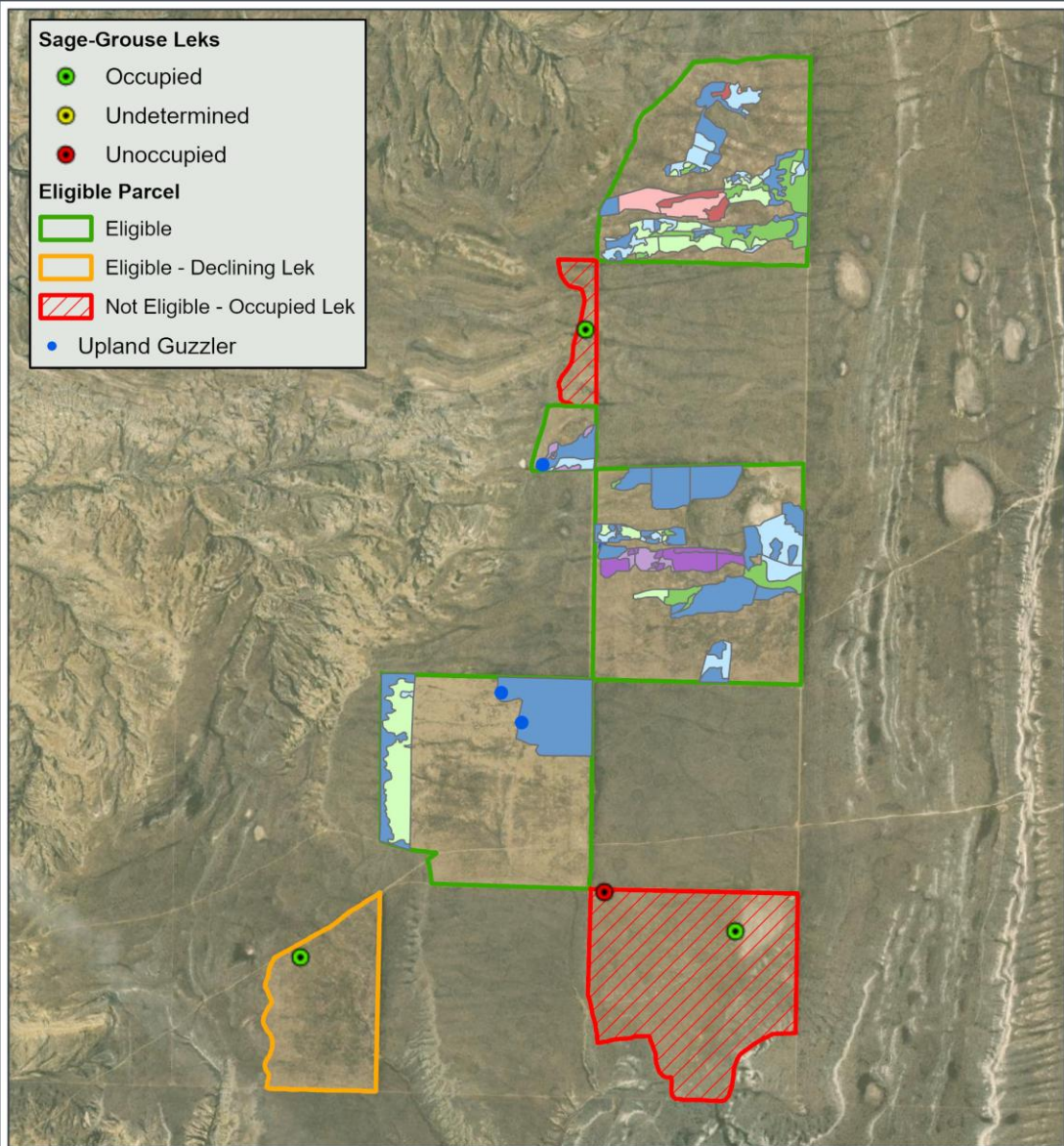
- Located north of Saratoga, Wyoming
 - Within the South Rawlins Greater Sage-Grouse Core Population Area
- Site consists of relic dryland wheat fields on private ranch lands
- Historic agricultural conversion reduced sagebrush habitat structure and function
- Existing fields lack shrub structure for year-round sage-grouse habitat use;
 - Limited moisture retention
 - Limited seed recruitment
 - Poor soil health
- The mitigation plan is designed to improve both habitat structure and function



Habitat Enhancement Opportunity

- Converted from sagebrush to dryland wheat in 1940s and 1950s
 - Abandoned shortly after conversion
- High sage-grouse winter, lek, and early-brood use surrounding fields
- Very low or no use in converted/abandoned fields





Greater Sage-Grouse Conservation Implementation

Potential Enhancement Projects



Treatment & Enhancement	
	Cheatgrass, Perennial Grasses, Forbs
	Cheatgrass, Perennial Grasses, Forbs, Sagebrush
	Rejuvra, Perennial Grasses, Forbs
	Rejuvra, Perennial Grasses, Forbs, Sagebrush
	Plateau, Perennial Grasses, Forbs
	Plateau, Perennial Grasses, Forbs, Sagebrush
	Perennial Grasses, Forbs
	Perennial Grasses, Forbs, Sagebrush

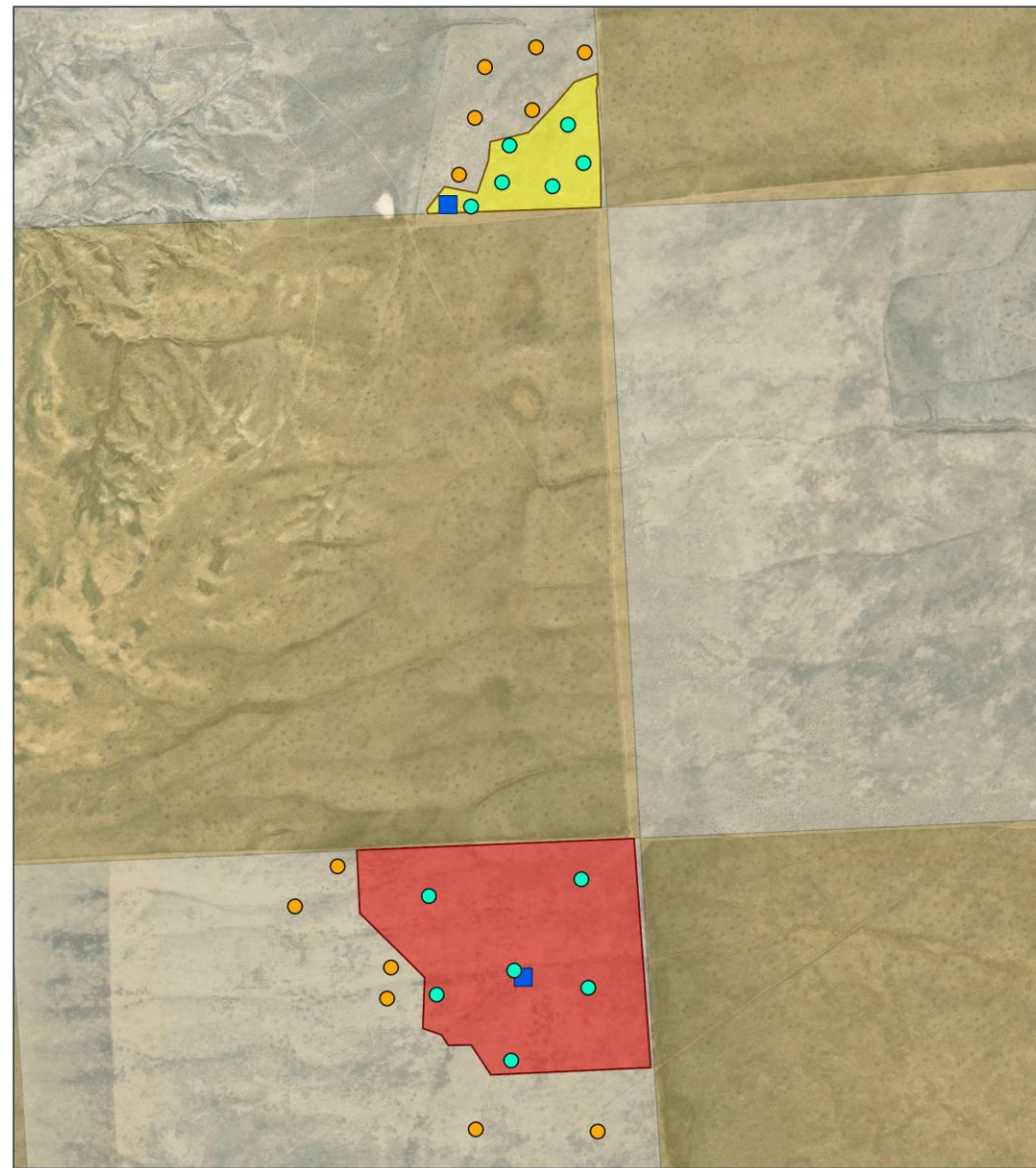
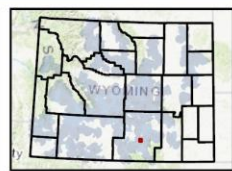
NAD 1983 UTM Zone 13N
106°52'7"W 41°36'18"N



1:50,000

Base Map: ESRI ArcGIS Online,
accessed October 2022

Updated: 10/14/2022



TWE Project Greater Sage-Grouse Enhancement Areas

Monitoring Points

- Control (Orange circle)
- Seed (Cyan circle)

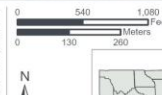
GRSG Habitat Enhancement

- Enhancement Area 1 (Red)
- Enhancement Area 2 (Yellow)

Upland Guzzler Location

- BLM (Orange square)
- Private (White square)

Carbon County, WY
USGS 7.5' Quadrangle:
Overland, WY, 41106-E7
T19N R84W Section
16, 17, 20, 28, 29
NAD 1983 UTM Zone 12N
41.6039°N 106.8664°W



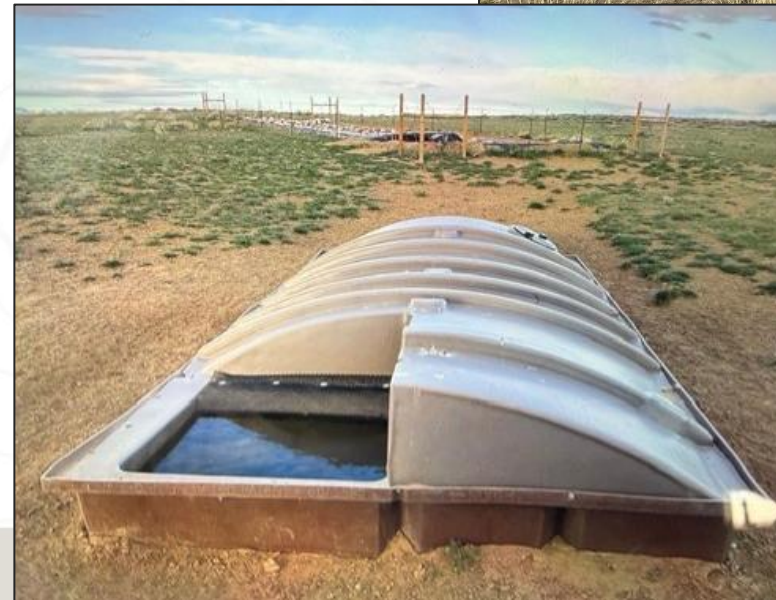
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Base Map: ESRI ArcGIS Online,
accessed February 2026
Layout: TWE GRSG Enhancement
Areas 2023
Apr: TWE_GRSG_Exception_Request



2023 Enhancement Work Completed

- Enhancement implemented September–November 2023 across two areas totaling approximately 110 acres
- **Area 1**: Roughened topsoil, shrub seeding, and irrigation support
- **Area 2**: Roughened topsoil, forb and grass seeding, and irrigation support
- **Native grasses, forbs, and shrubs seeded; two water catchment tanks installed for supplemental irrigation**
- **Actions conditioned soils and improved brood-rearing habitat, creating the foundation for 2025 shrub-focused enhancement**



Enhancement Strategy & Actions

- Strategy emphasizes big sagebrush establishment and shrub recovery
- Restoration methods complement rather than replace 2023 actions
- Transplant big sagebrush seedlings into targeted restoration plots
- Monitoring results will guide maintenance and future adaptive management

Sagebrush Wildling Plantings (Bailey et al. 2024)

- Well matched to dryland restoration constraints
- Mature sagebrush transplanted from local donor locations
- Bypasses germination and seedling bottleneck
- Higher survival and recruitment than conventional seeding;
- Harvest in fall (October–November)
 - Target non-reproductive shrubs approximately 4 to 9 inches tall

Transplanted sagebrush “wildlings” exhibit higher survival than greenhouse-grown tubelings yet both recruit new plants



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Abstract

Background Land uses such as crop production, livestock grazing, mining, and urban development have contributed to degradation of drylands worldwide. Loss of big sagebrush (*Artemisia tridentata*) on disturbed drylands across the western U.S. has prompted massive efforts to re-establish this foundational species. There has been growing interest in avoiding the severe limitations experienced by plants at the seed and seedling stages by instead establishing plants from containerized greenhouse seedlings (“tubelings”). In some settings, a potential alternative approach is to transplant larger locally-collected plants (“wildlings”). We compared the establishment of mountain big sagebrush (*A. tridentata* ssp. *vaseyana*) from tubelings vs. wildlings in southeastern Idaho. A mix of native and non-native grass and forb species was drill-seeded in a pasture previously dominated by the introduced forage grass, smooth brome (*Bromus inermis*). We then established 80 m x 80 m treatment plots and planted sagebrush tubelings ($n = 12$ plots, 1200 plants) and wildlings ($n = 12$ plots, 1200 plants). We also established seeded plots ($n = 12$) and untreated control plots ($n = 6$) for long-term comparison. We tracked project expenses in order to calculate costs of using tubelings vs. wildlings as modified by probability of success.

Results There was high (79%) tubeling and low (10%) wildling mortality within the first year. Three years post-planting, chance of survival for wildlings was significantly higher than that of tubelings (85% and 14% respectively). Despite high up-front costs of planting wildlings, high survival rates resulted in their being < 50% of the cost of tubelings on a per-surviving plant basis. Additionally, by the third year post-planting 34% of surviving tubelings and 95% of surviving wildlings showed evidence of reproduction (presence / absence of flowering stems), and the two types of plantings recruited new plants via seed (3.7 and 2.4 plants, respectively, per surviving tubeling/wildling).

Conclusions Our results indicate that larger plants with more developed root systems (wildlings) may be a promising avenue for increasing early establishment rates of sagebrush plants in restoration settings. Our results also illustrate the potential for tubelings and wildlings to improve restoration outcomes by “nucleating” the landscape via recruitment of new plants during ideal climate conditions.

Keywords Bare-root, Containerized stock, Nucleation, Plugs, Rangeland, Rehabilitation, Restoration, Seedling, Transplant, Wildling

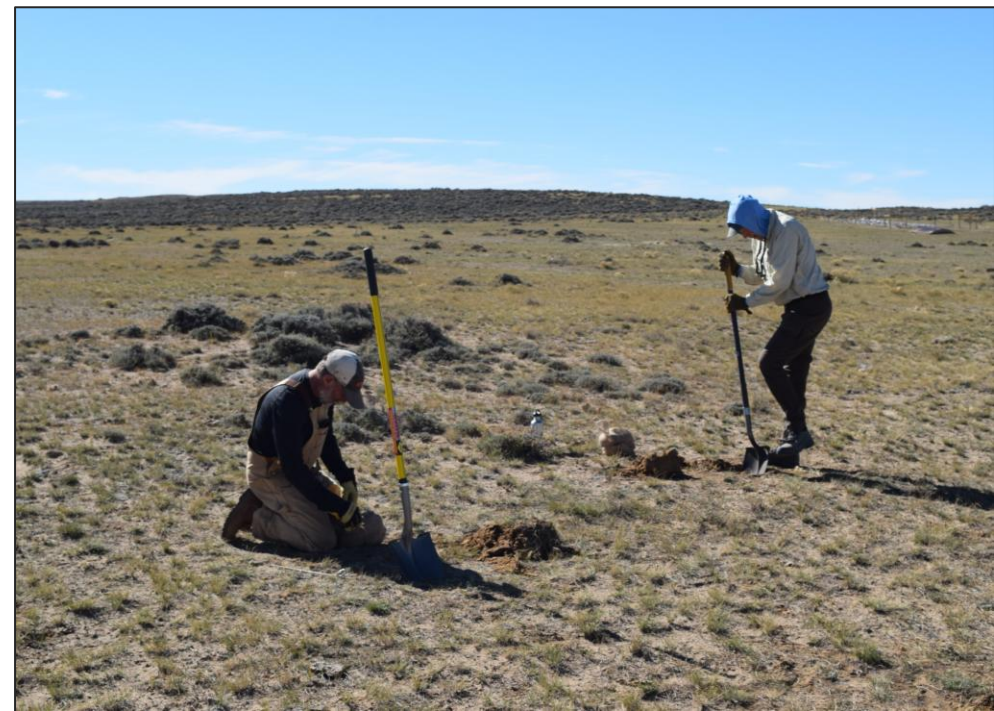


Sagebrush Wildling Plantings

- Wildlings shown to be more successful than tubelings
- Locally sourced – small (4-9 inch tall) sagebrush shovel harvested with rootball
- Replanted in island plots combined with microtopography treatments and other moisture catchment methods
- Tagged to identify wildlings vs natural recruitment



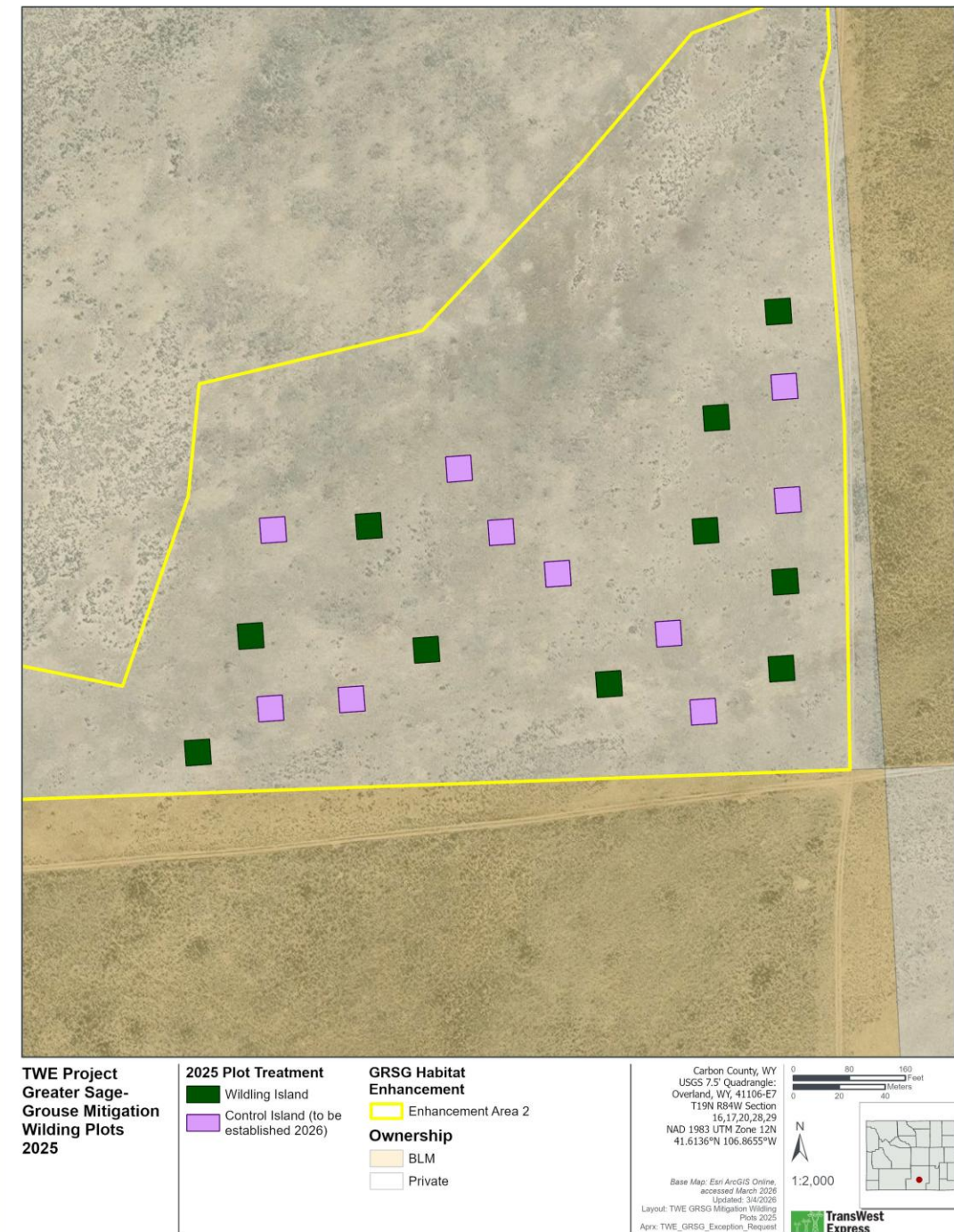






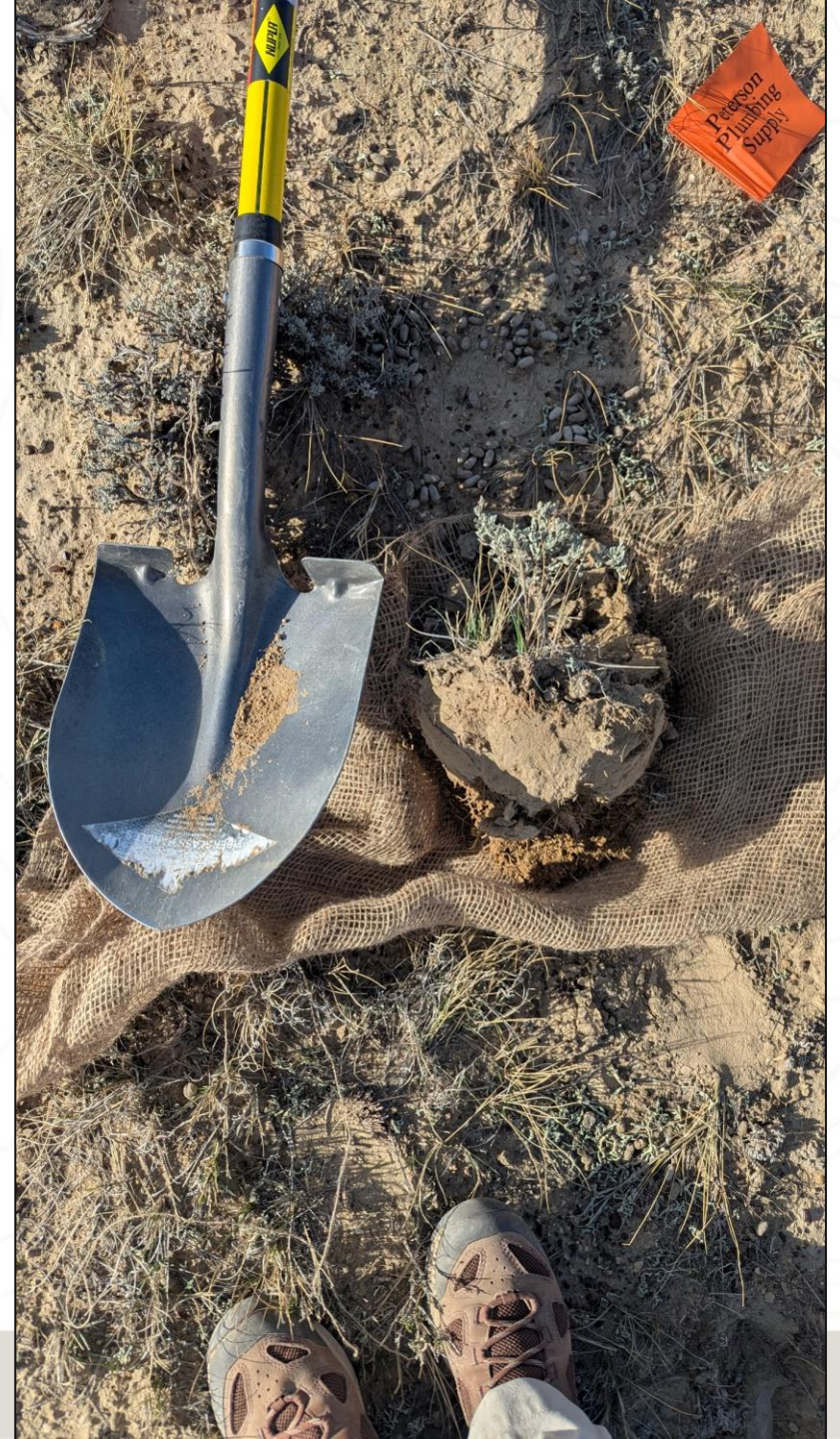
Monitoring & Adaptive Management

- Monitoring includes implementation, performance, and adaptive management components
- Implementation monitoring confirms work was completed to specification
- Performance monitoring evaluates whether restoration objectives are being achieved
- Vegetation response in dryland systems may be delayed by limited precipitation
- Results reviewed with Technical Advisory Committee; maintenance may include erosion repair, basin adjustments, or added stabilization



Key Takeaways & Next Steps

- Preliminary Results
- Advance shrub-focused restoration on an implementation foundation
- Strategy combines soil restoration, shrub establishment, and adaptive monitoring
- Success depends on careful field execution and long-term performance tracking



Questions?



For More Information on TWE

<https://www.transwestexpress.net/>

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