

Ecological site group DX035X01CESG07

Mesas and Benches - Saline Uplands and Flats - sandy loams

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Key Characteristics

- Mesa and Benches
- Saline Uplands and Flats
- Soils are sandy loams

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 occurs on mesas, benches, hillslopes, mountain slopes, pediments, valleys, cuestras, and ridges. Run off is medium to high and is often influenced by micro-topography. Typically slopes range from 2-30% however sites have been mapped on slopes up to 70%.

Climate

The climate is characterized by hot summers and cool to warm winters, which can be slightly modified by local topographic conditions, such as aspect. Large fluctuations in daily temperatures are common. Mean annual high temperatures range from 67-75 degrees Fahrenheit and mean annual low temperatures range from 35-50 degrees Fahrenheit. Approximately 65-70% of moisture occurs as rain from July-November, mostly as convection thunderstorms and snow. Precipitation is variable from month to month and from year to year but averages between 5-10 inches. Snow packs when present are generally light and not persistent.

Soil features

The soils are very shallow to shallow, weakly to moderately developed, and well drained. Typically the dry surface is light reddish brown to dark reddish brown. Erosion potential of soils on reference state sites typically depends on surface rock fragments. Sites with greater than 30% rock fragments have lower wind and water erosion potentials than sites with less than 30% surface rock fragments. The soil temperature and moisture regimes are mesic and typic aridic or ustic aridic respectively. Surface and subsurface textures are generally loamy sands, channery loams, or gravelly sandy loams. Soils are nonsaline and the water holding capacity is low. Biological crust cover is characterized as a weak crust, with light cyanobacteria and/or isolated moss clumps with no continuity.

Vegetation dynamics

The ecological sites in this group developed under Colorado Plateau ecological conditions and the natural influences of climate and grazing. The dynamics described in this site description were determined through the study of rangeland relic areas, areas protected from excessive disturbance and influences such as improper livestock grazing and damaging recreational activities. Literature reviews, trends in plant community dynamics, and historical accounts have also been considered. Community phases, community pathways, states, transitions, thresholds, and restoration pathways have been determined through similar studies and experiences.

These ecological sites are found on very shallow to moderately deep, poorly developed soils in Major Land Resource Area (MLRA) 35. Vegetation on salt desert shrub lands is generally very sparse and thus fire did not carry well and therefore is not part of the historic natural disturbance regime (Simonin, 2001). Due to scarcity of local water sources this site was minimally influenced by large grazing ungulates before European settlement. The most

prominent disturbance regime associated with this site is weather. During periods of drought perennial warm and cool season grasses decrease, while periods of normal and above average precipitation result in an increase in perennial warm and cool season grasses. Shrub cover is generally similar under both climatic conditions; however, annual production decreases during drought.

This site has been grazed by domestic livestock since they were introduced into the area. This introduction of livestock with it's use of fencing, and the development of reliable water sources have impacted the disturbance regime of this site. Improper livestock grazing (i.e., continuous season long grazing, heavy stocking rates, etc.) can cause this site to depart from it's reference plant communities and allow annual grasses, such as cheatgrass, to invade, and broom snakeweed to increase dramatically. These annual grasses can increase the sites fine fuel loads and make fire more prevalent, increasing the possibility that it will convert to an annual grassland community(Simonin, 2001).

As vegetative communities respond to changes in management or natural influences that move them to different ecological states, a return to previous states may not be possible. The amount of energy needed to affect vegetative shifts depends on present biotic and abiotic features and the desired results.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XY130UT–Desert Shallow Sandy Loam (Shadscale)
- R035XY230UT–Semidesert Shallow Sandy Loam (Shadscale)

Correlated Map Unit Components

22960105, 22960249, 22960260, 22934079, 22592523, 22592298, 22592542, 22592304, 22592309, 22592461, 22592567, 22592685, 22592687, 22592571, 22592584, 22592472, 22592590, 22592716, 22592603, 22592388, 22592394, 22592620, 22592508

Stage

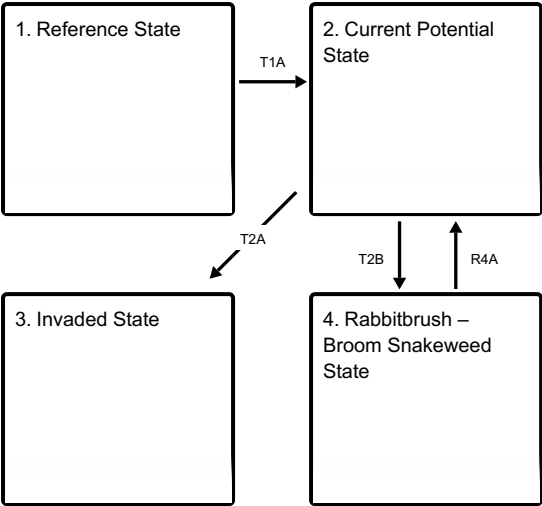
Provisional

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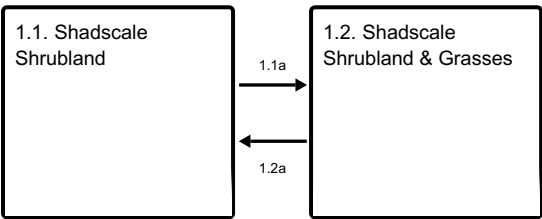
State and transition model

Ecosystem states



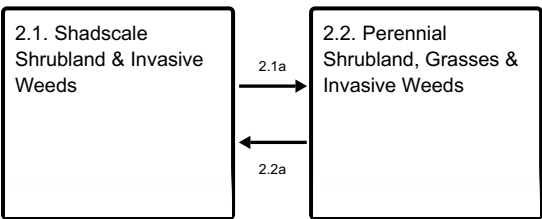
- T1A** - D = Drought WS = Establishment of non-native invasive species ILG = Improper livestock grazing SD = Surface disturbances
- T2A** - D = Drought ILG = Improper livestock grazing F = Fire
- T2B** - ILG = Improper livestock grazing SD = Surface disturbances
- R4A** - BC = Biological Control PLG = Proper livestock grazing T = Time without disturbances W = Wet weather periods

State 1 submodel, plant communities



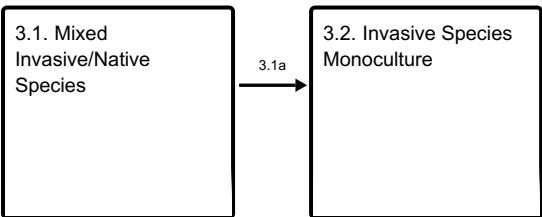
- 1.1a** - PLG = Proper livestock grazing T = Time without disturbances W = Wet weather periods
- 1.2a** - D = Drought ILG = Improper livestock grazing SD = Surface disturbances

State 2 submodel, plant communities



- 2.1a** - W = Wet weather periods PLG = Proper livestock grazing T = Time without disturbances
- 2.2a** - D = Drought ILG = Improper livestock grazing SD = Surface disturbances

State 3 submodel, plant communities



- 3.1a** - D = Drought ILG = Improper livestock grazing F = Fire

State 4 submodel, plant communities

4.1. Rabbitbrush –
Broom Snakeweed
Shrubland

State 1 Reference State

The ecological sites in this group are dominated by shadscale, Torrey's jointfir is also commonly present. Warm season grasses such as James' galleta are common on most sites. Cool season grasses, such as Indian ricegrass, are more prevalent in sites found on soils with more structural development.

Community 1.1 Shadscale Shrubland

This plant community phase is dominated by shadscale and Torrey's jointfir, warm and cool season perennial grasses are present in varying amounts. Grasses may include but are not limited to, Indian ricegrass, James galleta, and sand dropseed. James galleta is typically the dominant species in this plant community phase. Utah juniper may be present in areas of higher precipitation.

Community 1.2 Shadscale Shrubland & Grasses

This plant community phase is dominated by shadscale, Torrey's jointfir, and perennial grasses. Grasses may include, but are not limited to, Indian ricegrass, James galleta, and sand dropseed. James galleta is typically the dominant species in this plant community phase. Other perennial grasses may also be present depending on harshness of the soil conditions. Utah juniper may be present in areas of higher precipitation.

Pathway 1.1a Community 1.1 to 1.2

This pathway occurs on properly managed sites when positive weather events, such as years with normal to above average precipitation favor the establishment of perennial grasses.

Pathway 1.2a Community 1.2 to 1.1

This pathway occurs when drought coupled with season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization and/or other surface disturbance reduces the percentage of perennial herbaceous vegetation growing on the site.

State 2 Current Potential State

This state is similar to state one, however there are now non-native invasive species established in the understory—cheatgrass and halogeton being the most common. The primary disturbance mechanism is weather fluctuation; however livestock grazing now may influence the ecological dynamics of the site. The current potential state has less ability resist change and less resilience following disturbances.

Community 2.1 Shadscale Shrubland & Invasive Weeds

This plant community phase is dominated by shadscale and Torrey's jointfir, warm and cool season perennial grasses are minimally present. Grasses may include but are not limited to, Indian ricegrass, James galleta, and

sand dropseed. James galleta is typically the dominant species in this plant community phase. Utah juniper may be present in areas of higher precipitation. Cheatgrass is now present.

Community 2.2

Perennial Shrubland, Grasses & Invasive Weeds

This plant community phase is dominated by shadscale, Torrey's jointfir, and perennial grasses. Grasses may include Indian ricegrass, James galleta, and sand dropseed. James galleta is typically the dominant species in this plant community phase. Utah juniper may be present in areas of higher precipitation. Cheatgrass is now present. Other perennial or invasive grasses, shrubs, and forbs may also be present and cover is variable.

Pathway 2.1a

Community 2.1 to 2.2

This pathway occurs when events, such as years with normal to above average precipitation, and properly managed livestock grazing favor the establishment of perennial grasses.

Pathway 2.2a

Community 2.2 to 2.1

This pathway occurs when events, such as surface disturbance, drought and/or season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization, decrease the amount of perennial grasses present on the site.

State 3

Invaded State

This state is dominated by invasive species—cheatgrass, halogeton, and Russian thistle being the most common. The primary disturbance mechanisms are fire, improper livestock grazing and drought. One or more invasive species has increased to a point where they influence or drive the disturbance regime and nutrient cycle.

Community 3.1

Mixed Invasive/Native Species

This plant community phase is characterized by a dominance of invasive species, with a minimal occurrence of shadscale, Torrey's jointfir, James galleta, and other native perennial grasses, shrubs, and forbs. Utah juniper may be present in areas of higher precipitation. Invasive species include cheatgrass, halogeton, and Russian thistle. Other grasses, forbs, or shrubs may also be present and cover is variable.

Community 3.2

Invasive Species Monoculture

This plant community phase is characterized by a monoculture of invasive species, which may include cheatgrass, halogeton, and Russian thistle. Evidence of dead shadscale and Torrey's jointfir can be found in this plant community phase.

Pathway 3.1a

Community 3.1 to 3.2

This pathway occurs when events such as drought and season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization further reduce the sites vigor. When this now at-risk community receives sufficient moisture for invasive annuals to flourish, fire can convert site to one dominated by cheatgrass and non-native forbs.

State 4

Rabbitbrush – Broom Snakeweed State

This state is dominated by rubber rabbitbrush and broom snakeweed, with minimal occurrence of shadscale, Torrey mormontea, galleta, and other native perennial shrubs, grasses, and forbs. The primary disturbance mechanisms are improper livestock grazing, weather fluctuations, and mining or other surface disturbances. Rubber rabbitbrush and broom snakeweed have increased to a point where they influence or drive the disturbance regime and nutrient cycle. These alterations can eventually create ecologically impoverished sites that are very difficult to restore to functionally diverse perennial herbaceous and woody communities.

Community 4.1

Rabbitbrush – Broom Snakeweed Shrubland

This plant community phase is characterized by a dominance of rubber rabbitbrush and broom snakeweed, where native grasses shrubs, grasses, and forbs may also be present.

Transition T1A

State 1 to 2

This transition occurs as non-native invasive species become established in the plant community. Common non-native invasive species include cheatgrass, halogeton, and Russian thistle. Disturbances that may accelerate this transition include season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization, surface disturbance and/or extended drought. Invasive species such as cheatgrass have also been known to invade an intact perennial plant community, however, where no disturbance has occurred.

Transition T2A

State 2 to 3

Transition from Current Potential State (State 2) to Invaded State (State 3). This transition occurs as events favor the dominance of invasives species such as cheatgrass, Russian thistle, and halogeton. Events include drought and possibly fire; if fine fuel accumulation increases to a point where fire can carry through the current potential state. That fire could cause a transition into the invaded state.

Transition T2B

State 2 to 4

This transition occurs as events favor the increased dominance of rabbitbrush and broom snakeweed. Events typically include season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization, mining or other large surface disturbance.

Restoration pathway R4A

State 4 to 2

This restoration pathway occurs as events favor the reestablishment of native grasses, shrubs, and forbs. Fall livestock grazing and insects may be used to control the establishment and dominance of rubber rabbitbrush; however care must be taken to allow for the reestablishment of native perennial shrub, grass, and forb species, without an increase in broom snakeweed which is enhanced by grazing pressures. Time without surface disturbances and livestock grazing may allow for the reestablishment of native perennial shrubs and grasses without an increase in broom snakeweed; however, this may take many years to accomplish.

Citations

. 2001 (Date accessed). *Atriplex confertifolia*. <http://www.fs.fed.us/database/feis/>.