

Ecological site group DX035X01CESG04

Mesas and Benches - Saline Hills and Badlands - gypsic

Last updated: 10/05/2022
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Key Characteristics

- Mesa and Benches
- Saline Hills and Badlands
- Soil parent material is dominantly gypsiferous

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

The sites in this group occur on hills, pediments, alluvial fans, valleys, ridges, and structural benches at elevations between 4300-6000 feet. Slopes range from 2-50 percent.

Climate

This site is hot in the summer and cool in the winter. Average annual precipitation is 6 to 9 inches, with about half of the precipitation occurring as convection thunderstorms from July through October. June is typically the driest month during the growing season. Precipitation is extremely variable from month to month and from year to year. Large fluctuations in daily temperatures are also common.

Soil features

Soils are very shallow to deep and are gypsum affected. Soil textures range from very fine sandy loams to loamy fine sands with moderately rapid permeability. These soils formed in residuum or slope alluvium derived from sandstone material high in gypsum. Rock fragments range from 0 to 30 percent on the soil surface or throughout the profile. The soil moisture regime is typic aridic and the soil temperature regime is mesic. Water-holding capacity ranges from 2 to 3 inches of water in the upper 40 inches of soil or to gypsum bedrock. Water and wind erosion hazard is severe. Runoff is high.

Vegetation dynamics

This group developed under Colorado Plateau ecological conditions and the natural influences of herbivory and climate. This site's plant species composition is generally dominated by Torrey's jointfir, shadscale, crispleaf buckwheat, James' galleta, and Indian ricegrass. Crispleaf buckwheat can occasionally dominate on steep north exposures. James galleta, Indian ricegrass and other perennial grass production is somewhat dependant on weather patterns (summer or winter precipitation).

There is no evidence that sites in this group historically burned on a regular basis due to very large and persistent gaps between plants. However, modern disturbances such as recreation and livestock grazing, may result in an opportunity for invasive annuals to enter the system.

This ecological site has been grazed by domestic livestock since they were first introduced into the area around 1860. It is highly resistant to grazing due to the low palatability of Torrey's jointfir and lack of forage plants. The introduction of domestic livestock and the use of fencing and reliable water sources have therefore only minimally influenced the historic disturbance regime associated with this group

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XY106UT–Desert Gypsum Loam (Torrey's Jointfir)
- R035XY142UT–Desert Very Shallow Gypsum (Torrey's Jointfir)

Correlated Map Unit Components

22338511, 22592321, 22592458, 22592362, 22592365, 22592366, 22592369, 22592493, 22592739

Stage

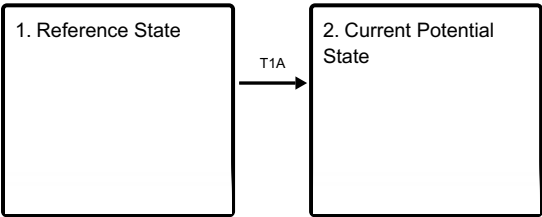
Provisional

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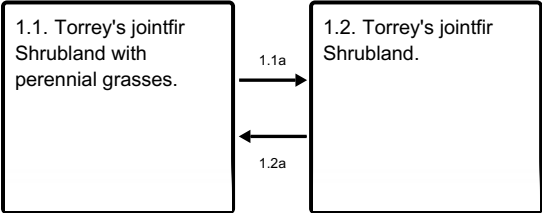
State and transition model

Ecosystem states



T1A - D = Drought E = Establishment of non-native invasive species ILG = Improper livestock grazing SD = Surface disturbances

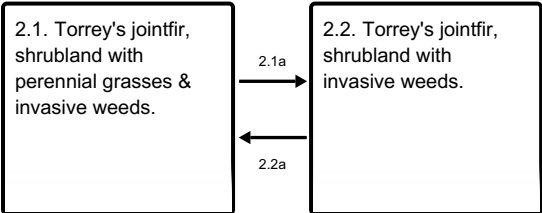
State 1 submodel, plant communities



1.1a - D = Drought ILG = Improper livestock grazing SD = Surface disturbances

1.2a - PLG = Proper livestock grazing T = Time without disturbances W = Wet weather periods

State 2 submodel, plant communities



2.1a - D = Drought ILG = Improper livestock grazing SD = Surface disturbances

2.2a - PLG = Proper livestock grazing T = Time without disturbances W = Wet weather periods

State 1

Reference State

This state is dominated by Torrey's jointfir, a mixture of other shrubs, and limited amounts of perennial grasses. The reference state is self sustaining and resistant to change due to high resistance to natural disturbances and high resilience following natural disturbances. Biological soil crusts are highly variable in their expression on this site.

Characteristics and indicators. Reference State: Community phases resistant to natural disturbances. Indicators: A site dominated by Torrey's jointfir where James galleta, Indian ricegrass and sand dropseed may also be present.

Resilience management. Feedbacks: Natural fluctuations in climate that allows for a self sustaining Torrey's jointfir and a native grass community understory. Any disturbance that may allow for the establishment of invasive species. At-risk Community Phase: All communities are at risk when perennial plants are stressed and nutrients are available for invasive plants to establish. Trigger: Introduction of invasive plants to fill available niches.

Community 1.1

Torrey's jointfir Shrubland with perennial grasses.

The dominant aspect of the plant community is Torrey's jointfir, Blackbrush, and James galleta. Matted crinklemat is the dominant forb. The composition by air-dry weight is approximately 20% perennial grasses, 20% forbs, and 60% shrubs.

Community 1.2

Torrey's jointfir Shrubland.

The dominant aspect of the plant community is Torrey's jointfir, blackbrush, with some James galleta. Matted crinklemat is the dominant forb. The average annual production and species composition tables for this community phase are very similar to those tables developed for community phase 1.1 except that production of perennial grasses is lower and production of shrubs is higher.

Pathway 1.1a

Community 1.1 to 1.2

This pathway occurs when climatic events, such as drought disfavor the establishment and persistence of perennial grasses. Season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization and/or surface disturbance may accelerate this transition.

Pathway 1.2a

Community 1.2 to 1.1

This pathway occurs when weather events, such as years with normal to above average precipitation favor the establishment and persistence of perennial grasses. Carefully managed livestock grazing, where present can accelerate this transition.

State 2

Current Potential State

The plant communities found on this State are similar to those found State 1 except that invasive species have become established in the herbaceous layer. Species commonly invading this state include cheatgrass, red brome, Russian thistle and possibly halogeton.

Characteristics and indicators. Indicators: A site dominated by Torrey's jointfir where James galleta, Indian ricegrass and sand dropseed may also be present. Invasive weeds are present also.

Resilience management. Feedbacks: Natural fluctuations in climate that allow for the self-sustainment of Torrey's jointfir and a native grass community. Any disturbance that may allow for an increase in those invasive species presently occupying the state. Trigger: Any activity that allows invasive weeds to become more prominent in the plant communities.

Community 2.1

Torrey's jointfir, shrubland with perennial grasses & invasive weeds.

This plant community is similar to Reference State Community 1.1. except that invasive species are now present. The dominate aspect of this community is composed of Torrey's jointfir with a mixture of other shrubs including blackbrush, shadscale, and criskeaf buckwheat commonly occurring. Cheatgrass and/or red brome are common invasive species. Native perennial grasses are still present and may include but are not limited to, Indian ricegrass, James galleta, and several dropseed species. Other native and invasive forbs may also be present and cover is variable. Bare ground is 0-40% and biological crusts range from 5-60%.

Community 2.2

Torrey's jointfir, shrubland with invasive weeds.

This plant community is similar to Reference State Community 1.2 except that invasive species are now present. The dominate aspect of this community is composed of Torrey's jointfir with a mixture of other shrubs including blackbrush, shadscale, and criskeaf buckwheat commonly occurring. Cheatgrass and/or red brome are common invasive species. Native perennial grasses are still present and may include, but are not limited to, Indian ricegrass, James galleta, and several dropseed species. Other native and invasive forbs may also be present and cover is variable.

Pathway 2.1a

Community 2.1 to 2.2

This pathway occurs when weather events, such as drought disfavor the establishment and persistence of perennial grasses. Season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization and/or surface disturbance may accelerate this transition. Annuals such as cheatgrass may be able to take advantage of these conditions during short term wet spells.

Pathway 2.2a

Community 2.2 to 2.1

This pathway occurs when weather events, such as years with normal to above average precipitation favor the establishment and persistence of perennial grasses. Carefully managed livestock grazing, where present can accelerate this transition. Annual species such as cheatgrass may increase during this period.

Transition T1A

State 1 to 2

This transition is from the native perennial warm and cool season grass understory in the reference state to a state that contains invasive species. Events include season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization, prolonged drought, and surface disturbances, etc. However invasive species such as cheatgrass have been known to invade intact perennial plant communities with little to no disturbances. Once invasive plants are found in the plant community a threshold has been crossed.

Constraints to recovery. Once invasive plants are found in the plant community a threshold has been crossed.

Citations