USDA Natural Resources
Conservation Service

Ecological site F026XY074NV
Bouldery Stream Terrace 14-16 P.Z. POBAT WSG:6W1610

Last updated: 4/10/2024
Accessed: 05/21/2025

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

MLRA notes

Major Land Resource Area (MLRA): 026X–Carson Basin and Mountains

The area lies within western Nevada and eastern California, with about 69 percent being within Nevada, and 31 percent being within California. Almost all this area is 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. Most of the valleys are drained by three major rivers flowing east across this MLRA. A narrow strip along the western border of the area 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. This structure leaves an impressive wall of mountains directly west of this area. This helps create a rain shadow affect to MLRA 26. Parts of this eastern face, but mostly just the foothills, mark the western boundary of this area. Elevations range from about 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.

Valley areas are dominantly composed of Quaternary alluvial deposits with Quaternary playa or alluvial flat deposits often occupying the lowest valley bottoms in the internally drained valleys, and river deposited alluvium being dominant in externally drained valleys. Hills and mountains are dominantly Tertiary andesitic flows, breccias, ash flow tuffs, rhyolite tuffs or granodioritic rocks. Quaternary basalt flows are present in lesser amounts, and Jurassic and Triassic limestone and shale, and Precambrian limestone and dolomite are also present in very limited amounts. Also of limited extent are glacial till deposits along the east flank of the Sierra Nevada Mountains, the result of alpine glaciation.

The average annual precipitation in this area 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 this MLRA are Aridisols and Mollisols. The soils in the area dominantly have a mesic soil temperature regime, an aridic or xeric soil moisture regime, and mixed or smectitic mineralogy. They generally are well drained, are clayey or loamy and commonly skeletal, and are very shallow to moderately deep.

This area supports shrub-grass vegetation characterized by big sagebrush. Low sagebrush and Lahontan sagebrush occur on some soils. Antelope bitterbrush, squirreltail, desert needlegrass, Thurber needlegrass, and Indian ricegrass are important associated plants. Green ephedra, Sandberg bluegrass, Anderson peachbrush, and several forb species also are 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.

Some of the major wildlife species in this area are mule deer, coyote, beaver, muskrat, jackrabbit, cottontail, raptors, pheasant, chukar, blue grouse, mountain quail, and mourning dove. 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 with climatic and biotic affinities to the Sierra Nevada mountain range. The Sierra Influenced Ranges LRU receives greater precipitation that 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, such as 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

The Bouldery Stream Terrace 14-16 P.Z. occurs on stream terraces and alluvial fans of mountain canyons. Slopes range from 0 to 15 percent, but are typically 2 to 4 percent. Elevations are 6400 to 6700 feet. The soils in this site are very deep, somewhat poorly drained and have a very thick, dark-colored, surface layer high in organic matter and

boulder sized rocks. These soils are frequently flooded and have a seasonal water table at depths between 30 and 40 inches during the early spring and summer. The dominant plants are black cottonwood (Populus balsamifera ssp. trichocarpa), mountain big sagebrush (Artemisia tridentata ssp. vaseyana), and tufted hairgrass (Deschampsia caespitosa)

Similar sites

F026XY059NV	**Sandy Flood Plain 8-10 P.Z** Site is found below 6,000 feet and is dominated by Fremont cottonwood.

Table 1. Dominant plant species

Tree	(1) *Populus balsamifera ssp. trichocarpa*
Shrub	(1) *Artemisia tridentata ssp. vaseyana*
Herbaceous	(1) *Deschampsia caespitosa*

Physiographic features

The Bouldery Stream Terrace 14-16 P.Z. site occurs on stream terraces and alluvial fans of mountain canyons. Slopes range from 0 to 15 percent, but are typically 2 to 4 percent. Elevations are 6400 to 6700 feet.

Table 2. Representative physiographic features

Landforms	(1) Stream terrace (2) Alluvial fan
Runoff class	Low to high
Elevation	1,951–2,042 m
Slope	2–4%
Aspect	Aspect is not a significant factor

Climatic features

The climate associated with this site is subhumid with cool, dry summers and cold, wet winters. Average annual precipitation is 14 to 16 inches. Mean annual air temperature is 43 to 45 degrees F. The average growing season is 85 to 95 days. Climate data used to support this section were derived from PRISM and is not specifically tied to any dominant climate station.

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)	90 days
Freeze-free period (average)	
Precipitation total (average)	381 mm

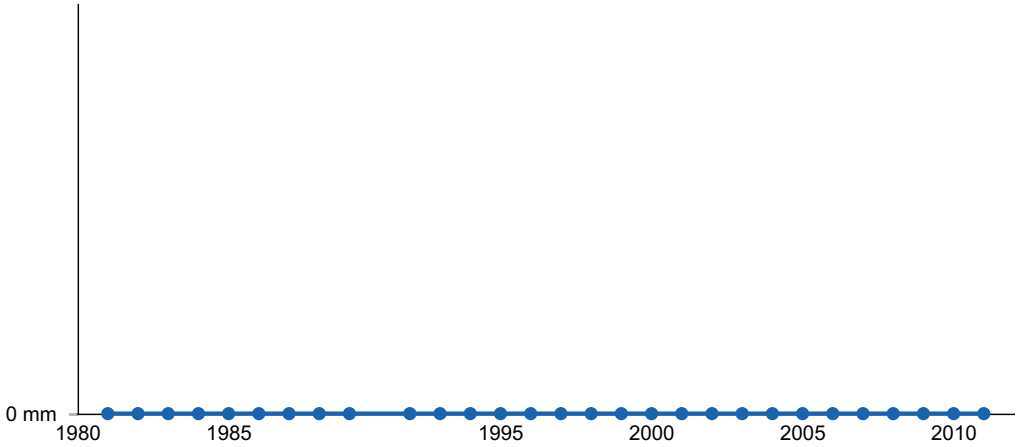


Figure 1. Annual precipitation pattern

Influencing water features

The Bouldery Stream Terrace 14-16 P.Z. site occurs on terraces of mountain streams. It is rarely flooded.

Soil features

The soils are very deep, somewhat poorly drained and have a very thick, dark-colored, surface layer high in organic matter. These soils are frequently flooded and have a seasonal water table at depths between 30 and 40 inches during the early spring and summer. The soil surface is a very bouldery sandy loam or very gravelly sandy loam. The soil profile generally is stratified with extremely gravelly or extremely cobbly lenses throughout the subsoil. Surface runoff is very slow to slow depending on slope. These soils are susceptible to gully formation which intercepts natural overflow patterns resulting in site degradation.

Table 4. Representative soil features

Parent material	(1) Alluvium–granodiorite (2) Alluvium
Surface texture	(1) Very bouldery sandy loam (2) Very gravelly sandy loam
Drainage class	Somewhat poorly drained
Permeability class	Moderate to moderately rapid
Surface fragment cover <=3"	21–28%
Surface fragment cover >3"	10–25%
Available water capacity (Depth not specified)	5.84–10.16 cm

Calcium carbonate equivalent (Depth not specified)	0%
Electrical conductivity (Depth not specified)	0 mmhos/cm
Sodium adsorption ratio (Depth not specified)	0
Soil reaction (1:1 water) (Depth not specified)	5.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	19–40%
Subsurface fragment volume >3" (Depth not specified)	13–45%

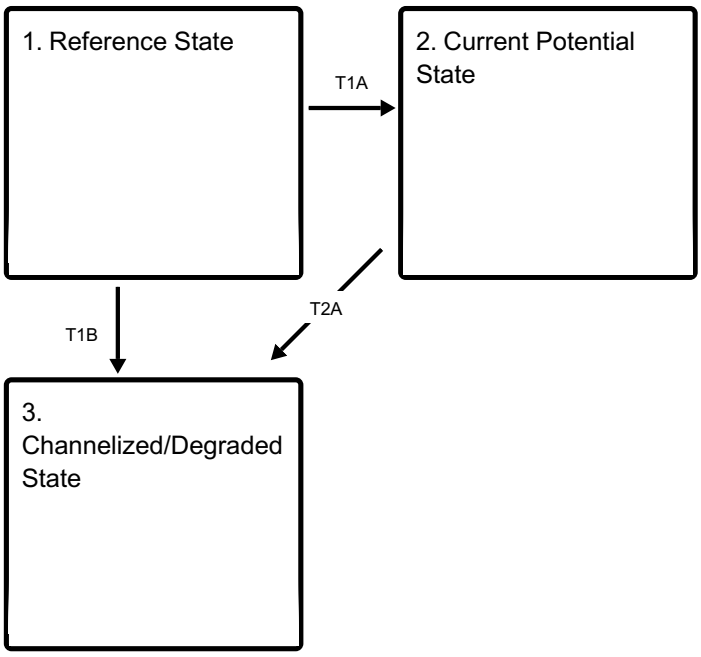
Ecological dynamics

HERBACEOUS: Vegetation is dominated by grasses and forbs under full sunlight. This stage is experienced after a major disturbance such as insect damage, disease damage or tree harvest. Residual trees left following disturbance have little or no affect on the composition and production of herbaceous vegetation.
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: In the absence of disturbance, the tree seedlings develop into saplings (20 inches to 4½ feet in height) with a range in canopy cover of about 5 to 10 percent. Vegetation consists of grasses, forbs and shrubs in association with tree saplings.
POLE STAGE: As the canopy closes, trees stratify into crown classes quickly. Cottonwood stands are self-thinning, especially at young ages. This stage is characterized by rapid growth of the cottonwood trees, both in height and canopy. The visual aspect and vegetal structure are dominated by cottonwood trees. Understory vegetation is moderately influenced by a tree canopy of about 15 to over 25 percent.
IMMATURE FOREST: The visual aspect and vegetal structure are dominated by black cottonwood greater than 4½ feet in height. Seedlings and saplings are present in the understory. Understory vegetation is moderately influenced by a tree overstory canopy of about 10 to 20 percent.
MATURE FOREST: The visual aspect and vegetal structure are dominated by cottonwood that have reached or are near maximal heights for the site. Tree canopy cover ranges from 20 to 35 percent. Understory vegetation is strongly influenced by tree competition, overstory shading, duff accumulation, etc. Few seedlings and/or saplings of cottonwood occur in the understory.
OVER-MATURE FOREST: In the absence of naturally occurring disturbances, the tree canopy on this site can become very dense. This stage is dominated by black cottonwood that have reached maximal heights for the site. Understory vegetation is relatively sparse due to tree competition, overstory shading, duff accumulation, etc. Tree canopy cover is

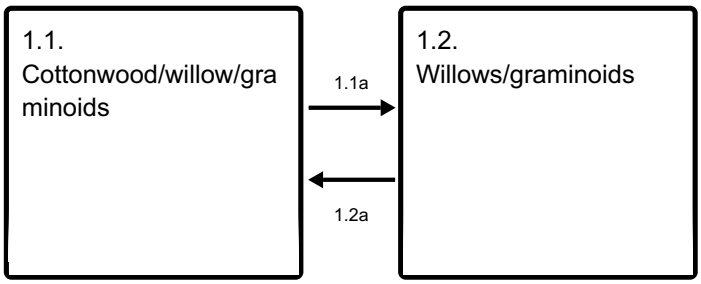
commonly greater than 50 percent.

State and transition model

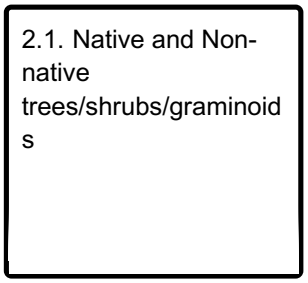
Ecosystem states



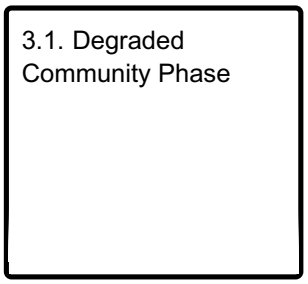
State 1 submodel, plant communities



State 2 submodel, plant communities



State 3 submodel, plant communities



State 1
Reference State

The Reference State concept has two main community phases influenced by time since disturbance (flooding, fire, etc.) Cottonwood seeds will be left behind after a seasonal flood event. The cottonwood seedlings will germinate if the soil conditions are right (moist and bare). These seedlings, if left undisturbed, will mature to trees. Understory plants, like rhizmomatous willow and graminoids are less influenced by seasonal flooding and may remain intact after seasonal flooding. Extreme flooding or fire may remove the tree overstory and the understory, allowing the graminoids and willows to dominate the site until the conditions are appropriate for cottonwood establishment.

Community 1.1
Cottonwood/willow/graminoids

This site is dominated by black cottonwood. Black cottonwood is the principal understory tree. Mountain big sagebrush, Wood's rose, redosier dogwood, and willow are the principal understory shrubs. Tufted hairgrass, slender wheatgrass, bluegrass, sedges, and creeping wildrye are the most prevalent understory grasses or grass-like plants. Clover, yarrow, geranium, columbine, and wildiris are common understory forbs. Overstory tree canopy composition is typically 100 percent black cottonwood, although at the upper elevational range of this site, quaking aspen often becomes important in the overstory. An overstory canopy of 20 to 35 percent is assumed to be representative of tree dominance on this site in the pristine environment.

Forest overstory. The visual aspect and vegetal structure are dominated by cottonwood that have reached or are near maximal heights for the site. Tree canopy cover ranges from 20 to 35 percent. Understory vegetation is strongly influenced by tree competition, overstory shading, duff accumulation, etc. Few seedlings and/or saplings of cottonwood occur in the understory.

Forest understory. Understory vegetative composition is about 45 percent grasses and grass-like plants, 15 percent forbs and 40 percent shrubs and young trees when the average overstory canopy is medium (20 to 35 percent). Average understory production ranges from 1000 to 2000 pounds per acre with a medium canopy cover. Understory production includes the total annual production of all species within 4?½ feet of the ground surface.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	504	757	1009
Shrub/Vine	392	588	785
Forb	168	252	336
Tree	56	84	112
Total	**1120**	**1681**	**2242**

Community 1.2
Willows/graminoids

This community phase occurs after a disturbance that removed the tree canopy. This can occur after a fire or large flood.

Pathway 1.1a
Community 1.1 to 1.2

Flooding, fire, or other disturbance that removes the tree canopy.

Pathway 1.2a
Community 1.2 to 1.1

Sufficient time to allow the cottonwood trees to again establish on the site.

State 2
Current Potential State

The Current Potential State occurs after non-native plant species introduction. The species can range from trees, shrubs, to herbaceous. Russian olive, Kentucky bluegrass, and thistles are common non-native plants that can establish on this site.

Community 2.1
Native and Non-native trees/shrubs/graminoids

Non-native trees, like Russian olive are present and may dominate the tree canopy. Kentucky bluegrass is effective at invading wet to semiwet sites and may dominate the understory.

State 3
Channelized/Degraded State

The Channelized/Degraded state is characterized by a adjacent stream that has been

channelized. Most seasonal floodwaters remain the in channel and do not inundate the flood plain. This reduces cottonwood recruitment and may reduce soil moisture on the site allowing species that are more tolerant to dry conditions to establish.

Community 3.1
Degraded Community Phase

The plant community at this phase may look like a drier ecological site with sagebrush or rabbitbrush. This phase may also be converted to a agricultural field or urban development.

Transition T1A
State 1 to 2

Introduction of non-native species.

Transition T1B
State 1 to 3

Reduced soil moisture and altered hydrology of the site. Urbanization and agriculture uses may be present.

Transition T2A
State 2 to 3

Reduced soil moisture and altered hydrology of the site. Urbanization and agriculture uses may be present.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1	**Primary Perennial Grasses**			673–1311	
	tufted hairgrass	DECE	*Deschampsia cespitosa*	168–404	–
	thickspike wheatgrass	ELLA3	*Elymus lanceolatus*	84–151	–
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	84–151	–
	rush	JUNCU	*Juncus*	84–151	–
	beardless wildrye	LETR5	*Leymus triticoides*	84–151	–
	bluegrass	POA	*Poa*	84–151	–

	bluegrass	PUCA	*Poa*	84–151	–
	sedge	CAREX	*Carex*	84–151	–
Forb					
2	**Perennial Forbs**			67–370	
	Rocky Mountain iris	IRMI	*Iris missouriensis*	17–84	–
	ragwort	SENEC	*Senecio*	17–84	–
	Fendler's meadow-rue	THFE	*Thalictrum fendleri*	17–84	–
	clover	TRIFO	*Trifolium*	17–84	–
	yarrow	ACHIL	*Achillea*	0–17	–
	columbine	AQUIL	*Aquilegia*	0–17	–
Shrub/Vine					
3	**Primary**			84–151	
	mountain big sagebrush	ARTRV	*Artemisia tridentata ssp. vaseyana*	84–151	–
4	**Secondary Shrubs**			84–420	
	black chokecherry	PRVIM	*Prunus virginiana var. melanocarpa*	17–84	–
	currant	RIBES	*Ribes*	17–84	–
	Woods' rose	ROWO	*Rosa woodsii*	17–84	–
	willow	SALIX	*Salix*	17–84	–
Tree					
5	**Trees**			84–151	
	black cottonwood	POBAT	*Populus balsamifera ssp. trichocarpa*	84–151	–

Animal community

lIVESTOCK INTERPRETATIONS
This site is suited to cattle and sheep grazing during the summer and fall. Livestock will often concentrate on this site taking advantage of the shade and shelter offered by the tree overstory. Harvesting trees under a sound management program for fuelwood or other products can open up the tree canopy to allow increased production of understory species desirable for grazing.
Initial stocking rates:
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.

Forage Value Rating:
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 provides valuable habitat to mule deer during the summer. It furnishes ideal habitat for a variety of tree and ground nesting birds. Beaver can be sustained by the trees on this site. It is also used by various small mammals and reptiles and their associate predators natural to the area.
THREATENED OR ENDANGERED SPECIES
The bald eagle is listed as an endangered species in Nevada. The bald eagle occasionally winters in eastern Nevada, between the months of October and March, and probably perches in cottonwood trees where they occur near bodies of water.

Hydrological functions

A well stocked black cottonwood stand provides excellent watershed protection. A mixture of herbaceous and woody root systems penetrate and anchor the soil. Erosion producing overland flow is almost non-existent. The hydrologic cover condition of this site is good in a representative stand. The average runoff curve is about 80 for group D soils. See Section 4, SCS National Engineering Handbook for runoff quantities and hydrologic curves.

Recreational uses

Aesthetic value is derived from the rich hues and textures of the trees, particularly in the fall. The diverse floral and faunal composition and the colorful flowering of wildflowers during the summer enhance the beauty of this site. The site offers rewarding opportunities to photographers and for nature study. It has high value for hunting, camping, picnicking and family wood gathering.

Wood products

PRODUCTIVE CAPACITY
This site is of medium quality for tree production. Site index ranges from about 81 to 92 (Baker & Broadfoot, 1977).
Productivity class: 6
CMAI*: 80 to 108 ft3/ac/yr
5.6 to 7.5 m3/ha/yr
*CMAI: is the culmination of mean annual increment or highest average growth rate of the stand in the units specified.
Fuelwood Production: About 8 to 10 cords per acre. Firewood is commonly measured by cords, or a stacked unit equivalent to 128 cubic feet. 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 volume per cord, there are about 15 million British Thermal Units (BTUs) heat value

in a cord of black cottonwood wood.
Saw timber: 200 to 300 board-feet per acre.

Potential for sheet erosion is low to moderate depending on slope.
Moderate to severe equipment limitations on wet soils.
Proper spacing is the key to a well managed, multiple use and multi-product black cottonwood Forest.
ESSENTIAL REQUIREMENTS
Adequately protect from high intensity wildfire.
Protect soils from accelerated erosion.
Apply proper grazing management.
SILVICULTURAL PRACTICES
Harvest cut selectively or in small patches (size dependent upon site conditions) to enhance forage production.
1) Thinning and improvement cutting - Removal of poorly formed, diseased and low vigor trees for fuelwood.
2) Harvest cutting - Selectively harvest surplus trees to achieve desired spacing. Harvest stands in small blocks of 1/5 to 1/2 acre with slash left in place to shelter emerging seedlings from browsing.
3) Selective Tree Removal - Remove selected trees on suitable sites to enhance forage production and manage site reproduction.
4) Spacing Guide - A spacing of about 15 X 15 feet at stand maturity is considered desirable for multiple use management.
Pest control - Use necessary and approved control for specific pests and diseases.
Fire hazard - Fire is rarely a problem in black cottonwood stands. However, even a light fire may kill black cottonwood seedlings, saplings, and mature trees.

Other products

Black cottonwood has been used for lumber, fence posts, and fuelwood. This tree has a considerable potential for increased utilization. It makes excellent pulp. Some of this wood is used for the production of excelsior, door corestock and boxwood. An undesirable characteristic of black cottonwood is the heavy drain on soil moisture.

Inventory data references

NASIS data for soil survey area CA686 and NV773.

Type locality

Location 1: Lyon County, NV	
Township/Range/Section	T11N R23E S8

General legal description	Along upper reaches of Burbank Creek, about 5 miles northwest of Wellington, Lyon County, Nevada. Distribution and extent. Carson City, Douglas, Lyon, and Washoe Counties, Nevada.

Other references

Airola, D. A. 1980. Northeast Interior Zone: Vol. III - Birds & Vol. IV - Mammals. U.S. Gov. Printing Off.: 1980-690-082/26.

Baker, J. B., Broadfoot, W. M. 1977. Site Evaluation for Eight Important Southern Hardwoods. USDA-FS, GTR 50-14.

Eyre, F.H. (editor). 1980. Forest Cover Types of the United States and Canada. Society of American Foresters, Washington, D.C.

Contributors

GED/DSH/RCB

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	05/21/2025
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):**

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:**