Ecological site group CEAP-ESG53B-1
Claypan Upland

Last updated: 04/11/2024
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Key Characteristics

None specified

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.

Physiography

Landscape Positions: Till Plain, Lake Plain, Swale, Terrace, Outwash Plain, Delta Plain
Slope (percent): 0 – 9

Climate

The following climate information is excerpted from the Loamy Upland Ecological Site Description and characterizes the climate in MLRA 53B. “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 hourannually, 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.”

Soil features

Soil Depth: Moderately Deep to Deep
Parent Material Kind: Alluvium, Residuum
Parent Material Origin: Mixed
Surface Texture: Loam, Silty Clay Loam, Fine Sandy Loam
Surface Texture Modifier: None
Subsurface Texture Group: Loamy to Clayey
Drainage Class: Moderately Well to Well
Permeability Class: Very Slow to Moderate
Chemistry: Moderate to Highly Sodic
Available Water Capacity: 1 – 5 inches

Vegetation dynamics

Community Class 1.1 in the State and Transition Model (Figure 2) was derived from the reference communities in the ecological site descriptions correlated to this ecological site class. The reference community for this ecological site class has an annual production of about 1633 lbs/ac/yr dominated by western wheatgrass, blue grama, needleandthread, green needlegrass, slender wheatgrass, prairie sandreed, threadleaf sedge, and needleleaf sedge. With heavy continuous grazing the site is likely to transition to a shortgrass community dominated by blue grama and buffalograss. Mechanical renovation and long term prescribed grazing may return the site to the reference state.

With invasion or introduction of non-native species such as Kentucky bluegrass, the site will transition to a Native -- Non-Native Herbaceous State. Community 3.1 is dominated by native species. With the introduction of non-native species, non-use and no-fire, the native dominated community (3.1) will transition to a non-native dominated community (3.2). With long term prescribed grazing and regular natural or prescribed burning, the site may return to the native dominated community class 2.1. The site will not transition from the Native -- Non-Native Herbaceous State back to the Native Herbaceous State.

Plowing and tillage convert the site to a Planted Herbaceous State. Cropping and harvesting of annual and perennial crops maintain a Cropland community class (Community Class 4.1). When seeded to native perennial grasses, the site transitions to a Native Planted community class (Community Class 4.2). Native planting species shown are those
recommended for the Conservation Reserve Program (CRP).

Major Land Resource Area

MLRA 053B
Central Dark Brown Glaciated Plains

Subclasses

- R053BY002ND–Claypan
- R053BY013ND–Thin Claypan
- R053BY026ND–Sandy Claypan

Correlated Map Unit Components

23991796, 23992045, 23992091, 23991795, 23992041, 23992019, 24334176, 24334182, 24334191, 24333609, 24333616, 24333952, 24333965, 24333972, 24333608, 24333618, 24334159, 24334164, 24334174, 24334181, 23996693, 23997593, 23997287, 23997429, 23997754, 23997592, 23997243, 23997553, 24337417, 24337429, 24337435, 24337441, 24337448, 24337222, 24336848, 24337181, 24337231, 24337239, 24336849, 24337434, 24336653, 24002938, 24003299, 24003012, 24003021, 24003030, 24002937, 24003298, 24003235, 24003689, 24004543, 24003688, 24340462, 24340474, 24340351, 24341958, 24341966, 24341783, 24341732, 24341740, 24341794, 24341799, 24345038, 24345032, 24344335, 24345031, 24344330, 24344087, 24348397, 24348401, 24348064, 24348070, 24348290, 24348400, 24348063, 24348071, 24347934, 24348396, 24018757, 24018799, 24019138, 24018756, 24020991, 24021330, 24021339, 24021255, 24020990, 24024518, 24025385, 24024517, 24025071, 24025728, 24026645, 24026659, 24025783, 24025727, 24026644, 24354206, 24354080, 24354205, 24693249, 24694003, 24694490, 24694499, 24694508, 24693423, 24693545, 24694002, 24694141, 24693244, 24693420, 24693542, 24693531, 24696088, 24695742, 24695972, 24695748, 24696086, 24702445, 24702054, 24702243, 24702444, 24702240, 24702147, 24703221, 24703731, 24703545, 24703583, 24703204, 24703213, 24703742, 24703227, 24703544, 24806204, 24806478, 24806487, 24806765, 24806433, 24805762, 24805828, 24806203, 24806712, 24805759, 24805825, 24806633, 24805819, 24810554, 24810238, 24810538, 24810489, 24814537, 24814620, 24814396, 24814333, 24814494, 24814536, 24813722, 24817397, 24817217, 24817226, 24817172, 24817396

Stage

Provisional

Contributors

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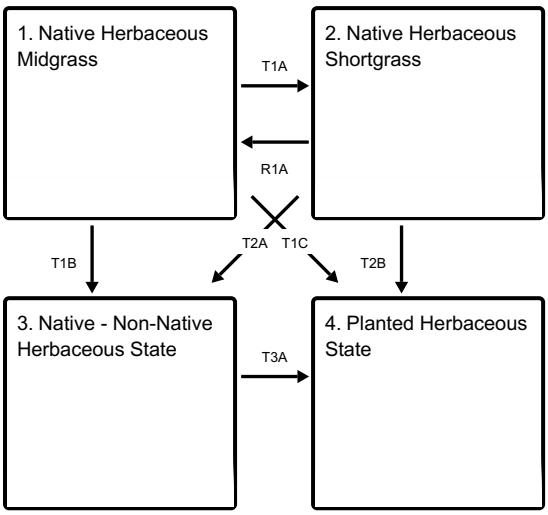
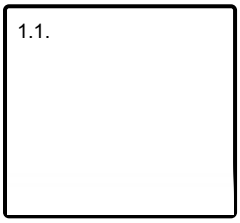
State and transition model

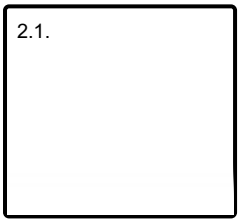
Ecosystem states



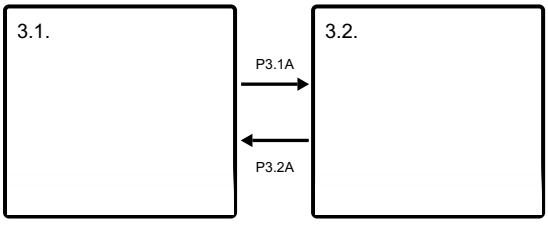
State 1 submodel, plant communities



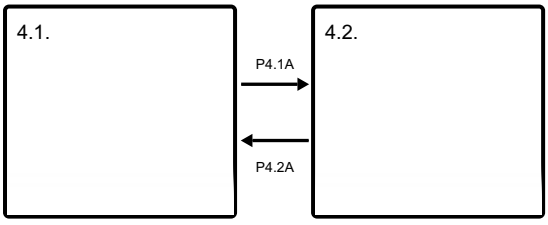
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1
Native Herbaceous Midgrass

Community 1.1

Spring Rhizomatous Grass, Spring Midgrass, Summer Shortgrass, Spring Perennial Forb, Spring Perennial Grasslike, Summer Perennial Forb, Summer Tallgrass 1633 lbs/ac

State 2
Native Herbaceous Shortgrass

Community 2.1

Ecological Site Community: Summer Shortgrass, Summer Stoloniferous Grass, Summer Perennial Grasslike, Summer Rhizomatous Grass, Spring Perennial Grasslike, Spring Shortgrass, Spring Rhizomatous Grass, Evergreen Subshrub 800 lbs/ac

State 3
Native - Non-Native Herbaceous State

Community 3.1

Spring Rhizomatous Grass, Spring Rhizomatous Grass(I), Spring Midgrass, Spring Perennial Grasslike, Summer Shortgrass, Evergreen Subshrub, Summer Perennial Forb 2808 lbs/ac

Community 3.2

Spring Rhizomatous Grass(I), Summer Perennial Forb, Spring Midgrass(I), Spring Rhizomatous Grass, Summer Rhizomatous Grass, Spring Midgrass, Summer Annual Forb 2541 lbs/ac

Pathway P3.1A
Community 3.1 to 3.2

Non-use and no fire

Pathway P3.2A
Community 3.2 to 3.1

Prescribed Burning, Prescribed Grazing, Range Planting

State 4
Planted Herbaceous State

Community 4.1

Wheat, Corn, Soybeans, Canola, Alfalfa Hay, Dry Beans

Community 4.2

Native Planting: Slender Wheatgrass, Western Wheatgrass, Little Bluestem, Blue Grama, Forb or legume

Pathway P4.1A
Community 4.1 to 4.2

Range Planting

Pathway P4.2A
Community 4.2 to 4.1

Transition T1A
State 1 to 2

Heavy continuous grazing and/or continuous early spring grazing

Transition T1B
State 1 to 3

Invasion or Introduction of Non Native Species, Non-Use, and No Fire

Transition T1C
State 1 to 4

Tillage and Planting

Restoration pathway R1A
State 2 to 1

Mechanical renovation to break sod with prescribed grazing

Transition T2A
State 2 to 3

Introduction of Non-Native Species, Non-Use, and No Fire

Transition T2B
State 2 to 4

Tillage and Planting

Transition T3A
State 3 to 4

Tillage and Planting

Citations