

# Ecological site R043BY274WY Subirrigated Foothills and Mountains West

Accessed: 05/05/2024

## 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.

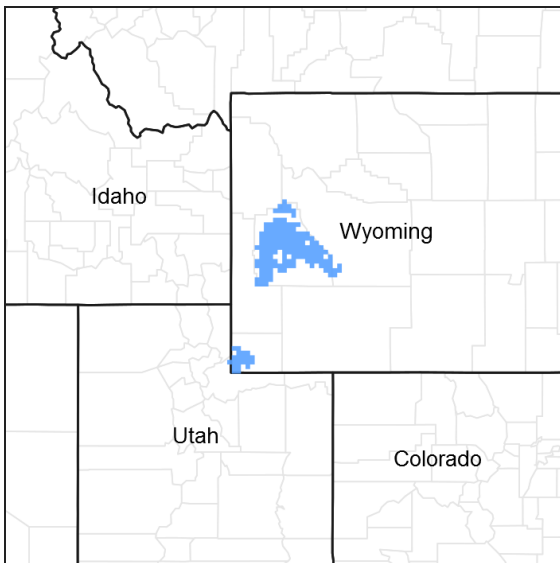


Figure 1. Mapped extent

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

R043BY206WY	<b>Clayey Overflow Foothills and Mountains West</b> Clayey Overflow
R043BY230WY	<b>Overflow Foothills and Mountains West</b> Overflow
R043BY242WY	<b>Saline Subirrigated Foothills and Mountains West</b> Saline Subirrigated
R043BY278WY	<b>Wetland Foothills and Mountains West</b> Wetland

## Similar sites

R043BY278WY	<b>Wetland Foothills and Mountains West</b> Wetland (WL) 15-19W has a higher water table and higher production.
R043BY274WY	<b>Subirrigated Foothills and Mountains West</b> Subirrigated (Sb) 10-14W has lower production.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

## Physiographic features

This site will usually occur on level to nearly level land along perennial or intermittent streams and near seeps, springs, and sloughs.

**Table 2. Representative physiographic features**

Landforms	(1) Alluvial fan (2) Stream terrace
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare to occasional
Ponding frequency	None
Elevation	1,707–2,530 m
Slope	1–10%
Ponding depth	0 cm
Water table depth	30–102 cm

## Climatic features

Annual precipitation ranges from 15-19 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.

Prevailing winds are from the southwest, and strong winds are less frequent than over other areas of Wyoming. Occasional storms, however, can bring brief periods of high winds with gusts exceeding 50 mph.

Growth of native cool season plants begins about May 15 and continues to about August 15.

The following information is from the “Jackson” climate station:

**Table 3. Representative climatic features**

Frost-free period (average)	60 days
Freeze-free period (average)	100 days
Precipitation total (average)	483 mm

## Influencing water features

Stream Type: C (Rosgen)

## Soil features

The soils of this site are moderately deep to very deep (greater than 20”to bedrock) with high organic matter

content and are affected by wetness. They have seasonal water tables about 1 to 3 feet below the surface for all of the growing season, but may have surface water from run-in for short periods. The water table is non-saline and non-alkaline. Soil textures range from moderately coarse to fine, but most commonly are medium and moderately fine. Mottling or gleying usually occurs within 20-40 inches of the surface.

**Table 4. Representative soil features**

Surface texture	(1) Gravelly loam (2) Cobbly clay loam (3) Loamy sand
Family particle size	(1) Loamy
Drainage class	Poorly drained to moderately well drained
Permeability class	Moderately slow to moderate
Soil depth	51–152 cm
Surface fragment cover <=3"	0–20%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	6.35–13.97 cm
Calcium carbonate equivalent (0-101.6cm)	0–40%
Electrical conductivity (0-101.6cm)	0–8 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.6
Subsurface fragment volume <=3" (Depth not specified)	0–30%
Subsurface fragment volume >3" (Depth not specified)	0–15%

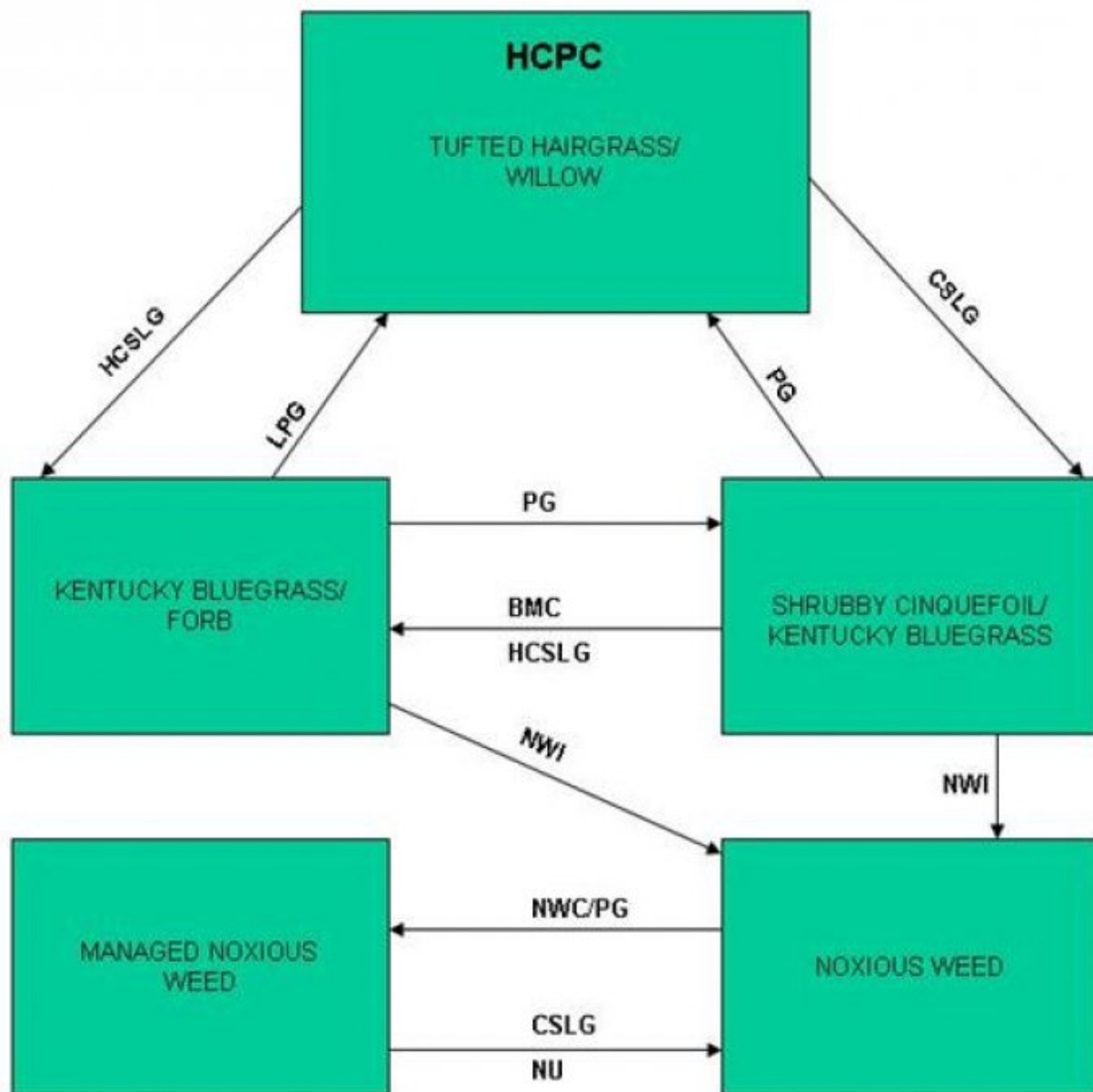
## Ecological dynamics

As this site deteriorates, species such as rhizomatous wheatgrass, shrubby cinquefoil, Rocky Mountain iris and other forbs, and Baltic rush increase. Species such as tufted hairgrass, Nebraska sedge, and basin wildrye will decrease in frequency and production. Willow stands will become decadent with a lack of diverse age classes as site declines. This site is vulnerable to noxious weed invasion by species such as Canada thistle.

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**  
**Tufted Hairgrass/Willow Plant Community (HCPC)**

**Community 1.1**  
**Tufted Hairgrass/Willow Plant Community (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 65% grasses or grass-like plants, 20% forbs and 15% woody plants. The major grasses and grass-like plants include tufted hairgrass, basin wildrye, Nebraska sedge, and rhizomatous wheatgrasses. Other grasses and grass-like species that may occur on this site include alpine timothy, Baltic rush, bearded wheatgrass, bentgrasses, big bluegrass, blue wildrye, Canby bluegrass, Columbia needlegrass, sedges, mountain and nodding brome, reedgrasses, slender wheatgrass, spike trisetum, and tall mannagrass. Woody plants are mainly willows and shrubby cinquefoil, but may also include chokecherry, wild rose, and water birch. A typical plant composition for this state consists of tufted hairgrass 35-45%, basin wildrye 5-10%, Nebraska sedge 20-30%, rhizomatous wheatgrass 5-10%, other grasses and grass-like plants 10-20%, perennial forbs 5-20%, willows 5-10%, and up to 10% other woody plants. Ground cover, by ocular estimate, varies from 85-100%. The total annual production (air-dry weight) of this state is about 4500 pounds per acre, but it can range from about 3500 lbs./acre in unfavorable years to about 5500 lbs./acre in above average years. The following is the growth curve of this plant community expected during a normal year: Growth curve number: WY0203 Growth curve name: 15-19W, FREE WATER SITES Growth curve description: WL, SB, SS FREE WATER SITES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 0 10 40 30 15 5 0 0 0 (Monthly percentages of total annual growth) The state is stable and well adapted to the Central Rocky Mountains climatic conditions. The diversity in plant species and the reliable water table, allow for high drought resistance. 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 Shrubby Cinquefoil/Kentucky Bluegrass State. • Heavy Continuous Season-long Grazing will convert this plant community to the Kentucky Bluegrass/Forb State.

Figure 4. Plant community growth curve (percent production by month). WY0203, 15-19W Free water sites - WL, Sb, SS.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	10	40	30	15	5	0	0	0

**State 2**  
**Managed Noxious Weed Plant Community**

**Community 2.1**  
**Managed Noxious Weed Plant Community**

This plant community is the result of noxious weed control and prescribed grazing. Grazing is used as a tool to control introduced and noxious weeds by selecting livestock type and timing use during the flowering of the identified weed such as Canada thistle. Other weed control efforts such as chemical, mechanical, or biological methods are employed in conjunction with a grazing management scheme. The native plant community responds to this management by increasing in production and vigor, however it is very sensitive to any management change that allows the seed production and increase of noxious weeds such as nonuse or overuse. Noxious weeds are still present, but in smaller amounts and may be isolated to exposed or bare ground areas such as sandbars along perennial streams. The total annual production (air-dry weight) of this state is about 4000 pounds per acre, but it can range from about 3000 lbs./acre in unfavorable years to about 5000 lbs./acre in above average years. The following is the growth curve of this plant community expected during a normal year: Growth curve number: WY0203 Growth curve name: 15-19W, FREE WATER SITES Growth curve description: WL, SB, SS FREE WATER SITES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 0 10 40 30 15 5 0 0 0 (Monthly percentages of total annual growth) Bare ground is minimal. The soil of this state is moderately protected. Degraded stream banks may still erode, but increased amounts of deep-rooting sedges provide adequate stability to the system. The biotic community has been compromised, but is relatively stable and at risk due to invasive plants. The watershed is functioning, but is at risk of degrading rapidly with the introduction of improper management techniques. Transitional pathways leading to other plant communities are as follows: • Nonuse OR

Continuous Season-long Grazing will convert this plant community to the Noxious Weed State.

**Figure 5. Plant community growth curve (percent production by month).**  
**WY0203, 15-19W Free water sites - WL, Sb, SS.**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	10	40	30	15	5	0	0	0

**State 3**  
**Shrubby Cinquefoil/Kentucky Bluegrass Plant Community**

**Community 3.1**  
**Shrubby Cinquefoil/Kentucky Bluegrass Plant Community**

This plant community is the result of frequent and severe grazing. Kentucky bluegrass and Baltic rush are the dominant species with other grasses including redtop, rhizomatous wheatgrass, and bearded wheatgrass. The site has dried due to downcutting associated with soil erosion from overgrazing. Common forbs include herbaceous cinquefoils, elephanthead, arrowgrass, and Rocky Mountain iris. Shrubby cinquefoil often dominates the landscape and produces more than 10-15% of the annual production on the site. Willow communities will lack a diversity of age classes. The total annual production (air-dry weight) of this state is about 3500 pounds per acre, but it can range from about 2500 lbs./acre in unfavorable years to about 4500 lbs./acre in above average years. The following is the growth curve of this plant community expected during a normal year: Growth curve number: WY0203 Growth curve name: 15-19W, FREE WATER SITES Growth curve description: WL, SB, SS FREE WATER SITES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 0 10 40 30 15 5 0 0 0 (Monthly percentages of total annual growth) The state is moderately stable and protected from excessive erosion. The biotic integrity of this plant community is intact. The watershed is 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 (Tufted Hairgrass/Willow State) although Kentucky bluegrass will remain a part of the plant community. • Continued Heavy Continuous Season-long Grazing and Brush Management will convert this plant community to the Kentucky Bluegrass/Forb State. • Noxious Weed Invasion will convert this plant community to the Noxious Weed State.

**Figure 6. Plant community growth curve (percent production by month).**  
**WY0203, 15-19W Free water sites - WL, Sb, SS.**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	10	40	30	15	5	0	0	0

**State 4**  
**Kentucky Bluegrass/Forb Plant Community**

**Community 4.1**  
**Kentucky Bluegrass/Forb Plant Community**

This plant community evolved under continuous heavy grazing pressure by domestic livestock. Kentucky bluegrass dominates as the site dries out. Shrubby cinquefoil remnants provide little protection for the herbaceous understory. American licorice and herbaceous cinquefoils are dominant forbs. Willows and other woody species are rare to nonexistent. The total annual production (air-dry weight) of this state is about 3000 pounds per acre, but it can range from about 2000 lbs./acre in unfavorable years to about 4000 lbs./acre in above average years. The following is the growth curve of this plant community expected during a normal year: Growth curve number: WY0203 Growth curve name: 15-19W, FREE WATER SITES Growth curve description: WL, SB, SS FREE WATER SITES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 0 10 40 30 15 5 0 0 0 (Monthly percentages of total annual growth) The state is unstable and vulnerable to excessive erosion. The biotic integrity of this plant community and watershed is nonfunctioning. Transitional pathways leading to other plant communities are as follows: • Prescribed Grazing will convert this plant community to the Shrubby Cinquefoil/Kentucky Bluegrass State. • Prescribed Grazing over the long term will result in a plant community very similar to the Historic Climax Plant Community (Tufted Hairgrass/Willow State). • Noxious Weed Invasion will convert this plant community to the Noxious Weed State.

Figure 7. Plant community growth curve (percent production by month). WY0203, 15-19W Free water sites - WL, Sb, SS.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	10	40	30	15	5	0	0	0

## State 5 Noxious Weed Plant Community

### Community 5.1 Noxious Weed Plant Community

This plant community is the result of long-term improper grazing use and subsequent downcutting of watercourses resulting in a lowered water table. Bare ground has allowed the invasion of noxious weeds such as musk and Canada thistle. The site has dried out, and most plants requiring additional moisture have disappeared. Rhizomatous wheatgrass and Kentucky bluegrass are dominant grasses. Rubber rabbitbrush, snowberry, and woods rose are the dominant woody plants. Willows may have disappeared although remnants may still exist. The total annual production (air-dry weight) of this state is about 2500 pounds per acre, but it can range from about 1500 lbs./acre in unfavorable years to about 3500 lbs./acre in above average years. The following is the growth curve of this plant community expected during a normal year: Growth curve number: WY0203 Growth curve name: 15-19W, FREE WATER SITES Growth curve description: WL, SB, SS FREE WATER SITES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 0 10 40 30 15 5 0 0 0 (Monthly percentages of total annual growth) Bare ground has increased. The soil of this state is not well protected. Degraded stream banks erode due to the lack of deep-rooted riparian plants. The watershed is nonfunctioning and usually produces excessive runoff. The biotic community is nonfunctioning due to invasive plants. Transitional pathways leading to other plant communities are as follows: • Noxious Weed Control in conjunction with Prescribed Grazing will convert this state to the Managed Noxious Weed State.

Figure 8. Plant community growth curve (percent production by month). WY0203, 15-19W Free water sites - WL, Sb, SS.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	10	40	30	15	5	0	0	0

## Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				1765–2270	
2				1009–1513	
	Nebraska sedge	CANE2	<i>Carex nebrascensis</i>	1009–1513	–
3				252–504	
	basin wildrye	LECI4	<i>Leymus cinereus</i>	280–504	–
4				252–504	
	bluejoint	CACA4	<i>Calamagrostis canadensis</i>	252–504	–
5				252–504	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	252–504	–
6				504–1009	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–252	–
	Columbia needlegrass	ACNE9	<i>Achnatherum nelsonii</i>	0–252	–
	bentgrass	AGROS2	<i>Agrostis</i>	0–252	–

	shortawn foxtail	ALAE	<i>Alopecurus aequalis</i>	0–252	–
	mountain brome	BRMA4	<i>Bromus marginatus</i>	0–252	–
	Porter brome	BRPO2	<i>Bromus porteri</i>	0–252	–
	water sedge	CAAQA	<i>Carex aquatilis</i> var. <i>aquatilis</i>	0–252	–
	inland sedge	CAIN11	<i>Carex interior</i>	0–252	–
	sedge	CAREX	<i>Carex</i>	0–252	–
	northern reedgrass	CASTI3	<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>	0–252	–
	spikerush	ELEOC	<i>Eleocharis</i>	0–252	–
	blue wildrye	ELGL	<i>Elymus glaucus</i>	0–252	–
	spreading wheatgrass	ELSC4	<i>Elymus scribneri</i>	0–252	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	0–252	–
	American mannagrass	GLGR	<i>Glyceria grandis</i>	0–252	–
	little barley	HOPU	<i>Hordeum pusillum</i>	0–252	–
	rush	JUNCU	<i>Juncus</i>	0–252	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	0–252	–
	alpine timothy	PHAL2	<i>Phleum alpinum</i>	0–252	–
	reed canarygrass	PHAR3	<i>Phalaris arundinacea</i>	0–252	–
	spike trisetum	TRSP2	<i>Trisetum spicatum</i>	0–252	–

### Forb

7				252–1009	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–252	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0–252	–
	arnica	ARNIC	<i>Arnica</i>	0–252	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–252	–
	fireweed	CHAN9	<i>Chamerion angustifolium</i>	0–252	–
	elk thistle	CIFO	<i>Cirsium foliosum</i>	0–252	–
	spotted water hemlock	CIMAA	<i>Cicuta maculata</i> var. <i>angustifolia</i>	0–252	–
	thistle	CIRSI	<i>Cirsium</i>	0–252	–
	shootingstar	DODEC	<i>Dodecatheon</i>	0–252	–
	horsetail	EQUIS	<i>Equisetum</i>	0–252	–
	aster	EUCEP2	<i>Eucephalus</i>	0–252	–
	yellow fritillary	FRPU2	<i>Fritillaria pudica</i>	0–252	–
	bedstraw	GALIU	<i>Galium</i>	0–252	–
	gentian	GENTI	<i>Gentiana</i>	0–252	–
	avens	GEUM	<i>Geum</i>	0–252	–
	American licorice	GLLE3	<i>Glycyrrhiza lepidota</i>	0–252	–
	common sneezeweed	HEAU	<i>Helenium autumnale</i>	0–252	–
	common cowparsnip	HEMA80	<i>Heracleum maximum</i>	0–252	–
	false goldenaster	HETER8	<i>Heterotheca</i>	0–252	–
	hawkweed	HIERA	<i>Hieracium</i>	0–252	–
	waterleaf	HYDRO4	<i>Hydrophyllum</i>	0–252	–
	rubberweed	HYMEN7	<i>Hymenoxys</i>	0–252	–
	Rocky Mountain iris	IRMI	<i>Iris missouriensis</i>	0–252	–



	flax	LINUM	<i>Linum</i>	0–252	–
	wild mint	MEAR4	<i>Mentha arvensis</i>	0–252	–
	bluebells	MERTE	<i>Mertensia</i>	0–252	–
	monkeyflower	MIMUL	<i>Mimulus</i>	0–252	–
	ragwort	PACKE	<i>Packera</i>	0–252	–
	elephanthead lousewort	PEGR2	<i>Pedicularis groenlandica</i>	0–252	–
	American bistort	POBI6	<i>Polygonum bistortoides</i>	0–252	–
	cinquefoil	POTEN	<i>Potentilla</i>	0–252	–
	buttercup	RANUN	<i>Ranunculus</i>	0–252	–
	ragwort	SENEC	<i>Senecio</i>	0–252	–
	blue-eyed grass	SISYR	<i>Sisyrinchium</i>	0–252	–
	goldenrod	SOLID	<i>Solidago</i>	0–252	–
	goldenbanner	THERM	<i>Thermopsis</i>	0–252	–
	clover	TRIFO	<i>Trifolium</i>	0–252	–
	arrowgrass	TRIGL	<i>Triglochin</i>	0–252	–
	stinging nettle	URDI	<i>Urtica dioica</i>	0–252	–
	violet	VIOLA	<i>Viola</i>	0–252	–
<b>Shrub/Vine</b>					
8				252–504	
	willow	SALIX	<i>Salix</i>	252–504	–
9				50–504	
	water birch	BEOC2	<i>Betula occidentalis</i>	0–252	–
	dogwood	CORNU	<i>Cornus</i>	0–252	–
	quaking aspen	POTR5	<i>Populus tremuloides</i>	0–252	–
	chokecherry	PRVI	<i>Prunus virginiana</i>	0–252	–
	currant	RIBES	<i>Ribes</i>	0–252	–
	Woods' rose	ROWOW	<i>Rosa woodsii var. woodsii</i>	0–252	–

## Animal community

### Animal Community – Wildlife Interpretations

Tufted Hairgrass/Willow Plant Community (HCPC): This plant community is very important for most wildlife in the area. Over 80% of all wildlife use this site to fulfill some part of their habitat needs. It provides forage and thermal and hiding cover for mule deer and moose. 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, neo-tropical migrants, and golden eagles.

Managed Noxious Weed 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 due to enhanced insect populations.

Shrubby Cinquefoil/Kentucky Bluegrass Plant Community: This plant community may be useful for the same large grazers 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.

**Kentucky Bluegrass/Forb Plant Community:** This plant community may be beneficial for some of the same wildlife that would use the Historic Climax Plant Community. However, the woody component is typically less productive and unable to support large browsers such as moose. As woody plants decrease, structural diversity is lost for neotropical migrants, cover decreased for deer and elk, and nesting for shrub-nesting birds is impacted. It may provide some brood rearing and foraging opportunities for sage grouse when it occurs proximal to woody cover.

**Noxious Weed Plant Community:** This plant community is much less diverse, and thus, less able to meet the habitat needs of many wildlife. Herbaceous forage and cover is not as dense and will aid in successful predation of nesting birds, therefore improving habitat for predators such as raptors, red fox, and coyote. It may provide some brood rearing and foraging opportunities for sage grouse when it occurs proximal to woody cover.

#### 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. If distribution problems occur, stocking rates must be reduced to maintain plant health and vigor.

#### Plant Community Production Carrying Capacity\*

(lb./ac) (AUM/ac)

Tufted Hairgrass/Willow (HCPC) 3500-5500 1.7

Managed Noxious Weed 3000-5000 1.3

Shrubby Cinquefoil/Kentucky Bluegrass 2500-4500 1.1

Kentucky Bluegrass/Forb 2000-4000 .9

Noxious Weed 1500-3500 .8

\* - 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

Climate is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group C. Infiltration rate is slow when soils are thoroughly wet. These soils have a slow rate of water transmission due to moderately fine to fine textures and/or high water table conditions. However, high forage production on this site diminishes runoff potential as long as site is managed for maintaining adequate residual vegetation. (Refer to Part 630, NRCS National Engineering Handbook for detailed hydraulic information).

Rills and gullies should not typically be present. Water flow patterns may be present if associated with a perennial flowing stream. Litter typically falls in place, and signs of movement are not common unless associated with a perennial flowing stream. Chemical and physical crusts are rare to non-existent.

### Recreational uses

This site provides a variety of hunting opportunities as well 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. Those areas with high precipitation have a fair potential for snowmobiling.

## Wood products

No appreciable wood products are present on the site.

## Inventory data references

Inventory Data References (narrative)

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.

Inventory Data References

Data Source Number of Records Sample Period State County

SCS-RANGE-417 58 1966-1986 WY Lincoln & others

## Contributors

K. 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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Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

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

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2. **Presence of water flow patterns:** Water flow patterns sometimes evident in floodplain zone where this site occurs.

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

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is typically less than 5%.

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5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** Minimal to nonexistent.
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7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter exhibits slight movement only associated with water flow patterns.
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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil Stability Index ratings typically 6.0.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Typically an A-horizon of 5 to 20 inches (13-50 cm) with weak to moderate granular, platy, or subangular blocky structure and color hues of 7.5 YR or 10YR, values of 4-5, and a chroma of 1-3. Soil OM typically ranges from 3-6%.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 60-70% grasses, 20% forbs, and 10-20% shrubs. Dense plant canopy (75-100%) and litter, despite slow to moderate infiltration rates, results in no runoff on this site until soils are saturated. Basal cover is typically 10-20% for this site and effectively reduces runoff on this site.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction layer exists.
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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**
- Dominant:
- Sub-dominant:
- Other:
- Additional: mid-size, cool season bunchgrasses>> perennial forbs=perennial shrubs>rhizomatous grass-likes=tall, cool season bunchgrasses=cool season rhizomatous grasses
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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.
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14. **Average percent litter cover (%) and depth ( in):** Litter ranges from 0-25% of total canopy measurement with total

litter (including beneath the plant canopy) from 75-100% expected. Herbaceous litter depth typically ranges from 15-30 mm. Woody litter can be up to a couple inches (4-6cm).

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** English: 3500-5500 lb/ac (4500 lb/ac average); Metric: 3920-6160 kg/ha (5040 kg/ha average).
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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 15% and presence of noxious weeds or Kentucky bluegrass are the most common indicators of a threshold being crossed. Baltic rush, slim sedge, herbaceous cinquefoil, Rocky Mountain iris, and shrubby cinquefoil are common increasers. Kentucky bluegrass, common dandelion, and Canada thistle are common invasive species.
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17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.
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