

# Ecological site group DX035X01IESG09

## Little Colorado River Basin- Loamy shallow soils on hills, escarpments, slopes and cliffs, non run-in moisture

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### Key Characteristics

- Little Colorado River Basin
- Loamy
- Does not receive extra run-in moisture
- Shallow
- On hills, escarpments, slopes and cliffs

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 occurs on bedrock controlled hillsides and mesa escarpments with slopes ranging from 15 to 60 percent. The site can include small areas that have less slope with pockets of deeper soils. It has excessive drainage and significant runoff.

### Climate

The 35.2 Colorado Plateau Cold Desert Shrub - Grassland common resource area has a very dry and windy climate that is hot in the summer and cold in the winter. The annual precipitation averages between 6 and 10 inches. The soil moisture regime is typic aridic and the soil temperature regime is mesic. A slight majority of the precipitation arrives during the late fall, winter, and early spring. This winter season moisture originates in the Pacific Ocean and arrives as rain, or sometimes snow, during widespread frontal storms of generally low intensity. The majority of the snow (average range of 1 to 17 inches) falls from December through February, but rarely lasts more than a few days. A seasonal drought occurs from late May through early July. Summer rains occur from July through September during brief intense local thunderstorms. The rain is sporadic in intensity and location. The moisture originates from the Gulf of Mexico in the early summer and the Gulf of California in the late summer/early fall. Windy conditions are common year round, but the winds are strongest and most frequent during the spring.

### Soil features

The soils on this ecological site are mostly very shallow to shallow (<20") over mudstone and sandstone bedrock. The site can include small areas with pockets of deeper soils on side slopes. Surface textures range from sandy loam to very cobbly loam. Subsurface textures range from sand to sandy clay loam. The soils are formed primarily as residuum and alluvium from a mix of mudstone and sandstone parent material. Available water capacity is from very low to high depending on depth.

### Vegetation dynamics

An ecological site is not a precise assemblage of species for which the proportions are the same from place to place or from year to year. In all plant communities, variability is apparent in productivity and occurrence of individual species. Spatial boundaries of the communities; however, can be recognized by characteristic patterns of species composition, association, and community structure. The historic climax plant community for this ecological site has been described by sampling relict or relatively undisturbed sites and/or reviewing historic records. The reference community is the plant community that evolved over time with the soil forming process and long term changes in

climatic conditions of the area. It is the plant community that was best adapted to the unique combination of environmental factors associated with the site.

The reference state which includes the Historic Climax Plant Community has been determined by study of relict areas or areas protected from excessive disturbances. Trends in plant communities going from unmanaged grazed areas to managed grazed areas, seasonal use pastures and historical accounts have also been used. This reference state is characterized by mix of grasses and shrubs dominated by galleta, Indian rice-grass, Bigelow sagebrush and Torrey Mormon tea.

#### Grasses with Mixed Shrubs

Perennial grasses decrease, especially cool and warm season bunchgrasses. Shrubs such as four-wing saltbush, Greene rabbitbrush, Mormon tea and broom snakeweed increase. Changes in vegetative structure leads to some increased erosion on steepest slopes.

#### Shrub Invaded State

This state is characterized by an invasion of native shrubs with an understory of scattered grasses. Shrubs like Mormon tea, rabbitbrush, snakeweed, Bigelow sage and shadscale have increased to dominate the plant community. There is a significant increase in rills and water flow patterns with a reduction of herbaceous canopy cover.

#### Half Shrubs - Grasses

Shrubs become dominant on the site, with increases in composite shrubs such as broom snakeweed and Greene rabbitbrush. Bunchgrasses are mostly absent, stoloniferous grasses persist. Grazing in cooler season has significantly reduced cool season grasses. There is an increase of bare ground with a decline of herbaceous ground cover. This allows for invasive of annuals and higher runoff rates.

#### Eroded/ Invasives State

This state is characterized by a shrubland with an increase of annual forbs and grasses, both native and non-native. Small patches of native perennial grasses may occur.

#### Native / Non-Native

The majority of production on this site is from native and non-native annual grasses and forbs, including Russian thistle and cheatgrass. Shrubs present include broom snakeweed, Greene's rabbitbrush and Mormon tea. Small patches of galleta may persist. There is a significant increase in water erosion.

## Major Land Resource Area

MLRA 035X

Colorado Plateau

## Subclasses

- DX035X04B335–Sandstone/Shale Hills 10-14" p.z.
- R035XA101AZ–Breaks 10-14" p.z.
- R035XB201AZ–Mudstone/Sandstone Hills 6-10" p.z.
- R035XB240AZ–Limestone/Sandstone Cliffs 6-10" p.z.
- R035XB251AZ–Mudstone/Sandstone Hills 6-10" p.z. Warm
- R035XB283AZ–Mudstone Slopes 6-10" p.z.
- R035XC302AZ–Sedimentary Cliffs 10-14" p.z.
- R035XC308AZ–Limestone/Sandstone Hills 10-14" p.z.
- R035XC348AZ–Limestone Hills 10-14" p.z.
- R035XE516AZ–Sedimentary Cliffs 6-10" p.z.
- R035XG717AZ–Shallow Loamy 14-18" p.z.

## Correlated Map Unit Components

22341198, 22353870, 22353871, 22353898, 22353897, 22354006, 22354004, 22396716, 22396663, 22396803, 22396622, 22396619, 22396662, 22396722, 22396805, 22396617, 22396698, 22396700, 22396829, 22396701, 22396703, 22396734, 22396695, 22396809, 22484734, 22484740, 22484765, 22484753, 22484785, 22484786,

**Stage**

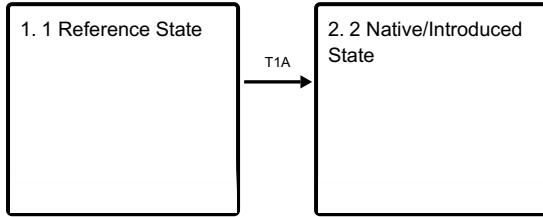
Provisional

**Contributors**

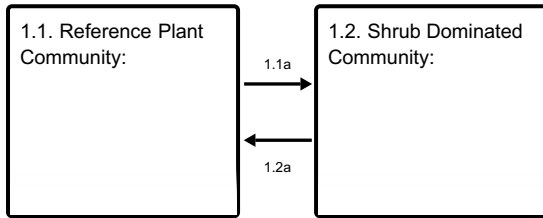
Curtis Talbot

**State and transition model**

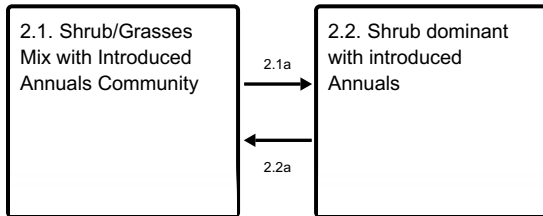
**Ecosystem states**



**State 1 submodel, plant communities**



**State 2 submodel, plant communities**



**State 1**

**1 Reference State**

This reference state is characterized by mix of grasses and shrubs dominated by galleta, Indian rice-grass, Bigelow sagebrush and Torrey Mormon tea.

**Community 1.1**

**Reference Plant Community:**

The dominant aspect of the site is a grass-shrub mix. Major grasses are muttongrass, blue grama and bottlebrush squirreltail. The dominant shrubs are Wyoming big sagebrush and/or Bigelow sage, fourwing saltbush, and Mormon tea.

**Resilience management.** With severe disturbance, plants that will increase are Wyoming big sagebrush and broom snakeweed; plants that will invade are annual forbs.

**Community 1.2**

**Shrub Dominated Community:**

This plant community is dominated by shrubs, including Wyoming big sagebrush, Bigelow sage, fourwing saltbush, broom snakeweed, rabbitbrush. The perennial grasses are primarily sod forming grasses. Annual grasses and forbs are more abundant.

### **Pathway 1.1a**

#### **Community 1.1 to 1.2**

Repetitive, high utilization on palatable perennial grasses will give shrubs a competitive advantage over time.

### **Pathway 1.2a**

#### **Community 1.2 to 1.1**

Management where palatable grasses are allowed to reproduce and colonize.

## **State 2**

### **2 Native/Introduced State**

The plant communities in the Natives /Introduced state are the same as in the reference state, but the plant communities now contain introduced annuals such as red brome, cheatgrass, and Russian thistle that compete with the native species on the site.

### **Community 2.1**

#### **Shrub/Grasses Mix with Introduced Annuals Community**

This plant community resembles the reference state, but introduced annuals are now part of the plant community and compete with the native species. The biotic integrity, fire intensity/frequency, and/or hydrologic function have lessened from the reference state.

### **Community 2.2**

#### **Shrub dominant with introduced Annuals**

Native shrubs species dominate the site. Perennial grasses are primarily the sod forming grasses. Introduced annuals such as red brome, cheatgrass, and Russian thistle are part of the plant community and compete with the natives.

### **Pathway 2.1a**

#### **Community 2.1 to 2.2**

Disturbances such as drought, fire, and grazing can allow the introduced species to continue to increase on the site.

### **Pathway 2.2a**

#### **Community 2.2 to 2.1**

Management where perennial grass species are allowed to colonize along with a disturbance to set back the shrubs.

## **Transition T1A**

### **State 1 to 2**

Introduced annuals such as red brome, cheatgrass, and Russian thistle that compete with the native species have invaded the site. This is often brought about by low vigor native composition. Once introduced species are prevalent it is unlikely the site can return to reference.

## **Citations**