Ecological site group DX035X01EESG08
Green River Desert - Sandy Grasslands and Shrublands - mid elevation

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

Key Characteristics

- Green River Desert
- Sandy Grasslands and Shrublands
- 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 site occurs on dunes, structural benches, plateaus, alluvial fans, fan terraces, broad valleys, mesas, sandsheets, and cuestas. Vegetated dunes are very common. Depending up on plant community and the presences or absence of disturbance, active dunes can become more prevalent. Slopes are typically between 2 and 15 percent but may be as high as 30 percent in some areas. Runoff potential is very low to low.

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 temperature are common. Approximately 70-75% of moisture occurs as rain from October-March as convection thunderstorms and snow. Precipitation is extremely variable from month to month and from year to year but averages between 6-12 inches. Snow packs are generally light and not persistent.

Soil features

The soils in the ecological sites of this group are moderately deep to very deep sands formed in eolian deposits derived mainly from sandstone. Runoff is low or very low on flatter slopes, however, sites with slopes greater than 20% have a medium runoff potential. These soils have a high wind and water erosion potential and are subject to blowing and drifting even when the site is in the reference state. Surface and subsurface textures are generally sandy loams, sands, and loamy sands. Soils are nonsaline and the water holding capacity is moderate. Biological soil crust cover varies by plant community phase, soil, aspect, elevation, etc., but is generally characterized as a weak light cyanobacteria crust and/or isolated moss clumps with no continuity or isolated pinnacles of lichen and moss with little continuity.
Soil moisture regime ranges from typic aridic to ustic aridic and soil temperature regime is mesic.

Vegetation dynamics

These ecological sites occur on moderately deep to very deep, poorly developed soils found on vegetated dunes, structural benches, plateaus, mesas, sandsheets, and cuestas in Major Land Resource Area (MLRA) 35-The Colorado Plateau. Fourwing saltbush or winterfat typically forms the dominant visual aspect. Some areas of very deep sands have a dominant shrub overstory of sand sagebrush. Small areas within this ecological site may be subject to blowing; these areas are sparsely vegetated with dune vegetation including species such as purple sage, resin bush, and sandhill muhly. Utah juniper (0-5% canopy cover) may be found invading these plant communities when the site is in close proximity to a juniper stand.

These sites developed under Colorado Plateau climatic conditions and included natural influences of herbivory, fire,

and climate. The natural disturbance regime consisted of fairly infrequent fires ignited by both natural causes and Native Americans. Fires are normally infrequent due to broken topography (i.e.,large expanses exposed rock in the landscape), the fact that warm season grasses are usually green during the thunderstorm season, and that few lightning strikes actually occur. This ecological site group is commonly described as a desert grassland plant community. It is estimated that the historic fire return interval was 35-100+ years depending on fine fuel accumulations.

This ecological site group has been grazed by domestic livestock since they were first introduced into the area. This livestock introduction, with its the use of fencing and the development of reliable water sources have influenced the disturbance regime historically associated with these ecological sites. Fires would typically only carry on after several good moisture years created continuous fine fuels, however, the introduction of domestic livestock reduced these fine fuels, reducing fires periods. In addition to influencing this sites fire regime, improperly managed livestock grazing (i.e., continuous season long grazing, heavy stocking rates, etc.) can cause these sites to depart from the reference plant community. When this occurs, native perennial grasses and shrubs will decrease while invasive forbs and annual grasses will increase. Continued improper domestic livestock grazing will likely remove the native perennial grasses and shrubs from the system and create large bare interspaces, which can increase erosion, active duning, and opportunities for invasive plants to establish.

Other disturbance mechanisms include extended drought, changes in the site's drainage patterns, alluvial deposits, insect herbivory, poorly managed off road vehicle (OHV) use, and prolonged rodent activity. These disturbances can either facilitate the transition into different plant communities or the transition from one stable state to another, depending on severity, duration, and ecological site resilience.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XY115UT–Desert Sand (Sand Sagebrush)
- R035XY118UT–Desert Sandy Loam (Fourwing Saltbush)
- R035XY212UT–Semidesert Sand (Fourwing Saltbush)
- R035XY215UT–Semidesert Sandy Loam (4-Wing Saltbush)

Correlated Map Unit Components

22479995, 22484249

Stage

Provisional

Contributors

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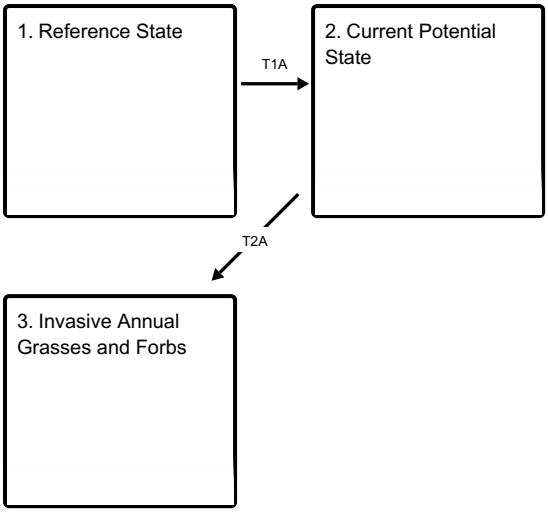
State and transition model

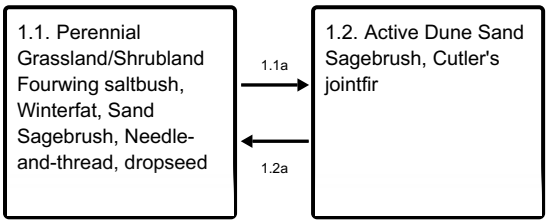
Ecosystem states



T1A - E = Establishment of non-native invasive species

T2A - D = Drought F = Fire ILG = Improper livestock grazing SD = Surface disturbances

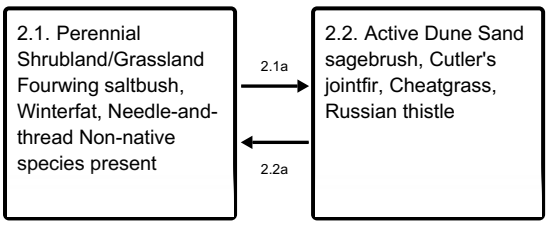
State 1 submodel, plant communities



1.1a - D = Drought SD = Surface disturbances

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

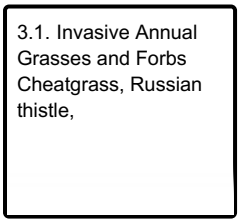
State 2 submodel, plant communities



2.1a - D = Drought SD = Surface disturbances

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

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.

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 surfaces 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 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 community 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

. Fire Effects Information System. http://www.fs.fed.us/database/feis/.