

# Ecological site group DX035X01BESG08

## Circle Cliffs - Saline Uplands and Flats - shallow soils

Last updated: 10/05/2022  
Accessed: 05/02/2024

---

### Key Characteristics

- Circle Cliffs
- Saline Uplands and Flats
- Soils are shallow

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 group of ecological sites is located on mountain slopes, mesa tops, structural benches, hillslopes, ridges, pediments, and cuerdas. Elevations range from 4000 to 6800 feet. Run off is slow 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 winters where large fluctuations in daily temperatures are common. Approximately 70-75% of moisture occurs from March-October as convection thunderstorms and snow. Precipitation is variable from month to month and from year to year but averages 5 to 9 inches. Snow packs are generally light and not persistent.

### Soil features

The soils are typically very shallow or shallow to bedrock but include moderately deep soils in some areas. Rock fragment cover on the soil surface ranges from 10 to 85 percent. Surface texture ranges from loamy sand to loam, typically with more than 15 percent rock fragments. Subsurface textures range from loamy sand to clay loam with 0 to 40 percent rock fragments, mostly gravel or channers. These soils are typically slightly saline. Biological crust cover, where present, is characterized as a weak crust, with light cyanobacteria and/or isolated moss clumps with no continuity. Soil moisture regime is typic aridic or ustic aridic and soil temperature regime is mesic.

### Vegetation dynamics

Plant species composition is generally dominated by shadscale, Torrey's tea, Bigelow sage and/or corymbose buckwheat. Indian ricegrass and James' galleta are the most common grasses.

These ecological sites have been grazed by domestic livestock since they were first introduced into the area around 1860 and have typically been used as wintering pastures for sheep and cattle. This livestock introduction, and the use of fencing and reliable water sources, has influenced the disturbance regime historically associated with this ecological site. Heavy stocking rates, continuous season long grazing, and other improper grazing practices can decrease the prevalence of perennial grasses allowing broom snakeweed and/or rabbitbrush to increase and annual grasses, such as cheatgrass to invade.

There is little evidence that these sites historically burned on a regular basis due to very large and persistent gaps between plants. However, areas that have been invaded by annual grasses have increased fine fuel loads and may make fire more prevalent, increasing the possibility that it will convert to an annual grassland community.

## Major Land Resource Area

MLRA 035X  
Colorado Plateau

## Subclasses

- R035XY130UT–Desert Shallow Sandy Loam (Shadscale)
- R035XY230UT–Semidesert Shallow Sandy Loam (Shadscale)
- R035XY239UT–Semidesert Shallow Clay (Shadscale-Utah Juniper)

## Correlated Map Unit Components

22966788, 22967030, 22966970, 22966868, 22966858, 22966875, 22966773, 22966959

## Stage

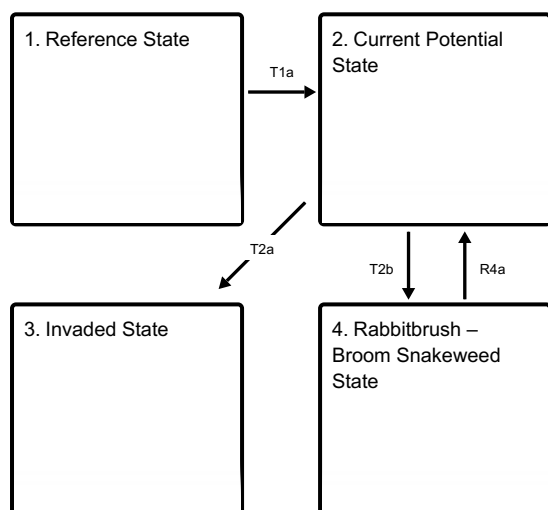
Provisional

## Contributors

Vic Parslow  
Keith Crossland  
Curtis Talbot

## State and transition model

### Ecosystem states



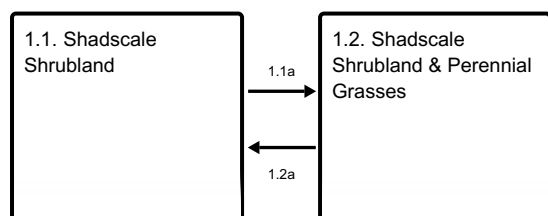
**T1a** - D = Drought WS = Establishment of non-native invasive species ILG = Improper livestock grazing SD = Surface disturbances

**T2a** - D = Drought 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

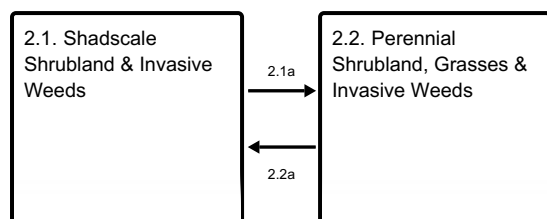
### State 1 submodel, plant communities



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

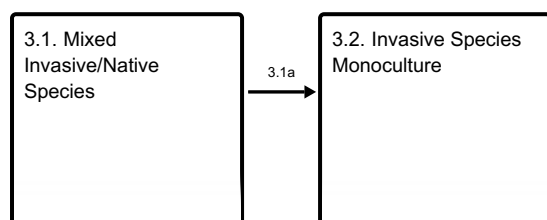
#### State 2 submodel, plant communities



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

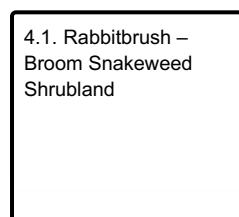
2.2a - D = Drought ILG = Improper livestock grazing SD = Surface disturbances

#### 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 & Perennial 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 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**