

Ecological site group DX035X02FESG03

Kaibab Plateau - Ustic Aridic - Limestone or Loamy Bottoms

Last updated: 09/02/2021
Accessed: 04/19/2024

Key Characteristics

- Kaibab Plateau (F)
- Site parent material is limestone or loamy.
- Soils are ustic aridic, or precipitation is within the range of 10 to 14 inches.
- Site is and/or located in a wash.

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

Site is and/or located in bottoms with slopes <3%. Aspects tend toward the perimeter of the LRU subset.

Climate

Site soils are aridic ustic or within a 10-14" precipitation zone. Precipitation comes predominantly from winter storm patterns from November through March at upper elevations. Monsoonal patterns and xeric patterns occur more equally at lower elevations.

Soil features

Parent material is limestone. Soils are loamy. Site consists of broad alluvial deposits in washes, streams or fans, often deep.

Vegetation dynamics

This site is dominated by basin big sagebrush and perennial grasses. Percent composition by air-dry weight is 25-60% perennial grasses, 5-15% forbs, and 40-70% shrubs.

Major Land Resource Area

MLRA 035X
Colorado Plateau

Subclasses

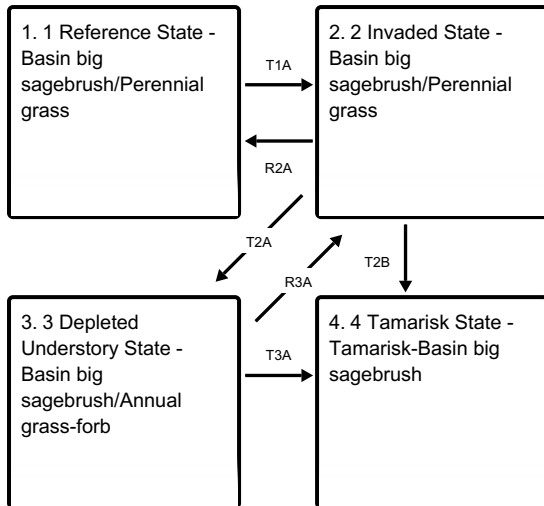
- R035XY011UT–Loamy Bottom (Basin Big Sagebrush)

Stage

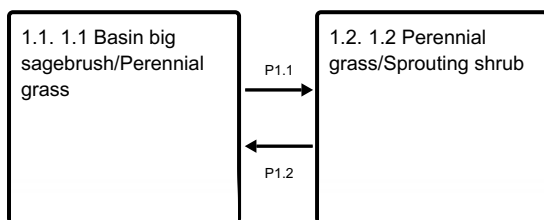
Provisional

State and transition model

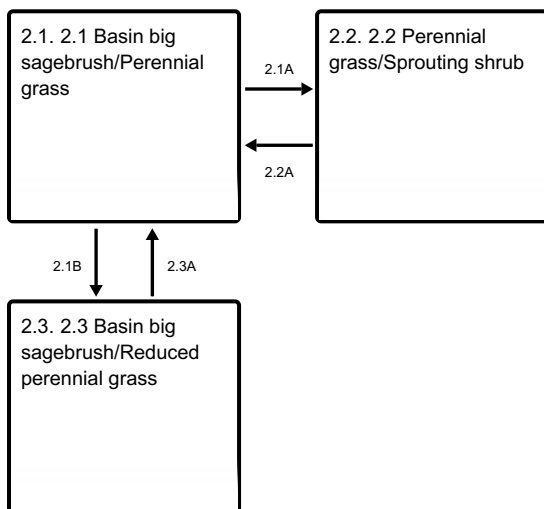
Ecosystem states



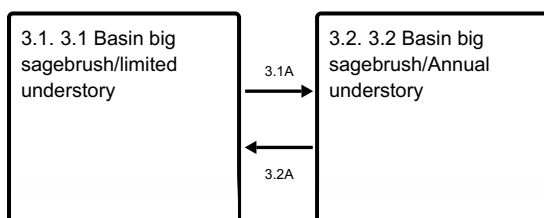
State 1 submodel, plant communities



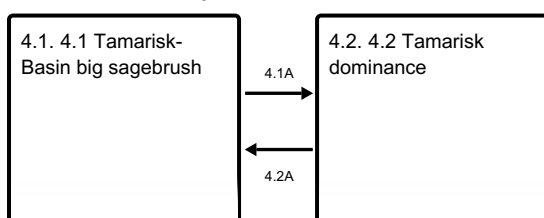
State 2 submodel, plant communities



State 3 submodel, plant communities



State 4 submodel, plant communities



State 1

1 Reference State - Basin big sagebrush/Perennial grass

The reference state contains plant communities presumed to occur prior to the introduction of non-native plants, livestock grazing, and other modern disturbances. Basin big sagebrush dominance depends on time since fire, aroga moth, or extended drought.

Community 1.1

1.1 Basin big sagebrush/Perennial grass

Phase 1.1 is dominated by basin big sagebrush and perennial grasses. Percent composition by air-dry weight is 25-60% perennial grasses, 5-15% forbs, and 40-70% shrubs. In the reference state, this is the most common community phase.

Community 1.2

1.2 Perennial grass/Sprouting shrub

Phase 1.2 is dominated by perennial grasses. Percent composition by air-dry weight is 60-85% perennial grasses, 5-25% forbs, and 15-35% shrubs. Sprouting shrubs make up most of the shrub component. This phase is usually the result of stand-replacing fire that eliminates basin big sagebrush for the space of several years. Sagebrush may begin to re-establish in the community within 10 years following fire, and will steadily increase in the community until it becomes co-dominant with the perennial grass.

Pathway P1.1

Community 1.1 to 1.2

This phase is usually the result of stand-replacing fire that eliminates basin big sagebrush for the space of several years.

Pathway P1.2

Community 1.2 to 1.1

Sagebrush may begin to re-establish in the community within 10 years following fire, and will steadily increase in the community until it becomes co-dominant with the perennial grass.

State 2

2 Invaded State - Basin big sagebrush/Perennial grass

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 incapable of recovering perennial grasses without significant management inputs.

Community 2.1

2.1 Basin big sagebrush/Perennial grass

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 basin big sagebrush and perennial grasses. Percent composition by air-dry weight is 25-60% perennial grasses, 5-15% forbs, and 40-70% shrubs.

Community 2.2

2.2 Perennial grass/Sprouting shrub

Phase 2.2 is dominated by perennial grasses. It is similar to phase 1.2 in composition and ecological function, but allows for non-native/invasive species to be present. Percent composition by air-dry weight is 60-85% perennial grasses, 5-25% forbs, and 15-35% shrubs. Sprouting shrubs make up most of the shrub component. This phase is usually the result of stand-replacing fire that eliminates basin big sagebrush for the space of several years.

Sagebrush may begin to re-establish in the community within 10 years following fire, and will steadily increase in the community until it becomes co-dominant with the perennial grass.

Community 2.3

2.3 Basin big sagebrush/Reduced perennial grass

Phase 2.3 is at-risk of crossing a threshold into the depleted understory state (state 3). Excessive grazing of perennial grasses during growth has favored non-native invasive species, primarily cheatgrass and/or Russian thistle, to co-dominate the understory. Prescribed grazing is required to improve the reproductive capability of perennial grasses and avoid the transition to state 3.

Pathway 2.1A

Community 2.1 to 2.2

This phase is usually the result of stand-replacing fire that eliminates basin big sagebrush for the space of several years.

Pathway 2.1B

Community 2.1 to 2.3

Excessive grazing of perennial grasses during growth has favored non-native invasive species, primarily cheatgrass and/or Russian thistle, to co-dominate the understory.

Pathway 2.2A

Community 2.2 to 2.1

Sagebrush may begin to re-establish in the community within 10 years following fire, and will steadily increase in the community until it becomes co-dominant with the perennial grass.

Pathway 2.3A

Community 2.3 to 2.1

Careful grazing management is required to improve the reproductive capability of perennial grasses and avoid the transition to state 3.

State 3

3 Depleted Understory State - Basin big sagebrush/Annual grass-forb

The depleted understory state occurs when perennial grasses have been lost from the understory. Perennial forbs may also be reduced. This state is not as capable of carrying a stand replacing fire that removes big sagebrush due to a reduction in fine fuels. As a result, sagebrush continues to increase and the understory continues to be reduced. Thinning of sagebrush by livestock trampling or other disturbance results in an increase in annual species in the understory.

Community 3.1

3.1 Basin big sagebrush/limited understory

Perennial grasses have been lost from the understory. Basin big sagebrush continues to increase beyond the natural fire return interval due to lack of fuel to carry a fire. Moss and biological soil crusts cover much of the soil surface.

Community 3.2

3.2 Basin big sagebrush/Annual understory

This phase is dominated by basin big sagebrush in the overstory and annual grasses and/or forbs in the understory.

Pathway 3.1A
Community 3.1 to 3.2

Perennial grasses have been lost from the understory.

Pathway 3.2A
Community 3.2 to 3.1

Management to increase perennial grasses.

State 4
4 Tamarisk State - Tamarisk-Basin big sagebrush

This state has only been documented on low stream terraces. The stream provides a corridor for tamarisk invasion, which spreads throughout the loamy bottom on low stream terraces, eventually dominating the site.

Community 4.1
4.1 Tamarisk-Basin big sagebrush

This community is co-dominated by basin big sagebrush and tamarisk. Production is 10-20% perennial and/or annual grasses, 10-20% forbs, 20-40% tamarisk, and 30-50% other shrubs.

Community 4.2
4.2 Tamarisk dominance

This community occurs when tamarisk becomes the lone dominant species.

Pathway 4.1A
Community 4.1 to 4.2

Pathway 4.2A
Community 4.2 to 4.1

Transition T1A
State 1 to 2

Invasion of introduced species

Restoration pathway R2A
State 2 to 1

It is highly unlikely that once introduced species have invaded the site can be restored to reference.

Transition T2A
State 2 to 3

The depleted understory state occurs when perennial grasses have been lost from the understory. Perennial forbs may also be reduced. This state is not as capable of carrying a stand replacing fire that removes big sagebrush due to a reduction in fine fuels. As a result, sagebrush continues to increase and the understory continues to be reduced.

Transition T2B
State 2 to 4

Restoration pathway R3A

State 3 to 2

Restoration of soil, plant, and hydrologic processes.

Transition T3A

State 3 to 4

This state has only been documented on low stream terraces. The stream provides a corridor for tamarisk invasion, which spreads throughout the loamy bottom on low stream terraces, eventually dominating the site.

Citations