

Ecological site group DX035X01CESG05

Mesas and Benches - Saline Hills and Badlands - saline, non-gypsic

Last updated: 10/05/2022
Accessed: 04/19/2024

Key Characteristics

- Mesa and Benches
- Saline Hills and Badlands
- Soil parent material is dominated by salts other than gypsum

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 cuestas, fan terraces, alluvial fans, hillslopes, knolls, structural benches, pediments, mesas, valley sides and valley floors. Elevations typically range from 3500 to 6600 feet. Slopes may range from 0-60%, but 2-30% is typical. Runoff ranges from medium to very high, but high is typical.

Climate

The climate is characterized by hot summers and cool winters. Large fluctuations in daily temperature are common. The majority of precipitation comes with summer monsoons from July through October, while winter rains are typical from December through March. April, May, and June are the driest months. Precipitation is variable from month to month and from year to year, but typically ranges between 5 and 13 inches. Some years are so dry that little plant growth occurs, and some plants remain dormant.

Soil features

The soils associated with these ecological sites are fine-textured, very shallow to very deep, and formed in alluvium and or residuum derived mainly from shale, and less commonly from sandstone, diorite, and sedimentary rock. Soils are well drained with very slow to slow permeability. The soil moisture regime is typical to ustic aridic and the soil temperature regime is mesic. Soils are sodium affected and alkaline, with pH commonly between 8.0 and 9.0. These soils typically are in the very early stages of soil development.

Vegetation dynamics

Relatively low vegetative cover with high amounts of bare ground are typical on the fine alkaline and saline soils of this site. This site developed with a natural disturbance regime that included decadal level variation in precipitation with alternating wet and dry periods, including severe drought, and light grazing by native ungulates. Fire was minimal due to low vegetative cover and fine fuels. The introduction of domestic livestock and the use of fencing and reliable water sources have typically only had a minor influence on the historic disturbance regime associated with this ecological site. Improper livestock grazing, including continuous season long grazing and/or heavy stocking rates, could cause this site to depart from the reference community state by removing perennial grasses. This change could increase the chances of invasion by cheatgrass and invasive annual forbs. Current disturbances impacting this site include climatic variation, livestock grazing, invasion by non-native species and climate change.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XY006UT–Alkali Fan (Valley Saltbush)
- R035XY103UT–Desert Clay (Castle Valley Saltbush)
- R035XY124UT–Desert Shallow Clay (Mat Saltbush)
- R035XY223UT–Semidesert Shallow Clay (Mat Saltbush)

Correlated Map Unit Components

22933830, 22592280, 22592424, 22592302, 22592429, 22592537, 22592434, 22592323, 22592443, 22592444, 22592670, 22592673, 22592674, 22592325, 22592568, 22592381, 22592482, 22592382, 22596914, 22597191, 22597057, 22597096, 22966794, 22966793, 22963324

Stage

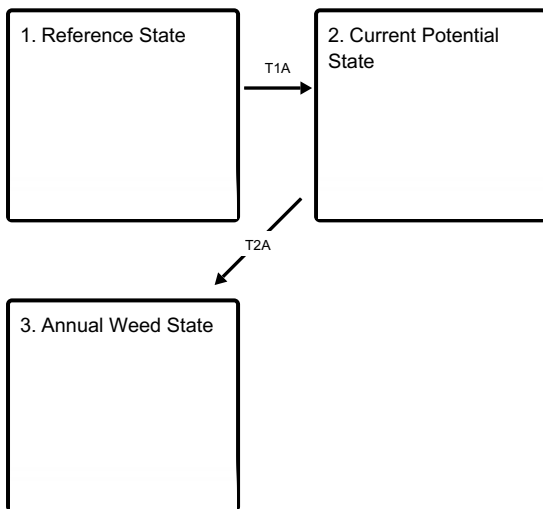
Provisional

Contributors

Vic Parslow
Keith Crossland
Jim Harrigan
Harry Hosler
Curtis Talbot

State and transition model

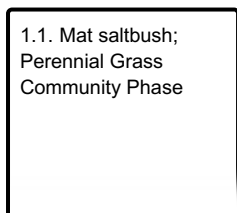
Ecosystem states



T1A - D = Drought E = Establishment of non-native invasive species HWB = Heavy wildlife browsing ILG = Improper livestock grazing

T2A - D = Drought F = Fire HWB = Heavy wildlife browsing ILG = Improper livestock grazing SD = Surface disturbances

State 1 submodel, plant communities



State 2 submodel, plant communities

2.1. Mat Saltbush/
Invasive Weed Phase

State 3 submodel, plant communities

3.1. Annual Weedy
Herbaceous Phase

State 1 Reference State

This state is typically composed of a shrub layer dominated mat saltbush with lesser amounts of perennial warm and cool grasses present. It is normally self sustaining and stable due to its high resistance to natural disturbances and high resilience following natural disturbances. Once invasive plants become established, return to the reference state may not be possible.

Characteristics and indicators. Reference State: Community phases influenced by native herbivore grazing, insect herbivory, and weather. Indicators: A sparse perennial cool and warm season grass understory with mat saltbush forming the dominant visual aspect.

Resilience management. Feedbacks: Extended drought and/or improper grazing that result in a reduction of native perennial plant vigor which may cause invasive species to become established in the understory, increased bare spaces, erosion, and soil loss. Properly managed grazing that maintains the perennial bunchgrass understory. At-risk Community Phase: All communities in this state are at risk when native plants are stressed and/or nutrients become available for invasive plants to establish. Trigger: Introduction and establishment of non-native invasive plants such as cheatgrass and Russian thistle.

Community 1.1 Mat saltbush; Perennial Grass Community Phase

This community is characterized by a mat saltbush shrub canopy with perennial native grasses present in the herbaceous layer. Commonly occurring grasses include Indian ricegrass and James galleta. As grass cover increases, shrub interspaces are reduced. Other perennial grasses, shrubs, and forbs may or may not be present and cover is variable. Bare ground is variable (40-70%) depending on the number of surface rock fragments which is also variable. Steep hillslopes are often dissected by rills and gullies.

State 2 Current Potential State

The current potential state is similar to the reference state except that invasive species are now present. It is generally dominated by mat saltbush, native perennial grasses and forbs may also be present. Primary disturbance mechanisms include climate fluctuations, native herbivore grazing, domestic livestock grazing, and surface disturbances such as road and pipeline development and off road vehicle (OHV) use. Timing of these disturbances dictates the ecological dynamics that occur.

Characteristics and indicators. Indicators: A site dominated by mat saltbush. James galleta, Indian ricegrass and sand dropseed may also be present. Non-native species are now present in the stand.

Resilience management. Feedbacks: Extended drought resulting in a reduction of native perennial plant vigor. Normal fluctuations in weather allowing for the maintenance of both shrubs and perennial grasses. At-risk

Community Phase: This state is at risk when perennial plant cover is reduced and nutrients become available for invasive plants to flourish. Trigger: Spread of invasive plants to fill available niches.

Community 2.1

Mat Saltbush/ Invasive Weed Phase

This community phase is characterized by a mat saltbush shrub canopy, where perennial native grasses are present. Invasive plants are also present. Commonly seen grasses include Indian ricegrass, James galleta, and cheatgrass. Other grasses, shrubs, and forbs may or may not be present and cover is variable. Bare ground, rock fragments, and biological crust cover are very similar to community phase 1.1 in their variability and responses to each other.

State 3

Annual Weed State

The Annual Weed State is generally dominated by invasive annual plants such as cheatgrass, halogeton and Russian thistle. Mat saltbush may or may not be present.

Characteristics and indicators. Annual Weed State: Community phases maintained, in a self-sustaining manner, by invasive annual weed domination and/or occasional fire. Indicators: A site where ecological processes are driven by cheatgrass and/or other invasive annual forbs.

Resilience management. Feedbacks: A self sustaining disturbance regime of invasive annual weed domination and/or occasional fire.

Community 3.1

Annual Weedy Herbaceous Phase

This community phase is characterized by a reduction in mat saltbush and other shrubs, and an increase in invasive annuals. Common invasives include Russian thistle, halogeton, and cheatgrass. This state is the result of disturbances that reduce shrub canopy cover. Bare ground, rock fragments, and biological crust cover are very similar to community phase 1.1 in their variability and responses to each other.

Transition T1A

State 1 to 2

This transition is from the reference state where only native perennial warm and cool season grasses occur to a state that also includes invasive species. Events may include combinations of conditions favorable for the establishment of invasive plant species, including season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization, heavy wildlife browsing, prolonged drought, and surface disturbances. However, invasive species such as cheatgrass have been known to invade intact perennial plant communities with little to no disturbance. Once invasive species are present in the plant community, a threshold has been crossed.

Transition T2A

State 2 to 3

This transition is from a state dominated by perennial shrubs, grasses and invasive weeds to a state that is dominated by annual invasive species. Events include brush treatments, season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization, coupled with prolonged drought, and surface disturbances that remove shrubs including off-road vehicle use, and road and pipeline development. Once brush is removed and invasive plants dominate, a threshold has been crossed.

Citations