

Ecological site group DX035X01BESG05

Circle Cliffs - Outcrops and Slopes - moderately deep or deeper soils

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Key Characteristics

- Circle Cliffs
- Outcrops and Slopes
- Soils are moderately deep or deeper

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 canyon sideslopes, talus slopes, escarpments, landslides, hillslopes, mountain slopes, structural benches, ledges, and steep alluvial fans. Runoff potential is medium to very high due steep slopes. Slopes typically range from 20-80%. Elevations generally range from 3700-8500 ft.

Climate

The climate is characterized by hot summers and cool winters which can be slightly modified by local topographic conditions such as aspect. Large fluctuations in daily temperatures are common. Mean annual air temperatures range from 46-59 degrees Fahrenheit. Average annual precipitation is 5 to 16 inches. Approximately 75 percent occurs as rain from March through October. On the average, February, June, and December are the driest months and May, August, September, and October are the wettest months. Precipitation is extremely variable from month to month and from year to year. Much of the summer precipitation occurs as convection thunderstorms.

Soil features

Soils typically are moderately deep to deep and well drained or somewhat excessively well drained. These sites sometimes occur on shallow soils. These soils formed in alluvium, colluvium and residuum deposits derived mainly from sandstone, shale and other sedimentary parent material. Surface rock fragments range from gravel to boulders and typically cover 50% or more of the soil surface. Rock fragments in the soil profile usually exceed 35% and vary in size. Soil textures range from loamy sands to clay loams. Available water holding capacity ranges from 1 to 5 inches in the upper 40 inches of soil. Soil temperature regime is mesic and soil moisture regime ranges from typic aridic to aridic ustic.

Vegetation dynamics

The ecological sites in this group are characterized by steep slopes. In the drier sites the dominant vegetative aspect is a sparse overstory of shrubs with a herbaceous understory dominated by perennial grasses. Moist sites at higher elevations have a overstory of Utah juniper and two-needle pinyon.

Currently there is no evidence to indicate that these sites historically maintained a short burn frequency. Climatic variation, including periodic drought, and insect damage appear to have been the main disturbances to these sites under historic conditions. These sites likely did not experience much disturbance from large native herbivores or domestic livestock due to steep slopes, stoniness, and broken terrain. However, due to modern disturbances such as brush treatments, invasive species, and OHV use, the resilience of the plant communities may be at risk. Disturbances that reduce the presence of perennial grasses result in an opportunity for invasive annuals to enter into the system.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XY018UT–Talus Slope (Blackbrush-Shadscale)
- R035XY260UT–Semidesert Very Steep Stony Loam (Salina Wildrye)
- R035XY263UT–Semidesert Very Steep Stony Loam (Two-Needle Pinyon, Utah Juniper)
- R035XY317UT–Upland Steep Stony Loam (Utah Juniper-Pinyon)

Correlated Map Unit Components

22966730, 22966918, 22966995, 22966997, 22966742, 22967024, 22966772, 22966745

Stage

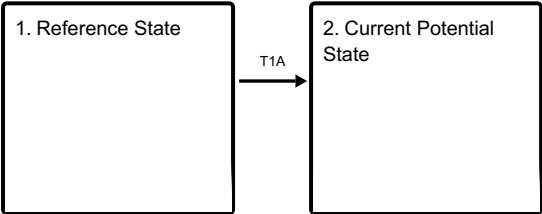
Provisional

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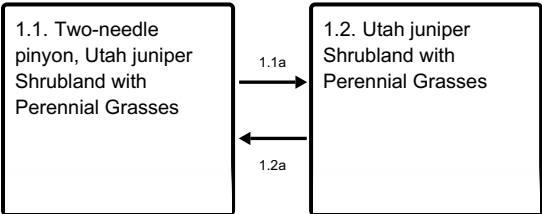
State and transition model

Ecosystem states



T1A - D = Drought I = Insect Damage E = Establishment of non-native invasive species SD = Surface disturbances

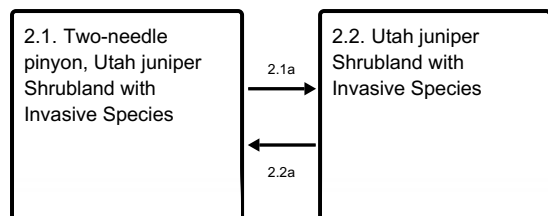
State 1 submodel, plant communities



1.1a - D = Drought I = Insect Damage SD = Surface disturbances

1.2a - W = Wet weather periods T = Time without disturbances

State 2 submodel, plant communities



2.1a - D = Drought I = Insect Damage SD = Surface disturbances

2.2a - W = Wet weather periods T = Time without disturbances

State 1

Reference State

This state is dominated by a very sparse canopy of two-needle pinyon and Utah juniper with a well developed understory of native shrubs, perennial grasses and perennial and annual forbs. The primary disturbance mechanisms for this site in the reference condition include drought and insects.

Characteristics and indicators. Reference state: Community phases maintained by drought and insect pathogen cycles. Indicators: A well developed shrub and grass understory co-existing with a canopy of Utah juniper and Two-needle pinyon.

Resilience management. Feedbacks: Infrequent, but regular droughts that reduce tree cover. At-risk Community Phase: All communities are at risk when plants in the understory are stressed, and nutrients become available for invasives to establish. Trigger: The introduction of invasive plants into the understory.

Community 1.1

Two-needle pinyon, Utah juniper Shrubland with Perennial Grasses

This plant community phase is characterized by a very sparse canopy of two-needle pinyon and Utah juniper, with a well developed shrub layer and perennial grass understory. Shrubs commonly seen include Bigelow's sagebrush and mormon tea. Typical grasses include Indian ricegrass and Salina wildrye. Forb composition varies greatly depending on seed source, soil, and growing conditions. Other grasses and shrubs are also present; however, species composition varies from one site to the next. Surface rock fragments ranging from gravels to boulders make up much of the cover on these sites and may be as high as 65 percent.

Community 1.2

Utah juniper Shrubland with Perennial Grasses

This community phase is characterized by a very sparse canopy of Utah juniper. Other commonly occurring plants include Bigelow's sagebrush mormon tea. Indian ricegrass, and a variety of other perennial grasses and forbs occupy the understory. Two-needle pinyon may be present in small amounts. The sites species composition varies greatly from one location to another depending on seed source, soil, and growing conditions. Surface rock fragments include from channers, gravels to boulders and run as high as 65 percent cover.

Pathway 1.1a

Community 1.1 to 1.2

1.1a This pathway occurs as drought and/or insect herbivory removes two-needle pinyon from the site. Drought can also impact shrub and herbaceous production which may be reduced until more normal weather patterns return. A reduction in the overstory canopy may also allow for more nutrients to be captured by perennial grasses and shrubs.

Pathway 1.2a

Community 1.2 to 1.1

1.2a - T, W This pathway occurs as normal to above average precipitation patterns coupled with time, allow for the reestablishment and persistence of two-needle pinyon and other less drought tolerant shrubs and grasses.

State 2

Current Potential State

This state is very similar to the reference state, except that invasive grasses and/or forbs are present in all phases. The primary disturbance mechanisms for this state include natural and human caused disturbances; however, due to steep slopes there are very little man induced disturbances. Drought and insects may influence the community shifts. Trailing of livestock to water and some minor recreational activities (i.e. hiking) are the most common and have very little impact on the site other than introduction of invasive grasses and forbs. The shift in species composition could affect nutrient cycling, hydrology and soil stability. At this time there is no known way to effectively remove invasive plants from the site once they have become established. Therefore, this site is often irreversibly altered from the reference state

Characteristics and indicators. Current Potential State: Community phases maintained by drought and insect herbivory cycles. Indicators: A shrub and grass understory co-existing with a canopy of Utah juniper.

Resilience management. Feedbacks: Infrequent, but regular droughts to reduce tree cover. Establishment of invasive plant species such as cheatgrass.

Community 2.1

Two-needle pinyon, Utah juniper Shrubland with Invasive Species

This plant community phase is characterized by a very sparse canopy of two-needle pinyon and Utah juniper, with a mixed shrub and perennial grass understory. Shrubs commonly seen include Bigelow's sagebrush and mormon tea. Grasses that typically inhabit this site include cheatgrass, Indian ricegrass, and Salina wildrye. Forb composition varies greatly depending on seed source, soil, and growing conditions. Other grasses and shrubs are present; however, species composition varies from one site to the next. Surface rock fragments ranging from gravels to boulders make up much of the cover for these sites and may be as high as 65 percent.

Community 2.2

Utah juniper Shrubland with Invasive Species

This plant community phase is characterized by a very sparse canopy of Utah juniper. Other commonly occurring plants include Bigelow's sagebrush, mormon tea, cheatgrass, Indian ricegrass, and various forbs, including invasive species. Pinyon may be present in small amounts. Forb composition varies greatly depending on seed source, soil, and growing conditions. Other grasses, shrubs, and trees are present, however, species composition varies from one site to the next. Surface rock fragments ranging from gravels to boulders make up much of the cover for these sites and may be as high as 65 percent.

Pathway 2.1a

Community 2.1 to 2.2

This pathway occurs as drought and/or insect herbivory removes two-needle pinyon from the site. Drought can also impact shrub and herbaceous production which may be reduced until more normal weather patterns return. A reduction in the overstory canopy may also allow for more nutrients to be captured by perennial grasses and shrubs. Invasive species may also increase during periods favorable for annual growth.

Pathway 2.2a

Community 2.2 to 2.1

This pathway occurs as normal to above average precipitation patterns coupled with time, allow for the reestablishment and persistence of two-needle pinyon and other less drought tolerant shrubs and grasses. Invasive annual species may also increase during this time.

Transition T1A

State 1 to 2

This transition from the perennial grass and forb understory found in the reference state to a state that has contains invasive plants. This transition occurs as natural and/or management actions favor an increase in invasive grasses and forbs, especially annuals. Possible events include the mere presence of invasive species seed sources and extended droughts.

Citations