USDA Natural Resources
Conservation Service

Ecological site F026XY065NV
Very Shallow Sandy Side Slope 12-14 P.Z. PIPO/ERRO10/CAREX

Last updated: 4/10/2024
Accessed: 05/05/2024

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): 026X–Carson Basin and Mountains

MLRA 26 is in western Nevada and eastern California; approximately 69 percent is in Nevada, and 31 percent in California. The area is predominantly in the Great Basin Section of the Basin and Range Province of the Intermontane Plateaus. Isolated north- south trending mountain ranges are separated by aggraded desert plains. The mountains are uplifted fault-blocks with steep side slopes. The valleys are drained by three major rivers flowing east across MLRA 26; the Truckee, Carson and Walker rivers. A narrow strip along the western border of MLRA 26 is in the Sierra Nevada Section of the Cascade-Sierra Mountains Province of the Pacific Mountain System. The Sierra Nevada Mountains are primarily a large fault-block that has been uplifted with a dominant tilt to the west. The structure creates an impressive wall of mountains directly west of the area creating a rain shadow affect to MLRA 26. Parts of the eastern face; the foothills, mark the western boundary of the area. Elevations range from near 3,806 feet (1,160 meters) on the west shore of Pyramid Lake to 11,653 feet (3,552 meters) on the summit of Mount Patterson in the Sweetwater Mountains.

In MLRA 26, the valleys are composed dominantly of Quaternary alluvial deposits. Quaternary playa or alluvial flat deposits typically occupy the lowest valley bottoms in the internally drained valleys. Tertiary andesitic flows, breccias, ash flow tuffs, rhyolite tuffs or granodioritic rocks dominate the hills and mountains. Quaternary basalt flows are present in lesser amounts. Jurassic and Triassic limestone and shale, and Precambrian limestone and dolomite are also present in very limited amounts. Glacial till deposits, of limited extent are along the east flank of the Sierra Nevada Mountains; the result of alpine glaciation.

The average annual precipitation in MLRA 26 is 5 to 36 inches (125 to 915 millimeters), increasing with elevation. Most of the rainfall occurs as high-intensity, convective storms in spring and autumn. Precipitation is mostly snow in winter. Summers are dry. The average annual temperature is 37 to 54 degrees F (3 to 12 degrees C). The freeze-free period averages 115 days and ranges from 40 to 195 days, decreasing in length with elevation.

The dominant soil orders in MLRA 26 are Aridisols and Mollisols. The soils in the area typically have a mesic soil temperature regime, an aridic or xeric soil moisture regime, and mixed or smectitic mineralogy. The soils are generally well drained, clayey or loamy and are commonly skeletal. The soils depths are typically very shallow to moderately deep.

This area supports shrub-grass vegetation characterized by big sagebrush. Low sagebrush and Lahontan sagebrush are on some soils. Antelope bitterbrush, squirreltail, desert needlegrass, Thurber needlegrass, and Indian ricegrass are important associated plants. Green ephedra, Sandberg bluegrass, desert peach, and several forb species are also common. Juniper-pinyon woodland is typical on mountain slopes. Jeffrey pine, lodgepole pine, white fir, and manzanita grow on the highest mountain slopes. Shadscale is the typical plant in the drier parts of the area. Sedges, rushes, and moisture-loving grasses grow on the wettest parts of the wet flood plains and terraces. Basin wildrye, alkali sacaton, saltgrass, buffaloberry, black greasewood, and rubber rabbitbrush grow on the drier sites that have a high concentration of salts.

Wildlife species in the area are mule deer, coyote, beaver, muskrat, jackrabbit, cottontail, raptors, pheasant, chukar, blue grouse, mountain quail, and mourning dove, amongst other species. The species of fish in the area include trout and catfish. The Lahontan cutthroat trout in the Truckee River is a threatened and endangered species.

LRU notes

The Sierra Influenced Ranges LRU is characterized by wooded great basin mountains and climatic and biotic affinities to the Sierra Nevada Mountain range. The Sierra Influenced Ranges LRU receives greater precipitation than the mountain ranges of central Nevada.
Amount of precipitation varies in relation to the local strength of the Sierra Nevada rain shadow, characterized by pinyon and juniper trees. The White, Sweetwater, Pine Nut, Wassuk, and Virginia ranges of Nevada support varying amounts of Sierra Nevada flora, like ponderosa pine. Elevations range from 1610 to 2420 meters and slopes range from 5 to 49 percent, with a median value of 22 percent.

Frost free days (FFD) ranges from 92 to 163.

Ecological site concept

This forestland community is on the summits and steep side slopes of lower elevation mountains. Slopes range from 15 to 75 percent, but slope gradients of 15 to 50 percent are typical. Elevations range from 4900 to 6700 feet. The soils associated with this site are very shallow to weathered bedrock and well drained. Soils are coarse textured and have little horizonation. The dominant plants are ponderosa pine (Pinus ponderosa), granite buckwheat (Eriogunum robustum), and sedge (Carex).

Associated sites

F026XY044NV	**Shallow Sandy Slope 10-12 P.Z.**
R026XY005NV	**LOAMY 12-14 P.Z.**
R026XY010NV	**LOAMY 10-12 P.Z.**

Table 1. Dominant plant species

Tree	(1) *Pinus ponderosa*
Shrub	(1) *Eriogonum robustum*
Herbaceous	(1) *Carex*

Physiographic features

The Very Shallow Sandy Side slope 12-14 P.Z. occurs on the summits and steep side slopes of lower elevation mountains. Slopes range from 15 to 75 percent, but slope gradients of 15 to 50 percent are typical. Elevations range from about 4900 to 6700 feet.

Table 2. Representative physiographic features

Landforms	(1) Mountain
Runoff class	High to very high
Elevation	4,900–6,700 ft
Slope	15–50%
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is arid, characterized by cool, moist winters and warm, dry summers. Average annual precipitation is 12 to 14 inches (36 cms). Mean annual air temperature is 46 to 49 degrees F. The average frost-free period is 80 to 110 days.

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. The prevailing winds are from the west, and as the warm moist air from the Pacific Ocean ascend the western slopes of the Sierra Range, the air cools, condensation occurs and most of the moisture falls as precipitation. As the air descends the eastern slope, it is warmed by compression, and very little precipitation occurs. The effects of this mountain barrier are felt not only in the

West but throughout the state, with the result that the lowlands of Nevada are largely desert or steppes. The temperature regime is also affected by the blocking of the inland-moving maritime air. Nevada sheltered from maritime winds, has a continental climate with well- developed seasons and the terrain responds quickly to changes in solar heating.
Nevada lies within the mid-latitude belt of prevailing westerly winds which occur most of the year. These winds bring frequent changes in weather during the late fall, winter and spring months, when most of the precipitation occurs. To the south of the mid-latitude westerlies, lies a zone of high pressure in subtropical latitudes, with a center over the Pacific Ocean. In the summer, this high-pressure belt shifts northward over the latitudes of Nevada, blocking storms from the ocean. The resulting weather is mostly clear and dry during the summer and early fall, with scattered thundershowers. The eastern portion of the state receives significant summer thunderstorms generated from monsoonal moisture pushed up from the Gulf of California, known as the North American monsoon. The monsoon system peaks in August and by October the monsoon high over the Western U.S. begins to weaken and the precipitation retreats southward towards the tropics (NOAA 2004).

Table 3. Representative climatic features

Frost-free period (average)	95 days
Freeze-free period (average)	
Precipitation total (average)	12 in

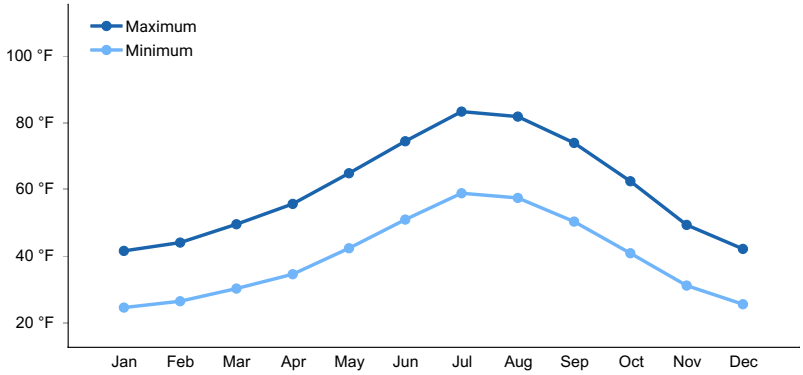


Figure 1. Monthly average minimum and maximum temperature

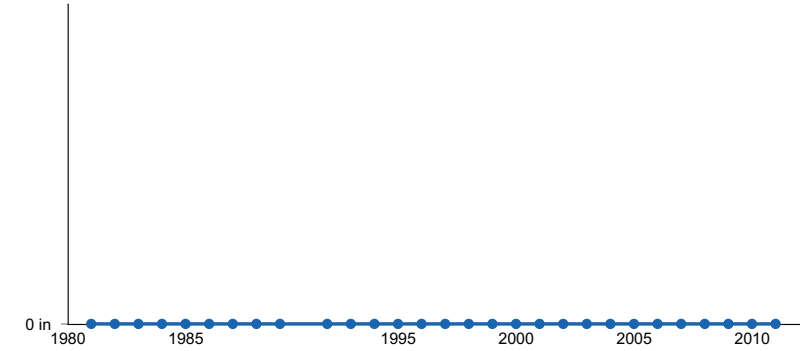


Figure 2. Annual precipitation pattern

Influencing water features

No influencing water features are associated with this site.

Soil features

The soils are very shallow to weathered bedrock and well drained. Soils are coarse textured and have little horizonation. Soil material mixes with the underlying altered andesite parent material. The andesite base rock has been altered by chemical (hydrothermal) weathering with much of the mineral nutrients. The available nitrogen and available phosphorous in these soils is extraordinarily low. These soils have low base saturation with soil pH generally ranging between 4.5 and 6.0. Potential for sheet and rill erosion is moderate to severe depending on slope. The soil series associated with this site include Smallcone.

Table 4. Representative soil features

Parent material	(1) Residuum–andesite
Surface texture	(1) Very gravelly coarse sandy loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Very slow
Depth to restrictive layer	4–10 in
Soil depth	4–10 in
Surface fragment cover <=3"	45%
Surface fragment cover >3"	3%
Available water capacity (0-40in)	0.2–0.4 in
Calcium carbonate equivalent (Depth not specified)	0%
Electrical conductivity (0-40in)	0–2 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	4.5–6
Subsurface fragment volume <=3" (Depth not specified)	50%
Subsurface fragment volume >3" (Depth not specified)	15%

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. Skeleton forest (dead trees) remaining after fire or other disturbances have little or no affect on the composition and production of the herbaceous vegetation.

SHRUB-HERBACEOUS: Herbaceous vegetation and woody shrubs dominate the site. This stage is experienced within two to three years after fire or other major disturbance. Various amounts of tree seedlings (less than 20 inches (51 cms) in height) may be present up to the point where they are obviously a major component of the vegetal structure.

SAPLING: In the absence of disturbance, the tree seedlings develop into saplings (20 inches to 4.5 feet (51 cms to 137 cms) in height) with a canopy cover generally of about 5 to 10 percent. Vegetation consists of grasses, forbs and shrubs in association with tree saplings.

IMMATURE FORESTLAND: The visual aspect and vegetal structure are dominated by ponderosa pine greater than 4.5 feet in height. The upper crown of dominant and co-dominant ponderosa pine are cone or pyramidal shaped. Seedlings and saplings of pines are common in the understory. Dominants are the tallest trees on the site; co-dominants are 65 to 85 percent of the highest of dominant trees. Understory vegetation is moderately influenced by a tree overstory canopy of about 5 to 15 percent.

MATURE FORESTLAND: The visual aspect and vegetal structure are dominated by ponderosa pine that have reached or are near maximal heights for the site. Tree canopy cover ranges from 10 to 20 percent. This stage of community development is assumed to be representative of this forestland site in the pristine environment.

OVER-MATURE FORESTLAND: In the absence of wildfire or other major disturbances the tree canopy will continue to expand. This stage is dominated by ponderosa pine that have reached maximal heights for the site. Understory vegetation is sparse or absent due to tree competition, overstory shading, duff accumulation, etc. Few seedlings or saplings of ponderosa pine are found in the understory. Tree canopy cover is commonly greater than 20 percent.

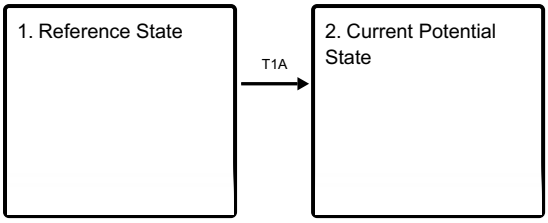
Ponderosa pine is shade intolerant and grows most rapidly in near full sunlight. A strong tendency exists for climax pine stands to be even- aged in small groups rather than being truly uneven-aged.

The successional status of ponderosa pine can be expressed in terms of its successional role, which ranges from seral to climax depending on specific site conditions. It plays a climax role on sites toward the extreme limits of its environmental range and becomes increasingly seral with more favorable conditions. On sites with more favorable moisture, pine encounters greater competition and must establish itself opportunistically. On moist sites it is usually seral. On severe sites it is climax by default because other species cannot establish. On such sites, establishment is likely to be highly dependent upon the cyclical nature of large seed crops and favorable weather conditions.

Fire Ecology:
Historically, surface fires were most common in Ponderosa pine stands, with occasional flare-ups occurring in brush patches. Crown fires were unlikely in most stands. Long, loosely packed pine needles and herbaceous species maintained frequent and mild surface burns. These fires created openings for pine seedling establishment, thus maintaining its persistence. These fires also thinned saplings and maintained the relatively open understories. The recent increase in understory density has been attributed to the current longer fire intervals. Ponderosa pine is fire-adapted in all stages of its life history and is especially well adapted to light, regular surface fires. The seeds prefer openings with mineral soil usually prepared by fire for seedbed. For the seedlings and young trees, early development of insulative bark, shielded meristems, high moisture content in living needles, and rapid extension of taproots reduce their mortality from fire. For mature trees, thick bark, deep roots, and low- flammability crown structures help them survive most fires. Following a stand-replacement fire, the successional sequence in these types' proceeds from herbaceous species to shrub and hardwood, and finally ponderosa pine stages. 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, rhizomatous spread or both. Desert needlegrass has persistent dead leaf bases, which make it susceptible to burning. Fire removes the accumulation; a rapid, cool fire will not burn deep into the root crown.
Bottlebrush squirreltail's small size, coarse stems, and sparse leafy material aid in its tolerance of fire. Postfire regeneration occurs from surviving root crowns and from on- and off-site seed sources. Frequency of disturbance greatly influences postfire response of bottlebrush squirreltail. Undisturbed plants within a 6 to 9 year age class generally contain large amounts of dead material, increasing bottlebrush squirreltail's susceptibility to fire.

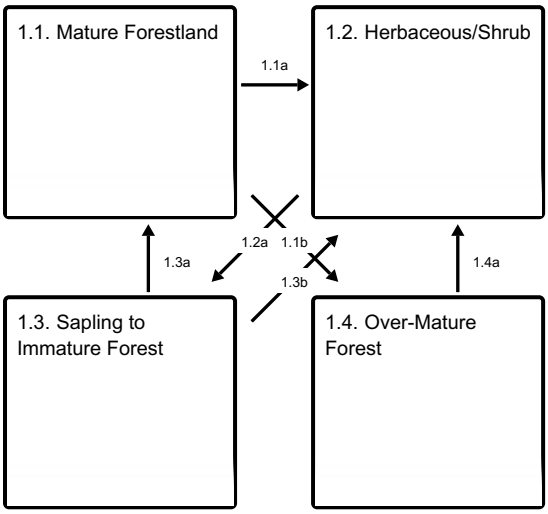
State and transition model

Ecosystem states



T1A - This transition occurs with establishment of non-native plants.

State 1 submodel, plant communities



1.1a - This pathway is a result of fire which reduces trees and increases herbaceous vegetation.

1.1b - This pathway is a result of time and lack of disturbance.

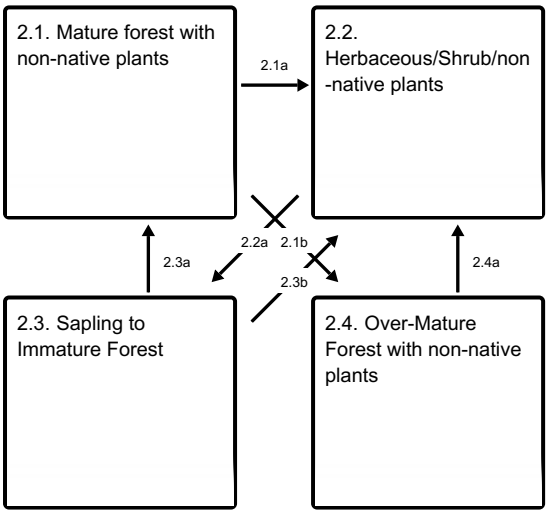
1.2a - This pathway is a result of time and lack of disturbance.

1.3a - This pathway is a result of time and lack of disturbance.

1.3b - This pathway is a result of disturbance such as fire, insects, or disease.

1.4a - This pathway is a result of disturbance, such as fire.

State 2 submodel, plant communities



2.1a - This pathway is a result of disturbance (fire) that removes tree canopy and increases understory grasses and shrubs.

2.1b - This pathway is a result of time and lack of disturbance.

2.2a - This pathway is a result of time and lack of disturbance.

2.3a - This pathway is a result of time and lack of disturbance.

2.3b - This pathway is a result of disturbance, such as fire, that removes trees and increases grasses and shrubs.

2.4a - This pathway is a result of disturbance, such as fire, that removes tree canopy.

State 1
Reference State

The Reference State 1.0 is a representative of the natural range of variability under pristine conditions. This site has four general community phases: (1) a mature woodland phase, (2) a sucker/sapling phase, (3) an immature woodland phase and (4) an over mature woodland/conifer phase. 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, fuel loads, and retention of organic matter and nutrients. Plant community phase changes are primarily driven by fire, periodic drought, insect or disease attack.

Community 1.1
Mature Forestland

The reference plant community is dominated by ponderosa pine. Altered andesite buckwheat is the principal understory plant. An overstory canopy cover of about 15 percent is assumed to be representative of tree dominance on this site in the pristine environment. Overstory tree canopy composition is typically 100 percent ponderosa pine. Singleleaf piñyon, Utah juniper and/or Jeffrey pine may compose up to 5 percent of the overstory. MATURE FORESTLAND: The visual aspect and vegetal structure are dominated by ponderosa pine that have reached or are near maximal heights for the site. Tree canopy cover ranges from 10 to 20 percent. This stage of community development is assumed to be representative of this forestland site in the pristine environment.

Forest overstory. MATURE FORESTLAND: The visual aspect and vegetal structure are dominated by ponderosa pine that have reached or are near maximal heights for the site. Tree canopy cover ranges from 10 to 20 percent. This stage of community development is assumed to be representative of this forestland site in the pristine environment.

Forest understory. Understory vegetative composition is about 30 percent grasses, 05 percent forbs and 65 percent shrubs and young trees when the average overstory canopy is medium (10 to 20 percent). Average understory production ranges from 25 to 125 pounds per acre with a medium canopy cover. Understory production includes the total annual production of all species within 4.5 feet of the ground surface.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Tree	9	18	44
Shrub/Vine	8	15	38
Grass/Grasslike	7	14	37
Forb	1	3	6
Total	**25**	**50**	**125**

Community 1.2
Herbaceous/Shrub

HERBACEOUS: Vegetation is dominated by grasses and forbs under full sunlight. This stage is experienced after a major disturbance such as wildfire. Skeleton forest (dead trees) remaining after fire or other disturbances have little or no affect on the composition and production of the herbaceous vegetation. SHRUB-HERBACEOUS: Herbaceous vegetation and woody shrubs dominate the site. This stage is experienced within two to three years after fire or other major disturbance. Various amounts of tree seedlings (less than 20 inches (51 cms) in height) may be present up to the point where they are obviously a major component of the vegetal structure.

Community 1.3

Sapling to Immature Forest

SAPLING: In the absence of disturbance, the tree seedlings develop into saplings (20 inchesto 4.5 feet (51 cms to 137 cms) in height) with a canopy cover generally of about 5 to 10 percent. Vegetation consists of grasses, forbs and shrubs in association with tree saplings. IMMATURE FORESTLAND: The visual aspect and vegetal structure are dominated by ponderosa pine greater than 4.5 feet in height. The upper crown of dominant and co-dominant ponderosa pine are cone or pyramidal shaped. Seedlings and saplings of pines are common in the understory. Dominants are the tallest trees on the site; co-dominants are 65 to 85 percent of the highest of dominant trees. Understory vegetation is moderately influenced by a tree overstory canopy of about 5 to 15 percent.

Community 1.4
Over-Mature Forest

OVER-MATURE FORESTLAND: In the absence of wildfire or other major disturbances the tree canopy will continue to expand. This stage is dominated by ponderosa pine that have reached maximal heights for the site. Understory vegetation is sparse or absent due to tree competition, overstory shading, duff accumulation, etc. Few seedlings or saplings of ponderosa pine are found in the understory. Tree canopy cover is commonly greater than 20 percent.

Pathway 1.1a
Community 1.1 to 1.2

This pathway is a result of fire which reduces trees and increases herbaceous vegetation.

Pathway 1.1b
Community 1.1 to 1.4

This pathway is a result of time and lack of disturbance.

Pathway 1.2a
Community 1.2 to 1.3

This pathway is a result of time and lack of disturbance.

Pathway 1.3a
Community 1.3 to 1.1

This pathway is a result of time and lack of disturbance.

Pathway 1.3b
Community 1.3 to 1.2

This pathway is a result of disturbance such as fire, insects, or disease.

Pathway 1.4a
Community 1.4 to 1.2

This pathway is a result of disturbance, such as fire.

State 2
Current Potential State

This state is similar to the Reference State 1.0 with four similar community phases. Ecological function has not changed, however the resiliency of the state has been reduced by the presence of invasive weeds. Non-natives may increase in abundance but will not become dominant within this State. These non-natives can be highly flammable and can promote fire where historically fire had been infrequent. Negative feedbacks enhance ecosystem resilience and contribute to the stability of the state. These feedbacks include the presence of all structural and functional

groups, low fine fuel loads, and retention of organic matter and nutrients. Positive feedbacks decrease ecosystem resilience and stability of the state. These include the non-natives' high seed output, persistent seed bank, rapid growth rate, ability to cross pollinate, and adaptations for seed dispersal.

Community 2.1
Mature forest with non-native plants

This community is similar to 1.1 with non-native plants. The visual aspect and vegetal structure are dominated by ponderosa pine that have reached or are near maximal heights for the site. Tree canopy cover ranges from 10 to 20 percent. This stage of community development is assumed to be representative of this forestland site in the pristine environment.

Community 2.2
Herbaceous/Shrub/non-native plants

This community is similar to 1.2 with non-native plants. Vegetation is dominated by grasses and forbs under full sunlight. This stage is experienced after a major disturbance such as wildfire. Skeleton forest (dead trees) remaining after fire or other disturbances have little or no affect on the composition and production of the herbaceous vegetation. SHRUB-HERBACEOUS: Herbaceous vegetation and woody shrubs dominate the site. This stage is experienced within two to three years after fire or other major disturbance. Various amounts of tree seedlings (less than 20 inches (51 cms) in height) may be present up to the point where they are obviously a major component of the vegetal structure.

Community 2.3
Sapling to Immature Forest

This community is similar to 1.3 with non-native plants. SAPLING: In the absence of disturbance, the tree seedlings develop into saplings (20 inches to 4.5 feet (51 cms to 137 cms) in height) with a canopy cover generally of about 5 to 10 percent. Vegetation consists of grasses, forbs and shrubs in association with tree saplings. IMMATURE FORESTLAND: The visual aspect and vegetal structure are dominated by ponderosa pine greater than 4.5 feet in height. The upper crown of dominant and co-dominant ponderosa pine are cone or pyramidal shaped. Seedlings and saplings of pines are common in the understory. Dominants are the tallest trees on the site; co-dominants are 65 to 85 percent of the highest of dominant trees. Understory vegetation is moderately influenced by a tree overstory canopy of about 5 to 15 percent.

Community 2.4
Over-Mature Forest with non-native plants

This community is similar to 1.4 with non-native plants. In the absence of wildfire or other major disturbances the tree canopy will continue to expand. This stage is dominated by ponderosa pine that have reached maximal heights for the site. Understory vegetation is sparse or absent due to tree competition, overstory shading, duff accumulation, etc. Few seedlings or saplings of ponderosa pine are found in the understory. Tree canopy cover is commonly greater than 20 percent.

Pathway 2.1a
Community 2.1 to 2.2

This pathway is a result of disturbance (fire) that removes tree canopy and increases understory grasses and shrubs.

Pathway 2.1b
Community 2.1 to 2.4

This pathway is a result of time and lack of disturbance.

Pathway 2.2a

Community 2.2 to 2.3

This pathway is a result of time and lack of disturbance.

Pathway 2.3a
Community 2.3 to 2.1

This pathway is a result of time and lack of disturbance.

Pathway 2.3b
Community 2.3 to 2.2

This pathway is a result of disturbance, such as fire, that removes trees and increases grasses and shrubs.

Pathway 2.4a
Community 2.4 to 2.2

This pathway is a result of disturbance, such as fire, that removes tree canopy.

Transition T1A
State 1 to 2

This transition occurs with establishment of non-native plants.

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**			9–20	
	sedge	CAREX	*Carex*	5–12	–
	squirreltail	ELEL5	*Elymus elymoides*	2–4	–
	desert needlegrass	ACSP12	*Achnatherum speciosum*	2–4	–
2	**Secondary Perennial Grasses**			2–4	
	muttongrass	POFE	*Poa fendleriana*	1–2	–
	Sandberg bluegrass	POSE	*Poa secunda*	1–2	–
Forb					
3	**Perennial**			2–4	
	common spikerush	ELPA3	*Eleocharis palustris*	1–2	–
Shrub/Vine					
4	**Primary Shrubs**			5–10	
	Utah serviceberry	AMUT	*Amelanchier utahensis*	1–2	–
	mormon tea	EPVI	*Ephedra viridis*	1–2	–
	Parry's rabbitbrush	ERPA30	*Ericameria parryi*	1–2	–
	desert peach	PRAN2	*Prunus andersonii*	1–2	–
	antelope bitterbrush	PUTR2	*Purshia tridentata*	1–2	–
Tree					
5	**Evergreen**			8–18	
	ponderosa pine	PIPO	*Pinus ponderosa*	5–12	–
	Utah juniper	JUOS	*Juniperus osteosperma*	1–2	–
	Jeffrey pine	PIJE	*Pinus jeffreyi*	1–2	–
	singleleaf pinyon	PIMO	*Pinus monophylla*	1–2	–

Table 7. Community 1.1 forest overstory composition

Common Name	Symbol	Scientific Name	Nativity	Height (Ft)	Canopy Cover (%)	Diameter (In)	Basal Area (Square Ft/Acre)
Tree							
ponderosa pine	PIPO	*Pinus ponderosa*	Native	–	100	–	–

Animal community

Livestock Interpretations:
This site is not suited to cattle and sheep grazing due to very low forage productivity and steep slopes.

Stocking rates vary with such factors as kind and class of grazing animal, season of use and fluctuations in climate. Actual use records for individual sites, a determination of the degree to which the sites have been grazed and an evaluation of trend in site condition offer the most reliable basis for developing initial stocking rates.

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.

Wildlife Interpretations:
This site has moderate value for mule deer habitat year around. It is also used by various songbirds, rodents, reptiles and associated predators natural to the area.

Hydrological functions

Runoff is very high. Potential for sheet and rill erosion is moderate to severe depending on slope.

Recreational uses

This site has potential for hiking, deer and upland game hunting. Off-road vehicles can destroy the fragile soil-vegetation complex causing severe erosion problems.

Wood products

The timber produced on this site is of such poor quality that these stands of ponderosa pine were left uncut when the forests on all sides were completely cut over during the mining boom of the 1860's and 1870's in western Nevada.

It has been suggested that these pine stands are relicts of a much earlier, wetter, climate which have persisted because of the inability of sagebrush zone plants to invade the mineral-deficient soils of the site.

PRODUCTIVE CAPACITY

Very low-quality site for tree production. Site index ranges from about 40 to 48 (Meyer, 1938. Even-aged Stands of Ponderosa Pine. USDA Tech Bull 630).

Productivity Class: 2
CMAI*: 30 to 36 cubic feet per acre per year;
2.1 to 2.5 cubic meters per hectare per year
*CMAI: is the culmination of mean annual increment highest average growth rate of the stand in the units specified.

Fuelwood Production: About 7 to 10 cords per acre for stands averaging 30 to 40 feet in height and 16 inches (41 cms) diameter at breast height (dbh) with a medium canopy cover. About 213,750 gross British Thermal Units (BTUs) heat content exist per cubic foot of ponderosa pine wood. Solid wood volume in a cord varies but usually ranges from 65 to 90 cubic feet. Assuming an average of 75 cubic feet of solid wood per cord, there are about 16 million BTUs of heat value in a cord of ponderosa pine wood.

Posts (7 foot): 5 to 15 per acre in stands of medium canopy. MANAGEMENT GUIDES AND INTERPRETATIONS
1. LIMITATIONS AND CONSIDERATIONS
a. Potential for sheet and rill erosion is moderate to severe depending on slope.
b. Severe equipment limitations due to steep slopes and on sites having extreme surface stoniness.
c. Proper spacing is the key to a well-managed, multiple use and multi-product ponderosa forestland.

2. ESSENTIAL REQUIREMENTS
a. Adequately protect from wildfire.
b. Protect soils from accelerated erosion.
c. Apply proper grazing management.

3. SILVICULTURAL PRACTICES
Due to the low productivity of thus site and limitations to harvest, silvicultural interpretations are not listed.

Other products

Native Americans use the inner cambial layer as food. The resin has been traditionally converted into medicinal salve for rheumatism, backaches, and dandruff. Bottlebrush squirreltail is a dietary component of several wildlife species.

Other information

Ponderosa pine is widely used for soil stabilization and watershed protection. Bareroot stock is used occasionally for planting on mine-spoils in the West. Bottlebrush squirreltail is tolerant of disturbance and is a suitable species for

revegetation.

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
ponderosa pine	*PIPO*	40	48	30	36	–	–	–	

Inventory data references

NASIS data for soil survey area CA614, CA686, CA729, NV625, NV628, NV772, NV773, and NV774.

Type locality

Location 1: Washoe County, NV	
Township/Range/Section	T17N R21E S6
UTM zone	N
UTM northing	270321
UTM easting	4360872
Latitude	39° 22′ 0″
Longitude	119° 39′ 57″
General legal description	About 14 miles east of junction of US Hwy 395 and NV Hwy 341, Gieger Grade area, Washoe County, Nevada. This site also occurs in Carson City, Douglas, and Storey county, Nevada.

Other references

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

Billings, W.D. 1950. Vegetation and plant growth as affected by chemically altered rocks in the Western Great Basin.

Meyer, W.H. 1938. Even-aged stands of Ponderosa Pine. USDA Tech Bull 630.

USDA-NRCS. 2000 National forestry manual - Part 537. Washington, D.C.

USDA-NRCS. 2004 National forestry handbook, Title 190. Washington, D. C.

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

Contributors

FR

Approval

Kendra Moseley, 4/10/2024

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	05/05/2024
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:**
