

# Ecological site R053BY025ND Shallow Marsh

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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.

#### **Classification relationships**

Level IV Ecoregions of the Conterminous United States: 42a – Missouri Coteau; 42b – Collapsed Glacial Outwash; 42c – Missouri Coteau Slope; 42d – Northern Missouri Coteau; 42f – Southern Missouri Coteau Slope; 42g – Ponca Plains; and 42h – Southern River Breaks.

#### **Associated sites**

R053BY005ND	Loamy Overflow
R053BY006ND	Saline Lowland
R053BY012ND	Subirrigated
R053BY018ND	Linear Meadow

#### **Similar sites**

R053BY018ND	Linear Meadow
	[Very poorly drained soils, redoximorphic features within 6 inches or just below organic soil layer, found in
	depressions or along streams where water ponds for more than a week. Found down slope of Wet
	Meadow site and can be in micro low positions within the listed associated sites. Similar species, but less
	slough sedge, less whitetop and more prairie cordgrass, and higher production.]

R053BY019ND	Wet Meadow
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[Poorly drained soils adjacent to streams or in depressions, with water table at or within 1.5 feet of the surface, no evidence of salts, redoximorphic features within 6 inches or just below the organic soil layer. Found downslope of Subirrigated or Loamy Overflow sites; can be located within associated sites. More prairie cordgrass, no whitetop or slough sedge, less production.]

#### Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	<ul><li>(1) Scolochloa festucacea</li><li>(2) Carex atherodes</li></ul>

# **Physiographic features**

This site occurs on level to nearly level, or concave low lying positions.

Landforms	<ul><li>(1) Depression</li><li>(2) Drainageway</li><li>(3) Swale</li></ul>
Flooding frequency	None
Ponding duration	Brief (2 to 7 days) to long (7 to 30 days)
Ponding frequency	Occasional to frequent
Elevation	1,600–2,000 ft
Slope	0–1%
Ponding depth	0–12 in
Water table depth	0–6 in
Aspect	Aspect is not a significant factor

#### Table 2. Representative physiographic features

# **Climatic features**

MLRA 53B is considered to have a continental climate – cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperature are characteristic. The climate is the result of this MLRA's location in the geographic center of North America. There are few natural barriers on the northern Great Plains. The air masses move unobstructed across the plains and account for rapid changes in temperature.

Annual precipitation ranges from 15 to 20 inches per year. The normal average annual temperature is about 41° F. January is the coldest month with average temperatures ranging from about 4° F (Powers Lake, ND) to about 10° F (Pollock, SD). July is the warmest month with temperatures averaging from about 67° F (Powers Lake, ND) to about 72° F (Pollock, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 62° F. This large annual range attests to the continental nature of this MLRA's climate. Winds average about 11 miles per hour annually, ranging from about 13 miles per hour during the spring to about 10 miles per hour during the summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 50 miles per hour.

Growth of native cool-season plants begins in late March and continues to early to mid July. Native warm-season plants begin growth in mid May and continue to the end of August. Green up of cool-season plants can occur in September and October when adequate soil moisture is present.

#### Table 3. Representative climatic features

Frost-free period (average)	135 days
Freeze-free period (average)	156 days
Precipitation total (average)	20 in

### Influencing water features

Sub-class:

Permanently or Semipermanently or Seasonally Flooded or Saturated

#### **Soil features**

The common features of soils in this site are the silt clay loam to silty clay-textured subsoil and slopes of 0 to 1 percent. The soils in this site are poorly to very poorly drained and formed in glacial drift. The silt clay loam surface layer is 6 to 22 inches thick. The soils have a slow infiltration rate. This site should show no evidence of rills, wind scoured areas or pedestalled plants. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

These soils are not susceptible to water erosion. Ponded water conditions and slow permeability strongly influences the soil-water-plant relationship.

Major soil series correlated to this ecological site can be found in Section II of the Natural Resources Conservation Service Field Office Technical Guide or the following web sites: http://www.nrcs.usda.gov/technical/efotg/

Surface texture	(1) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Poorly drained
Permeability class	Slow
Soil depth	80 in
Surface fragment cover <=3"	0–5%
Surface fragment cover >3"	0–5%
Available water capacity (0-40in)	6–7 in
Calcium carbonate equivalent (0-40in)	0–20%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0–1
Soil reaction (1:1 water) (0-40in)	6.1–8.4
Subsurface fragment volume <=3" (Depth not specified)	0–10%
Subsurface fragment volume >3" (Depth not specified)	0–5%

#### Table 4. Representative soil features

# **Ecological dynamics**

The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores, occasional fire and yearly flooding events. Changes will occur in the plant communities due to management actions and/or climatic conditions. Due to the nature of the soils, the site is considered highly variable but very stable. Under continued adverse impacts, a slow decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can rapidly recover to the Historic Climax Plant Community (HCPC). High variability of ponding levels and duration is the major cause of the fluctuating plant community. However, management can greatly influence the plant community dynamics during extended drought periods.

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community under normal precipitation periods. The HCPC has been determined by study of rangeland relic areas, areas protected from excessive disturbance, and areas under long-term rotational grazing regimes. Trends in plant community dynamics ranging from heavily grazed to lightly grazed areas, seasonal use pastures, and historical accounts also have been used.

Continuous grazing without adequate recovery opportunities between grazing events over several years will cause this site to depart from the HCPC. Species such as reed canarygrass, spikerush and Baltic rush will increase in frequency and density. Non-use (rest) and lack of fire will cause litter levels and plant decadence/mortality to increase. Cattails are greatly influenced by the fluctuating water regime.

The following is a diagram that illustrates the common plant communities that can occur on the site and the transition pathways between communities. The ecological processes will be discussed in more detail in the plant community descriptions following the diagram.

# State and transition model



**CSG** – Continuous seasonal grazing; **HCG** – Heavy continuous grazing; **HCPC** – Historic Climax Plant Community; **Inundation** – Long-term inundation; **LTPG** – Long-term prescribed grazing; **PG** – Prescribed grazing with adequate recovery opportunity; **RS** – Range seeding with prescribed grazing; **WR** – Wetland restoration.

# State 1 Whitetop/Slough Sedge (HCPC)

# Community 1.1 Whitetop/Slough Sedge (HCPC)

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This plant community evolved with grazing by large herbivores, infrequent wild fires and periodic flooding events and is suited for grazing by domestic livestock. This plant community can be found on areas that are grazed and where the grazed plants receive adequate periods of rest during the growing season in order to recover. Historically, fires occurred infrequently. The potential vegetation is about 55% grasses, 30% grass-likes, and 15% forbs. The major grasses and grass-likes include whitetop, slough sedge, woolly sedge, American mannagrass, prairie cordgrass, Sartwell's sedge, Nebraska sedge and spikerush. Key forbs include smartweeds, western dock and white panicle aster. The plant community is well adapted to the Northern Great Plains climatic conditions. It is a critical plant community, 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 (soil stability, watershed function, and biologic integrity).

#### Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	3900	4160	4400
Shrub/Vine	1200	1600	2000
Forb	300	640	1000
Total	5400	6400	7400

Figure 5. Plant community growth curve (percent production by month). ND5307, Missouri Coteau, cool-season dominant, warm-season sub-dominant. Cool-season dominant, warm-season sub-dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	2	7	36	35	10	3	6	1	0	0

# State 2 Slough Sedge/Spikerush

# Community 2.1 Slough Sedge/Spikerush

This plant community will slowly develop from the adverse effects of continuous grazing, without adequate recovery periods between each grazing event during the growing season. When compared to the Historical Climax Plant Community, whitetop, prairie cordgrass, American mannagrass and reedgrasses have decreased. The grass-like species, such as slough sedge, spikerush, woolly sedge, Sartwell's sedge, Nebraska sedge and rushes have increased, and tend to dominate this plant community. The abundant production and proximity to water make this plant community important for livestock and wildlife such as birds, mule deer, and antelope. The plant community is stable and protected from excessive erosion. The biotic integrity of this plant community is usually intact. The watershed is usually functioning.

#### Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Shrub/Vine	2700	3025	3400
Grass/Grasslike	1550	1925	2200
Forb	250	550	900
Total	4500	5500	6500

Figure 7. Plant community growth curve (percent production by month). ND5306, Missouri Coteau, lowland cool-season dominant.. Cool-season dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	37	35	5	2	8	0	0	0

# State 3 Spikerush/Baltic Rush/Fowl Bluegrass/Forbs

# Community 3.1 Spikerush/Baltic Rush/Fowl Bluegrass/Forbs

This plant community developed with heavy continuous grazing without adequate recovery periods between grazing events and/or inundation during periods of extended above-average precipitation. Spikerush, Baltic rush, bulrush and other less desirable grass-likes, along with grasses such as fowl bluegrass and American sloughgrass dominate the community. Quackgrass, creeping meadow foxtail, Kentucky bluegrass and other non-native species can invade on drier portions of the community. Whitetop, slough sedge, other sedges, prairie cordgrass, and reedgrasses will be virtually eliminated the plant community. Smartweeds, dock and cinquefoil have increased. Areas of bare ground can be present throughout the site. A significant amount of production and diversity has been lost when compared to the HCPC. Loss or reduction of native grasses, grass-likes and forbs has negatively impacted energy flow and nutrient cycling. It will take a long time to restore this plant community back to the HCPC with improved management or return of more normal precipitation patterns.

#### **Representative Value** High Low Plant Type (Lb/Acre) (Lb/Acre) (Lb/Acre) Shrub/Vine 1200 1440 1800 1400 Grass/Grasslike 700 1200 Forb 300 1000 560 Total 2200 3200 4200

#### Table 7. Annual production by plant type

Figure 9. Plant community growth curve (percent production by month). ND5306, Missouri Coteau, lowland cool-season dominant.. Cool-season dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	10	37	35	5	2	8	0	0	0

# Additional community tables

Table 8. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass	/Grasslike		I	1 1	
1	Cool-Season Tall Grasse	s		1280–1920	
	common rivergrass	SCFE	Scolochloa festucacea	960–1920	_
	American mannagrass	GLGR	Glyceria grandis	320–640	_
2	Warm-Season Tall Grass	es	L.	320–640	
	prairie cordgrass	SPPE	Spartina pectinata	320–640	-
3	Reedgrasses			0–320	
	bluejoint	CACA4	Calamagrostis canadensis	0–320	
	plains reedgrass	CAMO	Calamagrostis montanensis	0–320	
	northern reedgrass	CASTI3	Calamagrostis stricta ssp. inexpansa	0–320	
	slimstem reedgrass	CASTS5	Calamagrostis stricta ssp. stricta	0–320	
4	Other Native Grasses			320–640	
	Grass, perennial	2GP	Grass, perennial	320–640	_
	American sloughgrass	BESY	Beckmannia syzigachne	320–640	_
6	Grass-Likes			1280–1920	
	wheat sedge	CAAT2	Carex atherodes	960–1920	_
	Nebraska sedge	CANE2	Carex nebrascensis	0–640	
	woolly sedge	CAPE42	Carex pellita	0–640	
	Sartwell's sedge	CASA8	Carex sartwellii	0–640	
	spikerush	ELEOC	Eleocharis	320–640	
	Grass-like (not a true grass)	2GL	Grass-like (not a true grass)	0–640	
	chairmaker's bulrush	SCAM6	Schoenoplectus americanus	128–512	-
	rush	JUNCU	Juncus	0–320	_
	flatsedge	CYPER	Cyperus	0–320	
Forb	Forb				
7	Forbs			320–960	
	knotweed	POLYG4	Polygonum	128–640	_
	northern water plantain	ALTR7	Alisma triviale	128–512	
	white panicle aster	SYLA6	Symphyotrichum lanceolatum	128–512	_
	broadleaf cattail	TYLA	Typha latifolia	0–320	_
	Forb, perennial	2FP	Forb, perennial	0–320	_
	western dock	RUAQ	Rumex aquaticus	0–320	_
	hemlock waterparsnip	SISU2	Sium suave	0–192	_
	cinquefoil	POTEN	Potentilla	0–192	_
	Macoun's buttercup	RAMA2	Ranunculus macounii	64–192	
	Forb, annual	2FA	Forb, annual	0–192	_
	dogbane	APOCY	Apocynum	0–192	-
	bur-reed	SPARG	Sparganium	0–192	
	Canadian anemone	ANCA8	Anemone canadensis	0–128	
	blue-eyed grass	SISYR	Sisyrinchium	0–128	

#### Table 9. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass	;/Grasslike		·		
1	Cool-Season Tall Grasse	es		0–440	
	common rivergrass	SCFE	Scolochloa festucacea	0–275	
	American mannagrass	GLGR	Glyceria grandis	0–165	
2	Warm-Season Tall Grass	Ses		0–275	
	prairie cordgrass	SPPE	Spartina pectinata	0–275	
3	Reedgrasses	-		0–110	
	northern reedgrass	CASTI3	Calamagrostis stricta ssp. inexpansa	0–110	_
	slimstem reedgrass	CASTS5	Calamagrostis stricta ssp. stricta	0–110	
4	Other Native Grasses			55–275	
	Grass, perennial	2GP	Grass, perennial	0–275	
	American sloughgrass	BESY	Beckmannia syzigachne	0–275	
	foxtail barley	HOJU	Hordeum jubatum	55–275	
5	Non-Native Grasses	_		55–275	
	American sloughgrass	BESY	Beckmannia syzigachne	0–275	
	foxtail barley	HOJU	Hordeum jubatum	55–275	
6	Grass-Likes			2750–3300	
	wheat sedge	CAAT2	Carex atherodes	1100–2200	
	spikerush	ELEOC	Eleocharis	825–1650	
	woolly sedge	CAPE42	Carex pellita	275–825	_
	Sartwell's sedge	CASA8	Carex sartwellii	0–550	
	flatsedge	CYPER	Cyperus	0–550	
	Nebraska sedge	CANE2	Carex nebrascensis	0–550	
	rush	JUNCU	Juncus	0–550	
	chairmaker's bulrush	SCAM6	Schoenoplectus americanus	110–550	
	Grass-like (not a true grass)	2GL	Grass-like (not a true grass)	0–550	
Forb					
7	Forbs			275–825	
	knotweed	POLYG4	Polygonum	110–550	
	curly dock	RUCR	Rumex crispus	55–440	
	broadleaf cattail	TYLA	Typha latifolia	0–440	
	white panicle aster	SYLA6	Symphyotrichum lanceolatum	55–275	
	hemlock waterparsnip	SISU2	Sium suave	0–275	
	dogbane	APOCY	Apocynum	55–275	
	western dock	RUAQ	Rumex aquaticus	0–275	
	Forb, annual	2FA	Forb, annual	0–275	
	Forb, perennial	2FP	Forb, perennial	0–275	
	northern water plantain	ALTR7	Alisma triviale	0–275	_
	Canadian anemone	ANCA8	Anemone canadensis	0–110	
	cinquefoil	POTEN	Potentilla	0–110	_

Macoun's buttercup	RAMA2	Ranunculus macounii	0–110	-
bur-reed	SPARG	Sparganium	0–55	-

Table 10. Community 3.	1 plant	community	composition
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Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)	
Grass	rass/Grasslike					
4	Other Native Grasses			64–480		
	American sloughgrass	BESY	Beckmannia syzigachne	0–320	_	
	foxtail barley	HOJU	Hordeum jubatum	0–320	_	
	Grass, perennial	2GP	Grass, perennial	0–160	_	
5	Non-Native Grasses	•		0–320		
	barnyardgrass	ECCR	Echinochloa crus-galli	0–320	_	
	quackgrass	ELRE4	Elymus repens	0–160	_	
	Graminoid (grass or grass- like)	2GRAM	Graminoid (grass or grass- like)	0–160	_	
	creeping meadow foxtail	ALAR	Alopecurus arundinaceus	0–160	_	
6	Grass-Likes			1280–1600		
	spikerush	ELEOC	Eleocharis	320–960	_	
	wheat sedge	CAAT2	Carex atherodes	160–480	_	
	Grass-like (not a true grass)	2GL	Grass-like (not a true grass)	0–320	_	
	rush	JUNCU	Juncus	0–320	_	
	chairmaker's bulrush	SCAM6	Schoenoplectus americanus	32–256	_	
	flatsedge	CYPER	Cyperus	0–256	_	
	woolly sedge	CAPE42	Carex pellita	0–256	_	
	Sartwell's sedge	CASA8	Carex sartwellii	0–160	_	
	Nebraska sedge	CANE2	Carex nebrascensis	0–160	_	
Forb	Forb					
7	Forbs			320–800		
	curly dock	RUCR	Rumex crispus	96–480	-	
	knotweed	POLYG4	Polygonum	128–480	-	
	dogbane	APOCY	Apocynum	32–256	-	
	western dock	RUAQ	Rumex aquaticus	0–256	-	
	white panicle aster	SYLA6	Symphyotrichum lanceolatum	32–256	-	
	Forb, annual	2FA	Forb, annual	0–160	-	
	Forb, perennial	2FP	Forb, perennial	0–160	-	
	northern water plantain	ALTR7	Alisma triviale	0–128	-	
	broadleaf cattail	TYLA	Typha latifolia	0–96	_	
	hemlock waterparsnip	SISU2	Sium suave	0–96	_	
	cinquefoil	POTEN	Potentilla	0–64	_	
	Macoun's buttercup	RAMA2	Ranunculus macounii	0–32	_	
	Canadian anemone	ANCA8	Anemone canadensis	0–32	_	

# Animal community

Wildlife Interpretations: Under development.

Grazing Interpretations:

This site is adapted to managed grazing by domestic livestock. The predominance of herbaceous plants across all plant community phases best lends these sites to grazing by cattle but other domestic grazers with differing diet preferences may also be a consideration depending upon management objectives. Often, the current plant community does not entirely match any particular plant community (as described in the ecological site description). Because of this, a resource inventory is necessary to document plant composition and production. Proper interpretation of this inventory data will permit the establishment of a safe, initial stocking rate for the type and class of animals and level of grazing management. More accurate stocking rate estimates should eventually be calculated using actual stocking rate information and monitoring data.

# Hydrological functions

Water ponding is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic groups C and D. Infiltration is slow and runoff potential for this site is negligible. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An exception would be where short grasses form a dense sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Section 4, NRCS National Engineering Handbook for runoff quantities and hydrologic curves).

# **Recreational uses**

This site provides hunting opportunities for upland and waterfowl 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

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. All descriptions were peer reviewed and/or field-tested by various private, state and federal agency specialists. Those involved in developing this site description include: Stan Boltz, NRCS Range Management Specialist; Michael D. Brand, State Land Dept., Director Surface Management; David Dewald, NRCS State Biologist; Paul Drayton, NRCS District Conservationist; Jody Forman, NRCS Range Management Specialist; Dennis Froemke, NRCS Range Management Specialist; Kevin Sedivec, Extension Rangeland Management Specialist; Dash Saunders, NRCS Range Management Specialist; Kevin Sedivec, Extension Rangeland Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; and Lee Voigt, NRCS Range Management Specialist.

# **Other references**

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# Contributors

Jeff Printz Stan Boltz/Jeff Printz

# Approval

Suzanne Mayne-Kinney, 1/11/2024

# 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)	Jeff Printz, Stan Boltz, Lee Voigt, Jody Forman
Contact for lead author	Jeff.printz@nd.usda.gov 701-530-2080
Date	04/13/2012
Approved by	Suzanne Mayne-Kinney
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

#### Indicators

- 1. Number and extent of rills: None.
- 2. Presence of water flow patterns: None.
- 3. Number and height of erosional pedestals or terracettes: None.
- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground): Bare ground is 0 to 5%. Amount of bare ground may increase for a short time following periods of inundation.
- 5. Number of gullies and erosion associated with gullies: None.
- 6. Extent of wind scoured, blowouts and/or depositional areas: None.

- 7. Amount of litter movement (describe size and distance expected to travel): None.
- 8. Soil surface (top few mm) resistance to erosion (stability values are averages most sites will show a range of values): Soil surface fragments will typically retain structure indefinitely when dipped in distilled water.
- 9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Use soil series description for depth, color and structure of A horizon/surface layer. Stability class of 6.
- 10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Combination of shallow and deep rooted species (mid & tall rhizomatous and tufted perennial cool- and warm-season grasses) with fine and coarse roots positively influences infiltration.
- 11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): None.
- 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: Tall, cool-season grasses = grass-likes >

Sub-dominant: Forbs >

Other: Tall, warm-season rhizomatous grasses > mid, cool-season rhizomatous grasses

Additional: Due to differing root structure and distribution, Kentucky bluegrass and smooth bromegrass do not fit into reference plant community F/S groups.

- 13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): None.
- 14. Average percent litter cover (%) and depth ( in): Plant litter is in contact with soil surface.
- 15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annualproduction): Representative value = 6400 lbs./ac air dry with a range of 5400 to 7400 lbs./ac air dry depending upon growing conditions.
- 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: State and local noxious, Kentucky bluegrass, smooth bromegrass, reed canarygrass, redtop

17. **Perennial plant reproductive capability:** All species exhibit high vigor relative to climatic conditions. Do not rate based solely on seed production. Perennial grasses should have vigorous rhizomes or tillers.