

# Ecological site group DX035X01FESG13

## Canyonlands - Sandy Grasslands and Shrublands - mid elevation

Last updated: 10/12/2022  
Accessed: 05/02/2024

---

### Key Characteristics

- Canyonlands
- Sandy Grasslands and Shrublands
- Mid-elevation MAST < 54 degrees F.

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

The ecological sites in this group occur on dunes, sandsheets, and alluvial fans on structural benches, mesas, plateaus, cuevas, terraces, and toeslopes. Elevations range from 3,700 to 6,700 feet. Slopes are 1 to 30 percent. Runoff is very low to low due to the rapid permeability of the soil and may be influenced by local micro-topography.

### Climate

The climate is characterized by hot summers and cool to cold winters, which can be slightly modified by local topographic conditions, such as aspect. Large fluctuations in daily temperature are common. Mean annual air temperatures range from 48 to 54 degrees Fahrenheit. On the average, February, May, and June are the driest months and August, September, and October are the wettest months, most of the summer precipitation occurs as convection thunderstorms. Precipitation is variable from month to month and from year to year, but averages range between 6-12 inches annually but may be as much as 18 inches at higher elevations. Snow packs in the lower elevations are generally light and not persistent.

### Soil features

The soils are moderately deep to very deep sands and sandy loams formed in eolian deposits and alluvium derived, dominantly from sandstone. Material derived from shale, siltstone and igneous sources may influence the soils locally. Soil drainage ranges from well drained to excessively well drained. Permeability is moderately rapid to rapid. The soils have high potential for erosion by wind and water after disturbance. Rock fragments are generally rare, but may occur in soils influenced by alluvial processes. Soils are typically nonsaline and nonsodic. Biological soil crust cover varies by surface texture and plant community; sandy loams in grass dominated communities being more likely to support biological soil crusts. The more active dunes are generally dominated by shrub communities, supporting sand sagebrush, Cutler's jointfir, Harvard oak, or green Mormon tea depending on precipitation. More stable sites support a higher proportion of grasses. Soil moisture regime ranges from typic aridic to aridic ustic and soil temperature regime is mesic.

### Vegetation dynamics

The ecological sites in this group are typically perennial grasslands consisting of a mixture of cool and warm season grasses. A shrub layer consisting of fourwing saltbush, winterfat, sand sagebrush, Cutler's jointfir, or green Mormon tea is usually present and is the dominant visual aspect of the sites. In areas of recent deposition or soil movement the shrub layer may be more evident.

The natural disturbance regime consisted of fluctuations in precipitation and infrequent fires ignited by both natural causes and by Native Americans. Herbivory by insects and small mammals were localized influences as was use

by native large herbivores.

It is estimated that the historic fire regime was 35-100+ years, depending on fine fuel accumulations (Howard 2003).

These ecological sites have been grazed by domestic livestock since they were first introduced into the area. Before grazing began, fires would often only carry when several good moisture years created sufficient fuels for them to burn. With the introduction of domestic livestock, however, these fuel loads have typically been reduced, lengthening the fire return interval and allowing shrubs to increase at the expense of grasses. Conversely, the introduction of cheatgrass, which accompanied livestock grazing but is not restricted to grazed areas, has led to a shorter fire return interval in some cases, which promotes a cheatgrass dominated state.

## **Major Land Resource Area**

MLRA 035X  
Colorado Plateau

### **Subclasses**

- R035XY115UT–Desert Sand (Sand Sagebrush)
- R035XY118UT–Desert Sandy Loam (Fourwing Saltbush)
- R035XY211UT–Semidesert Sand (Dune)
- R035XY212UT–Semidesert Sand (Fourwing Saltbush)
- R035XY215UT–Semidesert Sandy Loam (4-Wing Saltbush)
- R035XY217UT–Semidesert Sandy Loam (Spiny Hopsage)
- R035XY309UT–Upland Sand (Mormon Tea)

### **Correlated Map Unit Components**

22340909, 22934177, 22481133, 22481134, 22480932, 22480933, 22480937, 22481078, 22481181, 22481182, 22480897, 22481213, 22480922, 22594027, 22593433, 22593739, 22593741, 22594305, 22593744, 22593474, 22594072, 22594073, 22594347, 22593500, 22593820, 22594081, 22594084, 22593527, 22593837, 22594381, 22594396, 22594397, 22598325, 22597887, 22598201, 22598204, 22598354, 22598068, 22598075, 22598080, 22728241, 22965345, 22965572, 22964723, 22964758, 22964700, 22964698, 22964718, 22964716, 22963829, 22963830, 22963772, 22963770, 22963817, 22963811, 22963812, 22963775, 22963834, 22963745, 22963743, 22963839, 22963724, 22963718, 22963634, 22963739, 22963693, 22963735

### **Stage**

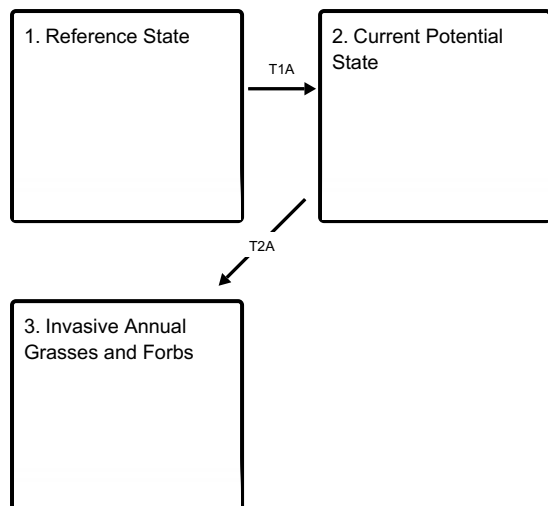
Provisional

### **Contributors**

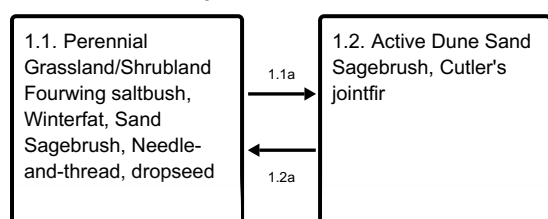
Vic Parslow  
Keith Crossland  
Curtis Talbot

### **State and transition model**

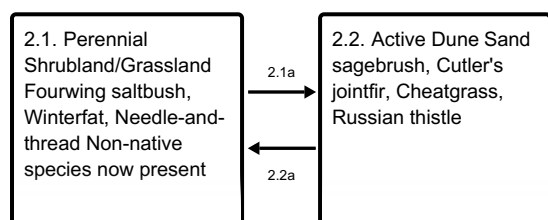
## Ecosystem states



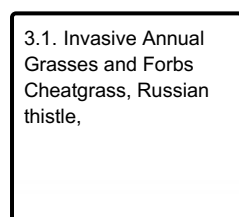
## State 1 submodel, plant communities



## State 2 submodel, plant communities



## State 3 submodel, plant communities



## State 1 Reference State

Native shrubs and an understory of perennial warm and cool season grasses form the dominant visual aspect.

**Characteristics and indicators.** The natural disturbance regime consisted of fairly infrequent fires ignited by both natural causes and Native Americans. It is estimated that the historic fire return interval was 35-100+ years depending on fine fuel accumulations (Howard, 2003).

## Community 1.1

### Perennial Grassland/Shrubland Fourwing saltbush, Winterfat, Sand Sagebrush, Needle-and-thread, dropseed

This plant community is characterized by both native shrubs and perennial warm and cool season grasses. Biological crusts are common (20-30% cover) and characterized by continuous moss and lichen pinnacles. Bare ground (10-20% cover) is minimal.

## **Community 1.2**

### **Active Dune Sand Sagebrush, Cutler's jointfir**

This plant community is characterized by dune vegetation. Sand sagebrush and Cutler's jointfir may dominate the shrub layer. Dominant perennial cool season grasses typically include Indian ricegrass and dominant perennial warm season grasses typically include sandhill muhly. This community is typically represented by small patches where localized surface disturbances have occurred within one of the other reference state plant communities. Bare ground (30-60% cover) is common, and biological crust (0-25%) cover is typically characterized as crustless to light cyanobacteria in the interspaces.

## **Pathway 1.1a**

### **Community 1.1 to 1.2**

This pathway occurs when events favor an increase in active dunes and common dune vegetation. Events could include any type of natural surface disturbance that would increase erosion and soil movement, such as prolonged rodent activity, a severe drought that reduces plant cover, excessive trampling by wildlife, etc.

## **Pathway 1.2a**

### **Community 1.2 to 1.1**

This pathway occurs as natural events such as time without surface disturbances favors the stabilization of the site and increased establishment of native shrubs and perennial warm and cool season grasses.

## **State 2**

### **Current Potential State**

This state is similar to the reference state except that non-native plants are now present in all plant community phases. The primary disturbance mechanisms can be natural or human induced. Events, such as improper livestock grazing, prolonged rodent activity, changes in historic fire regimes, OHV overuse, insect herbivory, or drought may influence this site. A shift in species composition will affect the nutrient cycling, soil-water relationships, hydrology, and soil stability.

**Characteristics and indicators.** A perennial cool and warm season grass understory with native shrubs forming the dominant visual aspect, when present. Non-native species are now present in all plant communities.

## **Community 2.1**

### **Perennial Shrubland/Grassland Fourwing saltbush, Winterfat, Needle-and-thread Non-native species now present**

This plant community is characterized by both native shrubs and perennial warm and cool season grasses. Biological crusts are variable (5-30% cover) and characterized by cyanobacteria and discontinuous moss and lichen pinnacles. Bare ground (10-40% cover) is variable.

## **Community 2.2**

### **Active Dune Sand sagebrush, Cutler's jointfir, Cheatgrass, Russian thistle**

This plant community is characterized by dune vegetation. Dominant perennial shrubs typically include Cutler's jointfir, sand buckwheat, resinbush, and purple sage. Dominant perennial cool season grasses typically include Indian ricegrass and dominant perennial warm season grasses include sandhill muhly. Commonly seen invasive plant species include cheatgrass, Russian thistle, annual *Cryptantha*, annual stickseed, and tansy mustard. Bare ground (30-60% cover) is common, and biological crust (0-25%) cover is typically characterized as crustless to light cyanobacteria in the interspaces.

## **Pathway 2.1a**

### **Community 2.1 to 2.2**

This pathway occurs when events favor an increase in active dunes and common dune vegetation. Events could

include any type of natural surface disturbance that would increase erosion and soil movement, such as prolonged rodent activity, a severe drought that reduces plant cover, excessive trampling by wildlife or livestock, OHV overuse, etc.

## **Pathway 2.2a**

### **Community 2.2 to 2.1**

This pathway occurs as natural events such as time without disturbance favors the stabilization of the site and increased establishment of native shrubs and perennial warm and cool season grasses.

## **State 3**

### **Invasive Annual Grasses and Forbs**

This state is characterized by a near absence of native perennial vegetation. Broom snakeweed and sand sagebrush may be present to some degree, but the ecological dynamics are driven by cheatgrass and/or Russian thistle.

## **Community 3.1**

### **Invasive Annual Grasses and Forbs Cheatgrass, Russian thistle,**

This state is characterized by the dominance of invasive forbs/shrubs. These species may include, but are not limited to Russian thistle, cheatgrass, tansy mustard, broom snakeweed, annual stickseed, or annual *Cryptantha*. One or more invasive species has increased to a point where they influence or drive the disturbance regime and nutrient cycle. Russian thistle and/or cheatgrass are the most likely of these species to establish and dominate.

## **Transition T1A**

### **State 1 to 2**

Introduction and establishment of non-native species

## **Transition T2A**

### **State 2 to 3**

This transition occurs when events favor the increased establishment and dominance of invasive plant species. Events include any type of surface disturbance, such as fire, improper domestic livestock grazing, OHV overuse, and drought. Once invasive species drive the ecological dynamics a threshold has been crossed.

## **Citations**

Howard, J.L. 2003. *Atriplex canescens*.