

Ecological site R023XY602OR ARID NORTH 8-10 PZ

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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.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. tridentata</i> (2) <i>Artemisia tridentata ssp. wyomingensis</i>
Herbaceous	(1) <i>Pseudoroegneria spicata ssp. spicata</i>

Physiographic features

This site occurs on north facing side-slopes of basin hills and low mountains. Slopes range from 10-80%, with gradients of 20 to 70% being most common. Elevations vary from 4400-5500 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Mountain slope
Flooding frequency	None
Ponding frequency	None
Elevation	1,340 – 1,680 m
Slope	20 – 70 %
Aspect	N

Climatic features

The annual precipitation averages 8-10 inches, most of which occurs during the months of October through March. The mean annual air temperature is 48 degrees F. Temperature extremes range from 110 to -30 degrees F. The period for optimum Plant growth is from April through early June.

Table 3 Representative climatic features

Frost-free period (average)	0 days
Freeze-free period (average)	0 days
Precipitation total (average)	0 mm

Influencing water features

Soil features

The soils of this site are shallow to very shallow over a strongly cemented duripan, bedrock, or clay layer. Typically the surface is a very gravelly or cobbly sandy clay loam over a very cobbly clay loam subsoil. Permeability is moderate to moderately slow. The available water holding capacity is about .5 to 3 inches for the profile. The potential for erosion is high. See Appendix II for soils that correlate to this site.

Table 4. Representative soil features

Surface texture	(1) Very cobbly sandy clay loam (2) Very gravelly sandy clay loam
Family particle size	(1) Clayey
Permeability class	Moderately slow to moderate
Available water capacity (0-101.6cm)	1.27 – 7.62 cm

Ecological dynamics

Four states have been identified for this site: a reference state; a state with the presence of annuals; a state with a shrub/annual co-dominance; and a state with annual dominance.

Reference: Plant community phase change is driven by infrequent fire. Wyoming and basin big sagebrush decline after fire while Thurber’s needlegrass, Indian ricegrass and other grasses increase. May see a temporary increase in rabbitbrush after fire. Time facilitates the reintroduction of sagebrush. The introduction of invasive annual grasses and forbs transitions into the state 2.

State 2: Compositionally similar to the reference state with a trace of cheatgrass and weedy forbs. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. Prescribed grazing and infrequent fire (> 50 year return interval) maintain state dynamics. The timing and/or intensity of grazing or prolonged drought favors Wyoming and basin big sagebrush, squirreltail and Sandberg’s bluegrass. Prescribed grazing and/or release from drought may reverse the decline in needlegrass and Indian ricegrass production. Infrequent fire reduces the shrub community and promotes the bunchgrass component. Mismanaged grazing and/or prolonged drought leads to a biotic threshold and into state 3.

State 3: Wyoming and basin big sagebrush is decadent with little recruitment. The perennial grass component is significantly reduced in both density and productivity. Cheatgrass and/or annual forbs and/or Sandberg’s bluegrass along with sagebrush control site resources and drive ecological dynamics. Bare ground is abundant. Spatial and temporal energy capture and nutrient cycling has been truncated. Infiltration may be reduced due to lack of ground cover. Risk of soil erosion by both wind and water is increased. Catastrophic wildfire will lead to an abiotic threshold and into state 4.

State 4: Cheatgrass and/or annual weed dominated plant community with limited to no shrub or perennial grass component. Soil erosion and redistribution along with changes in dynamic soil properties affect the hydrologic cycle and thus the nutrient cycle. Harsh

environmental factors increase state resiliency to change.

State and transition model

Figure 5. Group 6, STM

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, moderately deep rooted, bunchgrass			269-404	
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata ssp. spicata</i>	269-404	–
2	Perennial, moderately deep rooted, bunchgrass			0-72	
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	0-45	–
	Idaho fescue	FEID	<i>Festuca idahoensis</i>	0-27	–
3	Perennial, shallow rooted, bunchgrass			45-90	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	45-90	–
	milkvetch	ASTRA	<i>Astragalus</i>	3-7	–
	lupine	LUPIN	<i>Lupinus</i>	3-7	–
4	Other perennial bunchgrass			18-45	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	41-84	–
	yellow rabbitbrush	CHVIS5	<i>Chrysothamnus viscidiflorus ssp. viscidiflorus var. stenophyllus</i>	4-21	–
	silver sagebrush	ARCA13	<i>Artemisia cana</i>	4-21	–
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	4-21	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0-18	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-18	–
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	0-9	–
	rubber rabbitbrush	ERNAS	<i>Ericameria nauseosa ssp. nauseosa var. salicifolia</i>	0-4	–
Forb					
5	Perennial forbs			18-90	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0-18	–
	pussytoes	ANTEN	<i>Antennaria</i>	0-18	–
	rockcress	ARABI2	<i>Arabis</i>	0-18	–
	milkvetch	ASTRA	<i>Astragalus</i>	0-18	–
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	0-18	–
	mariposa lily	CALOC	<i>Calochortus</i>	0-18	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0-18	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	0-18	–
	fleabane	ERIGE2	<i>Erigeron</i>	0-18	–
	buckwheat	ERIOG	<i>Eriogonum</i>	0-18	–
	lupine	LUPIN	<i>Lupinus</i>	0-18	–
	phlox	PHLOX	<i>Phlox</i>	0-18	–
	deathcamas	ZIGAD	<i>Zigadenus</i>	0-18	–
Shrub/Vine					
6	Dominant, evergreen, non-sprouting shrubs			108-224	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	90-179	–
	Wyoming big sagebrush	ARTRW8	<i>Artemisia tridentata ssp. wyomingensis</i>	18-45	–

7	Common, evergreen, non-sprouting shrub			9-27	
	spiny hopsage	GRSP	<i>Grayia spinosa</i>	9-27	-
8	Other shrubs			18-54	
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0-18	-
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0-18	-
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	0-18	-
	littleleaf horsebrush	TEGL	<i>Tetradymia glabrata</i>	0-18	-

Contributors

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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	
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:

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

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

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

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:

17. Perennial plant reproductive capability:
