

# Ecological site group DX035X01JESG01

## Paria and Kaibito Plateaus Saline Bottoms and Streambanks

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### Key Characteristics

- Paria and Kaibito Plateaus
- Saline
- Bottoms and streambanks

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 flood plains, stream terraces, near stream channels, and in valley floors. It is a run-in site that receives extra moisture from surrounding uplands, and often has a seasonally high water table within 72 inches of the soil surface. Runoff is very low to high. Slopes typically range from 0-8%, and elevations are generally 4200 to 6500 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 7-11 inches. Much of the summer precipitation occurs as convection thunderstorms. This is a run-in site that receives additional moisture from adjacent sites and occasional flooding.

### Soil features

The soils of this site are very deep alluvial deposits, primarily derived from sedimentary materials. The defining characteristics of these soils are a seasonally high water table and high salt content, which results in high production of halophytic plants. Surface and subsurface textures can range from clay loams to sandy loams. 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 are well-drained with slow to rapid permeability. Rock fragments range from 0 to 10 percent on the surface and throughout the profile. The soil temperature regime is mesic and the soil moisture regime can be aridic (torric) or ustic aridic.

### Vegetation dynamics

In areas where irrigation is possible and salinity problems are addressed, this site has been used for cropland with mixed success.

This site was historically dominated by greasewood and a diverse perennial understory, including seepweed, pale evening primrose, Indian ricegrass, *Sporobolus* spp, and James' galleta.

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

### Subclasses

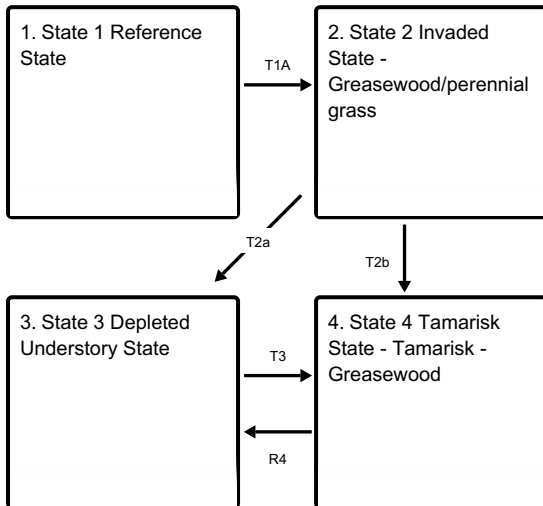
- R035XY003UT–Alkali Bottom (Greasewood)
- R035XY012UT–Semiwet Saline Streambank (Fremont Cottonwood)

### Stage

Provisional

### State and transition model

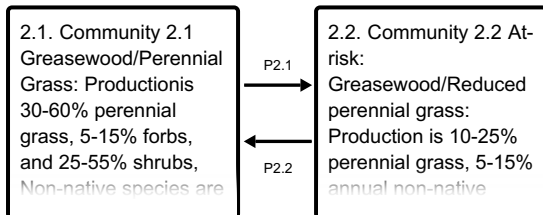
#### Ecosystem states



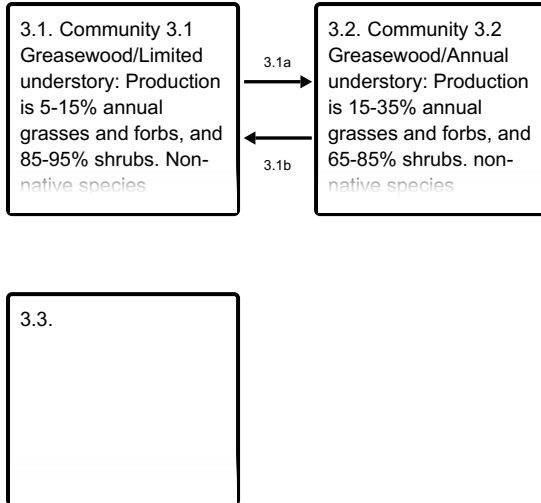
#### State 1 submodel, plant communities

1.1. Community 1.1  
Greasewood/Perennial grass: Production is 30-60% perennial grass, 5-15% forbs, and 25-55% shrubs.  
Non-native species are

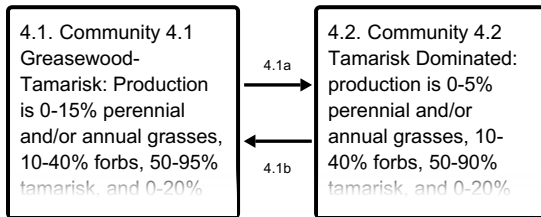
#### State 2 submodel, plant communities



### State 3 submodel, plant communities



### State 4 submodel, plant communities



## State 1 State 1 Reference State

State 1 Reference State The reference state contains plant communities presumed to occur on the Alkali Bottom site prior to the introduction of non-native plants, livestock grazing, and other modern disturbances. 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

**Community 1.1 Greasewood/Perennial grass: Production is 30-60% perennial grass, 5-15% forbs, and 25-55% shrubs. Non-native species are present but not dominant.**



R035XY003UT—Alkali Bottom (Greasewood) community 1.1—Greasewood/Perennial grass. Cover is 30%

Community 1.1 Greasewood/Perennial grass Phase 1.1 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. Composition by air-dry weight is 40-60% grasses, 5-15% forbs, and 25-50% shrubs. Community 1.1 plant community composition

Grass/Grasslike Group	Group name	Common name	Symbol	Scientific name	Annual production (pounds per acre)	Foliar cover (%)
0	Dominant Grasses	200-450	Indian ricegrass	ACHY <i>Achnatherum hymenoides</i>	10-120	0-8
0-8	needle and thread	HECO26	<i>Hesperostipa comata</i>	0-120	0-8	James' galleta
PLJA	<i>Pleuraphis jamesii</i>	10-100	0-6	alkali sacaton	SPAI	<i>Sporobolus airoides</i>
0-120	0-8	spike dropseed	SPCO4	<i>Sporobolus contractus</i>	0-120	0-8
0-8	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0-120	0-8	mesa dropseed
SPFL2	<i>Sporobolus flexuosus</i>	0-120	0-8	1	Sub-Dominant Grasses	50-100
0-20	purple threeawn	ARPU9	<i>Aristida purpurea</i>	0-20	0-1	blue grama
BOGR2	<i>Bouteloua gracilis</i>	0-30	0-2	saltgrass	DISP	<i>Distichlis spicata</i>
0-10	0-1	squirreltail	ELEL5	<i>Elymus elymoides</i>	0-5	0-1
0-1	Grass, perennial	2GP	Grass, perennial	10-50	1-5	sixweeks fescue
VUOC	<i>Vulpia octoflora</i>	1-20	0-2	Forb Group	Group name	Common name
Symbol	Scientific name	Annual production (pounds per acre)	Foliar cover (%)	2	Forbs	25-75
0-1	sand gilia	ALLE7	<i>Aliciella leptomeria</i>	0-10	0-2	madwort
ALYSS	Alyssum	0-8	0-6	yellow spiderflower	CLLU2	<i>Cleome lutea</i>
0-3	0-1	scrambled eggs	COAU2	<i>Corydalis aurea</i>	0-5	0-2
0-2	cryptantha	CRYPT	Cryptantha	3-6	0-2	thicksepal cryptantha
CRCR3	<i>Cryptantha crassisejala</i>	0-10	0-3	tansymustard	DESCU	Descurainia
0-12	0-2	Forb, annual	2FA	Forb, annual	5-25	Forb, perennial
2FP	Forb, perennial	5-25	gilia	GILIA	Gilia	0-6
0-1	common pepperweed	LEDE	<i>Lepidium densiflorum</i>	0-8	0-2	pale evening primrose
OEPA	<i>Oenothera pallida</i>	0-10	0-1	woolly plantain	PLPA2	<i>Plantago patagonica</i>
0-5	0-1	primrose	PRIMU	Primula	0-10	1-2
0-2	ragwort	SENEC	Senecio	0-5	0-2	longbeak
STLO4	<i>Streptanthella longirostris</i>	0-2	0-1	Mojave seablite	SUMO	<i>Suaeda moquinii</i>
0-50	0-5	Townsend daisy	TOWNS	Townsendia	0-5	0-1

## State 2

### State 2 Invaded State - Greasewood/perennial grass

State 2 Invaded State 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

### Community 2.1 Greasewood/Perennial Grass: Production is 30-60% perennial grass, 5-15% forbs, and 25-55% shrubs, Non-native species are present but not dominant.

Community 2.1 Greasewood/Perennial Grass Phase 2.1 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. Percent composition by air-dry weight is 30-60% perennial grasses, 5-15% forbs, and 25-55% shrubs.

## Community 2.2

### Community 2.2 At-risk: Greasewood/Reduced perennial grass: Production is 10-25% perennial grass, 5-15% annual non-native species, 5-15% forbs, and 50-65% shrubs. non-native species co-dominate the understory with perennial grass.

Community 2.2 At-risk: Greasewood/Reduced perennial grass Phase 2.2 This plant community is at-risk of crossing a threshold into the depleted understory state (state 3). Years of 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 P2.1

### Community 2.1 to 2.2

Repetitive, high utilization of palatable grass species have given shrubs a competitive advantage.

## Pathway P2.2

## **Community 2.2 to 2.1**

Management to improve palatable grass species, along with a set back to the shrubs such as fire.

## **State 3**

### **State 3 Depleted Understory State**

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 fuels. As a result, greasewood may continue to increase as the understory continues to be reduced.

## **Community 3.1**

### **Community 3.1 Greasewood/Limited understory: Production is 5-15% annual grasses and forbs, and 85-95% shrubs. Non-native species dominate the sparse understory.**

Community 3.1 Greasewood/Limited understory Phase 3.1 3.1 after tamarisk removal 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 greasewood dominance on the site.

## **Community 3.2**

### **Community 3.2 Greasewood/Annual understory: Production is 15-35% annual grasses and forbs, and 65-85% shrubs. non-native species dominate the understory.**

Community 3.2 Greasewood/Annual understory Phase 3.2 This phase is dominated by greasewood in the overstory and annual grasses and/or forbs in the understory. Pathway 3.2a Community 3.2 to 3.1 Greasewood/Annual understory Greasewood/Limited understory This pathway occurs when livestock use reduces the annual invasive species between shrubs. It may also be reinforced by an increase in salt deposits on the soil surface from increased greasewood production.

## **Community 3.3**

### **Pathway 3.1a**

#### **Community 3.1 to 3.2**

Further degradation to the understory reducing annual production to annuals.

### **Pathway 3.1b**

#### **Community 3.2 to 3.1**

This pathway occurs when livestock use reduces the annual invasive species between shrubs. It may also be reinforced by an increase in salt deposits on the soil surface from increased greasewood production.

## **State 4**

### **State 4 Tamarisk State - Tamarisk - Greasewood**

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**

### **Community 4.1 Greasewood-Tamarisk: Production is 0-15% perennial and/or annual grasses, 10-40% forbs, 50-95% tamarisk, and 0-20% shrubs**

Community 4.1 Greasewood-Tamarisk Phase 4.1 This community phase is characterized by the establishment and persistence of tamarisk. Greasewood is co-dominant with tamarisk in this phase.

## **Community 4.2**

**Community 4.2 Tamarisk Dominated: production is 0-5% perennial and/or annual grasses, 10-40% forbs, 50-90% tamarisk, and 0-20% shrubs.**

Community 4.2 Tamarisk Dominated Phase 4.2 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**

### **Pathway 4.1b**

**Community 4.2 to 4.1**

### **Transition T1A**

**State 1 to 2**

A decline of ecosystem health along with invasion of introduced species. Once introduced species have invaded it is unlikely the site can be restored to reference.

### **Transition T2a**

**State 2 to 3**

Repetitive, high utilization of palatable understory species over time increases bare ground and erosion.

### **Transition T2b**

**State 2 to 4**

Site degradation along with invasion of tamarisk and an increase in greasewood.

### **Transition T3**

**State 3 to 4**

Further degradation along with establishment of tamarisk.

### **Restoration pathway R4**

**State 4 to 3**

Treatment to reduced tamarisk along with further colonization of shrubs.

## **Citations**