Ecological site DX032X02W140
Saline Lowland Drained (SLDr)
Wind River Basin Wet

Last updated: 3/10/2025
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General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 032X–Northern Intermountain Desertic Basins

032X – Northern Intermountain Desertic Basins – This MLRA is comprised of two major Basins, the Big Horn and Wind River. These two basins are distinctly different and are split by LRU's to allow individual ESD descriptions. These warm basins are surrounded by uplifts and rimmed by mountains, creating a unique set of plant responses and communities. Unique characteristics of the geology and geomorphology further individualize these two basins. For information regarding MLRAs, refer to: United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. Available electronically at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/? cid=nrcs142p2_053624#handbook.

LRU notes

32X02W (WY): This LRU is the Wind River Basin within MLRA 32X. This LRU tends to be just a fraction higher in elevation, slightly cooler (by 1-degree Celsius), and snowpack tends to persist longer into the spring than the Big Horn Basin (LRU 01). This LRU was originally divided into two LRU's - LRU C which was the core and LRU D which was the rim. With the most current standards, this LRU is divided into three subsets. This subset is the "wet" subset of the Wind River Basin and is comprised of drainages, floodplains, floodplain steps, and stream terraces. This subset is driven by hydrology and the connectivity or disconnection from the water table, and significant periods of surface flow, that affects the soil chemistry, influencing the variety of ecological sites and plant interactions. The wet subset includes all of the core subset and extensions into the rim subset. The hydrology factor is the driving factor over precipitation in this subset. Because of this and historic mapping, the extent of soils currently correlated to this ecological site does not fit within the current subset or LRU boundary. Many of the map unit components are correlated to ecological sites outside of this MLRA, but will be reviewed and corrected during mapping update projects. Moisture Regime: typic aridic or ustic aridic Temperature Regime: Mesic Dominant Cover: Rangeland, with sagebrush steppe intermixed with saltbush flats, is the dominant vegetative cover. Representative Value (RV) Effective Precipitation: 9-12 inches (229 – 305 mm) RV Frost-Free Days: 85-115 days

Classification relationships

Relationship to other established classification systems: National Vegetation Classification System (NVC): 3 Xeromorphic Woodland, Scrub & Herb Vegetation Class 3.B Cool Semi-Desert Scrub & Grassland Subclass 3.B.1 Cool Semi-Desert Scrub and Grassland formation 3.B.1.NE Western North American Cool Semi-Desert Scrub & Grassland Division M171 Great Basin - Intermountain Dry Shrubland & Grassland Macrogroup G301 Intermountain Dwarf Saltbush - Sagebrush Scrub Group Ecoregions (EPA): Level I: 10 North American Deserts Level II: 10.1 Cold Deserts Level III: 10.1.18 Wyoming Basin Level IV: 10.1.18g Big Horn Salt Desert Shrub Basin National Hierarchical Framework of Ecological Units (USFS): 300 Dry Domain 340 Temperate Desert Division 342 Intermountain Semi-Desert Province 342A Bighorn Basin 342Ad Big Horn Basin

Ecological site concept

• Site receives additional moisture from surrounding uplands. • Site exists along degraded (down-cut) channel systems that have had a significant drop in the water table. • Slope is 6%. • Soils are: - Textures range from sandy loam to clay in top four inches (10 cm) of mineral soil surface, and varies within profile. - All subsurface horizons in the particle size control section have a weighted average of > 18% clay. (The particle size control section is the segment of the profile from either the start of an argillic horizon for 50 cm or from 25-100 cm). - Not skeletal (35% rock fragments) within 20 inches (50 cm) of mineral soil surface, may have stratification with gravels. - None to strong effervescence throughout upper 20 inches (50 cm) of the mineral soil surface. - Saline, sodic, or saline-sodic; but this may occur deeper in the profile (within rooting zone of woody species).

Associated sites

R032XY204WY	**Clayey (Cy) 5-9” Wind River Basin Precipitation Zone** Clayey sites are found in pockets or bands just above or within the Saline Lowland Drained soils. Clayey sites have never been influenced by a water table or significant overflow. Many times Clayey and Saline Lowland drained ecological sites will be found in bands or patchy complexes along eroded stream terraces or fans forming below shale outcroppings.
R032XY228WY	**Lowland (LL) 5-9” Wind River Basin Precipitation Zone** Saline Lowland Drained have lost the recognizable water table and are found on relict stream terraces, along drainageways, or on alluvial fans. The soils transition into Saline Lowland the closer to the existing water table you move. Lowland soils have a water table that fluctuates between depths of 100 to 200 cm below the soil surface during the growing season, and are on active floodplains or floodplain steps.
DX032X02A144	**Saline Upland (SU) Wind River Basin Core** The soils transition into Saline Upland the further up on the landform, as they shift off of old floodplains and stream terraces. Saline Upland does not have the influence of a historic water table or additional effective overland flow and so are lower in production and lack the greasewood and alkali sacaton components. Saline Upland in the core is on the lower/drier extents of Saline Lowland Drained.
DX032X02B144	**Saline Upland (SU) Wind River Basin Rim** The soils transition into Saline Upland the further up on the landform, as they shift off of old floodplains and stream terraces. Saline Upland does not have the influence of a historic water table or additional effective overland flow and so are lower in production and lack the greasewood and alkali sacaton components. Saline Upland in the Rim is on the upper/ higher precipitation extents of Saline Lowland Drained.

Similar sites

R032XY340WY	**Saline Lowland Drained (SLDr) 10-14" East Precipitation Zone** This is the historic version of the current ecological site description. This legacy site was developed for the upper extents of the Basin, including the foothills. Production and plant communities were narrowed to the Basin only.
R032XY240WY	**Saline Lowland Drained (SLDr) 5-9” Wind River Basin Precipitation Zone** This is the historic version of the current ecological site description. This legacy site was developed for the lower extents of the Basin only. Production and plant communities were updated to represent the full extent of this ecological site within the Basin.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Sarcobatus vermiculatus* (2) *Atriplex gardneri*
Herbaceous	(1) *Sporobolus airoides* (2) *Distichlis spicata*

Legacy ID

R032XW140WY

Physiographic features

This site normally occurs on land that receives overflow or runoff from adjacent slopes. The origin of the Saline Lowland Drained ecological site is related to the natural process of stream progressive formation processes and changing water tables. Degradation of the hydrological system has expediated this process in segments of the system. The stream process has created varying degrees of site transformation and community ages that relate to the landforms where the site is located.

Table 2. Representative physiographic features

Slope shape across	(1) Concave
Slope shape up-down	(1) Linear
Geomorphic position, terraces	(1) Tread
Landforms	(1) Intermontane basin > Alluvial fan (2) Intermontane basin > Drainageway (3) Intermontane basin > Stream terrace
Runoff class	Negligible to low
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding duration	Brief (2 to 7 days)
Ponding frequency	None to rare
Elevation	1,220 – 2,070 m
Slope	0 – 10 %
Aspect	Aspect is not a significant factor

Climatic features

Although not the primary driver, climate is a factor in the overall ecology of this subset. Annual precipitation and modeled relative effective annual precipitation ranges from 9 to 12 inches (229–305 mm). The normal precipitation pattern shows peaks in May and June and a secondary peak in September. This amounts to about 50 percent of the mean annual precipitation. Much of the moisture that falls in the latter part of the summer is lost by evaporation, and much of the moisture that falls during the winter is lost by sublimation. Average

snowfall totals about 20 inches annually. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation.

Average temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring. High winds generally are blocked from the basin by high mountains, but can occur in conjunction with an occasional thunderstorm. Growth of native cool-season plants begins about April 1st and continues until about July 1st. Cool weather and moisture in September may produce some green-up of cool-season plants that will continue through late October.

Review of 30-year trend data for average temperature, indicates there has been a warming trend. The last 12 years graphed, however, show temperatures have swayed high and low, but overall have maintained a steady trajectory, neither increasing nor decreasing. On the moisture side, the trajectory in trend has been a slow decline. The swings of when spring warm-up and first frost hit, combined with the decline in average precipitation, have produced a drought effect where the moisture is not being received when the plants and soils are able to utilize the moisture. In some cases, the late precipitation has encouraged the warm-season or mat-forming species over the cool-season bunchgrasses that are the drivers of the natural system. Early frosts, with dry, open winters have created a more arid or desert effect on plants, resulting in high rates of winter kill, loss of vigor, or overall damage to the plant.

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at http://www.wcc.nrcs.usda.gov/. Riverton, Shoshoni, Boysen Dam, Pavillion, and Diversion Dam are the representative weather stations within LRU 02W. The following graphs and charts are a collective sample representing the averaged normals and 30-year annual rainfall data for the selected weather stations from 1981 to 2010.

Table 3 Representative climatic features

Frost-free period (characteristic range)	90-110 days
Freeze-free period (characteristic range)	120-140 days
Precipitation total (characteristic range)	200-230 mm
Frost-free period (actual range)	90-110 days
Freeze-free period (actual range)	110-140 days
Precipitation total (actual range)	200-230 mm
Frost-free period (average)	100 days
Freeze-free period (average)	130 days
Precipitation total (average)	230 mm

- (1) RIVERTON [USC00487760], Riverton, WY
- (2) RIVERTON [USW00024061], Riverton, WY
- (3) SHOSHONI [USC00488209], Shoshoni, WY
- (4) BOYSEN DAM [USC00481000], Riverton, WY
- (5) DIVERSION DAM [USC00482595], Kinnear, WY
- (6) PAVILLION [USC00487115], Pavillion, WY

Influencing water features

The transitional process of streams striving to reach gradient leads to natural downcutting and channel morphic processes that creates this site. The degradation of the site expediates this process. Downcutting of the stream channel and removal or disconnection of the water table creates an alteration of the plant community. Overflow during the spring runoff or snow melt provides additional moisture to this site. The site is generally adjacent to an active channel (ephemeral, intermittent or perennial). There may be instances of this site occurring in an upland position where a perched water table once existed.

Soil features

The soils of this site are moderately deep and very deep well-drained soils formed in alluvium. These soils have moderate to rapid permeability and are moderately to strongly saline and/or alkaline. Higher soluble salt concentrations may be found in the subsoils. The surface soil will be highly variable and vary from 2 to 8 inches in thickness. A water table if present is below 5 feet and is too deep to benefit the herbaceous species. These areas are subject to occasional overflow. The soil characteristics having the most influence on the plant community are the elimination of the water table near the surface, reduction in the potential to flood and the elevated quantities of soluble salts. Salts are generally found lower in the soil profile.

Major soil series correlated to this site include: Lostwells.
Soil series are subject to change upon completion and correlation of the initial soil surveys. It is recognized that some of these series are classified as typic aridic (5-9 inches precipitation, Mesic); however, map units were mapped across zones that are both typic aridic and ustic aridic (10-14 inches precipitation, Mesic). As surveys are correlated, this will be corrected.

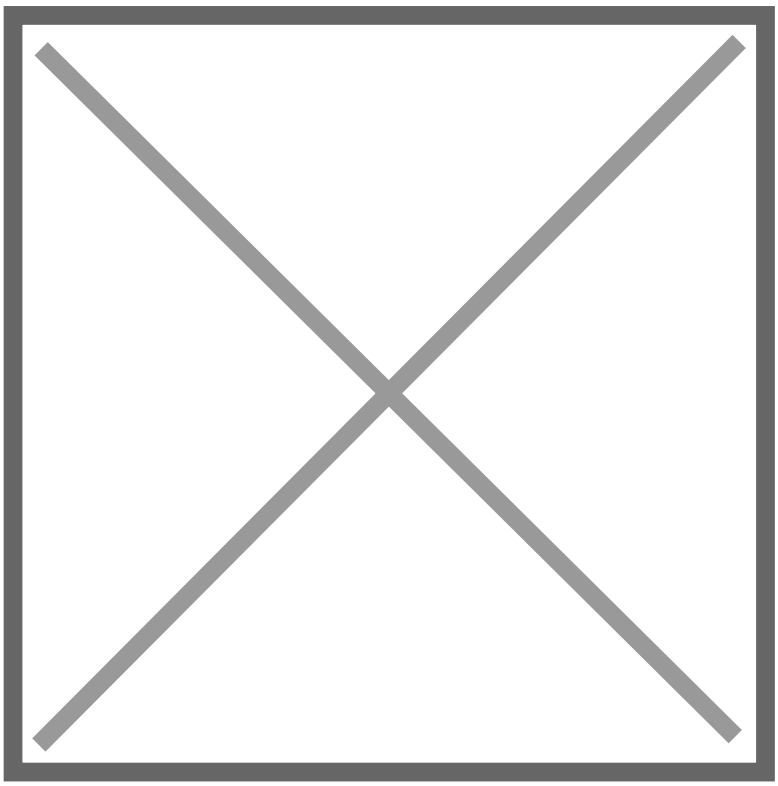

Figure 7.

Table 4. Representative soil features

Parent material	(1) Alluvium − sandstone and shale

Surface texture	(1) Loam (2) Clay loam (3) Silt loam (4) Clay (5) Sandy loam (6) Silty clay
Family particle size	(1) Fine-loamy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately slow to moderately rapid
Soil depth	50 – 150 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	0 – 20 %
Available water capacity (0-101.6cm)	8.38 – 11.43 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 10 %
Electrical conductivity (0-101.6cm)	0 – 20 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 40
Soil reaction (1:1 water) (0-101.6cm)	7.4 – 10

Subsurface fragment volume <=3" (Depth not specified)	0 – 20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

The Saline Lowland Drained ecological site is the result of natural stream morphology processes and also occurs as a direct result of a hydrologic disruption to the Saline Lowland and Saline Subirrigated ecological sites. This disturbance, whether natural or human caused, alters the hydrologic function of a Saline Lowland to such a degree that rehabilitation is not an option. As a result, subsoil that at one time was sufficiently moist during part of the growing season is literally drained as water is now diverted to deeply incised channels. Consequently, supplemental water that was predictable and available to herbaceous plants during part of the growing year is now lacking and the water table is permanently below the rooting depth of these plants. The Saline Lowland ecological site, however, gets an occasional overflow from the adjacent uplands and the water table is commonly at a depth that is still beneficial to deep-rooted shrub species.

Potential vegetation on this site is dominated by tall- and mid-stature perennial grasses, which can tolerate soils with moderate amounts of salinity and alkalinity and adapt to periodic overflows. Other significant vegetation includes greasewood, Gardner's saltbush, and a variety of forbs. The expected potential cover composition for this ecological site is about 70% grasses, 10% forbs and 20% woody plants. The composition and production will vary naturally due to historical use and fluctuating precipitation.

As this site deteriorates, species such as inland saltgrass and greasewood will increase. Weedy annuals will invade. Grasses such as alkali sacaton, Indian ricegrass, and basin wildrye will decrease in frequency and production.

The Reference Community (description follows the State-and-Transition diagram) has been determined by study of rangeland relict areas, or areas protected from excessive disturbance. Trends in plant communities going from heavily to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

The following is a State-and-Transition Model (STM) diagram for this ecological site. An STM has five fundamental components: states, transitions, restoration pathways, community phases, and community pathways. The state is a single community phase or suite of community phases. The Reference State is recognized as State 1. It describes the ecological potential and natural range of variability resulting from the natural disturbance regime of the site. The designation of alternative states (State 2, etc) in STMs denotes changes in ecosystem properties that cross a certain threshold.

Transitions are represented by the arrows between states moving from a higher state to a lower state (State 1 to State 2) and are denoted in the legend as a "T" (T1-2). They describe the variables or events that contribute directly to loss of state resilience and result in shifts between states. Restoration pathways are represented by the arrows between states returning back from a lower state to a higher state (State 2 to State 1) or better illustrated by State 1, and are denoted in the legend as a "R" (R2-1).

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Tall-stature Cool-season Bunchgrasses**			28-56	
	basin wildrye	LECI4	*Leymus cinereus*	28-56	2-5
2	**Mid-stature Cool-season Bunchgrasses**			28-56	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	28-56	5-10
3	**Rhizomatous Wheatgrasses**			28-112	
	western wheatgrass	PASM	*Pascopyrum smithii*	28-84	5-15
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	0-28	0-5
4	**Short-stature Cool-season Bunchgrasses**			28-84	

	squirreltail	ELEL5	*Elymus elymoides*	28-84	5-15
	Sandberg bluegrass	POSE	*Poa secunda*	0-28	0-5
5	**Mid-stature Warm-season Grasses**			56-196	
	alkali sacaton	SPAI	*Sporobolus airoides*	56-112	10-20
	saltgrass	DISP	*Distichlis spicata*	0-84	0-15
6	**Short-stature Warm-season Grasses**			0-28	
	blue grama	BOGR2	*Bouteloua gracilis*	0-28	0-5
7	**Other Grasses/Grasslikes**			0-56	
	threadleaf sedge	CAFI	*Carex filifolia*	0-28	0-5
	Grass, perennial	2GP	*Grass, perennial*	0-28	0-5
Forb					
8	**Perennial Forbs**			0-56	
	smooth woodyaster	XYGL	*Xylorhiza glabriuscula*	0-28	0-5
	spiny phlox	PHHO	*Phlox hoodii*	0-28	0-5
	desertparsley	LOMAT	*Lomatium*	0-28	0-5
	Pursh seepweed	SUCA2	*Suaeda calceoliformis*	0-28	0-5
	povertyweed	IVAX	*Iva axillaris*	0-28	0-5
	textile onion	ALTE	*Allium textile*	0-28	0-5
	Forb, perennial	2FP	*Forb, perennial*	0-28	0-5
Shrub/Vine					
9	**Dominant Shrubs**			28-112	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	28-84	5-
	Gardner's saltbush	ATGA	*Atriplex gardneri*	6-28	0-5
10	**Miscellaneous Shrubs**			0-28	
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0-28	0-5
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	0-28	0-5

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Mid-stature, Cool-season Bunchgrasses**			11-56	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	11-56	1-10
2	**Rhizomatous Wheatgrasses**			56-112	
	western wheatgrass	PASM	*Pascopyrum smithii*	56-112	10-20
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	0-28	0-5
3	**Short-stature, Cool-season Bunchgrasses**			28-112	
	squirreltail	ELEL5	*Elymus elymoides*	28-84	5-15
	Sandberg bluegrass	POSE	*Poa secunda*	0-28	0-5
4	**Mid-stature, Warm-season Grasses**			11-56	
	alkali sacaton	SPAI	*Sporobolus airoides*	11-56	1-10
5	**Short-stature, Warm-season Tillering Grasses**			0-28	
	blue grama	BOGR2	*Bouteloua gracilis*	0-28	0-5
6	**Native Annual Grasses**			0-28	
	sixweeks fescue	VUOC	*Vulpia octoflora*	0-28	0-5
7	**Miscellaneous Grasses/Grasslikes**			0-28	
	threadleaf sedge	CAFI	*Carex filifolia*	0-28	0-5

	Grass, perennial	2GP	*Grass, perennial*	0-28	0-5
Forb					
8	**Perennial Forbs**			0-56	
	smooth woodyaster	XYGL	*Xylorhiza glabriuscula*	0-28	0-5
	spiny phlox	PHHO	*Phlox hoodii*	0-28	0-5
	desertparsley	LOMAT	*Lomatium*	0-28	0-5
	povertyweed	IVAX	*Iva axillaris*	0-28	0-5
	textile onion	ALTE	*Allium textile*	0-28	0-5
	plains pricklypear	OPPO	*Opuntia polyacantha*	0-28	0-5
	Forb, perennial	2FP	*Forb, perennial*	0-28	0-5
9	**Annual Forbs**			0-28	
	woolly plantain	PLPA2	*Plantago patagonica*	0-28	0-5
Shrub/Vine					
10	**Dominant Shrubs**			56-280	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	56-224	5-15
	Gardner's saltbush	ATGA	*Atriplex gardneri*	6-56	0-5
11	**Miscellaneous Shrubs**			0-56	
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0-28	0-5
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	0-28	0-5

Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Rhizomatous Wheatgrasses**			28-56	
	western wheatgrass	PASM	*Pascopyrum smithii*	28-56	5-10
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	0-28	0-5
2	**Short-stature, Cool-season Bunchgrasses**			28-56	
	squirreltail	ELEL5	*Elymus elymoides*	28-56	5-10
	Sandberg bluegrass	POSE	*Poa secunda*	0-28	0-5
3	**Short-stature, Warm-season Tillering Grasses**			0-28	
	blue grama	BOGR2	*Bouteloua gracilis*	0-28	0-5
4	**Annual Grasses**			0-28	
	sixweeks fescue	VUOC	*Vulpia octoflora*	0-28	0-5
5	**Miscellaneous Grasses/Grasslikes**			0-28	
	threadleaf sedge	CAFI	*Carex filifolia*	0-28	0-5
	Grass, perennial	2GP	*Grass, perennial*	0-28	0-5
Forb					
6	**Perennial Forbs**			0-56	
	smooth woodyaster	XYGL	*Xylorhiza glabriuscula*	0-28	0-5
	desertparsley	LOMAT	*Lomatium*	0-28	0-5
	povertyweed	IVAX	*Iva axillaris*	0-28	0-5
	textile onion	ALTE	*Allium textile*	0-28	0-5
	plains pricklypear	OPPO	*Opuntia polyacantha*	0-28	0-5
	Forb, perennial	2FP	*Forb, perennial*	0-28	0-5
7	**Annual Forbs**			0-28	
	woolly plantain	PLPA2	*Plantago patagonica*	0-28	0-5

Shrub/Vine					
8	**Dominant Shrubs**			56-280	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	56-224	10-30
	Gardner's saltbush	ATGA	*Atriplex gardneri*	6-56	2-10
9	**Miscellaneous Shrubs**			0-56	
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0-28	0-5
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	0-28	0-5

Table 8. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1	**Mid-stature, Cool-season Bunchgrasses**			0-28	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	0-28	0-5
2	**Rhizomatous Wheatgrasses**			0-28	
	western wheatgrass	PASM	*Pascopyrum smithii*	0-28	0-5
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	0-28	0-5
3	**Short-stature, Cool-season Bunchgrasses**			0-28	
	squirreltail	ELEL5	*Elymus elymoides*	0-28	0-5
	Sandberg bluegrass	POSE	*Poa secunda*	0-28	0-5
4	**Short-stature, Warm-season Tillering Grasses**			56-84	
	blue grama	BOGR2	*Bouteloua gracilis*	56-84	20-30
5	**Native Annual Grasses**			0-28	
	sixweeks fescue	VUOC	*Vulpia octoflora*	0-28	0-5
6	**Miscellaneous Grasses/Grasslikes**			0-56	
	threadleaf sedge	CAFI	*Carex filifolia*	0-28	0-10
	Grass, perennial	2GP	*Grass, perennial*	0-28	0-5
Forb					
7	**Perennial Forbs**			0-56	
	smooth woodyaster	XYGL	*Xylorhiza glabriuscula*	0-28	0-5
	spiny phlox	PHHO	*Phlox hoodii*	0-28	0-5
	desertparsley	LOMAT	*Lomatium*	0-28	0-5
	plains pricklypear	OPPO	*Opuntia polyacantha*	0-28	0-5
	Forb, perennial	2FP	*Forb, perennial*	0-28	0-5
8	**Annual Forbs**			0-28	
	woolly plantain	PLPA2	*Plantago patagonica*	0-28	0-5
Shrub/Vine					
9	**Dominant Shrubs**			56-112	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	28-84	5-15
	Gardner's saltbush	ATGA	*Atriplex gardneri*	6-56	0-10
10	**Miscellaneous Shrubs**			0-56	
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0-28	0-5
	Wyoming big sagebrush	ARTRW8	*Artemisia tridentata ssp. wyomingensis*	0-28	0-5

Table 9. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 10. Community 4.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 11. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Animal community

Wildlife Interpretations 1.1 Reference - Alkali Sacaton/Greasewood Plant Community: The predominance of grasses in this plant community favors grazers and mixed-feeders, such as bison, deer, and antelope. Suitable thermal and escape cover for wildlife is available as quantities of woody plants is adequate. In addition, topographical variations provide some escape cover as well. When found adjacent to sagebrush dominated states, this plant community may provide brood rearing/foraging areas for sage grouse. Other birds that would frequent this plant community include western meadowlarks, horned larks, and golden eagles as well as upland game birds. Many grassland obligate small mammals would occur here. 1.2 Rhizomatous Wheatgrasses/Greasewood Plant Community: This plant community exhibits a moderate level of plant species diversity due to the accumulation of salts in the soil. It provides both thermal and escape cover for deer and antelope especially if other woody communities are nearby. Other birds that would frequent this plant community include western meadowlarks, horned larks, and golden eagles as well as upland game birds. Many grassland obligate small mammals would occur here. 2.1 Greasewood/Bare Ground Plant Community: This plant community can provide important winter foraging and cover for mule deer and antelope. This community provides escape and thermal cover for large ungulates, as well as nesting habitat for sage grouse and other upland game birds. 3.1 Blue Grama/Greasewood Plant Community: These communities provide some foraging and cover for deer, antelope, and other large ungulates. This plant community, especially if proximal to other woody cover, may be used by sage grouse and other game birds for foraging and cover. Grazing Interpretations The following table lists suggested stocking rates for cattle under continuous, season-long grazing with normal growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular pant community (as described in this ecological site description). Because of this, a field visit is recommended in all cases to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using this information along with animal preference data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies can result in an increased carrying capacity. If distribution problems occur, stocking rates must be reduced to maintain plant health and vigor. The Carrying capacity is calculated as the production for a normal year X .25 efficiency factor / 912.5 #/AUM (Animal Unit Month) to calculate the AUMs/Acre. Plant Community Production (lbs./ac); Carrying Capacity* (AUM/ac); (Ac/AUM) Below Avg. - Normal - Above Avg. 1.1 Reference - Alkali sacaton/Greasewood 350-525-700 0.14 7.14 1.2 R. Wheatgrasses/Greasewood 275-450-600 0.12 8.33 2.1 Greasewood/Bare ground 100-350-450 0.09 11.11 3.1 Blue grama/Greasewood 150-250-400 0.07 14.71 State 4 and State 5 not defined. ** * - Continuous, season-long grazing by cattle under average growing conditions. ** - Production and carrying capacity is dependent on the species mixture that is present and the stage of succession in which each community is located. Site-specific investigation is necessary due to the highly variable composition. Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide year-long forage for cattle, sheep, or horses. Supplementation of livestock may be necessary during the dormant season (protein and minerals) if the quality does not meet minimum livestock requirements. Distance to water, terrain, slope and length of slope, access, shrub density, fencing, and management can affect carrying capacity (grazing capacity) within a management unit as well as kind, class, and breeds of livestock. Adjustments should be made for the area that is considered necessary for reduction of animal numbers. For example, 30 percent of a management unit may have 25 percent slopes and distances of greater than one mile from water; therefore, the adjustment is only calculated for 30 percent of the unit (i.e. 50 percent reduction on 30 percent of the management unit).

Hydrological functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group B and C, with localized areas in hydrologic group D. Infiltration ranges from moderate to rapid. Runoff potential for this site varies from moderate to high depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75 percent ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where short-grasses form a strong sod and dominate the site. Areas where ground cover is less than 50 percent have the greatest potential to have reduced infiltration and higher runoff (refer to Part 630, NRCS National Engineering Handbook for detailed hydrology information). Rills and gullies should not typically be present with the exception of relics, which should now be stabilized. Water flow patterns should be barely distinguishable if at all present. Pedestals are only slightly present in association with bunchgrasses. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts may be present. Cryptogamic crusts are present, but only cover one to two percent of the soil surface.

Recreational uses

This site provides excellent hunting opportunities for upland game species as well as antelope and deer. The proximity to water and the shrub canopy provides cover for birds and other wildlife. Cultural artifacts can be found or viewed in the area, especially along the drainages that typically dissect these landforms. The extent of this ecological site is found within wild horse range and tribal horse ranges. This ecological site, however, proves to be limited in association with roadways and trails in relation to erosion potential and functionality. The soils will be sticky or slick when wet and are more erosive than other associated ecological sites. These soils need to be taken into consideration when crossing the area with trails or roadways. The site is generally rough and provides no soft cover for camping or

resting. The spiny and defensive nature of greasewood is also harsh on tires, clothing and skin when moving through the shrub cover.

Wood products

No appreciable wood products are present on the site.

Other products

None noted.

Inventory data references

Information presented in the original site description was derived from NRCS inventory data. Field observations from range-trained personnel were also used. Those involved in developing the original site include: Chris Krassin, Range Management Specialist, NRCS and Everet Bainter, Range Management Specialist. Other sources used as references include USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, USDI and USDA Interpreting Indicators of Rangeland Health Version 4 and 5, and USDA NRCS soil surveys from various counties. Information presented here has been derived from NRCS inventory data, Field observations from range trained personnel, and the existing range site descriptions. Those involved in developing the Saline Upland range site include Chris Krassin, Range Management Specialist, NRCS and Everet Bainter, Range Management Specialist. Those involved in the development of the new concept for Saline Upland Ecological site include: Ray Gullion, Area Range Management Specialist, Jim Haverkamp, Area Range Management Specialist, NRCS; Mandi Hirsch, Range Management Specialist, Popo Agie Conservation District; Jim Wolf, Resource Manager, USDI-BLM; John Likins, Range Management Specialist, Retired USDI-BLM; Jeremy Artery, Rangeland Management Specialist, USDI-BLM; Leah Yandow, Wildlife Biologist, USDI-BLM; Daniel Wood, MLRA Soil Survey Leader, NRCS; Jane Karinen, Soil Data Quality Specialist, NRCS; and Marji Patz, Ecological Site Specialist, NRCS. Quality control and quality assurance completed by: John Hartung, State Rangeland Management Specialist, NRCS; Brian Jensen, State Wildlife Biologist, NRCS; Kirt Walstad, Regional Quality Assurance Ecological Site Specialist, NRCS. Inventory Data References: Ocular field estimations observed by trained personnel were completed at each site. Then sites were selected where a 100-foot tape was stretched and the following sample procedures were completed by inventory staff. For full sampling protocol and guidelines with forms please refer to the Wyoming ESI Operating Procedures, compiled in 2012 for the Powell and Rock Springs Soil Survey Office, USDA-NRCS. • Double Sampling Production Data (9.6 hoop used to estimate 10 points, clipped a minimum of 3 of these estimated points, with two 21 foot X 21 foot square extended shrub plots). • Line Point Intercept (overstory and understory captured with soil cover). Height of herbaceous and woody cover is collected every three feet along established transect.) • Continuous Line Intercept (woody canopy cover, with minimum gap of 0.2 foot for all woody species and succulents. Intercept height collected at each measurement.) • Gap Intercept (basal gap measured with a minimum gap requirement of 0.7 foot.) • Sample Point (10 – 1 meter square point photographs taken at set distances on transect. Read using the sample point computer program established by the High Plains Agricultural Research Center, WY). • Soil Stability (slake test) – surface and subsurface samples collected and processed according to the soil stability guidelines provided by the Jornada Research Center, NM.)

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Approval

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Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

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Date	02/03/2021
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** **None. Rills are not expected on this site.**

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2. **Presence of water flow patterns:** **None, or barely visible. Evidence of water flow may be present after high overland flow events, but vegetation normally remains intact.**

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3. **Number and height of erosional pedestals or terracettes:** **None. Erosional pedestals and terracettes are not expected on this site.**

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** **Bare ground is typically 25 to 35 percent occurring in small areas throughout site**

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5. **Number of gullies and erosion associated with gullies:** **Active gullies should not be present Evidence of pre-exiting gullies may be extensive due to the hydrologic disruption resulting in this site and should not be construed as active unless current headcutting or downcutting is evident.**

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6. **Extent of wind scoured, blowouts and/or depositional areas:** None. Wind-scoured areas and areas of deposition from wind are not expected on this site in reference; however, as the site degrades, this becomes prominent.

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7. **Amount of litter movement (describe size and distance expected to travel):** Litter of small and medium size classes will show no or minimal movement after average to high rainfall events. Litter does not travel far, typically being trapped in small bunches by the vegetative cover. Small woody debris may move up to 6 inches. Fine litter may move up to 12 inches. Numerous debris dams or vegetative barriers may be present.

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Plant cover and litter is at 60 percent or greater of soil surface and maintains soil surface integrity. Soil aggregate stability ratings should typically be 2 to 5 normally. Surface organic matter adheres to the soil surface. Soil surface peds will typically retain structure indefinitely when dipped in distilled water. In the interspaces, ratings could be 0 to 3 if around 12 inches in diameter. Under canopy should be a rating of 2 to 4. Elevated salt content of these soils reduces the stability of these soils.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A-horizon should be 1 to 4 inches; light brownish gray (10YR7/2) loam, grayish brown (10YR 5/2) moist; moderate fine granular structure; weak thick platy structure in upper half inch; slightly hard, firm; slightly sticky and slightly plastic; strongly alkaline (pH 8.8); gradual smooth boundary (3 to 6 inches thick).

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Relative composition is approximately 70% grasses and grass-like plants, 10% forbs, 20% shrubs. (F/S Group Information Needed). Grass canopy and basal cover should reduce raindrop impact and slow overland flow providing increased time for infiltration to occur. Healthy deep rooted native grasses enhance infiltration and reduce runoff. Infiltration is Moderate.

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction layer or soil surface crusting should be present.

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: Mid-stature Warm-season Bunchgrasses are greater than Shrubs. Groups are comprised of 2 and 3 species respectively, and account for 45% of the composition by production.

    Sub-dominant: Rhizomatous Wheatgrasses are greater than Short Stature Cool-season Bunchgrasses. Groups are comprised of 2 prominent species each, and account for 28% of the composition by production.

    Other: Mid-stature Cool-season Bunchgrasses are equal or greater than Tall-stature Cool-season bunchgrasses. Groups are comprised of 1 species each, and account for 22% of the composition by production.

    Additional: There are a total of 9 Functional/Structural Groups. (3 are trace). There are 9 dominant and sub-dominant species. Functional/Structural Groups not expected are Introduced annual grasses, perennial introduced and naturalized grasses and annual forbs.

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very little evidence of decadence or mortality. Bunch grasses have strong, healthy centers and shrubs have few dead stems.

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14. **Average percent litter cover (%) and depth (in):** Plant litter cover is expected to be 25-40 percent and at a depth of 0.25-0.50 inch.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Reference (Community Phase 1.1) Annual production ranges from a low of 350 to a high of 800 pounds per acre (air dry basis). Normal Annual production is 525 pounds per acre in a year with normal precipitation and weather conditions. Community Phase 1.2 - Annual production ranges from 275 to 600 pounds per acre with the normal average production of 450 pounds per acre.

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** Greasewood, rubber rabbitbrush, and inland saltgrass are natives that can be aggressive on this ecological site. Cheatgrass, clasping pepperweed, mustards (Brassicas), bull thistle, Canada thistle, pennycress, annual forbs, and others as they become known. See: Wyoming Weed and Pest Council Website: https://wyoweed.org/

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17. **Perennial plant reproductive capability:** All perennial species exhibit moderate vigor relative to recent weather conditions. Perennial grasses should have vigorous rhizomes or tillers; vegetative and reproductive structures are slightly stunted in response to high salt content in soils. All perennial species should be capable of reproducing annually.
