Ecological site group DX035X01FESG02
Canyonlands - Bottoms and Flats - run in - sodic

Last updated: 10/12/2022
Accessed: 04/19/2024

Key Characteristics

- Canyonlands
- Bottoms and Flats
- Extra water is from run-in or local water table
- Soils are sodic

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 group occurs on alluvial valleys, alluvial fans, flood plains, valleys, stream terraces, near stream channels, and valley flats. These are run-in sites that receive extra moisture from surrounding uplands and may have a seasonal high water table within 72 inches of the soil surface in the lowest positions. Slopes range from 0-8% and elevations are generally 4200-6600 ft.

Climate

The climate is characterized by hot summers and cool to warm winters. Large fluctuations in daily temperatures are common. Approximately 70-75% occurs as rain from March through October. On the average, April, May, and June are the driest months and August through October are the wettest months. Precipitation is extremely variable from month to month and from year to year but averages between 7-12 inches. Much of the summer precipitation occurs as convection thunderstorms. This is a run-in site that receives additional moisture from adjacent sites. Rare to occasional flooding occurs from April to September.

Soil features

The soils of this site are very deep alluvial deposits, primarily derived form sedimentary materials. Typically soil surface fragments range from 0-10%. Surface and subsurface textures are generally silty loams, clays, fine sandy loams, loamy fine sands, and very fine sandy loams. Permeability ranges from very slow to moderately rapid. Water holding capacity in the upper 40 inches of soil also has a broad range; from 3.7 inches in coarse soils to 7.4 in fine textured soils. These soils typically receive extra water from run in and may have a seasonally high water table. The soils have high salt and sodium content and usually support halophytic plants. The soil temperature regime is mesic and the soil moisture regime can be aridic (torric) or ustic aridic.

Vegetation dynamics

These sites were historically dominated by greasewood and a diverse perennial understory, including seepweed, pale evening primrose, Indian ricegrass, Sporobolus spp, and James' galleta. The historic fire return interval is presumed to be about 35-100 years (Anderson 2004). Greasewood and native grasses would have resprouted within one year following fire and maintained dominance of the site. There is no evidence that prolonged drought would dramatically alter the species composition of the site in reference condition, although production is expected to be lower.
Today this site often burns less frequently due to fire suppression efforts and reduced fine fuel loads resulting from livestock grazing. In addition, excessive livestock grazing during the spring and summer can cause native grasses and forbs to lose vigor or disappear from the community completely.

Cheatgrass and Russian thistle commonly establish on this site, and Tamarisk can become dominant when the site occurs near stream and drainage corridors.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

- R035XY003UT–Alkali Bottom (Greasewood)
- R035XY009UT–Alkali Flat (Greasewood)

Correlated Map Unit Components

22593745, 22594088, 22593845, 22594387, 22964754, 22963798, 22963835, 22963636

Stage

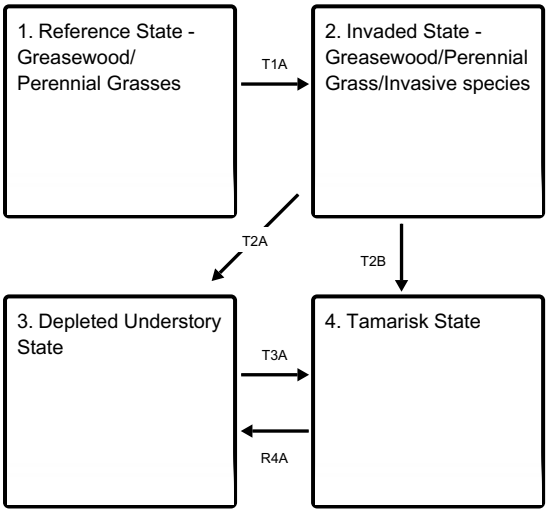
Provisional

Contributors

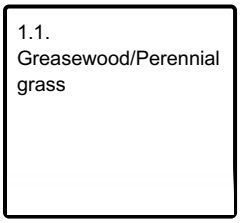
Vic Parslow
Keith Crossland
Curtis Talbot

State and transition model

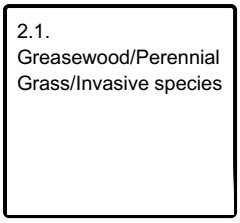
Ecosystem states



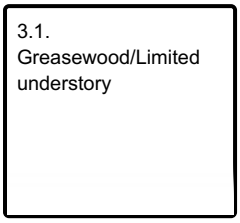
State 1 submodel, plant communities



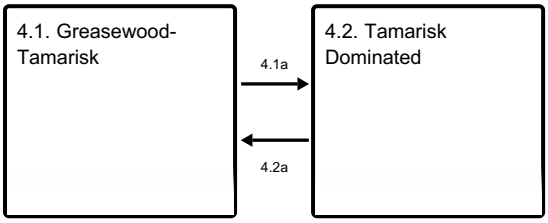
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1
Reference State - Greasewood/ Perennial Grasses

The reference state is generally dominated by greasewood and deep-rooted perennial bunchgrasses. Greasewood harvests salts from the soil profile and concentrates them in its leaves. As a result, salts are deposited on the soil surface when the leaves are dropped or burned, which increases salinity and pH under greasewood plants. Seepweed commonly establishes in the harsh soils under greasewood plants, while perennial grasses and forbs tend to dominate the spaces between shrubs. Invasive plant species, particularly cheatgrass and Russian thistle, can establish on the site given a seed source and germination sites in disturbed soil. These invasive annuals require little or no disturbance to establish. Once invasive plants establish, return to the reference state may not be possible.

Community 1.1
Greasewood/Perennial grass

Community phase 1.1 is characterized by a greasewood canopy with diverse perennial grasses and forbs in the interspaces. The fire-return interval for this phase is 35-100 years, which triggers vigorous re-sprouting of greasewood and perennial grasses within one year following fire.

State 2
Invaded State - Greasewood/Perennial Grass/Invasive species

The invaded state is similar to the reference state in composition and ecological function, but allows for non-native species to be present. It also includes an at-risk plant community with reduced perennial grass production. When perennial grasses are losing vigor and the ability to propagate themselves, this state is at risk of transitioning to the depleted understory state, which is not capable of recovering perennial grasses without significant management inputs.

Community 2.1
Greasewood/Perennial Grass/Invasive species

Phase 2.1 is similar to the reference plant community in composition and ecological function, but it allows for the presence of non-native/invasive species. It is dominated by greasewood and perennial grasses.

Resilience management. If the perennial grasses are reduced in the understory due to excessive grazing during the growing period. Perennial grasses may lose their ability to propagate themselves, and non-native species may co-dominate the understory.

State 3
Depleted Understory State

The depleted understory state occurs when perennial grasses have been lost from the understory. Perennial forbs may also be reduced. Interspaces may be sparsely vegetated or dominated by Russian thistle or other annual invasive species. This state is not as capable of carrying fire due to a reduction in fine fules. As a result, greasewood may continue to increase as the understory continues to be reduced.

Community 3.1
Greasewood/Limited understory

Phase 3.1 is characterized by greasewood dominance and a sparse understory that results from continued overgrazing. Increased size and production of greasewood plants may result in increased soil salinity in surface layers, further reinforcing greaswood dominance on the site.

State 4
Tamarisk State

This state primarily occurs on low stream terraces. The stream provides a corridor for tamarisk invasion, which spreads throughout the alkali bottom on low stream terraces, eventually dominating the site.

Community 4.1
Greasewood-Tamarisk

This community phase is characterized by the establishment and persistence of tamarisk. Greasewood is co-dominant with tamarisk in this phase.

Community 4.2
Tamarisk Dominated

This community phase is characterized by dominance of tamarisk. Greasewood is not dominant in this phase, but may be present as a sub-dominant shrub. Invasive grasses and forbs are often present in this phase.

Pathway 4.1a
Community 4.1 to 4.2

This pathway occurs without disturbance, but may occur more quickly with major disturbaces such as fire, heavy livestock grazing, or a combination of the two.

Pathway 4.2a
Community 4.2 to 4.1

This community pathway may occur with tamarisk control efforts, either mechanical or biological.

Transition T1A
State 1 to 2

Establishment and persistence of non-native species results in a transition from the reference state to the invaded state.

Transition T2A
State 2 to 3

This transition occurs when perennial grasses are reduced by improper grazing to the point that they can no longer self-propagate. Few remnant plants may still persist under shrubs, but re-establishment and dominance by perennial grasses will not occur following a fire, or with the removal of livestock grazing.

Transition T2B
State 2 to 4

This transition only occurs when the site is on low stream terraces. The stream provides a corridor for tamarisk invasion, which spreads to low terraces dominated by greasewood.

Transition T3A
State 3 to 4

This transition most commonly occurs when the site is on low stream terraces. The stream provides a corridor for tamarisk invasion, which spreads to greasewood-dominated floodplains.

Restoration pathway R4A
State 4 to 3

This community pathway may occur with tamarisk control efforts, either mechanical or biological.

Citations

Anderson, M.D. 2004. Sarcobatus vermiculatus.. Fire Effects Information System, [Online].. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer)..