

PINEDALE RESOURCE AREA
COOPERATIVE FIELD
EVALUATION PLANTING
2006 QUESTAR SHRUB
TRIAL

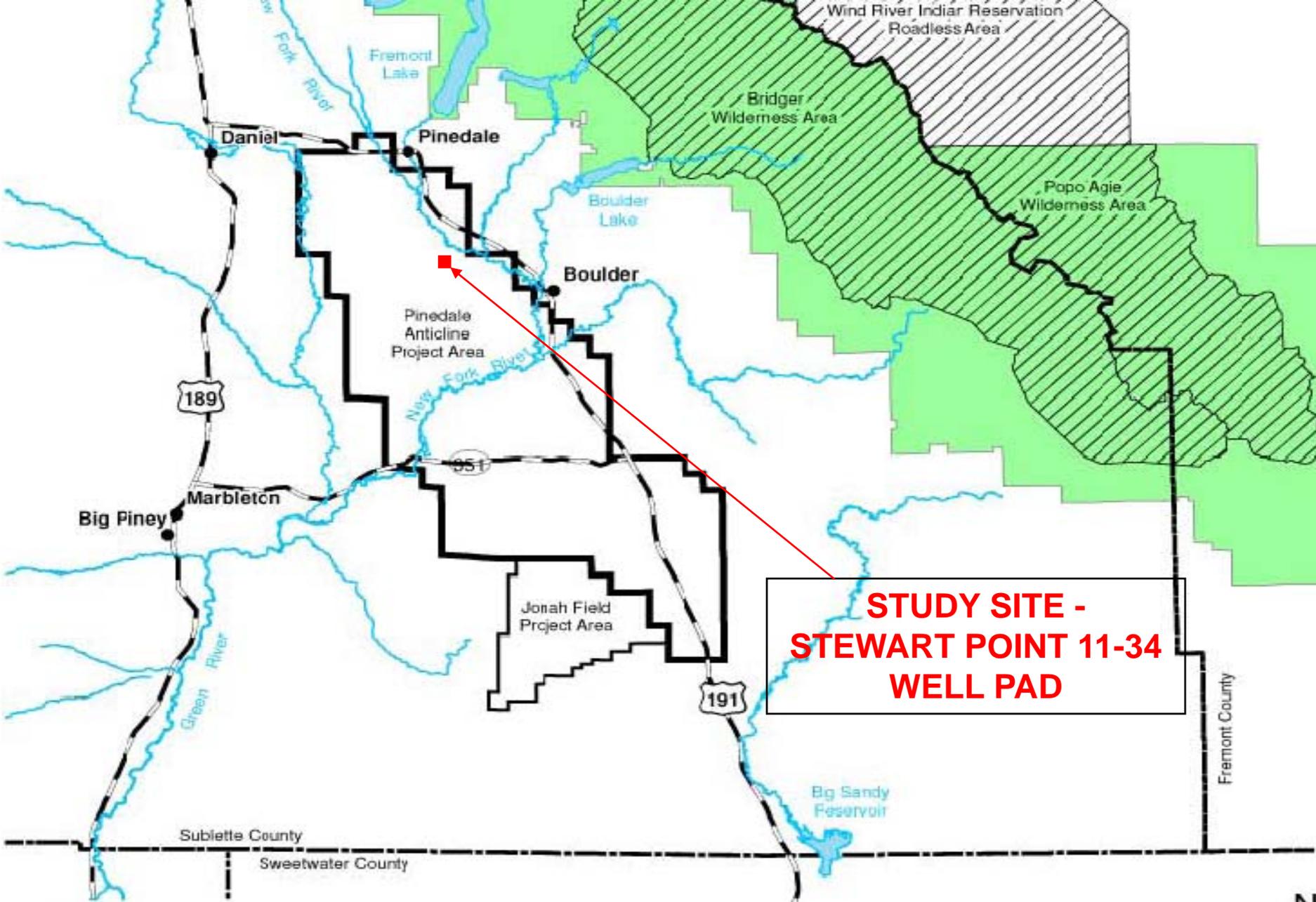
PARTICIPANTS

- **USDA, Natural Resources Conservation Service (NRCS)**
- **Wyoming Game and Fish Department (WGFD)**
- **USDI, Bureau of Land Management (BLM)**
- **Questar Exploration and Production Company**

STUDY OBJECTIVES

- Test shrub species, cultivars, and varieties for adaptation to the Mesa.
- Test selected bluebunch wheatgrass cultivars for adaptation to the Mesa.

Emphasis on species native to the Rocky Mountain Region that provide forage production, a diverse ecosystem, and habitat for sage grouse, mule deer, antelope, and other wildlife species, especially those dependent upon sagebrush communities.



**STUDY SITE -
STEWART POINT 11-34
WELL PAD**

U.S. Forest Service Lands



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SP 11-34 PAD



STUDY SITE

- **Elevation:** 7515 feet
 - **Precipitation:** 12-14 inches annually, mainly in the form of snow. Peak growing season precipitation is from May to June.
 - **Growing Season:** 60 days.
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SP 11-34 Development History and 0.7-Acre Site Preparation

Location = T33N, R109W, Section 34, SW1/4 of SW1/4

Development = Single well in 1998 (4-acre pad), no additional wells planned

Reclamation = 2005 - 3 acres topsoiled (5-6 inches), seeded and enclosure built

Site Prep = 2006 - broadleaf weed control (kochia, Russian thistle, lambs quarter);
English harrowed (2-3 inch depth)

Pad Monitoring = 2007 – initial reclamation monitoring, and pad fence removal





PRE-DISTURBANCE VEGETATION

MATURE WYOMING BIG SAGEBRUSH COMMUNITY

REPRESENTATIVE MESA DATA (2005)

PERCENT COVER: TOTAL GROUND = 67.9% TOTAL VEGETATION = 45.7%
TOTAL GRASS = 19.5% TOTAL FORB = 8.7%
TOTAL SHRUB = 17.5%

PRIMARY SPECIES: Wyoming big sagebrush (14%), thickspike wheatgrass (7%), sandberg bluegrass (6%), green rabbitbrush (4%), bluegrass spp. (3%), Hood's phlox (3%), goldenweed (3%)

HERBACEOUS PRODUCTION (LB/ACRE): 442

Ecological Site Description: Loamy , 10-14", Foothills and Basins West

STUDY SITE SOILS

➤ SURFACE (TOP 5 INCHES):

Loam - 43.6% sand, 40% silt, 16.4% clay

pH - 8.0

Nutrients (ppm) - N (27), P (20), K (303), OM (2.7%)

Other (ppm) - Na (32), Ca (5,691), Mg (347), EC (0.77 mmhos)
SAR (0.52), Saturation (56.3%), Density (1.3)

➤ SUBSURFACE (BELOW 5 INCHES):

Sandy Clay Loam - 49.6% sand, 22% silt, 28.4% clay

pH - 8.6

Nutrients (ppm) - N (21), P (36), K (112), OM (1.6%)

Other (ppm) - Na (179), Ca (3,757), Mg (642), EC (1.01 mmhos)
SAR (2.43), Saturation (66.7%), Density (1.2)

METHODS

➤ PLOT DESIGN (randomized):

Shrub Plots: 29 Accessions

4 Replications

48' x 20' Per Replication

Bluebunch Plot Size: 4 Accessions

20' x 100' per plot

GENERAL PLOT LAYOUT

NW												PSSP6 'Goldar'
BLOCK I	ATFA	RHTR	AMUT	ROWO	ERNA10	CELE3	RICE	ATCA2	PUTR2	SYOC		
	SYOR2	RIAU	ARLU	AMAL2	ARNO4	SYOC	CEMO2	PRVI	ARTRV	ARCA13		
	ATxAP	ARTRW8	SYAL	KRLA	ARTRV	ARTRT	PUTR2	ARFR4	KRLA			
BLOCK II	AMUT	SYOC	CEMO2	ARFR4	PRVI	ARTRV	SYOR2	ARLU	KRLA	RICE	PSSP6 'Whitmar'	
	ATCA2	PUTR2	ERNA10	PUTR2	ARTRW8	SYOC	ATFA	RHTR	ARTRV	ARTRT		
	CELE3	AMAL2	ARCA13	ARNO4	SYAL	RIAU	ROWO	KRLA	ATxAP		PSSP6 'P-7'	
BLOCK III	CELE3	RHTR	ARFR4	SYOC	ARTRV	ARLU	RICE	ARTRW8	SYOR2	PRVI		
	ARTRT	ARTRV	ATxAP	AMUT	ATFA	AMAL2	ERNA10	SYOC	RIAU	SYAL	PSSP6 'Anatone'	
	ARCA13	ROWO	CEMO2	KRLA	ATCA2	PUTR2	ARNO4	PUTR2	KRLA			
BLOCK IV	AMAL2	ARTRT	ARTRV	RHTR	ARNO4	SYAL	ATFA	KRLA	ARTRV	ATxAP	PSSP6 'Secar'	
	ARLU	PRVI	SYOR2	KRLA	PUTR2	AMUT	ARCA13	CELE3	ARFR4	SYOC		
	RIAU	ROWO	RICE	SYOC	ARTRW8	PUTR2	CEMO2	ERNA10	ATCA2			
SW												

Species/Accession List

Common Name – Scientific Name, Cultivar

Antelope Bitterbrush - *Purshia tridentata*, Maybell

Chokecherry - *Prunus virginiana*, common

Golden Currant - *Ribes aureum*, common

Wax Currant - *Ribes cereum*, common

Curl-leaf Mountain Mahogany - *Cercocarpus ledifolius*, common

True Mountain Mahogany - *Cercocarpus montanus*, common

Rubber Rabbitbrush - *Ericameria nauseosa* ssp. *albicaulis*, common

Woods Rose - *Rosa woodsii* var. *woodsii*, common

Basin Big Sagebrush - *Artemisia tridentata* ssp. *tridentata*, common

Black Sagebrush - *Artemisia nova*, common

Mountain Big Sagebrush - *Artemisia tridentata* ssp. *vaseyana*, Hobble Creek

Silver Sagebrush - *Artemisia cana*, Caballo

Wyoming Big Sagebrush - *Artemisia tridentata* ssp. *wyomingensis*, Powder River & Bonneville hyb.

Cudweed Sagewort - *Artemisia ludoviciana*, common

Fringed Sage - *Artemisia frigida*, common

Four-wing Saltbush - *Atriplex canescens*, Snake River Plain Germ.

Gardner's Saltbush - *Atriplex gardneri*, 9016134

Serviceberry - *Amelanchier alnifolia*, common

Utah Serviceberry - *Amelanchier utahensis*, common

Common Snowberry - *Symphoricarpos albus*, Prospectors Germplasm

Mountain Snowberry - *Symphoricarpos oreophilus*, common

Western Snowberry - *Symphoricarpos occidentalis*, Trapper Germplasm

Skunkbush Sumac - *Rhus trilobata*, common

Winterfat - *Krascheninnikovia lanata*, Open Range & Hatch & Northern Cold Desert Germ.

METHODS

➤ PLANTING METHOD AND TIMING:

Date = October 11, 2006

Weather = Sunny, mid 30s, wind 10-15 mph

Seeded shrub plots with 3 hand seeders (2 belt, 1 cone) -
seed depths adjusted based upon seed size 0.25-0.75"

Seeded grass plots with hand broadcaster – hand raked in seed







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SnoAnn Engler



METHODS

➤ POST-PLANTING MANAGEMENT:

Plots marked to indicate species/variety/accession

In the event of failure replanting all or portions of the area will be considered

Weed control will be applied as needed

On-site water available, and may be used if needed

Exclosure fence maintained for 15 years or until team elects removal

EVALUATION METHODS

- Annually for up to 15 years post-planting
- Photo points – Each Row, 1/year in late summer/ throughout evaluation
- Germination/Emergence – If poor, seedlings counted for entire plot; if good, seedlings counted in 3 random 1 foot sections per plot. Years 1-3 as needed in spring/early summer
- Survival – If stand is thin, all surviving plants counted; If stand is good, then 2nd year measurement will be % basal cover. Every year in late summer.
- Health – Ocular estimate of plant condition vigor rating (1 = very best; 9 = worst; 0 = no plants). Every year in late summer.
- Canopy Cover – Line-intercept, every year after year 1 in late summer.
- Palatability – After initial period (up to 15 years) and after fence removal, the area will be visited at least once to determine use and assumed relative palatability of all plants

REPORTING

- Published under multiple authorship (NRCS lead) after evaluation
- Results available to a wide audience
- Results anticipated to be relevant to other areas of the intermountain west with similar site conditions

QUESTIONS?

