

Ecological site group DX035X01GESG19

Chinle Valley Shale or Clayey Shallow

Last updated: 10/12/2022
Accessed: 05/02/2024

Key Characteristics

- Chinle Valley
- Shale or clayey
- Upland
- Moderately deep to very deep

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 on footslopes, backslopes and canyon sides over shale bedrock, gently sloping plains, plateaus or fan remnants. Also occurs on summits and footslopes of mesas and buttes, hills and escarpments, and pediments. Slopes generally range from 0 to 60 percent. Elevations are generally 3500 to 6000 ft.

This group occurs in an upland position. It neither benefits from run-in moisture nor sustains excessive runoff unless denuded of its vegetation.

Climate

Area has a very dry and windy climate that is hot in the summer and cold in the winter. Average annual precipitation is from 6 to 10 inches. A slight majority of the precipitation arrives during the late fall, winter, and early spring. This winter season moisture originates in the Pacific Ocean and arrives as rain, or sometimes snow, during widespread frontal storms of generally low intensity. The majority of the snow falls from December through February, but rarely lasts more than a few days. The driest period is from late May to early July. Summer rains occur from July through September during brief intense local thunderstorms. The rain is sporadic in intensity and location.

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. Mean annual air temperature ranges from 46 to 52 degrees Fahrenheit. Large fluctuations in daily temperatures are typical.

Windy conditions are common year round with the strongest most frequently in the spring.

Soil features

Soils in this group are shallow and well drained to shale parent material. The surface layer is clay, silty clay, or clay loam. The substratum is clay or silty clay. Permeability is very slow. Available water capacity is moderate. Salinity is low to high. The water erosion hazard is moderate to severe and the wind erosion hazard is slight. Effective rooting depth is typically shallow into the fractured parent material. Soils are moderately alkaline (pH 7.4-8.4). Soil moisture regime is typical aridic or ustic aridic, and the soil temperature regime is mesic.

Vegetation dynamics

Large gaps between plants in relic areas indicate that this site did not historically burn often enough for fire to strongly influence the ecological processes of this site. Until further research indicates otherwise, this ecological site description will not include fire as a disturbance in the reference state. Other disturbances such as brush

treatments, invasive species, and OHV use, could reduce the resilience of the reference community, creating risk.

This group provides only marginal livestock grazing due to the small amount forage available and the shortage of drinking water. However, the plants present are easily accessible and relatively nutritious. Improper grazing practices can cause any grasses, and perennial forbs present to be grazed out. Improper grazing coupled with drought can also remove the mat saltbush and other shrubs. Once the native community is lost on these soils it is very difficult to get desirable vegetation back.

Halogeton and Russian thistle are most likely to invade this site. At this time, cheatgrass is not readily invading these sites likely due the chemical properties of the soil. Drought, erosion or improper grazing, in combination, can permanently alter the reference plant community.

Other natural disturbance mechanisms include fluctuations in climate, which influence the soil/water/vegetation relationships. These fluctuations can facilitate changes in production from one year to the next.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XB220AZ–Shale Upland 6-10" p.z.
- R035XB224AZ–Clayey Slopes 6-10" p.z. Bouldery
- R035XB268AZ–Shale Hills 6-10" p.z.
- R035XC320AZ–Shale Hills 10-14" p.z.
- R035XC324AZ–Clayey Slopes 10-14" p.z. Bouldery
- R035XY124UT–Desert Shallow Clay (Mat Saltbush)

Correlated Map Unit Components

22397312, 22397198, 22397252, 22960380, 22857869, 22934066, 22933937, 22933800, 22999412, 22999443, 22999484, 22999633, 22999653, 22999791, 23000031, 22999807, 22999843, 22601660

Stage

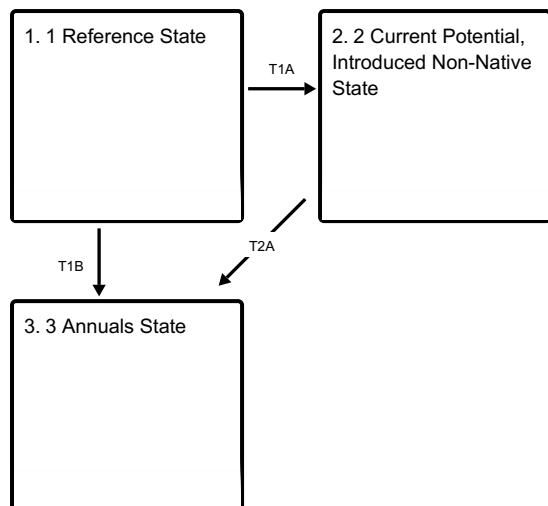
Provisional

Contributors

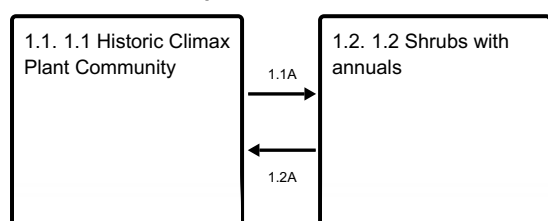
Curtis Talbot

State and transition model

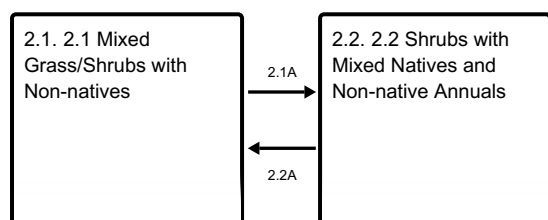
Ecosystem states



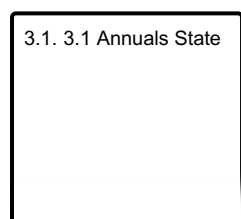
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1

1 Reference State

The general aspect of the site is made up of primarily mid and short grasses with a significant percentage of cold desert shrubs and a few forbs. In the original plant community there is a mixture of both cool and warm season grasses. Plant species most likely to invade or increase on this site when it deteriorates are saltbushes, broom snakeweed and annuals. Continuous grazing during the winter and spring periods will decrease the cool season grasses, which are replaced by warm season, lower forage value grasses and shrubs.

Community 1.1

1.1 Historic Climax Plant Community

The mixed shrubs/grass plant community is made up of primarily mid and short grasses with a significant percentage of cold desert shrubs and a few forbs. The plant composition for the site is typically 65-70% grasses, 5-10% forbs and 20-25% shrubs. Plant species most likely to invade or increase on this site when it deteriorates are broom snakeweed and annuals. Continuous grazing during the winter and spring periods will decrease the cool season grasses, which are replaced by warm season, lower forage value grasses and shrubs.

Community 1.2

1.2 Shrubs with annuals

Mound saltbush and/or shadscale dominate with an increase of annual forbs. There is a decrease of perennial grasses such as alkali sacaton, gallata. Common forbs include mealy goosefoot, spring parsley, annual buckwheats, globemallow and spectaclepod.

Pathway 1.1A

Community 1.1 to 1.2

Drought, Continuous grazing/improper grazing

Pathway 1.2A

Community 1.2 to 1.1

Favorable climate (wet), Time with lack of surface disturbance, prescribed grazing.

State 2

2 Current Potential, Introduced Non-Native State

Community 2.1

2.1 Mixed Grass/Shrubs with Non-natives

This plant community is very similar to the Mixed Shrubs/Grasses plant community except with trace amounts of non-native annuals such as cheatgrass and Russian thistle

Community 2.2

2.2 Shrubs with Mixed Natives and Non-native Annuals

Mound saltbush and/or shadscale dominate with an increase of native and non-native annual forbs and grasses. There is a decrease of perennial grasses such as alkali sacaton, gallata. Common annuals include mealy goosefoot, spring parsley, annual buckwheats, globemallow, spectaclepod, cheatgrass and Russian thistle.

Pathway 2.1A

Community 2.1 to 2.2

Drought, Continuous grazing/improper grazing management

Pathway 2.2A

Community 2.2 to 2.1

Favorable climate (wet), Time with lack of surface disturbance, prescribed grazing.

State 3

3 Annuals State

(3.1) Annual Forbs/Grasses - This plant community is characterized by a dominance of scattered native and non-native forbs and annuals with mostly barren surface. Shrubs and perennial grasses may not be present or only present in minor amounts.

Community 3.1

3.1 Annuals State

(3.1) Annual Forbs/Grasses - This plant community is characterized by a dominance of scattered native and non-native forbs and annuals with mostly barren surface. Shrubs and perennial grasses may not be present or only present in minor amounts.

Transition T1A**State 1 to 2**

Introduction of non-native annuals create a irreversible change in the plant community.

Transition T1B**State 1 to 3**

Severe drought, sometimes followed by large storm events, continuous improper grazing management, off-road vehicle traffic, invasion/establishment of annuals.

Transition T2A**State 2 to 3**

Severe drought followed by large storm events, continuous improper grazing and management, off-road vehicle traffic, invasion/establishment of annuals.

Citations