

# Ecological site R049XA178WY Wetland (Foothills and Mountains Southeast)

Accessed: 04/18/2024

## 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.

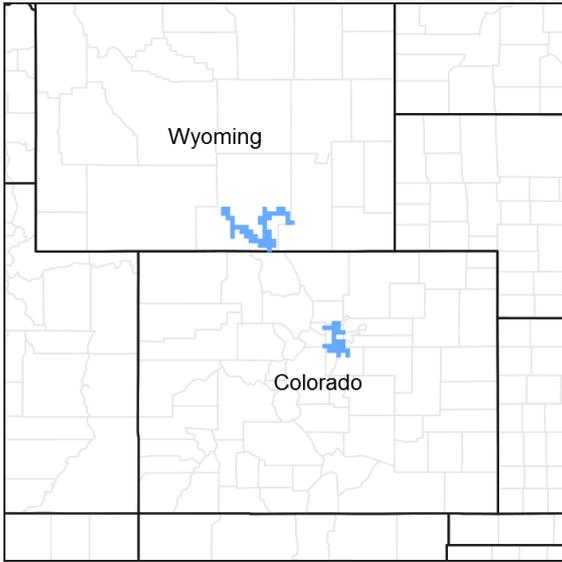


Figure 1. Mapped extent

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

R049XA126WY	<b>Loamy Overflow (Foothills and Mountains Southeast)</b> Loamy Overflow
R049XA174WY	<b>Subirrigated (Foothills and Mountains Southeast)</b> Subirrigated

## Similar sites

R049XA174WY	<b>Subirrigated (Foothills and Mountains Southeast)</b> Subirrigated, R049XA174WY is less productive
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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 bottomlands near springs, seeps and sloughs.

**Table 2. Representative physiographic features**

Landforms	(1) Drainageway (2) Oxbow (3) Stream terrace
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional to frequent
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	Frequent
Elevation	6,500–8,500 ft
Slope	0–6%
Ponding depth	0–12 in
Water table depth	0–18 in
Aspect	Aspect is not a significant factor

### 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 1 and continues to about August 1.

The following information is from the “Hecla 1E” climate station:

Minimum Maximum 5 yrs. out of 10 between  
 Frost-free period (days): 93 151 May 20 – September 14  
 Freeze-free period (days): 106 184 May 9 – September 26  
 Annual Precipitation (inches): 9.56 24.23

Mean annual precipitation: 16.04 inches

Mean annual air temperature: 44.7F (32.1F Avg. Min. to 57.2F Avg. Max.)

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/> website. Other climate station(s) representative of this precipitation zone include “Glenrock 14 SSE”, “Foxpark” and “Horse Creek 2 NW”.

**Table 3. Representative climatic features**

Frost-free period (average)	151 days
Freeze-free period (average)	184 days
Precipitation total (average)	19 in

## Influencing water features

Stream Type: C (Rosgen)

## Soil features

This site consists of deep to very deep poorly drained soils formed in alluvium with a water table above the surface for part but not all of the growing season. They are on nearly level to slightly depressed areas with poor surface drainage. In some places the surface layers have high organic matter content. Layers of the soil most influential to the plant community vary from 3 to 6 inches thick.

Major Soil Series correlated to this site include:

Other Soil Series correlated to this site include:

**Table 4. Representative soil features**

Surface texture	(1) Mucky clay (2) Clay loam (3) Loam
Family particle size	(1) Loamy
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Slow to moderate
Soil depth	20–60 in
Surface fragment cover ≤3"	0%
Surface fragment cover >3"	0%
Available water capacity (0–40in)	2.2–6.6 in
Calcium carbonate equivalent (0–40in)	0–5%
Electrical conductivity (0–40in)	0–4 mmhos/cm
Sodium adsorption ratio (0–40in)	0–5
Soil reaction (1:1 water) (0–40in)	6.6–7.8
Subsurface fragment volume ≤3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

## Ecological dynamics

As this site deteriorates, species such as spike sedge and Baltic rush increase. Grasses and grasslikes such as Nebraska sedge, tufted hairgrass, slough sedge, and northern and bluejoint reedgrass will decrease in frequency and production

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.

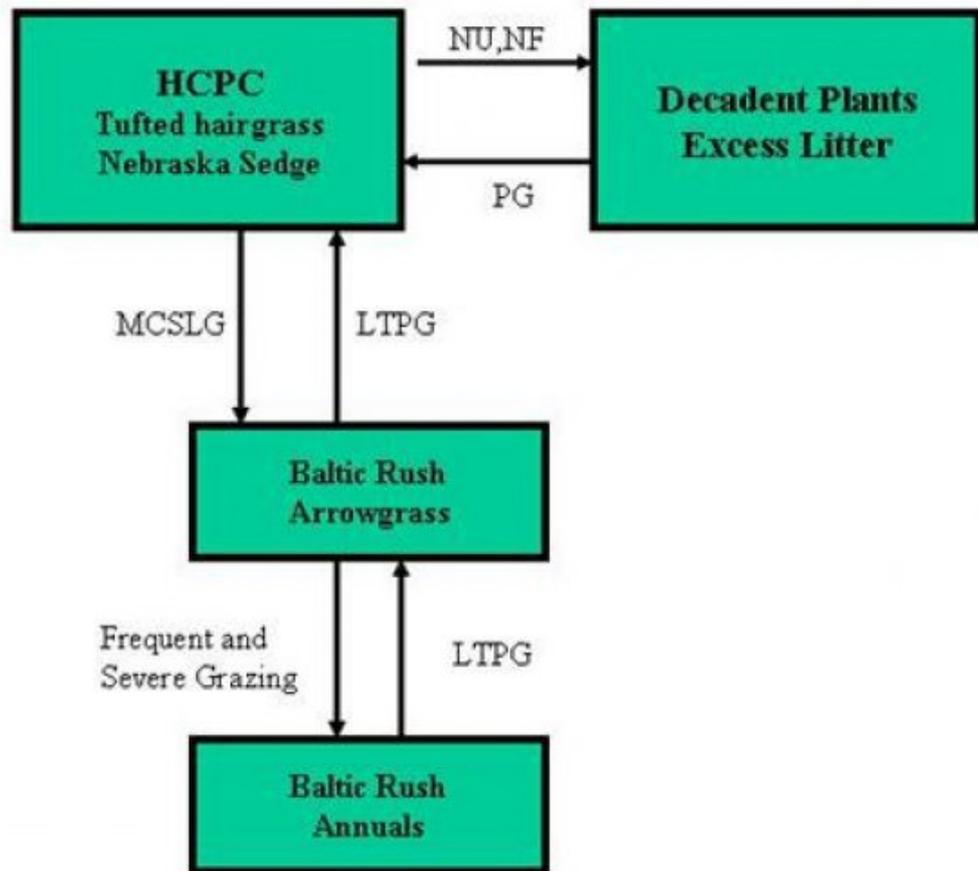
The following is a State and Transition Model Diagram that illustrates the common plant communities (states) that

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**

Site Type: Rangeland  
MLRA: 49XA - Southern Rocky Mountain Foothills, northern part

Wetland 15-19" P.Z.  
R049XA178WY



**Freq. & Severe Grazing** - Frequent and Severe Utilization of the Cool-season Mid-grasses/grasslikes during the Growing Season

**LTPG** - Long-term Prescribed Grazing (proper stocking rates with adequate recovery periods during the growing season)

**MCSLG** - Moderate, Continuous Season-long Grazing

**NU,NF** - No Use and No Fire

**PG** - Prescribed Grazing (proper stocking rates with adequate recovery periods during the growing season)

## State 1

### Tufted hairgrass, Nebraska sedge Community

#### Community 1.1

##### Tufted hairgrass, Nebraska sedge Community

The interpretive plant community for this site is the Historic Climax Plant Community. This state evolved with grazing by large herbivores and is well suited for grazing by domestic livestock. Potential vegetation is about 75% grasses or grass-like plants, 10% forbs and 15% woody plants. The major grasses/grass-likes include Nebraska sedge, slough sedge, northern and bluejoint reedgrass, and tufted hairgrass. Grasses/grass-likes of lesser importance are Baltic rush and spike sedge. The total annual production (air-dry weight) of this state is about 5500 pounds per acre, but it can range from about 4000 lbs./acre in unfavorable years to about 6500 lbs./acre in above average years. The following is the growth curve of this plant community expected during a normal year: Growth curve number: Growth curve name: Growth curve description: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 0 15 30 35 10 5 5 0 0 (Monthly percentages of total annual growth) The state is well adapted to the climatic conditions. It is a critical state providing water and habitat for the surrounding area. The diversity in plant species provides a variety of habitats for wildlife. 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: • Moderate, continuous season-long grazing will convert this plant community to the Baltic rush/Arrowgrass Vegetation State. • Frequent and Severe grazing will convert this plant community to the Baltic rush/Annuals Vegetation State. • No Use and No Fire will convert this plant community to the Decadent Plants, Excess Litter Plant Community.

Figure 3. Plant community growth curve (percent production by month). WY1003, 15-19SE free water sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	10	20	30	25	10	0	0	0

## State 2

### Baltic rush, Arrowgrass Plant Community

#### Community 2.1

##### Baltic rush, Arrowgrass Plant Community

This plant community evolved under moderate grazing by domestic livestock. Dominant grasses include spike sedge and Baltic rush. Willows are present near the dryer edges of this state. When compared to the Historical Climax Plant Community, slough sedge, northern and bluejoint reedgrass, Nebraska sedge, and tufted hairgrass have decreased. Spike sedge and Baltic rush have increased. The abundant production and proximity to water make this state important for livestock and wildlife such as birds, mule deer, and antelope. 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 expected during a normal year: Growth curve number: Growth curve name: Growth curve description: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 0 15 30 35 10 5 5 0 0 (Monthly percentages of total annual growth) The state is stable and protected from excessive erosion. The biotic integrity of this plant community is usually intact. The watershed is usually functioning. Transitional pathways leading to other plant communities are as follows: • Prescribed grazing over the long-term will result in a plant community very similar to the Historic Climax Plant Community. • Frequent and Severe grazing will convert this plant community to the Baltic rush/Annuals Vegetation State.

Figure 4. Plant community growth curve (percent production by month). WY1003, 15-19SE free water sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	10	20	30	25	10	0	0	0

## State 3

## Baltic rush, Annuals Plant Community

### Community 3.1

#### Baltic rush, Annuals Plant Community

This plant community is the result of long-term improper grazing use. Baltic rush and annuals dominate this state. The total annual production (air-dry weight) of this state is about 1800 pounds per acre, but it can range from about 1200 lbs./acre in unfavorable years to about 2500 lbs./acre in above average years. The following is the growth curve expected during an average year. Growth curve number: Growth curve name: Growth curve description: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 0 20 35 25 10 5 5 0 0 (Monthly percentages of total annual growth) Bare ground has increased. The soil of this state is not well protected. Degraded stream banks may erode. The watershed is functioning but may produce excessive runoff. The biotic community is at risk due to invasive plants. Transitional pathways leading to other plant communities are as follows: • Prescribed Grazing over the long-term will return this state to near Historic Climax Plant Community.

Figure 5. Plant community growth curve (percent production by month). WY1003, 15-19SE free water sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	10	20	30	25	10	0	0	0

## State 4

### Decadent Plants, Excess Litter Plant Community

#### Community 4.1

#### Decadent Plants, Excess Litter Plant Community

This plant community developed under the absence of grazing and fire. Excessive litter is shading out plants. This inhibits photosynthesis and reduces soils temperatures, delaying green-up in the spring. Plants become decadent and exhibit low vigor. Bunch grasses often develop dead centers. Organic matter oxidizes in the air rather than being incorporated into the soil. The dominant plants tend to be somewhat similar to those found in the Historic Climax Plant Community. Weedy species, cool-season grasses, and sedges have increased. Noxious weeds may invade if a seed source is present. Plant diversity is moderate to high. The total annual production (air-dry weight) is about 5000 pounds per acre during an average year, but it can range from about 4500 pounds per acre in unfavorable years to about 5500 pounds per acre in above average years. The following is the growth curve expected during an average year. Growth curve number: Growth curve name: Growth curve description: JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC 0 0 0 0 10 30 35 15 5 5 0 0 (monthly percentages of total annual growth) This plant community is not resistant to change. The introduction of grazing quickly changes the plant community. It is somewhat more vulnerable to severe disturbance than the HCPC. Bare ground has increased. The soil is not well protected. The watershed is functioning but may produce excessive runoff. The biotic community is at risk due to invasive plants. Transitions or pathways leading to other plant communities are as follows: • Prescribed Grazing over the long-term will return this plant community to near Historic Climax Plant Community.

Figure 6. Plant community growth curve (percent production by month). WY1003, 15-19SE free water sites.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	5	10	20	30	25	10	0	0	0

## Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				3025–4125	
	Nebraska sedge	CANE2	<i>Carex nebrascensis</i>	550–1375	–
	wheat sedge	CAAT2	<i>Carex atherodes</i>	275–550	–
2				275–825	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–275	–
	golden sedge	CAAU3	<i>Carex aurea</i>	0–275	–
	bluejoint	CACA4	<i>Calamagrostis canadensis</i>	0–275	–
	spike sedge	CANA2	<i>Carex nardina</i>	0–275	–
	slimstem reedgrass	CAST36	<i>Calamagrostis stricta</i>	0–275	–
<b>Forb</b>					
3				275–550	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–275	–
	textile onion	ALTE	<i>Allium textile</i>	0–275	–
	water hemlock	CICUT	<i>Cicuta</i>	0–275	–
	horsetail	EQUIS	<i>Equisetum</i>	0–275	–
	waterleaf	HYDRO4	<i>Hydrophyllum</i>	0–275	–
	iris	IRIS	<i>Iris</i>	0–275	–
	cinquefoil	POTEN	<i>Potentilla</i>	0–275	–
	blue-eyed grass	SISYR	<i>Sisyrinchium</i>	0–275	–
	arrowgrass	TRIGL	<i>Triglochin</i>	0–275	–
<b>Shrub/Vine</b>					
4				275–1650	
	willow	SALIX	<i>Salix</i>	55–825	–
	water birch	BEOC2	<i>Betula occidentalis</i>	55–550	–
	alpine laurel	KAMI	<i>Kalmia microphylla</i>	55–550	–

## Animal community

### Animal Community – Wildlife Interpretations

Tufted hairgrass, Nebraska sedge Community: The predominance of grasses in this plant community favors grazers and mixed-feeders, such as bison, elk, and antelope. Suitable thermal and escape cover for deer may be limited due to the low quantities of woody plants. Birds that would frequent this plant community include red-wing blackbirds, sandhill cranes, Wilson snipe, western meadowlarks, and golden eagles. Many small mammals would occur here.

Baltic rush/Arrowgrass 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. Good grasshopper habitat equals good foraging for birds.

Baltic rush/Annuals 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. Good grasshopper habitat equals good foraging for birds.

Decadent Plants, Excess Litter 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. Good grasshopper habitat equals good foraging for

birds.

## 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, Nebraska sedge 5500 3.0

Baltic rush/Arrowgrass 3000 2.0

Baltic rush/Annuals 1800 1.0

Decadent Plants, Excess Litter 5000 2.5

\* - 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 B and C, with localized areas in hydrologic group D. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group and water table. Runoff will be high on this site since the soil may be saturated. (Refer to Part 630, NRCS National Engineering Handbook for detailed hydraulic information.

Rills and gullies should not typically be present. Water flow patterns should be barely distinguishable if at all present. 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 1-2% of the soil surface.

## Recreational uses

This site provides hunting opportunities for upland game species. The wide variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

## Wood products

No appreciable wood products are present on the site.

## Other products

None noted.

## 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 was also used.

Inventory Data References

Data Source Number of Records Sample Period State County  
SCS-RANGE-417 24 1963 -1987 WY Albany & others

## Other references

Other sources used as references include: High Plains Regional Climate Center, USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

## 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	03/01/2005
Approved by	E. Bainter
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** Rills should not be present

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

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3. **Number and height of erosional pedestals or terracettes:** Essentially non-existent

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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 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:** None

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7. **Amount of litter movement (describe size and distance expected to travel):** Little to no plant litter movement. Plant litter remains in place and is not moved by erosional forces.
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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):** Plant cover and litter is at 95% or greater of soil surface and maintains soil surface integrity. Soil Stability class is anticipated to be 5 or greater.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Use Soil Series description for depth and color of A-horizon
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Grass canopy and basal cover should reduce raindrop impact and slow overland flow providing increased time for infiltration to occur. Healthy deep rooted native grasses enhance infiltration and reduce runoff. Infiltration varies from moderate to low and runoff is high since the soil is usually saturated.
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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 or soil surface crusting should be present.
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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: Cool Season Mid stature Grasses > Tall and Mid Stature Grasslike > Forbs > Shrubs/Trees
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very Low
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14. **Average percent litter cover (%) and depth ( in):** Average litter cover is 50-55% with depths of 0.75 to 1.5 inches
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 5500 lbs/ac
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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: Baltic Rush, Arrowgrass and Species found on Noxious Weed List**

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17. **Perennial plant reproductive capability:** All species are capable of reproducing

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