Ecological site group DX035X01GESG14
Chinle Valley Loamy Shallow Escarpments, Slopes, and Cliffs

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Key Characteristics

- Chinle Valley
- Loamy
- Upland
- Shallow
- Hills, escarpments, cliffs

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 ecological group occurs as steep canyon walls, with small plateaus, hills, deep canyons, and ledges. Slopes generally range from 15 to 80 percent. Elevations range from 3700-6400 feet. Sedimentary rock classes dominate the plateau with volcanic fields occurring for the most part near its margin.

Climate

The ecological group consists of very dry and windy climate that is hot in the summer and cold in the winter. The annual precipitation averages between 6 and 14 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 (average range of 1 to 17 inches) falls from December through February, but rarely lasts more than a few days. A seasonal drought occurs from late May through early July. Summer rains occur from July through September during brief intense local thunderstorms. The rain is sporadic in intensity and location. The moisture originates from the Gulf of Mexico in the early summer and the Gulf of California in the late summer/early fall.

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 temperatures range from 53-59 degrees Fahrenheit.

Windy conditions are common year round, but the winds are strongest and most frequent during the spring.

Soil features

The soils on this ecological group are mostly very shallow to shallow (<20") over mudstone and sandstone or other bedrock. The site can include small areas with pockets of deeper soils on side slopes. Surface textures range from sandy loam to very cobbly loam. Subsurface textures range from sand to sandy clay loam. The soils are formed primarily as residuum and sheet alluvium from a mix of mudstone and sandstone parent material. Escarpment soils are often very or extremely stony or flaggy. Available water capacity is from very low to high depending on depth. The soil moisture regime is typic aridic or ustic aridic, and the soil temperature regime is mesic.

Vegetation dynamics

An ecological site is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. In all plant communities, variability is apparent in productivity and occurrence of individual

species. Spatial boundaries of the communities; however, can be recognized by characteristic patterns of species composition, association, and community structure. The historic climax plant community for this ecological site has been described by sampling relict or relatively undisturbed sites and/or reviewing historic records. The historic climax plant community is the plant community that evolved over time with the soil forming process and long term changes in climatic conditions of the area. It is the plant community that was best adapted to the unique combination of environmental factors associated with the site.

Natural disturbances, such as drought, fire, grazing of native fauna, and insects, are inherent in the development and maintenance of these plant communities. The effects of these disturbances are part of the range of characteristics of the ecological site. Fluctuations in plant community structure and function caused by the effects of natural disturbances help establish the boundaries and characteristics of an ecological site. They are accounted for as part of the range of characteristics of the ecological site. Recognizable plant community phases are identified in the reference state of the ecological site. Some sites may have a small range of variation, while others have a large range. Some plant community phases may exist for long periods of time, while others may only occur for a couple of years after a disturbance.

Deterioration of the plant community, hydrology, or soil site stability on an ecological site can result in crossing a threshold or potentially irreversible boundary to another state, or equilibrium. This can occur as a result of the loss of soil surface through erosion, the loss of the stability of the site due to disturbances that cause active erosion on the site, increases in the amounts and/or patterns or runoff from rainstorms, changes in availability of surface and subsurface water, significant changes in plant structural and functional types, or the introduction of non-native species. When these thresholds are crossed, the potential of the ecological site to return to the historic climax plant community can be lost, or restoration will require significant inputs . There may be multiple states possible for an ecological site, determined by the type and or severity of disturbance.

The known states and transition pathways for this ecological site are described in the state and transition model. Within each state, there may be one or more known plant community phases. These community phases describe the different plant community that can be recognized and mapped across this ecological site. The state and transition model is intended to help land users recognize the current plant community on the ecological site, and the management options for improving the plant community to the desired plant community.

Plant production information in this site description is standardized to the annual production on an air-dry weight basis in near normal rainfall years.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- DX035X04B335–Sandstone/Shale Hills 10-14" p.z.
- R035XA101AZ–Breaks 10-14" p.z.
- R035XB201AZ–Mudstone/Sandstone Hills 6-10" p.z.
- R035XB251AZ–Mudstone/Sandstone Hills 6-10" p.z. Warm
- R035XB283AZ–Mudstone Slopes 6-10" p.z.
- R035XC302AZ–Sedimentary Cliffs 10-14" p.z.
- R035XY146UT–Desert Very Steep Stony Loam (Shadscale)

Correlated Map Unit Components

22397361, 22397457, 22397195, 22397194, 22397565, 22397264, 22397251, 22856870, 22999615, 22999616, 22999658, 22999678, 22999686, 22999701, 22601514

Stage

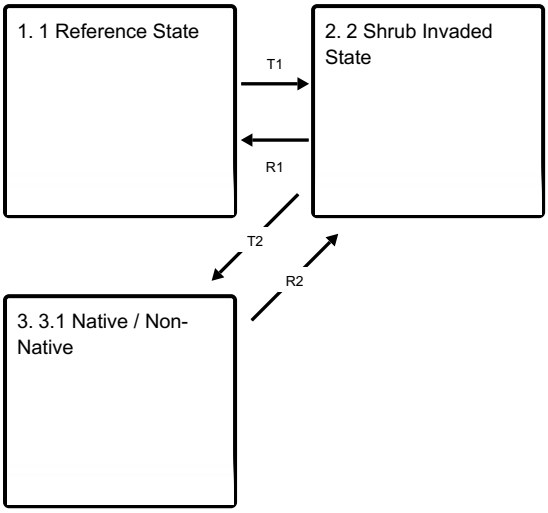
Provisional

Contributors

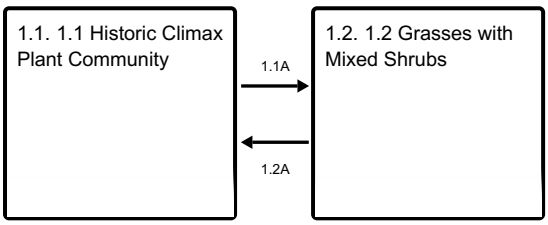
Curtis Talbot

State and transition model

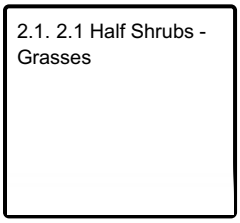
Ecosystem states



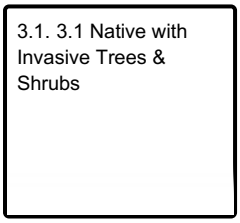
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1
1 Reference State

The reference state which includes the Historic Climax Plant Community has been determined by study of relict areas or areas protected from excessive disturbances. Trends in plant communities going from unmanaged grazed areas to managed grazed areas, seasonal use pastures and historical accounts have also been used. This reference state is characterized by mix of grasses and shrubs dominated by galleta, Indian ricegrass, Bigelow sagebrush and Torrey Mormon tea.

Community 1.1
1.1 Historic Climax Plant Community

The Historic Climax Plant Community is a grassland dominated by warm season bunch grasses (galleta, sideoats grama, blue grama and black grama) mixed with cool season grasses (Indian ricegrass, needle and thread, squirreltail) and shrubs (Bigelow sage, Mormon tea). Plants that will increase with disturbance are galleta, Fendler threeawn, snakeweed and annual buckwheats. Minor amounts of non-native annual grasses and forbs may be present.

Community 1.2
1.2 Grasses with Mixed Shrubs

Perennial grasses decrease, especially cool and warm season bunchgrasses. Shrubs such as fourwing saltbush, Greene rabbitbrush, Mormon tea and broom snakeweed increase. Changes in vegetative structure leads to some increased erosion on steepest slopes.

Pathway 1.1A
Community 1.1 to 1.2

Unmanaged grazing, drought

Pathway 1.2A
Community 1.2 to 1.1

Managed grazing, favorable precipitation

State 2
2 Shrub Invaded State

This state is characterized by an invasion of native shrubs with an understory of scattered grasses. Shrubs like Mormon tea, rabbitbrush, snakeweed, Bigelow sage and shadscale have increased to dominate the plant community. There is a significant increase in rills and water flow patterns with a reduction of herbaceous canopy cover.

Community 2.1
2.1 Half Shrubs - Grasses

2.1 Shrubs become dominant on the site, with increases in composite shrubs such as broom snakeweed and Greene rabbitbrush. Bunchgrasses are mostly absent, stoloniferous grasses persist. Grazing in cooler season has significantly reduced cool season grasses. There is an increase of bare ground with a decline of herbaceous ground cover. This allows for invasive of annuals and higher runoff rates..

State 3
3.1 Native / Non-Native

The majority of production on this site is from native and non-native annual grasses and forbs, including Russian thistle and cheatgrass. Shrubs present include broom snakeweed, Greene's rabbitbrush and Mormon tea. Small patches of galleta may persist. There is a significant increase in water erosion.

Community 3.1
3.1 Native with Invasive Trees & Shrubs

This plant community contains an canopy of invasive species like tamarisk and/or camelthorn. Native shrubs and grasses are present in small patches. Native shrubs and grasses are being replaced by native and non-native annual species, such as Russian thistle, in the understory.

Transition T1
State 1 to 2

Unmanaged grazing, drought

Restoration pathway R1
State 2 to 1

Managed grazing, woody species control, favorable climate.

Transition T2
State 2 to 3

Loss of perennial grasses and shrubs, reduced soil site stability and hyrologic function, invasion of non-native annuals.

Restoration pathway R2
State 3 to 2

Invasive Weed Control, woody species control, erosion control, Range seeding, managed grazing, favorable climate.

Citations