

Ecological site R013XY022ID Subalpine Loamy 16-22 PZ ARTRS2/ELTR7-BRMA4

Last updated: 9/23/2020
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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): 013X–Eastern Idaho Plateaus

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 "Speciformis"/ *Bromus carinatus* 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".

Land Resource Unit: B (Northwestern Wheat and Range)

MLRA: 13 (Eastern Idaho Plateaus)

EPA EcoRegion: Level III (Middle Rockies)

Ecological site concept

Site does not receive any additional water.

Soils are:

not saline or saline-sodic.

moderately deep, deep, with < 3% stone (10-25") and boulder (>25") cover. not skeletal within 20" of soil surface.

not strongly or violently effervescent in surface mineral 10".

textures usually range from very fine sandy loam to clay loam in surface mineral 4".

Slope is < 30%.

Clay content is = <32% in surface mineral 4".

Site does not have an argillic horizon with > 35% clay.

Associated sites

R013XY005ID	Loamy 16-22 PZ ARTRV/FEID-PSSPS
R013XY014ID	Shallow Stony 12-20 PZ ARAR8/PSSPS
R013XY016ID	Moist Mountain Loam 20+ PZ POTR
R013XY019ID	Stony Loam 16-22 PZ ARTRV/PSSPS
R013XY020ID	Loamy Tall Brush 16-22 PZ ACGL/BRMA4
R013XY031ID	Steep Stony North 16-22 PZ ARTRV/FEID

Similar sites

R013XY024ID	Loamy 22+ PZ ARTRV/FEID-BRMA4
R013XY020ID	Loamy Tall Brush 16-22 PZ ACGL/BRMA4
R013XY005ID	Loamy 16-22 PZ ARTRV/FEID-PSSPS

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata ssp. spiciformis</i>
Herbaceous	(1) <i>Elymus trachycaulus</i> (2) <i>Bromus marginatus</i>

Physiographic features

This site occurs on moderately steep to steep mountain tops and mountain slopes. Slopes range from 2 to 30 percent, occasionally up to 60, on all aspects. Elevations range from 7000 to 9500 feet (2100 to 2900 meters).

Table 2. Representative physiographic features

Landforms	(1) Mountain slope (2) Ridge
Flooding frequency	None
Elevation	2,134–2,896 m
Slope	2–60%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

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)	483 mm

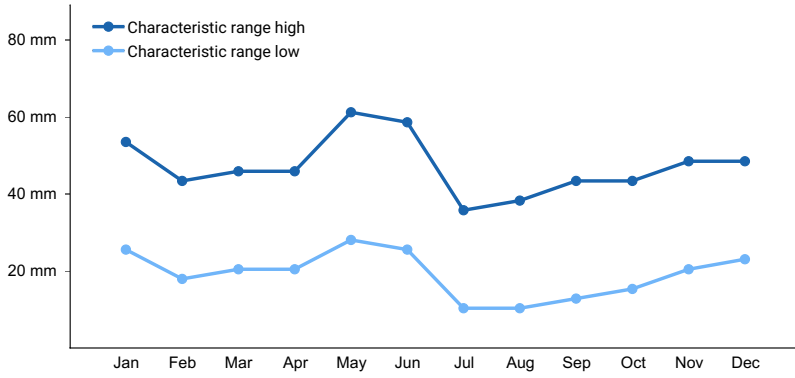


Figure 1. Monthly precipitation range

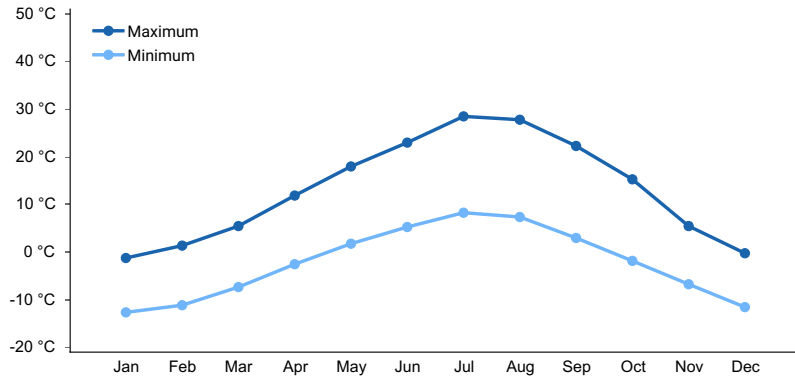


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

These soils are moderately deep to very deep well drained gravelly to very stony silt loams with very cobbly and extremely cobbly subsoil. They formed in residuum, alluvium, and colluvium derived from sedimentary and metasedimentary rock dominated by quartzite. Coarse fragments exist in the soil profile and increase with depth, usually exceeding 35 percent by volume and in some cases exceeding 60 percent. Permeability is moderate and runoff is high. The available water holding capacity (AWC) is very low to low. The site is characterized by a xeric soil moisture regime and a cryic soil temperature regime.

Soil Series Correlated to this Ecological Site

Camelback variant Valmar variant

Table 4. Representative soil features

Surface texture	(1) Gravelly silt loam (2) Very stony
Drainage class	Well drained
Permeability class	Moderate
Soil depth	51–152 cm
Surface fragment cover ≤3"	10–20%
Surface fragment cover >3"	5–25%

Available water capacity (0-101.6cm)	5.08–11.94 cm
Soil reaction (1:1 water) (0-101.6cm)	6.1–7.3
Subsurface fragment volume <=3" (Depth not specified)	50–60%
Subsurface fragment volume >3" (Depth not specified)	2–25%

Ecological dynamics

The dominant visual aspect is subalpine big sagebrush with slender wheatgrass and mountain brome in the understory. Composition by weight is approximately 60 to 70 percent grasses, 10 to 20 percent forbs, and 10 to 20 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, moose, and lagomorphs.

Fire has historically occurred on the site at intervals of 20-50 years.

The Historic Climax Plant Community (HCPC), the Reference State (State 1), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase A. This plant community is dominated by subalpine big sagebrush in the overstory with slender wheatgrass and mountain brome in the understory. Subdominant species include spike fescue, Columbia needlegrass, Letterman's needlegrass, violet, fleabane, buckwheat, and mountain snowberry. A wide variety of other grasses, forbs, and shrubs occur in small amounts. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 1400 pounds per acre (1568 kilograms per hectare) in a normal year. Production in a favorable year is 1800 pounds per acre (2016 kilograms per hectare). Production in an unfavorable year is 1000 pounds per acre (1120 kilograms per hectare). Structurally, cool season deep rooted perennial bunchgrasses are very dominant, followed by perennial forbs being about equal to tall shrubs.

FUNCTION:

This site is well suited for deer, elk, moose, raptors, and other wildlife in summer and early fall. It is also well suited for livestock use in the summer. The site has high value for hunting, hiking, and horse back riding. The site has numerous showy flowers in spring and summer.

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 is moderate. Runoff, when it does occur is non-erosive except during high intensity convection storms. Snow accumulates on the site due to high elevation and presence of tall shrubs.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency, shrubs can gradually increase. Rocky Mountain juniper can invade the site if a seed source is in the proximity. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, juniper can displace most of the shrubs and other understory species. See "Influence of juniper invasion" below.

Rocky Mountain Douglas fir may invade the site in the absence of fire.

When fires become more frequent than historic levels (20-50 years), subalpine big sagebrush is reduced significantly. With continued short fire frequency, subalpine big sagebrush can be completely eliminated along with many of the desirable understory species such as mountain brome. These species may be replaced by Kentucky bluegrass along with a variety of annual and perennial forbs including noxious and invasive species. Mountain snowberry and rabbitbrush 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. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to Rocky Mountain juniper invasion, an increase in subalpine big sagebrush 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 subalpine big sagebrush and/or Rocky Mountain juniper. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any brush management should be carefully planned as a reduction in shrubs without a suitable understory of perennial grasses can lead to an increase in undesirable species.

Weather influences:

Above normal precipitation in April, May, and June can 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 reduce total annual production and be detrimental to viable seed production. Overall plant composition is normally not affected when perennials have good vigor.

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. 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. 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:

There are very few noxious and invasive species adapted to this high elevation site. The few species that are can 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 early fall. Their numbers are seldom high enough to adversely affect the plant community.

Watershed:

Decreased infiltration and increased runoff occur with the invasion of Rocky Mountain juniper. 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 Rocky Mountain 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 A to B. Develops in the absence of fire and improper grazing management. There is a Rocky Mountain juniper seed source present in the vicinity near the site.

Phase A to C. Results from a fire or prescribed burning.

Phase A to D. Results from improper grazing management and no fire. There is no Rocky Mountain juniper seed source present in the vicinity.

Phase B to C. Results from a wildfire or brush management.

Phase B to A. Occurs with prescribed grazing and brush management or prescribed burning.

Phase C to A. Results from prescribed grazing and no fire.

Phase D to A. Occurs with prescribed grazing.

Phase D to C. Occurs with fire or prescribed burning and prescribed grazing.

Phase C to D. Occurs with no fire and improper grazing management.

State 1 Phase C and D 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 B to 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.

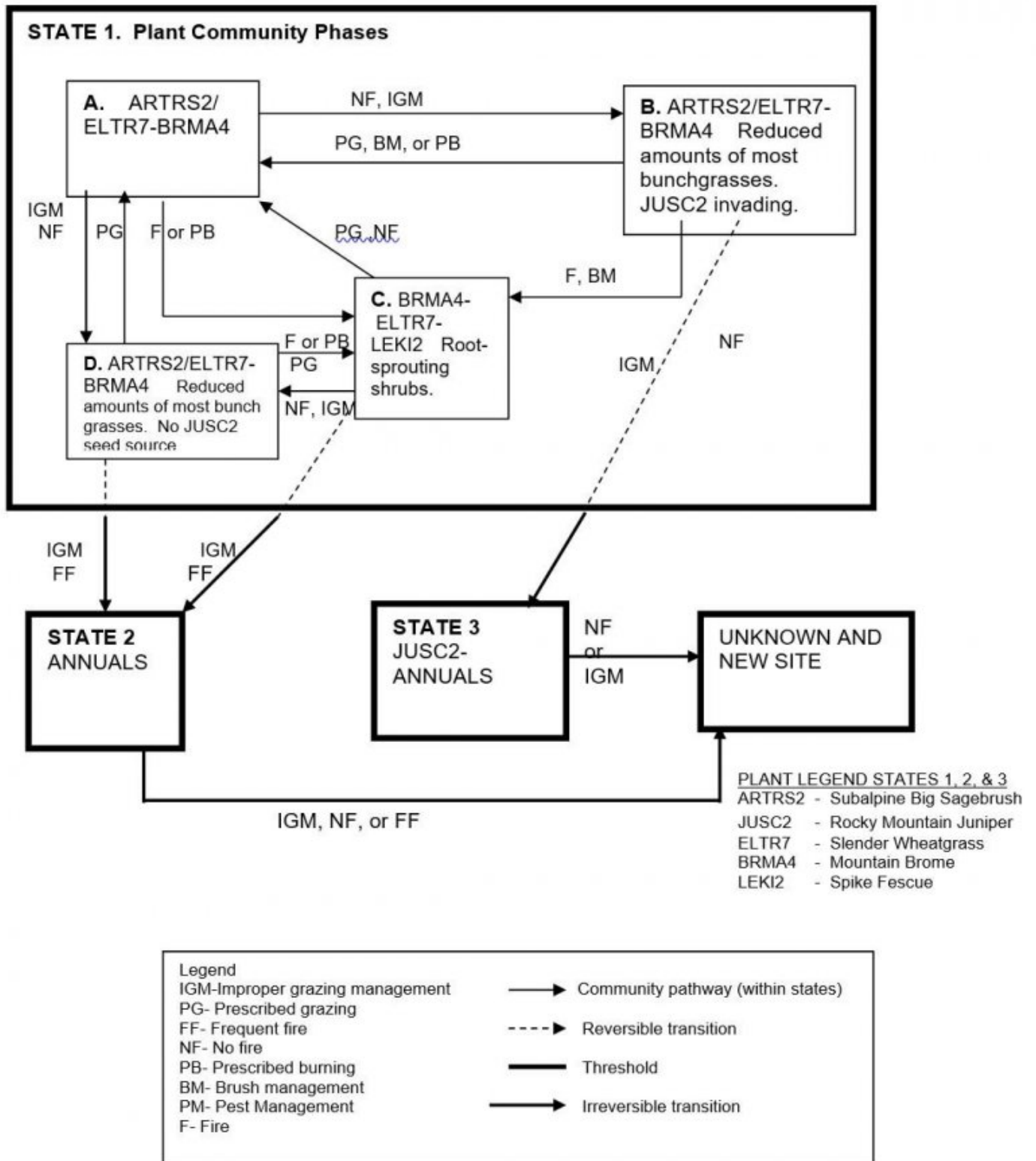
State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by improper grazing management and no fire or frequent fire cause this state to cross the threshold and retrogress to a new site with reduced potential. It is economically impractical to return this state to State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

State 3 to unknown site. Continued improper grazing management or lack of fire 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:

Seeding on this site is somewhat restricted by a short growing season and gravelly surface textures. Brush management should generally be limited to prescribed burning, beating, or chemical application due to short growing season. Revegetation would be slow if the seedbed were plowed and reseeded due to the short growing season.

State and transition model



State 1
State 1

Community 1.1
State 1 Phase A

Reference Plant Community Phase. This plant community is dominated by subalpine big sagebrush in the overstory with slender wheatgrass and mountain brome in the understory. Subdominant species include spike fescue, Columbia needlegrass, Letterman's needlegrass, violets, fleabane, buckwheat, and mountain snowberry. A wide variety of other grasses, forbs, and shrubs occur in small amounts. Natural fire frequency is 20-50 years.

Table 5. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	60-70%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

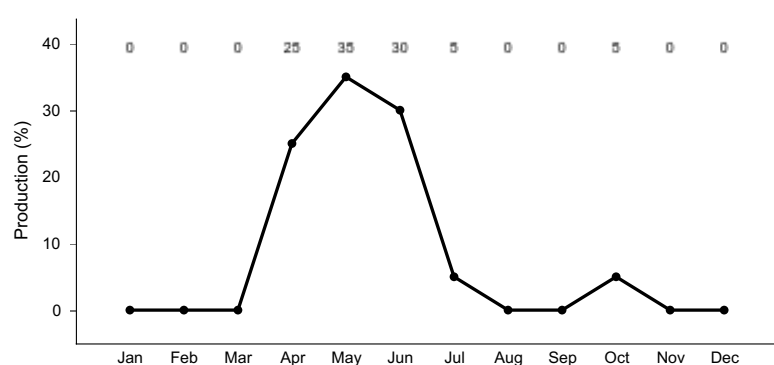


Figure 3. Plant community growth curve (percent production by month). ID0805, B13 ARTRV . State 1.

Community 1.2 State 1, Phase B

This plant community is dominated in the overstory by subalpine big sagebrush with some Rocky Mountain juniper seedlings and saplings invading. Slender wheatgrass and mountain brome are still dominant in the understory but with reduced amounts and in low vigor. A wide variety of other grasses, forbs, and shrubs may occur but in small amounts and may be in low vigor. A Rocky Mountain juniper seed source is present in nearby sites. Some Kentucky bluegrass may have invaded the site. This state has developed due to fire frequency being much longer than normal and improper grazing management.

Community 1.3 State 1, Phase C

This plant community is dominated by mountain brome with slender wheatgrass. Spike fescue is still a sub dominant due to its' ability to sprout from rhizomes. There is a wide variety of other grasses and forbs in small amounts. Letterman's and Columbia needlegrasses have decreased and may have died out due to fire. Most shrubs are absent from the site due to recent fire, except for some mountain snowberry and other root sprouting shrubs may be present. Some Kentucky bluegrass may have invaded the site. The community is a result of recent wildfire or prescribed burning.

Community 1.4 State 1, Phase D

This plant community is dominated by subalpine big sagebrush in the overstory. Slender wheatgrass and mountain brome have increased. Other bunchgrasses have been reduced and are in low vigor. There is no Rocky Mountain

juniper seed source in the proximity. Some Kentucky bluegrass may have invaded the community. This plant community has developed due to improper grazing management and no fire.

Pathway A to B
Community 1.1 to 1.2

Develops in the absence of fire and improper grazing management. There is a Rocky Mountain juniper seed source present in the vicinity near the site.

Pathway A to C
Community 1.1 to 1.3

Results from a fire or prescribed burning.

Pathway A to D
Community 1.1 to 1.4

Results from improper grazing management and no fire. There is no Rocky Mountain juniper seed source present in the vicinity.

Pathway B to A
Community 1.2 to 1.1

Occurs with prescribed grazing and brush management or prescribed burning.

Pathway B to C
Community 1.2 to 1.3

Results from a wildfire or brush management.

Pathway C to A
Community 1.3 to 1.1

Results from prescribed grazing and no fire.

Pathway C to D
Community 1.3 to 1.4

Occurs with no fire and improper grazing management.

Pathway D to A
Community 1.4 to 1.1

Occurs with prescribed grazing.

Pathway D to C
Community 1.4 to 1.3

Occurs with fire or prescribed burning and prescribed grazing.

State 2
State 2

This plant community is dominated by annuals and some perennial forbs. There may be a variety of forbs and some noxious plant species may 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.

State 3
State 3

This plant community is dominated by Rocky Mountain juniper with annuals in the understory. There are few shrubs present due to competition from junipers. Some deep-rooted perennials may be present under the junipers. When shrub cover is below 12-13%, bare ground is above 27-28%, juniper cover is greater than 20%, and infiltration less than 6 cm/hr. the plant community has crossed the threshold. Some soil loss has occurred. This plant community has developed due to the lack of fire and continued improper grazing management. It is economically impractical to return this community to State 1 with accelerated practices.

State 4
State 4

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 State 3 with dominance of the site by juniper. It is economically impractical to return this community to States 1, 2, or 3 with accelerated practices

State 5
State 2

Community 5.1
State 2

This plant community is dominated by annuals and some perennial forbs. There may be a variety of forbs and some noxious plant species may 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.

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	60-70%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

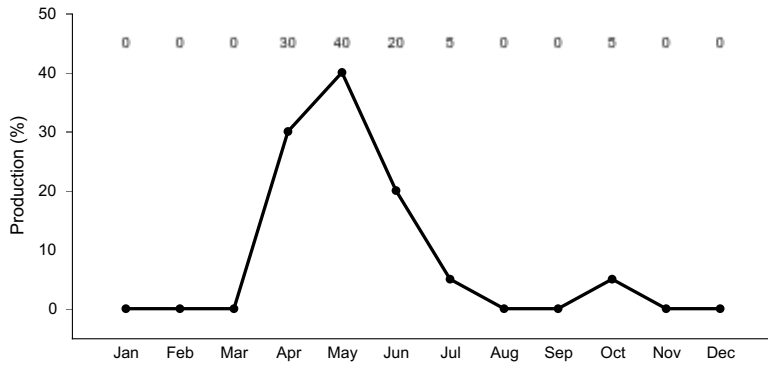


Figure 4. Plant community growth curve (percent production by month). ID0802, B13 ARTRV Early Seral. State 2.

**State 6
State 3**

**Community 6.1
State 3**

This plant community is dominated by Rocky Mountain juniper with annuals in the understory. There are few shrubs present due to competition from junipers. Some deep-rooted perennials may be present under the junipers. When shrub cover is below 12-13%, bare ground is above 27-28%, juniper cover is greater than 20%, and infiltration less than 6 cm/hr. the plant community has crossed the threshold. Some soil loss has occurred. This plant community has developed due to the lack of fire and continued improper grazing management. It is economically impractical to return this community to State 1 with accelerated practices.

Table 7. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	60-70%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

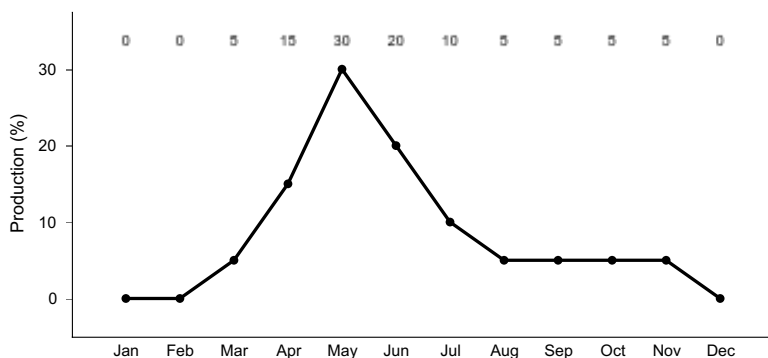


Figure 5. Plant community growth curve (percent production by month).

State 7**State 4****Community 7.1****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 no fire or frequent fires from State 2 or the continued absence of fire and improper grazing management from State 3 with dominance of the site by juniper. It is economically impractical to return this community to States 1, 2, or 3 with accelerated practices.

Table 8. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	60-70%
Surface fragments >0.25" and ≤3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Transition T1A**State 1 to 2**

State 1 Phase C and D 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.

Transition T1B**State 1 to 3**

State 1, Phase B to 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.

Transition T2A**State 2 to 4**

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.

Transition T3A**State 3 to 4**

Continued improper grazing management or lack of fire 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.

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 –Subalpine Big Sagebrush/ Slender Wheatgrass/ Mountain Brome 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 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 (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. Slender wheatgrass and mountain brome are important forage species for these large mammals during spring and fall. Subalpine big sagebrush provides big game forage throughout the year. A diverse small mammal population including golden-mantled ground squirrels, jackrabbits, deer mice, Great Basin Kangaroo rat, and chipmunks utilize this plant community. Pikas may utilize the site if adjacent to talus slopes at higher elevations.

State 1 Phase 1.2- Subalpine Big Sagebrush/ Slender Wheatgrass/ Mountain Brome/ Rocky Mountain Juniper Plant Community: This plant community is the result of improper grazing management and fire return intervals being much longer than normal. 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. The reduced diversity of insects and understory cover may reduce the quality of food and cover for reptiles. As juniper increases, quality of 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 encroachment increases the quality of this habitat is severely reduced or eliminated. The plant community supports spring through fall habitat for mule deer, elk, and moose. As juniper encroaches, the site will provide additional thermal cover for large mammals. Winter habitat quality for mule deer may increase with the addition of juniper to the plant community. A small mammal population similar to that in State 1 Phase 1.1 is present, including golden-mantled ground squirrels, jackrabbits, deer mice, Great Basin Kangaroo rat, and pikas (when talus slopes are adjacent to site).

State 1 Phase 1.3 – Slender Wheatgrass/ Mountain Brome/ Spike Fescue/ Root Sprouting Shrubs Plant Community: This plant community is a result of recent wildfire or prescribed burning. The plant community, dominated by herbaceous vegetation with little or no sagebrush would provide less vertical structure for animals. Patches of root sprouting shrubs (mountain snowberry) may be present to provide limited vertical structure. Insect diversity would be reduced, but a native forb plant community similar to that in State 1 Phase 1.1 would still support select pollinators. Reptiles including common sagebrush lizard would be limited due to the loss of sagebrush. 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

patches of mountain snowberry would limit or exclude nesting by Brewer's sparrow, sage sparrow, sage grouse, and sage thrasher. The 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 but the site would offer little young of year cover due to the loss of shrubs. The populations of small mammals would be dominated by species that prefer grass seed and open habitat. Large blocks of this plant community would fragment the reference plant community and severely reduce the quality of the habitat for shrub-steppe obligate animal species.

State 1 Phase 1.4 – Subalpine Big Sagebrush/ Slender Wheatgrass/ Mountain Brome 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. The reduced herbaceous understory results in lower diversity of insects. The reptile community would be similar to the State 1Phase 1.1 animal community. The reduced diversity of insects may reduce reptile diversity and populations. Shrub-steppe obligate bird species include Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. Quality of brood-rearing habitat 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 and elk. Young of year cover would be provided for mule-deer. Small mammal populations would be similar to those in State 1Phase 1.1

State 2 – Annuals Plant Community:

This state has developed due to continued improper grazing management and frequent fire. The plant community does not support a diverse insect community. The lack of native forbs and shrubs in the plant community would support a very limited population of pollinators. Most reptilian species are not supported with food, water, or cover. This plant community does not support the habitat requirements 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 invasive annuals (cheatgrass) are more palatable. 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 3 - Rocky Mountain Juniper / Annuals Plant Community: This state has developed due to improper grazing management and no fire. The loss of native understory vegetation will reduce insect diversity on the site. The lack of flowering plants reduces use by pollinator use by butterflies and moths. Quality of habitat for reptilian species identified in State 1 Phase 1.1 is reduced. This plant community does not support the habitat requirements 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 by raptors may decrease due to a heavy overstory of juniper. Hunting success by raptors on adjacent ecological sites may increase due to roosting and perch sites provided by juniper. The plant community supports limited seasonal habitat for elk and moose in spring and fall. The quality of winter habitat for mule deer may increase. As juniper encroaches, the site will provide additional thermal cover young of year cover for large mammals.

Grazing Interpretations.

This site suitable for summer grazing by domestic livestock.

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

The soils in this site are in hydrologic group B. They have low to moderate runoff potential.

Recreational uses

This site has limited recreational values. It offers some hunting, hiking, horseback riding, and photographic opportunities. Off-road vehicle use can also occur.

Wood products

None

Other products

None

Other information

Field Offices

American Falls, ID

Blackfoot, ID

Burley, ID

Driggs, ID

Idaho Falls, ID

Malad, ID

Pocatello, ID

Rexburg, ID

Soda Springs, ID

St. Anthony, ID

Revision Notes: "Previously Approved" Provisional

This Provisional ecological site concept has passed Quality Control (QC) and Quality Assurance (QA) to ensure that the site meets the 2014 NESH standards for a Provisional ecological site description. This is an updated "Previously Approved" ESD that represents a first-generation tier of documentation that, prior to the release of the 2014 National Ecological Site Handbook (NESH), met all requirements as an "Approved" ESD as laid out in the 1997 (rev.1, 2003) National Range and Pasture Handbook (NRPH). The document fully described the Reference State and Community Phase in the State-and-Transition model. All other alternative states are at least described in narrative form. The "Previously Approved" ESD has been field-tested for a minimum of five years and is a proven functional document for conservation planning. The "Previously Approved" ESD does not contain all tabular and narrative entries as required in the current "Approved" level of documentation, but it is expected that the "Previously Approved" ESD will continue refinement toward an "Approved" status.

Site Development and Testing Plan:

Future work, as described in a Project Plan, is necessary to validate the information in this Provisional Ecological Site Description. This will include field activities to collect low-, medium-, and high-intensity sampling, soil correlations, and analysis of that data. Annual field reviews should be done by soil scientists and vegetation specialists. The final field review, peer review, quality control, and quality assurance reviews of the ESD will be required to produce the final document.

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
Kristen May, Resource Soil Scientist, NRCS, Idaho

Type locality

Location 1: Bannock County, ID	
General legal description	Near Sedgewick Peak in Bannock County, Idaho

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".

Petersen, S.L., 2004. A Landscape-Scale Assessment of Plant Communities, Hydrologic Processes, and State-and-Transition Theory in a Western Juniper Dominated Ecosystem. PhD Dissertation. Oregon State University, Corvallis, Oregon.

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/feis

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.

Author(s)/participant(s)	Dave Franzen and Jacy Gibbs Intermountain Range Consultants 17700 Fargo Rd. Wilder, ID 83676
Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	05/14/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** rills rarely occur on this site. If rills are present they are most likely to occur immediately following wildfire on lighter textured soils. Gravelly surfaces reduce rill formation.
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2. **Presence of water flow patterns:** water-flow patterns rarely occur on this site. They are most likely to occur on slopes greater than 15 percent with high intensity storms. When they occur they are short, disrupted by cool season perennial grasses and tall shrubs and are not extensive.

3. **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.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** data not available. On sites in mid-seral status, bare ground may range from 10-20 percent.

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

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. 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 but needs to be tested.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** structure ranges from weak very fine and fine granular to weak fine subangular blocky. Soil organic matter (SOM) ranges from 3 to 5 percent. Surface color is usually very dark brown to very dark grayish brown. The A or A1 horizon is typically 2 to 5 inches thick.

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. 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: cool season deep-rooted perennial grasses

Sub-dominant: perennial forbs

Other: tall shrubs

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** mountain big sagebrush will become decadent in the absence of fire and ungulate grazing. Grass and forb mortality will occur as tall shrubs increase.
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14. **Average percent litter cover (%) and depth (in):** annual litter cover in the interspaces will be 5-10 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
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 1400 lbs. per acre in a year with normal precipitation and temperatures. Perennial grasses produce 60-70 percent of the total, forbs 10-20 percent, and shrubs 10-20 percent.
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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** includes Kentucky bluegrass, Canada thistle, knapweed, and leafy spurge.
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17. **Perennial plant reproductive capability:** all functional groups have the potential to reproduce in most years.
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