Ecological site group DX035X01AESG05
Grand Staircase-Saline Hills & Badlands-Gypsiferous Parent Material

Last updated: 10/05/2022
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Key Characteristics

- Grand Staircase-Kaiparowits
- Saline Hills and Badlands
- Soil parent material is dominantly gypsiferous

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 group occurs on dipslopes of cuestas and hogbacks, and can occur in flatter areas where soils are deep and gypsum-affected. Slopes are 5-65% and elevations range from 3800-5400 feet.

Climate

This ecological site group is hot in the summer and cool in the winter. Average annual precipitation is 7 to 11 inches, with about half of the precipitation occuring as convection thunderstorms from July through October. June is typically the driest month during the growing season. Precipitation is extremely variable from month to month and from year to year. Large fluctuations in daily temperatures are also common.

Soil features

Soils characterizing this site are very shallow to deep to any plant root restricting layer. Rock outcrop is common. The soil profile is extremely variable on the site. Various amounts of gypsum are always present. The gypsum may be visible in powdery or crystalline forms. The pH may exceed 9.0 and is usually above 7.8.

Vegetation dynamics

This site developed under Colorado Plateau ecological conditions and the natural influences of herbivory and climate. This site's plant species composition is generally dominated by Torrey's jointfir, shadscale, Bigelow sagebrush, and diverse perennial grasses. In some areas, lichen crusts stabilize the soil and preclude grass production.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XD404AZ–Gypsum Hills 7-11" p.z.
- R035XD405AZ–Gypsum Upland 7-11" p.z.
- R035XY264UT–Semidesert Gypsum (Torrey's Jointfir)
- R035XY337UT–Upland Shallow Gypsum (Pinyon - Juniper)
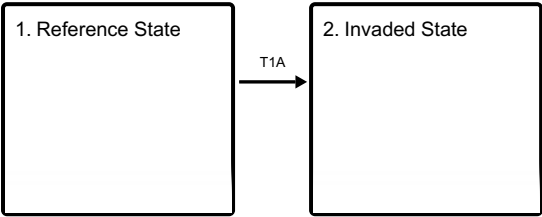
Correlated Map Unit Components

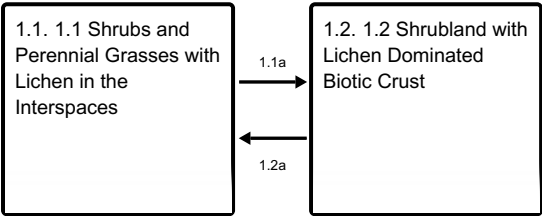22601737, 22601808, 22601719, 22601288, 22966796, 22963417, 22963420, 22963387

Stage

Provisional

Contributors

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State and transition model

Ecosystem states

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┌──────────────────┐         ┌──────────────────┐
│ 1. Reference State│  T1A   │ 2. Invaded State │
│                  │ ─────> │                  │
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State 1 submodel, plant communities

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┌──────────────────┐         ┌──────────────────┐
│1.1. 1.1 Shrubs and│  1.1a  │1.2. 1.2 Shrubland with│
│Perennial Grasses with│ ────>│Lichen Dominated  │
│Lichen in the     │         │Biotic Crust      │
│Interspaces       │ <────   │                  │
│                  │  1.2a   │                  │
└──────────────────┘         └──────────────────┘
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State 2 submodel, plant communities

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┌──────────────────┐         ┌──────────────────┐
│2.1. 2.1 Shrubs with│  2.1a │2.2. 2.2 Shrubs with│
│Perennial Grasses and│ ────>│Invasives         │
│Invasive Species  │         │                  │
│                  │ <────   │                  │
│                  │  2.2a   │                  │
└──────────────────┘         └──────────────────┘
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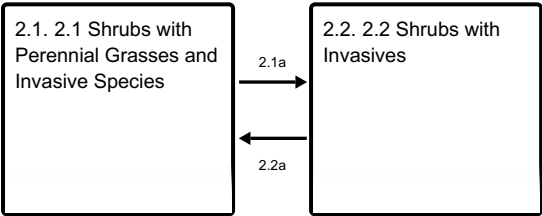
State 1
Reference State

The refence state consists of a diverse shrub canopy. The understory is usually dominated by a diverse perennial grass community, but can sometimes be dominated by lichen crusts. Lichen crusts tend to dominate in areas with relatively harsh soil conditions (less deep, less infiltration, more gypsum, etc) that are less likely to be disturbed (more isolated, more steep, etc). This state is susceptible to non-native invasive species establishment. Disturbances such as livestock grazing and recreation can increase the likelihood of invasion by promoting germination sites and/or seed sources for non-native species. However, Russian thistle is capable of establishing in the absence of disturbance.

Community 1.1
1.1 Shrubs and Perennial Grasses with Lichen in the Interspaces

This plant community phase is dominated by Torrey's jointfir, shadscale, Bigelow Sagebrush, and diverse perennial grasses. Fourwing saltbush may also be present. Lichens typically occupy the interspaces between plants.

Community 1.2
1.2 Shrubland with Lichen Dominated Biotic Crust

This plant community phase is dominated by Torrey's jointfir, and other shrubs. Grasses are limited or absent from the community, while lichen crusts dominate the soil surface.

Pathway 1.1a
Community 1.1 to 1.2

This pathway occurs when climatic events, such as extended drought reduce the basal cover of perennial grasses for a long periods of time. When coupled with a lack of surface disturbance, it is expected that lichen crust will increase and preclude the re-establishment of perennial grasses.

Pathway 1.2a
Community 1.2 to 1.1

Wet periods combined with soil surface disturbance facilitate this community pathway. Seed source for perennial grasses must also be available.

State 2
Invaded State

The invaded state resembles the reference state in both community structure and function, but non-native species, notably Russian thistle, are present. As a result, the resilience of the state is somewhat reduced and the possibility of further degradation is greater.

Community 2.1
2.1 Shrubs with Perennial Grasses and Invasive Species

This plant community is similar to Reference State Community 1.1. except that invasive species are now present. Dominant species are Torrey's jointfir, shadscale, Bigelow sagebrush, James' galleta and Indian ricegrass.

Community 2.2
2.2 Shrubs with Invasives

This plant community is similar to Reference State Community 1.2 except that invasive species are now present. Perennial grasses are greatly reduced, and Russian thistle or other invasive annuals are present. This phase may produce annuals, but it is still dominated by lichen crusts and shrubs, typically,Torrey's jointfir.

Pathway 2.1a
Community 2.1 to 2.2

This pathway occurs when climatic events, such as extended drought reduce the basal cover of perennial grasses for a long periods of time. When coupled with a lack of surface disturbance, it is expected that lichen crust will increase and preclude the re-establishment of perennial grasses.

Pathway 2.2a
Community 2.2 to 2.1

Wet periods combined with soil surface disturbance facilitate this community pathway. Seed source for perennial grasses must also be available.

Transition T1A
State 1 to 2

This transition occurs with the establishment of non-native invasive species. Disturbances that promote this transition include season long continuous grazing of perennial grasses, prolonged drought, recreation or other surface disturbances. However, invasive species such as Russian thistle can invade intact perennial plant communities with little to no disturbance. Once invasive plants are found in the plant community, a return to the

reference state is not likely.

Citations