

# Ecological site group DX035X01DESG03

## Henry Mtns-Saline Uplands & Flats

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### Key Characteristics

- Henry Mountains
- Saline Uplands & Flats

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, pediments, valleys, cuestas, and ridges. Run off is medium to high and is often influenced by micro-topography. Typically slopes range from 2-15% however sites have been mapped on slopes up to 50%.

### 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 5-9 inches. Snow packs when present are generally light and not persistent.

### Soil features

This site occurs on shallow to moderately deep soils. The dry surface layer color is typically reddish or grayish and the surface soil textures range from sandy loams to very fine sandy loams which can include a stony or channery modifier. These soils are poorly developed, well drained, and have moderate water holding capacities. Soil temperature regime is mesic and moisture regime ranges typic aridic to ustic aridic. 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. Biological crust cover is characterized as crustless with the possible occurrence of light cyanobacteria and/or isolated lichen and moss pinnacles.

### Vegetation dynamics

This site developed under the Colorado Plateau climatic conditions and included the natural influences of herbivory and climate. The site is dominated by shadscale, Torrey's jointfir is also commonly present. Cool season grasses, such as Indian ricegrass, are more prevalent in sites found on soils with more structural development. For example sites mapped on Lime Ridge, near Bluff, UT, found on Limeridge soils, which have more development, are dominated by Indian ricegrass, James galleta, and shadscale. Conversely, sites mapped on the White Rim of Canyonlands National Park, near Moab, UT, found on Moenkopie and Tsaya soils, which are very weakly developed, are dominated by James galleta and shadscale. Indian ricegrass may or may not be present.

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. Drought and other climatic conditions

was the major natural disturbances influencing this site.

This site has been grazed by domestic livestock since they were introduced into the area. This introduction of livestock with its 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 its reference plant communities and allow annual grasses, such as cheatgrass, to invade, and broom snakeweed to increase dramatically. These annual grasses can increase the site's fine fuel loads and make fire more prevalent, increasing the possibility that it will convert to an annual grassland community (Simonin, 2001).

## Major Land Resource Area

MLRA 035X  
Colorado Plateau

## Subclasses

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

## Stage

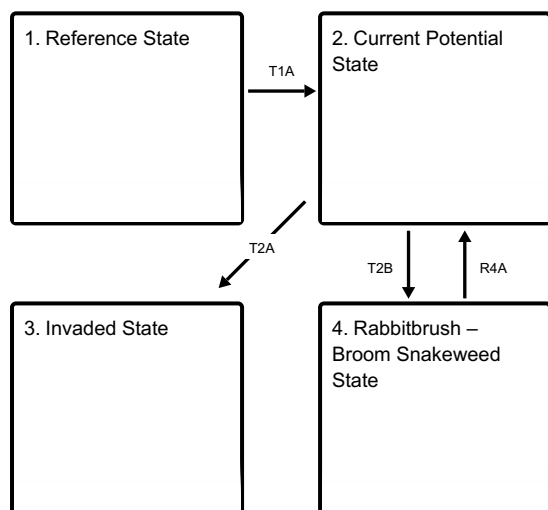
Provisional

## Contributors

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## State and transition model

### Ecosystem states



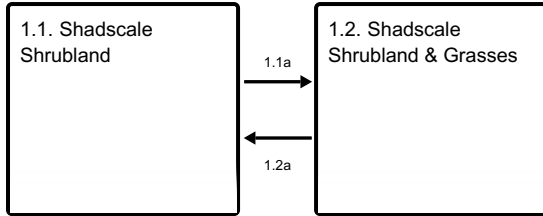
**T1A** - D = Drought ILG = Improper livestock grazing SD = Surface disturbances WS = Establishment of non-native invasive species

**T2A** - D = Drought F = Fire ILG = Improper livestock grazing

**T2B** - ILG = Improper livestock grazing SD = Surface disturbances

**R4A** - BC = Biological Control PLG = Proper livestock grazing T = Time without disturbances W = Wet weather periods

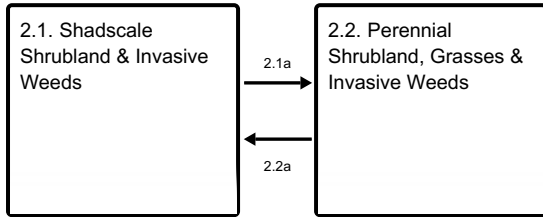
### State 1 submodel, plant communities



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

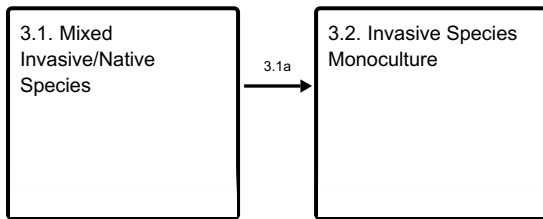
### State 2 submodel, plant communities



2.1a - PLG = Proper livestock grazing T = Time without disturbances W = Wet weather periods

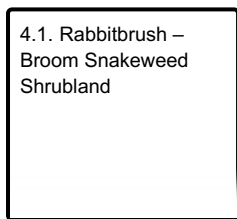
2.2a - D = Drought ILG = Improper livestock grazing SD = Surface disturbances

### State 3 submodel, plant communities



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

### State 4 submodel, plant communities



## 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**

This transition occurs as events favor the dominance of invasive 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/>.