

Ecological site group DX035X01EESG04

Green River Desert - Saline Hills and Badlands

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Key Characteristics

- Green River Desert
- Saline Hills and Badlands

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 ecological sites of this group occur on hills, structural benches, mesas, dissected pediments and on alluvial fans and valley floors associated with these landforms. Slopes range from 2 to 50 percent. Runoff is typically high. Elevations generally range from 3500 to 6800 feet.

Climate

The climate is characterized by hot, dry summers, cold winters and moist springs. March, April and July through October are the wettest months of the year with May, June and November through February being the driest. Approximately 65 to 70% of the precipitation occurs as rain from May through October. Precipitation is extremely variable from month to month and from year to year but averages between 5-13 inches. Mean annual air temperature ranges from 46 to 52 degrees Fahrenheit. Large fluctuations in daily temperatures are typical. Much of the summer precipitation occurs as convection thunderstorms. Some years are so dry that little plant growth occurs, and some plants remain dormant.

Soil features

The soils associated with this ecological site group range from very shallow to very deep and formed in residuum, colluvium, slope alluvium and alluvium derived from marine shales and gypsiferous shale. The areas dominated by gypsiferous parent material are typically medium textured and usually support a sparse overstory of Torrey's jointfir and sparse grass and forb cover usually associated with thin, patchy eolian deposits on the lee side of the shrubs or of pinnacles in the biotic crust which commonly covers the interspaces in the gypsiferous sites. The marine shale sites usually support a sparse overstory of saltbush and a very sparse understory of native grasses. They are usually moderately fine to fine textured and strongly saline. Biotic crusts are uncommon on these sites due to high salinity. Thin physical crusts often form in the plant interspaces.

Soil moisture regime is aridic and soil temperature regime is mesic.

Vegetation dynamics

The general aspect of the sites in this group in the reference state is represented by a shrub layer dominated by saltbush or Torrey's jointfir with a highly variable herbaceous layer of perennial grasses, principally James galleta and Indian ricegrass.

Large gaps between plants in relic areas indicate that these sites did not historically burn often enough for fire to strongly influence the ecological processes of this site. Other disturbances such as brush treatments, invasive species, and OHV use, could reduce the resilience of the reference community, creating risk.

These sites provides only marginal livestock grazing due to the small amount forage available and the shortage of

drinking water. Torrey's jointfir, found on the gypsiferous sites has low palatability. However, other plants present are easily accessible and relatively nutritious. Improper grazing practices can cause any grasses, and perennial forbs present to be grazed out. Improper grazing coupled with drought can also remove the saltbush and other shrubs. Once the native community is lost on these soils it is very difficult to get desirable vegetation back.

Halogeton and Russian thistle are most likely to invade these sites. At this time, cheatgrass is not readily invading these sites likely due the chemical properties of the soil. Drought, erosion or improper grazing, in combination, can permanently alter the reference plant community.

Other natural disturbance mechanisms include fluctuations in climate, which influence the soil/water/vegetation relationships. These fluctuations can facilitate changes in production from one year to the next.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

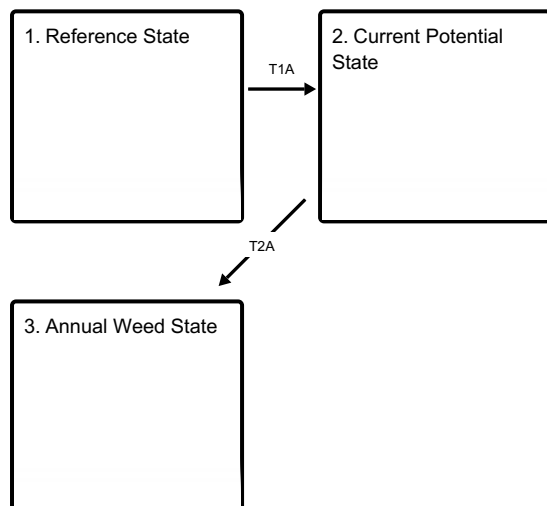
- R035XY006UT–Alkali Fan (Valley Saltbush)
- R035XY124UT–Desert Shallow Clay (Mat Saltbush)
- R035XY142UT–Desert Very Shallow Gypsum (Torrey's Jointfir)

Stage

Provisional

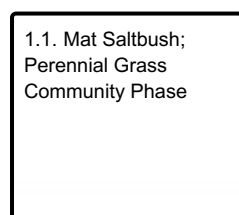
State and transition model

Ecosystem states

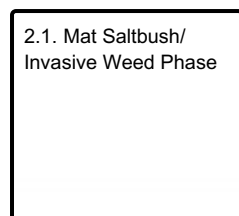


T1A - D = Drought E = Establishment of non-native invasive species HWB = Heavy wildlife browsing ILG = Improper livestock grazing
T2A - D = Drought F = Fire HWB = Heavy wildlife browsing ILG = Improper livestock grazing SD = Surface disturbances

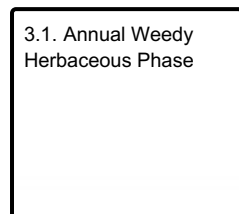
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



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.

Constraints to recovery. 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