

Ecological site group DX035X01HESG01

Black Mesa-Navajo Mtn-Saline/Sodic Soils

Last updated: 09/01/2021
Accessed: 04/19/2024

Key Characteristics

- Black Mesa Navajo Mountain
- Saline/Sodic soils

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

This site occurs in the drainage or bottom positions on the landscape that have the potential to flood following storm events. This are deep to very deep, saline-sodic soils on terraces, valley floors, alluvial flats and swales that benefit from run-in moisture from adjacent uplands. The soil surface texture generally range from clay loam to clayey textures, but it does not include soils with shrink/swell clays at the surface. The soils are saline-sodic.

Climate

Winter summer moisture ratios range from 70:30 to 60:40. Late spring is usually the driest period, and early fall moisture can be sporadic. Summer rains fall from June through September; moisture originates in the Gulf of Mexico and creates convective, usually brief, intense thunderstorms. Cool season moisture from October through May tends to be frontal; it originates in the Pacific and the Gulf of California and falls in widespread storms with longer duration and lower intensity. Precipitation generally comes as snow from December through February. Accumulations above 12 inches are not common but can occur. Snow usually lasts for 3-4 days, but can persist much longer. Summer daytime temperatures are commonly 95-100 F and, on occasion, exceed 105 F. Winter air temperatures can regularly go below 10 F and have been recorded below -20 F.

Soil features

Soils are deep to very deep and well-drained. They are formed from alluvium derived from sandstone, shale, and siltstone. The soil surface texture generally range from loam to silty clay loams, but some sites may have clayey textures. Subsurface horizon textures are generally clay loam, silty clay loam, sandy clay, and may have stratified loamy soils. The soil is slightly to strongly effervescent in the surface and subsurface profile. Available water capacity is high. Soils are moderately to strongly alkaline (pH 7.9-8.6) and are affected by soluble salts.

Vegetation dynamics

The dominant aspect of this site is a grass-shrub mix dominated by western wheatgrass, alkali sacaton, fourwing saltbush with scattered black greasewood. Other important grass species include Indian ricegrass, James' galleta, and squirreltail. The plant species most likely to increase or invade on this site are cheatgrass, Russian thistle, annual weeds, broom snakeweed, Greene rabbitbrush, rubber rabbitbrush, and black greasewood.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XB203AZ–Clay Loam Upland 6-10" p.z. Saline
- R035XB211AZ–Loamy Wash 6-10" p.z. Saline-Sodic
- R035XC309AZ–Clay Loam Terrace 10-14" p.z. Saline-Sodic
- R035XC326AZ–Sandy Loam Upland 10-14" p.z. Saline

Stage

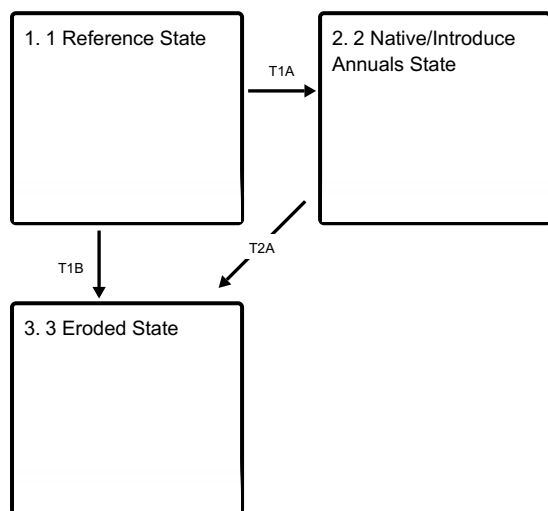
Provisional

Contributors

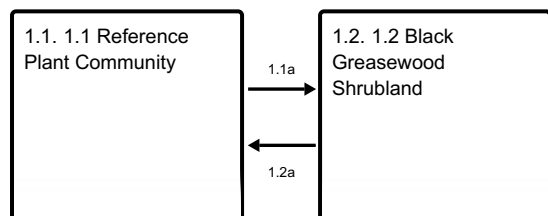
Keith Crossland, Vic Parslow, Jeff Fenton, Harry Hosler

State and transition model

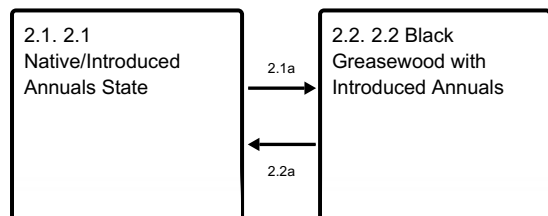
Ecosystem states



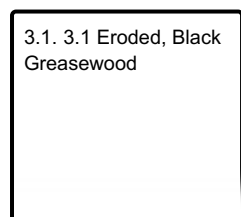
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1

1 Reference State

The general aspect of the Clay Loam Terrace, Saline-Sodic site is a grass-shrub mix characterized by alkali sacaton, western wheatgrass, fourwing saltbush and greasewood.

Community 1.1

1.1 Reference Plant Community

The dominant aspect of this site is a grass-shrub mix dominated by western wheatgrass, alkali sacaton, fourwing saltbush with scattered black greasewood. Other important grass species include Indian ricegrass, James' galleta, and squirreltail. The plant species most likely to increase or invade on this site are cheatgrass, Russian thistle, annual weeds, broom snakeweed, Greene rabbitbrush, rubber rabbitbrush, and black greasewood. Continuous grazing and drought conditions will decrease preferred herbaceous cover (cool season grasses), which is replaced by lower forage value grasses, forbs, and shrubs. A decrease in cool season grasses and increase of bare ground favor the establishment of annual weeds and shrubby species.

Community 1.2

1.2 Black Greasewood Shrubland

The dominant aspect of this plant community is a greasewood shrubland with lesser amounts of fourwing saltbush and rabbitbrush. The understory is dominated by alkali sacaton, galleta along with increased annuals such as annual wheatgrass, mustards, buckwheats and globemallow.

Pathway 1.1a

Community 1.1 to 1.2

Unmanaged grazing, prolong drought

Pathway 1.2a

Community 1.2 to 1.1

Prescribed grazing/No grazing, favorable periods of precipitation.

State 2

2 Native/Introduce Annuals State

The plant communities are shrub dominated with a decrease of perennials grasses and increase of annuals, especially introduced annuals such as cheatgrass, filaree and Russian thistle. This state is a result of a degraded biotic function where perennial grasses are reduced and compete with annuals for resources. There are seasonal shifts in annual production, which results in moderate to high amounts of bare ground during dry periods.

Community 2.1

2.1 Native/Introduced Annuals State

This plant community still has a shrub canopy dominated by black greasewood and scattered fourwing, rabbitbrush and snakeweed. Perennial grasses are in decline with lesser amounts of alkali sacaton, galleta, squirreltail and western wheatgrass. Most perennial grasses occur with shrub canopies. Native and non-native annuals are present and well established across the site. Introduced annuals range from 2-15% by composition.

Community 2.2

2.2 Black Greasewood with Introduced Annuals

This plant community is dominated by black greasewood with annuals, both native and non-natives. There is few perennial grasses with most occurring in patches or within shrub canopies. Introduced annuals range from 2-15% by composition.

Pathway 2.1a

Community 2.1 to 2.2

Unmanaged continuous grazing and/or surface disturbances, severe drought

Pathway 2.2a
Community 2.2 to 2.1

Prescribed grazing with rest, favorable precipitation

State 3
3 Eroded State

This state is characterized by a loss of hydrologic function along with a degraded biotic function. The site no longer benefits from overland run-in moisture from uplands. Deep incised channels and/or active gullies have changed the site's ability to hold and capture run-in moisture. This site gets most of its moisture through precipitation.

Community 3.1
3.1 Eroded, Black Greasewood

This site is characterized by active gullies and deep incised channels with a black greasewood plant community. The dominant shrub is greasewood with an understory of annuals and very few scattered alkali sacaton and galleta. Common annuals include annual wheatgrass, globemallow, springparsley, stickseed, tansymustard, butterwort, goosefoots, sixweeks fescue, cheatgrass, filaree and Russian thistle.

Transition T1A
State 1 to 2

Introduction of non-native annuals, prolonged severe droughts, unmanaged continuous grazing.

Transition T1B
State 1 to 3

Prolonged severe droughts, unmanaged continuous grazing or frequent soil disturbance, loss of perennial grass cover, invasion of non-native annuals.

Transition T2A
State 2 to 3

Prolonged severe droughts, unmanaged continuous grazing or frequent soil disturbance, loss of perennial grass cover.

Citations