

# Ecological site R022AZ051CA KRUMMHOLZ

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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

F022AY126NV	<b>Pinus albicaulis-Pinus flexilis/Poa-Carex</b>
R022AY011NV	<b>MOUNTAIN RIDGE 30+ P.Z.</b>
R022AY032NV	<b>ALPINE RIDGE</b>

**Table 1. Dominant plant species**

Tree	(1) <i>Pinus albicaulis</i>
Shrub	Not specified
Herbaceous	Not specified

## Physiographic features

This site is on moderately to steeply sloping mountain sides at elevations between 8500 feet and 10,300 feet. This site can be found on all aspects but is generally orientated on northwest to south facing Slopes. The slopes range from 30 to 75 percent.

**Table 2. Representative physiographic features**

Landforms	(1) Mountain slope
Elevation	8,500–10,300 ft
Slope	30–75%
Aspect	NE, S, NW

## Climatic features

The climate on this site is subhumid-continental, characterized by cold, moist winters, and cool dry summers. The linear to convex slope shapes associated with this site cause some of the precipitation to be removed from the site because of wind action, thus reducing the moisture available for plant growth. The average annual precipitation ranges from 35 to 55 inches, mostly occurring as snow. The mean annual air temperature ranges from 34 to 38 degrees F. The average frost free growing season is 17 to 30 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)	30 days
Freeze-free period (average)	0 days
Precipitation total (average)	55 in

## Influencing water features

There are no influencing water features associated with this site.

## Soil features

CA693 Tahoe Basin Area, California and Nevada

9411;Freelpeak-Windyridge-Rock outcrop complex, 15 to 75 percent slopes;Jobsis

9461;Whittell-Jobsis-Rock outcrop complex, cool, 30 to 75 percent slopes;Jobsis

CA724 Eldorado National Forest Area, California, Parts of Alpine, Amador, El Dorado, and Placer Counties

101ty;Lithnip-Rock outcrop-Fishsnooze complex, 30 to 75 percent slopes;Fishsnooze;cold

CA729 Toiyabe National Forest Area, California

101;Lithnip-Rock outcrop-Fishsnooze complex, 30 to 75 percent slopes;Fishsnooze;cold

102;Lithnip-Rock outcrop-Fishsnooze complex, 8 to 30 percent slopes;Fishsnooze

110;Jobsis-Whittell-Rock outcrop complex, 8 to 30 percent slopes;Jobsis

113;Whittell-Jobsis-Rock outcrop complex, cool, 30 to 75 percent slopes;Jobsis

510;Rubble land-Lithnip-Rock outcrop association;Fishsnooze

513;Rubble land-Holdon-Rock outcrop complex, 30 to 100 percent slopes;Coldtree;cold

680;Rolldown-Mountpatterson-Rubble land complex, 4 to 30 percent slopes;Coldtree;cold

700;Coldtree-Rubble land complex, 30 to 75 percent slopes;Coldtree;cold

820;Freelpeak-Windyridge-Rock outcrop complex, 15 to 75 percent slopes;Jobsis

830;Windyridge-Freelpeak-Rock outcrop complex, 8 to 30 percent slopes;Jobsis

CA732 Inyo National Forest, Western Part, California

101ty;Lithnip-Rock outcrop-Fishsnooze complex, 30 to 75 percent slopes;Fishsnooze;cold

CA740 High Sierra Area, California

101ty;Lithnip-Rock outcrop-Fishsnooze complex, 30 to 75 percent slopes;Fishsnooze;cold

CA790 Yosemite National Park, California

101t;Lithnip-Rock outcrop-Fishsnooze complex, 30 to 75 percent slopes, mountains, cryic;Fishsnooze;cold

102t;Lithnip-Rock outcrop-Fishsnooze complex, 8 to 30 percent slopes, mountains, cryic;Fishsnooze  
 510t;Rubble land-Lithnip-Rock outcrop association, 8 to 30 percent slopes, mountains, cryic;Fishsnooze

NV773 Douglas County Area, Nevada

113;Whittell-Jobsis-Rock outcrop complex, cool, 30 to 75 percent slopes;Jobsis

**Table 4. Representative soil features**

Surface texture	(1) Very gravelly loamy coarse sand (2) Extremely gravelly sandy loam (3) Very gravelly coarse sandy loam
Family particle size	(1) Sandy
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderately rapid to rapid
Soil depth	10–60 in
Surface fragment cover <=3"	20–55%
Surface fragment cover >3"	4–20%
Available water capacity (0-40in)	0.6–3.6 in
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	4.5–7.3
Subsurface fragment volume <=3" (Depth not specified)	16–40%
Subsurface fragment volume >3" (Depth not specified)	3–26%

## Ecological dynamics

This is a subalpine rangeland site, distinguished by the presesnce of krummolz white bark pine. This community is very similar to the whitebark pine forest ecological site, but canopy cover is less than 25% and the trees are stunted in growth.

Krummholz or matted whitebark pine grows mostly on high-elevation sites where glacial scouring has eliminated most of the soil.

Fire Ecology:

Mature whitebark pine survive low-severity surface fire. Moderate-severity surface fire kills the majority of mature trees. Severe surface and crown fires kill even the largest whitebark pine.

Whitebark pine establishes from seed on open mineral soil seedbeds created by mixed-severity and stand-replacement fires.

## State and transition model

### Ecosystem states

1. Reference Plant Community
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## State 1 submodel, plant communities

1.1. Reference Plant Community
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## State 1 Reference Plant Community

### Community 1.1 Reference Plant Community

The reference plant community is characterized by an canopy of whitebark pine krummolz with an almost absent understory vegetation. The plant community is dominated by whitebark pine and perennial forbs. Potential vegetative composition is about 2% grasses, 5% forbs, 5% shrubs and 88% trees. Approximate ground cover(basal and crown) is 5 to 20 percent.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Tree	880	1320	1760
Shrub/Vine	50	75	100
Forb	50	75	100
Grass/Grasslike	20	30	40
<b>Total</b>	<b>1000</b>	<b>1500</b>	<b>2000</b>

## Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1	<b>Primary Perennial Grasses</b>			30–75	
	bluegrass	POA	<i>Poa</i>	30–75	–
2	<b>Secondary Perennial Grasses/Grasslikes</b>			15–32	
	western needlegrass	ACOCO	<i>Achnatherum occidentale</i> ssp. <i>occidentale</i>	2–6	–
	desert needlegrass	ACSP12	<i>Achnatherum speciosum</i>	2–6	–
	sedge	CAREX	<i>Carex</i>	2–6	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	2–6	–
<b>Forb</b>					
2	<b>Perennial Forbs</b>			1–15	
	dwarf alpine Indian paintbrush	CANA3	<i>Castilleja nana</i>	1–5	–
	Lake Tahoe draba	DRASA2	<i>Draba asterophora</i> var. <i>asterophora</i>	1–3	–
	lupine	LUPIN	<i>Lupinus</i>	1–3	–
	pioneer rockcress	ARPL	<i>Arabis platysperma</i>	1–3	–
<b>Tree</b>					
4	<b>Trees</b>			880–1760	
	whitebark pine	PIAL	<i>Pinus albicaulis</i>	880–1760	–

## Animal community

### Livestock Interpretations:

This site has limited value for livestock grazing, due to the low forage production. Livestock will use whitebark pine/shrub communities for shade and bedding cover.

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:

Whitebark pine is a valuable source of food and cover for wildlife. Bears, rodents, and birds consume the seeds. The trunks provide nesting sites for cavity nesters including northern flickers and mountain bluebirds. Blue grouse use the branches for roosting and escape cover. Whitebark pine is a minor browse species for big game, but whitebark pine understories often provide valuable forage. Mule deer consume trace amounts of whitebark pine.

## Recreational uses

Aesthetic value is derived from the diverse floral and faunal composition and the colorful flowering of wild flowers and shrubs during the spring and early summer. This site offers rewarding opportunities to photographers and for nature study. This site is used for hiking and has potential for upland and big game hunting.

## Type locality

Location 1: Mono County, CA	
Township/Range/Section	T3N R25E S31
UTM zone	N
UTM northing	301918

UTM easting	4216699
Latitude	38° 4' 35"
Longitude	119° 15' 30"
General legal description	Toiyabe National Forest; near headwaters of Dunderberg Creek; Mono, 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:**

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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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