

Ecological site R022AZ049CA CLAYPAN 14-16 P.Z.

Accessed: 05/11/2025

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): 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

R022AY028NV	CLAYPAN 16+ P.Z.
-------------	------------------

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia arbuscula</i>
Herbaceous	(1) <i>Achnatherum</i>

Physiographic features

This site typically occurs on mountain summits and sideslopes of all aspects. Slopes range from 4 to 50 percent, but slope gradients of 4 to 30 percent are most typical. Elevations are 6200 to over 8000 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain (2) Fan remnant
Flooding frequency	None

Elevation	6,200–8,000 ft
Slope	4–50%
Aspect	Aspect is not a significant factor

Climatic features

The average annual precipitation ranges from 14 to 16 inches, mostly occurring as snow. The convex slope shapes associated with this site causes much of the precipitation that occurs as snowfall to be removed from the site because of wind action, thus reducing the moisture available for plant growth. The mean annual air temperature ranges from 39 to 45 degrees F. The average frost free growing season is 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)	16 in

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils that support this site are typically very shallow to very deep and are well drained. They formed in alluvium from mixed rock sources or from residuum and colluvium derived from volcanic rocks. Surface layers are moderately coarse with greater than 35 percent rock fragments. Subsoil layers moderately fine or fine textured and are modified by 15 to over 35 percent rock fragments. These soils have a mollic epipedon that ranges from 7 to 16 inches thick. The soil characteristic that most influences the vegetative community is the near surface presence of a restrictive layer such as bedrock or an abrupt textural change to a fine textured layer, which limits root penetration. Soils correlated to this site include Gerdog and Joenchris.

CA729 Toiyabe National Forest Area, California
392;Heenlake-Loope association;Gerdog
580;Murain-Shorthike association;Joenchris

Table 4. Representative soil features

Surface texture	(1) Very gravelly sandy loam
Family particle size	(1) Clayey
Drainage class	Well drained
Permeability class	Moderately slow to slow
Soil depth	7–60 in
Surface fragment cover ≤3"	15–50%
Surface fragment cover >3"	0–15%
Available water capacity (0–40in)	0.75–7 in
Electrical conductivity (0–40in)	0–2 mmhos/cm

Soil reaction (1:1 water) (0-40in)	6.1–7.3
Subsurface fragment volume <=3" (Depth not specified)	15–60%
Subsurface fragment volume >3" (Depth not specified)	0–30%

Ecological dynamics

As ecological condition declines, low sagebrush, snowberry and other woody plants increase in prevalence as Letterman's needlegrass, and other perennial grasses and forbs decline in the understory.

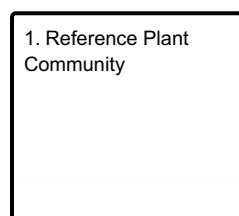
Fire Ecology:

Low sagebrush is severely damaged by fire and does not resprout.

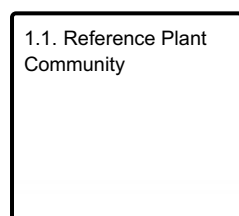
Season of burn affects needlegrasses ability to survive a fire. Needlegrasses tend to be more susceptible to fire when burned during mid-summer. The aboveground vegetation of needlegrass species is consumed by fire. When fire severity is high, heat may be transferred below the soil surface further damaging or killing the plant.

State and transition model

Ecosystem states



State 1 submodel, plant communities



State 1

Reference Plant Community

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 plant community is dominated by needlegrasses, and low sagebrush. Potential vegetative composition is about 55% grasses, 10% forbs, and 35% shrubs. Approximate ground cover(basal and crown) is 15 to 25 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	165	275	385
Shrub/Vine	105	175	245
Forb	30	50	70
Total	300	500	700

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Primary Perennial Grasses			105–180	
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	90–135	–
	western needlegrass	ACOCO	<i>Achnatherum occidentale ssp. occidentale</i>	8–23	–
	pine needlegrass	ACPI2	<i>Achnatherum pinetorum</i>	7–22	–
2	Secondary Perennnial Grasses/Grasslikes			15–45	
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	2–9	–
	sedge	CAREX	<i>Carex</i>	2–9	–
	squirrealtail	ELEL5	<i>Elymus elymoides</i>	2–9	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	2–9	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	2–9	–
Forb					
3	Perennial Forbs			15–45	
	rockcress	ARABI2	<i>Arabis</i>	2–6	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	2–6	–
	California rayless fleabane	ERIN2	<i>Erigeron inornatus</i>	2–6	–
	buckwheat	ERIOG	<i>Eriogonum</i>	2–6	–
	beardtongue	PENST	<i>Penstemon</i>	2–6	–
	phlox	PHLOX	<i>Phlox</i>	2–6	–
Shrub/Vine					
4	Primary Shrubs			60–90	
	little sagebrush	ARAR8	<i>Artemisia arbuscula</i>	60–90	–
5	Secondary Shrubs			6–30	
	curl-leaf mountain mahogany	CELE3	<i>Cercocarpus ledifolius</i>	2–9	–
	rubber rabbitbrush	ERNAN5	<i>Ericameria nauseosa ssp. nauseosa var. nauseosa</i>	2–9	–
	desert peach	PRAN2	<i>Prunus andersonii</i>	2–9	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	2–9	–
	currant	RIBES	<i>Ribes</i>	2–9	–
	mountain snowberry	SYOR2	<i>Symphoricarpos oreophilus</i>	2–9	–

Animal community

Livestock Interpretations:

Low sagebrush is considered a valuable browse plant for livestock during the spring, fall, and winter months.

Letterman's needlegrass provides valuable forage for domestic livestock.

Wildlife Interpretations:

Mule deer utilize and sometimes prefer low sagebrush, particularly in winter and early spring.

Western and Thurber's needlegrass provides valuable forage for many species of wildlife. Western needlegrass is consumed by mule deer. Western needlegrass provides some cover for small birds and mammals.

Hydrological functions

None

Recreational uses

Hiking and Hunting

Other information

Low sagebrush can be successfully transplanted or seeded in restoration.

Type locality

Location 1: Mono County, CA	
Township/Range/Section	T6N R24E S26
Latitude	38° 20' 46"
Longitude	119° 18' 44"
General legal description	Toiyabe National Forest Mack Canyon, Huntoon Valley, Mono County, California

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:**

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):**

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

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

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:

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

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

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

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:**

17. **Perennial plant reproductive capability:**
