Ecological site DX034A02X144
Saline Upland
Pinedale Plateau
(SU PP)

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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): 034A–Cool Central Desertic Basins and Plateaus

Major Land Resource Area (MLRA) 34A, Cool Central Desertic Basins and Plateaus, consists of approximately 21 million acres in Wyoming, Colorado and Utah, it consists of 10 Land Resource Units (LRU). These units are divisions of the MLRA based on geology, landscape, common soils, water resources and plant community potentials. The elevation ranges from approximately 5600 feet (1700 m) along the Green River in UT and CO to approximately 9500 feet (2900m) near Jeffrey City, WY. Annual precipitation ranges from 7 to 16 inches (177 to 406 mm), with the driest areas in the Green River and Great Divide Basins and the wettest areas in northern Carbon County, Southeast Fremont County and Albany County. There is a seasonal weather pattern that trends west to east, with more winter precipitation in the west and more spring/summer in the east, illustrated by diminishing amounts of Big Sagebrush in the eastern part of the MLRA.

LRU notes

The Pinedale Plateau LRU is in the upper Green River Drainage from Pinedale, Wyoming at the north working southward to Farson, Wyoming and easterly to South Pass, Wyoming. It is situated between the Wyoming Range and Wind River Range largely in Sublette County with some areas in Lincoln County, northern Sweetwater County, and a small portion of Fremont County. The total area of this LRU is approximately 1,210,000 acres. It shares a boundary with MLRA 46-Northern Rocky Mountain Foothills (proposed for the foothills of western Wyoming). This LRU is dominated by the New Fork Tongue of the Wasatch formation, a large artesian aquifer that is estimated to hold large amounts of water with relatively quick recharge (Martin, 1997). It is also home to the Lance Formation, a cretaceous strata that is part of the Mesaverde Group, which holds large amounts of hydrocarbons, giving way to one of the largest on shore natural gas fields (Jonah Field) (Bowker et al 2000). The soils in the Pinedale Plateau are dominated by older Alfisols with thick argillic and calcic horizons and younger deep alluvial soils along drainage ways and in river bottoms. Salts are not a major influence in the Pinedale Plateau compared to the adjacent Green River Basin LRU but do occur, including sodium, calcium carbonate, and other soluble salts. Soils are tied closely to their parent geology but are more developed and older so typically do not have bedrock contact within six feet. This LRU has an aridic ustic soil moisture regime and frigid (bordering on cryic) soil temperature regime. The precipitation pattern is bimodal with a slight spikes in the spring and fall. Winter temperatures are cold allowing snow to accumulated and stay until spring. This lends perfectly to cool season grasses and forbs to flourish, also allowing Big Sagebrush to establish and dominate the landscape. The mean annual soil temperatures are between 36 to 40 degrees Fahrenheit (2.2 to 4.4 degrees Celsius) and average precipitation is between 9 and 12 inches (230 to 305 mm) annually. Elevations of this LRU range between 6500 and 7500 feet (1980 to 2280 m).

Classification relationships

Relationship to Other Established Classification Systems National Vegetation Classification System (NVC): 3 Desert & Semi-Desert Class 3.B Cool Semi-Desert Scrub & Grassland Subclass 3.B.1 Cool Semi-Desert Scrub & Grassland Formation 3.B.1.Ne Western North American Cool Semi-Desert Scrub & Grassland Division M093 Great Basin Saltbush Scrub Macrogroup G301 Intermountain Dwarf Saltbush - Sagebrush Scrub Group A1110 Gardner's Saltbush Low Scrub Alliance CEGL001444 Atriplex gardneri / Achnatherum hymenoides Dwarf-shrubland Ecoregions (EPA): Level I: 10 North American Deserts Level II: 10.1 Cold Deserts Level III: 10.1.4 Wyoming Basin

Ecological site concept

• This site not does receive any additional water. • These soils: o are saline or saline-sodic o are moderately deep to very deep o are not skeletal within 20 inches (50 cm) of the soil surface; they have less than 35 percent rock fragments by volume in the top 20 inches (50 cm) o are not violently effervescent in the surface mineral layer (within top 10 inches; 25 cm) o have surface textures that usually range from clay loam to clay in surface mineral layer (4 inches; 10 cm) • have slopes less than 15 percent • clay content in the subsurface is greater than 35% and a natric horizon is present. Climate: aridic ustic moisture regime (ustic bordering on aridic) frigid (bordering on cryic) temperature regime

Associated sites

DX034A02X122	**Loamy Pinedale Plateau (Ly PP)** Lower salt content (EC and SAR) and soil surface textures typically have less clay.
DX034A02X104	**Clayey Pinedale Plateau (Cy PP)** Lower salt content (EC and SAR)

Similar sites

R034AY240WY	**Saline Lowland Drained Foothills and Basins West (SLDr)** Saline Lowland, drained 10-14W has somewhat higher production with greasewood as a dominant woody species and a small amount of Gardners saltbush. It is located in the drainage bottom and associated with down-cutting in the drainageway.
R034AY238WY	**Saline Lowland Foothills and Basins West (SL)** Saline Lowland 10-14W has a deep water table and much higher production with greasewood as a dominant woody species and a small amount of Gardners saltbush. It is located in the drainage botton.
R034AY244WY	**Saline Upland Foothills and Basins West (SU)** Previous version on this site, but applied to a larger geographic area.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Atriplex gardneri*
Herbaceous	(1) *Achnatherum hymenoides* (2) *Elymus elymoides*

Legacy ID

R034AC144WY

Physiographic features

The Saline Upland Pinedale Plateau (SU-PP) ecological site occurs in intermontane basin landscapes on hillslope, alluvial fan, and alluvial flat landforms (see following definitions). The slopes range from 0 to 15 percent, but could occur on sites up to 30 percent. This site occurs on all aspects.

Landscape Definitions:
intermontane basin–-A generic term for wide structural depressions between mountain ranges that are partly filled with alluvium and called "valleys" in the vernacular.

Landform Definitions:
hillslope - A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of the hill.

alluvial fan--A low, outspread mass of loose materials and rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley, or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

alluvial flat - (a) (colloquial: western U.S.A.) A nearly level, graded, alluvial surface in bolsons (closed basins) and semi-bolsons that lacks distinct channels, terraces or flood plain levels. Similar terms = flood-plain step, terrace, valley flat. (b) (not preferred) A general term for a small flood plain bordering a river, on which alluvium is deposited during floods.

Table 2. Representative physiographic features

Landforms	(1) Intermontane basin > Hillslope (2) Alluvial fan (3) Alluvial flat
Runoff class	Medium to very high
Flooding frequency	None
Ponding frequency	None to rare
Elevation	1,980 – 2,290 m
Slope	0 – 20 %
Aspect	Aspect is not a significant factor

Climatic features

Annual precipitation ranges from 9 to 12 inches per year. Wide fluctuations may occur in yearly precipitation and result in more below average years than those with above average precipitation. Temperatures show a wide range between summer and winter and between daily maximums and minimums. This is predominantly due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Much of the precipitation accumulation (45 percent) comes in the winter in the form of snow (October to April). The wettest month is May (1.69 inches). The dominant plants (sagebrush and cool season grasses) are well adapted to these conditions. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour. The growing season is short (less than 60 day) and cool (critical growth period): primary growth typically occurs between May and June. Growth of native cool-season plants begins about mid-April and continues to approximately early July. Some green-up of cool-season plants usually occurs in September with adequate fall moisture.

All data is based on the 30-year average from 1981-2010.

Table 3 Representative climatic features

Frost-free period (characteristic range)	30-70 days
Freeze-free period (characteristic range)	50-80 days
Precipitation total (characteristic range)	230-310 mm
Frost-free period (actual range)	20-70 days
Freeze-free period (actual range)	50-90 days
Precipitation total (actual range)	230-330 mm
Frost-free period (average)	40 days
Freeze-free period (average)	60 days
Precipitation total (average)	280 mm

- (1) BOULDER REARING STN [USC00480951], Boulder, WY
- (2) PINEDALE [USC00487260], Pinedale, WY
- (3) CORA [USC00482054], Cora, WY

Influencing water features

There are no influencing water features in the Saline Upland Pinedale Plateau ecological site.

Wetland description

N/A

Soil features

The soils of this site are moderately deep to very deep (at least 20 inches deep) well drained soils with an increase of clay percentage and salt concentration in the subsoil. Some soil cracking (not severe) may occur during the dry summer months, especially where the plant cover has been reduced. Water-holding capacity is moderate to high, but intake is restricted which causes reduces effectiveness of precipitation.
A common scenario is to have a one to two inch cap of sandy loam over other dominant surface textures due to young soil development from adjacent rock outcrops of weathered shale, mudstone, and sandstone parent materials.

Major Soil Series correlated to this site include: Zealot, Squaretop, Lauzer and Jewel
Representative soil taxonomy: Fine, smectitic, frigid Torrertic Natrustalfs and Fine-loamy, mixed, superactive, frigid Aridic Haplustalfs

Table 4. Representative soil features

Parent material	(1) Alluvium – clayey shale (2) Slope alluvium – sandstone and shale

Surface texture	(1) Gravelly loam (2) Silty clay loam (3) Fine sandy loam (4) Coarse sandy loam
Drainage class	Well drained
Permeability class	Moderate to very slow
Soil depth	50 – 510 cm
Surface fragment cover <=3"	0 – 20 %
Surface fragment cover >3"	0 – 10 %
Available water capacity (0-101.6cm)	5.84 – 17.02 cm
Calcium carbonate equivalent (0-50.8cm)	0 – 20 %
Clay content (0-50.8cm)	30 – 50 %
Electrical conductivity (Depth not specified)	0 – 20 mmhos/cm
Sodium adsorption ratio (Depth not specified)	10 – 20
Soil reaction (1:1 water) (Depth not specified)	8.4 – 10
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %

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

Ecological dynamics

A State-and-Transition Model (STM) diagram is depicted below. Thorough descriptions of each state, transition, plant community phase, and pathway are found after the model in this document. This diagram is based on available experimental research, field observations, professional consensus, and interpretations. While based on the best available information, the STM will change over time as knowledge of ecological processes increases.

Plant community composition within the same ecological site has a natural range of variability across the LRU due to the naturally occurring variability in weather, soils, and aspect. Not all managers will choose the Reference Plant Community as the management goal. Other plant communities may be desired to meet land management objectives. This is valid as long as the rangeland health attributes assessment departures are none to slight or slight to moderate from the Reference State. The biological processes on this site are complex; therefore, representative values are presented in a land management context. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

Both percent species composition by weight and percent cover are used in this ESD. Most observers find it easier to visualize or estimate percent cover for woody species (trees and shrubs). Foliar cover is used to define plant community phases and states in the State-and-Transition Model. Cover drives the transitions between communities and states because of the influence of shade and interception of rainfall.

Species composition by dry weight remains an important descriptor of the herbaceous community and of site productivity as a whole and includes both herbaceous and woody species. Calculating similarity index requires data on species composition by dry weight.

Although there is considerable qualitative experience supporting the pathways and transitions within the State-and-Transition Model, no quantitative information exists that specifically identifies threshold parameters between reference states and degraded states in this ecological site. For information on STMs, see the following citations: Bestelmeyer et. al. 2003, Bestelmeyer et. al. 2004, Bestelmeyer and Brown 2005, and Stringham et. al. 2003.

A resource concern risk assessment and dominant resource concerns are provided for each Land Use, State, Plant Community Phase based on NRCS resource concern and planning criteria used to determine resource treatment levels during the conservation planning process. A resource concern is the resource condition that does not meet the minimum accepted levels established by planning criteria as shown in Section III of the NRCS Field Office Technical Guide (https://efotg.sc.egov.usda.gov/#/).
• Low risk means a low probability for the category of resource concerns and additional assessment is typically not necessary.
• Medium risk means that the category of resource concerns could occur, and additional assessment is recommended if the identified resource is a client concern and/or objective.
• High risk means that a resource concern in that category is likely to occur.
The resource categories are: S (soil), W (water), A (air), P (plant), A (animal), E (energy), and H (human). The dominant resource concerns further refine the resource category to a specific resource concern within that category.

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	**Perennial Mid-Size Cool Season Bunchgrasses**			95-196	
	Indian ricegrass	ACHY	*Achnatherum hymenoides*	28-168	5-30
	squirreltail	ELEL5	*Elymus elymoides*	28-112	5-20
	Sandberg bluegrass	POSE	*Poa secunda*	0-56	0-10
	alkali sacaton	SPAI	*Sporobolus airoides*	0-28	0-5
	needle and thread	HECO26	*Hesperostipa comata*	0-28	0-5
2	**Rhizomatous Grasses**			28-56	
	thickspike wheatgrass	ELLAL	*Elymus lanceolatus ssp. lanceolatus*	28-56	1-10

	western wheatgrass	PASM	*Pascopyrum smithii*	28-56	1-10
3	**Misc Grasses/Grasslikes**			11-28	
	plains reedgrass	CAMO	*Calamagrostis montanensis*	0-28	0-5
	needleleaf sedge	CADU6	*Carex duriuscula*	0-28	0-5
	Sandberg bluegrass	POSE	*Poa secunda*	6-28	1-5
	Grass, perennial	2GP	*Grass, perennial*	0-28	0-5
Forb					
4	**Perennial Forbs**			11-28	
	spiny phlox	PHHO	*Phlox hoodii*	6-28	1-5
	longleaf phlox	PHLO2	*Phlox longifolia*	0-17	0-3
	flaxleaf plainsmustard	SCLI	*Schoenocrambe linifolia*	0-17	0-3
	scarlet globemallow	SPCO	*Sphaeralcea coccinea*	0-17	0-3
	princesplume	STANL	*Stanleya*	0-17	0-3
	stemless mock goldenweed	STAC	*Stenotus acaulis*	0-17	0-3
	agoseris	AGOSE	*Agoseris*	0-17	0-3
	fleabane	ERIGE2	*Erigeron*	0-17	0-3
	buckwheat	ERIOG	*Eriogonum*	0-17	0-3
	milkvetch	ASTRA	*Astragalus*	0-17	0-3
	hoary tansyaster	MACA2	*Machaeranthera canescens*	0-17	0-3
	evening primrose	OENOT	*Oenothera*	0-6	0-1
	cryptantha	CRYPT	*Cryptantha*	0-6	0-1
	western wallflower	ERAS2	*Erysimum asperum*	0-6	0-1
	ipomopsis	IPOMO2	*Ipomopsis*	0-6	0-1
	desertparsley	LOMAT	*Lomatium*	0-6	0-1
	onion	ALLIU	*Allium*	0-6	0-1
	rockcress	ARABI2	*Arabis*	0-6	0-1
	sandwort	ARENA	*Arenaria*	0-6	0-1
	violet	VIOLA	*Viola*	0-6	0-1
	deathcamas	ZIGAD	*Zigadenus*	0-6	0-1
	Forb, perennial	2FP	*Forb, perennial*	0-6	0-1
5	**Annual Forbs**			0-6	
	cryptantha	CRYPT	*Cryptantha*	0-6	0-1
	yellow owl's-clover	ORLU2	*Orthocarpus luteus*	0-6	0-1
	finebranched popcornflower	PLLE	*Plagiobothrys leptocladus*	0-6	0-1
	Forb, annual	2FA	*Forb, annual*	0-6	0-1
Shrub/Vine					
6	**Desert Salt Shrub**			106-224	
	Gardner's saltbush	ATGA	*Atriplex gardneri*	84-224	10-20
	winterfat	KRLA2	*Krascheninnikovia lanata*	28-84	5-10
	bud sagebrush	PIDE4	*Picrothamnus desertorum*	6-28	1-5
7	**Misc Shrubs**			11-28	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	0-28	0-5
	spineless horsebrush	TECA2	*Tetradymia canescens*	0-17	0-3
	shortspine horsebrush	TESP2	*Tetradymia spinosa*	0-17	0-3
	yellow rabbitbrush	CHVI8	*Chrysothamnus viscidiflorus*	0-17	0-3
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0-6	0-1

Table 6. Community 1.2 plant community composition

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

Table 7. Community 2.1 plant community composition

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

Table 8. Community 2.2 plant community composition

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

Table 9. Community 3.1 plant community composition

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

Animal community

The following table lists suggested stocking rates for cattle under continuous season-long grazing under normal growing conditions with a harvest efficiency (HE) of 25 percent. 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). A field visit is required to document actual plant composition and production. More precise carrying capacity estimates, considering forage preference and accessibility (slope, distance to water, etc.), should be calculated using field collected data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies (up to 35 percent) can result in an increased carrying capacity, but recovery time for upland sites is much longer. If distribution problems occur, stocking rates should be reduced or facilitating conservation practices (i.e., cross-fencing, water development) implemented to maintain plant health and vigor. Stocking rates are expressed in Animal Unit Months (AUMs) which is defined as the amount of forage consumed by a 1,000 pound cow with a less than 4 month old calf at her side. Initial Suggested Stocking Rate: Plant Community Production (lbs./ac.) (AUMs/ac.)* Ac./AUM 1.1 Desert Saltshrub/Bunchgrass 300-500-700 0.12 8 1.2 Desert Saltshrub/Rhizomatous Grass 300-500-700 0.07 14 2.1 Desert Saltshrub/Short-stature Grass 200-400-600 0.07 14 3.1 Reclaimed 300-500-700 0.12 8 3.2 Annuals 100-200-300 0.02 50 4.1 Desert Salt Shrub/Bare Ground 100-200-300 0.05 20 * Continuous, season-long grazing by cattle under average growing conditions. Calculation for stocking rates are as follows: Using representative values (RV) for production, take forage palatable to grazing cattle and multiply by 0.25 HE and divide by 912.5 pounds per AUM air-dry weight (ADW) to arrive at the initial suggested stocking rate in AUMs per acre. 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. During the dormant period, the forage for livestock must be supplemented with protein because the quality does not meet minimum livestock requirements. Distance to water, shrub density, and slope can affect grazing capacity within a management unit. Accessibility adjustments should be made for the planning area as necessary. For example, 30 percent of a management unit may have 25 percent slopes and distances of greater than one mile from water, resulting in a 50 percent reduction in grazing access; therefore, the adjustment is 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 grazing access within a management unit. Adjustments should be made that incorporate these factors when calculating the carrying capacity of a management unit. Wildlife: Reference State 1.1 Desert Saltshrub/Bunchgrass: Although animal populations of salt-desert shrub ranges are seemingly sparse and simple, a considerable number of species varying in size from insects to large ungulates are normal inhabitants. This community phase provides excellent winter forage for mule deer, pronghorn, and elk, while also providing critical nutrients for migrating big game with the spring green up of grasses. Gardner’s saltbush and winterfat are highly sought after plants throughout the year, but especially during winter months. This phase also provides excellent habitat for small mammals such as the white-tailed prairie dog and also provides some nesting and foraging opportunities for songbirds. 1.2 Desert Saltshrub/Rhizomatous Grass: While more variable in its value to large ungulates, this phase still provides good winter habitat for species such as mule deer and pronghorn that browse on salt-shrubs, however, due to the fluctuations in the bunchgrass cover the value of the grass component decreases some. In periods of high plant vigor, the herbaceous understory can still provide adequate habitat for small mammals and songbirds, but decreases during periods of drought or low vigor. Grazing Resistant State 2.1 Desert Saltshrub/Short-stature Grass: Given the lack of or complete absence of mid-size bunch grasses, the value of this phase to wildlife is variable. The value of the saltshrub community is similar to the reference state while the herbaceous understory lacks diversity and height to provide optimal habitat during most years. In periods of high plant vigor, this phase can still provide an important nutritional component during spring green up for migrating big game with the presence of Sandberg bluegrass, but lacking during non-productive periods. Highly Disturbed State 3.1 Reclaimed Plant Community: This community phase is highly variable in its value to wildlife. Reclamation success, size and configuration of the reclaimed area, the species planted, and the time it takes for plants to establish will determine the value of the site for wildlife. A fully reclaimed site containing a diversity of herbaceous and woody native plants can eventually provide the same wildlife habitat benefits as the reference state. In most cases, grasses and forbs establish early in the reclamation process, whereas shrubs take significantly longer to establish. 3.2 Annual Plant Community: This plant community exhibits a low level of plant species diversity, and thus, is less apt to meet the seasonal needs of most wildlife who frequent this community. Eroded State 4.1 Desert Saltshrub/Bare Ground: The lack of plant diversity in this phase provides a much lower value to wildlife. Big game species such as pronghorn and mule deer will still forage on woody species on this site, but are likely not able to get the quantity or quality of forage they require for nutritional demands. Small mammals and birds are likely not going to prefer this State relative to the Reference State.

Hydrological functions

Water is the principal factor limiting forage production on this site. This site is highly variable and is dominated by soils in hydrologic groups B and D, with localized areas in hydrologic group A and C. Infiltration ranges from very slow to moderate. Runoff potential for this site varies from moderate to high depending on soil hydrologic group, depth and fracturing of bedrock, slope, and ground cover (refer to Part 630, NRCS National Engineering Handbook for detailed hydrology information). Rills and gullies are not typically present in the Reference State. Water flow patterns should be barely distinguishable. 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 are rare to non-existent. Cryptogamic crusts are present, but only cover one to two percent of the soil surface.

Recreational uses

This site provides opportunities such as prairie dog hunting and Off-Road-Vehicle (ORV) recreational use.

Wood products

No wood products are present on the site.

Inventory data references

Information presented was derived from 1988 Range Site Descriptions, NRCS clipping data, literature, field observations (based on two sampled sites and observations from numerous others), and personal contacts with range-trained personnel (i.e., agency specialists, landowners, land managers, and scientists).

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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.

Author(s)/participant(s)	
Contact for lead author	
Date	02/24/2025
Approved by	
Approval date	

Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

   _____

2. **Presence of water flow patterns:**

   _____

3. **Number and height of erosional pedestals or terracettes:**

   _____

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

   _____

5. **Number of gullies and erosion associated with gullies:**

   _____

6. **Extent of wind scoured, blowouts and/or depositional areas:**

   _____

7. **Amount of litter movement (describe size and distance expected to travel):**

   _____

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

   _____

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

   _____

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

    _____

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

    _____

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:

Sub-dominant:

Other:

Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**

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17. **Perennial plant reproductive capability:**
