

Ecological site R025XY030ID MOUNTAIN BRUSH 18-22

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General information

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

MLRA notes

Major Land Resource Area (MLRA): 025X—Owyhee High Plateau

MLRA Notes 25—Owyhee High Plateau

This area is in Nevada (56 percent), Idaho (30 percent), Oregon (12 percent), and Utah (2 percent). It makes up about 27,443 square miles. MLRA 25 is characteristically cooler and wetter than the neighboring MLRAs of the Great Basin. The western boundary is marked by a gradual transition to the lower and warmer basins of MLRA 24. The boundary to the south-southeast, with MLRA 28B, is marked by gradual changes in geology marked by an increased dominance of singleleaf pinyon and Utah juniper and a reduced presence of Idaho fescue. The boundary to the north, with MLRA 11, is a rapid transition from the lava plateau topography to the lower elevation Snake River Plain.

Physiography:

All of this area lies within the Intermontane Plateaus. The southern half is in the Great Basin section of the Basin and Range province. This part of the MLRA is characterized by isolated, uplifted fault-block mountain ranges separated by narrow, aggraded desert plains. This geologically older terrain has been dissected by numerous streams draining to the Humboldt River.

The northern half of the area lies within the Columbia Plateaus province. This part of the MLRA forms the southern boundary of the extensive Columbia Plateau basalt flows. Most of the northern half is in the Payette section, but the northeast corner is in the Snake River Plain section. Deep, narrow canyons draining into the Snake River have been incised into this broad basalt plain. Elevation ranges from 3,000 to 7,550 feet on rolling plateaus and in gently sloping basins. It is more than 9,840 feet on some steep mountains. The Humboldt River crosses the southern half of this area

Geology:

The dominant rock types in this MLRA are volcanic. They include andesite, basalt, tuff, and rhyolite. In the north and west parts of the area, Cretaceous granitic rocks are exposed among Miocene volcanic rocks in mountains. A Mesozoic igneous and metamorphic rock complex dominates the south and east parts of the area. Upper and Lower Paleozoic calcareous sediments, including oceanic deposits, are exposed with limited extent in the mountains. Alluvial fan and basin fill sediments occur in the valleys.

Climate:

The average annual precipitation in most of this area is typically 11 to 22 inches. It increases to as much as 49 inches at the higher elevations. Rainfall occurs in spring and sporadically in summer. Precipitation occurs mainly as snow in winter. The precipitation is distributed fairly evenly throughout fall, winter, and spring. The amount of precipitation is lowest from midsummer to early autumn. The average annual temperature is 33 to 51 degrees F. The freeze-free period averages 130 days and ranges from 65 to 190 days, decreasing in length with elevation. It is typically less than 70 days in the mountains.

Water:

The supply of water from precipitation and streamflow is small and unreliable, except along the Owyhee, Bruneau, and Humboldt Rivers. Streamflow depends largely on accumulated snow in the mountains. Surface water from mountain runoff is generally of excellent quality and suitable for all uses. The basin fill sediments in the narrow alluvial valleys between the mountain ranges provide some ground water for irrigation. The alluvial deposits along the large streams have the most ground water. Based on measurements of water quality in similar deposits in

adjacent areas, the basin fill deposits probably contain moderately hard water. The water is suitable for almost all uses. The carbonate rocks in this area are considered aquifers, but they are little used. Springs are common along the edges of the limestone outcrops.

Soils:

The dominant soil orders in this MLRA are Aridisols and Mollisols. The soils in the area dominantly have a mesic or frigid temperature regime and an aridic, aridic bordering on xeric, or xeric moisture regime. Soils with aquic moisture regimes are limited to drainage or spring areas, where moisture originates or runs on and through. These soils are of a very limited extent throughout the MLRA. They generally are well drained, clayey or loamy, and shallow or moderately deep. Most of the soils formed in mixed parent material. Volcanic ash and loess mantle the landscape. Surface soil textures are loam and silt loam with ashy texture modifiers in some areas. Argillic horizons occur on the more stable landforms. They are exposed nearer the soil surface on convex landforms, where ash and loess deposits are more likely to erode. Soils that formed in carbonatic parent material in areas that receive less than 12 inches of precipitation are characterized by calcic horizons throughout the profile, while soils in areas that receive more than 12 inches of precipitation do not have calcic horizons in the upper part of the profile. Soils that formed on stable landforms at the lower elevations are dominated by ochric horizons. Soils that formed at the middle and upper elevations are characterized by mollic epipedons. Soils in drainage areas at all elevations that receive moisture running on or through them are characterized by thicker mollic epipedons.

Biological Resources:

This MLRA supports shrub-grass vegetation. Lower elevations are characterized by Wyoming big sagebrush associated with bluebunch wheatgrass, western wheatgrass, and Thurber's needlegrass. Other important plants include bluegrass, squirreltail, penstemon, phlox, milkvetch, lupine, Indian paintbrush, aster, and rabbitbrush. Black sagebrush occurs but is less extensive. Singleleaf pinyon and Utah juniper occur in limited areas. With increasing elevation and precipitation, vast areas characterized by mountain big sagebrush or low sagebrush/early sagebrush in association with Idaho fescue, bluebunch wheatgrass, needlegrasses, and bluegrass become common. Snowberry, curl-leaf mountain mahogany, ceanothus, and juniper also occur. Mountains at the highest elevations support whitebark pine, Douglas-fir, limber pine, Engelmann spruce, subalpine fir, aspen, and curl-leaf mountain mahogany.

Major wildlife species include mule deer, bighorn sheep, pronghorn, mountain lion, coyote, bobcat, badger, river otter, mink, weasel, golden eagle, red-tailed hawk, ferruginous hawk, Swainson's hawk, northern harrier, prairie falcon, kestrel, great horned owl, short-eared owl, long-eared owl, burrowing owl, pheasant, sage grouse, chukar, gray partridge, and California quail. Reptiles and amphibians include western racer, gopher snake, western rattlesnake, side-blotched lizard, western toad, and spotted frog. Fish species include bull, red band, and rainbow trout.

Classification relationships

Artemisia vaseyana/ *Symphoricarpos oreophilus*/ *Festuca idahoensis* HT in "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 is on undulating to steep slopes that range from 2 to 50 percent. This site is on all aspects. Elevations range from 6500 to 8400 feet (1950 to 2560 meters). This site is associated with mountain slopes and basaltic plateaus.

The soils supporting this site are moderately deep, well drained loams and gravelly loams over bedrock. Permeability is moderate and runoff is high to very high. The erosion hazard is slight to moderate from water and slight from wind. The surface texture is loam or gravelly loam.

The plant community of this site is dominated by mountain sagebrush and western juniper.

Associated sites

R025XY001ID	ASPEN THICKET
R025XY018ID	MAHOGANY SAVANNA 16-22
R025XY022ID	LOAMY 16-22

R025XY023ID	NORTH SLOPE LOAMY 16-22
R025XY037ID	CEANOTHUS THICKET 16-24

Similar sites

R025XY022ID	LOAMY 16-22 Dominant species are ARTRT/FEID
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> var. <i>vaseyana</i> (2) <i>Symphoricarpos oreophilus</i>
Herbaceous	(1) <i>Bromus marginatus</i>

Physiographic features

This site is on undulating to steep slopes that range from 2 to 50 percent on all aspects and on plateaus. Elevations range from 6500 to 8400 feet (1950 to 2560 meters). These sites are associated with mountain slopes and basaltic plateaus.

Table 2. Representative physiographic features

Landforms	(1) Mountains > Mountain slope (2) Lava plateau > Plateau
Runoff class	Medium to very high
Flooding frequency	None
Ponding frequency	None
Elevation	1,981–2,560 m
Slope	2–50%
Water table depth	122 cm
Aspect	Aspect is not a significant factor

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 of the MLRA is 14.39 inches (based on 6 long term climate stations located throughout the MLRA).

The average Mean Annual Precipitation of this site is estimated to be near 18 inches.

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 station exists nearby site.

Table 3. Representative climatic features

Frost-free period (characteristic range)	79-103 days
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Freeze-free period (characteristic range)	114-140 days
Precipitation total (characteristic range)	381-635 mm
Frost-free period (actual range)	79-103 days
Freeze-free period (actual range)	114-140 days
Precipitation total (actual range)	381-635 mm
Frost-free period (average)	90 days
Freeze-free period (average)	125 days
Precipitation total (average)	457 mm

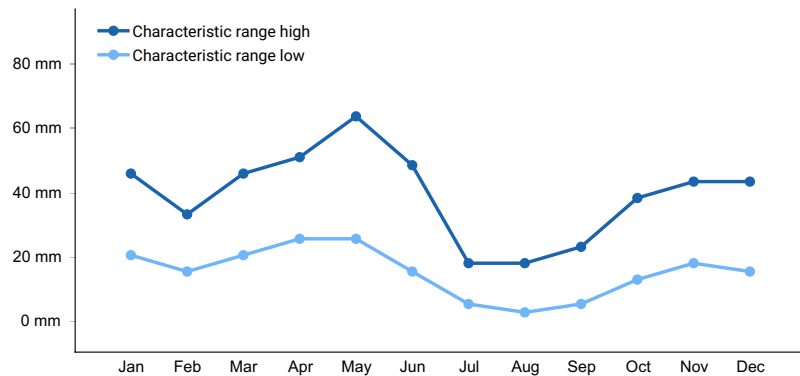


Figure 1. Monthly precipitation range

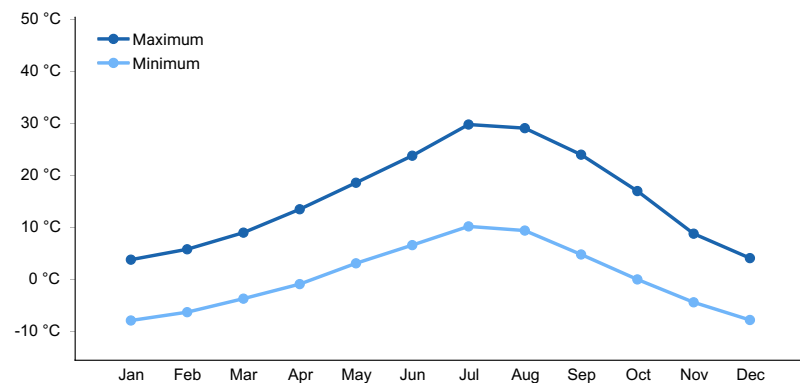


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

This site is not influenced by adjacent wetlands, streams, or run on.

Soil features

The soils supporting this site are moderately deep to bedrock and well drained. The surface texture is typically loam or gravelly loam. Permeability is moderate and runoff is high to very high. The erosion hazard is slight to moderate from water and slight from wind. Soil temperature regime is typically cryic, and soil moisture regime is typically xeric.

Soil series correlated with this site are: Nagitsy and Strickland

Table 4. Representative soil features

Parent material	(1) Residuum–basalt (2) Colluvium–gneiss
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Surface texture	(1) Gravelly loam (2) Loam
Family particle size	(1) Fine-loamy (2) Loamy-skeletal
Drainage class	Well drained
Permeability class	Moderate
Depth to restrictive layer	51–102 cm
Soil depth	51–102 cm
Surface fragment cover <=3"	5–24%
Surface fragment cover >3"	2–5%
Available water capacity (0-101.6cm)	8.38–9.65 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	5.1–7.3
Subsurface fragment volume <=3" (Depth not specified)	9–38%
Subsurface fragment volume >3" (Depth not specified)	10–30%

Ecological dynamics

The dominant visual aspect is mixed shrubs. Composition by weight is approximately 20-30 percent grasses, 15-25 forbs, and 50-60 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 mule deer, Rocky Mountain elk, and lagomorphs.

Fire has historically occurred on the site at intervals of 20 to 40 years.

The Reference Plant Community (RPC) 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 RPC is Phase 1.1. This plant community is dominated by mountain big sagebrush and mountain snowberry in the overstory with mountain brome and slender wheatgrass in the understory. Subdominant understory species include Columbia needlegrass, Idaho fescue, lupine, and arrowleaf balsamroot. Other shrubs on the site are Saskatoon serviceberry, quaking aspen, bittercherry, snowbrush ceanothus, and antelope bitterbrush. The plant species composition of Phase 1.1 is listed later under "RPC Plant Species Composition".

Total annual production is 1500 pounds per acre (1680 kilograms per hectare) in a normal year. Production in a favorable year is 2200 pounds per acre (2464 kilograms per hectare). Production in an unfavorable year is 1200 pounds per acre (1344 kilograms per hectare). Structurally, tall shrubs are very dominant, followed by cool season deep-rooted perennial bunchgrasses being about equal to perennial forbs.

FUNCTION:

This site is well suited for deer, elk, and other wildlife in summer and early fall. It is used by livestock in the summer

and fall. The high percentage of palatable shrubs provides a longer period of growth so the site provides good late season forage. The site has high value for hunting, hiking, and horseback riding.

Due to the relatively high rainfall, elevation, and favorable cool-season growing conditions, it is fairly resistant to disturbances that can potentially degrade the site.

Due to the relatively high production and deep soils, infiltration is normally high and runoff moderately low. Runoff, when it does occur is non-erosive except during high intensity convection storms or following wildfire. 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, shrubs, particularly mountain big sagebrush, can gradually increase. Snowbrush ceanothus dies out or becomes decadent. Western juniper or Douglas fir 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, western juniper can displace most of the shrubs and other understory species. See "Influence of juniper invasion" below. Douglas fir can also gradually invade the site. When Douglas fir invades the site the trees are usually stunted, irregular, or poorly shaped.

When fires become more frequent than historic levels (20-40 years), snowbrush ceanothus will maintain itself in the community or increase due to sprouting. Other root-sprouting shrubs such as mountain snowberry, serviceberry, chokecherry, green rabbitbrush, quaking aspen, and bittercherry will also increase. Mountain big sagebrush is reduced significantly. With continued short fire frequency, mountain big sagebrush can be completely eliminated along with many of the desirable understory species such as mountain brome. These species will be replaced by Kentucky bluegrass and slender wheatgrass along with a variety of annual and perennial forbs including noxious and invasive plants.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization 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 western juniper invasion, an increase in mountain big sagebrush, snowbrush ceanothus, root-sprouting shrubs, and noxious and invasive plants. Continued improper grazing management influences fire frequency by increasing fine fuels.

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, snowbrush ceanothus and/or western juniper. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. A prescribed burn will help to maintain a mixed shrub plant community on this specific site.

Weather influences:

Above normal precipitation in April, May, and June 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:

An outbreak of a particular insect is usually influenced by weather. 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. Snow mold can adversely affect the health of mountain big sagebrush.

Influence of noxious and invasive plants:

Many of these species add to the fine-fuel component and lead to increased fire frequency.

Annual and Perennial invasive species 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 summer and fall. Their numbers are seldom high enough to adversely affect the plant community.

Watershed:

Decreased infiltration and increased runoff occur with the invasion of western juniper. Douglas fir invasion has similar impacts on the watershed function of this site. Juniper invasion can be triggered by lack of fire, poor grazing management, and prolonged drought. The 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:

The following discussion deals with western juniper.

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 hydrologic 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 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: (1) hydrology, (2)

energy capture, and (3) nutrient cycling. The changes are primarily driven by the hydrologic 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 1.1 to 1.2. Develops in the absence of fire and improper grazing management. There is a western juniper seed source present in the vicinity.

Phase 1.1 to 1.3. Results from a fire or prescribed burning.

Phase 1.1 to 1.4. Results from improper grazing management and no fire. There is no juniper seed source present in the vicinity.

Phase 1.2 to 1.3. Results from a wildfire or brush management.

Phase 1.2 to 1.1. Occurs with prescribed grazing and brush management or prescribed burning.

Phase 1.3 to 1.1. Results from prescribed grazing and no fire.

Phase 1.4 to 1.1. Occurs with prescribed grazing.

Phase 1.4 to 1.3. Develops with fire or prescribed burning and prescribed grazing.

Phase 1.3 to 1.4. Occurs with no fire and improper grazing management.

State 1, Phase 1.3 or 1.4 to State 2. Develops through improper grazing management and frequent fire. This site has crossed the threshold. It is economically impractical to return this state to State 1 with accelerated practices.

State 1, Phase 1.2 to State 3. Develops with no fire and improper grazing management from a juniper invaded phase of State 1. This site has crossed the threshold. It is economically impractical to return this state to State 1 with accelerated practices.

State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by improper grazing management and no fire or frequent fire cause this state to cross the threshold and retrogress to a new site with reduced potential. It is economically impractical to return this state to State 1 with accelerated practices.

State 3 to unknown site. Continued lack of fire or improper grazing management cause this state to cross the threshold and retrogress to a new site with reduced potential due to significant soil loss and changes in hydrology. It is economically impractical to return this state to State 1 with accelerated practices.

Practice Limitations.

Slight to moderate limitations exist for implementation of vegetation management practices. Slight limitations exist for implementing facilitating practices on slopes less than 30 percent. Moderate limitations exist on slopes greater than 30 percent. Moderate to severe limitations exist for implementing accelerating practices on slopes greater than 30 percent.

State and transition model

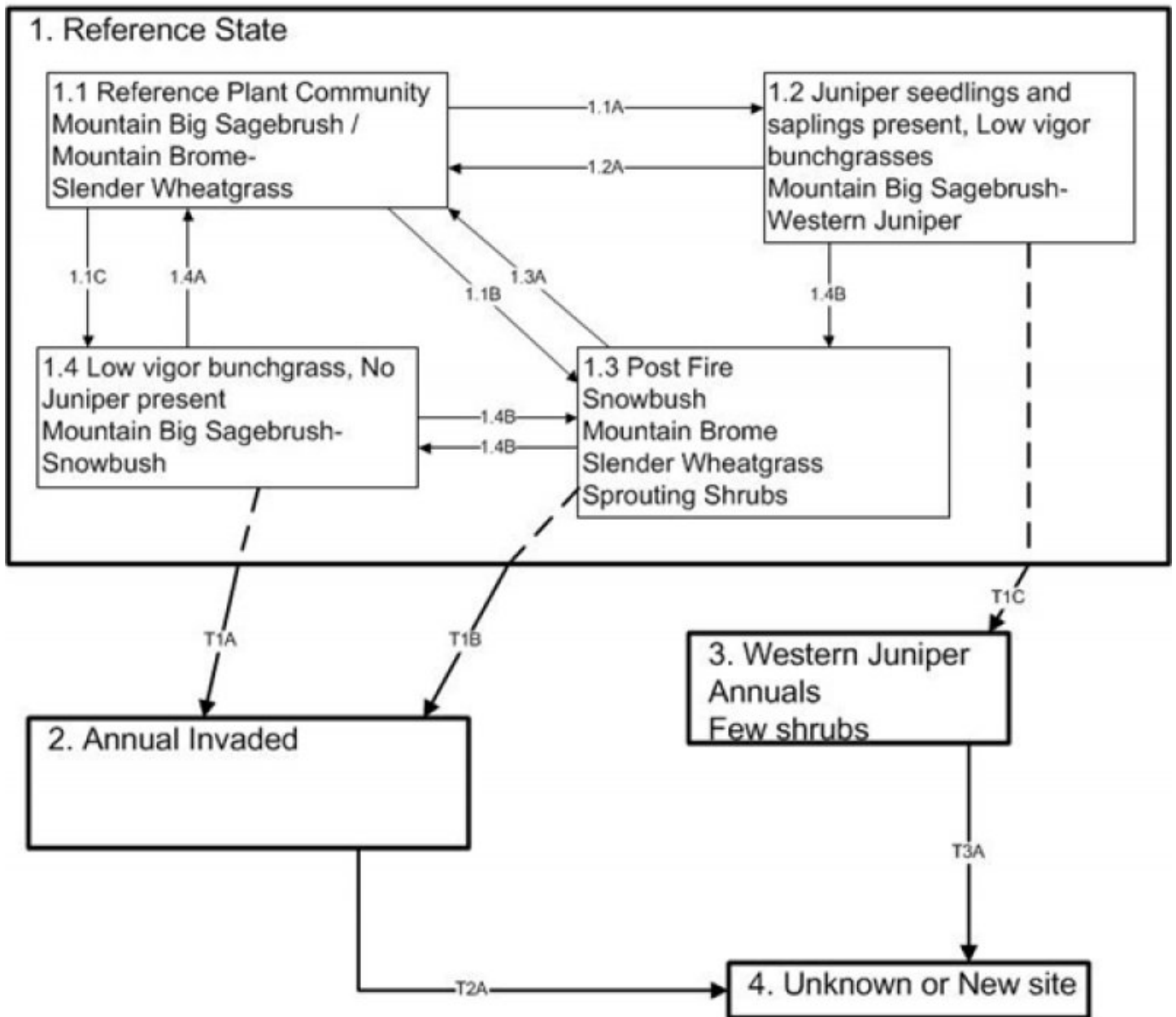


Figure 3. 25x-30

**State 1
Reference State**

The Reference Plant Community (RPC) moves through many phases depending on the natural and human cause forces that impact the community over time. State 1, described later, indicates some of these phases. The RPC is Phase 1.1. This plant community is dominated by mountain big sagebrush and mountain snowberry in the overstory with mountain brome and slender wheatgrass in the understory. Subdominant understory species include Columbia needlegrass, Idaho fescue, lupine, and arrowleaf balsamroot. Other shrubs on the site are Saskatoon serviceberry, quaking aspen, bittercherry, snowbrush ceanothus, and antelope bitterbrush. The plant species composition of Phase 1.1 is listed later under “RPC Plant Species Composition”.

**Community 1.1
Reference Plant Community**

The RPC is dominated by mountain big sagebrush in the overstory with mountain brome and slender wheatgrass in the understory. Common understory species include Columbia needlegrass, Idaho fescue, lupine, and arrowleaf balsamroot. Other shrubs on the site are Saskatoon serviceberry, quaking aspen, bittercherry, snowbrush

ceanothus, and antelope bitterbrush. Natural fire frequency is 20-40 years. The dominant visual aspect is mixed shrubs. Composition by weight is approximately 20 to 30 percent grasses, 15 to 25 forbs, and 50 to 60 percent shrubs. Total annual production is 1500 pounds per acre (1680 kilograms per hectare) in a normal year. Production in a favorable year is 2200 pounds per acre (2464 kilograms per hectare). Production in an unfavorable year is 1200 pounds per acre (1344 kilograms per hectare). Structurally, tall shrubs are very dominant, followed by cool season deep-rooted perennial bunchgrasses being about equal to perennial forbs.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Shrub/Vine	740	925	1356
Grass/Grasslike	336	420	616
Forb	269	336	493
Total	1345	1681	2465

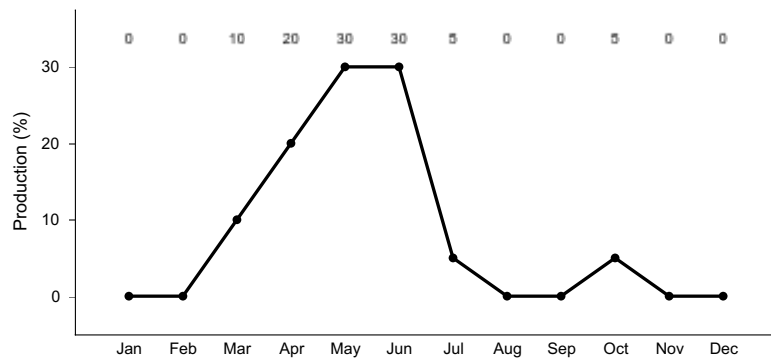


Figure 5. Plant community growth curve (percent production by month). ID0904, ARTRW8/PSSPS/ACTH7 HIGH PRECIP.

Community 1.2 Low Vigor Bunchgrasses - Juniper Seedlings

This plant community is dominated in the overstory by mountain big sagebrush with some western juniper seedlings and saplings invading. Mountain brome is the dominant understory species with reduced amounts of slender wheatgrass. All perennial grasses are in low vigor. A western juniper seed source is present on nearby sites. Some Kentucky bluegrass may have invaded the site. Douglas fir may increase on the site in the absence of normal fire frequency and with a seed source nearby. It will remain stunted. This state has developed due to fire frequency being much longer than normal and improper grazing management.

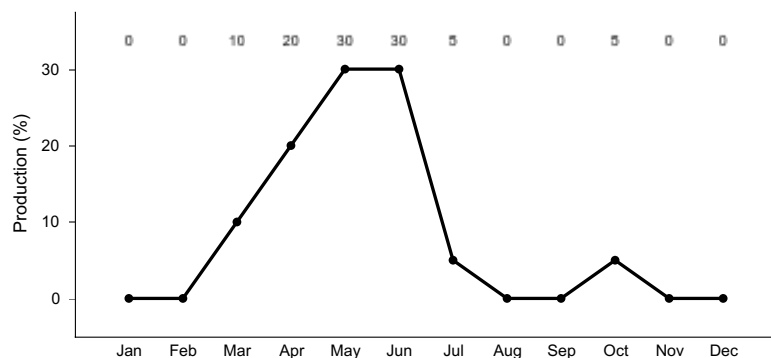


Figure 6. Plant community growth curve (percent production by month). ID0904, ARTRW8/PSSPS/ACTH7 HIGH PRECIP.

Community 1.3 Post Fire - Snowbrush, Mountain Brome, Sprouters

This plant community is dominated by snowbrush ceanothus with some slender wheatgrass and mountain brome.

Idaho fescue and Nevada bluegrass have decreased and may have died out due to fire. Western juniper and antelope bitterbrush has been killed by fire. Other shrubs that have re-sprouted after fire include mountain snowberry, Saskatoon serviceberry, chokecherry, green rabbitbrush, quaking aspen, and bittercherry. Kentucky bluegrass may have invaded the site. The community is a result of recent wildfire or prescribed burning.

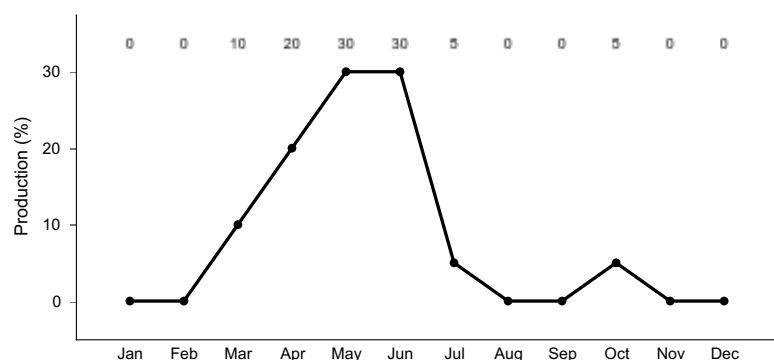


Figure 7. Plant community growth curve (percent production by month). ID0904, ARTRW8/PSSPS/ACTH7 HIGH PRECIP.

Community 1.4 Low Vigor Bunchgrasses - No Juniper present

This plant community is dominated by snowbrush ceanothus in the overstory with significantly reduced amounts of mountain brome in low vigor. Other bunchgrasses have been reduced and are in low vigor. Mountain big sagebrush may have increased. There is no western juniper seed source in the proximity. Some Kentucky bluegrass may have invaded the site. This plant community has developed due to improper grazing management and no fire.

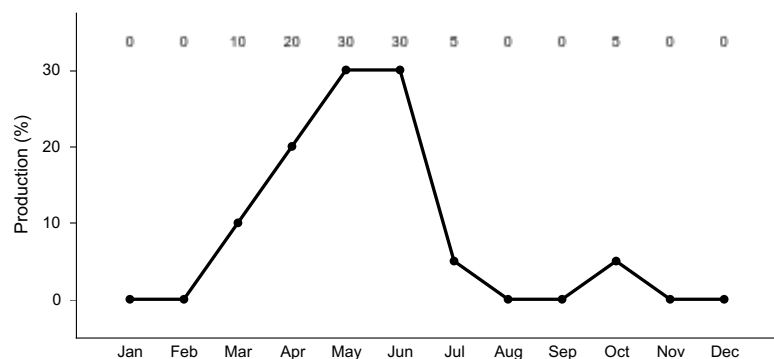


Figure 8. Plant community growth curve (percent production by month). ID0904, ARTRW8/PSSPS/ACTH7 HIGH PRECIP.

Pathway 1.1a Community 1.1 to 1.2

This pathway develops with both a lack of fire and improper grazing management. Western juniper seed source is present within the vicinity.

Pathway 1.1b Community 1.1 to 1.3

This pathway is a result of fire or prescribed burning.

Pathway 1.1c Community 1.1 to 1.4

This pathway is a result of improper grazing management and lack of fire. No juniper seed source is present within the vicinity.

Pathway 1.2a Community 1.2 to 1.1

This pathway is a result of prescribed grazing, brush management or prescribed burning.

Pathway 1.2b Community 1.2 to 1.3

This pathway results from a wildfire or brush management.

Pathway 1.3a Community 1.3 to 1.1

This pathway results from prescribed grazing and lack of fire.

Pathway 1.3b Community 1.3 to 1.4

This pathway is a result of improper grazing management and lack of fire.

Pathway 1.4a Community 1.4 to 1.1

This pathway is a result of prescribed grazing.

Pathway 1.4b Community 1.4 to 1.3

This pathway develops with fire or prescribed burning and prescribed grazing.

State 2 Annual Invaded

This state is dominated by non-native annual plants.

Community 2.1 Annual Dominated

This plant community is dominated by annuals and some perennial forbs. There may be a variety of noxious plants that have invaded the site. Some soil loss has occurred. The community has developed due to continued improper grazing management and frequent fire. This site has crossed the threshold. It is economically impractical to return this state to State 1 with accelerated practices.

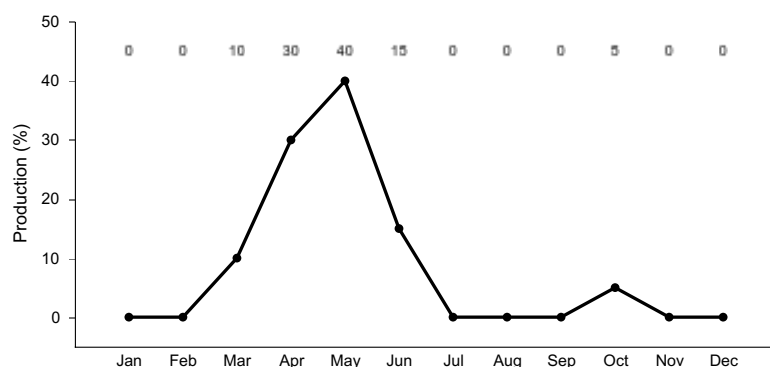


Figure 9. Plant community growth curve (percent production by month). ID0902, D25 ARTRV Early Seral.

State 3 Woodland

The Woodland state occurs when fire is excluded from the site and western juniper is not controlled and then dominates the plant community.

Community 3.1 Western Juniper and Annuals

This plant community is dominated by western juniper with annuals in the understory. There is a western juniper seed source in the proximity. There are few shrubs present due to competition from junipers. Some deep-rooted perennials may be present under the junipers. Generally, shrub cover is below 10-15%, bare ground is above 25-30%, and juniper cover is greater than 20%. Some soil loss has occurred. This plant community has developed due to the continued lack of fire and improper grazing management. This site has crossed the threshold. It is economically impractical to return this community to State 1 with accelerated practices.

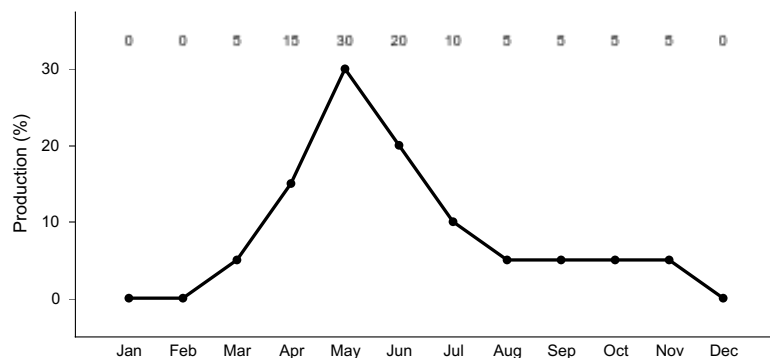


Figure 10. Plant community growth curve (percent production by month). ID0903, D25 JUOC/POSE/ANNUALS.

State 4 Unknown New Site

Undocumented state that may occur with extensive soil and plant community degradation.

Community 4.1 Unknown New Site

This plant community has gone over the threshold to a new site. Site potential has been reduced. Significant soil loss has occurred. Infiltration has been reduced and run-off has become more rapid. This state has developed due to continued improper grazing management and no fire or frequent fires from State 2 or the continued absence of fire and improper grazing management from the juniper dominated plant community in State 3. It is economically impractical to return this community to State 1 with accelerated practices.

Transition T1A State 1 to 2

From both 1.3 and 1.4 this transition develops through improper grazing management and frequent fire. This site has crossed the threshold. It is economically impractical to return this state to State 1 with accelerated practices.

Transition T1B State 1 to 3

This transition develops with lack of fire and improper grazing management from a juniper invaded phase of State 1. This site has crossed the threshold. It is economically impractical to return this state to State 1 with accelerated practices.

Transition T2A

State 2 to 4

This transition is from excessive soil loss and changes in the hydrologic cycle caused by improper grazing management and lack of fire. This state crosses the threshold and retrogresses to a new site with reduced potential. It is economically impractical to return this state to State 1 with accelerated practices.

Transition T3A

State 3 to 4

This transition is from continued lack of fire or improper grazing management. This state crosses the threshold and retrogresses to a new site with reduced potential due to significant soil loss and changes in hydrology. It is economically impractical to return this state to State 1 with accelerated practices.

Additional community tables

Animal community

Animal Community – Wildlife Interpretations

The rangeland ecological site provides diverse habitat for many native wildlife species. The plant community exhibits a diverse mixture of forbs throughout the growing season offering excellent habitat for invertebrates. Mule deer and elk may utilize the site at different times of the year. The rangeland habitat provides seasonal habitat for resident and migratory animals including western toad, shrews, bats, ground squirrels, mice, coyote, red fox, badger, Ferruginous hawk and prairie falcon. Area sensitive bird species include Brewer's sparrow, sage thrasher, sage sparrow and greater sage-grouse. Water features are sparse provided by seasonal runoff, artificial water catchments and springs.

State 1 Phase 1.1 – Mountain Big Sagebrush/ Mountain Brome/ Slender Wheatgrass Reference Plant Community (RPC): This plant community provides a diversity of grasses, forbs and shrubs, used by native insect communities that assist in pollination. An extensive array of forbs is represented throughout the growing season leading to a diverse insect community. Many bird and mammal species utilize this habitat based on the availability of invertebrate prey species. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, western toad and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Development of spring sites that collect all available water would exclude amphibian use on these sites. Native shrub-steppe obligate bird species utilizing the habitat include the Brewer's sparrow, sage sparrow and sage thrasher. Sage-grouse habitats (nesting, brood-rearing and winter) are provided by this plant community. The plant community provides seasonal (spring, summer and fall) food and cover for mule deer and elk. Antelope bitterbrush, snowbrush ceanothus, mountain snowberry, mountain brome and slender wheatgrass are desirable forage species for large herbivores. A small mammal population including golden-mantled ground squirrels, Merriam's shrew, Columbia Plateau ground squirrel, bushy-tailed woodrat, jackrabbit and yellow-bellied marmots utilize this plant community.

State 1 Phase 1.2- Mountain Big Sagebrush/ Mountain Brome/ Western Juniper Plant Community: This state has developed due to fire frequency being much longer than normal and improper grazing management. An increase in canopy of sagebrush and junipers contributes to a sparse herbaceous understory. A reduced herbaceous understory results in less diversity of insects. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, and western toad. Amphibians are associated with adjacent spring sites. As juniper increases, habitat quality for Brewer's sparrow, sage thrasher and sage sparrow may decrease. Remaining sagebrush provides brood-rearing, winter cover and winter food for sage-grouse but as juniper encroaches the quality of this habitat is severely reduced or eliminated. The plant community supports limited seasonal (spring and fall) habitat for mule deer and elk. As juniper increases the site will provide additional thermal cover for large mammals. Juniper provides winter habitat for mule deer. A small mammal population including golden-mantled ground squirrels, Merriam's shrew, Columbia Plateau ground squirrel, bushy-tailed woodrat, jackrabbit and yellow-bellied marmots utilize this plant community.

State 1 Phase 1.3 – Snowbrush Ceanothus/ Slender Wheatgrass/ Mountain Brome Plant Community: The plant community is a result of wildfire or prescribed burning. The plant community, dominated by snowbrush ceanothus and re-sprouting of chokecherry, serviceberry and rabbitbrush retains insect diversity similar to State 1 Phase 1.1 insect diversity. Reptile community would be similar to State 1 Phase 1.1 reptile community. The loss of sagebrush and antelope bitterbrush would limit use of these areas as nesting habitat by Brewer's sparrow, sage sparrow and sage thrasher. Limited brood-rearing habitat for sage-grouse would be provided if site is adjacent to sagebrush cover. No winter habitat for sage-grouse is available. The loss of Idaho fescue and reduced production of slender wheatgrass and mountain brome lowers quality of forage habitat for mule deer. Thermal cover and young of year cover would be available for mule deer and elk when brush matures. Snowbrush ceanothus provides desirable forage for elk in all seasons and for mule deer in spring and summer. The diversity and populations of small mammals would be similar to State 1 Phase 1.2 small mammal community.

State 1 Phase 1.4 – Mountain Big Sagebrush/ Mountain Brome Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy of sagebrush and snowbrush ceanothus contributes to a sparse herbaceous understory. The reduced herbaceous understory results in less diversity of insects. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake and western toad. Amphibians are associated with springs adjacent to the site. Reduced herbaceous understory is a factor in limiting the use of this plant community by ground nesting bird species. Shrub-steppe obligate bird species using the site include Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Habitat (brood-rearing and nesting) quality for sage-grouse is reduced due to poor vigor and less diversity and production of understory cover. Winter habitat (cover and food) for sage-grouse is provided. The reduced vigor of understory vegetation provides for a shorter grazing season for mule deer and elk. Young of year cover would be provided for mule deer. Small mammal diversity and populations would be similar to State 1 Phase 1.1 small mammal community.

State 2 – Annuals/ Forbs Plant Community: The community has developed due to continued improper grazing management and frequent fire. The plant community does not support a diverse insect community. The loss of native forbs and shrubs and increase in noxious plants would support a very limited population of pollinators. Quality of food and cover habitat for reptilian species is reduced. This plant community does not support the life requisites for sage thrasher, Brewer's sparrow, sage-grouse or sage sparrow. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Large herbivores may utilize the herbaceous vegetation in the spring when the vegetation is more palatable. The diversity and populations of small mammals would be dominated by open grassland species. Large blocks of this plant community would fragment historic plant community and reduce the quality of habitat for shrub-steppe obligate animal species.

State 3 – Western Juniper/ Annuals Plant Community: This site has developed due to improper grazing management and no fire. The loss of native forbs and understory vegetation will reduce insect diversity on the site. This plant community does not support life requisites for sage-grouse. Birds using this site as resident or migratory habitat include Juniper titmouse, western bluebird and Virginia's warbler. The Juniper titmouse relies heavily on juniper seeds for winter food. Hunting success on the site by raptors may decrease due to heavy overstory of juniper. Hunting success by raptors on adjacent ecological sites may increase due to an increase in roosting sites. As juniper increases, the site will provide additional thermal cover for large mammals. This site can provide food and cover for mule deer in spring, fall and winter.

Grazing Interpretations.

It is used by livestock in the summer and fall. The high percentage of palatable shrubs provides a longer period of growth so the site provides good late season forage.

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.

Hydrological functions

Due to the relatively high production and deep soils, infiltration is normally high and runoff moderately low. Runoff, when it does occur is non-erosive except during high intensity convection storms or following wildfire. Snow accumulates on the site due to high elevation and presence of tall shrubs.

Recreational uses

The site has high value for hunting, hiking, and horseback riding.

Wood products

None.

Other products

None.

Other information

Field Offices

Marsing, ID

Twin Falls, ID

Mountain Home, ID

Ontario, OR

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, Range Management Specialist, IASCD

Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho

Lee Brooks, Range Management Specialist, IASCD

Type locality

Location 1: Owyhee County, ID	
Location 2: Owyhee County, ID	
Township/Range/Section	T6S R4W S36
General legal description	SE 1/4, NW 1/4
Location 3: Owyhee County, ID	
Township/Range/Section	T8S R5W S13
General legal description	NW 1/4, SE 1/4
Location 4: Owyhee County, ID	
Township/Range/Section	T8S R4W S33
General legal description	NE 1/4, NW 1/4

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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.

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Contact for lead author	USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	06/25/2009
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:** rills rarely occur on this site. If rills are present they are most likely to occur on slopes greater than 15 percent and immediately following wildfire. Rills are most likely to occur on soils with surface textures of silt loam.

- Presence of water flow patterns:** water flow patterns rarely occur on this site. When they occur they are most likely to occur on slopes greater than 15 percent. When they occur they are short, disrupted by cool season perennial grasses and tall shrubs and are not extensive.

- Number and height of erosional pedestals or terracettes:** both are rare on this site. In areas where flow patterns and /or rills are present, a few pedestals may be expected.

- 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 15-25 percent.

5. **Number of gullies and erosion associated with gullies**: do not occur on this site.

6. **Extent of wind scoured, blowouts and/or depositional areas**: usually does not occur.

7. **Amount of litter movement (describe size and distance expected to travel)**: fine litter in the interspaces may move up to 2 feet following a significant run-off event. Terracettes and bunchgrass can trap fine litter. Coarse litter generally does not move.

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 to 6.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness)**: The A or A1 horizon is typically 4 to 7 inches thick. Structure ranges from weak thin platy to moderate medium subangular blocky. Soil organic matter (SOM) needs to be determined.

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 down run-off and increase infiltration. Shrubs accumulate 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)**: 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: tall shrubs

Sub-dominant: perennial forbs

Other: grasses

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence)**: snowbrush will become decadent in the absence of fire and when shaded by taller shrubs and trees, when present. Grass and forb mortality will occur as tall shrubs such as serviceberry, chokecherry, aspen and bittercherry increase.

14. **Average percent litter cover (%) and depth (in):** annual litter cover in the interspaces will be 20-30 percent to a depth of <0.2. Under the mature shrubs litter is greater than 0.5 inches. Fine litter can accumulate on the terracettes.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 1500 lbs. per acre in a year with normal precipitation and temperatures. Perennial grasses produce 20-30 percent of the total, forbs 15-25 percent, and shrubs 50-60 percent.

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:** includes Kentucky bluegrass, western juniper, spotted and diffuse knapweed, leafy spurge, and Canada thistle.

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