Ecological site group DX035X01IESG02
Little Colorado River Basin-salt affected soils-non run in moisture

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Key Characteristics

- Little Colorado River Basin
- Salt affected soils
- Soils do not receive extra water from run-in moisture
- 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 site is found on limestone and calcareous sandstone on benches and slopes of plateaus. The site 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 typic 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 site 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 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.
The dominant aspect of this site is a shrub-grassland. Shadscale saltbush dominates both the visual aspect and the production in pounds of the site. Several other shrubs, including Ephedra and several cactus species are common, but make up only a small proportion of the aspect. Perennial grasses, both warm and cool season, are common, but sub-dominate to shadscale saltbush. Common warm season grasses include sand dropseed and galleta. Common cool season grasses include Indian ricegrass and squirreltail. The occurrence and production of sand dropseed may be expected to decrease in years of below average warm season precipitation and increase in years of above average warm season precipitation. The same can be expected of squirreltail except a decrease would be the result of below average cool season precipitation and an increase due to above average cool season precipitation. Cool season annuals may increase as a result of above average cool season precipitation and decrease as a result of below average cool season precipitation.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XB228AZ–Sandstone Upland 6-10" p.z. Sodic
- R035XB233AZ–Limestone/Sandstone Upland 6-10" p.z. Saline

Correlated Map Unit Components

22396651, 22396646, 22396644, 22396764, 22396765, 22396775

Stage

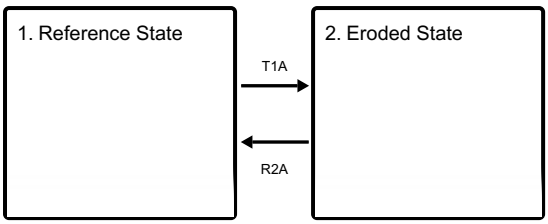
Provisional

Contributors

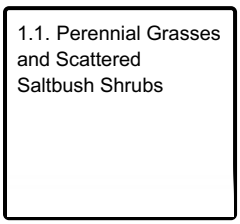
Curtis Talbot

State and transition model

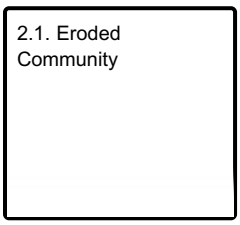
Ecosystem states



State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Reference State

The reference state is a grass/shrub mix. Loamy Upland, Sodic - Higher elevation/Moderately Grazed Loamy Upland, Sodic - Low elevation site This plant community is made up primarily of mid and short grasses with a moderate amount of shrubs and relatively small percentage of 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 cheatgrass, broom snakeweed, annuals, cacti, shadscale, mound saltbush and black greasewood. 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. The dominance of shadscale and mound saltbush may vary between sites depending on degree of salinity and sodicity. Sites that are more saline-sodic will favor shadscale and site with higher sodicity favors mound saltbush.

Community 1.1
Perennial Grasses and Scattered Saltbush Shrubs

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State 2
Eroded State

The eroded state is characterized by a increase of mound saltbush and some forbs. As the surface is reduced of perennial plant cover the site tend to become more sodic. This favors the increase of mound saltbush and decline of galleta, alkali sacaton and shadscale.

Community 2.1
Eroded Community

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Transition T1A
State 1 to 2

Continuous heavy grazing/improper grazing management coupled with heavy utilization, especially on palatable species during drought, decreases the vigor and density of perennial species, This leads to the establishment of native and non-native annuals. Loss of perennial herbaceous cover leads to increased bare ground and decrease of surface resistance to wind/water erosion. This allows for increased rills, sheet flow and wind erosion.

Restoration pathway R2A
State 2 to 1

Rebuilding of the soil by managing for increased organic matter and moisture retention.

Citations