USDA Natural Resources Conservation Service

# Ecological site R025XY036ID
# SOUTH SLOPE LOAMY 12-16

Last updated: 4/25/2024
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): 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.

## Classification relationships

Artemisia vaseyana/ Agropyron spicatum ht. Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush- Grass Habitat Types of Southern Idaho. University of Idaho. Moscow, Idaho. Bulletin Number 35.

## Ecological site concept

This site occurs on south and west facing exposures of mountain slopes ranging from 30-60 percent with elevations from 5500' to 6800 feet.

The soils supporting this site are very deep with a loamy texture and greater than 40 percent rock fragments. They are well drained, with moderately slow permeability. Runoff is medium to very high. The erosion hazard is moderate or very severe by water, and moderate by wind. Due to the hi volume of rock fragments, the available water holding capacity (AWC) is low.

Dominant plant communities for this include Wyoming big sagebrush or western juniper and bluebunch wheatgrass.

## Associated sites

| | |
|---|---|
| R025XY008ID | **NORTH SLOPE STONY 12-16** |
| R025XY011ID | **LOAMY 13-16** |
| R025XY017ID | **SHALLOW BREAKS 14-18** |
| R025XY028ID | **LOAMY BOTTOM 12-16** |
| R025XY010ID | **CLAYPAN 12-16** |

## Similar sites

| | |
|---|---|
| R025XY008ID | **NORTH SLOPE STONY 12-16**<br>North Slope Stony 12-16 occurs on north aspects. Dominant species are ARTRV/FEID. |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | Not specified |
| Shrub | (1) *Artemisia tridentata subsp. tridentata* |
| Herbaceous | (1) *Pseudoroegneria spicata subsp. spicata* |

## Physiographic features

This site occurs on south and west facing exposures of mountain slopes ranging from 30-60 percent. Elevation is 5500 to 6800 feet (1676-2073 meters).

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Mountains > Mountain slope |
| Runoff class | High to very high |
| Flooding frequency | None |
| Ponding frequency | None |
| Elevation | 5,500–6,800 ft |
| Slope | 30–60% |
| Water table depth | 60 in |
| Aspect | W, S, SW |

## Climatic features

In MLRA 25 summers are hot, especially at lower elevations, and winters are cold and snowy. Precipitation is usually lighter at lower elevations throughout the year. At higher elevations precipitation is much greater, and snow accumulates to a considerable depth. The average total precipitation is 14.39 inches (based on 6 long term climate stations located throughout the MLRA).
The mean annual temperature is 45.9 degrees F. The average high is 59.7 and the average low temperature is 32.1 degrees. The prevailing wind is from the west. Average wind speed is greatest, at about 10 miles per hour, in March.
The frost-free period ranges from 79 to 103 days and the freeze free period ranges from 114 to 140 days.

No climate stations exists nearby site.

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (average) | 103 days |
| Freeze-free period (average) | 140 days |
| Precipitation total (average) | 16 in |

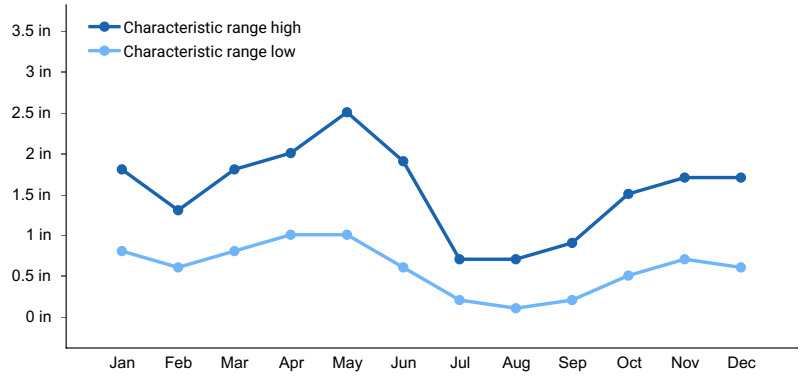



**Figure 1. Monthly precipitation range**

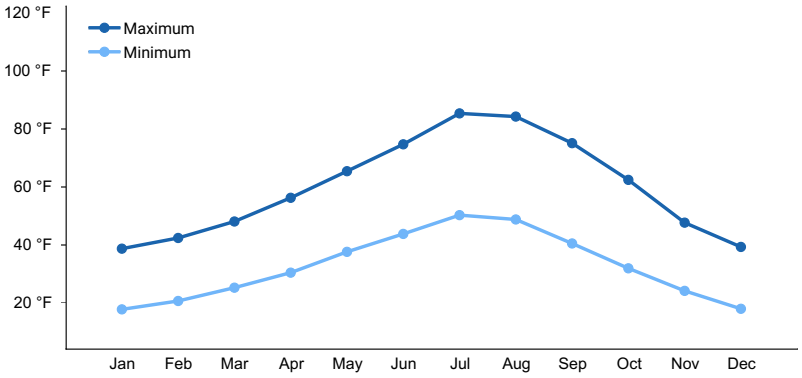



**Figure 2. Monthly average minimum and maximum temperature**

## Influencing water features

There are no influencing water or wetland features commonly associated with this site.

## Soil features

The soils supporting this site are very deep, well drained, with moderately slow permeability. Runoff is medium to very high. The erosion hazard is moderate or very severe by water, and moderate by wind. The available water holding capacity (AWC) is low. The surface texture is generally a gravelly loam with few or no surface stones. The subsoil is usually well developed with clay of approximately 30 percent. These soils are characterized by a xeric soil moisture regime. Soil temperature regime is frigid.

Soil series associated with the site are: Obray and Streek

**Table 4. Representative soil features**

| | |
|---|---|
| Parent material | (1) Colluvium |
| Surface texture | (1) Gravelly loam |
| Family particle size | (1) Loamy-skeletal |
| Drainage class | Well drained |
| Permeability class | Moderately slow |
| Depth to restrictive layer | 60 in |
| Soil depth | 60 in |
| Surface fragment cover <=3" | 0–13% |
| Surface fragment cover >3" | 3–19% |
| Available water capacity (0-40in) | 3.1–5.3 in |

| | |
|---|---|
| Calcium carbonate equivalent (0-40in) | 0% |
| Electrical conductivity (0-40in) | 0 mmhos/cm |
| Sodium adsorption ratio (0-40in) | 0 |
| Soil reaction (1:1 water) (0-40in) | 6.6–7.8 |
| Subsurface fragment volume <=3" (Depth not specified) | 0–23% |
| Subsurface fragment volume >3" (Depth not specified) | 14–43% |

## Ecological dynamics

The dominant visual aspect is mountain big sagebrush and bluebunch wheatgrass. Composition by weight of the potential plant community is about 40-55 percent grasses, 15-20 percent forbs and 25-35 percent shrubs.

During the last few thousand years, this site has evolved in an arid climate characterized by dry summers and cold, wet winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, Rocky Mountain elk and lagomorphs. Fire has historically occurred on the site at intervals of 20-50 years.

The Historic Climax Plant Community (HCPC), the Reference State (State 1), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase A. This plant community is dominated by bluebunch wheatgrass and mountain big sagebrush. Subdominant species include Idaho fescue, basin wildrye, Sandberg bluegrass, bottlebrush squirreltail, arrowleaf balsamroot and tapertip hawksbeard and antelope bitterbrush. The plant species composition of Phase A is listed later under “Reference Plant Community Phase Plant Species Composition”.

Total annual production is 900 pounds per acre (1008 kilograms per hectare) in a normal year. Production in a favorable year is 1100 pounds per acre (1232 kilograms per hectare). Production in an unfavorable year is 700 pounds per acre (784 kilograms per hectare). Structurally, cool season deep-rooted perennial bunchgrasses are very dominant, followed by tall shrubs being more dominant than perennial forbs while shallow rooted bunchgrasses are subdominant.

FUNCTION:

This site is well suited for big game and livestock as late spring, summer and fall range. The site can be winter range for big game in moderate winters. It is also well suited for recreation use in the summer and fall.

Due to the rainfall, elevation and steep topography on this site, it is susceptible to degradation from erosion. Infiltration is good where the community is in mid to late seral status. The site has moderately low runoff potential. Runoff, when it does occur, can be erosive on steeper slopes particularly during high intensity convection storms. Snow accumulates on the site due to high elevation and presence of tall shrubs.

Impacts on the Plant Community:
Influence of fire:

In the absence of normal fire frequency, mountain big sagebrush and antelope bitterbrush can gradually increase on the site. Juniper can invade the site if a seed source is in the proximity. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, mountain big sagebrush or juniper can displace most of the primary understory species.

When fires become more frequent than historic levels (25-50 years), mountain big sagebrush and bitterbrush are

reduced significantly. Rabbitbrushes can increase slightly. With continued short fire frequency, mountain big sagebrush and bitterbrush can be completely eliminated along with many of the desirable understory species such as Idaho fescue and bluebunch wheatgrass. These species may be replaced by Sandberg bluegrass and bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive plants. Cheatgrass will invade the site at lower elevations. These fine fuels will increase the fire frequency.

Influence of improper grazing management:

Season-long grazing and/or excessive grazing can be very detrimental to this site. This type of management leads to reduced vigor of the bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an invasion of juniper and/or noxious and invasive species and an increase in mountain big sagebrush. With a juniper seed source in the proximity, an increase in tall shrubs generally leads to an increase in juniper by providing bird perches and “nursery” sites for juniper establishment.

Continued improper grazing management influences fire frequency by increasing fine fuels. If cheatgrass and other annuals increase and become co-dominant with Sandberg bluegrass, fires become more frequent, particularly at lower elevations.

Proper grazing management that addresses frequency, duration and intensity of grazing can also keep fine fuels from developing, thereby reducing fire frequency. This can lead to gradual increases in mountain big sagebrush and/or western juniper. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any brush management should be carefully planned, as a reduction in shrubs can increase cheatgrass which will lead to more frequent fire intervals.

Weather influences:

Above normal precipitation in March, April and May can dramatically increase total annual production of the plant community. These weather patterns can also increase viable seed production of desirable species to provide for recruitment. Likewise, below normal precipitation during these spring months can significantly reduce total annual production and be detrimental to viable seed production. Overall plant composition is normally not affected when perennials have good vigor.

Below normal temperatures in the spring can have an adverse impact on total production regardless of the precipitation. An early, hard freeze can occasionally kill some plants.

Prolonged drought adversely affects this plant community in several ways. Vigor, recruitment and production are usually reduced. Mortality can occur. Prolonged drought can lead to a reduction in fire frequency.

Influence of Insects and disease:

Outbreaks can affect vegetation health. Bitterbrush can be severely affected by the western tent caterpillar (Malacosoma fragilis). Two consecutive years of defoliation by the tent caterpillar can cause mortality in bitterbrush. Mormon cricket and grasshopper outbreaks occur periodically. Outbreaks seldom cause plant mortality since defoliation of the plant occurs only once during the year of the outbreak.

Influence of noxious and invasive plants:

Many of these species add to the fine-fuel component and lead to increased fire frequency. Many of the perennial and annual weeds compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

Influence of wildlife:

Big game animals use this site in the spring, summer and fall and in moderate winters. Their numbers are seldom high enough to adversely affect the plant community. Herbivory can be detrimental to bitterbrush when livestock grazing and browsing by big game occurs at the same time and season. This will occur when both kinds of animal are using the plant in the late summer or fall. The adverse impact is excessive use of the current year’s leader growth. High numbers of burrowing rodents provide bare ground areas that allow invasion of invasive plants. The

deer mouse is beneficial to this site as it is the principal vector for planting bitterbrush seed.

Watershed:

Decreased infiltration and increased runoff occur with the invasion of juniper or an increase in mountain big sagebrush. Juniper invasion can be triggered by lack of fire, improper grazing management and prolonged drought. Desired understory species can be reduced. This composition change can affect nutrient and water cycles. Increased runoff also causes sheet and rill erosion. Abnormally short fire frequency also gives the same results, but to a lesser degree. The long term effect is a transition to a different state.

Influence of juniper invasion:

In plant communities that are invaded by juniper, the species has a competitive advantage for the following reasons:
• Juniper is very drought tolerant.
• It has the ability to extract soil moisture from a wide range of soil depths.
• Juniper has high evapo-transpiration rates.
• The species intercepts rain and snow before it reaches the soil surface.
• It has the ability to grow as long as there is soil moisture and the temperature is above freezing.
• Juniper has a relatively rapid growth rate and is long-lived. It can readily over-top shade intolerant species which leads to mortality.
• Nutrient cycling is reduced.
• As the canopy closes, juniper gains control of energy capture.

As juniper extracts water, other plants are unable to acquire sufficient water and nutrients to sustain growth and reproduction, thus reducing cover and biomass in the interspaces. After the canopy closes, there is sufficient soil moisture available for shallow-rooted, shade tolerant species to persist directly under the tree.

The following hydrological impacts occur on sites invaded by juniper:
• Infiltration in the interspaces is reduced.
• Run-off increases resulting in increased sheet and rill erosion with elevated sediment loads.
• Soil temperatures increase in the interspaces which results in accelerated drying of the soil surface.
• Increased bare ground in the interspaces.
• Soil moisture storage is reduced.

As bare ground and interconnectiveness of patches of bare ground increases, flow rates are accelerated (reduction of flow sinuosity) and run-off out of the area increases.

Degradation of these systems can result in the formation of a feedback cycle in which greater juniper cover and density results in greater plant and soil disturbance between the canopies.

In summary, a closed juniper community takes control of the following ecological processes: hydrology, energy capture and nutrient cycling. The changes are primarily driven by the hydrological processes. The development of a closed juniper canopy always results in a transition across the threshold to a different state. Generally, when juniper canopy cover nears 20%, the plant community is approaching the threshold.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:
State 1.
Phase A to B. Develops in the absence of fire. No juniper seed source in the proximity.
Phase A to C. Usually results from improper grazing management and absence of fire. A juniper seed source is present.
Phase A to D. Results from one or more fires.
Phase A to E. Develops in the absence of fire. A juniper seed source is present.
Phase A to F. Results from improper grazing management and absence of fire. No juniper seed source is present.
Phase B to A. Results from prescribed grazing management.
Phase C to A. Develops with prescribed grazing management and prescribed burning or fire.

Phase D to A. Usually results from prescribed grazing management and no fire.
Phase E to A. Develops from prescribed grazing management and prescribed burning or brush management.
Phase F to A. Results from prescribed grazing management, no fire or brush management.
Phase B to D. This develops from prescribed burning or fire.
Phase C to D. This develops from prescribed burning or fire.
Phase F to D. Results from prescribed burning or fire.
Phase E to D. Results from prescribed burning or fire.

State 1 Phase D to State 2, Phase B. Develops through improper grazing management and lack of fire. This site has crossed the threshold. It is usually uneconomical to return this community to State 1 through accelerated practices.

State 1 Phase F to State 2 Phase A. Develops through improper grazing management with no fire. This site has crossed the threshold. It is usually uneconomical to return this community to State 1 through accelerated practices.

State 1 Phase C or E to State 3. Results from improper grazing management and lack of fire. This site has crossed the threshold. It is usually uneconomical to return this community to State 1 through accelerated practices.

State 2 Phase A to State 2 Phase B. Results from improper grazing management and frequent fire.

State 2 Phase B to State 2 Phase A. Results from no fire.

State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by improper grazing management and/or frequent fire cause this state to retrogress to a new site with reduced potential. It has crossed the threshold. This site will not return to State 1 or 2 because of significant soil loss.

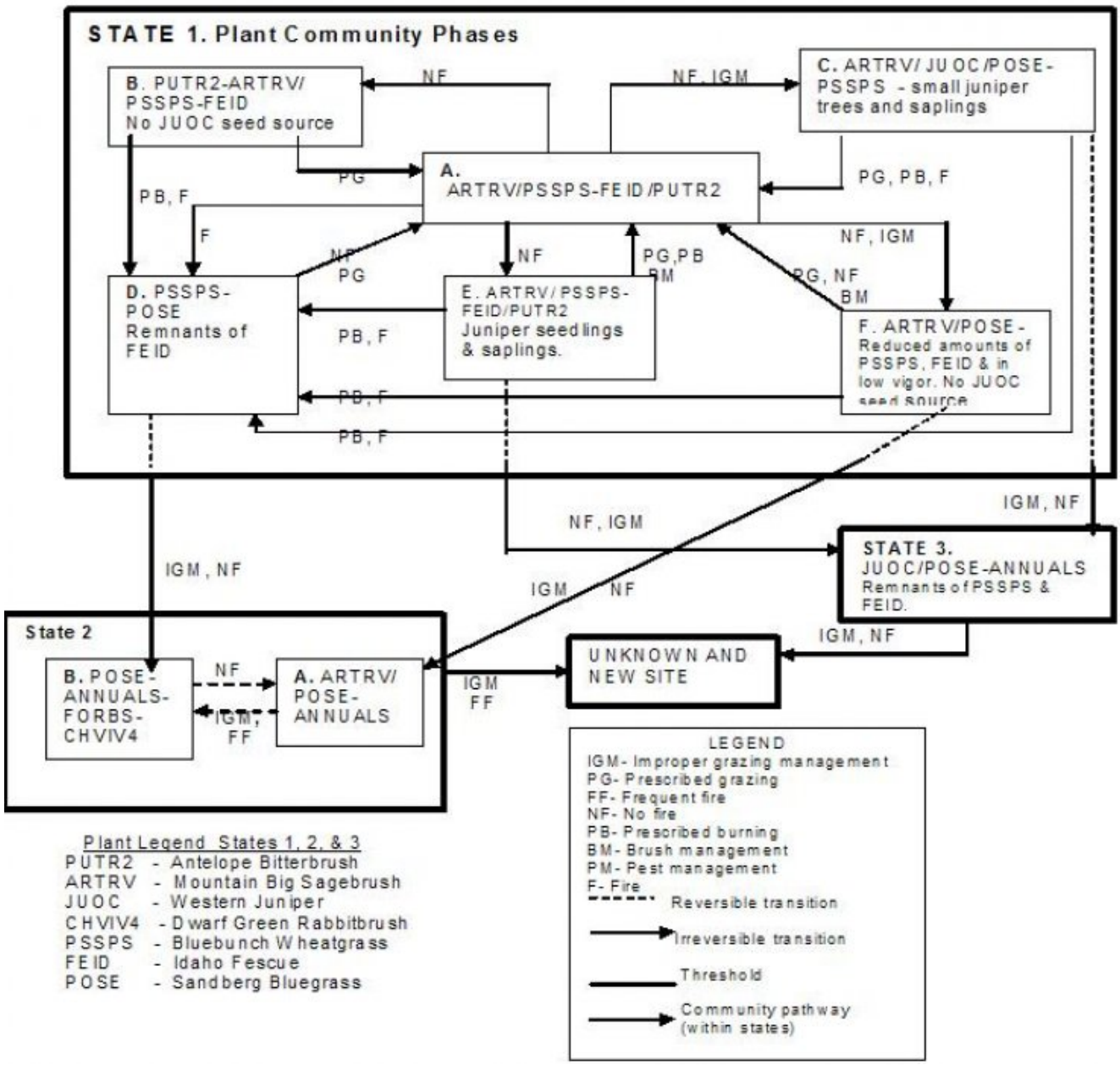
State 3 to unknown site. Continued lack of fire and improper grazing management cause this state to retrogress to a new site with reduced potential due to significant soil loss and changes in hydrology. It has crossed the threshold. This site will not return to State 1 or 2 because of significant soil loss.

Practice Limitations:

Mechanical seeding is generally not feasible on the steeper slopes in this unit. Mechanical brush control is difficult or not feasible on steep slopes. Brush management can occur with aerial chemical application or prescribed burning.

## State and transition model

The Reference State (State 1), the Historic Climax Plant Community (HCPC), moves through many phases depending on the natural and man-made forces that impact the community over time. The Reference Plant Community Phase is Phase A, State 1. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".




## State 1

Reference State: Historic Plant Climax Community

### Community 1.1
### 1.1 Reference Plant Community

This plant community has mountain big sagebrush in the overstory with bluebunch wheatgrass in the understory. Other significant species in the plant community are Idaho fescue, basin wildrye, Nevada bluegrass, Sandberg bluegrass, arrowleaf balsamroot and antelope bitterbrush. Natural fire frequency is 20 to 50 years.

### Community 1.2
### 1.2 Phase B

This plant community is dominated in the overstory by bitterbrush and mountain big sagebrush. Bluebunch wheatgrass is the dominant species in the understory. Other perennial grasses and forbs include Idaho fescue,

Sandberg bluegrass, bottlebrush squirreltail, arrowleaf balsamroot and lupine. No juniper seed source is present. This state has developed due to fire frequency being much longer than normal.

### Community 1.3
### 1.3 Phase C

This plant community is dominated mountain big sagebrush in the overstory with small juniper trees or saplings. Sandberg bluegrass is the dominant grass in the understory. Bluebunch wheatgrass and Idaho fescue are present but in reduced amounts and typically in low vigor. This state has developed due to improper grazing management and lack of fire. A juniper seed source is in the proximity.

### Community 1.4
### 1.4 Phase D

This plant community is dominated by bluebunch wheatgrass. Sandberg bluegrass and other perennial grasses and forbs are subdominant. Remnants of Idaho fescue may be present. No shrubs are present due to fire.

### Community 1.5
### 1.5 Phase E

This plant community is similar to the Reference Plant Community Phase except that juniper seedlings and saplings are invading the site due to a lack of fire. A juniper seed source is in the proximity. This state has developed due to the absence of fire.

### Community 1.6
### 1.6 Phase F

This plant community is dominated by mountain big sagebrush in the overstory. Sandberg bluegrass is the dominant grass in the understory. Bluebunch wheatgrass and Idaho fescue are present but in reduced amounts and typically in low vigor. This state has developed due to improper grazing management and a lack of fire. No juniper seed source is in the proximity.

### Pathway P1.1a
### Community 1.1 to 1.2

Develops in the absence of fire. No juniper seed source in the proximity.

### Pathway P1.1b
### Community 1.1 to 1.3

Usually results from improper grazing management and absence of fire. A juniper seed source is present.

### Pathway P1.1c
### Community 1.1 to 1.4

Results from one or more fires.

### Pathway P1.1d
### Community 1.1 to 1.5

Develops in the absence of fire. A juniper seed source is present.

### Pathway P1.1e
### Community 1.1 to 1.6

Results from improper grazing management and absence of fire. No juniper seed source is present.

### Pathway P1.2a
### Community 1.2 to 1.1

Results from prescribed grazing management.

### Pathway P1.2b
### Community 1.2 to 1.4

This develops from prescribed burning or fire.

### Pathway P1.3a
### Community 1.3 to 1.1

Develops with prescribed grazing management and prescribed burning or fire.

### Pathway P1.3b
### Community 1.3 to 1.4

This develops from prescribed burning or fire.

### Pathway P1.4a
### Community 1.4 to 1.1

Develops with prescribed grazing management and prescribed burning or fire.

### Pathway P1.5a
### Community 1.5 to 1.1

Develops from prescribed grazing management and prescribed burning or brush management.

### Pathway P1.5b
### Community 1.5 to 1.4

Results from prescribed burning or fire.

### Pathway P1.6a
### Community 1.6 to 1.1

Results from prescribed grazing management, no fire or brush management.

### Pathway P1.6b
### Community 1.6 to 1.4

Results from prescribed burning or fire.

## State 2
## Annual Grasses

### Community 2.1
### 2.1

This plant community is dominated by mountain big sagebrush with Sandberg bluegrass and annuals in the interspaces. This state has developed due to improper grazing management and the absence of fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

### Community 2.2

### 2.2

This plant community is dominated by Sandberg bluegrass and other annuals and forbs. Root sprouting shrubs such as Dwarf green rabbitbrush and snowberry are present. This state has developed due to frequent fires and improper grazing management. This site has crossed the threshold. It is usually uneconomical to return this community to State 1 through accelerated practices.

### Pathway P2.1a
### Community 2.1 to 2.2

Results from improper grazing management and frequent fire.

### Pathway P2.2a
### Community 2.2 to 2.1

Results from no fire.

## State 3
## State 3

Juniper Dominated with Annual Grasses

### Community 3.1
### State 1, Phase C

This plant community is dominated mountain big sagebrush in the overstory with small juniper trees or saplings. Sandberg bluegrass is the dominant grass in the understory. Bluebunch wheatgrass and Idaho fescue are present but in reduced amounts and typically in low vigor. This state has developed due to improper grazing management and lack of fire. A juniper seed source is in the proximity.

## State 4
## Reference State

### Community 4.1

### Transition T1A
### State 1 to 2

Develops through improper grazing management with no fire. This site has crossed the threshold. It is usually uneconomical to return this community to State 1 through accelerated practices.

### Transition T1B
### State 1 to 3

Results from improper grazing management and lack of fire. This site has crossed the threshold. It is usually uneconomical to return this community to State 1 through accelerated practices.

### Transition T2A
### State 2 to 4

Excessive soil loss and changes in the hydrologic cycle caused by improper grazing management and/or frequent fire cause this state to retrogress to a new site with reduced potential. It has crossed the threshold. This site will not return to State 1 or 2 because of significant soil loss.

### Transition T3A
### State 3 to 4

Continued lack of fire and improper grazing management cause this state to retrogress to a new site with reduced potential due to significant soil loss and changes in hydrology. It has crossed the threshold. This site will not return to State 1 or 2 because of significant soil loss.

## Additional community tables

## Animal community

Wildlife Interpretations.

This site is used by upland game birds, deer, elk, small game animals, predators and songbirds. Antelope use the site occasionally. This site provides good habitat for mule deer especially during the late winter and early spring due to its southerly exposure.

Grazing Interpretations.

This site is well suited for livestock as late spring, summer and fall range.

Estimated initial stocking rate will be determined with the landowner or decision-maker. They will be based on the inventory which includes species, composition, similarity index, production, past use history, season of use and seasonal preference. Calculations used to determine estimated initial stocking rate will be based on forage preference ratings.

## Hydrological functions

This site is in hydrologic group B and has moderately low runoff potential.

## Recreational uses

This site offers good opportunities for recreation and natural beauty. Colorful spring forbs provide good opportunities for photography and nature study. Hiking and hunting are among the recreational activities suited to this site. Other opportunities include horseback riding and wildlife viewing.

## Wood products

Mature juniper that has invaded and increased on the site can be cut for posts, poles, firewood and lumber.

## Other products

None.

## Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used.

Those involved in developing this site description include:
Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC
Jacy Gibbs, co-owner, Intermountain Rangeland Consultants, LLC
Jim Cornwell, State Rangeland Management Specialist, NRCS, Idaho (retired)
Joe May, State Rangeland Management Specialist, NRCS, Idaho
Leah Juarros, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Assistant State Conservationist, NRCS, Idaho (retired)

## Type locality

| |
|---|
| Location 1: Elko County, NV |

| | |
|---|---|
| Latitude | 42° 34′ 27″ |
| Longitude | 116° 44′ 73″ |
| Location 2: Elko County, NV | |
| Township/Range/Section | T46 N R53 E S22 |
| Location 3: Elko County, NV | |
| Township/Range/Section | T46 N R53 E S6 |

## Other references

Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush- Grass Habitat Types of Southern Idaho. University of Idaho. Moscow, Idaho. Bulletin Number 35.

USDA Forest Service, Rocky Mountain Research Station. 2004. Restoring Western Ranges and Wildlands. General Technical Report RMRS-GTR-136-vols. 1-3.

USDA, NRCS.2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov.) National Plant Data Center, Baton Rouge, LA 70874-4490 USA

USDA, Forest Service, Fire Effects Information Database. 2004. www.fs.fed.us/database.

USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service, Agricultural Research Service; Interpreting Indicators of Rangeland Health. Technical Reference 1734-6; version 4-2005.

## Contributors

Dave Franzen And Jacy Gibbs

## Approval

Kendra Moseley, 4/25/2024

## 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 | USDA/NRCS<br>9173 W. Barnes Drive, Suite C<br>Boise, ID 83709<br>208-378-5722 |
| Date | 07/09/2007 |
| Approved by | Kendra Moseley |
| Approval date | |
| Composition (Indicators 10 and 12) based on | Annual Production |

## Indicators

1. **Number and extent of rills:** Rills can occur on this site. If rills are present, they are likely to occur immediately following wildfire. Rills are most likely to occur on soils with surface textures of silt loam and clay loam.

2. **Presence of water flow patterns:** Water-flow patterns occur on this site. When they occur, they are short and disrupted by cool season grasses and tall shrubs and are not extensive. Gravelly surface texture interrupts flows.

3. **Number and height of erosional pedestals or terracettes:** Both occur on this site but are not extensive. In areas where flow patterns and/or rills are present, a few pedestals may be expected. Terracettes occur uphill from tall shrub bases and large bunchgrasses.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** On sites in mid-seral status, bare ground may range from 25-45 percent.

5. **Number of gullies and erosion associated with gullies:** None.

6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind-scoured, blowouts and/or deposition areas usually are not present. Immediately following wildfire, some soil movement may occur on lighter textured soils.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter in the interspaces may move up to 3 feet following a significant run-off event. Coarse litter generally does not move. Gravels on the surface help reduce fine litter movement.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Values should range from 4-6.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The surface horizon is typically 5 to 16 inches thick. Structure typically includes moderate fine granular. Soil organic matter (SOM) ranges from 2 to 4 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Bunchgrasses, especially deep-rooted perennials, slow run-off and increase infiltration. Tall shrubs catch blowing snow in the interspaces.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Compaction layer is not present.

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: Cool season, deep-rooted perennial bunchgrasses>>tall shrubs

    Sub-dominant: Perennial forbs>shallow rooted bunchgrasses

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Mountain big sagebrush will become decadent in the absence of normal fire frequency and ungulate grazing. Grass and forb mortality will occur as tall shrubs increase.

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14. **Average percent litter cover (%) and depth ( in):** Additional litter cover data is needed but is expected to be 15-20 percent to a depth of 0.1 inches. Under mature shrubs, litter is >0.5 inches deep and is 90-100 percent ground cover.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual production is 900 pounds per acre (1008 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 40-55 percent of the total production, forbs 15-20 percent and shrubs 25-35 percent.

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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:** Invasive Plants include bulbous bluegrass, rush skeletonweed, musk and scotch thistle and diffuse and spotted knapweed. Cheatgrass can invade the site at the lower elevations.

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17. **Perennial plant reproductive capability:** All functional groups have the potential to reproduce in most years.

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