

## Ecological site R022AZ037CA CLAY BASIN

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### 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): 022A–Sierra Nevada and Tehachapi Mountains

This ESD was developed using older policy requirements which have been improved with the intent of improving ESD products overall. Users should approach these materials with some caution as the content herein, while likely useful for some purposes, was developed within parameters now recognized as needing varying levels of improvement. As always, a site-specific investigation is highly recommended when site-specific management alternatives are to be developed and/or management decisions are to be made.

Each ESD is an interpretation of the ecological relationships between biotic and abiotic aspects of the landscape. Users of this document should be aware of the limitations of this tool to the extent that specific local conditions may not be entirely captured within the ESD. In particular, management decisions should be supported by site-specific inventories, assessments and planning processes based on the best available information including and extending beyond the ESD.

An ESD is not a permanent determination of ecological dynamics. Rather, each ESD is an evolving body of work intrinsically tied to the soil surveys and data associated with soil map unit components of correlated soil-ecological site relationships. As new information becomes available, updates may be made or may be underway at any given time. Minor updates may be made without announcement when such changes do not modify the ecological site concept, the soils correlated or the state-and-transition model.

### Associated sites

R022AY017NV	<b>SEMI-WET MEADOW</b>
R022AY022NV	<b>LOAMY SLOPE 14-16 P.Z.</b>
R022AY023NV	<b>LOAMY SLOPE 16-20 P.Z.</b>

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia cana ssp. viscidula</i>
Herbaceous	(1) <i>Poa</i> (2) <i>Carex</i>

### Physiographic features

This site occurs on toeslopes in intermontane basins. Slopes range from 2 to 15, but slope gradients of 2 to 8 are most typical. Elevations are 7000 to over 9000 feet.

Table 2. Representative physiographic features

Landforms	(1) Intermontane basin
Elevation	2,134–2,743 m
Slope	2–15%

### Climatic features

The climate on this site is subhumid-continental, characterized by cold, moist winters, and cool dry summers. Average annual precipitation is about 16 inches to over 24 inches. Mean annual air temperature is 40 to 44 degrees F. The average growing season is about 40 to 70 days. Climate data used to support this section were derived from PRISM and is not specifically tied to any dominant climate station.

Table 3. Representative climatic features

Frost-free period (average)	70 days
Freeze-free period (average)	0 days
Precipitation total (average)	610 mm

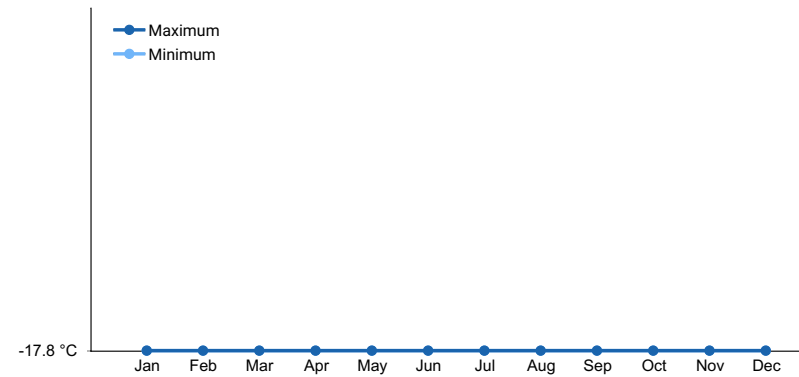


Figure 1. Monthly average minimum and maximum temperature

### Influencing water features

There are no influencing water features associated with this site.

### Soil features

The soils associated with this site are very deep, well drained soils that formed in alluvium derived from altered tuff, tuff-breccia, and andesite. An argillic horizon occurs from 2 to 60 inches, and a mollic epipedon occurs from the soil surface to 60 inches. Vertical cracks are present in the upper 30 to 45 inches and are open from July to October of most years. The soils are usually moist in the moisture control section during fall, winter, and spring and usually dry from July through early October.

Soil series associated with this site include: Bagval.

CA729 Toiyabe National Forest Area, California  
 310;Bagval-Wetbag complex, 0 to 8 percent slopes;Bagval  
 390;Heenlake-Loope-Chenhigh association;Bagval

Table 4. Representative soil features

Parent material	(1) Alluvium–tuff breccia
Surface texture	(1) Clay loam
Family particle size	(1) Clayey
Drainage class	Moderately well drained

Permeability class	Very slow
Soil depth	183–213 cm
Surface fragment cover <=3"	0–10%
Available water capacity (0-101.6cm)	17.02–17.27 cm
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	6.1–8.5
Subsurface fragment volume <=3" (Depth not specified)	0–8%
Subsurface fragment volume >3" (Depth not specified)	1–2%

## Ecological dynamics

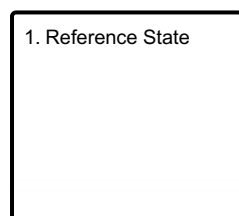
As ecological condition declines, silver sagebrush, rabbitbrush and other woody plants increase in prevalence as bluegrasses, sedges and other perennial grasses and forbs decline in the understory.

### Fire Ecology:

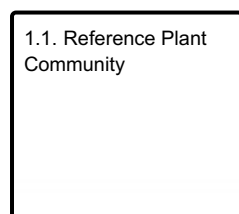
Silver sagebrush steppes experience stand-replacement fires. Fire ecologists estimate frequent stand-replacement fires in this type, with mean fire return intervals ranging from 3 to 45+ years Silver sagebrush has a strong sprouting response after top-kill by fire. Because it possesses several organs capable of regeneration, including roots and rhizomes that are protected by soil, it is not as susceptible to fire mortality as most woody sagebrush species. Cusick's bluegrass is unharmed to slightly harmed by light-severity fall fire. Cusick's bluegrass regenerates after fire from seed and by tillering. Nevada bluegrass is generally unharmed by fire. It produces little litter, and its small bunch size and sparse litter reduces the amount of heat transferred to perennating buds in the soil. Sedge is top-killed by fire, with rhizomes protected by insulating soil. The rhizomes of sedge species may be killed by high-severity fires that remove most of the soil organic layer. Reestablishment after fire occurs by seed establishment and/or rhizomatous spread. Mat muhly is top killed by fire. Fire does not harm mat muhly to any great extent because the rhizome buds are insulated by the soil.

## State and transition model

### Ecosystem states



### State 1 submodel, plant communities



## State 1 Reference State

Community 1.1  
Reference Plant Community



The reference plant community is characterized by an open canopy of soft-woody shrubs and a dense understory of perennial grasses. The representative plant community is dominated by bluegrasses and silver sagebrush. Potential vegetative composition is about 55% grasses, 10% forbs, and 35% shrubs. Approximate ground cover(basal and crown) is 20 to 35 percent.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	123	247	370
Shrub/Vine	78	157	235
Forb	22	45	67
Total	223	449	672

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Primary Perennial Grasses/Grasslikes</b>			377–655	
	Cusick's bluegrass	POCU3	<i>Poa cusickii</i>	135–202	–
	sedge	CAREX	<i>Carex</i>	90–179	–
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	18–72	–
2	<b>Secondary Perennial Grasses/Grasslikes</b>			45–90	
	big squirreltail	ELMU3	<i>Elymus multisetus</i>	2–13	–
	slender wheatgrass	ELTRT	<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>	2–13	–
	beardless wildrye	LETR5	<i>Leymus triticoides</i>	2–13	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	2–13	–
<b>Forb</b>					
3	<b>Perennial Forbs</b>			18–135	
	beardless wildrye	LETR5	<i>Leymus triticoides</i>	9–17	–
	mat muhly	MURI	<i>Muhlenbergia richardsonis</i>	9–17	–
<b>Shrub/Vine</b>					
4	<b>Primary Shrubs</b>			269–314	
	silver sagebrush	ARCA13	<i>Artemisia cana</i>	269–314	–
	dwarf mountain ragwort	SEFRO	<i>Senecio fremontii</i> var. <i>occidentalis</i>	18–72	–
	basin wildrye	LECI4	<i>Leymus cinereus</i>	9–17	–
5	<b>Secondary Shrubs</b>			1–45	
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	4–9	–

## Animal community

### Livestock Interpretations:

This site is suited to livestock grazing. Grazing management should be keyed to bluegrass production. Nevada bluegrass is a palatable species, but its production is closely tied to weather conditions. It produces little forage in drought years, making it a less dependable food source than other perennial bunchgrasses. Cusick's bluegrass makes up only a small proportion of the biomass of the sagebrush communities in which it lives, but it is often taken preferentially by cattle, especially early in the season. Sedge provides good to fair forage for domestic grazing. Young mat muhly is readily eaten by livestock. Plants become less palatable as they mature. Mat muhly plants usually grow in scattered patches, so they are seldom sufficiently abundant to be of major importance to livestock. In the northern part of its range, mat muhly is rated as good to very good forage for cattle and horses and fairly good for domestic sheep. Livestock use of silver sagebrush is variable depending upon availability of palatable herbs. Domestic sheep generally browse silver sagebrush more heavily than cattle. Livestock may actually make greater use of silver sagebrush when there is ample grass to go with it.

Stocking rates vary over time depending upon season of use, climate variations, site, and previous and current management goals. A safe starting stocking rate is an estimated stocking rate that is fine tuned by the client by adaptive management through the year and from year to year.

### Wildlife Interpretations:

Nevada bluegrass is desirable for pronghorn antelope and mule deer in the spring and preferable in the spring, summer, and fall for elk and desirable as part of their winter range. Deer, elk, and mountain goat also use Cusick's bluegrass early in the season. The value of Cusick's bluegrass as cover for small animals has been rated as poor to fair. Sedges have a high to moderate resource value for elk and a medium value for mule deer. Elk consume beaked sedge later in the growing season. The palatability of mat muhly for wildlife species has been rated as fair to

poor. Silver sagebrush provides valuable habitat and forage for wildlife. Deer, pronghorn, bighorn sheep, and sage-grouse browse the foliage. Mule deer may browse silver sagebrush heavily when other forage is dormant. Silver sagebrush is also important on fall and winter ranges.

## Hydrological functions

Permeability is very slow.

## Other products

Tribes of the Great Basin used silver sagebrush branches as a fuelbed for roasting pinyon pinecones. Many tribes use the branches in ceremonial rites.

## Other information

Silver sagebrush has potential as a soil stabilizer and for use in rangeland, wildlife and riparian restoration projects.

## Type locality

Location 1: Alpine County, CA	
Township/Range/Section	T9N R21E S23
Latitude	38° 36' 24"
Longitude	119° 38' 54"
General legal description	Humboldt-Toiyabe National Forest, approximately 0.43 miles from the mouth of Dump Canyon.

## Other references

Fire Effect Information System (Online; <http://www.fs.fed.us/database/feis/plants/>).

USDA-NRCS Plants Database (Online; <http://plants.usda.gov/>).

## Contributors

ALM/GKB

## 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	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

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

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

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

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

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

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

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

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

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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:**

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