

Ecological site EX043B23B138

Saline Lowland (SL)

Absaroka

Upper Foothills

Last updated: 3/06/2025

Accessed: 08/30/2026

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): 043B–Central Rocky Mountains

43B – Central Rocky Mountains – The Central Rocky Mountains extends from northern Montana to southern extent of Wyoming and from Idaho to central Wyoming. The southern extent of 43B is comprised of a combination of metamorphic, igneous, and sedimentary mountains and foothills. Climatic changes across this extent are broad and create several unique breaks in the landscape. Further 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

Land Resource Unit (LRU) 43B23B: Absaroka Upper Foothills Based on the shifts in geology, precipitation patterns and other climatic factors, as well as elevations and vegetation, the Absaroka Range was divided into LRU 23. Further division of this LRU is necessary due to the gradient moving from the foothills to the summit, as well as aspect shifts (north/east face versus south/west face). Subset B is set for the higher elevations within the foothills, with 15 to 19 inches of precipitation. To verify or identify Subset B (the referenced subset for this ecological site), refer to the Wyoming LRU matrix key contained within the Ecological Site Key. This particular LRU/Subset occurs along the eastern foothills of the Absaroka Range. This LRU starts north of Clark, WY and runs to the Thermopolis, WY area. Once the foothills cross into the Northern Beartooth Range, the climatic patterns and elevational changes shifts the plant community and allows for a break in LRU's near the Montana state line. As the LRU follows to the south and then tracks east to the intersection of the Absaroka Range and the Owl Creek Range, the face changes aspect and geology creating a shift in plant dynamics and a break in the LRU. The extent of soils currently correlated to this ecological site does not fit within the digitized boundary. Many of the noted soils are provisional and will be reviewed and corrected in mapping update projects. Other map units are correlated as small inclusions within other MLRA's/LRU's based on elevation, landform, and biological references. Moisture Regime: Typic Ustic Temperature Regime: Frigid Dominant Cover: Rangeland – Sagebrush Steppe (major species is Mountain Big Sagebrush) Representative Value (RV) Effective Precipitation: 15-19 inches (381 – 483 mm) RV Frost-Free Days: 37 - 80 days

Classification relationships

Relationship to Other Established Classification Systems: National Vegetation Classification System (NVC): 2 Shrub & Herb Vegetation Class 2.B Temperate & Boreal Grassland & Shrubland Subclass 2.B.2 Temperate Grassland & Shrubland Formation 2.B.2.Na Western North American Grassland & Shrubland Division Division M048 Central Rocky Mountain Montane-Foothill Grassland & Shrubland Macrogroup G273 Central Rocky Mountain Lower Montane, Foothill & Valley Grassland Group Ecoregions (EPA): Level I: 10 North American Deserts Level II: 10.1 Cold Deserts Level III: 10.1.18 Wyoming Basin Level IV: 10.1.18.d Foothills and Low Mountains

Ecological site concept

- Site receives additional water from a fluctuating water table and overflow from stream flow.
- Depth of water can vary from one to five feet, but is below 40 inches for a majority of the growing season.
- Slope is 6%
- Soils are:
 - o Poorly drained
 - o Saline, sodic, or saline-sodic
 - o Moderately deep to very deep (20-80+ in. (50-200+ cm)
 - o None to Slightly effervescent throughout top 20" (50 cm) of mineral soil surface
 - o Textures range from loamy sand to clay loams, often soils are stratified in nature with gravels.
 - o 10% stone and boulder cover and 10% cobble and gravel cover

Associated sites

EX043B23B140	Saline Lowland Drained (SLDr) Absaroka Upper Foothills Saline Lowland Drained ecological sites occur on terraces or relict floodplains that have lost their connection to the water table due to down cutting of the original stream channel.
EX043B23B178	Wetland (WL) Absaroka Upper Foothills Wetland ecological sites are often connected to Saline Lowland sites. Wetlands hold water year round and have water over the surface for part of the growing season. Saline Lowland sites will receive additional water as overflow from stream channels and be influenced from fluctuating water table. However, the water table of a saline lowland site is generally 40 inches or deeper from the soil surface and are generally on the driest edge of the drainage system or wetland.
EX043B23B142	Saline Subirrigated (SS) Absaroka Upper Foothills Saline Subirrigated is associated with Saline Lowland in perennial stream systems or in irrigated landscapes (historic flood irrigation seepage or runoff). Saline Subirrigated has a receding water table during the growing season and rarely has water standing on the surface for long periods of time. Whereas Saline Lowland ecological site is drier with a water table that is even lower (100 cm) in the profile for most of the growing season. The productivity is less and the plant community is a mixture of upland (dry) and moist or water loving plants.

Similar sites

EX043B23A138	Saline Lowland (SL) Absaroka Lower Foothills The lower foothills Saline Lowland ecological site is lower in production, with a few minor plant shifts, but are very similar in overall composition.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Sarcobatus vermiculatus</i>
Herbaceous	(1) <i>Sporobolus airoides</i> (2) <i>Leymus cinereus</i>

Legacy ID

R043BX638WY

Physiographic features

This site is located on nearly level land adjacent to streams that run water at least during the major part of the growing season. Saline Lowland ecological sites are also found on upland or dryland areas associated with irrigation water seepage from conveyance ditches or excess flood irrigation.. Slopes are nearly flat to 10 percent, with an average slope of 5 percent.

Table 2. Representative physiographic features

Landforms	(1) Foothills > Flood plain (2) Foothills > Drainageway (3) Foothills > Stream terrace
Runoff class	Negligible to low
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Occasional to frequent
Elevation	1,830 – 2,740 m
Slope	0 – 10 %
Water table depth	100 – 150 cm
Aspect	Aspect is not a significant factor

Climatic features

Annual precipitation and modeled relative effective annual precipitation ranges from 15 to 19 inches (381 – 483 mm). The normal precipitation pattern shows peaks in June tapering into September. This amounts to about 50 percent of the mean annual precipitation. Average snowfall is about 150 inches annually. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation.

Because of the varied topography, the wind will vary considerably for different parts of the area. The wind is usually much lighter at the lower elevations and in the valleys as compared with the higher terrain. The average winter wind velocity is 8.5 mph while the summer wind velocity averages 7.5 mph. Winds during storms and on ridges may exceed 45 mph.

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. High winds are generally blocked by high mountains but occur in conjunction with thunderstorms, which are common in late summer. Growth of native cool-season plants begins about May 1 to May 15 and continues until about October 15.

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/>. Historically, Crandall Creek was the representative weather stations within this subset. However, Sunshine 3NE, Tower Falls, and Yellowstone Pk Mammoth are the available weather stations within a close proximity in location and characteristics for this subset. 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)	20-60 days
Freeze-free period (characteristic range)	40-100 days

Precipitation total (characteristic range)	360-410 mm
Frost-free period (actual range)	10-70 days
Freeze-free period (actual range)	20-110 days
Precipitation total (actual range)	360-410 mm
Frost-free period (average)	40 days
Freeze-free period (average)	70 days
Precipitation total (average)	380 mm

- (1) SUNSHINE 3NE [USC00488758], Meeteetse, WY
- (2) TOWER FALLS [USC00489025], Yellowstone National Park, WY
- (3) YELLOWSTONE PK MAMMOTH [USC00489905], Yellowstone National Park, WY

Influencing water features

The characteristics of these bottomland soils have a minor influence from ground water (water table below 40 inches (100 cm)) and have an influence from surface water/overland flow. Irrigation induced seeps and overflow create these features on stream terraces and other isolated upland landforms.

Wetland description

The Saline Lowland ecological site may be associated with a wetland area, but does not currently have a wetland designation assigned.

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 range from 2 to 8 inches in thickness. A fluctuating water table occurs in these areas that is usually deeper than 40 inches, but will be higher during spring melt and irrigation season.. These areas are subject to occasional overflow. The soil characteristics having the most influence on the plant community are depth to a water table during the growing season, occasional overflow or flooding during the growing season, and the elevated quantities of soluble salts.

Major soil series correlated to this site include: Ravalli-like series.

Figure 7. Image taken of a cut bank showing the soil profile for Saline Lowland ecological site.

Figure 8. Image of hand dug pit showing the soil profile for Saline Lowland ecological site.

Table 4. Representative soil features

Parent material	(1) Alluvium – interbedded sedimentary rock (2) Slope alluvium – igneous, metamorphic and sedimentary rock
Surface texture	(1) Loam (2) Clay loam (3) Silt loam (4) Clay (5) Sandy clay loam
Family particle size	(1) Fine-loamy (2) Fine (3) Fine-loamy over sandy or sandy-skeletal
Drainage class	Somewhat poorly drained to poorly drained
Permeability class	Moderate to rapid
Soil depth	50 – 150 cm
Surface fragment cover <=3"	0 – 10 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (Depth not specified)	2.54 – 15.75 cm
Calcium carbonate equivalent (Depth not specified)	0 – 20 %
Electrical conductivity (Depth not specified)	0 – 20 mmhos/cm
Sodium adsorption ratio (Depth not specified)	10 – 40

Soil reaction (1:1 water) (Depth not specified)	7.8 – 9.2
Subsurface fragment volume ≤3" (Depth not specified)	0 – 20 %
Subsurface fragment volume >3" (Depth not specified)	0 – 10 %

Ecological dynamics

Potential vegetation on this site is dominated by tall and mid perennial grasses, which can tolerate soils with moderate amounts of salinity and alkalinity. These grasses are also adapted to periodic overflows and a water table near the surface for a portion of the growing season. Other significant vegetation includes greasewood, rubber rabbitbrush and a variety of forbs. The expected potential composition for this site is about 75 percent grasses, 10 percent forbs, and 15 percent woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.

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

Any significant hydrologic disturbance that results in channelization and down cutting of the stream channel will result in the conversion to a plant community dominated more by upland plant species. The transition from lowland plants to upland plants is usually not recoverable and with time will develop into a Saline Lowland Drained ecological site.

The ecological states and community phases as well as the dynamic processes driving the transitions between these communities have been determined by studying this ecological site under all management scenarios, including those that do not include cattle grazing. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have been used.

The following State and Transition Model (STM) Diagram has five fundamental components: states, transitions, restoration pathways, community phases and community pathways. The state, designated by the bold box, is considered to be a set of parameters with thresholds defined by ecological processes. A State can be 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 dynamic ecological processes occurring on 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 - 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 - State) or better illustrated by State 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 Grasses			560-1401	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	280-841	10-30
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	280-560	10-20
	alkali cordgrass	SPGR	<i>Spartina gracilis</i>	0-280	0-10

	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	0-280	0-10
2	Mid-stature Cool-season Grasses			112-560	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	112-336	5-15
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	0-112	0-5
	Nuttall's alkaligrass	PUNU2	<i>Puccinellia nuttalliana</i>	0-112	0-5
3	Rhizomatous Cool-Season Grasses			112-448	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	112-336	5-15
	Montana wheatgrass	ELAL7	<i>Elymus albicans</i>	0-112	0-5
4	Short-stature Cool-season Grasses			0-112	
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0-84	0-5
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-84	0-5
5	Miscellaneous Grasses/Grass-Likes			0-112	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-112	0-5
	saltgrass	DISP	<i>Distichlis spicata</i>	0-112	0-5
	sedge	CAREX	<i>Carex</i>	–	–
	Grass-like, perennial	2GLP	<i>Grass-like, perennial</i>	–	–
Forb					
6	Forbs			112-280	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-112	0-5
	textile onion	ALTE	<i>Allium textile</i>	0-112	0-5
	silverweed cinquefoil	ARAN7	<i>Argentina anserina</i>	0-112	0-5
	povertyweed	IVAX	<i>Iva axillaris</i>	0-112	0-5
	phlox	PHLOX	<i>Phlox</i>	0-112	0-5
	Pursh seepweed	SUCA2	<i>Suaeda calceoliformis</i>	0-112	0-5
	woodyaster	XYLOR	<i>Xylorhiza</i>	0-112	0-5
Shrub/Vine					
7	Dominant Shrubs			112-336	
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	224-448	10-20
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0-112	0-5
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0-112	0-5
	Woods' rose	ROWOW	<i>Rosa woodsii</i> var. <i>woodsii</i>	0-112	0-5
8	Miscellaneous Shrubs			0-112	

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 1.3 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 9. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 10. Community 3.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 11. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 12. Community 4.2 plant community composition

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

1.1 - Reference Community Phase: 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 are 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, as well as lek sites. 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 - Alkali Sacaton/Inland Saltgrass/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. 1.3 - Mixed Shrub/Inland Saltgrass Sod Plant Community: These communities provide some foraging and cover for deer, antelope, and other large ungulates. This plant community may be used by sage grouse and other game birds for foraging and cover. 2.1 - Dense Shrub/Bare Ground Plant Community: This plant community can provide important winter foraging and cover for mule deer and antelope during that time. The plant community composition comprises little diverse, and thus, less apt to meet the seasonal needs of large grazers. It may provide some foraging opportunities and cover for sage grouse, pheasant, and partridge. Animal Community – 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 plant 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. Plant Community Production Carrying Capacity* The Carrying capacity is calculated as the production (normal year) X .25 efficiency factor / 912.5 # /AUM to calculate the AUM's/Acre. Plant Community Description Title Lbs./Acre AUM/Acre* Acres/AUM* Below Ave. Normal Above Ave. Plant Community Production Carrying Capacity* (lb./ac) (AUM/ac) (Ac/AUM) 1.1 - Reference Community Phase 1600-2200-2600 .60 1.7 1.2 - Alkali sacaton/Inland saltgrass/Greasewood 1300-1700-2100 .47 2.1 1.3 - Mixed Shrub/Inland Saltgrass Sod 1000-1300-1600 .36 2.8 2.1 - Dense Shrub/Bare Ground ** ** 3._ - Invaded State ** ** 4._ - Disturbed State ** ** * - Carrying Capacity is figured for continuous, season-long grazing by cattle under average growing conditions. ** - Sufficient data for invaded and reclaimed communities has not be collected or evaluated, at this time, so no projection of a stocking rate recommendation or production range will be established at this time. Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage for cattle, sheep, or horses. During the dormant period, the forage for livestock use needs to be supplemented with protein because the quality does not meet minimum livestock requirements. Distance to water, shrub density, and slope can affect carrying capacity (grazing capacity) within a management unit. 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). Fencing, slope length, management, access, terrain, kind and class of livestock, and breeds are all factors that can increase or decrease the percent of graze-able acres within a management unit. Adjustments should be made that incorporate these factors when calculating stocking rates.

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% 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 that dominates the site. Areas where ground cover is less than 50% 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. 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 1-2% of the soil surface.

Recreational uses

This site provides hunting opportunities for upland game species and big game such as deer and antelope. The wide varieties of plants which bloom from spring until fall have an aesthetic value that appeals to visitors.

Wood products

No appreciable wood products are present on the site.

Other products

none noted

Inventory data references

Information presented in this description was derived from NRCS inventory data. Field observations from range trained personnel were also used. Those involved in the development of the new concept for the Saline Lowland ecological site include: Blaise Allen, Area Range Management Specialist, NRCS; Jim Wolf, Resource Manager, USDI-BLM; Daniel Wood, MLRA Soil Survey Leader, NRCS; Jane Karinen, Soil Data Quality Specialist, NRCS; and Marji Patz, Ecological Site Specialist, NRCS. 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 IV, and USDA NRCS Soil Surveys from various counties. 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 ten points, clipped a minimum of three of the estimated points, with two 21-foot X 21-foot square extended shrub plots). • Line Point Intercept (over story 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 of a 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 (ten – 1 meter square point photographs taken at set distances on transect. Red 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	03/31/2020
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rare to nonexistent. A very slight amount of rill development may be observed following large storm events or spring runoff periods, but they should heal within the following growing season. Slight rill development may also be observed where the site is adjacent to ecological sites that produce large amounts of runoff (i.e. steeper sites)

2. **Presence of water flow patterns:** Barely observable. Any flow patterns present should be sinuous and wind around perennial plant bases. They should be short (5 to 10 feet), one foot wide, and spaced from 20 to 30 feet apart. They should be stable with only minor evidence of deposition. This site is periodically inundated with runoff water from adjacent sites. It also acts as a filter and trap sediment.

3. **Number and height of erosional pedestals or terracettes:** None to rare. A few plants may show very minor pedestalling where they are adjacent to any water flow patterns present, but there will be no exposed roots. Terracettes are not present.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground can range from 0-20%. Any bare ground openings present should be < 2 feet in size and should not be connected.

5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present.

6. **Extent of wind scoured, blowouts and/or depositional areas:** No evidence of wind generated soil movement. Wind scoured (blowouts) and depositional areas are not present.

7. **Amount of litter movement (describe size and distance expected to travel):** The majority of litter accumulates in place at the base of plant canopies. Slight movement of the finest material (< 1/8 inch) may move 1 to 2 feet downslope when transported by water. Little accumulation is observed behind obstructions. Wood litter not expected to move.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil Stability Index ratings range from 2 (interspaces) to 6 (under plant canopy), but average values should be 3.5 or greater.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil data is limited for this site. Organic matter typically ranges from 0.5 to 2%.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 60-80% grasses, 5% forbs, and 15-35% shrubs. Dense plant canopy (75-100%) and litter, despite slow to moderate infiltration rates, result in minimal runoff. Basal cover is typically greater than 5% for this site and does effectively reduce runoff on this site.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None. This site will normally have textural changes within the soil profile. These should not be mistaken for

compaction layers.

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: Perennial Bunchgrasses (2 species), perennial shrubs (1 species)

Sub-dominant: cool season rhizomatous grasses (1 species)

Other: Community 1.1 = Perennial bunchgrasses & cool season rhizomatous grasses & Shrubs & Perennial Forbs 12b. F/S Groups not expected for the site: Annual Grasses 12c. Number of F/S Groups: 3 groups 12d. Species number in Dominate and Sub-dominate F/S Groups: 4 species

Additional: Disturbance regimes include insects, infrequent fire, and flooding. Temporal variability can be caused by fires, droughts, insects, etc. Spatial variability can be caused by runoff, soil pH, and topography.

13. **Amount of plant mortality and decadence** (include which functional groups are expected to show mortality or decadence): Minimal decadence, typically associated with shrub component. During years with average to above average precipitation, there should be no mortality or decadence in either perennial grasses or grasslikes. During severe (multi-year) droughts that affect groundwater levels, up to 10% of the perennial plants may die. There may be partial mortality of individual grasses and grasslikes during less severe droughts.
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14. **Average percent litter cover (%) and depth (in):** Litter ranges from 10-30% of total canopy measurement with total litter (including beneath the plant canopy) from 75-90% expected. Herbaceous litter depth typically ranges from 10-25 mm. Woody litter can be up to a couple inches (4-6 cm)
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15. **Expected annual annual-production** (this is TOTAL above-ground annual-production, not just forage annual-production): Total annual production ranges from 1600-2600 lb/ac (1793-2914 kg/ha); with an average annual production of 2200 lb/ac (2466 kg/ha).
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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: Bare ground greater than 30% is the most common indicator of a threshold being crossed. Greasewood and inland saltgrass are common increasers. Perennial pepperweed, annual mustards, kochia, and Russian thistle are common invasive species in disturbed sites.
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17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.
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