USDA Natural Resources
Conservation Service

Ecological site R053BY003ND
Closed Depression

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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.

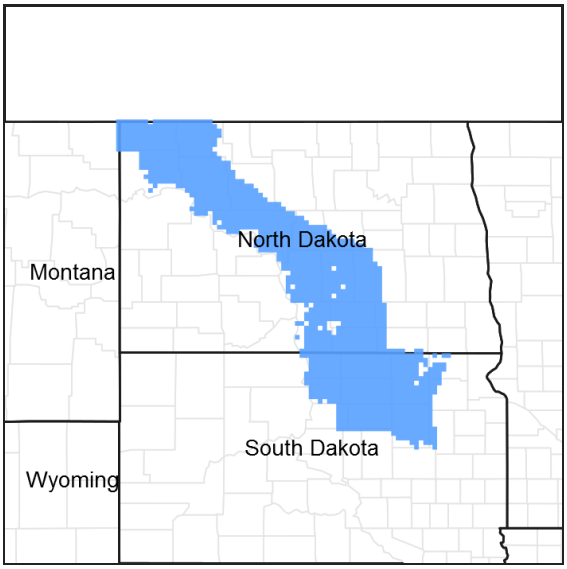


Figure 1. Mapped extent

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

R053BY001ND	**Clayey**
R053BY002ND	**Claypan**
R053BY013ND	**Thin Claypan**
R053BY018ND	**Linear Meadow**

Similar sites

R053BY019ND	**Wet Meadow** [Poorly drained soils found adjacent to streams or in depressions, with water table at the surface or within 1.5 feet from the surface with no evidence of salts, noticeable redoximorphic features within 6 inches or just below the organic soil layer. Found upslope from Wet Land and downslope of Subirrigated or Loamy Overflow sites; can be located within the listed associated sites. Indicator species are prairie cordgrass and northern reedgrass. This site has more production, less western wheatgrass, more prairie cordgrass, and a water table without a restrictive sodic layer or evidence of salts within the soil profile.]
R053BY006ND	**Saline Lowland** [Found adjacent to streams, toe slopes, foot slopes or sideslopes. Most are poorly drained soils, with water table at the surface or within 3 feet from the surface with evidence of salts within soil profile, noticeable redoximorphic features within 6 inches or just below the organic soil layer. Found upslope from Wet Land or Wet Meadow and downslope of Subirrigated or Loamy Overflow sites. Can be located within the listed associated sites. Indicator species are Nuttall's alkaligrass intermixed with western wheatgrass, some rushes and sedges. This site has similar species and production, less western wheatgrass, more prairie cordgrass, and a water table.]
R053BY018ND	**Linear Meadow** [Very poorly drained soils with noticeable redoximorphic features within 6 inches or just below the organic soil layer, found in depressions and along streams where water ponds at or above the surface for more the 7 days. Found down slope of Wet Meadow sites and can be in low positions within the listed associated sites. Indicator species are slough sedge, whitetop, prairie cordgrass, cattail, and smartweed. This site has similar landscape position, more production, no western wheatgrass, more prairie cordgrass and slough sedge, no restrictive sodic layer or evidence of salts within the soil profile.]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Pascopyrum smithii*

Physiographic features

This site occurs on level shallow lake basins and flat enclosed upland depressions.

Table 2. Representative physiographic features

Landforms	(1) Depression (2) Till plain
Flooding frequency	None
Ponding duration	Long (7 to 30 days)
Ponding frequency	Occasional to frequent
Elevation	488–610 m
Slope	0–2%
Ponding depth	0–30 cm
Water table depth	0–91 cm
Aspect	Aspect is not a significant factor

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)	508 mm

Influencing water features

No significant water features typically influence this site.

Soil features

These are very deep, poorly drained, fine textured soils. Saturated hydraulic conductivity is slow to very slow. Salinity is slight to strong and sodicity is slight. This site is on enclosed depressions on residual uplands and till plains. Slope ranges from 0 to 2 percent. The soils crack when dry and heavy traffic can cause surface compaction when wet. Sub-surface soil layers are restrictive to water movement and root penetration. This site should show slight to no evidence of rills, wind scoured areas or pedestalled plants. Water flow paths are broken, irregular in appearance or discontinuous. The soil surface is stable and intact.

These soils are not susceptible to water erosion. Low available water capacity coupled with high accumulations of sodium 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/

Table 4. Representative soil features

Surface texture	(1) Silt loam (2) Silty clay loam
Family particle size	(1) Clayey
Drainage class	Poorly drained
Permeability class	Very slow to slow
Soil depth	15–99 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Calcium carbonate equivalent (0-101.6cm)	0–20%
Electrical conductivity (0-101.6cm)	0–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–5

Soil reaction (1:1 water) (0-101.6cm)	5.6–9
Subsurface fragment volume <=3" (Depth not specified)	0–10%
Subsurface fragment volume >3" (Depth not specified)	0–3%

Ecological dynamics

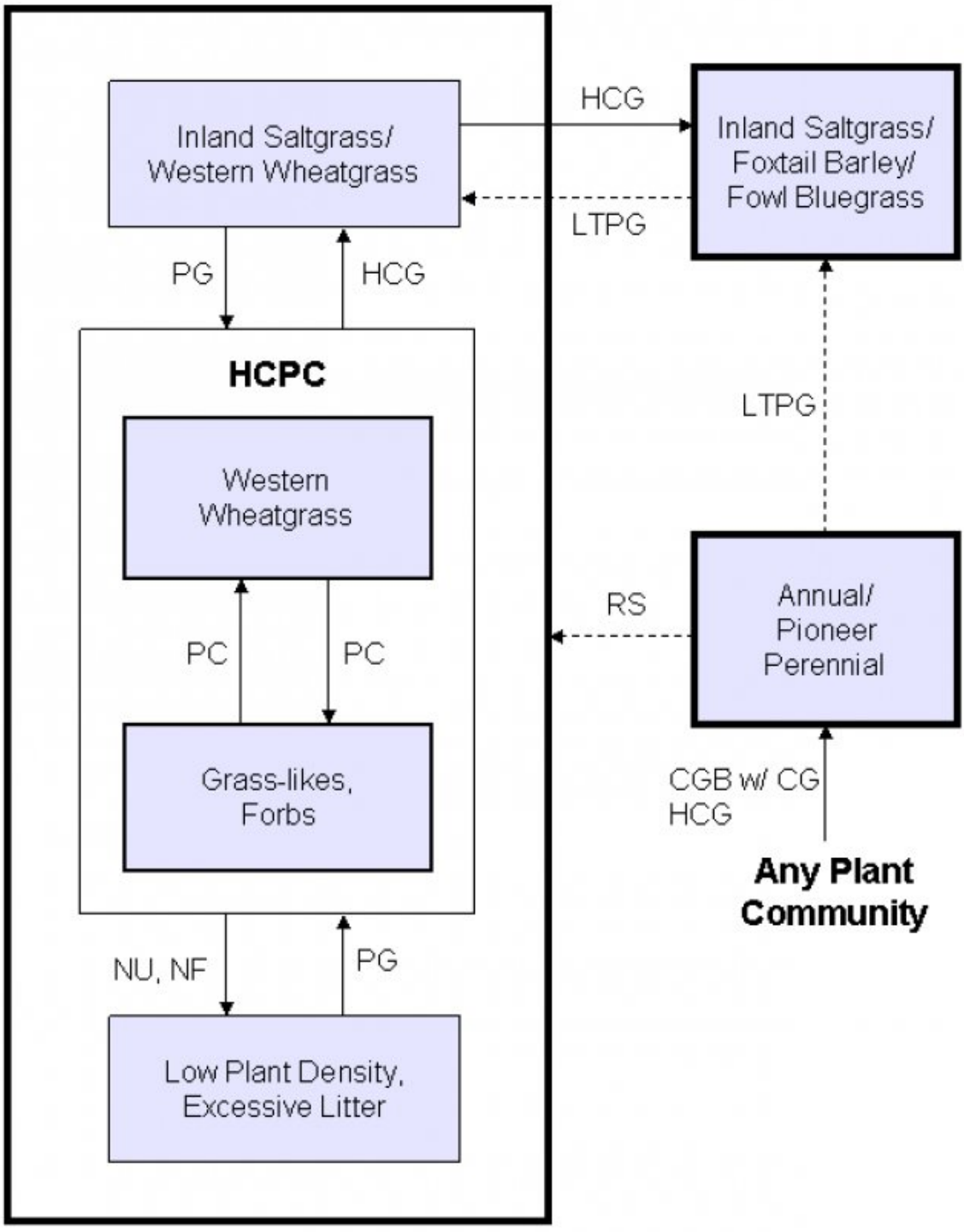
The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores, periodic flooding events and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils, the site is considered moderately resilient. Under continued adverse impacts, a moderate decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can more readily return to the Historic Climax Plant Community (HCPC).

The plant community upon which interpretations are primarily based is the Historic Climax Plant Community. 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. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

Heavy continuous grazing and/or continuous seasonal (spring) grazing, without adequate recovery periods following each grazing occurrence causes this site to depart from the HCPC. Inland saltgrass will begin to increase. Western wheatgrass will increase initially and then begin to decrease. In time, heavy continuous grazing will cause inland saltgrass, foxtail barley, fowl bluegrass, other pioneer perennials and annuals to increase. Extended periods of non-use and/or lack of fire will result in a plant community having high litter levels and decadent plants.

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



CGB w/ CG – Cropped go-back land with continuous grazing; **HCG** – Heavy continuous grazing; **HCPC** – Historic Climax Plant Community; **LTPG** – Long-term prescribed grazing; **NU, NF** – Extended periods on non-use and no fire; **PC** – Precipitation cycles; **PG** – Prescribed grazing.

State 1
Western Wheatgrass/Grass-likes, Forbs (HCPC)

Community 1.1
Western Wheatgrass/Grass-likes, Forbs (HCPC)

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores, occasional prairie fires and periodic flooding events. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest. The potential vegetation is about 60% grasses, 20% grass-like plants and 20% forbs. Western wheatgrass dominates the plant community. Other grasses and grass-like plants include Nuttall's alkaligrass, slender wheatgrass, inland saltgrass, fowl bluegrass, ticklegrass, common spikerush, needle spikerush and other rushes and sedges. Significant forbs include smartweed, silverleaf cinquefoil, Pursh seepweed, slender cinquefoil and western dock. There are no principal shrubs that occur on this site. This plant community is well adapted to the Northern Great Plains climatic conditions. Individual species can vary greatly in production depending on growing conditions (timing and amount of precipitation and temperature). Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. The diversity in plant species allows for both the fluctuation of ponding as well as the occurrence of randomly occurring drought.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1861	2942	3363
Shrub/Vine	191	490	841
Forb	191	491	841
Total	**2243**	**3923**	**5045**

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
Inland Saltgrass/Western Wheatgrass

Community 2.1
Inland Saltgrass/Western Wheatgrass

This plant community is the result of a short-term heavy use, or a longer term continuous grazing and/or annual, early spring seasonal grazing. Repeated defoliation depletes stored carbohydrates, resulting in weakening and eventual death of the most palatable grasses. Lack of litter and reduced plant vigor result in higher soil temperatures, poor water infiltration rates, high evapotranspiration and increased percolation of the high water table, which increases salt concentrations on the surface. This gives inland saltgrass and other salt tolerant species a competitive advantage over less tolerant species. Inland saltgrass drastically increases and replaces the western wheatgrass as the dominant species with the balance being a few species of cool-season grasses, and grass-likes including Nuttall's alkaligrass, plains bluegrass, ticklegrass, common spikerush, needle spikerush and other sedges and rushes. Early cool-season grasses including foxtail barley, fowl bluegrass and Kentucky bluegrass begin to invade. Forbs that will invade are curly dock, curlycup gumweed and cocklebur while lambsquarters, pepperweed, povertyweed, purslane and western dock increase. This plant community is relatively stable and well adapted to increased salinity. Plant vigor, litter, frequency and production have decreased. The biological integrity, water and nutrient cycles of this plant community are becoming impaired. This plant community is less productive than the HCPC.

Table 6. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1110	2096	3082
Shrub/Vine	118	185	252
Forb	118	185	252
Total	**1346**	**2466**	**3586**

Figure 7. Plant community growth curve (percent production by month). ND5309, Missouri Coteau, warm-season dominant, cool-season sub-dominant.. Warm-season dominant, cool-season sub-dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	2	32	33	20	7	4	2	0	0

State 3
Low Plant Density, Excessive Litter

Community 3.1
Low Plant Density, Excessive Litter

This plant community occurs when grazing is removed for long periods of time (rest) in the absence of fire. Plant composition is similar to the HCPC, however individual species production and frequency will be lower. Much of the nutrients are tied up in excessive litter. Standing dead plant residues that are not in contact with a moist soil surface result in a slow nutrient cycling process. Above ground litter also limits sunlight from reaching plant crowns. Many plants, especially the warm-season grasses (inland saltgrass) reduce in density and vigor and typically develop into small but dense colonies. Thick litter and absence of grazing animals (animal impact) and fire reduces seed germination and establishment. This plant community develops after an extended period (10+ years) of non-use by herbivores and exclusion of fire. This plant community is resistant to change without prescribed grazing or fire. The combination of both grazing and fire is most effective in moving this plant community towards the HCPC. Soil erosion is low. Runoff is similar to the HCPC. Once this plant community is reached, time and external resources will be needed to see any immediate recovery in diversity.

Table 7. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1620	2354	2858
Forb	247	471	673
Shrub/Vine	151	314	504
Total	**2018**	**3139**	**4035**

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

State 4
Inland Saltgrass/Foxtail Barley/Fowl Bluegrass

Community 4.1
Inland Saltgrass/Foxtail Barley/Fowl Bluegrass

This plant community developed with heavy continuous grazing where adequate recovery periods between grazing events were not allowed. Patches of inland saltgrass sod are typical and foxtail barley and fowl bluegrass is well distributed throughout the community. Nuttall's alkaligrass and western wheatgrass have been greatly reduced in production and vigor, and may persist in remnant amounts. This plant community is resistant to change due to the grazing tolerance of inland saltgrass and increased surface salts. A significant amount of production and diversity has been lost when compared to the HCPC. Loss of key cool season grasses and increased bare ground have negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly due to the massive shallow root system "root pan", characteristic of inland saltgrass, and increased bare ground. It will take a long time to bring this plant community back to the HCPC with management alone. Renovation (mechanical and/or chemical inputs) is not recommended due to high salt content of the soil and saltgrass persistence.

Table 8. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	1154	1664	2146
Forb	95	202	336
Shrub/Vine	95	151	207
Total	**1344**	**2017**	**2689**

Figure 11. Plant community growth curve (percent production by month). ND5308, Missouri Coteau, lowland cool-season/warm-season co-dominant.. Cool-season, warm-season co-dominant, lowland..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	3	35	35	15	5	5	2	0	0

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Western Wheatgrass**			392–1569	
	western wheatgrass	PASM	*Pascopyrum smithii*	392–1569	–
2	**Other Native Grasses**			196–785	
	Grass, perennial	2GP	*Grass, perennial*	39–196	–
	saltgrass	DISP	*Distichlis spicata*	39–196	–
	foxtail barley	HOJU	*Hordeum jubatum*	0–196	–
	green needlegrass	NAVI4	*Nassella viridula*	0–196	–
	fowl bluegrass	POPA2	*Poa palustris*	39–196	–
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	39–196	–
	alkali cordgrass	SPGR	*Spartina gracilis*	0–196	–
	prairie cordgrass	SPPE	*Spartina pectinata*	0–196	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	39–118	–
	rough bentgrass	AGSC5	*Agrostis scabra*	39–118	–
	plains bluegrass	POAR3	*Poa arida*	39–78	–
	scratchgrass	MUAS	*Muhlenbergia asperifolia*	0–78	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–78	–
	American sloughgrass	BESY	*Beckmannia syzigachne*	0–39	–
4	**Grass-Likes**			196–785	

	sedge	CAREX	*Carex*	78–392	–
	common spikerush	ELPA3	*Eleocharis palustris*	78–314	–
	rush	JUNCU	*Juncus*	39–196	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–196	–
	needle spikerush	ELAC	*Eleocharis acicularis*	39–118	–
Forb					
5	**Forbs**			196–785	
	Pursh seepweed	SUCA2	*Suaeda calceoliformis*	39–392	–
	curlytop knotweed	POLA4	*Polygonum lapathifolium*	39–392	–
	knotweed	POLYG4	*Polygonum*	39–392	–
	western dock	RUAQ	*Rumex aquaticus*	39–196	–
	Forb, perennial	2FP	*Forb, perennial*	39–196	–
	silver cinquefoil	POAR8	*Potentilla argentea*	39–196	–
	slender cinquefoil	POGRF2	*Potentilla gracilis var. fastigiata*	39–196	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	39–118	–
	povertyweed	IVAX	*Iva axillaris*	39–118	–
	pepperweed	LEPID	*Lepidium*	0–118	–
	redwool plantain	PLER	*Plantago eriopoda*	39–118	–
	little hogweed	POOL	*Portulaca oleracea*	0–78	–
	wild mint	MEAR4	*Mentha arvensis*	0–78	–
	lambsquarters	CHAL7	*Chenopodium album*	0–39	–
	prairie ironweed	VEFA2	*Vernonia fasciculata*	0–39	–

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Western Wheatgrass**			493–986	
	western wheatgrass	PASM	*Pascopyrum smithii*	493–986	–
2	**Other Native Grasses**			370–740	
	saltgrass	DISP	*Distichlis spicata*	247–493	–
	foxtail barley	HOJU	*Hordeum jubatum*	74–247	–
	fowl bluegrass	POPA2	*Poa palustris*	74–247	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–123	–
	Grass, perennial	2GP	*Grass, perennial*	25–123	–
	rough bentgrass	AGSC5	*Agrostis scabra*	25–123	–
	plains bluegrass	POAR3	*Poa arida*	25–99	–
3	**Non-Native Grasses**			74–247	
	Kentucky bluegrass	POPR	*Poa pratensis*	49–197	–
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	0–123	–
	smooth brome	BRIN2	*Bromus inermis*	25–123	–
4	**Grass-Likes**			123–247	
	rush	JUNCU	*Juncus*	25–123	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–74	–
	sedge	CAREX	*Carex*	25–74	–
	needle spikerush	ELAC	*Eleocharis acicularis*	25–74	–
	common spikerush	ELPA3	*Eleocharis palustris*	0–49	–
Forb					
5	**Forbs**			123–247	
	curly dock	RUCR	*Rumex crispus*	25–123	–
	curlytop knotweed	POLA4	*Polygonum lapathifolium*	25–123	–
	western dock	RUAQ	*Rumex aquaticus*	25–74	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	25–74	–
	povertyweed	IVAX	*Iva axillaris*	0–74	–
	pepperweed	LEPID	*Lepidium*	25–74	–
	lambsquarters	CHAL7	*Chenopodium album*	25–49	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–49	–
	knotweed	POLYG4	*Polygonum*	0–49	–
	little hogweed	POOL	*Portulaca oleracea*	0–49	–
	prairie ironweed	VEFA2	*Vernonia fasciculata*	0–49	–
	cocklebur	XANTH2	*Xanthium*	25–49	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–25	–
	Forb, perennial	2FP	*Forb, perennial*	0–25	–
	wild mint	MEAR4	*Mentha arvensis*	0–25	–
	redwool plantain	PLER	*Plantago eriopoda*	0–25	–

Table 11. Community 3.1 plant community composition

				Annual Production	Foliar

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Western Wheatgrass**			471–785	
	western wheatgrass	PASM	*Pascopyrum smithii*	471–785	–
2	**Other Native Grasses**			471–785	
	fowl bluegrass	POPA2	*Poa palustris*	63–314	–
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	63–314	–
	plains bluegrass	POAR3	*Poa arida*	31–157	–
	Grass, perennial	2GP	*Grass, perennial*	31–157	–
	rough bentgrass	AGSC5	*Agrostis scabra*	31–157	–
	saltgrass	DISP	*Distichlis spicata*	31–157	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	0–157	–
	foxtail barley	HOJU	*Hordeum jubatum*	31–157	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–94	–
	alkali cordgrass	SPGR	*Spartina gracilis*	0–94	–
	prairie cordgrass	SPPE	*Spartina pectinata*	0–94	–
	American sloughgrass	BESY	*Beckmannia syzigachne*	0–31	–
3	**Non-Native Grasses**			157–471	
	Kentucky bluegrass	POPR	*Poa pratensis*	157–314	–
	smooth brome	BRIN2	*Bromus inermis*	63–251	–
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	0–157	–
4	**Grass-Likes**			157–471	
	rush	JUNCU	*Juncus*	63–314	–
	sedge	CAREX	*Carex*	63–251	–
	common spikerush	ELPA3	*Eleocharis palustris*	31–157	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–157	–
	needle spikerush	ELAC	*Eleocharis acicularis*	0–126	–
Forb					
5	**Forbs**			314–628	
	curly dock	RUCR	*Rumex crispus*	63–471	–
	western dock	RUAQ	*Rumex aquaticus*	31–238	–
	silver cinquefoil	POAR8	*Potentilla argentea*	31–238	–
	curlytop knotweed	POLA4	*Polygonum lapathifolium*	31–157	–
	knotweed	POLYG4	*Polygonum*	0–94	–
	slender cinquefoil	POGRF2	*Potentilla gracilis var. fastigiata*	31–94	–
	cocklebur	XANTH2	*Xanthium*	0–94	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	31–94	–
	Forb, perennial	2FP	*Forb, perennial*	31–94	–
	lambsquarters	CHAL7	*Chenopodium album*	31–94	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–94	–
	wild mint	MEAR4	*Mentha arvensis*	31–94	–
	povertyweed	IVAX	*Iva axillaris*	0–63	–
	pepperweed	LEPID	*Lepidium*	0–63	–

	Pursh seepweed	SUCA2	*Suaeda calceoliformis*	0–63	–
	prairie ironweed	VEFA2	*Vernonia fasciculata*	0–63	–
	little hogweed	POOL	*Portulaca oleracea*	0–63	–
	redwool plantain	PLER	*Plantago eriopoda*	0–31	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–31	–

Table 12. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Western Wheatgrass**			101–404	
	western wheatgrass	PASM	*Pascopyrum smithii*	101–404	–
2	**Other Native Grasses**			404–1009	
	saltgrass	DISP	*Distichlis spicata*	202–807	–
	foxtail barley	HOJU	*Hordeum jubatum*	202–807	–
	fowl bluegrass	POPA2	*Poa palustris*	101–303	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–202	–
	Grass, perennial	2GP	*Grass, perennial*	0–101	–
	rough bentgrass	AGSC5	*Agrostis scabra*	0–61	–
	plains bluegrass	POAR3	*Poa arida*	0–61	–
3	**Non-Native Grasses**			0–101	
	Kentucky bluegrass	POPR	*Poa pratensis*	0–101	–
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	0–101	–
	smooth brome	BRIN2	*Bromus inermis*	0–61	–
4	**Grass-Likes**			101–202	
	rush	JUNCU	*Juncus*	20–202	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0–101	–
	sedge	CAREX	*Carex*	20–101	–
	needle spikerush	ELAC	*Eleocharis acicularis*	0–101	–
	common spikerush	ELPA3	*Eleocharis palustris*	0–61	–
Forb					
5	**Forbs**			101–303	
	curly dock	RUCR	*Rumex crispus*	0–202	–
	curlytop knotweed	POLA4	*Polygonum lapathifolium*	0–101	–
	curlycup gumweed	GRSQ	*Grindelia squarrosa*	0–101	–
	western dock	RUAQ	*Rumex aquaticus*	0–101	–
	povertyweed	IVAX	*Iva axillaris*	20–81	–
	prairie ironweed	VEFA2	*Vernonia fasciculata*	0–81	–
	cocklebur	XANTH2	*Xanthium*	0–61	–
	knotweed	POLYG4	*Polygonum*	0–61	–
	pepperweed	LEPID	*Lepidium*	20–61	–
	Forb (herbaceous, not grass nor grass-like)	2FORB	*Forb (herbaceous, not grass nor grass-like)*	0–61	–
	Forb, perennial	2FP	*Forb, perennial*	0–61	–
	lambsquarters	CHAL7	*Chenopodium album*	0–61	–
	little hogweed	POOL	*Portulaca oleracea*	0–40	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–20	–
	redwool plantain	PLER	*Plantago eriopoda*	0–20	–

Animal community

Wildlife Interpretations:

Under development.

Grazing Interpretations:
This site is well 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 is the principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic groups D. Infiltration varies from moderate to slow and the site is a depression without any runoff potential. 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 game species. The wide varieties of plants that 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

Seed harvest of native plant species can provide additional income on this site.

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; Jeff Printz, NRCS State Range Management Specialist; Josh Saunders, NRCS Range Management Specialist; Kevin Sedivec, Extension Rangeland Management Specialist; Darrell Vanderbusch, NRCS Resource Soil Scientist; and Lee Voigt, NRCS Range Management Specialist.

Data Source Number of Records Sample Period State County
SCS-RANGE-417 1 1972 SD Edmunds

Other references

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://hprcc.unl.edu)
USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://www.wcc.nrcs.usda.gov)
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USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A,

Fort Collins, CO 80526. (http://nasis.nrcs.usda.gov)
USDA, NRCS. 2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
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Contributors

Jeff Printz
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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
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Date	03/01/2012
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):** Normally bare ground is less than 5% with bare patches 2 inches in diameter. Following well above, or well below average precipitation periods bare ground can be very high for brief periods of time.

5. **Number of gullies and erosion associated with gullies:** None.

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):** None.

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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):** Average 4 to 6 rating.

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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, color and structure of A horizon/surface layer.

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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.

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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 should be present. Some soils may have a naturally occurring platy layer at the surface.

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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: Drier precipitation cycles: Mid cool-season rhizomatous grasses>> mid cool-season bunchgrasses >
    Wetter precipitation cycles: Grass-likes = forbs >

    Sub-dominant: Drier precipitation cycles: short warm-season grasses >
    Wetter precipitation cycles: mid cool-season rhizomatous grasses > short warm-season grasses

    Other: Drier precipitation cycles: Forbs > grass-likes
    Wetter precipitation cycles: Mid cool-season bunchgrasses

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

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very little or no evidence of plant morality or decadence.

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14. **Average percent litter cover (%) and depth (in):** Plant litter is in contact with soil surface.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 2000 3500 4500 lbs./acre 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 weeds, Kentucky bluegrass, smooth bromegrass, Russian olive.

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.