Ecological site R026XF006CA
Dry Floodplain

Last updated: 4/10/2024
Accessed: 05/12/2025

General information

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.

MLRA notes

Major Land Resource Area (MLRA): 026X–Carson Basin and Mountains

The area lies within western Nevada and eastern California, with about 69 percent being within Nevada, and 31 percent being within California. Almost all this area is in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. Isolated north-south trending mountain ranges are separated by aggraded desert plains. The mountains are uplifted fault blocks with steep side slopes. Most of the valleys are drained by three major rivers flowing east across this MLRA. A narrow strip along the western border of the area is in the Sierra Nevada Section of the Cascade-Sierra Mountains Province of the Pacific Mountain System. The Sierra Nevada Mountains are primarily a large fault block that has been uplifted with a dominant tilt to the west. This structure leaves an impressive wall of mountains directly west of this area. This helps create a rain shadow affect to MLRA 26. Parts of this eastern face, but mostly just the foothills, mark the western boundary of this area. Elevations range from about 3,806 feet (1,160 meters) on the west shore of Pyramid Lake to 11,653 feet (3,552 meters) on the summit of Mount Patterson in the Sweetwater Mountains.

Valley areas are dominantly composed of Quaternary alluvial deposits with Quaternary playa or alluvial flat deposits often occupying the lowest valley bottoms in the internally drained valleys, and river deposited alluvium being dominant in externally drained valleys. Hills and mountains are dominantly Tertiary andesitic flows, breccias, ash flow tuffs, rhyolite tuffs or granodioritic rocks. Quaternary basalt flows are present in lesser amounts, and Jurassic and Triassic limestone and shale, and Precambrian limestone and dolomite are also present in very limited amounts. Also of limited extent are glacial till deposits along the east flank of the Sierra Nevada Mountains, the result of alpine glaciation.

The average annual precipitation in this area is 5 to 36 inches (125 to 915 millimeters), increasing with elevation. Most of the rainfall occurs as high-intensity, convective storms in spring and autumn. Precipitation is mostly snow in winter. Summers are dry. The average annual temperature is 37 to 54 degrees F (3 to 12 degrees C). The freeze-free period averages 115 days and ranges from 40 to 195 days, decreasing in length with elevation.

The dominant soil orders in this MLRA are Aridisols and Mollisols. The soils in the area dominantly have a mesic soil temperature regime, an aridic or xeric soil moisture regime, and mixed or smectitic mineralogy. They generally are well drained, are clayey or loamy and commonly skeletal, and are very shallow to moderately deep.

This area supports shrub-grass vegetation characterized by big sagebrush. Low sagebrush and Lahontan sagebrush occur on some soils. Antelope bitterbrush, squirreltail, desert needlegrass, Thurber needlegrass, and Indian ricegrass are important associated plants. Green ephedra, Sandberg bluegrass, Anderson peachbrush, and several forb species also are common. Juniper-pinyon woodland is typical on mountain slopes. Jeffrey pine, lodgepole pine, white fir, and manzanita grow on the highest mountain slopes. Shadscale is the typical plant in the drier parts of the area. Sedges, rushes, and moisture-loving grasses grow on the wettest parts of the wet flood plains and terraces. Basin wildrye, alkali sacaton, saltgrass, buffaloberry, black greasewood, and rubber rabbitbrush grow on the drier sites that have a high concentration of salts.

Some of the major wildlife species in this area are mule deer, coyote, beaver, muskrat, jackrabbit, cottontail, raptors, pheasant, chukar, blue grouse, mountain quail, and mourning dove. The species of fish in the area include trout and catfish. The Lahontan cutthroat trout in the Truckee River is a threatened and endangered species.

LRU notes

The Mono-Adobe-Long Valleys LRU is comprised of the basins surrounding Mono Lake, Adobe Valley, and Long Valley to the southeast. Pleistocene and Holocene age alluvium and lacustrine deposits predominate. Ash layers occur from eruptions of the numerous volcanic domes that are mostly in adjacent LRUs. Soil temperature regimes are mesic and soil moisture regimes are aridic. Elevations range from 1310 to 2680 meters and slopes are typically less than 10 percent, however there are some ecological sites within the Mono-Adobe-Long Valleys LRU that are greater than 10 percent. Frost free days (FFD) range from 97-125.

Ecological site concept

The Dry Floodplain site occurs on alluvial fans and valley floors. Elevations are 5300 to 7400 feet. Slopes range from 0 to 4 percent. The soils are very deep and somewhat excessively drained. They formed in mixed alluvium influenced by volcanic ash. Surface textures are gravelly loamy sand. Underlying material is loamy sand and sandy, and may be stratified. The Dry Floodplain site does not have a water table with in 60 inches of the soils surface, but the site does experience rare flooding. The reference plant community is dominated by basin big sagebrush (*Artemisia tridentata* ssp. tridentata).

Associated sites

R026XF005CA	**Deep Ashy 10-12" P.Z.** The Deep Ashy 10-12 P.Z. is found adjacent to the Dry Floodplain on interdune areas.
R026XF046CA	**Gravelly Sand (BLM)** The Gravelly Sand (BLM) site is found adjacent to the Dry Floodplain site on lake terraces.
R026XF004CA	**Gravelly Coarse Loamy 8-12" P.Z.** The Gravelly Coarse Loamy 8-12 P.Z. is on gravelly lake terraces adjacent to the Dry Floodplain site.
R026XF016CA	**Wet Sodic Meadow** The Wet Sodic Meadow site is found on wet soils with a water table less than 24 inches deep.

Similar sites

R026XY012NV	**DRY FLOODPLAIN 8-10 P.Z.** The Dry Floodplain 8-10 P.Z. is in a lower precipitation zone.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Artemisia tridentata ssp. tridentata*
Herbaceous	(1) *Achnatherum hymenoides*

Physiographic features

This site occurs on alluvial fans and valley floors. Slopes range from 0 to 4 percent.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Valley floor
Runoff class	Negligible
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Rare

Elevation	1,615–2,256 m
Slope	0–4%
Aspect	Aspect is not a significant factor

Climatic features

The climate on this site is characterized by cold winters (20 to 40 degrees F) and warm, mostly dry summers (45 to 85 degrees F). The average annual precipitation ranges from 8 to 10 inches, with most falling as snow from November to March.

Table 3. Representative climatic features

Frost-free period (characteristic range)	
Freeze-free period (characteristic range)	
Precipitation total (characteristic range)	203-254 mm
Frost-free period (average)	108 days
Freeze-free period (average)	135 days
Precipitation total (average)	254 mm

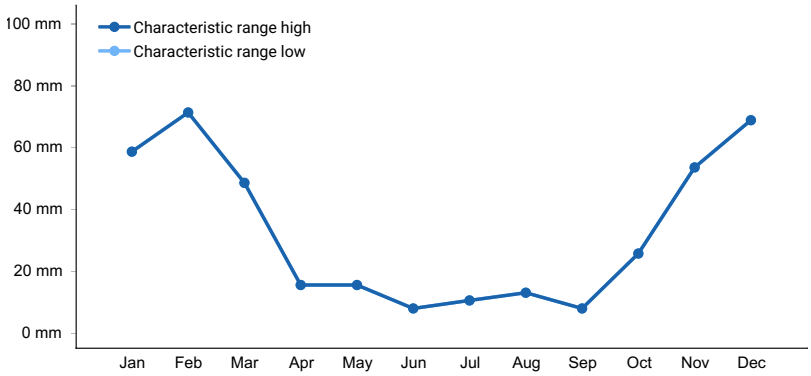


Figure 1. Monthly precipitation range

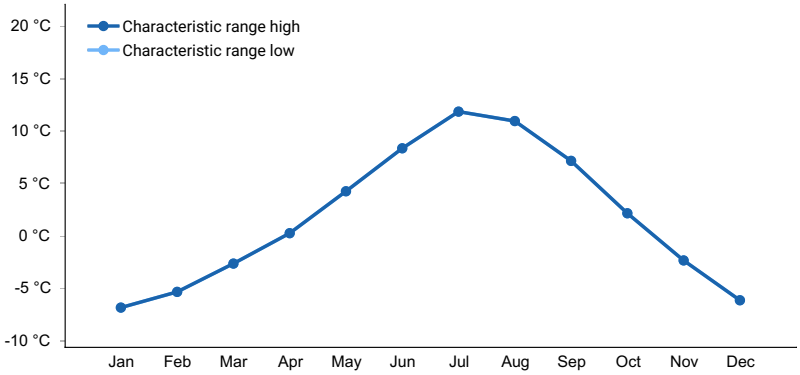


Figure 2. Monthly minimum temperature range

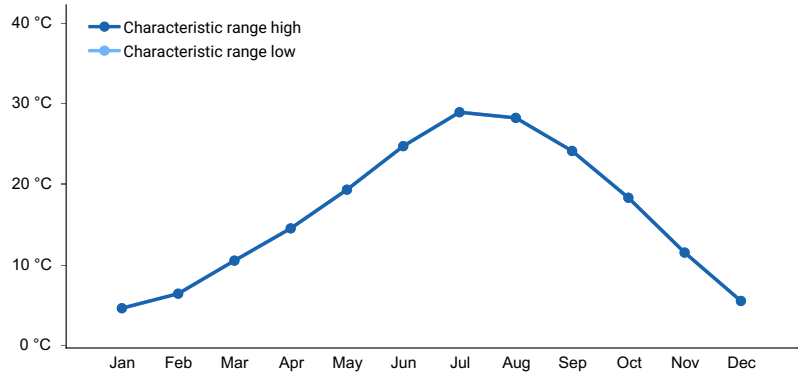


Figure 3. Monthly maximum temperature range

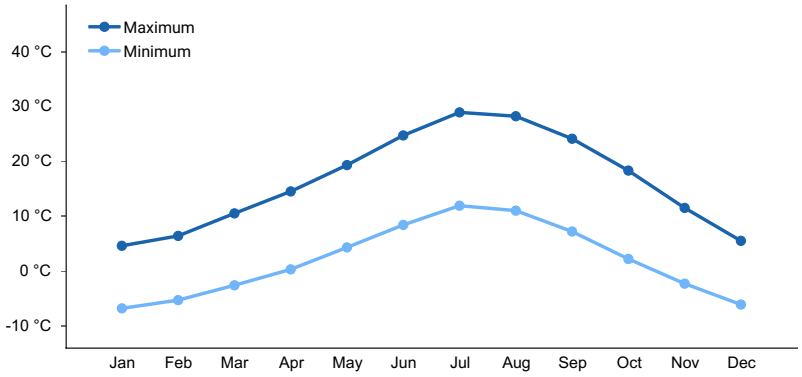


Figure 4. Monthly average minimum and maximum temperature

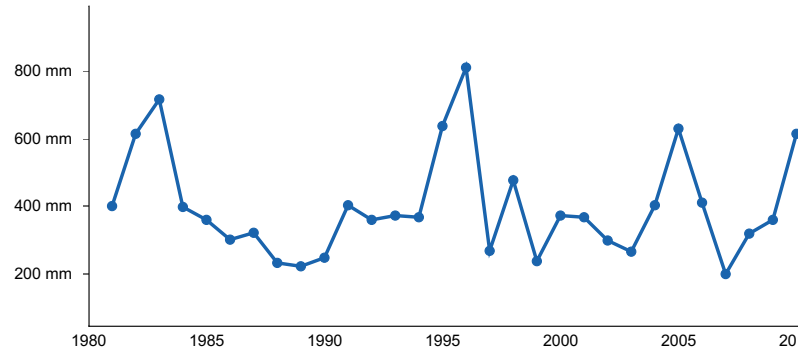


Figure 5. Annual precipitation pattern

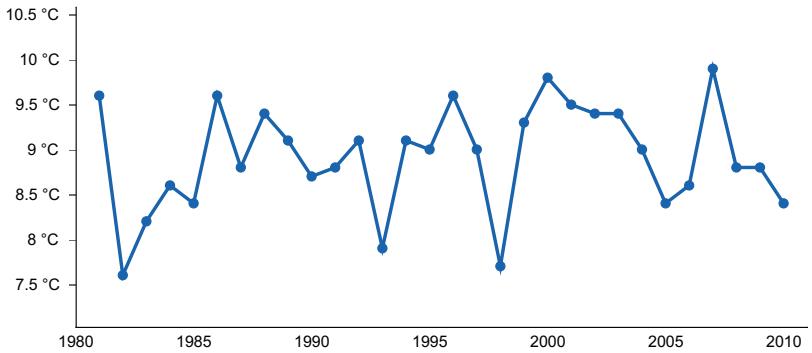


Figure 6. Annual average temperature pattern

Climate stations used

- (1) LEE VINING [USC00044881], Lee Vining, CA

Influencing water features

The Dry Floodplain site may be influenced by adjacent drainageways. Flooding is rare and very brief.

Soil features

The soils that characterize this site are very deep and somewhat excessively drained. They formed in mixed alluvium influenced by volcanic ash. Surface textures are gravelly loamy sand. Underlying material is loamy sand and sandy, and may be stratified. Available water capacity is moderate and the hazard of water erosion is slight. Wind erosion hazard is severe. Effective rooting depth is greater than 60 inches.

Dry Floodplain is correlated to the following soil series:
Brantel (Surveys CA732 and CA802)

Table 4. Representative soil features

Parent material	(1) Volcanic ash
Surface texture	(1) Gravelly loamy sand
Drainage class	Somewhat excessively drained
Permeability class	Rapid
Soil depth	152 cm
Surface fragment cover <=3"	26%
Surface fragment cover >3"	0%
Available water capacity (Depth not specified)	7.87–11.94 cm
Calcium carbonate equivalent (Depth not specified)	0%
Electrical conductivity (Depth not specified)	0 mmhos/cm
Sodium adsorption ratio (Depth not specified)	0
Soil reaction (1:1 water) (Depth not specified)	6.6–7.8
Subsurface fragment volume <=3" (Depth not specified)	26%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

The plant community is dominated by basin big sagebrush. Potential vegetation composition is about 70 percent shrubs, 25 percent grasses, and 5 percent forbs.

As ecological condition deteriorates, rabbitbrush and big sagebrush would increase, and perennial grasses and fourwing saltbush would decrease.

The Dry Floodplain site is similar to sites in Disturbance Response Group 11.

Description of MRLA 26 DRG 11:

Disturbance Response Group (DRG) 11 consists of three ecological sites, R026XY012NV, R026XY032NV, and R026034NV. The precipitation zone for these sites ranges from 8 to 12 inches. The elevation range of this group is 4,500 to 5,600 feet. Slopes range from 0 to 15 percent, however slopes under 4 percent are most typical. Soils on these sites are very deep with high available water capacity. These soils can be somewhat poorly drained and may be alkaline. Annual production in a normal year ranges from 800 to 1,200 lb/ac for the group. The potential native

plant community for these sites varies depending on precipitation, elevation and landform. The shrub component is dominated by basin big sagebrush (*Artemisia tridentata* ssp. tridentata), mountain big sagebrush (*Artemisia tridentata* ssp. vaseyana) and fourwing saltbush (*Atriplex canescens*). Rubber rabbitbrush (*Ericameria nauseosa*) and Torrey's saltbush (*Atriplex torreyi*) are also important shrub species. The understory is dominated by deep-rooted perennial bunchgrasses, primarily basin wildrye (*Leymus cinereus*). Other important grasses include western wheatgrass (*Pascopyrum smithii*) and Indian ricegrass (*Achnatherum hymenoides*).

State and Transition Model Narrative for Group 11
This is a text description of the states, phases, transitions, and community pathways possible in the State and Transition model for the MLRA 26 Disturbance Response Group 11.

Reference State 1.0:

The Reference State 1.0 is a representation of the natural range of variability under pristine conditions. The reference state has three general community phases: a shrub-grass dominant phase, a perennial grass dominant phase, and a shrub dominant phase. State dynamics are maintained by interactions between climatic patterns and disturbance regimes. Negative feedbacks enhance ecosystem resilience and contribute to the stability of the state. These include the presence of all structural and functional groups, low fine fuel loads, and retention of organic matter and nutrients. Plant community phase changes are primarily driven by fire, periodic drought and/or insect or disease attack.

Community Phase 1.1:
Basin wildrye and basin big sagebrush dominate the plant community. Forbs and other grasses make up smaller components.

Community Phase Pathway 1.1a, from phase 1.1 to 1.2:
Fire would decrease or eliminate the overstory of sagebrush and allow the perennial bunchgrasses and forbs to dominate the site. Fires would typically be small and patchy due to low or moist fuel loads.

Community Phase Pathway 1.1b, from phase 1.1 to 1.3:
Time and lack of disturbance such as fire allows sagebrush to increase and become dominant. Long-term drought, herbivory, or combinations of these would cause a decline in basin wildrye and fine fuels, leading to a reduced fire frequency allowing big sagebrush to dominate the site.

Community Phase 1.2:
This community phase is characteristic of a post-disturbance, early- to mid-seral community. Basin wildrye, western wheatgrass, and other perennial bunchgrasses dominate. Depending on fire severity or intensity of Aroga moth infestation, patches of intact sagebrush may remain. Rabbitbrush may be sprouting and may be a significant component of the plant community.

Community Phase Pathway 1.2a, from phase 1.2 to 1.1:
Time and lack of disturbance allows sagebrush to reestablish.

Community Phase 1.3:
Big sagebrush dominates in the absence of disturbance. Mature sagebrush may be decadent. The deep-rooted perennial bunchgrasses in the understory are reduced either from competition with shrubs and/or from herbivory. Basin wildrye is a minor component.

Community Phase Pathway 1.3a, from phase 1.3 to 1.2:
Fire would decrease or eliminate the overstory of sagebrush and allow the perennial bunchgrasses to dominate the site. Fires would typically be low severity resulting in a mosaic pattern due to low fine fuel loads. A fire following an unusually wet spring or a change in management favoring an increase in fine fuels, may be more severe and reduce sagebrush cover to trace amounts. A severe infestation of Aroga moth could also cause a large decrease in sagebrush within the community, giving a competitive advantage to the perennial grasses and forbs.

Community Phase Pathway 1.3b, from phase 1.3 to 1.1:
Low severity fire, Aroga moth, or a combination of both will reduce some of the sagebrush overstory and allow grass species to increase.

T1A: Transition from Reference State 1.0 to Current Potential State 2.0:
Trigger: This transition is caused by the introduction of non-native annual weeds, such as cheatgrass, mustard and Russian thistle.
Slow variables: Over time, the annual non-native plants will increase within the community.
Threshold: Any amount of introduced non-native species causes an immediate decrease in the resilience of the site. Annual non-native species cannot be easily removed from the system and have the potential to significantly alter disturbance regimes from their historic range of variation.

Current Potential State 2.0:
This state is similar to the Reference State 1.0 with the addition of one community phase. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. This state has the same three general community phases. Negative feedbacks enhance ecosystem resilience and contribute to the stability of the state. These include the presence of all structural and functional groups, low fine fuel loads and retention of organic matter and nutrients. Positive feedbacks decrease ecosystem resilience and stability of the state. These include the non-natives high seed output, persistent seed bank, rapid growth rate, ability to cross pollinate and adaptations for seed dispersal. Additionally, the presence of highly flammable non-native species reduces State resilience because these species can promote fire where historically fire has been infrequent leading to positive feedbacks that further the degradation of the system. Seeded species may be present in all phases of this group. This site was not seen in a seeded state, however crested wheatgrass was found, likely from nearby seedings.

Community Phase 2.1:
This community phase is similar to Reference State Community Phase 1.1, with the presence of non-native annual species present. Basin wildrye and basin big sagebrush dominate the plant community. Forbs and other grasses make up smaller components.

Community Phase Pathway 2.1a, from phase 2.1 to 2.2:
Fire would decrease or eliminate the overstory of sagebrush and allow the perennial bunchgrasses and forbs to dominate the site. Fires would typically be small and patchy due to low or moist fuel loads.

Community Phase Pathway 2.1b, from phase 2.1 to 2.3:
Time without disturbance, long-term drought, grazing management that favors shrubs, or combinations of these would allow the sagebrush overstory to increase and dominate the site.

Community Phase 2.2:
This community phase is characteristic of a post-disturbance, early- to mid-seral community. Basin wildrye, western wheatgrass, and other perennial bunchgrasses dominate. Depending on fire severity or intensity of Aroga moth infestation, patches of intact sagebrush may remain. Rabbitbrush may be sprouting and may be a significant component of the plant community. Annual non-native species are stable or increasing within the community.

Community Phase Pathway 2.2a, from phase 2.2 to 2.1:
Absence of disturbance over time allows sagebrush to recover. This may be combined with grazing management that favors shrubs.

Community Phase Pathway 2.2b, from phase 2.2. to 2.4:
Fall and spring growing conditions that favor the germination and production of non-native, annual grasses cause these species to codominate with bunchgrasses in the understory. This pathway typically occurs three to five years post fire and phase 2.4 may be a transitory plant community.

Community Phase 2.3:
Big sagebrush dominates in the absence of disturbance. Mature sagebrush may be decadent. The deep-rooted perennial bunchgrasses in the understory are reduced either from competition with shrubs and/or from herbivory. Basin wildrye is a minor component. Rabbitbrush may be a significant component. Annual non-natives species may be stable or increasing due to lack of competition with perennial bunchgrasses. This site is susceptible to further degradation from grazing, drought, and fire.

Community Phase Pathway 2.3a, from phase 2.3 to 2.2:

Fire would decrease or eliminate the overstory of sagebrush and allow the perennial bunchgrasses to dominate the site. Fires would typically be low severity resulting in a mosaic pattern due to low fine fuel loads. A fire following an unusually wet spring or a change in management favoring an increase in fine fuels, may be more severe and reduce sagebrush cover to trace amounts. A severe infestation of Aroga moth could also cause a large decrease in sagebrush within the community, giving a competitive advantage to the perennial grasses and forbs. Annual non-native species respond well to fire and may increase post-burn. Brush management with minimal soil disturbance and/or late-fall/winter grazing that causes mechanical damage to sagebrush may also cause this change.

Community Phase Pathway 2.3b, from phase 2.3 to 2.1:
A change in grazing management that decreases shrubs will allow for the perennial bunchgrasses in the understory to increase. Heavy late-fall/winter grazing will reduce sagebrush and increase the herbaceous understory. A moderate infestation of Aroga moth may reduce some sagebrush overstory and allow perennial grasses to increase in the community. Brush treatments with minimal soil disturbance will also decrease sagebrush and release the perennial understory. Annual non-native species are present in the community.

Community Phase Pathway 2.3c, from phase 2.3 to 2.4:
Fall and spring growing season conditions that favor the germination and production of non-native annual grasses cause these species to become dominant. This phase may be a transitory plant community.

Community Phase 2.4:
This community is at risk of crossing to an annual state. Native bunchgrasses and forbs still comprise 50% or more of the understory annual production, however, non-native annual grasses are nearly codominant. If this site originated from phase 2.3 there may be significant shrub cover as well. Annual production and abundance of these annuals may increase drastically in years with heavy spring precipitation. Seeded species may be present. This site is susceptible to further degradation from grazing, drought and fire.

Community Phase Pathway 2.4a, from phase 2.4 to 2.3:
Growing season conditions that favor perennial bunchgrass production and reduce cheatgrass production.

Community Phase Pathway 2.4b, from phase 2.4 to 2.2:
Growing season conditions that favor perennial bunchgrass production and reduce cheatgrass production. May occur as site recovers from fire.

T2A: Transition from Current Potential State 2.0 to Shrub State 3.0:
Trigger: Inappropriate, long-term grazing of perennial bunchgrasses during growing season favors shrubs and initiates the transition to Phase 3.1 from Phase 2.3. May be exacerbated by a lowered seasonal water table. Fire causes a transition to Community Phase 3.2.
Slow variables: Long term reduction in deep-rooted perennial grass density results in a decrease in organic matter inputs and subsequent soil water decline.
Threshold: Loss of deep-rooted perennial bunchgrasses spatially and temporally changes nutrient cycling and redistribution, and reduces soil organic matter. Loss of high seasonal water table prevents regeneration of basin wildrye.

T2B: Transition from Current Potential State 2.0 to Annual State 4.0:
Trigger: Severe fire or multiple fires, long term inappropriate grazing, and/or soil disturbing treatments such as plowing.
Slow variables: Increased production and cover of non-native annual species.
Threshold: Loss of deep-rooted perennial bunchgrasses and shrubs truncates, spatially and temporally, nutrient capture and cycling within the community. Increased, continuous fine fuels from annual non-native plants modify the fire regime by changing intensity, size and spatial variability of fires.

Shrub State 3.0:
This state is a product of many years of heavy grazing during time periods harmful to perennial bunchgrasses. Sagebrush dominates the overstory and rabbitbrush may be a significant component. Sagebrush cover exceeds site concept and may be decadent, reflecting stand maturity and lack of seedling establishment due to competition with mature plants. The shrub overstory dominates site resources such that soil water, nutrient capture, nutrient cycling and soil organic matter are temporally and spatially redistributed.

Community Phase 3.1:
Sagebrush and/or rabbitbrush dominates the overstory and other shrubs may be a significant component. Perennial bunchgrasses are a minor component. Annual non-native species are present to increasing. Understory may be sparse, with bare ground increasing.

Community Phase Pathway 3.1a, from phase 3.1 to 3.2:
Fire or heavy fall grazing reduces or eliminates the overstory of sagebrush to trace amounts and allows bunchgrasses to dominate the site. Brush treatments causing minimal soil disturbance causing mechanical damage to shrubs may also cause this change.

Community Phase 3.2:
Rabbitbrush dominates the overstory. Annual non-native species may be present in the understory but are not dominant. Perennial bunchgrasses may be a minor component. Bare ground may be increasing.

Community Phase Pathway 3.2a, from phase 3.2 to 3.1:
Time and lack of disturbance over time and/or grazing management that favors the establishment and growth of sagebrush allows sagebrush to recover.

T3A: Transition from Shrub State 3.0 to Annual State 4.0:
Trigger: Fire or inappropriate grazing management can eliminate the perennial community and transition to community phase 4.1 or 4.2. This may be coupled with gullying and loss of seasonally high water table that maintains basin wildrye.
Slow variable: Increased seed production and cover of annual non-native species.
Threshold: Increased, continuous fine fuels modify the fire regime by changing intensity, size and spatial variability of fires. Changes in plant community composition and spatial variability of vegetation due to the loss of perennial bunchgrasses and sagebrush truncate energy capture and impact the nutrient cycling and distribution.

R3A: Restoration from Shrub State 3.0 to Current Potential State 2.0:
Brush management coupled with seeding of desired perennial bunchgrass. Concurrent herbicide treatment may be needed to avoid an increase in annual invasive species. If changes in vegetation were caused by altered hydrology, restoration of associated channels will be needed to achieve success.

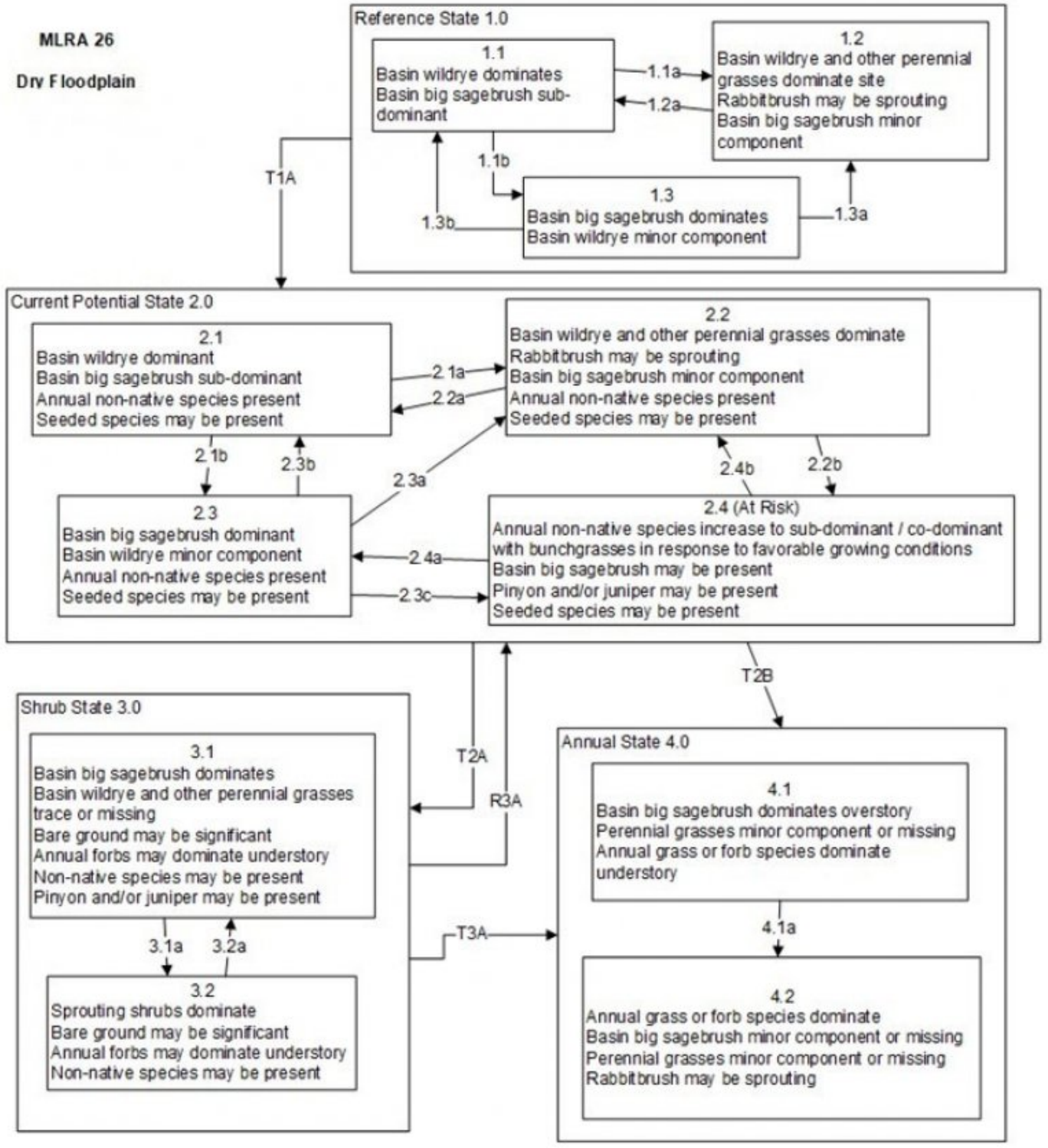
Annual State 4.0:
An abiotic threshold has been crossed and state dynamics are driven by fire and time. The herbaceous understory is dominated by annual non-native species such as cheatgrass and mustards. Resiliency has declined and further degradation from fire facilitates a cheatgrass and sprouting shrub plant community. Fire return interval has shortened due to the dominance of cheatgrass in the understory and is a driver in site dynamics.

Community Phase 4.1:
Big sagebrush dominates the overstory, with non-native annual grasses and forb species in the understory. Perennial grasses are a minor component and may be missing entirely.

Community Phase pathway 4.1a, from phase 4.1 to 4.2:
Fire and/or a failed brush treatment or seeding eliminates the shrub overstory. Annuals such as cheatgrass increase after fire and dominate the site.

Community Phase 4.2:
Annual non-native plants such as cheatgrass dominate the site. This phase may have seeded species present if resulting from a failed seeding attempt. Perennial bunchgrasses and forbs may still be present in trace amounts. Rabbitbrush may be sprouting Surface erosion may increase with summer convection storms; increased pedestalling of plants, rill formation, or extensive water flow paths identify these events.

State and transition model


MLRA 26
Dry Floodplain
Reference State 1.0
1.1
Basin wildrye dominates
Basin big sagebrush sub-dominant
1.2
Basin wildrye and other perennial grasses dominate site
Rabbitbrush may be sprouting
Basin big sagebrush minor component
1.3
Basin big sagebrush dominates
Basin wildrye minor component
1.1a
1.2a
1.1b
1.3a
1.3b
T1A
Current Potential State 2.0
2.1
Basin wildrye dominant
Basin big sagebrush sub-dominant
Annual non-native species present
Seeded species may be present
2.2
Basin wildrye and other perennial grasses dominate
Rabbitbrush may be sprouting
Basin big sagebrush minor component
Annual non-native species present
Seeded species may be present
2.1a
2.2a
2.1b
2.3b
2.3a
2.4b
2.2b
2.3
Basin big sagebrush dominant
Basin wildrye minor component
Annual non-native species present
Seeded species may be present
2.4 (At Risk)
Annual non-native species increase to sub-dominant / co-dominant with bunchgrasses in response to favorable growing conditions
Basin big sagebrush may be present
Pinyon and/or juniper may be present
Seeded species may be present
2.4a
2.3c
T2B
Shrub State 3.0
3.1
Basin big sagebrush dominates
Basin wildrye and other perennial grasses trace or missing
Bare ground may be significant
Annual forbs may dominate understory
Non-native species may be present
Pinyon and/or juniper may be present
T2A
R3A
3.1a
3.2a
3.2
Sprouting shrubs dominate
Bare ground may be significant
Annual forbs may dominate understory
Non-native species may be present
T3A
Annual State 4.0
4.1
Basin big sagebrush dominates overstory
Perennial grasses minor component or missing
Annual grass or forb species dominate understory
4.1a
4.2
Annual grass or forb species dominate
Basin big sagebrush minor component or missing
Perennial grasses minor component or missing
Rabbitbrush may be sprouting

Reference State 1.0 Community Phase Pathways.
1.1a: Fire significantly reduces sagebrush cover and leads to early/mid-seral community, dominated by grasses and forbs. Aroga moth may cause a large die-off in sagebrush resulting in a mosaic of grass and sagebrush.
1.1b: Time and lack of disturbance such as fire. Excessive herbivory, chronic drought or combinations may also decrease perennial understory.
1.2a: Time and lack of disturbance allows for shrub regeneration.
1.3a: Fire significantly reduces sagebrush cover and leads to early/mid-seral community, dominated by grasses and forbs. Aroga moth may cause a large die-off in sagebrush resulting in a mosaic of grass and sagebrush.
1.3b: A low severity fire, Aroga moth, or combinations will reduce some of the sagebrush overstory and allow grass species to increase.

Transition T1A: Introduction of non-native species such as cheatgrass.

Current Potential State 2.0 Community Phase Pathways.
2.1a: Low severity fire creates grass/sagebrush mosaic; high severity fire significantly reduces sagebrush and leads to early/mid-seral community, dominated by grasses and forbs: non-native annual species present.
2.1b: Time and lack of disturbance such as fire. Inappropriate grazing management may also reduce perennial understory.
2.2a: Time and lack of disturbance allows for shrub reestablishment.
2.2b: Fall and spring growing conditions that favors the germination and production of non-native, annual grasses. Pathway typically occurs 3 to 5 years post-fire and 2.4 may be a transitory plant community.
2.3a: High severity fire significantly reduces sagebrush cover and allows grass species to dominate.
2.3b: A low severity fire, Aroga moth, or combinations will reduce some of the sagebrush overstory and allow grass species to increase.
2.3c: Fall and spring growing season conditions that favors the germination and production of non-native annual grasses. 2.4 may be a transitory plant community.
2.4a: Growing season conditions favoring perennial bunchgrass production and reduced cheatgrass production.
2.4b: Growing season conditions favoring perennial bunchgrass production and reduced cheatgrass production.

Transition T2A: Hydrologic alteration (lowering of water table i.e. gullying of associated channel), inappropriate grazing management or combinations of these lead to 3.1. Fire can lead to phase 3.2.
Transition T2B: Inappropriate grazing management in the presence of non-native annual species leads to 4.1. Fire in the presence of annual species leads to 4.2.

Shrub State 3.0 Community Phase Pathways.
3.1a: Fire and/or brush management with minimal soil disturbance.
3.2a: Time and lack of disturbance (not likely to occur).

Transition T3A: Continual inappropriate grazing management and/or hydrologic alteration (i.e. gullying of associated channel) (4.1). Severe fire, and/or failed brush management and seeding (4.2).

Restoration R3A: Brush management and seeding of desired perennial bunchgrass, may be coupled with restoration of channel (2.2).

Annual State 4.0 Community Phase Pathways.
4.1a: Severe fire or failed brush treatment and seeding.

State 1

Community 1.1
Reference Community Phase 1.1

Dominant plant species

- basin big sagebrush (*Artemisia tridentata ssp. tridentata*), shrub
- rabbitbrush (*Chrysothamnus*), shrub
- Indian ricegrass (*Achnatherum hymenoides*), grass
- basin wildrye (*Leymus cinereus*), grass

Additional community tables

Inventory data references

NASIS data for site R026XF006CA.

Type locality

Location 1: Mono County, CA

Contributors

V.Burlingame/J.Hanson/P.Novak

Tamzen Stringham

Approval

Kendra Moseley, 4/10/2024

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	05/12/2025
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:**

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17. **Perennial plant reproductive capability:**
