

Ecological site R053BY012ND Subirrigated

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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.

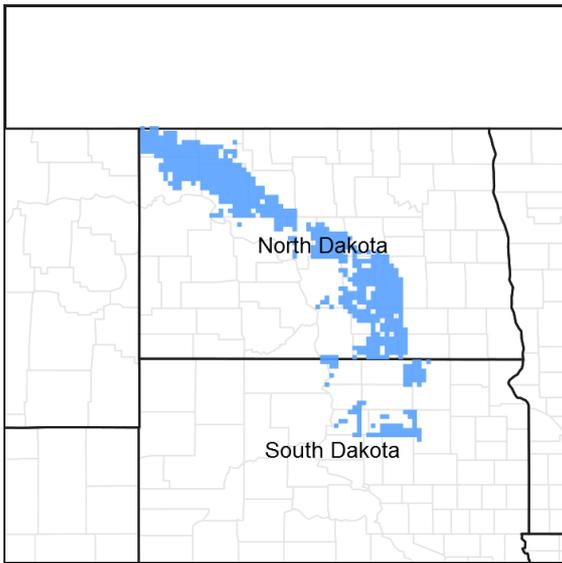


Figure 1. Mapped extent

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
R053BY018ND	Linear Meadow
R053BY019ND	Wet Meadow

Similar sites

R053BY005ND	<p>Loamy Overflow [Moderately well drained soils in intermittent drainage ways, swales and areas that frequently receive additional moisture throughout the growing season, with no apparent water table. Indicator species: big bluestem with western wheatgrass and green needlegrass, American licorice, and western snowberry. The site has no switchgrass or prairie cordgrass, less big bluestem, more green needlegrass and western wheatgrass; less production, no water table.]</p>
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Andropogon gerardii</i> (2) <i>Panicum virgatum</i>

Physiographic features

This site occurs on nearly level, slightly concave and gently undulating lowlands.

Table 2. Representative physiographic features

Landforms	(1) Till plain (2) Lake plain
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	None to occasional
Ponding frequency	None
Elevation	1,600–2,000 ft
Slope	0–3%
Water table depth	18–42 in
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)	20 in
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Influencing water features

Soil features

These are very deep, somewhat poorly drained, coarse to moderately fine textured soils. Saturated hydraulic conductivity is moderate to moderately slow and available water capacity is low to high. Salinity is none to very slight and sodicity is none. These soils have a high water table (1.5 to 3.5 feet from the surface) which keeps the rooting zone moist for most of the growing season. This site is on flats and swales on alluvial plains, lake plains and till plains. Slope ranges from 0 to 3 percent. This site should show slight to no evidence of rills, wind scoured areas or pedestalled plants. No water flow paths are seen on this site. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

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) Loam (2) Silt loam (3) Silty clay loam
Family particle size	(1) Loamy
Drainage class	Somewhat poorly drained
Permeability class	Moderately slow to moderate
Soil depth	80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	4-7 in
Calcium carbonate equivalent (0-40in)	0-20%
Electrical conductivity (0-40in)	0-4 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	5.1-8.4
Subsurface fragment volume <=3" (Depth not specified)	0-20%
Subsurface fragment volume >3" (Depth not specified)	0-5%

Ecological dynamics

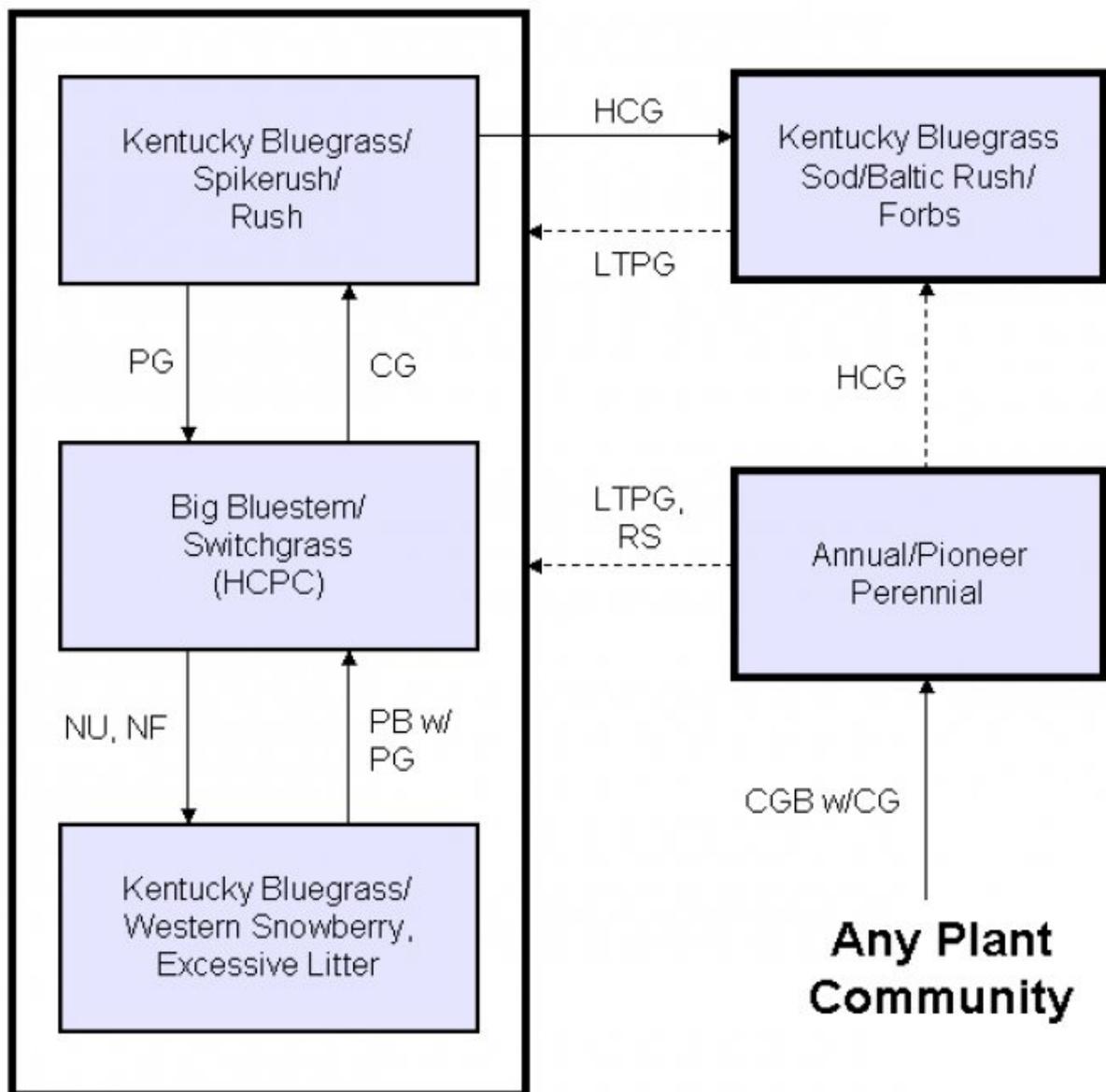
The site developed under Northern Great Plains climatic conditions, and included natural influence of large herbivores and occasional fire. Changes will occur in the plant communities due to climatic conditions and/or management actions. Due to the nature of the soils along with the high productivity of the subirrigated plants, this site is considered stable. Under continued adverse impacts, a slow decline in vegetative vigor and composition will occur. Under favorable vegetative management treatments the site can quickly 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 considered. Subclimax plant communities, states, transitional pathways, and thresholds have been determined through similar studies and experience.

As changes occur from continuous grazing without adequate recovery opportunities between grazing events, species such as Kentucky bluegrass, western wheatgrass and Baltic rush will invade or increase. Kentucky bluegrass may eventually form a dense sod. Grasses such as big bluestem, prairie cordgrass, and switchgrass will decrease in frequency and production and can be removed from the site. Non-use and lack of fire will cause litter levels and plant decadence or mortality to increase. Under extended periods of non-use and/or lack of fire, both invading grass and forb species such as Kentucky bluegrass, fowl bluegrass, sweetclover and possibly Canada thistle will dominate the site along with a heavy increase of shrubs and trees including invading trees such as Russian olive. This will eventually result in a wooded plant community.

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



CG – Continuous grazing without adequate recovery opportunity;
CGB w/CG – Cropped go-back with continuous grazing; **HCG** – Heavy continuous grazing; **HCPC** – Historic Climax Plant Community; **LTPG** – Long-term prescribed grazing; **NU, NF** – Non-use, no fire; **PB** – Prescribed burning; **PG** – Prescribed grazing with adequate recovery opportunity; **RS** – Range seeding followed by prescribed grazing.

State 1
Big Bluestem/Switchgrass (HCPC)

Community 1.1
Big Bluestem/Switchgrass (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 and is well suited for grazing by domestic livestock and 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 but were a very important natural effect on this site. The potential vegetation is about 70% grasses and grass-like, 10% forbs, 10% shrubs and 10% trees of the total air-dry weight. Tall warm season grasses dominate this community. The major grasses include big bluestem, switchgrass, Indiangrass, prairie cordgrass and little bluestem. Other grasses and grass-like occurring on the community include western wheatgrass, green needlegrass, northern reedgrass, Canada wildrye, sedges and rush species. Key forbs include American licorice, sunflower, aster, goldenrod and mint. Shrubs and tree species that recover quickly after fire events are juneberry, western snowberry, willows, boxelder, hawthorn, chokecherry and cottonwood. This plant community is diverse, stable, productive and is well adapted to the Northern Great Plains. The high water table supplies much of the moisture for plant growth. 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 a high tolerance to a fluctuating water table. Run-off from adjacent sites and moderate or high available water capacity provides a favorable soil-water-plant relationship.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	3340	3875	4350
Shrub/Vine	220	375	550
Tree	220	375	550
Forb	220	375	550
Total	4000	5000	6000

Figure 5. Plant community growth curve (percent production by month).
 ND5304, Missouri Coteau, warm-season dominant, cool-season sub-dominant.. Warm-season dominant, cool-season sub-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	1	5	20	38	25	8	3	0	0	0

State 2
Kentucky Bluegrass/Spikerush/Rush

Community 2.1
Kentucky Bluegrass/Spikerush/Rush

This plant community results from continuous grazing without adequate recovery periods between each grazing event during the growing season. Recognition of this plant community will enable the land user to implement key management actions before a significant ecological threshold is crossed. Kentucky bluegrass and western wheatgrass are the dominant species. Big bluestem, green needlegrass, switchgrass and Indiangrass are greatly reduced. Forb species would include asters, goldenrod, cudweed sagewort, heath aster, wavyleaf thistle and western yarrow. Invasive forbs are sweetclover, dandelion, and possibly Canada thistle. Shrub and tree regeneration have completely disappeared leaving little to no shrub understory beneath scattered large trees, when present. Plant diversity and production have been reduced. The soil remains stable. Water cycle, nutrient cycle and energy flow is slightly reduced but continues to adequately function. Water table tends to rise closer to the surface, which favors an increase of Baltic rush and common spikerush.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2030	2610	3165
Forb	145	225	325
Shrub/Vine	25	90	155
Tree	0	75	155
Total	2200	3000	3800

Figure 7. Plant community growth curve (percent production by month). ND5301, Missouri Coteau, cool-season dominant.. Cool-season dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	8	24	45	10	3	5	2	0	0

State 3 Kentucky Bluegrass Sod/Baltic Rush/Forbs

Community 3.1 Kentucky Bluegrass Sod/Baltic Rush/Forbs

This plant community developed with heavy continuous grazing without adequate recovery periods between grazing events. Kentucky bluegrass and Baltic rush, along with fowl bluegrass and common spikerush dominate the community. Kentucky bluegrass can develop into a thick sod. Prairie cordgrass, little bluestem, Indiangrass, green needlegrass, northern reedgrass and porcupine grass have been removed. Big bluestem, switchgrass, and western wheatgrass may persist in trace amounts, greatly reduced in vigor, and in some instances, not readily seen. Western yarrow, dandelion and goldenrod have increased. Key shrubs have been severely reduced in vigor or removed completely. A few scattered old decadent trees may remain. This plant community is resistant to change due to grazing tolerance of Kentucky bluegrass. Production and diversity is significantly reduced when compared to the HCPC. Loss or reduction of cool season grasses, tall warm season grasses, and shrub component have negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly due to the massive shallow root system “root pan”, characteristic of sodbound Kentucky bluegrass. The water table has risen closer to the surface that greatly favors the rush species. It will take a very long time to restore this plant community back to the HCPC with improved management. Renovation would be very costly.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1470	1898	2285
Forb	110	288	500
Shrub/Vine	20	69	120
Tree	0	46	95
Total	1600	2301	3000

Figure 9. Plant community growth curve (percent production by month). ND5301, Missouri Coteau, cool-season dominant.. Cool-season dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	8	24	45	10	3	5	2	0	0

State 4 Kentucky Bluegrass/Western Snowberry, Excessive Litter

Community 4.1

Kentucky Bluegrass/Western Snowberry, Excessive Litter

This plant community develops after an extended period (10 to 20 years or more) of non-use and exclusion of fire. Eventually litter levels become high enough to reduce native grass vigor, diversity and density. Kentucky bluegrass flourishes in this environment and may dominate this plant community. Common forbs include Canada goldenrod, American licorice, cudweed sagewort, and dogbane. Invading forbs are Canada thistle, sweetclover and dandelion. Shrubs such as western snowberry, willow, juneberry, rose, and chokecherry will increase in density and cover. Trees species such as green ash, boxelder, cottonwood, peachleaf willow and others may produce a dense canopy cover in some areas, shading out the grass understory. This plant community is resistant to change without prescribed grazing and 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.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2535	2760	3050
Tree	75	440	850
Forb	195	400	650
Shrub/Vine	195	400	650
Total	3000	4000	5200

Figure 11. Plant community growth curve (percent production by month). ND5302, Missouri Coteau, cool-season dominant, warm-season sub-dominant.. Cool-season dominant, warm-season sub-dominant..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3	7	23	42	15	5	4	1	0	0

Additional community tables

Table 9. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Warm-Season Grasses			2000–2500	
	big bluestem	ANGE	<i>Andropogon gerardii</i>	1250–2250	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	250–1000	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	250–750	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–500	–
	prairie cordgrass	SPPE	<i>Spartina pectinata</i>	0–250	–
2	Mid Cool-Season Grasses			250–500	
	northern reedgrass	CASTI3	<i>Calamagrostis stricta ssp. inexpansa</i>	150–250	–
	porcupinegrass	HESP11	<i>Hesperostipa spartea</i>	0–150	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	0–150	–
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	100–150	–
3	Other Native Grasses			150–250	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–250	–
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	50–100	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	50–100	–

	slender wheatgrass	ELTRS	<i>Elymus trachycaulus ssp. subsecundus</i>	50–100	–
4	Grass-Likes			150–250	
	Pennsylvania sedge	CAPE6	<i>Carex pensylvanica</i>	100–150	–
	common spikerush	ELPA3	<i>Eleocharis palustris</i>	50–100	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	50–100	–
	shortbeak sedge	CABR10	<i>Carex brevior</i>	50–100	–
	woolly sedge	CAPE42	<i>Carex pellita</i>	50–100	–
Forb					
6	Forbs			250–500	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0–150	–
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	50–100	–
	American licorice	GLLE3	<i>Glycyrrhiza lepidota</i>	50–100	–
	Maximilian sunflower	HEMA2	<i>Helianthus maximiliani</i>	50–100	–
	mint	MENTH	<i>Mentha</i>	50–100	–
	Canada goldenrod	SOCA6	<i>Solidago canadensis</i>	50–100	–
	white prairie aster	SYFA	<i>Symphotrichum falcatum</i>	50–100	–
	meadow zizia	ZIAP	<i>Zizia aptera</i>	50–100	–
	American vetch	VIAM	<i>Vicia americana</i>	0–50	–
	catnip	NECA2	<i>Nepeta cataria</i>	0–50	–
	cinquefoil	POTEN	<i>Potentilla</i>	0–50	–
	wood lily	LIPH	<i>Lilium philadelphicum</i>	0–50	–
	anemone	ANEMO	<i>Anemone</i>	0–50	–
	dogbane	APOCY	<i>Apocynum</i>	0–50	–
	Flodman's thistle	CIFL	<i>Cirsium flodmanii</i>	0–50	–
	northern bedstraw	GABO2	<i>Galium boreale</i>	0–50	–
	downy gentian	GEPU5	<i>Gentiana puberulenta</i>	0–50	–
Shrub/Vine					
7	Shrubs			250–500	
	willow	SALIX	<i>Salix</i>	100–250	–
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	100–250	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0–250	–
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	50–150	–
	chokecherry	PRVI	<i>Prunus virginiana</i>	50–150	–
	Missouri gooseberry	RIMI	<i>Ribes missouriense</i>	50–100	–
	prairie rose	ROAR3	<i>Rosa arkansana</i>	50–100	–
	false indigo bush	AMFR	<i>Amorpha fruticosa</i>	50–100	–
	redosier dogwood	COSE16	<i>Cornus sericea</i>	50–100	–
	American plum	PRAM	<i>Prunus americana</i>	0–50	–
Tree					
8	Trees			250–500	
	Tree	2TREE	<i>Tree</i>	0–150	–
	green ash	FRPE	<i>Fraxinus pennsylvanica</i>	50–150	–
	slip elm	BODEM	<i>Ulmus americana</i>	0–150	–

	plains cottonwood	FODEM	<i>Populus deltoides ssp. monilifera</i>	0-150	-
	peachleaf willow	SAAM2	<i>Salix amygdaloides</i>	50-150	-
	American elm	ULAM	<i>Ulmus americana</i>	0-50	-
	boxelder	ACNE2	<i>Acer negundo</i>	0-50	-

Table 10. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Warm-Season Grasses			90-240	
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0-150	-
	big bluestem	ANGE	<i>Andropogon gerardii</i>	60-150	-
	switchgrass	PAVI2	<i>Panicum virgatum</i>	30-90	-
	prairie cordgrass	SPPE	<i>Spartina pectinata</i>	0-90	-
2	Mid Cool-Season Grasses			90-420	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	60-300	-
	northern reedgrass	CASTI3	<i>Calamagrostis stricta ssp. inexpansa</i>	30-90	-
	green needlegrass	NAVI4	<i>Nassella viridula</i>	0-60	-
	porcupinegrass	HESP11	<i>Hesperostipa spartea</i>	0-30	-
3	Other Native Grasses			90-240	
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	30-120	-
	slender wheatgrass	ELTRS	<i>Elymus trachycaulus ssp. subsecundus</i>	30-120	-
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-90	-
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	30-90	-
4	Grass-Likes			450-750	
	common spikerush	ELPA3	<i>Eleocharis palustris</i>	150-450	-
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	30-120	-
	Pennsylvania sedge	CAPE6	<i>Carex pennsylvanica</i>	30-120	-
	shortbeak sedge	CABR10	<i>Carex brevior</i>	30-90	-
	woolly sedge	CAPE42	<i>Carex pellita</i>	30-90	-
5	Non-Native Grasses			300-750	
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	150-750	-
	smooth brome	BRIN2	<i>Bromus inermis</i>	0-450	-
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0-150	-
Forb					
6	Forbs			150-300	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-150	-
	Canada thistle	CIAR4	<i>Cirsium arvense</i>	0-150	-
	sweetclover	MELIL	<i>Melilotus</i>	0-150	-
	Canada goldenrod	SOCA6	<i>Solidago canadensis</i>	30-90	-
	common dandelion	TAOF	<i>Taraxacum officinale</i>	30-90	-
	Forb, annual	2FA	<i>Forb, annual</i>	0-90	-
	dogbane	APOCY	<i>Apocynum</i>	30-90	-
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	30-60	-

	western yellow	ACWIC	<i>Arnica montana</i> var. <i>occidentalis</i>	30-60	-
	Flodman's thistle	CIFL	<i>Cirsium flodmanii</i>	0-60	-
	American licorice	GLLE3	<i>Glycyrrhiza lepidota</i>	0-60	-
	curlycup gumweed	GRSQ	<i>Grindelia squarrosa</i>	0-60	-
	Maximilian sunflower	HEMA2	<i>Helianthus maximiliani</i>	30-60	-
	yellow salsify	TRDU	<i>Tragopogon dubius</i>	0-60	-
	cocklebur	XANTH2	<i>Xanthium</i>	0-60	-
	white prairie aster	SYFA	<i>Symphotrichum falcatum</i>	30-60	-
	black medick	MELU	<i>Medicago lupulina</i>	0-60	-
	mint	MENTH	<i>Mentha</i>	0-30	-
	catnip	NECA2	<i>Nepeta cataria</i>	0-30	-
	cinquefoil	POTEN	<i>Potentilla</i>	0-30	-
	northern bedstraw	GABO2	<i>Galium boreale</i>	0-30	-
	anemone	ANEMO	<i>Anemone</i>	0-30	-
Shrub/Vine					
7	Shrubs			30-150	
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	0-120	-
	prairie rose	ROAR3	<i>Rosa arkansana</i>	30-90	-
	willow	SALIX	<i>Salix</i>	0-60	-
	American plum	PRAM	<i>Prunus americana</i>	0-60	-
	Missouri gooseberry	RIMI	<i>Ribes missouriense</i>	0-60	-
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0-30	-
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	0-30	-
Tree					
8	Trees			0-150	
	Tree	2TREE	<i>Tree</i>	0-90	-
	green ash	FRPE	<i>Fraxinus pennsylvanica</i>	0-90	-
	plains cottonwood	PODEM	<i>Populus deltoides ssp. monilifera</i>	0-90	-
	peachleaf willow	SAAM2	<i>Salix amygdaloides</i>	0-60	-
	American elm	ULAM	<i>Ulmus americana</i>	0-30	-
	boxelder	ACNE2	<i>Acer negundo</i>	0-30	-

Table 11. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Warm-Season Grasses			0-69	
	big bluestem	ANGE	<i>Andropogon gerardii</i>	0-69	-
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0-46	-
2	Mid Cool-Season Grasses			23-115	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	23-115	-
3	Other Native Grasses			0-69	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-69	-
4	Grass-Likes			69-460	
	common spikerush	ELPA3	<i>Eleocharis palustris</i>	23-230	-

	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0–115	–
	shortbeak sedge	CABR10	<i>Carex brevior</i>	0–23	–
5	Non-Native Grasses			460–920	
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	230–805	–
	smooth brome	BRIN2	<i>Bromus inermis</i>	0–575	–
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–115	–
Forb					
6	Forbs			115–460	
	Forb, perennial	2FP	<i>Forb, perennial</i>	23–230	–
	Canada thistle	CIAR4	<i>Cirsium arvense</i>	0–230	–
	sweetclover	MELIL	<i>Melilotus</i>	0–230	–
	cocklebur	XANTH2	<i>Xanthium</i>	0–184	–
	Forb, annual	2FA	<i>Forb, annual</i>	23–115	–
	Canada goldenrod	SOCA6	<i>Solidago canadensis</i>	23–115	–
	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	23–115	–
	dogbane	APOCY	<i>Apocynum</i>	23–92	–
	Flodman's thistle	CIFL	<i>Cirsium flodmanii</i>	23–92	–
	common dandelion	TAOF	<i>Taraxacum officinale</i>	23–92	–
	yellow salsify	TRDU	<i>Tragopogon dubius</i>	0–69	–
	curlycup gumweed	GRSQ	<i>Grindelia squarrosa</i>	0–69	–
	white prairie aster	SYFA	<i>Symphyotrichum falcatum</i>	23–46	–
	black medick	MELU	<i>Medicago lupulina</i>	0–46	–
	cinquefoil	POTEN	<i>Potentilla</i>	0–46	–
Shrub/Vine					
7	Shrubs			23–115	
	prairie rose	ROAR3	<i>Rosa arkansana</i>	23–69	–
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	0–69	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0–23	–
	Missouri gooseberry	RIMI	<i>Ribes missouriense</i>	0–23	–
Tree					
8	Trees			0–92	
	Tree	2TREE	<i>Tree</i>	0–92	–
	boxelder	ACNE2	<i>Acer negundo</i>	0–23	–
	green ash	FRPE	<i>Fraxinus pennsylvanica</i>	0–23	–
	plains cottonwood	PODEM	<i>Populus deltoides ssp. monilifera</i>	0–23	–
	peachleaf willow	SAAM2	<i>Salix amygdaloides</i>	0–23	–
	American elm	ULAM	<i>Ulmus americana</i>	0–23	–

Table 12. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Warm-Season Grasses			40–160	

	big bluestem	ANGE	<i>Andropogon gerardii</i>	40–160	–
	little bluestem	SCSC	<i>Schizachyrium scoparium</i>	0–80	–
	prairie cordgrass	SPPE	<i>Spartina pectinata</i>	0–40	–
	switchgrass	PAVI2	<i>Panicum virgatum</i>	0–40	–
2	Mid Cool-Season Grasses			40–200	
	western wheatgrass	PASM	<i>Pascopyrum smithii</i>	40–200	–
	green needlegrass	NAVI4	<i>Nassella viridula</i>	0–120	–
	northern reedgrass	CASTI3	<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>	0–40	–
	porcupinegrass	HESP11	<i>Hesperostipa spartea</i>	0–40	–
3	Other Native Grasses			0–160	
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	0–120	–
	slender wheatgrass	ELTR7	<i>Elymus trachycaulus</i>	0–80	–
	slender wheatgrass	ELTRS	<i>Elymus trachycaulus</i> ssp. <i>subsecundus</i>	0–80	–
	Grass, perennial	2GP	<i>Grass, perennial</i>	0–80	–
4	Grass-Likes			80–280	
	Pennsylvania sedge	CAPE6	<i>Carex pennsylvanica</i>	0–200	–
	common spikerush	ELPA3	<i>Eleocharis palustris</i>	40–160	–
	shortbeak sedge	CABR10	<i>Carex brevior</i>	0–120	–
	woolly sedge	CAPE42	<i>Carex pellita</i>	0–80	–
	Grass-like (not a true grass)	2GL	<i>Grass-like (not a true grass)</i>	0–80	–
5	Non-Native Grasses			600–1200	
	Kentucky bluegrass	POPR	<i>Poa pratensis</i>	200–1200	–
	smooth brome	BRIN2	<i>Bromus inermis</i>	0–800	–
	cheatgrass	BRTE	<i>Bromus tectorum</i>	0–200	–
Forb					
6	Forbs			200–600	
	sweetclover	MELIL	<i>Melilotus</i>	0–400	–
	Canada thistle	CIAR4	<i>Cirsium arvense</i>	0–280	–
	Canada goldenrod	SOCA6	<i>Solidago canadensis</i>	40–200	–
	Forb, annual	2FA	<i>Forb, annual</i>	40–160	–
	Forb, perennial	2FP	<i>Forb, perennial</i>	40–160	–
	American licorice	GLLE3	<i>Glycyrrhiza lepidota</i>	40–160	–
	white prairie aster	SYFA	<i>Symphyotrichum falcatum</i>	40–120	–
	common dandelion	TAOF	<i>Taraxacum officinale</i>	40–120	–
	yellow salsify	TRDU	<i>Tragopogon dubius</i>	40–120	–
	dogbane	APOCY	<i>Apocynum</i>	40–120	–
	Maximilian sunflower	HEMA2	<i>Helianthus maximiliani</i>	40–120	–
	sleepydaisy	XANTH	<i>Xanthisma</i>	0–80	–
	black medick	MELU	<i>Medicago lupulina</i>	0–80	–
	mint	MENTH	<i>Mentha</i>	40–80	–
	catnip	NECA2	<i>Nepeta cataria</i>	0–80	–
	cinquefoil	POTEN	<i>Potentilla</i>	40–80	–

	western yarrow	ACMIO	<i>Achillea millefolium var. occidentalis</i>	40–80	–
	Flodman's thistle	CIFL	<i>Cirsium flodmanii</i>	40–80	–
	northern bedstraw	GABO2	<i>Galium boreale</i>	40–80	–
	downy gentian	GEPU5	<i>Gentiana puberulenta</i>	0–40	–
	curlycup gumweed	GRSQ	<i>Grindelia squarrosa</i>	0–40	–
	American vetch	VIAM	<i>Vicia americana</i>	0–40	–
	meadow zizia	ZIAP	<i>Zizia aptera</i>	0–40	–
	wood lily	LIPH	<i>Lilium philadelphicum</i>	0–40	–
Shrub/Vine					
7	Shrubs			200–600	
	willow	SALIX	<i>Salix</i>	0–400	–
	western snowberry	SYOC	<i>Symphoricarpos occidentalis</i>	80–400	–
	American plum	PRAM	<i>Prunus americana</i>	40–240	–
	prairie rose	ROAR3	<i>Rosa arkansana</i>	40–200	–
	Missouri gooseberry	RIMI	<i>Ribes missouriense</i>	0–160	–
	chokecherry	PRVI	<i>Prunus virginiana</i>	40–120	–
	false indigo bush	AMFR	<i>Amorpha fruticosa</i>	0–120	–
	redosier dogwood	COSE16	<i>Cornus sericea</i>	0–120	–
	Saskatoon serviceberry	AMAL2	<i>Amelanchier alnifolia</i>	0–80	–
	Subshrub (<.5m)	2SUBS	<i>Subshrub (<.5m)</i>	0–40	–
Tree					
8	Trees			80–800	
	green ash	FRPE	<i>Fraxinus pennsylvanica</i>	80–400	–
	plains cottonwood	PODEM	<i>Populus deltoides ssp. monilifera</i>	40–400	–
	peachleaf willow	SAAM2	<i>Salix amygdaloides</i>	40–200	–
	Tree	2TREE	<i>Tree</i>	0–200	–
	boxelder	ACNE2	<i>Acer negundo</i>	0–200	–
	American elm	ULAM	<i>Ulmus americana</i>	0–80	–

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 not a principal factor limiting herbage production on this site. The site is dominated by soils in hydrologic groups C and D, with localized areas in groups A and B. Infiltration varies from slow to moderate, and runoff potential varies from negligible to medium depending on soil hydrologic group and ground cover. 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 variety of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

Wood products

This site has potential for wood products from trees and shrubs.

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.

Other references

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USDA, NRCS, Various Published Soil Surveys.

Contributors

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Jeff Printz/Stan Boltz

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	01/17/2012
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):** 5% or less.

- 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 aggregate stability ratings should typically be 5 to 6, normally 6. 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.

- 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 warm-season rhizomatous grasses >>

Sub-dominant: Mid cool-season grasses >

Other: Mid warm-season bunchgrasses = forbs = shrubs = trees > grass-likes

Additional: Due to differing root structure and distribution, Kentucky bluegrass and smooth brome grass 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 annual-production):** Representative value = 5000 lbs./ac air dry with a range of 4000 to 6000 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 brome grass, Russian olive, Siberian elm

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.
