

Ecological site group DX035X01GESG06

Chinle Valley Saline Uplands Level to Rolling Shallow

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Key Characteristics

- Chinle Valley
- Saline
- Uplands
- Level to rolling
- Shallow

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 group is found on limestone and calcareous sandstone on benches and slopes of plateaus, knolls, footslopes and dipslopes of undulating plateaus and cuerdas. The group does not significantly benefit from run-on moisture. The soils are shallow (<20") to bedrock. The soil surface textures range from gravelly sandy loam to loams and are highly calcareous. It usually has an undulating appearance. Slopes generally range from 0 to 15 percent, but there can be steeper spots within the site.

Climate

The 35.2 Colorado Plateau Cold Desert Shrub - Grassland common resource area has a very dry and windy climate that is hot in the summer and cold in the winter. The annual precipitation averages between 6 and 10 inches. The soil moisture regime is typical aridic and the soil temperature regime is mesic. 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. Windy conditions are common year round, but the winds are strongest and most frequent during the spring.

Soil features

Soils associated with this group have developed in mixed alluvium from parent material of Kaibab formation limestone and sandstone, and Moenkopi formation sandstone, shale and gypsum. The soils are very alkaline (PH > 8.8), slightly saline (EC = 5.2), slightly sodic, and are strongly effervescent at or near the surface. Surface textures range from gravelly sandy loam to loams. They are generally very shallow to shallow, but there can be small areas with deeper soils.

Vegetation dynamics

An ecological group 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

- R035XB233AZ–Limestone/Sandstone Upland 6-10" p.z. Saline
- R035XB276AZ–Siltstone Upland 6-10" p.z. Saline

Correlated Map Unit Components

22397598, 22999528

Stage

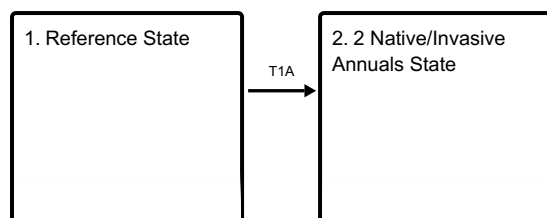
Provisional

Contributors

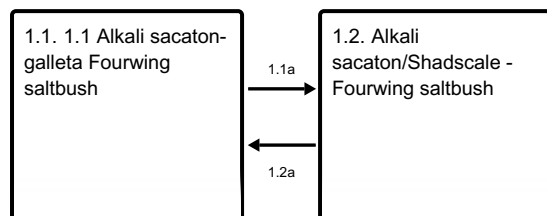
Curtis Talbot

State and transition model

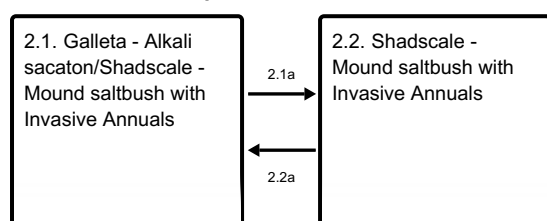
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1 Reference State

1.1 Alkali sacaton-galleta Fourwing saltbush The reference state and the reference (climax) plant community was determined by study of relict areas or areas protected from excessive disturbances. Trends in plant communities from unmanaged grazed areas to managed grazed areas, seasonal use pastures and historic accounts have also been used. The dominant aspect of this site is a mid and short grassland with scattered mixed shrubs with a small percentage of forbs.

Community 1.1 1.1 Alkali sacaton-galleta Fourwing saltbush

The reference plant community is made up primarily of mid and short grasses mixed (70-80%) with scattered shrubs (15-25%) and a relatively small percentage of annual and perennial forbs (1-5%). Dominant plants include fourwing saltbush, mound saltbush, alkali sacaton, and galleta. Disturbances can result in a slight decrease in the amount of cool season perennial grasses and palatable shrubs, like fourwing saltbush and winterfat. With unmanaged grazing, warm season grasses increase along with shrubs such as, shadscale, greasewood and mound saltbush. Plant species most likely to invade or increase on this site when it deteriorates are Galleta, shadscale, mound saltbush, black greasewood, Russian thistle and Annual forbs. Unmanaged 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 Alkali sacaton/Shadscale - Fourwing saltbush

This plant community is dominated by alkali sacaton with a mixture of other native grasses, shrubs and forbs. The plant community composition is mostly perennial grasses (65-85%), followed by annual forbs and grasses (5-20%) and lesser amount of shrubs (5-15%). This plant community has a moderate resistance to water erosion and moderate to high resistance to wind erosion.

Pathway 1.1a Community 1.1 to 1.2

This pathway occurs when drought and unmanaged grazing reduce cool season grasses and highly palatable shrubs.

Pathway 1.2a **Community 1.2 to 1.1**

This pathway occurs with favorable precipitation, managed grazing and time without frequent soil disturbance.

State 2 **2 Native/Invasive Annuals State**

This state is a result of the loss of biotic integrity and hydrologic function of the site. This plant community is characterized by an invasion of annual forbs and grasses with perennial grasses and shrubs. These sites will generally have a disturbed surface with high amounts of bare ground. Bare ground can range up to 80%. Annual composition by weight typically ranges from 25-90% in these plant communities.

Community 2.1 **Galleta - Alkali sacaton/Shadscale - Mound saltbush with Invasive Annuals**

This plant community is characterized by a increased annual forbs and grasses with a mix of perennial grasses, shrubs and lesser amounts of perennial forbs. Warm season bunch grasses, especially galleta, increase along with saltbushes. Cool season grasses may be severely reduced or absent in this plant community. Common grasses include galleta, alkali sacaton, sand dropseed, Indian ricegrass and annual grasses. Common shrubs include shadscale, mound saltbush, fourwing saltbush, snakeweed, rabbitbrush and cacti.

Community 2.2 **Shadscale - Mound saltbush with Invasive Annuals**

This plant community is characterized by increased annual forbs and scattered shrubs with lesser amounts of perennial grasses and forbs. Cool season grasses may be severely reduced or absent in this plant community. Common grasses in small amounts include galleta, alkali sacaton, sand dropseed, Indian ricegrass and annual grasses. Common shrubs include shadscale and/or mound saltbush, along with snakeweed, rabbitbrush and cacti.

Pathway 2.1a **Community 2.1 to 2.2**

This pathway occurs with unmanaged grazing/frequent surface disturbance, reduced perennial herbaceous cover, increase runoff, development of rills and flow patterns.

Pathway 2.2a **Community 2.2 to 2.1**

This pathway occurs when there is favorable precipitation, alluvial deposition/change in site hydrology favors the establishment of perennial grasses.

Transition T1A **State 1 to 2**

Establishment of Invasive Annuals, Unmanaged Grazing, Soil surface disturbance, Drought

Citations