

# Ecological site group DX035X01DESG04

## Henry Mtns-Shallow Shrub & Wood lands-sandy loam

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### Key Characteristics

- Henry Mountains
- Shallow Shrublands & Woodlands
- 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 ecological site group is located on dissected pediments, escarpments, ledges, hillslopes on structural benches, benches, rolling ridges, dissected cuestas, structural benches, top mesas, south facing hillslopes, and canyons. Runoff is high to very high. Slopes typically range from 1-20%, but in some areas, slopes are as steep as 60%. Elevations are generally 3700-6000 ft, but this site has been found on elevations as high as 7100 ft.

### Climate

The climate is characterized by hot summers and cool to warm winters. Large fluctuations in daily temperatures are common. The mean annual air temperature ranges from 40 to 57 degrees Fahrenheit. Approximately 65–70% of precipitation occurs as rain from March through October. On the average, April, May, and June are the driest months and August, September, and October are the wettest months. Precipitation is extremely variable from month to month and from year to year. Much of the precipitation occurs as convection thunderstorms.

### Soil features

The soils are very shallow to shallow and well drained. Typically the dry surface is dark reddish brown to yellowish red. Typically soil surface fragments range from 0-40%. The soil temperature and moisture regimes are mesic and typic aridic respectively. Surface and subsurface textures are generally fine gravelly fine sandy loams, loamy fine sands, gravelly very fine sands, and sandy loams. These soils formed in eolian deposits derived mainly from eroded calcareous sandstone parent materials. Soils are calcareous to the surface and have a layer of carbonate accumulation just above the bedrock. This layer occurs as a hardpan in Limeridge & Deleco soils which are shallow (7-20") to calcium carbonate cemented hardpan with depth to limestone bedrock of 20 to 40". Pennell has a horizon with loamier textures (i.e. sandy clay loam) and the available water capacity is 1 to 4 inches, and moderate (0.6 to 2.0 in/hr) permeability. Walknolls Family has 30-80% rock fragments on the surface. Deleco and Walknolls family has 35-70% rock fragments in the control section. Runoff is rapid for slopes over 15%. Lithic Torripsamments (Needle and Suzipon) have somewhat excessive to excessive drainage classes and rapid (greater than 20 in/hr) permeability. Site is often associated with rock outcrops. The average annual soil loss in potential is approximately 0.5-1.5 tons/acre. The soil surface factor (SSF) in potential is 30. Available water holding capacity is 0.6 to 3.1 inches.

### Vegetation dynamics

These sites developed under Colorado Plateau ecological conditions and the natural influences of herbivory and climate. Plant species composition is generally dominated by blackbrush with Torrey's jointfir commonly occurring. Some areas will have a sparse layer of Utah juniper and two-needle pinyon. Diverse biological crusts are common on this site, however, site with large amount of surface coarse fragments may lack these crusts. The amount of

James galleta and Indian ricegrass present is dependant on weather patterns (summer or winter precipitation)and on soil depth to a restrictive layer. The shallower the soil, the fewer herbaceous species. Blackbrush appears to act as a paleo-endenmic species in this MLRA and may not be able to reestablish itself after significant disturbance.

There is no evidence to indicate that these sites historically maintained a short burn frequency. Large gaps between plants (very discontinuous fuels)in relic areas indicate that this site may have historically rarely burned. Until further research indicates that fire played a significant role in the ecosystem processes of this site, this ecological site group description will not include fire as a disturbance in the reference state. However, due to modern disturbances such as brush treatments and OHV use, the resilience of the historical vegetation may be at risk. Disturbances that result in an opportunity for invasive annuals to enter the system and possibly produce sufficient fuel loads may allow fire to become a risk. Cheatgrass, red brome, and Russian thistle are most likely to invade this site.

These ecological sites have been grazed by domestic livestock since they were first introduced into the area around 1860. It is however highly resistant to grazing due to the unpalatable nature of blackbrush and lack of forage plants. Therefore the introduction of domestic livestock and the use of fencing and reliable water sources have only minimally influenced the historic disturbance regime associated with this ecological site.

Improper livestock grazing including, season long grazing and/or heavy stocking rates, may cause the sites to depart from the reference plant community. As ecological condition deteriorates, perennial grasses and Torrey's jointfir may decrease while yellow cryptantha, locoweed, desert trumpet, blackbrush, and snakeweed may increase. Improper grazing may also increase the chance of invasion by cheatgrass, red brome and invasive annual forbs. On the Colorado Plateau, however, these species are capable of establishing themselves in blackbrush communities in the absence of grazing, but they rarely increase to where they dominate them.

## Major Land Resource Area

MLRA 035X  
Colorado Plateau

## Subclasses

- R035XY133UT–Desert Shallow Sandy Loam (Blackbrush)
- R035XY233UT–Semidesert Shallow Sandy Loam (Blackbrush)
- R035XY236UT–Semidesert Shallow Sandy Loam (Utah Juniper, Blackbrush)

## Correlated Map Unit Components

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## Stage

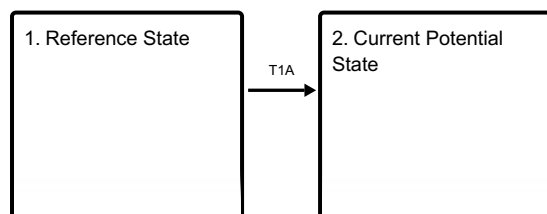
Provisional

## Contributors

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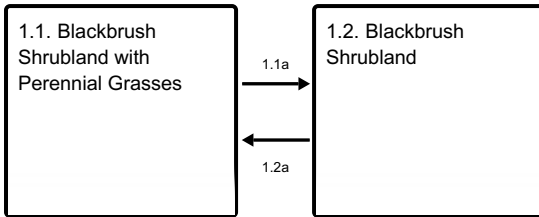
## State and transition model

Ecosystem states



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

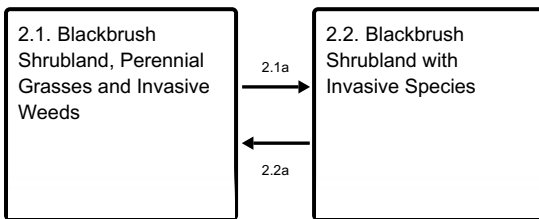
### State 1 submodel, plant communities



1.1a - D = Drought ILG = Improper livestock grazing SD = Surface disturbances

1.2a - PLG = Proper livestock grazing T = Time without disturbances W = Wet weather periods

### State 2 submodel, plant communities



2.1a - D = Drought ILG = Improper livestock grazing SD = Surface disturbances

2.2a - PLG = Proper livestock grazing T = Time without disturbances W = Wet weather periods

## State 1 Reference State

The reference state is generally dominated by blackbrush, however depending on disturbance history, native grasses, forbs, or other shrubs may occupy significant composition in the plant community.

**Characteristics and indicators.** Characteristics and indicators. A community dominated by blackbrush where native perennial grasses and forbs may or may not be present.

### Community 1.1 Blackbrush Shrubland with Perennial Grasses

This community phase is characterized by a shrub canopy dominated by blackbrush and Torrey's jointfir, perennial grasses are also present. Commonly occurring grasses include Indian ricegrass, James galleta, needle-and-thread, six weeks fescue, and dropseed species. Grasses make up 10 to 20 percent of the annual production.

### Community 1.2 Blackbrush Shrubland

This community phase is characterized by a shrub canopy dominated by blackbrush and Torrey's jointfir, perennial grasses may also be present. Herbaceous vegetation makes up less than 10 percent of the annual production.

### Pathway 1.1a Community 1.1 to 1.2

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

### Pathway 1.2a Community 1.2 to 1.1

This community pathway occurs when proper livestock grazing, wet weather periods and time allow for the recovery of surface disturbance which increases the amount of perennial herbaceous vegetation on the site.

## **State 2**

### **Current Potential State**

The current potential state is similar to the reference state, however invasive species are now present in all community phases of the current potential state. This state is generally dominated by blackbrush and Torrey's jointfir, however, depending on disturbance history, native grasses, forbs, or other shrubs may also commonly occupy the site.

**Characteristics and indicators.** A community dominated by blackbrush where native perennial grasses and forbs may also be present. Invasive grasses and forbs are present.

**Resilience management.** Primary disturbance mechanisms include weather fluctuations, native herbivore grazing, domestic livestock grazing, and surface disturbances such as road and pipeline development and off road vehicle (OHV) use. The current potential state is still self sustaining; but can be losing resistance to change due to lower resistance to disturbances and lower resilience following disturbances. Where annual species such as cheatgrass is present, disturbances such as fire are more likely to occur.

## **Community 2.1**

### **Blackbrush Shrubland, Perennial Grasses and Invasive Weeds**

This community phase is characterized by a shrub canopy dominated by blackbrush and Torrey's jointfir, perennial grasses are also present. Commonly occurring grasses include Indian ricegrass, James galleta, needle-and-thread, six weeks fescue, and dropseed species. Non-native and/or invasive species are now present with cheatgrass being most common. Herbaceous species make up 20 to 30 percent of annual production.

## **Community 2.2**

### **Blackbrush Shrubland with Invasive Species**

This community phase is characterized by a shrub canopy dominated by blackbrush and Torrey's jointfir. Non-native, invasive species are now present on the site and may increase following wet weather periods. There is little perennial herbaceous cover in the shrub interspaces but annuals may be present. Perennial herbaceous species make up less than 10 percent of annual production. Invasive species account for 5 to 25 percent of annual production

## **Pathway 2.1a**

### **Community 2.1 to 2.2**

This community pathway occurs when any combination of season long grazing providing little rest and recovery for preferred grazed plants during critical growing periods coupled with high utilization, drought or surface disturbance reduces the amount of perennial herbaceous vegetation on the site. Invasive annual species may increase following short-term wet periods.

## **Pathway 2.2a**

### **Community 2.2 to 2.1**

This community pathway occurs when proper livestock grazing, wet weather periods and time allow for the recovery of surface disturbance which increases the amount of perennial herbaceous vegetation on the site. Non-native invasive species may also increase during this time.

## **Transition T1A**

### **State 1 to 2**

This transition is from the native perennial warm and cool season grass understory in the reference state to a state that contains invasive species. Events may include any combination of improper livestock grazing, prolonged

drought, and/or surface disturbances. However, invasive species such as cheatgrass have been known to invade intact perennial plant communities with little to no disturbances. Once invasive plants are found in the plant community a threshold has been crossed.

## **Citations**