

Ecological site F030XC284NV

Pinus longaeva-Pinus flexilis/Juniperus communis var. depressa/Carex rossii

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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.

Classification relationships

Nachlinger, J. and G.A. Reese. 1996. Plant Community Classification of the Spring Mountains National Recreation Area, Clark and Nye Counties. The Nature Conservancy, Reno, Nevada. - Limber pine - Bristlecone pine Association.

Ecological site concept

This forest site occurs on north-facing upper back slopes of mountains generally in concave positions. Slopes range from 30 to 75 percent, but slope gradients of 50 percent are typical. Elevations range from 9000 to 10800 feet.

This is a group concept and provisional STM that also covers the following ecological sites: F030XC289NV, F030XC291NV

Associated sites

F030XC282NV	Abies concolor var. concolor/Ribes cereum Occurs at lower elevations. White fir site.
F030XC285NV	Pinus longaeva/Salvia dorrii ssp. dorrii var. clokeyi-Ribes montigenum/Achnatherum lettermanii-Carex rossii Occurs on drier slopes. Great Basin bristlecone pine site.
F030XC289NV	Pinus flexilis-Pinus longaeva/Ribes cereum-Juniperus communis var. depressa Occurs at lower elevations with higher cover of white fir.

Similar sites

F030XC289NV	Pinus flexilis-Pinus longaeva/Ribes cereum-Juniperus communis var. depressa Occurs at lower elevations with higher cover of white fir.
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Table 1. Dominant plant species

Tree	(1) <i>Pinus longaeva</i> (2) <i>Pinus flexilis</i>
Shrub	(1) <i>Juniperus communis var. depressa</i>
Herbaceous	(1) <i>Carex rossii</i>

Physiographic features

This forest site occurs on north-facing upper back slopes of mountains generally in concave positions. Slopes range

from 30 to 75 percent, but slope gradients of 50 percent are typical. Elevations range from 9000 to 10800 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain slope
Elevation	9,000–10,800 ft
Slope	30–75%
Aspect	N, NE, NW

Climatic features

The primary air masses affecting the Spring Mountains are cold maritime polar air from the Gulf of Alaska and warmer, moist maritime subtropical air from lower latitudes. Occasionally there are invasions of cold continental polar air from northern Canada or the Rocky Mountains. Precipitation in the area results primarily from the passage of cyclones with associated fronts during fall, winter and spring; from closed cyclones in late winter and spring; and from the flow of moist tropical air from the southeast to the southwest quadrant in the summer.

The mean annual precipitation is about 20 to 24 inches. Mean annual air temperature is 38 to 42 degrees F. The average growing season is about 50 to 90 days. There is no available climate station for this site.

Snow Course, Spring Mountains, Nevada. Average snow depth and snow water equivalent from 1971 to 2000 at March 1. and April 1. of each year.

Kyle Canyon. (Elevation 8200 feet.) March 1. 36 inch snow depth, 10.9 inches of water equivalent. April 1. 31 inch snow depth, 11.7 inches of water equivalent.

Rainbow Canyon #2 (Elevation 8100 feet) March 1. 44 inch snow depth, 13.8 inches of water equivalent. April 1. 46 inch snow depth, 16.7 inches of water equivalent.

Lee Canyon #2. (Elevation 9000 feet) March 1. 35 inch snow depth, 10.6 inches of water equivalent. April 1. 31 inch snow depth, 11.1 inches of water equivalent.

Lee Canyon #3. (Elevation 8500 feet) March 1. 28 inch snow depth, 8.5 inches of water equivalent. April 1. 24 inch snow depth, 9.1 inches of water equivalent.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	
Precipitation total (average)	24 in

Influencing water features

There are no influencing water features associated with this site.

Soil features

The soils associated with this site are moderately deep to very deep, well drained soils that formed in colluvium from limestone. The soil surface typically has an organic layer approximately 0.5 inches thick. Approximately 50 percent of the surface is covered with a needle and twig organic layer. Soil profiles are usually moist in late winter and spring, and periodically moist in the upper part following summer thunderstorms. Soils have an ustic soil moisture regime and a frigid temperature regime. Soil series associated with this site includes Ladyofsnow.

Table 4. Representative soil features

Surface texture	(1) Very gravelly loam (2) Gravelly silt loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	72–84 in
Surface fragment cover <=3"	40–65%
Surface fragment cover >3"	4–11%
Available water capacity (0-40in)	1.5–2.3 in
Calcium carbonate equivalent (0-40in)	30–85%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	15–75%
Subsurface fragment volume >3" (Depth not specified)	1–40%

Ecological dynamics

The amount and nature of the understory vegetation in a forestland is highly responsive of the amount and duration of shade provided by the overstory canopy. Significant changes in kinds and abundance of plants occur as the canopy changes. Some changes occur slowly and gradually as a result of normal changes in tree size and spacing. Other changes occur dramatically and quickly, following intensive harvesting, thinning or fire.

Fire Ecology:

Fire plays a minor role where bristlecone and limber pine occur because of limited productivity and fuel accumulation associated with poor soil development, short growing seasons and late snowmelt. When fires do occur at high elevations, they are usually small, low-severity surface fires. Unpredictable fire return intervals are up to 1000 years.

Major Successional Stages of Forest Development:

HERBACEOUS: The occurrence of natural wildfire is very infrequent across this woodland community. In the event that this woodland is burned over, the post-burn vegetation is dominated by grasses and forbs under full sunlight.

SHRUB-HERBACEOUS: Herbaceous vegetation and woody shrubs dominate the site. Various amounts of tree seedlings (less than 20 inches in height) may be present up to the point where they are obviously a major component of the vegetal structure.

SAPLING-POLE: In the absence of disturbance, the tree seedlings develop into saplings (20 inches to 4.5 feet in height). Vegetation consists of grasses, forbs and shrubs in association with tree saplings.

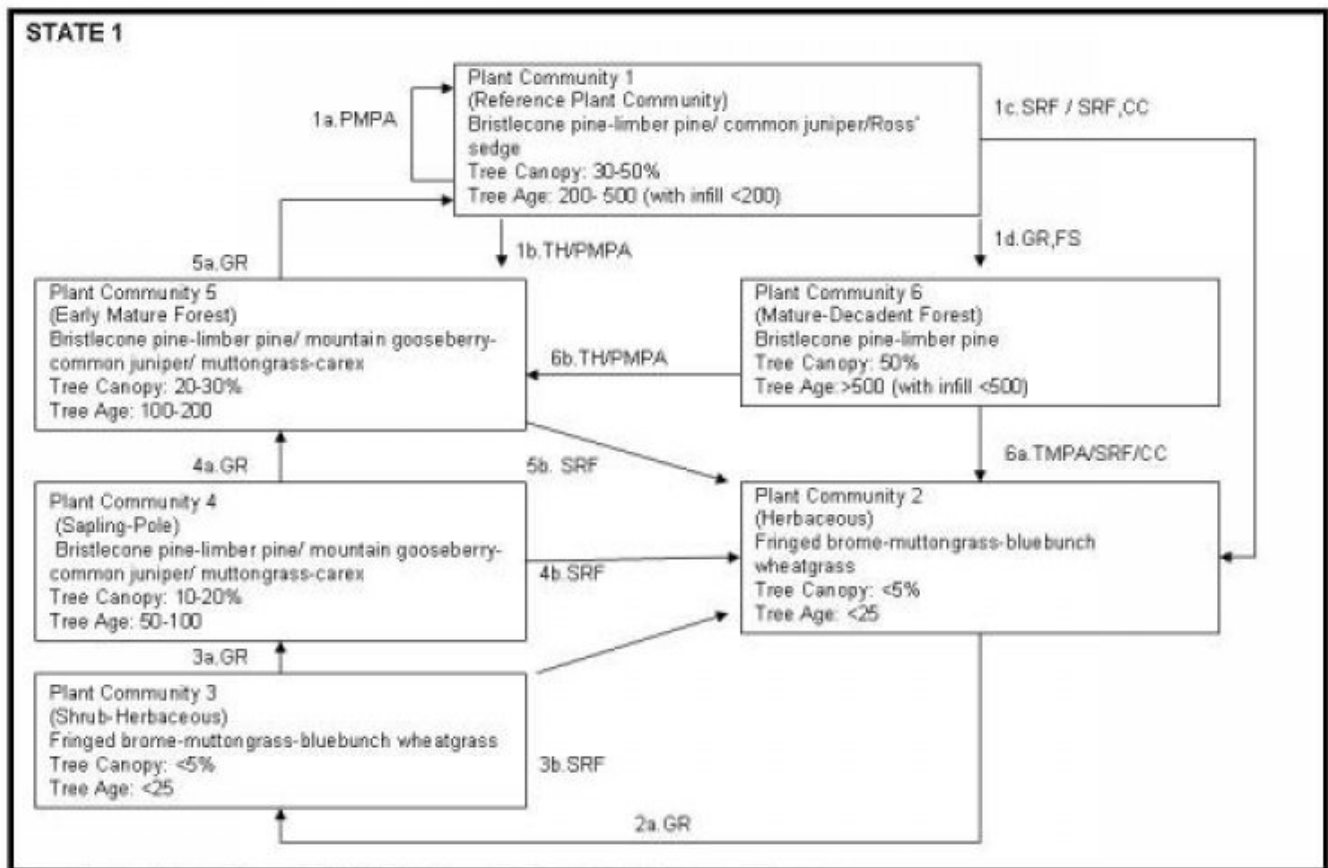
EARLY MATURE FOREST: The visual aspect and vegetal structure are dominated by bristlecone pine and limber pine that have reached or are near maximal heights for the site. Tree canopy cover ranges from 20 to 30 percent. Tree heights average 30 feet (20 to 40 feet).

MATURE FOREST: In the absence of wildfire or other naturally occurring disturbance tree canopy cover ranges

from 30 to 50 percent.

MATURE-DECADENT FOREST: In the absence of wildfire or other naturally occurring disturbances, the tree canopy on this site can become dense. This stage is dominated by bristlecone and limber pine that have reached maximal heights for the site. Dominate and codominant trees average greater than ten inches in diameter at breast height. Understory vegetation is sparse due to tree competition, overstory shading, duff accumulations, etc. Tree canopy cover is commonly greater than 50 percent.

State and transition model



Legend: CC=clearcut harvest, GR=growth, HPCP=Historic Climax Plant Community, PFS=presence of "fire-regime" species, PMPA=partial mortality pest attack, SF=surface fire, SP=site preparation, TH=thinning, TMPA=total mortality pest attack, TP=tree planting, FS=fire suppression, SRF=stand replacing fire, Symbols: "P" = and/or, "," = and, "." = or.

→ Community pathway

F30XC2B4NV *Pinus longaeva*-*Pinus flexilis*/*Juniperus communis*/*Carex rossii*

State 1 Reference Plant Community

Community 1.1 Reference Plant Community

The reference plant community is dominated by Great Basin bristlecone pine and limber pine. Ross's sedge and bluegrasses are the principal understory grasses. Currant and common juniper are the principal understory shrubs. The visual aspect and vegetal structure are dominated by bristlecone pine that have reached or are near maximal heights for the site with limber pine as a sub-dominant. Tree heights average 30 feet (20 to 40 feet). Average tree spacing is 15 feet and average trees/acre is 230. Tree canopy cover ranges from 30 to 50 percent. The overstory canopy is about 80 to 95 percent bristlecone pine, 5 to 20 percent limber pine, and 10 percent or less, other conifers such as white fir.

Table 5. Ground cover

Tree foliar cover	1-5%
Shrub/vine/liana foliar cover	5-10%
Grass/grasslike foliar cover	0-1%
Forb foliar cover	0-1%
Non-vascular plants	0-2%
Biological crusts	0%
Litter	40-60%
Surface fragments >0.25" and <=3"	40-65%
Surface fragments >3"	4-11%
Bedrock	0-1%
Water	0%
Bare ground	5-10%

Table 6. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	1-10%	1-5%	0-1%	0-1%
>0.5 <= 1	1-10%	1-5%	0-1%	1-3%
>1 <= 2	1-10%	1-10%	–	–
>2 <= 4.5	1-10%	1-10%	–	–
>4.5 <= 13	1-10%	–	–	–
>13 <= 40	30-50%	–	–	–
>40 <= 80	1-5%	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

Additional community tables

Table 7. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
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Animal community

Livestock Interpretations:

This site is not suited to cattle and sheep grazing because of lack of forage, steep slopes, and lack of adequate water.

Wildlife Interpretations:

This site has low to moderate value for big game during the summer, fall and early winter, especially in areas with gooseberry or other browse species in the understory. Various songbirds, rodents, and associated predators native to the area are also found. Great Basin bristlecone pine communities are high-use habitat for small birds and mammals including chickadees, nuthatches, flycatchers, sapsuckers, finches, dark-eyed juncos, mountain bluebirds, Clark's nutcrackers and ground squirrels.

Hydrological functions

Runoff on this site is high.

Recreational uses

This site has high aesthetic value and provides a variety of recreational opportunities such as hiking, camping, photography and bird watching.

Wood products

Great Basin bristlecone pine is harder and denser than wood of most conifers, but the species is not commercially important. Bristlecone pine has been historically used for mine and structural timbers.

Limber pine has been used for mine props, railroad ties, and fuelwood. Since the limbs of limber pine cling to the trunk for many years, the lumber cut from this tree is characteristically knotty. This tree has little commercial value at present. As demand for lumber increases, however, it may be used for knotty pine lumber and paneling.

Other products

Great Basin bristlecone pine is of unique biological and dendrological interest because of the great age attained by some individuals.

Other information

There are 6 plant species of concern, 3 of which are endemic to the Spring Mountain National Recreation Area (SMNRA) associated with this ecological site. There is also one animal species of concern, which is endemic to the SMNRA.

Table 8. Representative site productivity

Common Name	Symbol	Site Index Low	Site Index High	CMAI Low	CMAI High	Age Of CMAI	Site Index Curve Code	Site Index Curve Basis	Citation
Great Basin bristlecone pine	<i>PILO</i>	0	0	14	22	—	—	—	

Type locality

Location 1: Clark County, NV	
Township/Range/Section	T19 S. R57 E. S18 SW
UTM zone	N
UTM northing	4017526n
UTM easting	0622828e
General legal description	On North Loop trail, approximately 0.24 miles east of Mummy Springs, Spring Mountain, Clark County, Nevada.

Other references

Clokey, Ira. 1951. Flora of the Charleston Mountains, Clark County, Nevada. University of California Press, Berkeley and Los Angeles.

Fire Effects Information System [Online].<http://www.fs.fed.us/feis>

Glennie, G. and D. Johnson. 2002. Guide to Species of Concern in the Spring Mountains National Recreation Area, Clark and Nye Counties, Nevada. USFS, Las Vegas, NV.

Lanner, R.M. 1984. Trees of the Great Basin. University of Nevada Press, Reno NV.

Nachlinger, J. and G. Reese. 1996. Plant Community Classification of the Spring mountains National Recreation Area, Clark and Nye Counties, Nevada. The Nature Conservancy. Reno, Nevada.

USDA. NRCS National Forestry Handbook, Exhibit 637-32. 190-V-NFH, Feb. 2001.

USDA. SCS National Forestry Manual, Table 21 190-V-NFN, Amend. 3, 1983.

Contributors

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Approval

Kendra Moseley, 4/26/2024

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	05/08/2024
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):**

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:
