USDA Natural Resources
Conservation Service

Ecological site R013XY047ID
Shallow Fractured Loam 16-22 PZ ARTRV/PSSPS

Last updated: 9/23/2020
Accessed: 05/10/2025

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): 013X–Eastern Idaho Plateaus

Land Resource Region: B (Northwestern Wheat and Range)
MLRA: 13 (Eastern Idaho Plateaus)

EPA EcoRegion: Level III (Middle Rockies)

LRU notes

013X-Eastern Idaho Plateaus

Precipitation or Climate Zone: 16-22” P.Z.
https://soils.usda.gov/survey/geography/mlra/index.html

Classification relationships

Artemisia vaseyana/ Agropyron spicatum 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

Site does not receive any additional water.
Soils are:
not saline or saline-sodic.
Shallow, with >35% gravels (<3”) and cobbles (3-10”) cover. skeletal within 20” of soil surface, fragment percentage increasing with depth
Not strongly or violently effervescent in surface mineral 10”.
textures usually range from sandy loam to silty loam in surface mineral 4”.
Slope is > 30%.
Clay content is = <35% in surface mineral 4”.
Site does not have an argillic horizon with > 35% clay

Associated sites

R013XY001ID	**Loamy 12-16 PZ**
R013XY005ID	**Loamy 16-22 PZ ARTRV/FEID-PSSPS**
R013XY008ID	**Steep South Slopes 12-16 PZ ARTRV/PSSPS**
R013XY024ID	**Loamy 22+ PZ ARTRV/FEID-BRMA4**

Similar sites

R013XY008ID	**Steep South Slopes 12-16 PZ ARTRV/PSSPS**
R013XY019ID	**Stony Loam 16-22 PZ ARTRV/PSSPS**
R013XY005ID	**Loamy 16-22 PZ ARTRV/FEID-PSSPS**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on hills, lava plains and terraces. Slopes range from 1 to 50 percent. The soils are found on all aspects, but generally on north and east facing slopes. Elevations range from 5000 to 6900 feet (1500 to 2100 meters).

Table 2. Representative physiographic features

Landforms	(1) Lava plain (2) Terrace (3) Hill
Flooding frequency	None
Elevation	5,000–6,900 ft
Slope	1–50%
Water table depth	60 in
Aspect	N, E

Climatic features

MLRA 13, the Eastern Idaho Plateaus, is part of the Northwestern Wheat and Range Region. Its elevation ranges from 4209 to 9331 feet above sea level, with an average elevation of 5787 feet. The average annual precipitation is 16.41 inches, with a range of 13.56 to 18.75 inches, based on ten long term climate stations located throughout the MLRA. A spike in precipitation amount often occurs in late spring, usually in May.

Temperatures vary widely in the MLRA throughout the year. A maximum temperature of 103° Fahrenheit occurred at the McCammon climate station (# 105716; elevation 4770 feet), while a minimum of -41° was recorded at the Kilgore station (#104908). At all stations temperatures throughout the year are usually below the national average. Kilgore also recorded the greatest annual snowfall amount of 217 inches. The average temperature is 41.4 degrees F. with an average high of 55.3 degrees and an average low of 27.5 degrees.

The frost-free period ranges from 64 to 90 days, while the freeze-free period can be 98 to 123 days.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	123 days
Precipitation total (average)	19 in

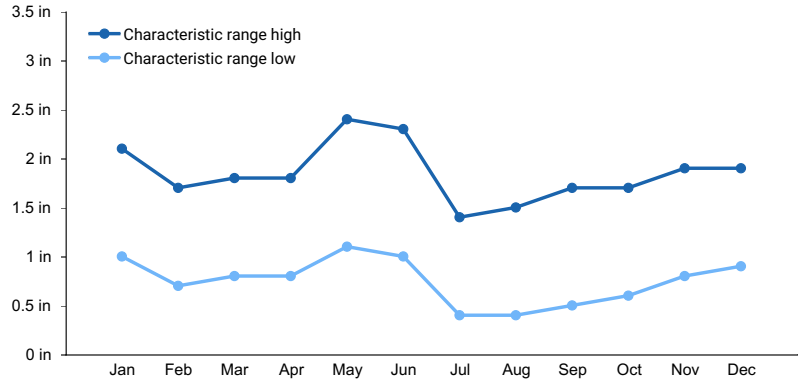


Figure 1. Monthly precipitation range

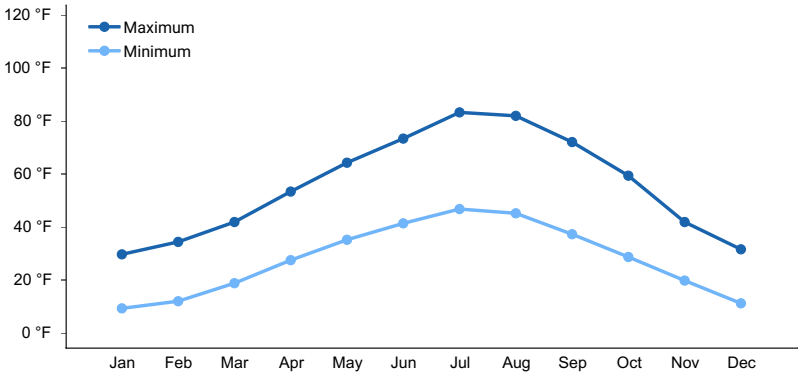


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

This site contains well drained soils that are shallow to bedrock. They are on basalt plains and rhyolite side slopes and have formed in side slope alluvium, loess, and residuum. Textures are dominantly loam, silt loam, fine sandy loam, gravelly sandy loam, and gravelly loam. Coarse fragments are angular basalt or rhyolitic tuff. The site has moderately slow to moderately rapid permeability and very low to high runoff. The available water holding capacity (AWC) is very low to low. The soils are characterized by a xeric soil moisture regime and either a frigid or cryic soil temperature regime.

Soil Series Correlated to this Ecological Site

Sadorus
Spliten
Katseanes

Table 4. Representative soil features

Surface texture	(1) Gravelly silt loam (2) Loam (3) Sandy loam
Drainage class	Well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	10–20 in
Surface fragment cover <=3"	5–25%

Surface fragment cover >3"	0–5%
Available water capacity (0-40in)	1.8–3.2 in
Soil reaction (1:1 water) (0-40in)	5.1–7.3
Subsurface fragment volume <=3" (Depth not specified)	10–25%
Subsurface fragment volume >3" (Depth not specified)	0–5%

Ecological dynamics

The dominant visual aspect of this site is mountain big sagebrush in the overstory and bluebunch wheatgrass in the understory. Composition by weight is approximately 20-35 percent grasses, 10-20 percent forbs, and 40-50 percent shrubs.

During the last few thousand years, this site has evolved in a semi-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, Shira's moose, lagomorphs, and small rodents.

Fire has historically occurred on the site at intervals of 20-50 years. In the absence of fire, Utah juniper can invade the site if a seed source is in the vicinity.

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. Antelope bitterbrush is usually present. Subdominant species include Idaho fescue and arrowleaf balsamroot. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 600 pounds per acre (672 kilograms per hectare) in a normal year. Production in a favorable year is 850 pounds per acre (952 kilograms per hectare). Production in an unfavorable year is 300 pounds per acre (336 kilograms per hectare). Structurally, tall shrubs are very dominant, followed by cool season deep rooted perennial bunchgrasses being more dominant than perennial forbs.

FUNCTION:

This site is well suited for big game in the late spring, summer, and fall. It is also well suited for livestock and recreation use in the late spring, summer, and fall.

Due to the relatively high rainfall and elevation on this site, it is fairly resistant to disturbances that can potentially degrade it.

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 increases. Grasses and forbs decrease as shrubs increase. Utah juniper will invade if a seed source is in the vicinity. See influence of juniper invasion below.

When fires become more frequent than historic levels (20-50 years), mountain big sagebrush and bitterbrush are reduced significantly. With continued short fire frequency, mountain big sagebrush and antelope bitterbrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass and

Idaho fescue. These species may be replaced by cheatgrass, bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive plants. Cheatgrass comes in at lower elevations of the site. These fine fuels will increase the fire frequency. Root sprouting shrubs such as rabbitbrush and mountain snowberry may increase.

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 and possibly bitterbrush. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in mountain big sagebrush and noxious and invasive plants. As cheatgrass increases, along with other annuals, fires become more frequent.

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. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any brush management needs to be very carefully planned because of the steepness of slopes, shallowness of the soils, and the specific shrub species occupying the site. A reduction in shrubs with out a suitable understory of perennial grasses can lead to an increase in fine fuels and will lead to a more frequent fire regime. Antelope bitterbrush is very important as a browse species for wildlife and needs to be protected with any brush control practices applied. Loss of shrub species on this site can have very negative impacts on wildlife.

Weather influences:

Above normal precipitation in May, June, and July 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, particularly bitterbrush from western tent caterpillars (Malacosoma fragilis). Two consecutive years of defoliation by the tent caterpillar can cause mortality in bitterbrush. An outbreak of a particular insect is usually influenced by weather but no specific data for this site is available. Mormon cricket and grasshopper outbreaks occur periodically. These 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 annual and perennial invasive species with deep root systems 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 late spring, summer, and fall. 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 years' leader growth.

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 increase in mountain big sagebrush and Utah juniper, when present. Desired understory species can be reduced. The increased runoff also causes sheet and rill erosion. This composition change can affect nutrient and water cycles. 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 Utah 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 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 A to B. Develops in the absence of fire or with some degree of improper grazing management. A Utah juniper seed source is present.
Phase A to C. Develops with fire. No juniper seed source is present.
Phase A to D. Develops in the absence of fire and with improper grazing management. No juniper seed source is present.
Phase B to A. Results from prescribed burning and prescribed grazing.
Phase C to A. Results from absence of fire and prescribed grazing.
Phase C to D. Results from no fire and prescribed grazing.

Phase D to A. Results from prescribed grazing.
Phase D to C. Results from one or more fires.

State 1, Phase C to State 2, Phase A and B. Both phases develop with improper grazing management. Frequent fire is a factor in the development of Phase B but not in Phase A. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 through accelerated practices.

State 1, Phase B to State 3. Develops with no fire and improper grazing management. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 through accelerated practices.

State 2. Phase A to B. Results from prescribed burning or wildfire and improper grazing management. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 through accelerated practices.

State 2. Phase B to A. Develops with no fire. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 through accelerated practices.

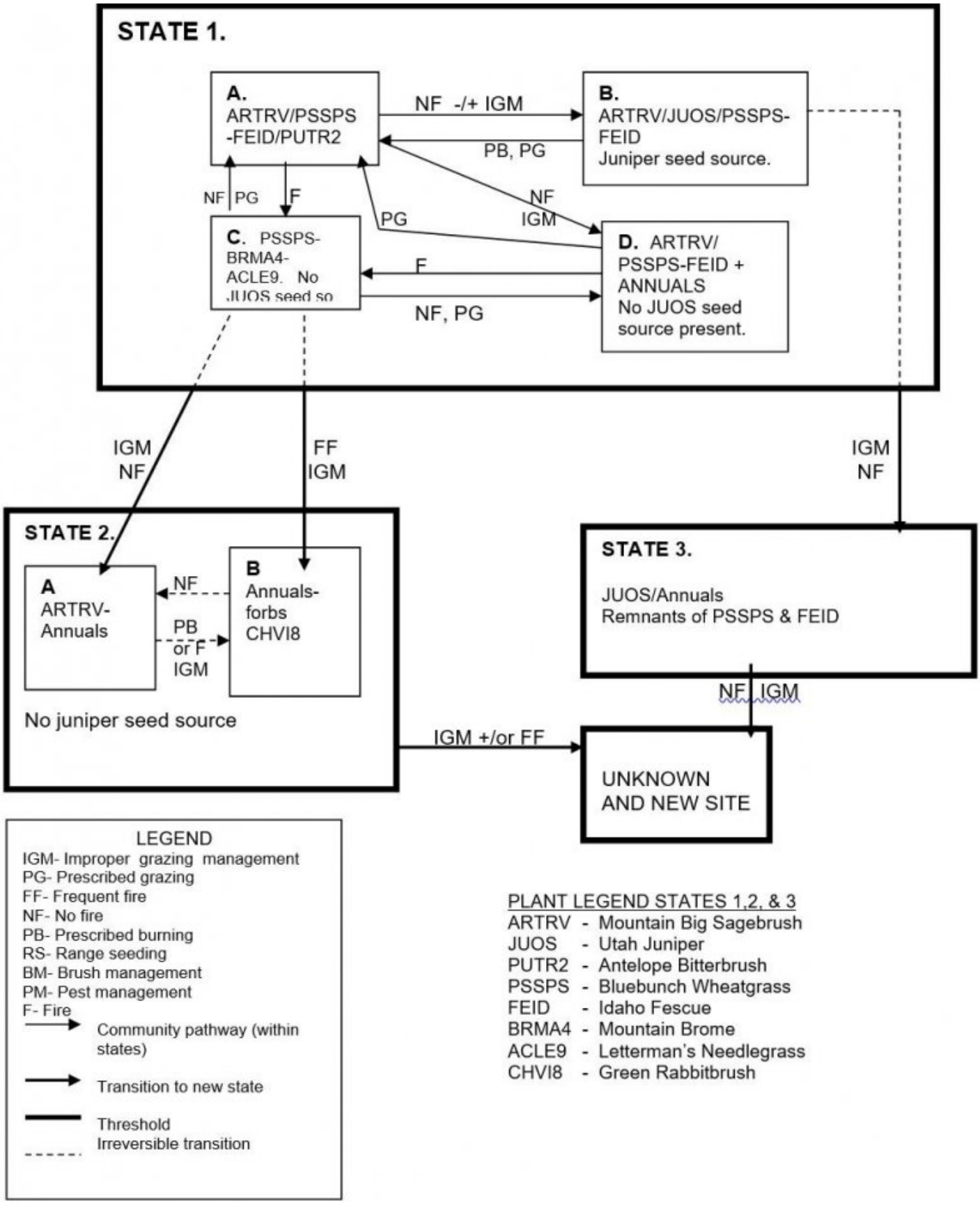
State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by improper grazing management and/or frequent fire cause this state to cross the threshold and retrogress to a new site with reduced potential. It is not economically practical to return this plant community to State 1 through accelerated practices.

State 3 to unknown site. Continued lack of fire and 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 not economically practical to return this plant community to State 1 through accelerated practices.

Practice Limitations.

Only slight limitations exist on this site for implementing vegetative management and accelerating practices. Moderate to severe limitations exist for implementing facilitating practices.

State and transition model



State 1
State 1 Phase A

Community 1.1
State 1 Phase A

Reference Plant Community Phase. This plant community has mountain big sagebrush in the overstory with

bluebunch wheatgrass in the understory. Idaho fescue and antelope bitterbrush occur in small amounts. A variety of other bunchgrasses and shrubs occur in minor amounts. Other significant species in the plant community are mountain brome, arrowleaf balsamroot, tapertip hawksbeard, snowberry, and serviceberry. Natural fire frequency is 20 to 50 years.

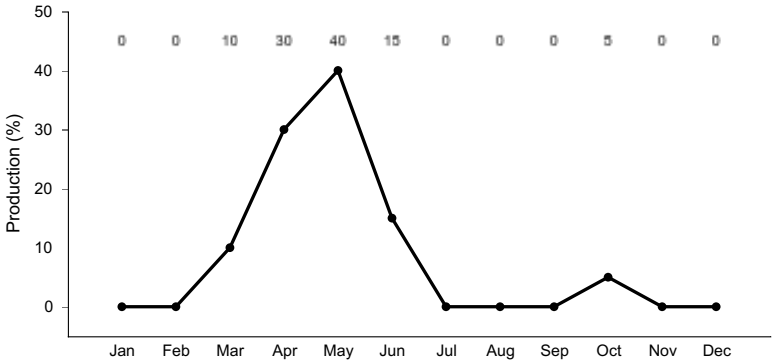


Figure 3. Plant community growth curve (percent production by month). ID0804, ARTRV, NORTH. STATE 1.

State 2
State 1 Phase B

Community 2.1
State 1 Phase B

This plant community is dominated by mountain big sagebrush with some invaded Utah juniper in the form of seedlings and saplings. There is a reduced amount of bluebunch wheatgrass and Idaho fescue and an increase in annual grasses and forbs. Kentucky bluegrass is beginning to invade. Bluebunch wheatgrass and Idaho fescue are typically in low vigor. This state has developed due to the lack of fire and some degree of improper grazing management.

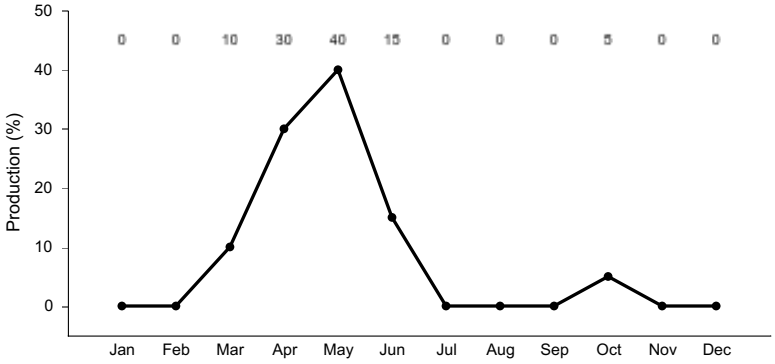


Figure 4. Plant community growth curve (percent production by month). ID0804, ARTRV, NORTH. STATE 1.

State 3
State 1 Phase C

Community 3.1
State 1 Phase C

This plant community is dominated by bluebunch wheatgrass. Mountain brome, Letterman’s needlegrass, and other perennial grasses and forbs are subdominant. Mountain big sagebrush and antelope bitterbrush have been significantly reduced due to wildfire. Some root sprouting shrubs are present. This state has developed due to one o more fires.

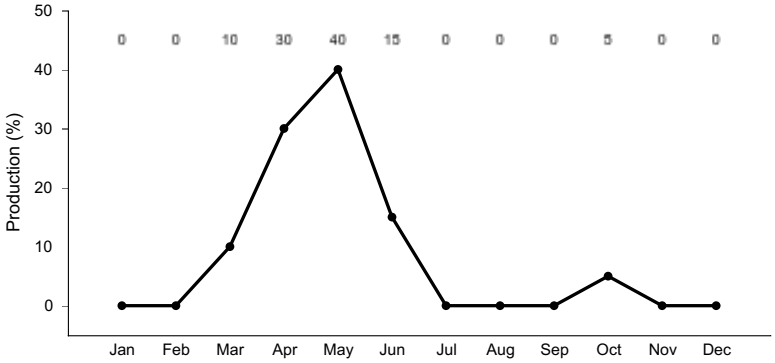


Figure 5. Plant community growth curve (percent production by month). ID0804, ARTRV, NORTH. STATE 1.

State 4
State 1 Phase D

Community 4.1
State 1 Phase D

This plant community is dominated by mountain big sagebrush in the overstory. There is a reduced amount of bluebunch wheatgrass and Idaho fescue and an increase in annual grasses, Kentucky bluegrass, and forbs. Bluebunch wheatgrass and Idaho fescue are typically in low vigor. Antelope bitterbrush is typically hedged. This state has developed due to the lack of fire and improper grazing management. No Utah juniper seed source is in the proximity.

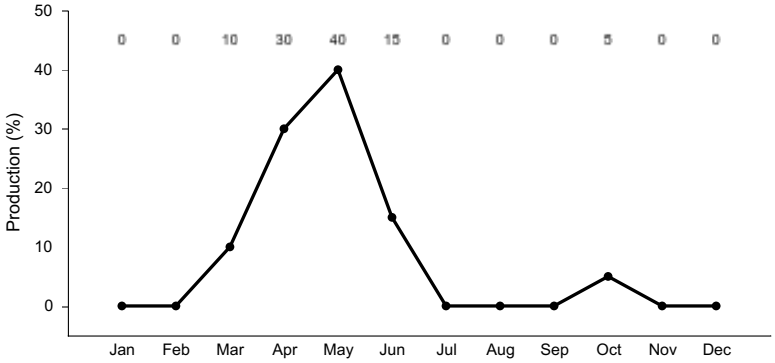


Figure 6. Plant community growth curve (percent production by month). ID0804, ARTRV, NORTH. STATE 1.

State 5
State 2 Phase A

Community 5.1
State 2 Phase A

This plant community is dominated by mountain big sagebrush with annuals in the interspaces. This state has developed due to improper grazing management and the absence of fire. Some soil loss has occurred. This site has crossed the threshold. It is not economically feasible to return this plant community to State 1 through accelerated practices.

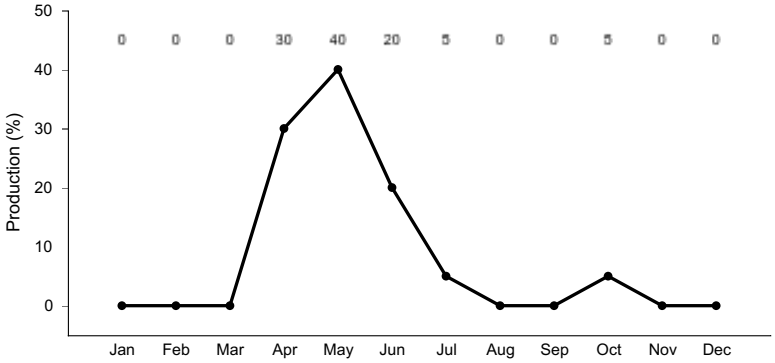


Figure 7. Plant community growth curve (percent production by month). ID0802, B13 ARTRV Early Seral. State 2.

State 6
State 2 Phase B

Community 6.1
State 2 Phase B

This plant community is dominated by annual grasses and forbs. Root sprouting shrubs such as green and gray rabbitbrush are present. This state has developed due to frequent fires and improper grazing management. This site has crossed the threshold. It is economically impractical to return this plant community to State 1 with accelerating practices

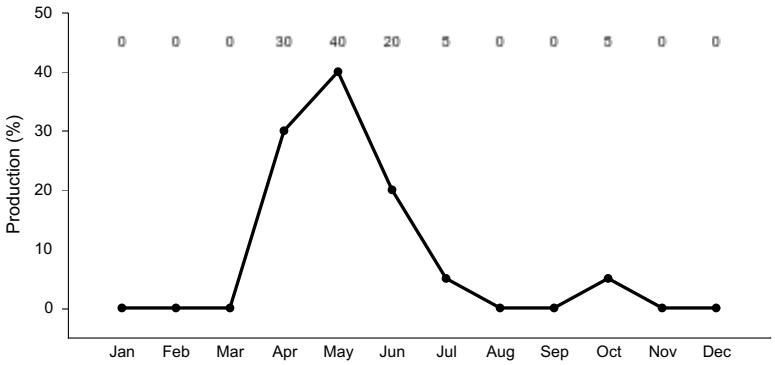


Figure 8. Plant community growth curve (percent production by month). ID0802, B13 ARTRV Early Seral. State 2.

State 7
State 3

Community 7.1
State 3

This plant community is dominated by Utah juniper. Remnants of bluebunch wheatgrass and Idaho fescue can be found in the understory. Shallow-rooted grasses and annuals can be found in the interspaces. Few shrubs are present due to shading and competition from Utah juniper. Some soil loss has occurred. This state has developed in the absence of fire and with improper grazing management. This site has crossed the threshold. It is not economically practical to return this plant community to State 1 through accelerated practices.

State 8
State 4

Community 8.1
State 4

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/or frequent fires from State 2 or the continued absence of fire and improper grazing management from the juniper dominated phase of State 3. It is not economically practical to return this plant community to State 1 through accelerated practices.

Additional community tables

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This 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, moose, and elk may utilize the site at different times of the year. The rangeland 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 sage-grouse. Water features are sparse provided by seasonal runoff, artificial water catchments, and springs.

State 1 Phase 1.1 – Mountain Big Sagebrush/ Bluebunch Wheatgrass/ Idaho Fescue/ Antelope Bitterbrush 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 avian 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, Great Basin spadefoot toad, 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 avian species utilizing the habitat include the Brewer's sparrow, sage sparrow, sage grouse, and sage thrasher. Sage-grouse habitat (leks, nesting, brood-rearing, and winter) is provided by this plant community. The plant community provides seasonal food and cover for large mammals including mule deer, moose, and elk. Antelope bitterbrush may be present in this plant community, , and along with bluebunch wheatgrass is an important forage species for these animals. Some areas (south and west slopes) may provide winter food for mule deer and elk. A diverse small mammal population including golden-mantled ground squirrels, jackrabbits, deer mice, and Great Basin pocket mice may utilize this plant community. The deer mouse is beneficial to this site as it is the principal vector for planting bitterbrush seed.

State 1 Phase 1.2- Mountain Big Sagebrush/ Utah Juniper/ Bluebunch Wheatgrass/ Idaho Fescue Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush and juniper contributes to a sparse herbaceous understory. A reduced herbaceous understory results in lower diversity and numbers of insects. The reptile community will be similar to the State 1 Phase 1.1 community, including common sagebrush lizard and western rattlesnake. The reduced diversity of insects and understory cover may reduce the quality of food and cover for reptile populations. As juniper increases, habitat for Brewer's sparrow, sage thrasher, and sage sparrow may increase. Remaining sagebrush provides brood-rearing, winter cover, and winter food habitat for sage-grouse, but as juniper encroaches the quality of this habitat is severely reduced or eliminated. The plant community provides limited spring and fall forage for mule deer and elk due to the loss of understory vegetation. Juniper can provide winter habitat (cover and food) for mule deer. As juniper encroaches, the site will provide additional thermal cover for ungulates. A diverse small mammal population including golden-mantled ground squirrels, jackrabbits, deer mice, and Great Basin pocket mice may utilize this plant community.

State 1 Phase 1.3 – Bluebunch Wheatgrass/ Mountain Brome/ Letterman's Needlegrass Plant Community: This plant community is a result of recent wildfire, prescribed burning, or brush management. The plant community, dominated by herbaceous vegetation with little to no sagebrush or antelope bitterbrush would provide less vertical structure for animals. Patches of root sprouting shrubs (snowberry and rabbitbrushes) may be present to provide limited vertical structure for wildlife. Insect diversity would be reduced but a native forb plant community similar to the one in State 1 Phase A would still support select pollinators. Quality of habitat for reptiles including common

sagebrush lizard and western rattlesnake would be reduced until root sprouting shrubs establish on the site. Amphibian habitat would be tied to permanent spring sites in the area. Development of spring sites that collect all available water would exclude the use of amphibians on these sites. The dominance of herbaceous vegetation with little sagebrush and antelope bitterbrush canopy cover would limit use of these areas as nesting habitat by Brewer's sparrow, sage sparrow, sage grouse, and sage thrasher. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark, savannah sparrow, vesper sparrow, and western meadowlark). Mule deer and elk use would be seasonal (spring through fall) but the site would offer little thermal or young of year cover due to the loss of shrub cover. The populations of small mammals would be dominated by open grassland species. Large blocks of this plant community would fragment the reference plant community and reduce the quality of the habitat for shrub-steppe obligate animal species.

State 1 Phase 1.4 – Mountain Big Sagebrush / Bluebunch Wheatgrass/ Idaho Fescue/ Annuals Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush contributes to a sparse and changing herbaceous understory. Grasses, forbs, and shrubs are used by native insects that assist in pollination but the reduced herbaceous understory may result in a less diverse insect population. The reptile and amphibian community is represented by common sagebrush lizard, western rattlesnake, Great Basin spadefoot toad, western toad, and northern leopard frog. The reduced diversity of insects may reduce reptile diversity and populations. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Shrub-steppe obligate bird species include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Quality of habitat (brood-rearing and nesting cover) for sage-grouse is reduced due to a less diverse herbaceous plant community. Winter habitat (cover and food) for sage-grouse is provided. The reduced vigor of understory vegetation provides a shorter forage season for mule deer, moose, and elk. Young of year cover and thermal cover would be provided for deer and elk. Small mammal diversity and populations would be similar to those in State 1 Phase 1.1.

State 2 Phase 2.1 - Mountain Big Sagebrush / Annuals Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. Insect diversity is low due to loss of native herbaceous understory plants. Insect communities would be dominated by ants with little diversity of other invertebrates. The reptile community is represented by common sagebrush lizard and western rattlesnake. The reduced diversity of insects may reduce reptile diversity and populations. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Shrub-steppe obligate bird species include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Quality of habitat (brood-rearing and nesting cover) for sage-grouse may be reduced or eliminated due to an annual herbaceous plant community. Winter habitat (cover and food) for sage-grouse is provided. The reduced vigor of understory vegetation does not provide suitable forage for mule deer, moose, and elk. Young of year cover and thermal cover would be provided for deer and elk. Small mammal diversity and populations would be similar to those in State 1 Phase 1.1.

State 2 Phase 2.2 –Annuals/ Forbs/ Green Rabbitbrush Plant Community:
This community has developed due to continued improper grazing management and frequent fire. The plant community does not support a diverse insect community. Annual forbs provide limited habitat for pollinators. Quality of habitat for western rattlesnake and common sagebrush lizard would be reduced due to the loss of sagebrush. This plant community does not provide quality habitat for sage thrasher, Brewer's sparrow, sage-grouse, or sage sparrow. Diversity of grassland avian species is reduced due to poor cover and available food. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Large mammals may utilize the herbaceous vegetation in the early part of the year when the vegetation is more palatable. The populations of small mammals would be dominated by open grassland species. Predator hunting success would increase due to the reduced amount of cover available to small mammals. Large blocks of this plant community would fragment the reference plant community and reduce the quality of the habitat for shrub-steppe obligate animal species.

State 3 - Utah Juniper/ Annuals Plant Community: This state 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. The lack of flowering plants reduces use by pollinators like butterflies and moths. Habitat for sagebrush lizard, Great Basin spadefoot toad, and western toad would be limited due to the loss of sagebrush. This plant community does not support the habitat requirements for sage-grouse. Birds using this site for 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 by raptors may decrease due to heavy overstory of juniper. As juniper encroaches, the

site will provide additional thermal cover for large mammals. The plant community provides winter food and cover for mule deer.

Grazing Interpretations.

This site is best adapted for domestic livestock grazing in the late spring, summer, and fall.
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

Soils on this site are in hydrologic group D. They have high run-off potential.

Recreational uses

This site provides opportunity for horseback riding, hiking, hunting, and photography.

Wood products

Utah juniper that has invaded the site can be used for posts and firewood.

Other products

none.

Other information

Field Offices

American Falls, ID
Blackfoot, ID
Burley, ID
Driggs, ID
Fort Hall, ID
Idaho Falls, ID
Malad, ID
Pocatello, ID
Rexburg, ID
Soda Springs, ID
St. Anthony, ID

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
Kristen May, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Range Management Specialist, IASCD

Type locality

Location 1: Fremont County, ID	
Township/Range/Section	T9N R42E S4

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.

Approval

Kendra Moseley, 9/23/2020

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	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	05/15/2008
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. Gravelly surface soils reduce the potential for rills. Rills are most likely to occur on soils with surface textures of loam and silt loam.

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2. **Presence of water flow patterns:** water-flow patterns occur on this site. When they occur, they may be long, continuous, and extensive. Gravelly surface texture interrupts flows.

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3. **Number and height of erosional pedestals or terracettes:** both can occur on this site. In areas where flow patterns and/or rills are present, a few pedestals may be expected. Terracettes occur on the site uphill from tall shrub bases and

large bunchgrasses. They are not extensive.

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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 15-25 percent.

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

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

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7. **Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces may move up to 5 feet following a significant run-off event. Coarse litter generally does not move. Gravels and cobbles on the surface help reduce fine litter movement. Terracettes and gravels can trap fine litter.

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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):** values should range from 4 to 6 but needs to be tested.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** structure ranges weak very fine and fine granular to weak and moderate fine and medium subangular blocky. Soil organic matter (SOM) ranges from 1 to 4 percent. Surface colors tend to be dark brown, very dark brown and very dark grayish brown. The A or A1 horizon is typically 3 to 17 inches thick.

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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.

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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):** not present.

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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant: tall shrubs

    Sub-dominant: cool season deep-rooted perennial bunchgrasses

    Other: perennial forbs

    Additional:

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

14. **Average percent litter cover (%) and depth (in):** additional litter cover data is needed but is expected to be 25-35 percent to a depth of 0.1 inches. Under mature shrubs litter is >0.5 inches deep and is 90-100 percent ground cover.

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 600 pounds per acre (672 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 20-35 percent of the total production, forbs 10-20 percent and shrubs 40-50 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 leafy spurge, bulbous bluegrass, musk and scotch thistle, and diffuse and spotted knapweed. Cheatgrass can invade the site at the lower elevations.

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