Ecological site R055BY076ND
Saline Subirrigated

Accessed: 09/24/2026

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.

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

R055BY056ND	**Clayey**
R055BY060ND	**Saline Lowland**
R055BY064ND	**Loamy**
R055BY070ND	**Shallow Marsh**
R055BY071ND	**Wet Meadow**

Similar sites

R055BY058ND	**Limy Subirrigated** (R055BY058ND) – Limy Subirrigated [less switchgrass & prairie cordgrass, more needlegrasses]

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified

Herbaceous	(1) *Andropogon gerardii* (2) *Schizachyrium scoparium*

Physiographic features

This site occurs on nearly level flood plains or swales.

Table 2. Representative physiographic features

Landforms	(1) Swale (2) Flood plain
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to frequent
Elevation	310 – 640 m
Slope	0 %
Water table depth	30 – 150 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 55B 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 16 to 21 inches per year. The normal average annual temperature is about 41.5° F. January is the coldest month with average temperatures ranging from about 2° F (Maddock, ND) to about 11° F (Mellette, SD). July is the warmest month with temperatures averaging from about 67° F (Maddock, ND) to about 73° F (Redfield 2 NE, SD). The range of normal average monthly temperatures between the coldest and warmest months is about 64° 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)	140 days
Freeze-free period (average)	160 days

Precipitation total (average)	530 mm

Influencing water features

No riparian areas or wetland features are directly associated with this site.

Soil features

The soils in this site are poorly to somewhat poorly drained and formed in alluvium and loamy till. The loam to silty clay loam surface layer is 6 to 24 inches thick and typically has a granular structure. Dark colors are very deep in these soils. The soils have a slow to moderate infiltration rate. This site should show no evidence of rills, wind scoured areas or pedestalled plants. If present, water flow paths are broken, irregular in appearance or discontinuous. The soil surface is stable and intact. These soils are mainly susceptible to water erosion. The hazard of water erosion increases where vegetative cover is not adequate. A drastic loss of the soil surface layer on this site can result in a shift in species composition and/or production.

Access Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/) for specific local soils information.

Table 4. Representative soil features

Surface texture	(1) Loam (2) Silty clay loam (3) Silt loam
Family particle size	(1) Loamy
Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Slow to moderate
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	15.24 – 17.78 cm
Calcium carbonate equivalent (0-101.6cm)	10 – 30 %

Electrical conductivity (0-101.6cm)	0 – 20 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0 – 10
Soil reaction (1:1 water) (0-101.6cm)	6.6 – 10
Subsurface fragment volume <=3" (Depth not specified)	0 – 10 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

This site developed under Northern Great Plains climatic conditions, light to severe grazing by bison and other large herbivores, sporadic natural or man-caused wildfire (often of light intensities), and other biotic and abiotic factors that typically influence soil/site development. Changes will occur in the plant communities due to short-term weather variations, impacts of native and/or exotic plant and animal species, and management actions. While the following plant community descriptions describe more typical transitions that will occur, severe disturbances, such as periods of well-below average precipitation, can cause significant shifts in plant communities and/or species composition that may not be described within this document.

Heavy continuous grazing without adequate recovery periods following each grazing occurrence over several years causes this site to depart from the interpretive plant community. Species such as little bluestem and sedge will initially increase. Big bluestem, Indiangrass, and switchgrass will decrease in frequency and production. Heavy continuous grazing causes inland saltgrass to increase and eventually develop into a sod condition. Extended periods of non-use and no fire will result in a plant community having high litter levels, which favors an increase in species such as spikerush, sedge, foxtail barley, and prairie cordgrass. Grazing, especially if adequate recovery periods are not allowed, may be more detrimental on this site than haying. Biotic integrity on this site may be maintained more readily through periodic haying than through grazing.

Interpretations are primarily based on the 1.1 Bluestem/Indiangrass/Switchgrass Plant Community Phase. It 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. Plant community phases, states, transitional pathways, and thresholds have been determined through similar studies and experience.

The following is a diagram that illustrates the common plant community phases that can occur on the site and the transition pathways between communities. These are the most common plant community phases based on current knowledge and experience, and changes may be made as more data is collected. Narratives following the diagram contain more detail pertaining to the ecological processes.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Grass/Grasslike					
1	**Tall Warm-season Grasses**			1233-1973	
	big bluestem	ANGE	*Andropogon gerardii*	493-1480	–
	switchgrass	PAVI2	*Panicum virgatum*	247-740	–
	Indiangrass	SONU2	*Sorghastrum nutans*	247-740	–
	prairie cordgrass	SPPE	*Spartina pectinata*	49-493	–
2	**Mid Warm-season Grasses**			740-1233	
	little bluestem	SCSC	*Schizachyrium scoparium*	740-1233	–
	alkali sacaton	SPAI	*Sporobolus airoides*	0-247	–
	sideoats grama	BOCU	*Bouteloua curtipendula*	0-247	–
3	**Cool-season Grasses**			247-493	
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	49-493	–
	western wheatgrass	PASM	*Pascopyrum smithii*	49-493	–
	plains bluegrass	POAR3	*Poa arida*	49-247	–
	foxtail barley	HOJU	*Hordeum jubatum*	0-49	–
4	**Short Warm-season Grasses**			49-99	
	saltgrass	DISP	*Distichlis spicata*	49-99	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0-49	–
5	**Other Native Grasses**			49-247	
	Graminoid (grass or grass-like)	2GRAM	*Graminoid (grass or grass-like)*	0-247	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	49-148	–
	Scribner's rosette grass	DIOLS	*Dichanthelium oligosanthes var. scribnerianum*	0-49	–
6	**Grass-likes**			99-395	
	sedge	CAREX	*Carex*	49-395	–
	spikerush	ELEOC	*Eleocharis*	0-148	–
	Grass-like (not a true grass)	2GL	*Grass-like (not a true grass)*	0-99	–
Forb					
7	**Forbs**			247-493	
	Forb, native	2FN	*Forb, native*	49-247	–
	white sagebrush	ARLU	*Artemisia ludoviciana*	49-148	–
	Maximilian sunflower	HEMA2	*Helianthus maximiliani*	49-148	–
	goldenrod	SOLID	*Solidago*	49-148	–
	white heath aster	SYER	*Symphyotrichum ericoides*	49-99	–
	silver cinquefoil	POAR8	*Potentilla argentea*	49-99	–
	upright prairie coneflower	RACO3	*Ratibida columnifera*	49-99	–
	Indianhemp	APCA	*Apocynum cannabinum*	49-99	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	49-99	–
	tall blazing star	LIAS	*Liatris aspera*	49-99	–
	western marbleseed	ONBEO	*Onosmodium bejariense var. occidentale*	49-99	–
	Flodman's thistle	CIFL	*Cirsium flodmanii*	49-99	–
	western yarrow	ACMIO	*Achillea millefolium var. occidentalis*	49-99	–
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	49-99	–
	Canadian anemone	ANCA8	*Anemone canadensis*	0-49	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	0-49	–
	bluebell bellflower	CARO2	*Campanula rotundifolia*	0-49	–
	redwool plantain	PLER	*Plantago eriopoda*	0-49	–

	palespike lobelia	LOSP	*Lobelia spicata*	0-49	–
	rough bugleweed	LYAS	*Lycopus asper*	0-49	–
	annual marsh elder	IVAN2	*Iva annua*	0-49	–
	western dock	RUAQ	*Rumex aquaticus*	0-49	–
	Norwegian cinquefoil	PONO3	*Potentilla norvegica*	0-49	–
	prairie violet	VIPE2	*Viola pedatifida*	0-49	–
	meadow zizia	ZIAP	*Zizia aptera*	0-49	–
	Pursh seepweed	SUCA2	*Suaeda calceoliformis*	0-49	–

Table 6. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 7. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Table 8. Community 2.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)

Animal community

Animal Community – Wildlife Interpretations Major Land Resource Area (MLRA) 55B lies within the Northern mixed-grass prairie ecosystem. Prior to European settlement, this area consisted of diverse grassland habitats interspersed with varying densities of depressional wetlands and limited woody riparian corridors. These habitats provided critical life cycle components for many of its users. Many species of grassland birds and herds of roaming bison, elk, and pronghorn were among the inhabitants. These species, as well as several small mammal and insect species, were the primary consumers linking the grassland resources to predators such as wolves, mountain lions, and grizzly bears as well as smaller carnivores such as coyotes, bobcats, foxes and raptors. In addition, a wide variety of small mammals, reptiles, amphibians and insects were adapted to this semi-arid climate. Historically, the Northern mixed-grass prairie was a disturbance-driven ecosystem with fire, herbivory and climate functioning as the primary disturbance factors either singly or in combination. Following European settlement, widespread conversion to cropland, elimination of fire, and habitat fragmentation influenced species composition and abundance. Introduced and invasive species further impacted plant and animal communities. Bison were historically a keystone species but have been extirpated as a free-ranging herbivore. The loss of bison and fire as ecological drivers greatly influenced the character of the remaining native plant community and the habitats that they provide. Fragmentation has reduced habitat quality for area-sensitive species. Animal Community – 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 forage production on this site. This site is dominated by soils in hydrologic groups C and D. Infiltration is typically moderate to moderately slow and runoff potential for this site varies from negligible to low depending on soil hydrologic group, slope and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where shortgrasses form a strong sod and dominate the site. Dominance by Kentucky bluegrass, and/or smooth bromegrass will result in reduced infiltration and increased runoff. 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, hiking, photography, bird watching and other opportunities. The wide variety of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood products

No appreciable wood products are typically present on this 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 data and other inventory data. Field observations from range-trained personnel were also used. Those involved in developing this site include: Stan Boltz, Range Management Specialist, NRCS; and Bruce Kunze, Soil Scientist, NRCS.

Other references

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://www.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)
USDA, NRCS. National Range and Pasture Handbook, September 1997
USDA, NRCS. National Soil Information System, Information Technology Center, 2150 Centre Avenue, Building A, Fort Collins, CO 80526. (http://soils.usda.gov/technical/nasis/)
USDA, NRCS. 2001. The PLANTS Database (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Contributors

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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	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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

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

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

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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:

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

14. **Average percent litter cover (%) and depth (in):**

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

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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:**

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17. **Perennial plant reproductive capability:**
