USDA Natural Resources Conservation Service

# Ecological site F025XY078NV
# High Mountain Loam

Last updated: 4/24/2024
Accessed: 05/19/2024

## 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): 025X–Owyhee High Plateau

MLRA 25 lies within the Intermontane Plateaus physiographic province. The southern half is in the Great Basin Section of the Basin and Range Province. This part of the MLRA is characterized by isolated, uplifted fault-block mountain ranges separated by narrow, aggraded desert plains. This geologically older terrain has been dissected by numerous streams draining to the Humboldt River. The northern half of the area lies within the Columbia Plateaus geologic province. This part of the MLRA forms the southern boundary of the extensive Columbia Plateau basalt flows. Deep, narrow canyons drain to the Snake River which incise the broad volcanic plain. The Humboldt River, route of a major western pioneer trail, crosses the southern half of this area. Reaches of the Owyhee River in this area have been designated as National Wild and Scenic Rivers.
Nevada’s climate is predominantly arid, with large daily ranges of temperature, infrequent severe storms, heavy snowfall in the higher mountains, and great location variations with elevation. Three basic geographical factors largely influence Nevada’s climate: continentality, latitude, and elevation. Continentality is the most important factor. The strong continental effect is expressed in the form of both dryness and large temperature variations. Nevada lies on the eastern, lee side of the Sierra Nevada Range, a massive mountain barrier that markedly influences the climate of the State.MLRA Notes 25—Owyhee High Plateau
This area is in Nevada (56 percent), Idaho (30 percent), Oregon (12 percent), and Utah (2 percent). It makes up about 27,443 square miles. MLRA 25 is characteristically cooler and wetter than the neighboring MLRAs of the Great Basin. The western boundary is marked by a gradual transition to the lower and warmer basins of MLRA 24. The boundary to the south-southeast, with MLRA 28B, is marked by gradual changes in geology marked by an increased dominance of singleleaf pinyon and Utah juniper and a reduced presence of Idaho fescue. The boundary to the north, with MLRA 11, is a rapid transition from the lava plateau topography to the lower elevation Snake River Plain.
Physiography:
All of this area lies within the Intermontane Plateaus. The southern half is in the Great Basin section of the Basin and Range province. This part of the MLRA is characterized by isolated, uplifted fault-block mountain ranges separated by narrow, aggraded desert plains. This geologically older terrain has been dissected by numerous streams draining to the Humboldt River.
The northern half of the area lies within the Columbia Plateaus province. This part of the MLRA forms the southern boundary of the extensive Columbia Plateau basalt flows. Most of the northern half is in the Payette section, but the northeast corner is in the Snake River Plain section. Deep, narrow canyons draining into the Snake River have been incised into this broad basalt plain. Elevation ranges from 3,000 to 7,550 feet on rolling plateaus and in gently sloping basins. It is more than 9,840 feet on some steep mountains. The Humboldt River crosses the southern half of this area
Geology:
The dominant rock types in this MLRA are volcanic. They include andesite, basalt, tuff, and rhyolite. In the north and west parts of the area, Cretaceous granitic rocks are exposed among Miocene volcanic rocks in mountains. A Mesozoic igneous and metamorphic rock complex dominates the south and east parts of the area. Upper and Lower Paleozoic calcareous sediments, including oceanic deposits, are exposed with limited extent in the mountains. Alluvial fan and basin fill sediments occur in the valleys.

Climate:
The average annual precipitation in most of this area is typically 11 to 22 inches. It increases to as much as 49 inches at the higher elevations. Rainfall occurs in spring and sporadically in summer. Precipitation occurs mainly as snow in winter. The precipitation is distributed fairly evenly throughout fall, winter, and spring. The amount of precipitation is lowest from midsummer to early autumn. The average annual temperature is 33 to 51 degrees F. The freeze-free period averages 130 days and ranges from 65 to 190 days, decreasing in length with elevation. It is typically less than 70 days in the mountains.
Water:
The supply of water from precipitation and streamflow is small and unreliable, except along the Owyhee, Bruneau, and Humboldt Rivers. Streamflow depends largely on accumulated snow in the mountains. Surface water from mountain runoff is generally of excellent quality and suitable for all uses. The basin fill sediments in the narrow alluvial valleys between the mountain ranges provide some ground water for irrigation. The alluvial deposits along the large streams have the most ground water. Based on measurements of water quality in similar deposits in adjacent areas, the basin fill deposits probably contain moderately hard water. The water is suitable for almost all uses. The carbonate rocks in this area are considered aquifers, but they are little used. Springs are common along the edges of the limestone outcrops.
Soils:
The dominant soil orders in this MLRA are Aridisols and Mollisols. The soils in the area dominantly have a mesic or frigid temperature regime and an aridic, aridic bordering on xeric, or xeric moisture regime. Soils with aquic moisture regimes are limited to drainage or spring areas, where moisture originates or runs on and through. These soils are of a very limited extent throughout the MLRA. They generally are well drained, clayey or loamy, and shallow or moderately deep. Most of the soils formed in mixed parent material. Volcanic ash and loess mantle the landscape. Surface soil textures are loam and silt loam with ashy texture modifiers in some areas. Argillic horizons occur on the more stable landforms. They are exposed nearer the soil surface on convex landforms, where ash and loess deposits are more likely to erode. Soils that formed in carbonatic parent material in areas that receive less than 12 inches of precipitation are characterized by calcic horizons throughout the profile, while soils in areas that receive more than 12 inches of precipitation do not have calcic horizons in the upper part of the profile. Soils that formed on stable landforms at the lower elevations are dominated by ochric horizons. Soils that formed at the middle and upper elevations are characterized by mollic epipedons. Soils in drainage areas at all elevations that receive moisture running on or through them are characterized by thicker mollic epipedons.
Biological Resources:
This MLRA supports shrub-grass vegetation. Lower elevations are characterized by Wyoming big sagebrush associated with bluebunch wheatgrass, western wheatgrass, and Thurber’s needlegrass. Other important plants include bluegrass, squirreltail, penstemon, phlox, milkvetch, lupine, Indian paintbrush, aster, and rabbitbrush. Black sagebrush occurs but is less extensive. Singleleaf pinyon and Utah juniper occur in limited areas. With increasing elevation and precipitation, vast areas characterized by mountain big sagebrush or low sagebrush/early sagebrush in association with Idaho fescue, bluebunch wheatgrass, needlegrasses, and bluegrass become common. Snowberry, curl-leaf mountain mahogany, ceanothus, and juniper also occur. Mountains at the highest elevations support whitebark pine, Douglas-fir, limber pine, Engelmann spruce, subalpine fir, aspen, and curl-leaf mountain mahogany.
Major wildlife species include mule deer, bighorn sheep, pronghorn, mountain lion, coyote, bobcat, badger, river otter, mink, weasel, golden eagle, red-tailed hawk, ferruginous hawk, Swainson’s hawk, northern harrier, prairie falcon, kestrel, great horned owl, short-eared owl, long-eared owl, burrowing owl, pheasant, sage grouse, chukar, gray partridge, and California quail. Reptiles and amphibians include western racer, gopher snake, western rattlesnake, side-blotched lizard, western toad, and spotted frog. Fish species include bull, red band, and rainbow trout.
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trout.

## Ecological site concept

This site is on high elevation mountain side slopes of northerly aspect. Slopes typically range from 30 percent to over 75 percent. Elevations are typically 8000 feet to over 10,000 feet.

The soils of this site are moderately deep to very deep. The soils typically have 35 to 50 percent gravels, cobbles, or stones distributed throughout the soil profile. The surface typically has a 1- to 3-inch-thick layer of decomposing organic matter present on the soil surface. This duff layer reduces moisture loss due to evaporation.

The reference plant community is dominated by subalpine fir with whitebark pine and quaking aspen occurring sporadically in the tree overstory. Mountain gooseberry is the principal understory shrub. Bluegrasses, Letterman's needlegrass, and Ross' sedge are the most prevalent understory grasses or grass-like plants. Mountain snowberry, spike trisetum, pinegrass, mountain brome, shinleaf and meadowrue, are other common understory plants. Mosses are common on the forest floor. Although subalpine fir may be the only overstory tree in many areas, overstory tree canopy composition can range from about 85 percent subalpine fir, with 5 to 15 percent whitebark pine, and less than 5 percent quaking aspen. An overstory canopy of about 45 percent is assumed to be representative of tree dominance on this site in the natural environment.

This site was formerly named:
ABLAL/RIMO2/POA-ACLE9-CAREX

## Associated sites

| | |
|---|---|
| R025XY010NV | **STEEP NORTH SLOPE**<br>Steep North Slope has a mollic epipedon. |
| R025XY031NV | **STONY MAHOGANY SAVANNA**<br>Stony Mahogany Savannah is usually shallow to bedrock. |
| F025XY065NV | **Backslope Aspen**<br>Backslope Aspen has a mollic epipedon. |

## Similar sites

| | |
|---|---|
| R025XY031NV | **STONY MAHOGANY SAVANNA**<br>Stony Mahogany Savannah is usually shallow to bedrock. |
| F025XY065NV | **Backslope Aspen**<br>Backslope Aspen has a mollic epipedon. |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | (1) *Abies lasiocarpa* |
| Shrub | (1) *Ribes montigenum* |
| Herbaceous | (1) *Poa*<br>(2) *Achnatherum lettermanii* |

## Physiographic features

The High Mountain Loam site is on high elevation mountain side slopes of northerly aspects. Slopes typically range from 30 percent to over 75 percent. Elevations are near 8000 feet to over 10,000 feet.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Mountains > Mountain slope |
| Runoff class | High to very high |

| | |
|---|---|
| Flooding frequency | None |
| Ponding frequency | None |
| Elevation | 2,438–3,048 m |
| Slope | 30–75% |
| Water table depth | 152 cm |
| Aspect | NW, N, NE |

## Climatic features

The climate associated with this site is semiarid, characterized by cold, moist winters and warm, dry summers. Mean annual air temperature is 40 to 43 degrees F.

Mean annual precipitation across the range of this ecological site is 15 inches.

Monthly mean precipitation: January 1.65”; February 1.68”; March 1.98”; April 2.43”; May 2.41”; June 1.62”; July 0.61”; August 0.63”; September 0.84”; October 1.41”; November 1.51”; December 1.79”.

*The above data is averaged from the Jarbridge 4N and Lamoille PH WRCC climate stations and from the NASIS database.

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (characteristic range) | 50-90 days |
| Freeze-free period (characteristic range) | 70-120 days |
| Precipitation total (characteristic range) | 356-406 mm |
| Frost-free period (actual range) | 50-90 days |
| Freeze-free period (actual range) | 70-120 days |
| Precipitation total (actual range) | 305-508 mm |
| Frost-free period (average) | 75 days |
| Freeze-free period (average) | 90 days |
| Precipitation total (average) | 381 mm |

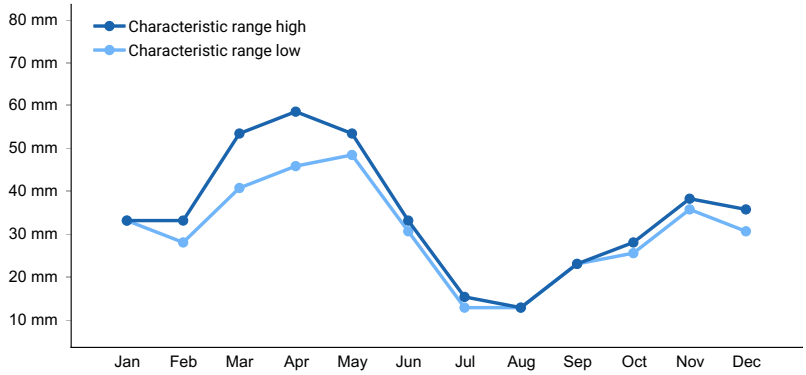



**Figure 1. Monthly precipitation range**

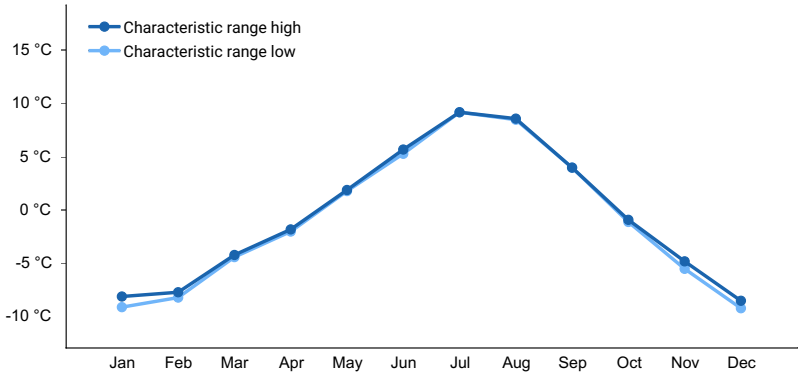



**Figure 2. Monthly minimum temperature range**

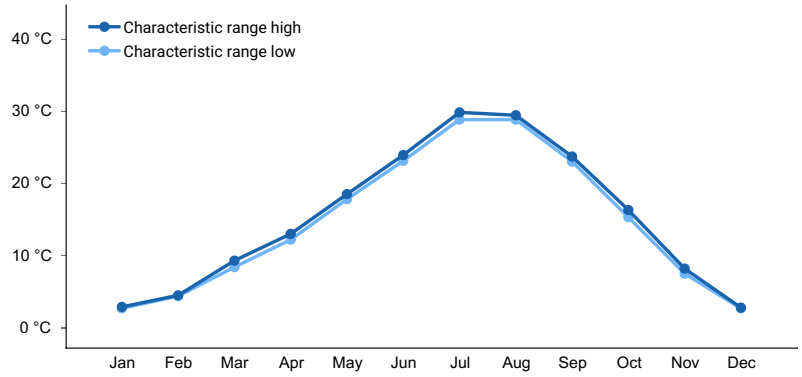



**Figure 3. Monthly maximum temperature range**

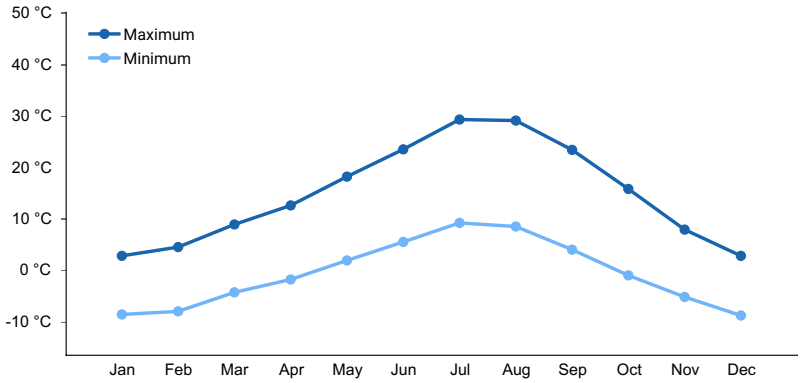



**Figure 4. Monthly average minimum and maximum temperature**

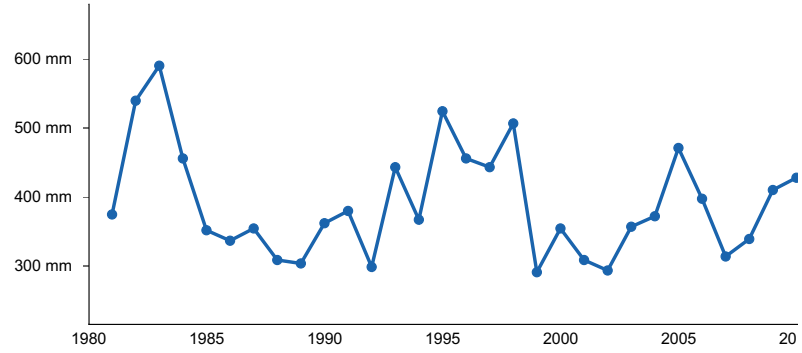



**Figure 5. Annual precipitation pattern**

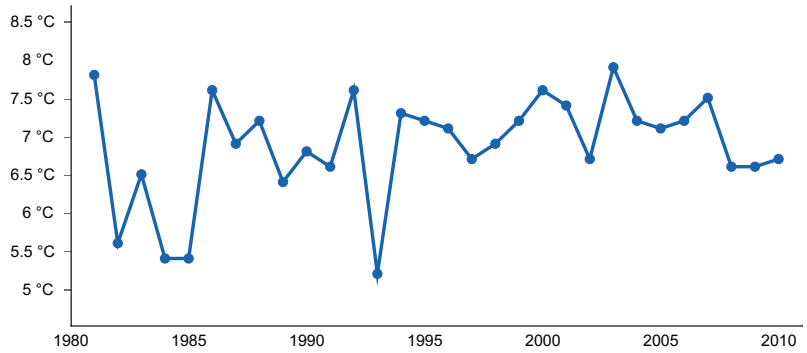



**Figure 6. Annual average temperature pattern**

## Climate stations used

- (1) JARBIDGE 7 N [USC00264039], Jackpot, NV
- (2) LAMOILLE YOST [USC00264394], Spring Creek, NV

## Influencing water features

No influencing water features are associated with this site.

## Soil features

The soils at this site are moderately deep to deep. The soils typically have 35 to 50 percent gravels, cobbles, or stones distributed throughout the soil profile. Typically the surface has a 1- to 3-inch-thick layer of decomposing organic matter present on the soil surface. This duff layer reduces moisture loss due to evaporation.
Available water capacity is moderate to high and the soils are well drained. Snow accumulation typically persists on this site into the late spring or early summer. Snow melt at this time adds to the soil moisture supply. Extra moisture is available in the lower part of the soil profile due to lateral water movement from higher landscape areas. This moisture is available for uptake by deep rooted plants.
Runoff is high to very high and the potential for sheet and rill erosion is moderate to severe depending on steepness of slope and amount of rock fragments on the soil surface. Typical soil series for this is Longhike.

Soil series correlated with this site are Longhike and Jumble.

**Table 4. Representative soil features**

| | |
|---|---|
| Parent material | (1) Colluvium<br>(2) Slope alluvium |
| Surface texture | (1) Stony sandy loam<br>(2) Extremely stony |
| Family particle size | (1) Loamy-skeletal |
| Drainage class | Well drained |
| Permeability class | Moderate to moderately rapid |
| Depth to restrictive layer | 76–127 cm |
| Soil depth | 76–127 cm |
| Surface fragment cover <=3" | 10–15% |
| Surface fragment cover >3" | 15–35% |
| Available water capacity (0-101.6cm) | 4.32–9.65 cm |
| Calcium carbonate equivalent (0-101.6cm) | 0% |

| | |
|---|---|
| Electrical conductivity (0-101.6cm) | 0–2 mmhos/cm |
| Sodium adsorption ratio (0-101.6cm) | 0 |
| Soil reaction (1:1 water) (0-101.6cm) | 5.6–6.5 |
| Subsurface fragment volume <=3" (Depth not specified) | 20–25% |
| Subsurface fragment volume >3" (Depth not specified) | 15–20% |

**Table 5. Representative soil features (actual values)**

| | |
|---|---|
| Drainage class | Not specified |
| Permeability class | Not specified |
| Depth to restrictive layer | Not specified |
| Soil depth | Not specified |
| Surface fragment cover <=3" | 10–40% |
| Surface fragment cover >3" | Not specified |
| Available water capacity (0-101.6cm) | Not specified |
| Calcium carbonate equivalent (0-101.6cm) | Not specified |
| Electrical conductivity (0-101.6cm) | Not specified |
| Sodium adsorption ratio (0-101.6cm) | Not specified |
| Soil reaction (1:1 water) (0-101.6cm) | Not specified |
| Subsurface fragment volume <=3" (Depth not specified) | Not specified |
| Subsurface fragment volume >3" (Depth not specified) | 15–40% |

## Ecological dynamics

Major Successional Stages of Forestland Development:

HERBACEOUS: Vegetation is dominated by grasses and forbs under full sunlight. This stage is experienced after a major disturbance such as wildfire. Thin bark, persistence of dead lower limbs, and high flammability of green material, makes subalpine fir especially susceptible to severe damage by fire. Skeleton forest (dead trees) remaining after fire or other disturbances has little or no affect on the composition and production of the herbaceous vegetation.

SHRUB-HERBACEOUS: Herbaceous vegetation, mountain gooseberry, mountain snowberry, whitebark pine seedlings/saplings and quaking aspen saplings dominate the site. Various amounts of subalpine fir seedlings (less than 20 inches in height) are present up to the point where they are obviously a component of the vegetal structure.

SAPLING: In the absence of disturbance, subalpine fir seedlings develop into saplings (20 inches to 4½ feet in height) with a canopy cover generally less than 10 percent. On cool, moist, northerly exposures, the very shade tolerant, subalpine fir usually returns at once following wildfire using whitebark pine or quaking aspen as a cover tree. With favorable growing conditions, subalpine fir seedlings reach 4 to 5 feet in height at about 20 to 40 years of age. Vegetation consists of grasses and forbs in association with saplings of subalpine fir, often in the understory of

young whitebark pine and quaking aspen trees. Quaking aspen is common on warmer, more moist sites, while whitebark pine is usually the dominant tree of colder, drier, environments.

IMMATURE FORESTLAND: Subalpine fir greater than 4½ feet in height form a major constituent of the visual aspect and vegetal structure of the plant community. Seedlings and sapling of subalpine fir are prevalent in the understory of whitebark pine and quaking aspen. Whitebark pine are the tallest trees on the site due to the slow growth of subalpine fir. Whitebark pine is at the pole stage of development and the stand can be quite dense. Understory vegetation is moderately influenced by a tree overstory canopy of about 40 to 60 percent.

MATURE FORESTLAND: As subalpine fir trees continue to develop, they eventually replace whitebark pine and dominate the site. Dominant trees average ten inches or more in diameter at breast height. Tree canopy cover is typically about 40 to 50 percent. Understory vegetation is strongly influenced by tree competition, overstory shading, duff accumulation, etc.. Few seedlings and/or saplings of quaking aspen or whitebark pine occur in the understory. This stage of forestland development is assumed to be representative of this forestland site in the natural environment.

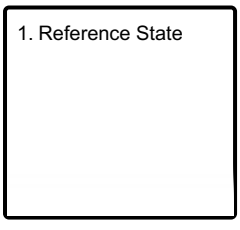
OVER-MATURE FORESTLAND: In the absence of wildfire or other naturally occurring disturbances, the tree canopy on this site can become very dense. This stage is dominated by subalpine fir that have reached maximal heights for the site. Dominant and codominant trees average greater than ten inches in diameter at breast height (DBH). Understory vegetation is sparse due to tree competition, overstory shading, duff accumulation, etc. Tree canopy cover is commonly greater than 60 percent.

The amount and nature of the understory vegetation in a forestland is highly responsive to the amount and duration of shade provided by the overstory canopy. Significant changes in kinds and abundance of plants occur as the canopy changes, often regardless of grazing use. 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 forestland harvest, thinning, or fire.

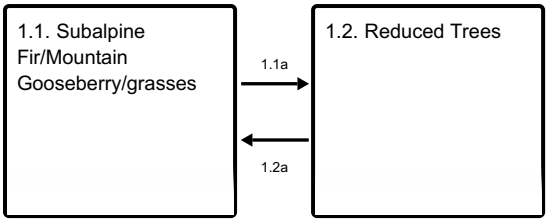
Fire Ecology:
Moist, middle and upper elevation subalpine fir habitat types generally experience high intensity stand-replacing fires at intervals of 100 years or more. Subalpine fir is also very susceptible to surface fires because fine fuels which are often concentrated under mature trees burn slowly and girdle the thin-barked bole. Subalpine fir is one of the least fire resistant western conifers and generally suffers high mortality even from low intensity fires. Fire also kills gooseberry, however, regeneration is favored by fire because scarification of soil-stored seed generally enhances germination in gooseberry. 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. Its rapid maturation in the spring also reduces fire damage, since it is dormant when most fires occur. Ross’ sedge survives fire through buried seed with long-term viability. These seeds germinate after heat treatment. Ross’ sedge’s rhizomes survive low- to moderate-severity fires. Little specific information is available on adaptations of Letterman's needlegrass to fire. It is morphologically similar to Columbia needlegrass, which is only slightly to moderately damaged by fire. Season of burn affects the plant's ability to survive a fire. Post-fire regeneration is through seeding and tillering.

## State and transition model

**Ecosystem states**



**State 1 submodel, plant communities**




## State 1
## Reference State

The Reference State is representative of the natural range of variability under pristine conditions. This reference state has four general community phases. 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 1.1
## Subalpine Fir/Mountain Gooseberry/grasses

The reference plant community is dominated by subalpine fir with whitebark pine and quaking aspen occurring sporadically in the tree overstory. Mountain gooseberry is the principal understory shrub. Bluegrasses, Letterman's needlegrass, and Ross' sedge are the most prevalent understory grasses or grass-like plants. Mountain snowberry, spike trisetum, pinegrass, mountain brome, shinleaf and meadowrue, are other common understory plants. Mosses are common on the forest floor. Although subalpine fir may be the only overstory tree in many areas, overstory tree canopy composition can range from about 85 percent subalpine fir, with 5 to 15 percent whitebark pine, and less than 5 percent quaking aspen. An overstory canopy of about 45 percent is assumed to be representative of tree dominance on this site in the natural environment.

**Forest overstory.** MATURE FORESTLAND: As subalpine fir trees continue to develop, they eventually replace whitebark pine and dominate the site. Dominant trees average ten inches or more in diameter at breast height. Tree canopy cover is typically about 40 to 50 percent. Understory vegetation is strongly influenced by tree competition, overstory shading, duff accumulation, etc. Few seedlings and/or saplings of quaking aspen or whitebark pine occur in the understory. This stage of forestland development is assumed to be representative of this forestland site in the natural environment.

**Forest understory.** Understory vegetative composition is about 50 percent grasses, 10 percent forbs and 40 percent shrubs and young trees when the average overstory canopy is medium (40 to 50 percent). Average understory production ranges from 100 to 300 pounds per acre with a medium canopy cover. Understory production includes the total annual production of all species within 4½ feet of the ground surface.

**Table 6. Annual production by plant type**

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|---|---|---|---|
| Grass/Grasslike | 56 | 126 | 168 |
| Shrub/Vine | 30 | 69 | 91 |
| Tree | 15 | 33 | 44 |
| Forb | 11 | 25 | 34 |
| **Total** | **112** | **253** | **337** |

## Community 1.2
## Reduced Trees

This community phase is representative of an early successional plant community. Sprouting shrubs and perennial

grasses such as bluebunch wheatgrass, spike fescue, muttongrass, and Letterman’s needlegrass increase due to reduced competition from the overstory for sunlight, nutrients and moisture. Conifers may be present in patches and fire safe zones. Remaining mature trees are important for the recovery of this ecological site and will provide seeds for regeneration.

### Pathway 1.1a
### Community 1.1 to 1.2

High severity, stand replacing fire would drastically reduce or eliminate tree cover and allowing herbaceous plants and sprouting shrubs to initially dominate. The chances of this happening are very low. The combination of low fine fuel loads, long lived trees and a short growing season result in a stable forest community that seldom experiences stand replacing disturbances. A lightning strike, low severity fire and/or disease and insects removes single trees or patches of trees releasing the understory and allowing for regeneration and seedling establishment.

### Pathway 1.2a
### Community 1.2 to 1.1

Absence from disturbance such as fire, drought or disease will allows trees to reach maturity.

## Additional community tables

**Table 7. Community 1.1 plant community composition**

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|---|---|---|---|---|---|
| **Grass/Grasslike** | | | | | |
| 1 | **Primary Perennial Grasses/Grasslikes** | | | 62–112 | |
| | Letterman's needlegrass | ACLE9 | *Achnatherum lettermanii* | 12–22 | – |
| | dunhead sedge | CAPH2 | *Carex phaeocephala* | 12–22 | – |
| | Ross' sedge | CARO5 | *Carex rossii* | 12–22 | – |
| | pinegrass | CARU | *Calamagrostis rubescens* | 12–22 | – |
| | bluegrass | POA | *Poa* | 12–22 | – |
| 2 | **Secondary Perennial Grasses** | | | 4–25 | |
| | mountain brome | BRMA4 | *Bromus marginatus* | 2–12 | – |
| | spike trisetum | TRSP2 | *Trisetum spicatum* | 2–12 | – |
| **Forb** | | | | | |
| 3 | **Perennial** | | | 25–45 | |
| | wintergreen | PYROL | *Pyrola* | 12–22 | – |
| | starwort | STELL | *Stellaria* | 12–22 | – |
| **Shrub/Vine** | | | | | |
| 4 | **Primary Shrubs** | | | 37–83 | |
| | gooseberry currant | RIMO2 | *Ribes montigenum* | 25–61 | – |
| | mountain snowberry | SYOR2 | *Symphoricarpos oreophilus* | 12–22 | – |
| **Tree** | | | | | |
| 5 | **Evergreen** | | | 15–35 | |
| | subalpine fir | ABLA | *Abies lasiocarpa* | 12–22 | – |
| | whitebark pine | PIAL | *Pinus albicaulis* | 2–12 | – |
| 6 | **Deciduous** | | | 2–12 | |
| | quaking aspen | POTR5 | *Populus tremuloides* | 2–12 | – |

## Animal community

Livestock Interpretations:
This site is poorly suited to cattle and sheep grazing due to steep slopes and lack of adequate water. Livestock may concentrate on this site taking advantage of the shade and shelter offered by the tree overstory. Attentive grazing management is required where this site is used due to steep slopes and associated erosion hazards particularly during the early stages of forest community development. During the early stages of succession, such as the shrub-herbaceous and sapling stages, the young trees are most susceptible to damage from livestock browsing and trampling.

The forage value rating is not an ecological evaluation of the understory as is the range condition rating for rangeland. The forage value rating is a utilitarian rating of the existing understory plants for use by specific kinds of grazing animals.

The amount and nature of the understory vegetation in a forestland is highly responsive to the amount and duration of shade provided by the overstory canopy. Significant changes in kinds and abundance of plants occur as the canopy changes, often regardless of grazing use.

Wildlife Interpretations:
Forest communities having open to sparse tree canopies provide forage and browse for deer and elk while medium to dense tree canopies provide shelter and protection for these animals. Upland game species including rabbits, and blue and ruffed grouse use this site. Whitebark pine provides a nutritious food source to seed eating birds and small mammals. Blue grouse roost in whitebark pine crowns during most of the year. It is also used by various song birds, rodents, reptiles and associated predators natural to the area.

## Hydrological functions

The hydrologic cover condition of this site is fair in a representative stand. The average runoff curve is about 90 for group D soils.

## Recreational uses

This site has high aesthetic value and provides a variety of recreational opportunities such as hiking, camping and hunting. Steep slopes may inhibit many forms of recreation.

## Wood products

Subalpine fir has been an important lumber source. Saw lumber from this tree sometimes has numerous knots because trees shed their lower limbs rather slowly. The wood has good strength qualities because of long wood fibers. Since it occurs mainly at high elevations, it is usually difficult to harvest. In addition to saw timber, this tree species has been used for poles, railroad ties, and mine props. It is also used for fuelwood and pulp.

PRODUCTIVE CAPACITY

This forest community has low to moderately low site quality for tree production. Site index for subalpine fir ranges from about 60 to 70(75) (Alexander, 1967).

Productivity Class: 4
CMAI*: 50 to 64(69) ft3/ac/yr;
3.5 to 4.5(4.8) m3/ha/yr
Culmination is 110 years for Site Index 70
Culmination is 120 years for Site Index 60
*CMAI: is the culmination of mean annual increment or highest average growth rate of the stand in the units specified.

Basal Area: 137 to 160 ft2/ac

Total Tree Volume: 3680 to 4720 ft3/ac

MANAGEMENT GUIDES AND INTERPRETATIONS

1. LIMITATIONS AND CONSIDERATIONS
a. Moderate to severe equipment limitations due to surface stoniness.
b. Severe equipment limitations due to steep slopes.
c. Potential for sheet and rill erosion is severe.

2. ESSENTIAL REQUIREMENTS
a. Protect soils from accelerated erosion.
b. Adequately protect from uncontrolled fire.

3. SILVICULTURAL PRACTICES
Silvicultural treatments are not feasible on this site due to relatively low site quality and severe limitations for equipment and tree harvest.

## Other products

Subalpine fir is sometimes used as a landscape plant to produce screenings or windbreaks. Native Americans used various parts of subalpine fir for numerous purposes. A hair tonic was prepared by mixing powdered needles with deer grease. Finely ground needles were also sprinkled on open cuts. Sticky resin collected from the bark was boiled and used as an antiseptic for wounds or as a tea for colds. Boughs were placed in rooms for their aroma, and pulverized needles were used as a body scent or as perfume for clothing. Currants (Ribes spp.) can be used for making jam, jelly, or pie. Some western Indian tribes used currants for making pemmican.

## Other information

Subalpine fir can be planted on disturbed sites within forest vegetation types where it naturally occurs. Gooseberry currant can be used to revegetate disturbed mountain areas.

**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 |
|---|---|---|---|---|---|---|---|---|---|
| subalpine fir | *ABLA* | 60 | 70 | 50 | 64 | – | – | – | |

## Inventory data references

Houghton, J.G., C.M. Sakamoto, and R.O. Gifford. 1975. Nevada’s Weather and Climate, Special Publication 2. Nevada Bureau of Mines and Geology, Mackay School of Mines, University of Nevada, Reno, NV.
National Oceanic and Atmospheric Administration. 2004. The North American Monsoon. Reports to the Nation. National Weather Service, Climate Prediction Center. Available online: http://www.weather.gov/

Physiographic and Soils features were gathered from NASIS database.

## Type locality

| Location 1: Elko County, NV | |
|---|---|
| Township/Range/Section | T45N R58E S18 |
| General legal description | About ¾ mile northeast of Coon Creek Summit, Jarbidge Mountains, Humboldt-Toiyabe National Forest, Elko County, Nevada. |

## Other references

Alexander, R.R. and Edminster. 1980. Management of Spruce-Fir in Even-Aged Stands in the Central Rocky

Mountains. USDA Forest Service. Research Paper RM-217.

Lanner, Ronald M.. 1984. Trees of the Great Basin, A Natural History. Reno University of Nevada Press.

Houghton, J.G., C.M. Sakamoto, and R.O. Gifford. 1975. Nevada's Weather and Climate, Special Publication 2. Nevada Bureau of Mines and Geology, Mackay School of Mines, University of Nevada, Reno, NV.

National Oceanic and Atmospheric Administration. 2004. The North American Monsoon. Reports to the Nation. National Weather Service, Climate Prediction Center. Available online: http://www.weather.gov/

USDA-NRCS. 2000. National Forestry Manual - Part 537. Washington, D.C.
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## Contributors

GKB

## Approval

Kendra Moseley, 4/24/2024

## 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 | 05/19/2024 |
| Approved by | Kendra Moseley |
| 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:

---

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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