

# Ecological site group DX035X01IESG07

## Little Colorado River Basin-sandy soils-non-run in moisture

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### Key Characteristics

- Little Colorado River Basin
- Sandy
- Do not receive extra moisture from run-in

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 is found on nearly level to gently rolling uplands to partially stabilized or stabilized dunes on plateaus, fans and abandoned stream terraces. The soils are deep to very deep to any plant root restricting layer. The texture of the soil throughout the profile is generally sandy loams to loamy coarse sand. The slope of the site is generally 1 to 10 percent, but may be as high as 15 percent.

### Climate

Winter summer moisture ratios range from 70:30 to 60:40. Late spring is usually the driest period, and early fall moisture can be sporadic. Summer rains fall from June through September; moisture originates in the Gulf of Mexico and creates convective, usually brief, intense thunderstorms. Cool season moisture from October through May tends to be frontal; it originates in the Pacific and the Gulf of California and falls in widespread storms with longer duration and lower intensity. Precipitation generally comes as snow from December through February. Accumulations above 12 inches are not common but can occur. Snow usually lasts for 3-4 days, but can persist much longer. Summer daytime temperatures are commonly 95 - 100 F and on occasion exceed 105 F. Winter air temperatures can regularly go below 10 F and have been recorded below - 20 F.

### Soil features

The soils associated with this ecological site are deep to very deep to any plant root restricting layer. The soil textures throughout the profile range from loamy fine sands to coarse sands. Where the site has been stable for long periods of time, there may be some accumulation of carbonates at moderate depths that can help the site retain more soil moisture within the root zone. The soil ranges from neutral to moderately alkaline (pH 6.6 to 8.4). The permeability is rapid to very rapid and the soil profile can capture both gentle winter rains and intense summer thunderstorms. The available water capacity is low. Wind erosion is a severe problem if the vegetative cover is lost.

### Vegetation dynamics

The reference community is composed of mid and short grasses with a moderate percentage of forbs and shrubs. There is a mixture of both cool and warm season grasses and half-shrubs.

Plant species most likely to invade or increase on this site when it deteriorates are sand sagebrush, big sagebrush, rabbitbrush, annuals, sandhill muhly, wooly groundsel, and snakeweed.

#### Shrubland with Grasses

This plant community is characterized by a mix of shrubs and grasses. There is a slight increase of large and half shrubs, decrease in perennial grasses, especially cool season grasses. Grasses in decline include black grama,

needle and thread and Indian rice-grass.  
Unmanaged grazing, long term winter dominated precipitation, and/or drought that reduces perennial warm and cool season grasses.

Major Land Resource Area

MLRA 035X  
Colorado Plateau

Subclasses

- R035XA118AZ–Sandy Upland 10-14" p.z.
- R035XB206AZ–Sandy Upland 6-10" p.z. Warm
- R035XB217AZ–Sandy Upland 6-10" p.z.
- R035XB222AZ–Sandy Terrace 6-10" p.z.
- R035XC315AZ–Sandy Upland 10-14" p.z.
- R035XC371AZ–Sandy Slopes 10-14" p.z. Bouldery
- R035XC373AZ–Sandy Upland 10-14" p.z. Warm
- R035XC377AZ–Sandy Slopes 10-14" p.z.

Correlated Map Unit Components

22341121, 22353951, 22353993, 22353995, 22396751, 22396738, 22396830, 22396833, 22396767, 22396771, 22396773, 22396650, 22396643, 22396837, 22396736, 22396730, 22396634, 22396633, 22396783, 22396850, 22396851, 22484757, 22484738, 22484742, 22484721, 22484744, 22484776, 22484768, 22484736, 22484772, 22484750

Stage

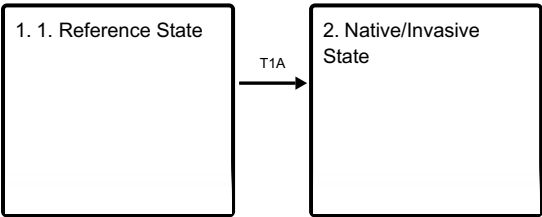
Provisional

Contributors

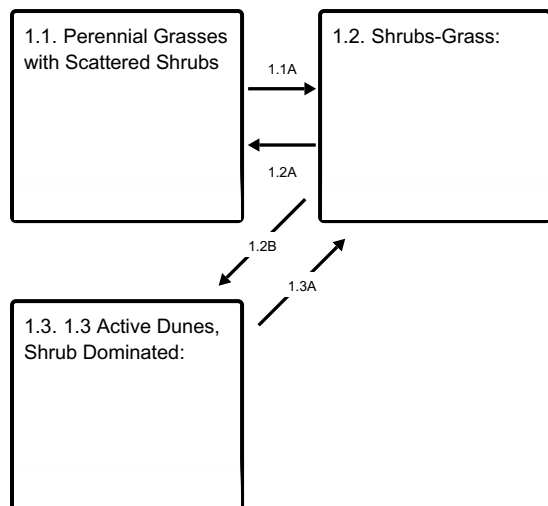
Curtis Talbot

State and transition model

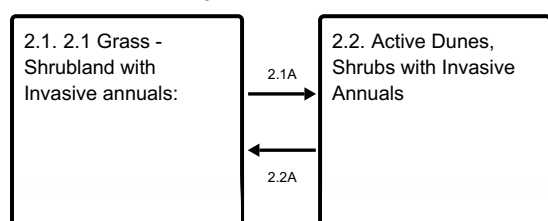
Ecosystem states



### State 1 submodel, plant communities



### State 2 submodel, plant communities



## State 1

### 1. Reference State

This state has been estimated by observing and sampling relatively undisturbed sites. This perennial grassland plant community has a mix of cool season bunchgrasses such as Indian ricegrass and needle-and-thread, and warm season grasses, such as black grama, galleta and blue grama. A mix of shrubs makes up the second most dominant component of the plant community followed by a mix of forbs, both perennial and annual. The production and percent composition of both individual plants and groups of plants varies from season to season and year to year due to the bi-modal nature of precipitation as well as variation from one year to the next in the amount and timing of precipitation received.

**Resilience management.** Transition T1A State 1 to 2 The invasion and establishment of non-native annual grasses and forbs along with continuous surface disturbance, reduce perennial cover. Transition R2A State 2 to 1 This possible return pathway may take several years or even decades. Reduce or no soil surface disturbance, prescribed grazing or no grazing, favorable precipitation, soil stability, seed source for grass recovery, possible reseeding of grasses and shrubs. Possible weed treatment for introduced annuals, large area may not be feasible.

### Community 1.1

#### Perennial Grasses with Scattered Shrubs

This plant community is made up primarily of mid and short grasses with a moderate percentage of forbs and shrubs. There is a mixture of both cool and warm season grasses and half-shrubs. Dominant grasses are Indian ricegrass, needle-and-thread, black grama, galleta, and dropseeds. Dominant shrubs are Cutler Mormon tea, sand sagebrush, rush scurfpea and gilia beardtongue.

### Community 1.2

#### Shrubs-Grass:

Shrubs such as sand sagebrush, rubber rabbitbrush, jimmyweed and broom snakeweed increase over more palatable shrubs. Perennial bunchgrasses such as Indian ricegrass and needle-and-thread decrease in relation to perennial sodgrasses such as sandhill muhly, galleta, and blue grama. Perennial forbs decrease in relation to annual forbs.

## **Community 1.3**

### **1.3 Active Dunes, Shrub Dominated:**

Mormon tea and/or sand sagebrush dominate along with sandhill muhly and an increase of rubber rabbitbrush, frosted mint, broom snakeweed and false pillar gumweed. Active soil erosion and desposition are evident.

#### **Pathway 1.1A**

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

Repetitive, high utilization of palatable species decrease plant vigor, density, and cover. This in turn increases non-palatable species, bare ground and erosion.

#### **Pathway 1.2A**

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

Management where palatable species have an opportunity to grow and reproduce.

#### **Pathway 1.2B**

##### **Community 1.2 to 1.3**

Loss of plant cover and root systems activating erosion and deposition.

#### **Pathway 1.3A**

##### **Community 1.3 to 1.2**

Management that improves plant colonization and soil stability.

## **State 2**

### **Native/Invasive State**

This state is characterized by a increase of shrubs with scattered perennial grasses, but non-native annual grasses and forbs are well established in the plant community. In this state the amount of annual grasses and forbs varies from 2-20%, but will fluctuate from year to year due to variable precipitation and degree of disturbance. Soil surface disturbance, especially when frequently disturbed, can cause the amount of non-native annual grasses and forbs to increase.

## **Community 2.1**

### **2.1 Grass - Shrubland with Invasive annuals:**

Native plants such as Indian ricegrass, dropseeds galleta, Mormon tea, sand sagebrush, broom snakeweed and rabbtbrush are present. Invasive annuals such as cheatgrass, Russian Thistle and/or other introduced annuals are well established and can make up to 20% of the plant composition by weight.

## **Community 2.2**

### **Active Dunes, Shrubs with Invasive Annuals**

Mormon tea and/or Sand sagebrush dominate along with an increase of rubber rabbitbrush, frosted mint, broom snakeweed and false pillar gumweed. Perennial grass cover has declined while annual grasses and forbs increase. Annuals forbs along with grasses are well established and can make up to 30% of the plant composition by weight.

#### **Pathway 2.1A**

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

Repetitive defoliation and high utilization of palatable species along with severe, prolonged drought causes perennial grasses and forbs reduction allowing less palatable and/or more drought tolerant shrubs to increase, resulting in reduced ground cover and increased wind erosion.

**Pathway 2.2A**  
**Community 2.2 to 2.1**

Reduced soil disturbance, managed or no grazing and/or return to more normal precipitation allows for recovery of soil surface structure resulting in recovery of perennial bunch grasses, perennial forbs, and more palatable shrubs.

**Transition T1A**  
**State 1 to 2**

Some degradation along with invasion of introduced species. Once introduced species have invaded it is unlikely the site can be restored to reference.

**Citations**