

Ecological site R034AY242WY Saline Subirrigated Foothills and Basins West (SS)

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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.

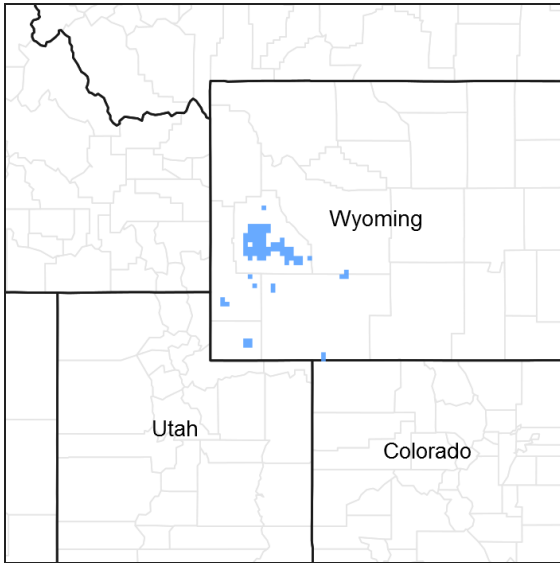


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Associated sites

R034AY228WY	Lowland Foothills and Basins West (LL) Lowland
R034AY238WY	Saline Lowland Foothills and Basins West (SL) Saline Lowland
R034AY274WY	Subirrigated Foothills and Basins West (Sb) Subirrigated
R034AY278WY	Wetland Foothills and Basins West (WL) Wetland

Similar sites

R034AY238WY	Saline Lowland Foothills and Basins West (SL) Saline Lowland (SL) 10-14W has a greater proportion of greasewood.
R034AY142WY	Saline Subirrigated Green River and Great Divide Basins (SS) Saline Subirrigated (SS) 7-9GR has lower production.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on nearly level land along perennial or intermittent streams, near seeps, sloughs, or springs. It is also found on broad, low lake terraces, lake plains, on alluvial bottoms, and poorly-drained bottom lands adjacent to stream channels. These areas receive additional run-in water from higher sites and from a fluctuating water table, well within the root zone. Slopes are mostly less than 3%. Water table depth is from 0 to 306 inches.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Drainageway (3) Stream terrace
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding frequency	None
Elevation	1,981–2,286 m
Slope	0–10%
Ponding depth	0 cm
Water table depth	30–102 cm
Aspect	Aspect is not a significant factor

Climatic features

Annual precipitation ranges from 10-14 inches per year. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal 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. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring.

Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 mph.

Growth of native cool season plants begins about April 15 and continues to about August 15. Some green up of cool season plants usually occurs in September depending upon fall moisture occurrences.

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/cgibin/state.pl?state=wy> website. Other climate stations representative of this precipitation zone include "Border 3 N" and Kemmerer Wtr Trtmt" in Lincoln County; "Evanston 1 E" in Uinta County; and "Merna" in Sublette County.

Table 3. Representative climatic features

Frost-free period (average)	67 days
Freeze-free period (average)	97 days
Precipitation total (average)	356 mm

Influencing water features

There are no water features associated with this site.

Soil features

Soils of this site are mostly deep and somewhat poorly drained. Textures are loamy, sometimes stratified, with a seasonal high water table depth of 1 to 3 feet most years. The soil and soil water have enough salinity to restrict plant establishment and growth. Mottling or gleying may occur within 20 to 40 inches of the surface. Parent material is from mixed sources.

Major soil series correlated to this site include: Mishak, Saleratus, and Yennick.

Other soil series correlated to this site in MLRA 34A include: Battlement, Davidell, and some phases of Henrysfork, Heinsaw, Tew, and Trembles series.

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silt loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Moderately slow to moderate
Soil depth	51–152 cm
Surface fragment cover ≤3"	0–10%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.62–15.24 cm
Calcium carbonate equivalent (0-101.6cm)	10–30%
Electrical conductivity (0-101.6cm)	8–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–10
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume ≤3" (Depth not specified)	0–30%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

As this site deteriorates from improper grazing management, species such as inland saltgrass and greasewood increase. Grasses such as alkali sacaton, basin wildrye, and Nuttall's alkaligrass will decrease in frequency and production.

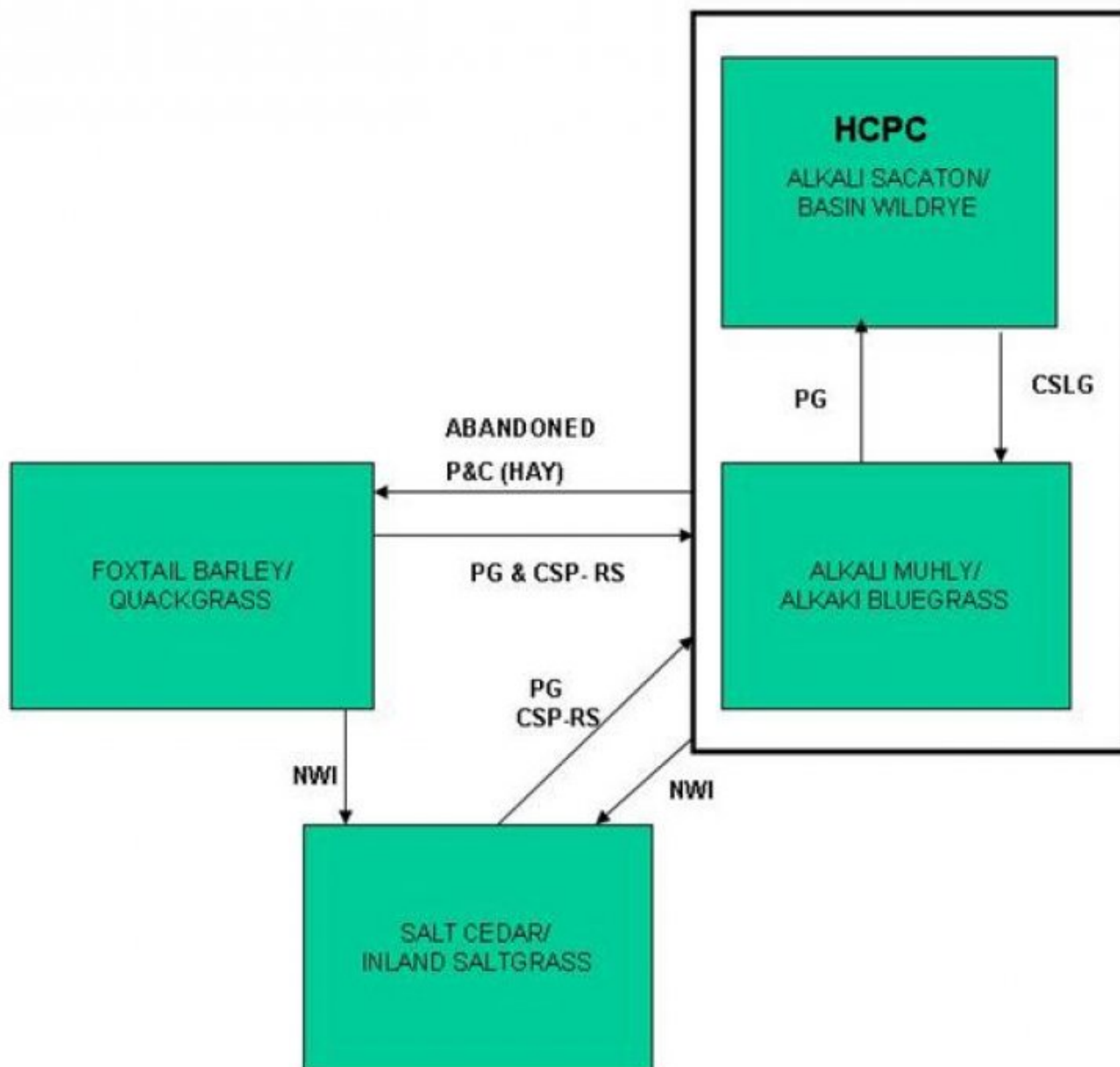
These plant communities narratives may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data is collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC's) will be determined by the decision-makers and will meet minimum quality criteria

established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

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

The following is a State and Transition Model Diagram that illustrates the common plant communities (states) that can occur on the site and the transitions between these communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.

State and transition model



BMA – Brush Management (all methods)
 BMC – Brush Management (chemical)
 BMF – Brush Management (fire)
 BMM – Brush Management (mechanical)
 CSP – Chemical Seedbed Preparation
 CSLG – Continuous Season-long Grazing
 DR – Drainage
 CSG – Continuous Spring Grazing
 HB – Heavy Browse
 HCSLG – Heavy Continuous Season-long Grazing
 HI – Heavy Inundation
 LPG – Long-term Prescribed Grazing
 MT – Mechanical Treatment (chiseling, ripping, pitting)

NF – No Fire
 NS – Natural Succession
 NWC – Noxious Weed Control
 NWI – Noxious Weed Invasion
 NU – Nonuse
 P&C – Plow & Crop (including hay)
 PG – Prescribed Grazing
 RPT – Re-plant Trees
 RS – Re-seed
 SGD – Severe Ground Disturbance
 SHC – Severe Hoof Compaction
 WD – Wildlife Damage (Beaver)
 WF – Wildfire

State 1
Alkali Sacaton/Basin Wildrye (HCPC)

Community 1.1
Alkali Sacaton/Basin Wildrye (HCPC)

The interpretive plant community for this site is the Historic Climax Plant Community. This state evolved with grazing by large herbivores and is suited for grazing by domestic livestock. Potential vegetation is estimated at 80% grasses or grass-like plants, 10% forbs and 10% woody plants. Saline tolerant species dominate the site. The major grasses include alkali sacaton, basin wildrye, Nuttall’s alkaligrass, western wheatgrass, alkali bluegrass, alkali muhly, and inland saltgrass. Common woody plants are greasewood and rubber rabbitbrush. A typical plant composition for this state consists of Alkali sacaton 40-50%, Basin wildrye 10-20%, Nuttall’s alkaligrass 10-20%, alkali bluegrass 5-10%, alkali muhly 5-10%, inland saltgrass 5-10%, perennial forbs 1-10%, greasewood 5-10%, and up to 5% rubber rabbitbrush. Ground cover, by ocular estimate, varies from 70-80%. The total annual production (air-dry weight) of this state is about 3000 pounds per acre, but it can range from about 2500 lbs./acre in unfavorable years to about 3400 lbs./acre in above average years. The state is stable and well adapted to the Cool Central Desertic Basins and Plateaus climatic conditions. It is a critical state providing water and habitat for the surrounding area. It is resistant to drought due to a dependable water supply. This is a sustainable plant community (site/soil stability, watershed function, and biologic integrity). Transitions or pathways leading to other plant communities are as follows: • Continuous Season-long Grazing will convert this plant community to the Alkali Muhly/Alkali Bluegrass State. • Noxious Weed Invasion will convert this plant community to the Salt Cedar/Inland Saltgrass State. • Plowing & Cropping (hay) followed by abandonment will convert this plant community to the Foxtail Barley/Quackgrass State.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	2242	2690	3049
Shrub/Vine	280	336	381
Forb	280	336	381
Total	2802	3362	3811

Figure 5. Plant community growth curve (percent production by month).
WY0303, 10-14W, Free Water Sites - WL, Sb, SS. WL, SB, SS Free Water Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	20	40	20	15	5	0	0	0

State 2
Alkali Muhly/Alkali Bluegrass

Community 2.1
Alkali Muhly/Alkali Bluegrass

This plant community evolved under continuous grazing by domestic livestock. Saline tolerant grasses make up the majority of the understory. Dominant grasses include alkali muhly and alkali bluegrass. The total annual production (air-dry weight) of this state is about 2000 pounds per acre, but it can range from about 1500 lbs./acre in unfavorable years to about 2400 lbs./acre in above average years. The state is stable and protected from excessive erosion. The biotic integrity of this plant community is at risk due to decreased species diversity. The watershed is usually functioning. Transitional pathways leading to other plant communities are as follows: • Prescribed Grazing will result in a plant community very similar to the Historic Climax Plant Community (Alkali Sacaton/Basin Wildrye State). • Noxious Weed Invasion will convert this plant community to the Salt Cedar/Inland Saltgrass State.

Figure 6. Plant community growth curve (percent production by month).
WY0303, 10-14W, Free Water Sites - WL, Sb, SS. WL, SB, SS Free Water Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	20	40	20	15	5	0	0	0

State 3

Foxtail Barley/Quackgrass

Community 3.1

Foxtail Barley/Quackgrass

This plant community is the result of plowing and cropping practices, typically haying. Following abandonment or with improper management, foxtail barley and quackgrass dominate. Povertyweed is a common forb on this site. Basin wildrye will disappear very quickly. The total annual production (air-dry weight) of this state is about 1500 pounds per acre, but it can range from about 1000 lbs./acre in unfavorable years to about 1900 lbs./acre in above average years. The state is moderately stable with some bare ground present. The biotic integrity of this plant community has been compromised, especially with introduction of nonnative, shallow-rooted species, and noxious weed invasion. The watershed is at risk. Transitional pathways leading to other plant communities are as follows: • Noxious Weed Invasion will convert this plant community to the Salt Cedar/Inland Saltgrass State. • Chemical Seedbed Preparation and Re-seeding followed by Prescribed Grazing over the long-term may return this state to near Historic Climax Plant Community (Alkali Sacaton/Basin Wildrye State). However, introduced and noxious weeds such as foxtail barley and quackgrass will persist to some degree.

Figure 7. Plant community growth curve (percent production by month). WY0303, 10-14W, Free Water Sites - WL, Sb, SS. WL, SB, SS Free Water Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	20	40	20	15	5	0	0	0

State 4

Salt Cedar/Inland Saltgrass

Community 4.1

Salt Cedar/Inland Saltgrass

This plant community evolved under frequent and severe grazing accompanied by the introduction of noxious weeds, mainly salt cedar and Russian knapweed. Inland saltgrass persists in the understory, but annual forbs and weeds have invaded the site. Salt Cedar comprises 80-90% of the annual production on the site. The total annual production (air-dry weight) of this state is about 1000 pounds per acre, but it can range from about 500 lbs./acre in unfavorable years to about 1400 lbs./acre in above average years. Bare ground has increased. The soil of this state is not well protected from erosion. The watershed is at risk and may produce excessive runoff. Transitional pathways leading to other plant communities are as follows: • Chemical Seedbed Preparation and Re-seeding followed by Prescribed Grazing over the long-term may result in a plant community very similar to the Historic Climax Plant Community (Alkali Sacaton/Basin Wildrye State), except that noxious weeds will persist to some degree.

Figure 8. Plant community growth curve (percent production by month). WY0303, 10-14W, Free Water Sites - WL, Sb, SS. WL, SB, SS Free Water Sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	20	40	20	15	5	0	0	0

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				1345–1681	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	1345–1681	–
2				336–673	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	336–673	–
3				336–673	
	Nuttall's alkaligrass	PUNU2	<i>Puccinellia nuttalliana</i>	336–673	–
4				168–336	
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	168–336	–
5				168–336	
	scratchgrass	MUAS	<i>Muhlenbergia asperifolia</i>	168–336	–
6				168–336	
	saltgrass	DISP	<i>Distichlis spicata</i>	168–336	–
7				168–336	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	168–336	–
8				0–168	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–168	–
Forb					
9				168–336	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–168	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–168	–
	scouringrush horsetail	EQHY	<i>Equisetum hyemale</i>	0–168	–
	arrowgrass	TRIGL	<i>Triglochin</i>	0–168	–
Shrub/Vine					
10				168–336	
	greasewood	SAVE4	<i>Sarcobatus vermiculatus</i>	168–336	–
11				34–168	
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	34–168	–

Animal community

Animal Community – Wildlife Interpretations

Alkali Sacaton/Basin Wildrye Plant Community (HCPC): This plant community is very important for many of the wildlife species in the area. With the presence of water at or near the soil surface, over 80% of all wildlife will use this site to fulfill some part of their habitat needs. It provides forage for mule deer and antelope. It provides nesting habitat for shorebirds, songbirds, and waterfowl as well as ground nesting birds such as harriers. The lush herbaceous material produces insects for sage grouse brood rearing and foraging. Dense ground cover provides escape cover, forage, and breeding areas for small mammals which draw predators such as raptors, red fox and coyote. Other birds that would frequent this plant community include red-wing blackbirds, sandhill cranes, western meadowlarks, and neotropical migrants.

Alkali Muhly/Alkali Bluegrass Plant Community: This plant community may be beneficial for the same wildlife that would use the Historic Climax Plant Community. However, the plant community composition is less diverse, and thus, less apt to meet the seasonal needs of these animals. It may provide some foraging opportunities for sage grouse when it occurs proximal to woody cover.

Foxtail Barley/Quackgrass Plant Community: This plant community exhibits a low level of plant species diversity. In most cases, it is not a desirable plant community to select as a wildlife habitat management objective.

Salt Cedar/Inland Saltgrass Plant Community: This plant community exhibits a low level of plant species diversity due to the accumulation of salts in the soil. It may provide some thermal and escape cover for deer and moose if no other woody community is nearby, but in most cases it is not a desirable plant community to select as a wildlife habitat management objective.

Animal Community – Grazing Interpretations

The following table lists suggested stocking rates for cattle under continuous season-long grazing under 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.

Plant Community Production (lb./ac) and Carrying Capacity* (AUM/ac)

Alkali Sacaton/Basin Wildrye (HCPC) 2500-3400 lb./ac and .9 AUM/ac

Alkali Muhly/Alkali Bluegrass 1500-2400 lb./ac and .6 AUM/ac

Foxtail Barley/Quackgrass 1000-1900 lb./ac and .5 AUM/ac

Salt Cedar/Inland Saltgrass 500-1400 lb./ac and .3 AUM/ac

* - Continuous, season-long grazing by cattle under average growing conditions.

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.

Hydrological functions

Salinity/alkalinity is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic groups C and D. Infiltration ranges from moderately slow to moderately well. 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. 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 are sometimes present.

Recreational uses

This site provides a variety of hunting opportunities as well as providing popular camping areas for recreationists. This site has a wide variety of forbs which bloom throughout spring and summer, providing esthetic values that appeal to visitors.

Wood products

No appreciable wood products are present on the site.

Other products

None noted.

Inventory data references

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel were also used. Those involved in developing this site include: Bill Christensen, Range Management Specialist, NRCS; Karen Clause, Range Management Specialist, NRCS; and Everet Bainter, Range Management Specialist, NRCS. Other sources used as references include: USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

Contributors

Karen Clause

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	03/16/2007
Approved by	E. Bainter
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rare to nonexistent.

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

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

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 0-5%.

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:** Minimal to nonexistent.

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous 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 3 (interspaces) to 6 (under plant canopy), but average values should be 4.0 or greater.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Typically an A-horizon of greater than 2 inches (5 cm) with massive structure and color hues of 10YR or 2.5Y, values of 5-6, and chromas of 2-3. Organic matter typically is 1-2%.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 75-90% grasses, 10% forbs, and 0-15% shrubs. Dense plant canopy (80-100%) and litter plus moderate infiltration rates result in minimal to nonexistent runoff until soils are saturated. Basal cover is typically greater than 5% for this site and effectively reduces 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):** No compaction layer exists.

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: warm season bunchgrasses>>tall, cool season bunchgrasses>perennial forbs=mid-size, cool season bunchgrasses=cool season rhizomatous grasses=warm season rhizomatous grasses>perennial shrubs

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

14. **Average percent litter cover (%) and depth (in):** Litter ranges from 0-20% of total canopy measurement with total litter (including beneath the plant canopy) from 80-100% expected. Herbaceous litter depth typically ranges from 10-25 mm.

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

production): English: 2500-3400 lb/ac (3000 lb/ac average); Metric: 2800-3808 kg/ha (3360 kg/ha average).

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 20% is the most common indicator of a threshold being crossed. Alkali muhly, inland saltgrass, and alkali bluegrass are common increasers.
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17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.
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