# Ecological site R025XY038ID
# ASHY SOUTH SLOPE 10-16

Last updated: 4/25/2024
Accessed: 05/19/2024

## General information

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

## MLRA notes

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

MLRA 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 wyomingensis 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 occurs on steep to very steep slopes with >30 percent slopes on southerly and westerly facing aspects. The elevation varies from 4800 to 5900 feet.

The soils supporting this site are moderately deep with an ashy texture. They are well to somewhat excessively drained, with moderately rapid permeability above weakly consolidated volcanic ash. Plant roots will penetrate into the fractured ash. Runoff is medium. The erosion hazard is moderate to severe by water and slight by wind. Soil erosion can be a severe hazard if the vegetative cover is disturbed. The available water holding capacity (AWC) is very low to low.

The plant community is dominated by Wyoming big sagebrush and Indian ricegrass.

## Associated sites

| | |
|---|---|
| R025XY008ID | **NORTH SLOPE STONY 12-16** |
| R025XY010ID | **CLAYPAN 12-16** |
| R025XY019ID | **LOAMY 10-13** |

| | |
|---|---|
| R025XY028ID | **LOAMY BOTTOM 12-16** |

## Similar sites

| | |
|---|---|
| R025XY004ID | **SHALLOW STONY 12-16**<br>Shallow Stony 12-16 is typically more shallow; 10 to 20 inches to bedrock. Dominant species are ARTRW8/PSSP6. |
| R025XY006ID | **SOUTH SLOPE STONY 10-13**<br>South Slope Stony 10-13 is typically 40 to 60 inches to bedrock. Dominant species are ARTRW8/PSSP6. |

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | Not specified |
| Shrub | (1) *Artemisia tridentata subsp. wyomingensis* |
| Herbaceous | (1) *Achnatherum hymenoides* |

## Physiographic features

This site occurs on steep to very steep slopes with >30 percent slopes on southerly and westerly facing aspects. The elevation varies from 4800 to 5900 feet (1463-1798 meters). Rock outcrops may be associated with this site.

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Hill<br>(2) Escarpment<br>(3) Mesa |
| Runoff class | Medium to very high |
| Flooding frequency | None |
| Ponding frequency | None |
| Elevation | 1,463–1,798 m |
| Slope | 30% |
| Water table depth | 152 cm |
| Aspect | W, S, SW |

## Climatic features

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

No climate stations exist nearby site.

**Table 3. Representative climatic features**

| | |
|---|---|
| Frost-free period (average) | 103 days |
| Freeze-free period (average) | 140 days |
| Precipitation total (average) | 406 mm |

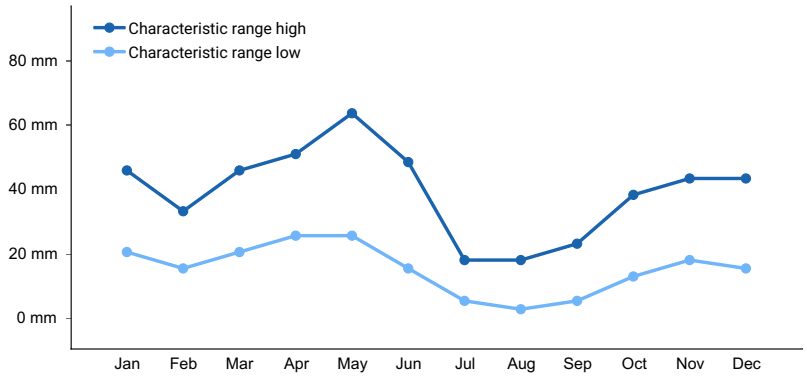



**Figure 1. Monthly precipitation range**

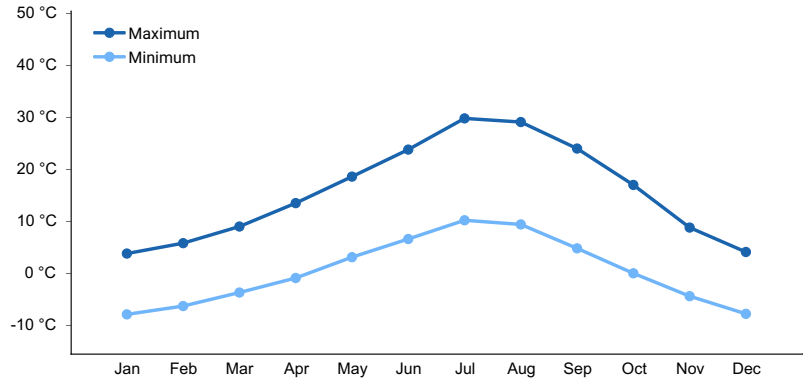



**Figure 2. Monthly average minimum and maximum temperature**

## 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, well to somewhat excessively drained, with moderately rapid permeability above weakly consolidated volcanic ash. Plant roots will penetrate into the fractured ash. Runoff is medium. The erosion hazard is moderate to severe by water and slight by wind. Soil erosion can be a severe hazard if the vegetative cover is disturbed. The available water holding capacity (AWC) is very low to low. The surface texture is generally loam or fine sandy loams with few or no surface stones. The subsoil is usually weakly developed with clay ranging from approximately 8 to 18 percent. These soils are characterized by limited AWC and a torric or xeric soil moisture regime. Soil temperature regime is mesic.

Soil series correlated to this site are: Bluehill and Udaho

**Table 4. Representative soil features**

| | |
|---|---|
| Parent material | (1) Alluvium<br>(2) Residuum |
| Surface texture | (1) Ashy loam<br>(2) Gravelly fine sandy loam |
| Drainage class | Well drained to somewhat excessively drained |
| Permeability class | Moderately rapid |
| Depth to restrictive layer | 51–102 cm |
| Soil depth | 51–102 cm |
| Surface fragment cover <=3" | 11–34% |
| Surface fragment cover >3" | 0–3% |

| | |
|---|---|
| Available water capacity (0-101.6cm) | 2.79–16.51 cm |
| Calcium carbonate equivalent (0-101.6cm) | 0–5% |
| Electrical conductivity (0-101.6cm) | 0–4 mmhos/cm |
| Sodium adsorption ratio (0-101.6cm) | 2–5 |
| Soil reaction (1:1 water) (0-101.6cm) | 7.4–8.4 |
| Subsurface fragment volume <=3" (Depth not specified) | 0–14% |
| Subsurface fragment volume >3" (Depth not specified) | 0–37% |

## Ecological dynamics

Ecological Dynamics of the Site:

The dominant visual aspect of this site is Wyoming big sagebrush overstory with Indian ricegrass and bluebunch wheatgrass in the understory. Composition by weight is approximately 45-65 percent grass, 10-15 percent forbs and 20-40 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, pronghorn antelope, lagomorphs and small rodents.

Fire has historically occurred on the site at intervals of 60-80 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 Indian ricegrass and bluebunch wheatgrass in the understory and Wyoming big sagebrush in the overstory. Bitterbrush is usually present. Subdominant species include needle and thread grass, Thurber’s needlegrass, basin wildrye, Sandberg bluegrass, bottlebrush squirreltail, aster, eriogonum, arrowleaf balsamroot and sand scurfpea. The plant species composition of Phase A is listed later under “Reference Plant Community Phase Plant Species Composition”.

*Tortula ruralis*, a moss, is an important contributor to ground cover. In this site and other Wyoming big sagebrush sites, it and other cryptogams may contribute in excess of 50 percent cover.

Total annual production is 450 pounds per acre (504 kilograms per hectare) in a normal year. Production in a favorable year is 750 pounds per acre (840 kilograms per hectare). Production in an unfavorable year is 250 pounds per acre (280 kilograms per hectare). Structurally, cool season deep rooted perennial bunchgrasses are very dominant, followed by tall shrubs being more dominant than perennial forbs while shallow rooted bunchgrasses are subdominant.

FUNCTION:

This site is best suited for late spring and fall grazing. The steeper slopes will limit livestock movement. This site provides valuable wildlife food and cover for deer, elk, raptors and other small wildlife species. There can be winter use by big game.

Due to the low production of the site, this site is easily degraded by improper grazing management or frequent fires.

This site provides recreational opportunities for hunting, hiking and photography.

Infiltration can be good and runoff low where the community is in mid to late seral status. Runoff, when it does occur can be erosive on these steep slopes particularly during high intensity convection storms. Snow does not normally accumulate to any degree on these slopes during the winter.

Impacts on the Plant Community:

Influence of fire:

In the absence of normal fire frequency, Wyoming big sagebrush can gradually increase on the site. Antelope bitterbrush may increase slightly and some western juniper can invade at the upper elevations of the site if a seed source is in the proximity. Grasses and forbs decrease as shrubs increase. At the upper elevations with the continued absence of fire, juniper can displace most of the shrubs and other understory species.

When fires become more frequent than historic levels (60-80 years), Wyoming big sagebrush and antelope bitterbrush are reduced significantly. With continued short fire frequency, big sagebrush and bitterbrush can be completely eliminated along with many of the desirable understory species such as Indian ricegrass and bluebunch wheatgrass. These species may be replaced by cheatgrass, Sandberg bluegrass and bulbous bluegrass along with a variety of annual and perennial forbs including noxious and invasive species.

Influence of improper grazing management:

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

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

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 Wyoming big sagebrush and/or western juniper. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any brush management should be carefully planned, as a reduction in shrubs can increase cheatgrass which will lead to more frequent fire intervals.

Due to the soil surface texture, improper grazing management usually results in the development of terracettes. On steeper slopes massive soil erosion can occur during intense convection storms.

Weather influences:

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

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

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

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. The sagebrush defoliator moth (Aroga websterii) causes mortality in relatively small patches. 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:

Many of these species add to the fine-fuel component and lead to increased fire frequency.
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 spring 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. Burrowing rodents can provide micro-sites for invasive species.

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 when Wyoming big sagebrush is removed following a fire or at higher elevation, the invasion of juniper. Juniper invasion can be triggered by lack of fire, improper grazing management and prolonged drought. The increased runoff also causes sheet and rill erosion. The long-term effect can be a transition to a different state.

Influence of juniper invasion:

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

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

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

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

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

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

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.
Phase A to B. Develops in the absence of fire. Improper grazing management could also be present. There is a juniper seed source near the site. This community is at the upper end of the precipitation zone for this site.
Phase A to C. Usually results from a wildfire or brush management.
Phase A to D. Results from improper grazing management and no fire.
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 or 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 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.

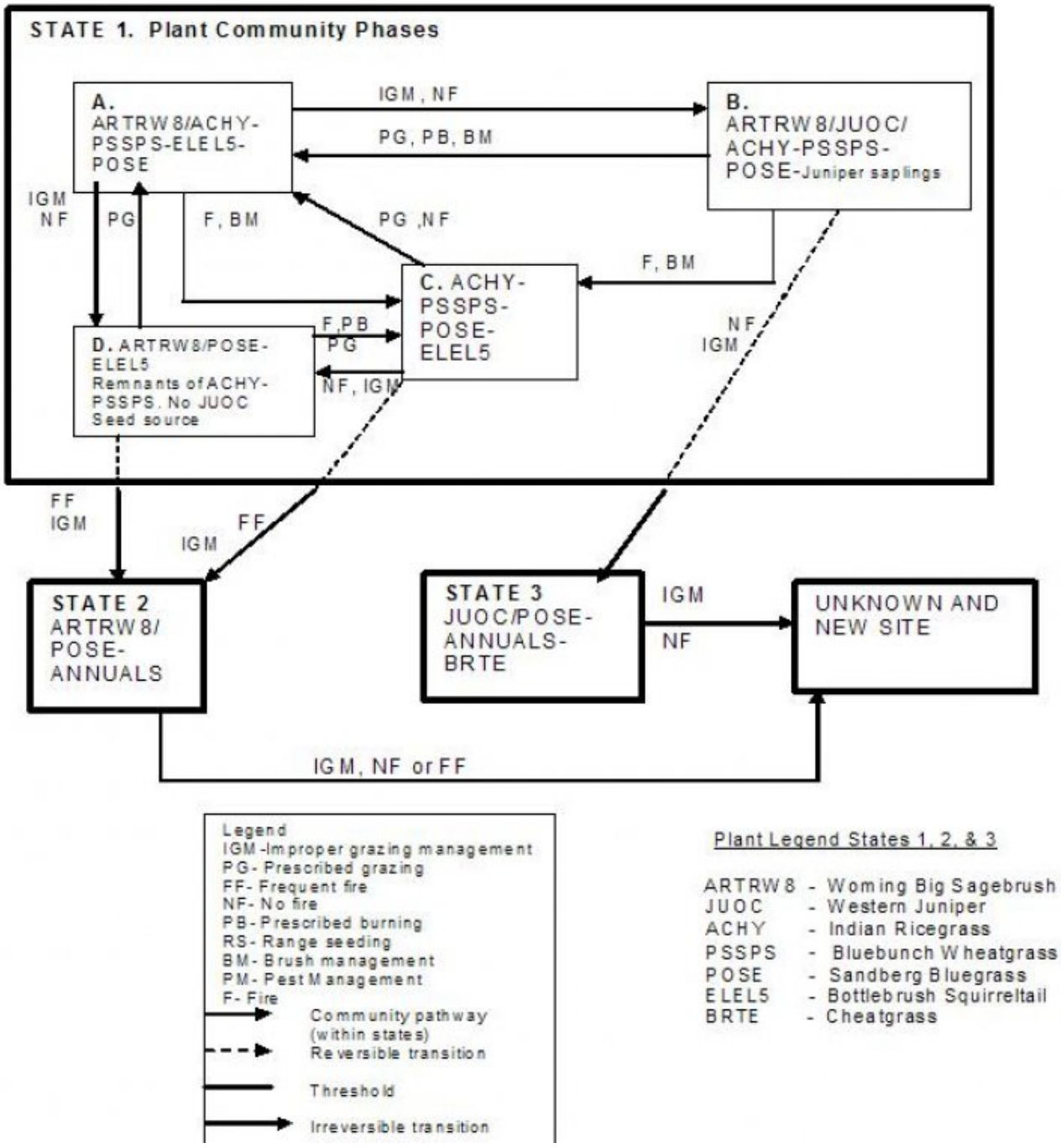
State 3 to unknown site. Continued lack of fire or improper grazing management cause this state to cross the threshold and retrogress to a new site with reduced potential due to significant soil loss and changes in hydrology. It is economically impractical to return this state to State 1 with accelerated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

Practice Limitations:

Severe limitations exist for seeding on this site with ground moving equipment due to the steepness of the slopes. Brush management is not recommended due to slopes and erosive potential of the soils.

## State and transition model

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




## State 1
## State 1, Phase A, Reference Plant Community Phase.

## Community 1.1
## State 1, Phase A, Reference Plant Community Phase.

This plant community has Wyoming big sagebrush in the overstory with Indian ricegrass and bluebunch wheatgrass in the understory. Other significant species in the plant community are bottlebrush squirreltail, Sandberg bluegrass, thickspike wheatgrass, basin wildrye, aster species, arrowleaf balsamroot, and scurfpea, antelope bitterbrush and four-wing saltbush. Natural fire frequency is 60-80 years.

**Table 5. Annual production by plant type**

| Plant Type | Low (Kg/Hectare) | Representative Value (Kg/Hectare) | High (Kg/Hectare) |
|---|---|---|---|
| Grass/Grasslike | 163 | 269 | 476 |
| Shrub/Vine | 84 | 168 | 252 |
| Forb | 34 | 67 | 112 |
| **Total** | **281** | **504** | **840** |

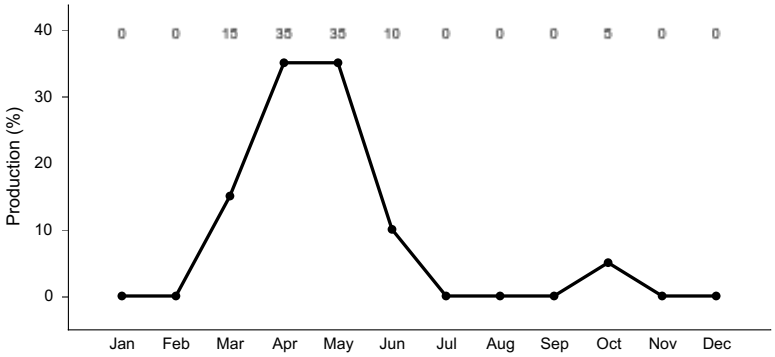



**Figure 4. Plant community growth curve (percent production by month). ID0907, ARTRW8/PSSPS LOW PRECIP..**

## Community 1.2
## 1.2 Community B

This plant community is dominated in the overstory by Wyoming big sagebrush with some western juniper seedlings and saplings invading. Indian ricegrass, bluebunch wheatgrass, and Sandberg bluegrass are present in the understory but some bunchgrasses may have reduced vigor. Some forbs such as aster, sand scurfpea, lomatium and lupine have increased. A juniper seed source is present in nearby sites. Some cheatgrass may be present. This state has developed due to fire frequency being much longer than normal or improper grazing management with no fire.

## Community 1.3
## 1.3 Community C

This plant community is dominated by Indian ricegrass and bluebunch wheatgrass. Sandberg bluegrass, bottlebrush squirreltail, thickspike wheatgrass and other perennial grasses and forbs are subdominant. Most shrubs are absent from the site due to recent fire, except some rabbitbrush may be present. Some cheatgrass may also be present. The community is a result of recent wildfire, prescribed burning or brush management.

## Community 1.4
## 1.4 Community D

This plant community is dominated by Wyoming big sagebrush in the overstory with reduced amounts of Indian ricegrass and bluebunch wheatgrass. Sandberg bluegrass and bottlebrush squirreltail have increased. Antelope bitterbrush has reduced vigor and maybe hedged in shape. There is no western juniper seed source in the proximity. Some cheatgrass may be present. This plant community has developed due to improper grazing management and no fire.

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

Develops in the absence of fire. Improper grazing management could also be present. There is a juniper seed source near the site. This community is at the upper end of the precipitation zone for this site.

## Pathway P1.1a

### Community 1.1 to 1.3

Usually results from a wildfire or brush management.

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

Results from improper grazing management and no fire.

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

Occurs with prescribed grazing and brush management or prescribed burning.

### Pathway P1.2b
### Community 1.2 to 1.3

Results from a wildfire or brush management.

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

Results from prescribed grazing and no fire.

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

Occurs with no fire and improper grazing management.

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

Occurs with prescribed grazing.

### Pathway P1.4b
### Community 1.4 to 1.3

Occurs with fire or prescribed burning and prescribed grazing.

## State 2
## State 2

Annual Grasses

### Community 2.1
### State 2

This plant community is dominated by Wyoming big sagebrush with Sandberg bluegrass and annuals in the understory. Cheatgrass is a dominant annual in the community. 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.

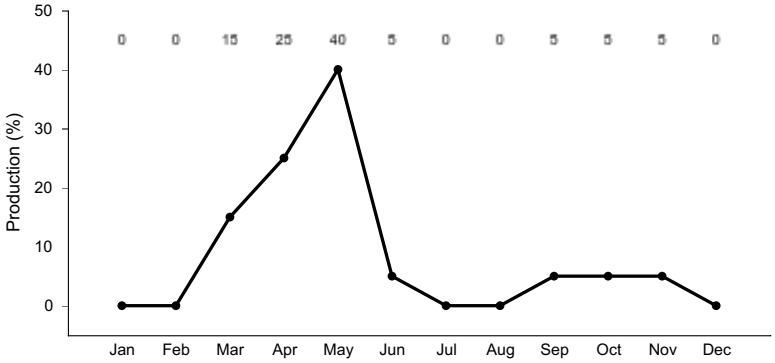



**Figure 5. Plant community growth curve (percent production by month). ID0911, D25 POSE/BRTE/ANNUALS.**

## State 3
## State 3.

Juniper with Annual Grasses

## Community 3.1
## State 3.

This plant community is dominated by western juniper with Sandberg bluegrass and annuals in the understory. Cheatgrass is a dominant annual. There are few shrubs present due to competition from junipers. Some deep-rooted perennial grasses may be present under the junipers. Some soil loss has occurred. This plant community has developed due to continued improper grazing management and lack of fire. This site has crossed the threshold. It is economically impractical to return this community to State 1 with accelerated practices.

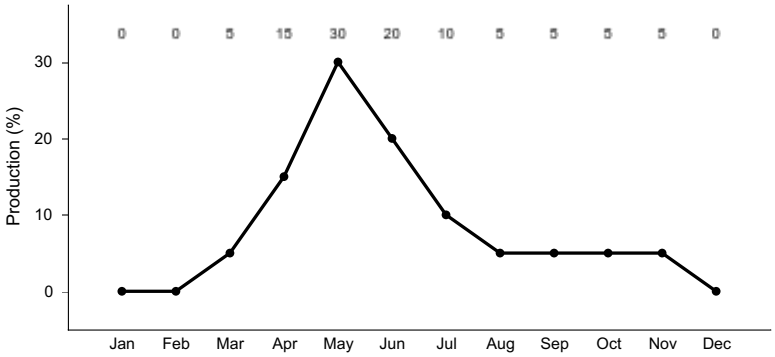



**Figure 6. Plant community growth curve (percent production by month). ID0903, D25 JUOC/POSE/ANNUALS.**

## State 4
## Unknown new site

## 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/or frequent fires or the continued absence of fire where a juniper seed source is present.

## Transition T1A
## State 1 to 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

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 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.

## Additional community tables

**Table 6. Community 1.1 plant community composition**

| Group | Common Name | Symbol | Scientific Name | Annual Production (Kg/Hectare) | Foliar Cover (%) |
|---|---|---|---|---|---|
| **Grass/Grasslike** | | | | | |
| 1 | **Grass/Grasslike** | | | 163–476 | |
| | Indian ricegrass | ACHY | *Achnatherum hymenoides* | 71–211 | – |
| | bluebunch wheatgrass | PSSPS | *Pseudoroegneria spicata ssp. spicata* | 35–105 | – |
| | needlegrass | ACHNA | *Achnatherum* | 21–63 | – |
| | Sandberg bluegrass | POSE | *Poa secunda* | 10–29 | – |
| | squirreltail | ELEL5 | *Elymus elymoides* | 10–29 | – |
| | thickspike wheatgrass | ELLAL | *Elymus lanceolatus ssp. lanceolatus* | 10–29 | – |
| | basin wildrye | LECI4 | *Leymus cinereus* | 10–29 | – |
| | sand dropseed | SPCR | *Sporobolus cryptandrus* | 1–12 | – |
| 2 | **Mid Grasses** | | | 84–224 | |
| | aster | ASTER | *Aster* | 10–29 | – |
| | balsamroot | BALSA | *Balsamorhiza* | 10–29 | – |
| | scurfpea | PSORA2 | *Psoralidium* | 9–26 | – |
| | buckwheat | ERIOG | *Eriogonum* | 7–21 | – |
| | evening primrose | OENOT | *Oenothera* | 6–17 | – |
| | vetch | VICIA | *Vicia* | 4–12 | – |
| | lupine | LUPIN | *Lupinus* | 4–12 | – |
| | phlox | PHLOX | *Phlox* | 1–4 | – |
| | desertparsley | LOMAT | *Lomatium* | 1–4 | – |
| | mustard | BRASS2 | *Brassica* | 1–4 | – |
| **Forb** | | | | | |
| 2 | **Forb** | | | 34–112 | |
| | Wyoming big sagebrush | ARTRW8 | *Artemisia tridentata ssp. wyomingensis* | 35–105 | – |
| | chrysactinia | CHRYS | *Chrysactinia* | 10–29 | – |
| | antelope bitterbrush | PUTR2 | *Purshia tridentata* | 10–29 | – |
| | spineless horsebrush | TECA2 | *Tetradymia canescens* | 7–21 | – |
| | fourwing saltbush | ATCA2 | *Atriplex canescens* | 0–9 | – |
| | plains pricklypear | OPPO | *Opuntia polyacantha* | 1–4 | – |
| **Shrub/Vine** | | | | | |
| 3 | **Shrub** | | | 84–252 | |

## Animal community

Wildlife Interpretations.

This site has high value as winter and spring range for mule deer. Elk may use the site at higher elevations. This site provides valuable wildlife food and cover for deer, elk, raptors and other small wildlife species. There can be winter use by big game.

Grazing Interpretations.

This site is best suited to late spring or fall grazing. The steep slopes will limit livestock movement and forage accessibility.

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 moderately low runoff potential.

## Recreational uses

The site has value for hiking, photography, and hunting activities.

## Wood products

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

## 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, State Rangeland Management Specialist, NRCS, Idaho
Joe May, State Rangeland Management Specialist, NRCS, Idaho
Leah Juarros, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Assistant State Conservationist, NRCS, Idaho (Retired)

## Type locality

| Location 1: Cassia County, ID | |
|---|---|
| Township/Range/Section | T16 S R21 E S10 |
| Latitude | 42° 3′ 5″ |
| Longitude | 113° 58′ 35″ |
| General legal description | about 14 miles south of Oakley, Idaho, about 1,200 feet west and 1,500 feet south of the northeast corner of sec. 10, T. 16 S., R. 21 E.; USGS Blue Hill 7.5 minute topographic quadrangle |

## 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; Technical Reference 1734-6; version 4-2005.

## Contributors

Dave Franzen And Jacy Gibbs

## Approval

Kendra Moseley, 4/25/2024

## Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

| | |
|---|---|
| Author(s)/participant(s) | D. Franzen and J. Gibbs |
| Contact for lead author | USDA, Natural Resources Conservation Service<br>Idaho State Office<br>9173 W. Barnes Drive, Suite C<br>Boise, ID 83709<br>(208) 378-5722 |
| Date | 03/12/2006 |
| Approved by | Kendra Moseley |
| Approval date | |
| Composition (Indicators 10 and 12) based on | Annual Production |

## Indicators

1. **Number and extent of rills:** Rills: can occur on this site. If rills are present they are likely to occur immediately following wildfire. Rills, when present, are weakly defined due to sandy surface textures.

---

2. **Presence of water flow patterns:** Water-Flow Patterns: can occur on this site. When they occur they are short and disrupted by cool season grasses and tall shrubs and are not extensive. Permeability is rapid once the surface is moist thus reducing runoff.

---

3. **Number and height of erosional pedestals or terracettes:** Pedestals and/or Terracettes: both can occur on this site. Terracettes are common and a natural occurrence on the site. Accumulation of sandy surface material develops on the uphill side of larger perennial grasses and shrubs. This accumulation is from concentrated flow or following intense rainfall events.

---

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare Ground: data is not available. On sites in mid-seral status, bare ground may range from 30-50%. *Tortula ruralis*, a moss, is an important contributor to ground cover.

---

5. **Number of gullies and erosion associated with gullies:**

---

6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind-Scoured, Blowouts, and/or Deposition Areas: can be found due to the sandy surface textures. Blowouts usually occur following a wildfire and will be noticeable by deposition around perennial bunchgrasses.

---

7. **Amount of litter movement (describe size and distance expected to travel):** Litter Movement: fine litter in the interspaces may move up to 5 feet following a significant run-off event. It generally moves onto terracettes. Coarse litter generally does not move except on the steeper slopes.

---

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil Surface Resistance to Erosion: values should range from 4-6 but needs to be tested.

---

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil Surface Loss or Degradation: the surface horizon is typically 3 to 7 inches thick. Structure typically includes weak fine granular, and weak medium subangular blocky. Soil organic matter (SOM) is 1 to 4 percent.

---

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant Community Composition and Distribution Relative to Infiltration: bunchgrasses, especially deep-rooted perennials, slow run-off and increase infiltration. Tall 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):** Compaction Layer: 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: Functional/Structural Groups: cool season deep-rooted perennial bunchgrasses > tall shrubs > perennial forbs > shallow rooted bunchgrasses. Deep-rooted perennials with fibrous root systems are needed for soil stability.

Sub-dominant:

Other:

Additional:

---

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

---

14. **Average percent litter cover (%) and depth ( in):** Litter Amount: additional litter cover data is needed but is expected to be 5-10 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):** Annual Production: is 450 pounds per acre (504 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 45-65 percent of the total production, forbs 10-15 percent and shrubs 20-40 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:** Invasive Plants: include cheatgrass, leafy spurge, dalmatian toadflax, bulbous bluegrass, rush skeletonweed, musk and scotch thistle and diffuse, Russian and spotted knapweed, Russian thistle, and mustard.

---

17. **Perennial plant reproductive capability:** Reproductive Capability of Perennial Plants: all functional groups have the potential to reproduce in favorable years.

---