USDA Natural Resources
Conservation Service

Ecological site R013XY036ID
Loamy 12-16 PZ ARTRW8/PSSPS

Last updated: 9/23/2020
Accessed: 05/14/2024

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): 013X–Eastern Idaho Plateaus

013X-Eastern Idaho Plateaus

Precipitation or Climate Zone: 12-16” P.Z.
https://soils.usda.gov/survey/geography/mlra/index.html

Classification relationships

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

R013XY035ID	**South Slope Loamy 12-16 PZ ARTRW8/PSSPS**
R013XY045ID	**Loamy Bottom 12-16 PZ ARTRT/LECI4-ELLAL**

Similar sites

R013XY004ID	**Shallow Gravelly 12-16 PZ ARTRV/PSSPS**
R013XY001ID	**Loamy 12-16 PZ**

Table 1. Dominant plant species

Tree	Not specified

Shrub	(1) *Artemisia tridentata ssp. wyomingensis*
Herbaceous	(1) *Pseudoroegneria spicata*

Physiographic features

This site occurs on gently to somewhat rolling hills, terraces and fans. Slopes are generally less than 20 percent, but occasionally reach 40 percent. Elevations range from 4600 to 6600 feet (1400 to 2000 meters).

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Terrace (3) Fan
Flooding frequency	None
Ponding frequency	None
Elevation	1,402–2,012 m
Slope	0–40%
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

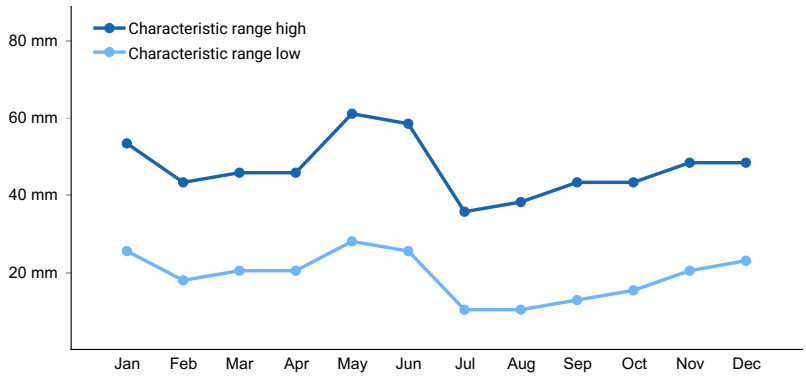


Figure 1. Monthly precipitation range

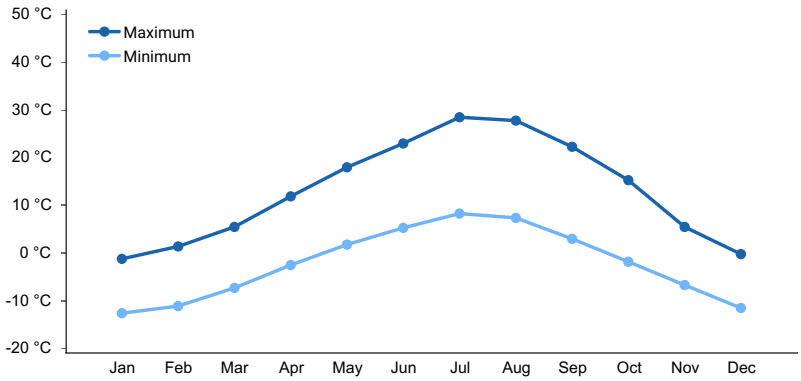


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils on this site are generally silt loams, or gravelly silt loams. They are very deep and Arimo has a strongly contrasting textural stratification at 20 to 40 inches. The soils are well drained and have a moderate permeability, and formed in a mixture of loess and mixed alluvium or silty alluvium overlying sand and gravel. Runoff hazard is low to rapid. The available water holding capacity (AWC) is low to medium. These soils are characterized by a xeric soil moisture regime and a frigid soil temperature regime.

Soil Series Correlated to this Ecological Site

Arimo
Bearhollow
Wursten

Table 4. Representative soil features

Surface texture	(1) Gravelly silt loam
Drainage class	Well drained
Permeability class	Moderate
Soil depth	152 cm
Surface fragment cover <=3"	2–25%
Surface fragment cover >3"	0–5%
Available water capacity (0-101.6cm)	11.18–17.53 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–8
Soil reaction (1:1 water) (0-101.6cm)	6.6–8.4

Subsurface fragment volume <=3" (Depth not specified)	10–40%
Subsurface fragment volume >3" (Depth not specified)	0–10%

Ecological dynamics

Ecological Dynamics of the Site:

The dominant visual aspect of the site is Wyoming big sagebrush and bluebunch wheatgrass. Composition by weight is approximately 55-75 percent grasses, 10-20 percent forbs, and 15-25 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, pronghorn antelope, lagomorphs, and small rodents.

Fire has historically occurred on the site at intervals of 35-55 years.

The Historic Climax Plant Community (HCPC), the Reference State (State 1), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase A. This plant community is dominated by bluebunch wheatgrass in the understory and Wyoming big sagebrush in the overstory. Subdominant species include Sandberg bluegrass, Nevada bluegrass, thickspike wheatgrass, prairie junegrass, arrowleaf balsamroot, and longleaf phlox. There is a large variety of other forbs and some other shrubs that can occur in minor amounts. The plant species composition of Phase A is listed later under “Reference Plant Community Phase Plant Species Composition”.

Total annual production is 1000 pounds per acre (11120 kilograms per hectare) in a normal year. Production in a favorable year is 1600 pounds per acre (1792 kilograms per hectare). Production in an unfavorable year is 600 pounds per acre (672 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 perennial bunchgrasses are subdominant.

FUNCTION:

This site is suited for grazing by domestic livestock in late spring, early summer, and fall. This site provides fair to good habitat for various upland wildlife including mule deer, sage grouse, and songbirds. This site has slight recreation or aesthetic value. Some spring blooming forbs add color to the landscape. Some hunting of upland game occurs in the fall. Due to the lack of surface stones and relatively flat slopes, this site is easily degraded by improper grazing management or frequent fires.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency, Wyoming big sagebrush and antelope bitterbrush can gradually increase on the site. Utah juniper can invade the site if a seed source is in the vicinity. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, Wyoming big sagebrush or juniper can displace most of the primary understory species. See “Influence of Utah juniper invasion” below.

When fires become more frequent than historic levels (35-55 years), Wyoming big sagebrush and antelope bitterbrush are reduced significantly. Rabbitbrush and horsebrush can increase slightly. With continued short fire frequency, Wyoming big sagebrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass and thickspike wheatgrass. These species may be replaced by Sandberg bluegrass along with a variety of annual and perennial forbs including noxious and invasive plants. Cheatgrass will invade the site. These fine fuels will increase the fire frequency.

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 antelope bitterbrush. Antelope bitterbrush usually is heavily hedged. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to juniper invasion, an increase in Wyoming big sagebrush, and noxious and invasive plants.

Continued improper grazing management influences fire frequency by increasing fine fuels. As cheatgrass increases and becomes co-dominant with Sandberg bluegrass and other annuals, 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 Utah juniper if a seed source is in the vicinity. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Brush management should be carefully planned, as a reduction in shrubs without a suitable understory of perennial grasses can cause an increase in cheatgrass which again, will lead to more frequent fire intervals. Sites with bitterbrush need to be very carefully evaluated because of its' importance to wildlife.

Weather influences:

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

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

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

Influence of insects and disease:

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. It seldom kills the entire stand. 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 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, fall, and winter. Their numbers are seldom high enough to adversely affect the plant community.

Watershed:

Decreased infiltration and increased runoff occur with an increase in Wyoming big sagebrush. Desired understory species can be reduced. This composition change can affect nutrient and water cycles. Increased runoff also causes sheet and rill erosion. Abnormally short fire frequency also gives the same results, but to a lesser degree. The long-term effect is a transition to a different state.

Influence of Utah juniper invasion:

In plant communities that are invaded by Utah juniper, the species has a competitive advantage for the following reasons:
• Utah juniper is very drought tolerant.
• It has the ability to extract soil moisture from a wide range of soil depths.
• Utah 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.
• Utah 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, Utah juniper gains control of energy capture.

As Utah 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 Utah 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 Utah juniper cover and density results in greater plant and soil disturbance between the canopies.

In summary, a closed Utah 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 Utah juniper canopy always results in a transition across the threshold to a different state. Generally, when Utah juniper canopy cover nears 20%, the plant community is approaching the threshold.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.
Phase A to B. Develops in the absence of fire. No Utah juniper seed source in the proximity.
Phase A to C. Usually results from improper grazing management and absence of fire. A Utah juniper seed source is present.
Phase A to D. Results from one or more fires.
Phase A to E. Develops in the absence of fire and improper grazing management. A Utah juniper seed source is present.
Phase A to F. Results from improper grazing management and absence of fire. No Utah juniper seed source is present.
Phase B to A. Results from prescribed grazing management.
Phase C to A. Develops with prescribed grazing management and prescribed burning or fire.
Phase D to A. Usually results from prescribed grazing management and no fire.
Phase E to A. Develops from prescribed grazing management and prescribed burning or brush management.
Phase F to A. Results from prescribed grazing management, no fire or brush management.
Phase B to D. This develops from prescribed burning or fire.
Phase C to D. This develops from prescribed burning or fire.

Phase E to D. Results from prescribed burning or fire.
Phase F to D. Results from prescribed burning or fire.

State 1 Phase D to State 2, Phase B. Develops through improper grazing management and frequent fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 1 Phase F to State 2, Phase A. Develops through improper grazing management with no fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 1 Phase C or E to State 3. Results from improper grazing management and lack of fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 2 Phase A to State 2, Phase B. Results from improper grazing management and fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 2 Phase B to State 2, Phase A. Results from no fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 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.

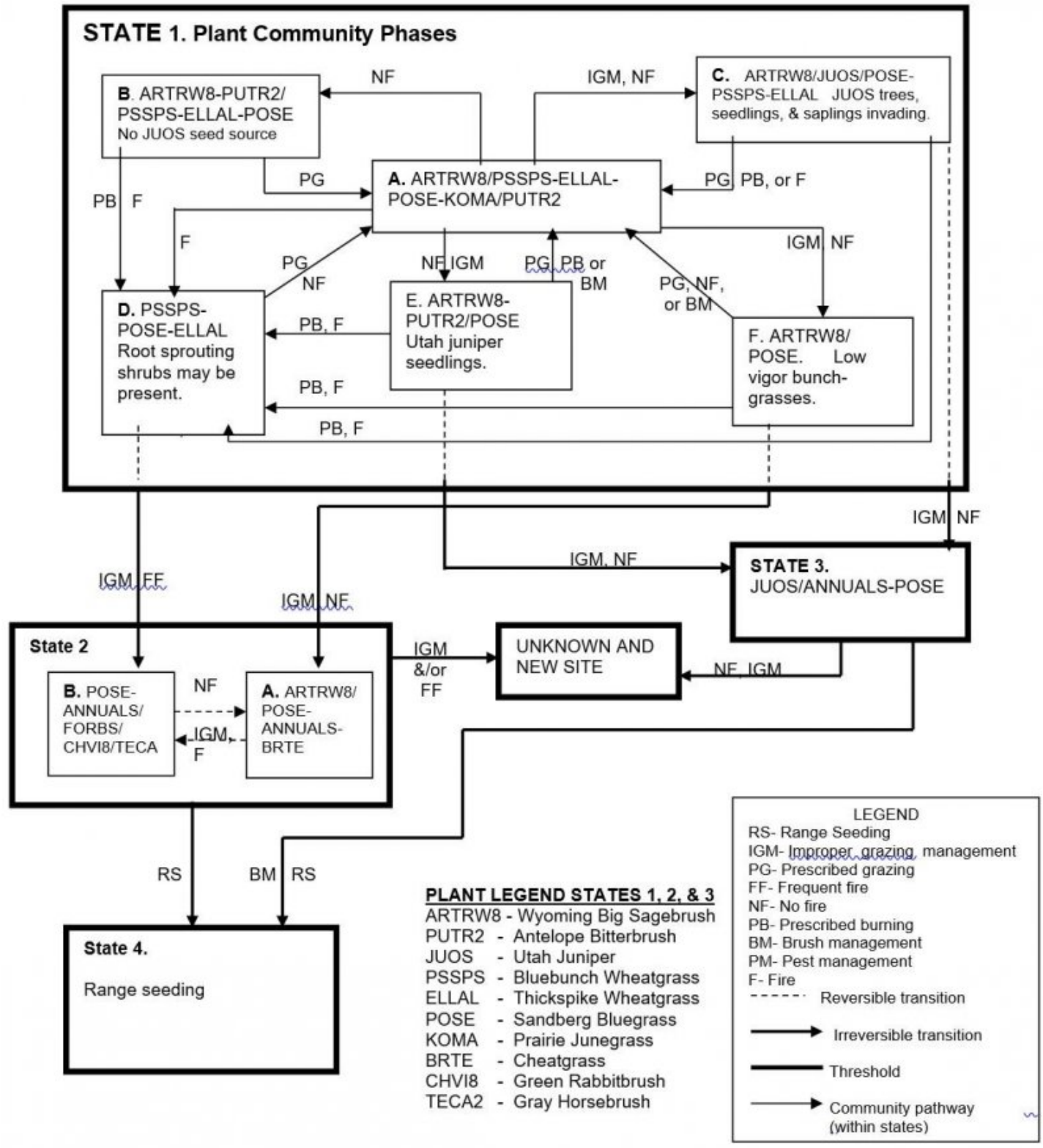
State 3 to unknown site. Continued lack of fire and improper grazing management cause this state to cross the threshold and retrogress to a new site with reduced potential due to significant soil loss and changes in hydrology.

State 2 to State 4 or State 3 to State 4. It is seeded to adapted improved species or native species that attempt to mimic the native plant community.

Practice Limitations.

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

State and transition model



State 1
State 1

Community 1.1
State 1 Phase A

Reference Plant Community Phase. This plant community has Wyoming big sagebrush in the overstory with bluebunch wheatgrass in the understory. Antelope bitterbrush can occur in the plant community. Other significant species include thickspike wheatgrass, Sandberg bluegrass, prairie junegrass, Nevada bluegrass, arrowleaf balsamroot, and longleaf phlox. There can be a variety of other grasses, forbs, and shrubs in minor amounts. Natural fire frequency is 35-55 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	15-25%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

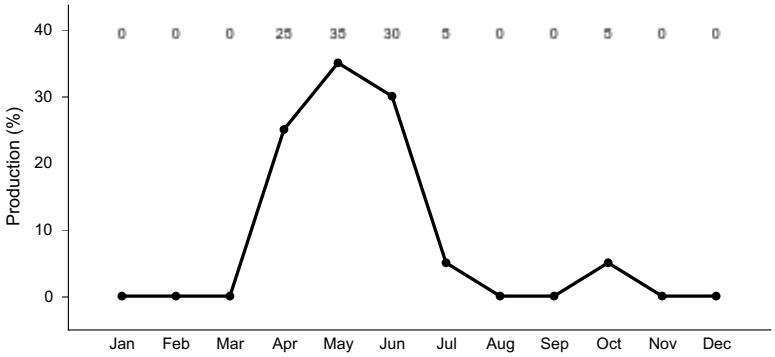


Figure 3. Plant community growth curve (percent production by month). ID0805, B13 ARTRV . State 1.

Community 1.2
State 1, Phase B

This plant community is dominated in the overstory by bitterbrush and Wyoming big sagebrush. Bluebunch wheatgrass is the dominant species in the understory. Other perennial grasses and forbs include thickspike wheatgrass, Sandberg bluegrass, prairie junegrass, Nevada bluegrass, arrowleaf balsamroot, and longleaf phlox. No Utah juniper seed source is present. This state has developed due to fire frequency being much longer than normal.

Community 1.3
State 1, Phase C

This plant community is dominated by Wyoming big sagebrush in the overstory with Utah juniper trees or saplings. Sandberg bluegrass is the dominant grass in the understory. Bluebunch wheatgrass and thickspike wheatgrass are present but in reduced amounts and typically in low vigor. Antelope bitterbrush is decadent and hedged. This state has developed due to improper grazing management and lack of fire. A Utah juniper seed source is in the proximity.

Community 1.4
State 1, Phase D

This plant community is dominated by bluebunch wheatgrass. Sandberg bluegrass and other perennial grasses and forbs are subdominant. Remnants of Nevada bluegrass and other fine-leaved grasses may be present. Root-sprouting shrubs such as rabbitbrush, and horsebrush may be present. This plant community is a result of prescribed burning or fire.

Community 1.5
State 1, Phase E

This plant community has Utah juniper seedlings and saplings that are invading the site due to a lack of fire. Sandberg bluegrass is the dominant grass in the understory. Bitterbrush is hedged and most of the grasses are in low vigor. A Utah juniper seed source is in the proximity. This state has developed due to the absence of fire and improper grazing management.

Community 1.6
State 1, Phase F

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

Pathway A to B
Community 1.1 to 1.2

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

Pathway A to C
Community 1.1 to 1.3

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

Pathway A to D
Community 1.1 to 1.4

Results from one or more fires.

Pathway A to E
Community 1.1 to 1.5

Develops in the absence of fire and improper grazing management. A Utah juniper seed source is present.

Pathway A to F
Community 1.1 to 1.6

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

Pathway B to A
Community 1.2 to 1.1

Results from prescribed grazing management.

Pathway B to D
Community 1.2 to 1.4

This develops from prescribed burning or fire.

Pathway C to A
Community 1.3 to 1.1

Develops with prescribed grazing management and prescribed burning or fire.

Pathway C to D
Community 1.3 to 1.4

This develops from prescribed burning or fire.

Pathway D to A
Community 1.4 to 1.1

Usually results from prescribed grazing management and no fire.

Pathway E to A
Community 1.5 to 1.1

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

Pathway E to D
Community 1.5 to 1.4

Results from prescribed burning or fire.

Pathway F to A
Community 1.6 to 1.1

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

Pathway F to D
Community 1.6 to 1.4

Results from prescribed burning or fire.

State 2
State 2

Community 2.1
State 2, Phase A

This plant community is dominated by Wyoming big sagebrush with Sandberg bluegrass and annuals in the interspaces. Cheatgrass has invaded the plant community. This state has developed due to improper grazing management and the absence of fire from phase F, State1 or with no fire from phase B, State 2. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

Community 2.2
State 2 Phase B

This plant community is dominated by Sandberg bluegrass and other annuals and forbs. Root sprouting shrubs such as rabbitbrush and horsebrush are present. This state has developed due to improper grazing management and frequent fire from phase D, State 1 or with improper grazing management and fire from phase A, State 2. This site has crossed the threshold. It is usually uneconomical to return this community to State 1 through 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	15-25%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

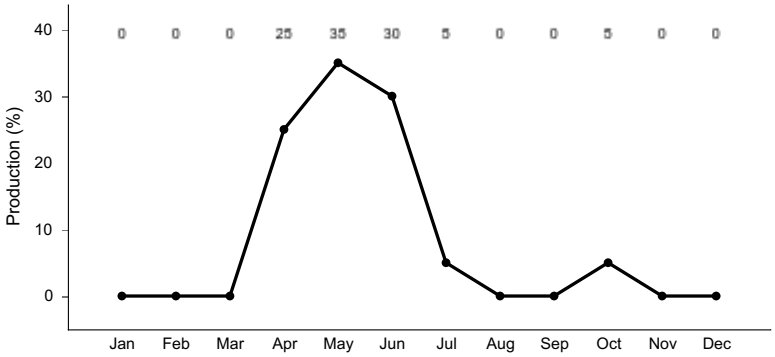


Figure 4. Plant community growth curve (percent production by month). ID0805, B13 ARTRV . State 1.

Pathway A to B
Community 2.1 to 2.2

Results from improper grazing management and fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

Pathway B to A
Community 2.2 to 2.1

Results from no fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 3
State 3

This plant community is dominated by Utah juniper. Remnants of bluebunch wheatgrass, thickspike wheatgrass, and Nevada bluegrass can be found in the understory, often under trees. Shallow-rooted grasses, such as Sandberg bluegrass and other annuals can be found in the interspaces. Few shrubs are present. This state has developed with improper grazing management and in the absence of fire. When shrub cover is below 10-15%, bare ground is above 25-30%, and Utah juniper cover is greater than 20%, the site has crossed the threshold. It is usually uneconomical to return this community to State 1 through accelerated practices.

State 4
State 4

This state is a range seeding. It is seeded to adapted improved species or native species that attempt to mimic the native plant community.

State 5
State 5

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 with the continued lack of fire and improper grazing management from the juniper dominated phase of State 3. This site will not return to State 1 or 2 because of significant soil loss.

Transition T1A
State 1 to 2

State 1 Phase D to State 2, Phase B. Develops through improper grazing management and frequent fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices. State 1 Phase F to State 2, Phase A. Develops through improper grazing management with no fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

Transition T1B
State 1 to 3

State 1 Phase C or E to State 3. Results from improper grazing management and lack of fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

Transition T2A
State 2 to 4

It is seeded to adapted improved species or native species that attempt to mimic the native plant community.

Transition T2B
State 2 to 5

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.

Transition T3A
State 3 to 4

It is seeded to adapted improved species or native species that attempt to mimic the native plant community.

Transition T3B
State 3 to 5

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.

Additional community tables

Animal community

Wildlife Interpretations.

This site provides fair to good habitat for various upland wildlife including mule deer, sage grouse, and songbirds.

Grazing Interpretations.

This site is suited for grazing by domestic livestock in late spring, early 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 B. They have moderately low runoff potential.
Due to the lack of surface stones and relatively flat slopes, this site is easily degraded by improper grazing management or frequent fires.

Recreational uses

This site has slight recreation or aesthetic value. Some spring blooming forbs add color to the landscape. Some hunting of upland game occurs in the fall.

Wood products

none.

Other products

none.

Other information

Field Offices

American Falls, ID
Blackfoot, ID
Burley, ID
Driggs, ID
Fort Hall, ID
Idaho Falls, 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
Lee Brooks, Range Management Specialist, IASCD
Kristen May, Resource Soil Scientist, NRCS, Idaho

Other references

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

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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Date	05/05/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** rarely occur on this site. If rills are present they are likely to occur on slopes over 10 percent and immediately following wildfire. They are most likely to occur on silt loam surface textures.

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2. **Presence of water flow patterns:** rarely occur on this site except on slopes greater than 15 percent. If they occur, they are short and disrupted. They are disrupted by cool season grasses and tall shrubs and are not extensive.

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

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** data is not available. On sites in mid-seral status bare ground may range from 50-65 percent.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** usually not present. Immediately following wildfire some soil movement may occur on lighter textured soils. Where sagebrush has repopulated the site after a fire, remnants of past wind scour may be present.

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 moderate very fine and fine granular to weak very thin and thin platy to weak fine, medium and coarse subangular blocky. Soil organic matter (SOM) ranges from 1 to 3 percent. Surface color ranges from dark brown to very dark grayish brown. The A or A1 horizon is typically 3 to 9 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. Tall shrubs can catch 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 bunchgrasses

    Sub-dominant: tall shrubs

    Other: perennial forbs

    Additional: shallow rooted grasses

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Wyoming big sagebrush and antelope bitterbrush will become decadent in the absence of normal fire frequency. 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 5-20

percent to a depth of 0.1 inches. Under mature shrubs litter is <0.5 inches deep and is 90-100 percent ground cover.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 1000 pounds per acre (1120 kilograms per hectare) in a year with normal temperatures and precipitation. Perennial grasses produce 55-75 percent of the total production, forbs 10-20 percent and shrubs 15-25 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 cheatgrass, Vulpia sp., annual mustards, halogeton, Russian thistle, yellow salsify, and spotted and diffuse knapweeds.

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17. **Perennial plant reproductive capability:** includes cheatgrass, Vulpia sp., annual mustards, halogeton, Russian thistle, yellow salsify, and spotted and diffuse knapweeds.
