

Ecological site R010XY032ID Loamy 12-16 PZ

Last updated: 3/10/2025
 Accessed: 05/10/2025

General information

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

Classification relationships

Artemisia tridentata/*Agropyron spicatum* HT in "Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Glass Habitat Types of Southern Idaho. University of Idaho, Moscow, Idaho. Bulletin Number "35."

Ecological site concept

This ecological site meets the NESH 2014 requirements for PROVISIONAL. A provisional ecological site is established after ecological site concepts are developed and an initial state-and-transition model is drafted. Following quality control and quality assurance reviews of the ecological site concepts, an identification number and name for the provisional ecological site are entered into ESIS. A provisional ecological site may include literature reviews, land use history information, some soils data, legacy data, ocular estimates for canopy and/or species composition by weight, and even some line-point intercept information. A provisional ecological site does not meet the NESH 2014 standards for an Approved ESD, but does provide the conceptual framework of soil-site correlation for the development of the ESD.

Associated sites

R010XY019ID	South Slope Loamy 12-16 PZ ARTRX/PSSPS
R010XY001ID	North Slope Loamy 12-16 PZ FEID-PSSPS
R010XY007ID	Loamy 12-16 PZ
R010XY008ID	South Slope Granitic 12-16 PZ PUTR2/PSSPS
R010XY009ID	Stony Loam 12-16 PZ ARTRT/PSSPS
R010XY011ID	South Slope Stony 12-16 PZ ARTRT/PSSPS
R010XY014ID	North Slope Granitic 12-16 PZ ARTRX/FEID
R010XY016ID	Shallow South Stony 12-16 PZ ARTRX/PSSPS

Similar sites

R010XY007ID	Loamy 12-16 PZ
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Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) <i>Artemisia tridentata</i> ssp. <i>tridentata</i>
Herbaceous	(1) <i>Pseudoroegneria spicata</i>

Physiographic features

This site occurs on gently sloping to steep slopes of 1 to 30 percent. Elevation ranges from 2500 to 3200 feet (750 to 975 meters). This site is associated with alluvial fans, terraces and low rolling hills.

Table 2. Representative physiographic features

Landforms	(1) Fan remnant (2) Hill (3) Structural bench
Elevation	2,500–3,200 ft
Slope	1–30%
Water table depth	60 in
Aspect	Aspect is not a significant factor

Climatic features

The elevation of MLRA 10 ranges from 1791 feet to 9236 feet, with a mean of 4602 feet. Overall, elevation increases from west to east. However, average annual precipitation decreases from west to east, ranging from 16.59 inches to 22.17 inches, with a mean of 19.56 inches, based on 7 long term climate stations throughout the MLRA. In general, precipitation peaks in December and January, with a steady decline to a low in July and August, then a steep increase during the autumn months. Most of the winter precipitation falls as snow, and maximum annual snowfalls of up to 82 inches have been recorded.

There is considerable variation in temperature throughout the year. Temperatures as low as -52° Fahrenheit and as high as 117° Fahrenheit are on record. Some areas have recorded the occurrence of more than 50 days with temperatures above 90° Fahrenheit. The average maximum annual temperature is 63 degrees F, while the average minimum temperature is 36.2 degrees F. The frost-free period can range from 128 to 152 days, while the freeze-free period can be from 164 to 189 days.

Both the average morning and average afternoon relative humidity values are lowest in July and August, and are below the national average. The number of clear, sunny days peaks during this same period, and is higher then the national average. During the Spring and Summer months high-intensity convective thunderstorms are not unusual.

Table 3. Representative climatic features

Frost-free period (average)	152 days
Freeze-free period (average)	189 days
Precipitation total (average)	22 in

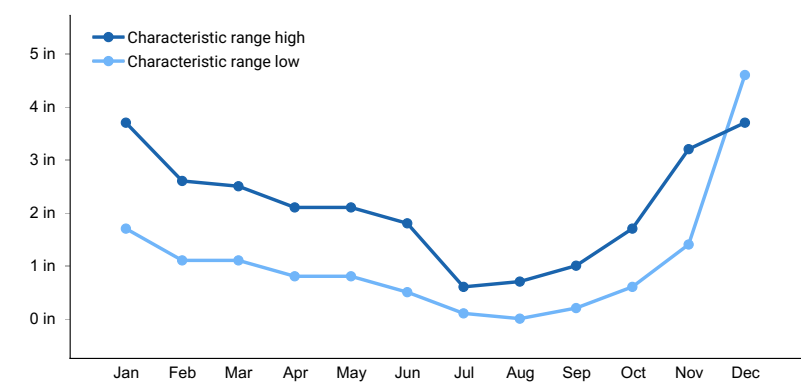


Figure 1. Monthly precipitation range

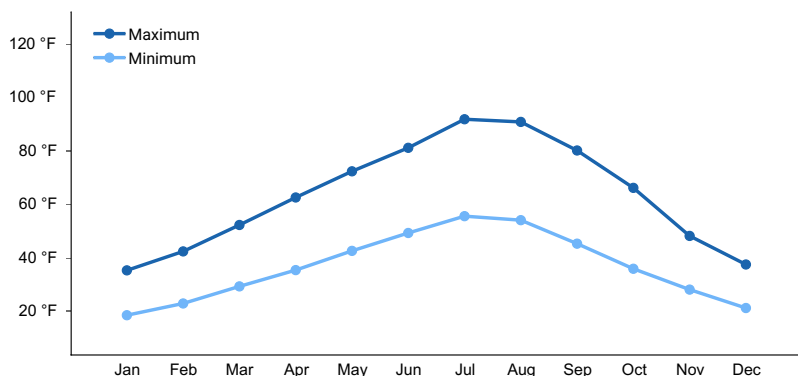


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils supporting this site are moderately deep to very deep with very slow to moderate permeability. Runoff is high or very high. The erosion hazard by wind is severe when plant cover is scarce or lacking. The available water holding capacity is low to moderate. The surface texture is silt loam becoming coarser to a loam, sandy loam, and finally coarse sandy loam. Soil temperature regime is mesic and the soil moisture regime is xeric bordering on aridic.

Table 4. Representative soil features

Parent material	(1) Alluvium–welded tuff (2) Colluvium–siltstone (3) Residuum–volcanic breccia
Surface texture	(1) Cobbly sandy loam (2) Gravelly silt loam (3) Coarse sandy loam
Drainage class	Well drained
Permeability class	Very slow to moderate
Soil depth	35–60 in
Surface fragment cover ≤3"	0–35%
Surface fragment cover >3"	0–15%
Available water capacity (0–40in)	5.4–10.8 in
Calcium carbonate equivalent (0–40in)	0%
Electrical conductivity (0–40in)	0 mmhos/cm
Sodium adsorption ratio (0–40in)	0
Soil reaction (1:1 water) (0–40in)	6.1–7.3
Subsurface fragment volume ≤3" (Depth not specified)	0–35%

Subsurface fragment volume >3" (Depth not specified)	0–35%
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Ecological dynamics

The dominant visual aspect of this site is basin big sagebrush and bluebunch wheatgrass. Composition by weight is approximately 55 to 65 percent grasses, 10 to 20 percent forbs, and 20 to 30 percent shrubs.

During the last few thousand years, this site has evolved in a semi-arid climate characterized by dry summers and cold winters. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include mule deer, lagomorphs, and small rodents. Pronghorn antelope occasionally use the site in the winter.

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

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 is plant community 1.1. This plant community is dominated by bluebunch wheatgrass in the understory and basin big sagebrush in the overstory. Subdominant species include Indian ricegrass, Thurber's needlegrass, bottlebrush squirreltail, Sandberg bluegrass, and arrowleaf balsamroot. There is a large variety of other grasses, forbs, and shrubs that can occur in minor amounts. The plant species composition of Community 1.1 is listed later under "Reference Plant Community Plant Species Composition".

Total annual production is 950 pounds per acre (1055 kilograms per hectare) in a normal year. Production in a favorable year is 1200 pounds per acre (1330 kilograms per hectare). Production in an unfavorable year is 650 pounds per acre (722 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.

This site is suited for livestock grazing in the spring, early summer, and fall. The distance to water may be a problem in some areas.

The site provides winter and spring range for mule deer. Pronghorn antelope use the site in the winter. It is also used by small mammals and songbirds. It has some value as sage grouse brood rearing.

The site has limited value for recreation but does provide some hunting, hiking, and photography opportunities.

Due to gentle slopes and relatively low production, this site can be degraded by improper livestock management. A mixed stand of shrubs and perennial grasses is necessary for the site to reach it's potential.

Impacts on the Plant Community.

Influence of fire:

In the absence of normal fire frequency, basin big sagebrush can gradually increase on the site. Grasses and forbs decrease as shrubs increase. With the continued absence of fire, basin big sagebrush can displace most of the primary understory species.

When fires become more frequent than historic levels (20-50 years), basin big sagebrush is reduced significantly. Rabbitbrush can increase slightly. With continued short fire frequency, basin big sagebrush can be completely eliminated along with many of the desirable understory species such as bluebunch wheatgrass. These species may be replaced by bottlebrush squirreltail and 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. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to increase in basin big sagebrush and noxious and invasive plants.

Continued improper grazing management influences fire frequency by increasing fine fuels. As cheatgrass increases along with 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 basin big sagebrush. 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 can increase cheatgrass leading to more frequent fire intervals.

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. Prolonged drought can lead to a reduction in fire frequency.

Influence of Insects and disease:

Outbreaks can affect vegetation health. 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 plants compete with desirable species 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 primarily in the spring and winter. Their numbers are seldom high enough to adversely affect the plant community. Burrowing rodents can impact the community providing microsites for the invasion of undesirable plant species.

Watershed:

Decreased infiltration and increased runoff occur with an increase in basin 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. See the "Hydrology" section for more detail.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

Reference State 1.

1.1 Basin Big Sagebrush / Bluebunch Wheatgrass

Phase 1.1 to 1.2 (1.1A). Develops with improper grazing management.

Phase 1.1 to 1.3 (1.1B). Develops with fire.

Phase 1.2 to 1.1 (1.2A). Develops with prescribed grazing.

Phase 1.3 to 1.1 (1.3A). Develops with prescribed grazing and no fire.

Phase 1.2 to State 2 (T1A). Develops with frequent fire and continued improper grazing management. This site has crossed the threshold. It is generally not economically feasible to move this state back to State 1 with accelerated practices.

Phase 1.3 to State 2 (T1B). Develops through frequent fire and/or continued improper grazing management. This site has crossed the threshold. It is generally not economically feasible to move this state back to State 1 with accelerated practices.

State 2 to State 3 (T2A). Develops with range seeding.

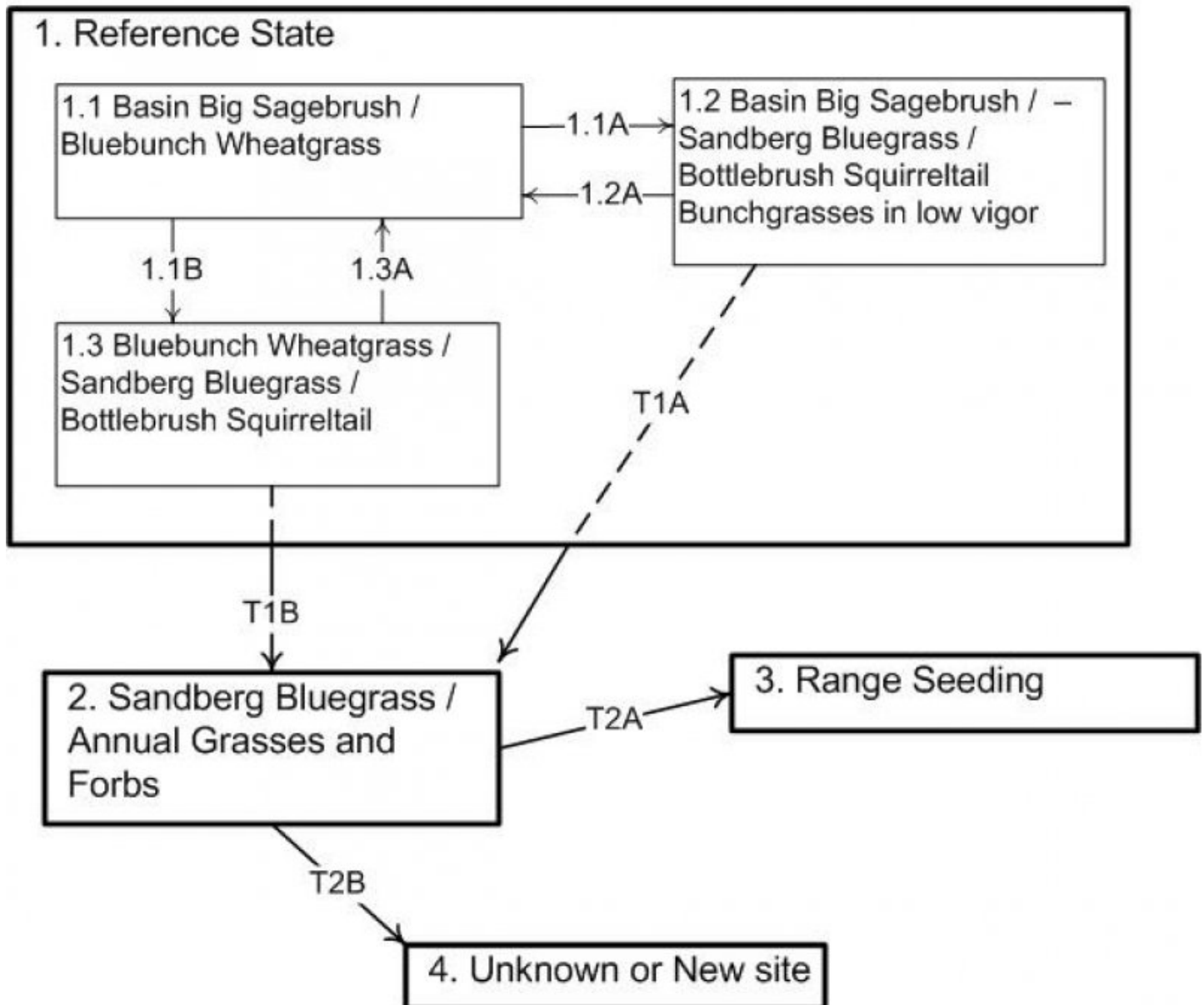
State 2 to State 4 unknown new site (T2B). Excessive soil loss and changes in the hydrologic cycle caused by continued improper grazing management and/or frequent fires cause this state to cross a threshold and retrogress to a new site with reduced potential. It is generally not economically feasible to move this state back to State 1 with accelerated practices.

Practice Limitations:

Few limitations exist for implementing vegetative management and facilitating practices on this site. Adequate vegetative cover must be maintained to prevent wind erosion. Slight to moderate limitations exist on this site for implementing accelerating practices. Low average annual precipitation and light textured soils make certain precautions necessary to be followed in seeding, brush management, prescribed burning, and some mechanical means of treating the soil.

State and transition model

R010XY032ID – Loamy 12-16 ARTRT/PSSPS



State 1 Reference

Community 1.1 Basin big sagebrush - bluebunch wheatgrass

The Reference Plant Community is dominated by bluebunch wheatgrass in the understory and basin big sagebrush in the overstory. Subdominant species include Indian ricegrass, Thurber's needlegrass, bottlebrush squirreltail, Sandberg bluegrass, and arrowleaf balsamroot. There is a large variety of other grasses, forbs, and shrubs that can occur in minor amounts. Natural fire frequency is 20-50 years.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	390	570	720
Shrub/Vine	160	240	300
Forb	100	140	180
Total	650	950	1200

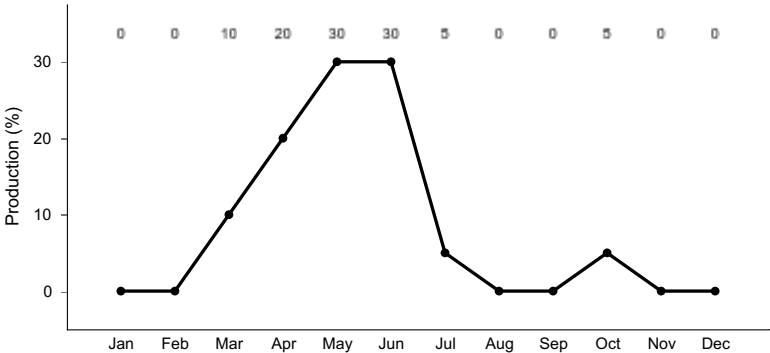


Figure 4. Plant community growth curve (percent production by month). ID0206, ARTRT/PSSPS. State 1.

Community 1.2
Basin big sagebrush - low vigor bunchgrasses

This plant community is dominated by basin big sagebrush with reduced amounts of bluebunch wheatgrass. Sandberg bluegrass and bottlebrush squirreltail have increased in the understory. There is a reduced amount of Indian ricegrass and other perennial grasses. All deep-rooted bunchgrasses are typically in low vigor. Basin big sagebrush has increased. This state has developed due to improper grazing management (T 1.1A). Some cheatgrass may have invaded the site.

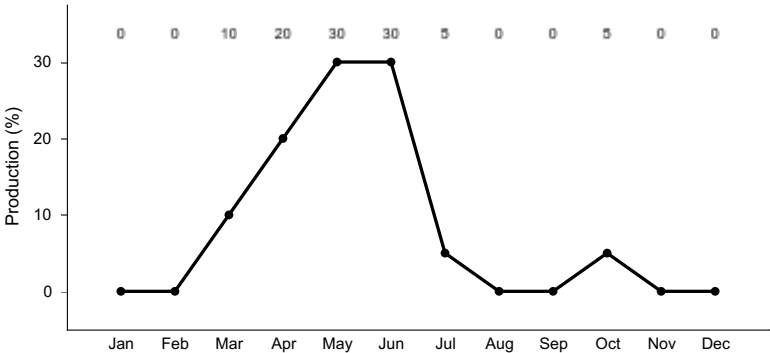


Figure 5. Plant community growth curve (percent production by month). ID0206, ARTRT/PSSPS. State 1.

Community 1.3
Bluebunch wheatgrass - sandberg bluegrass

This plant community is dominated by bluebunch wheatgrass. Some Thurber’s needlegrass, when present, may be lost due to fire. Bottlebrush squirreltail and Sandberg bluegrass have increased. Forbs remain about in the same proportion as Plant Community 1.1. Little basin big sagebrush is present due to wildfire, but some rabbitbrush and horsebrush are present due to sprouting. Some cheatgrass has invaded the site. This plant community is the result of wildfire (1.1B).

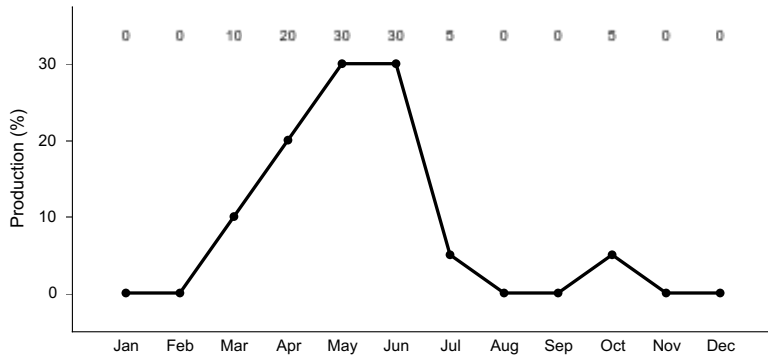


Figure 6. Plant community growth curve (percent production by month). ID0206, ARTRT/PSSPS. State 1.

State 2
Shortgrass Annuals

Community 2.1
Sandberg bluegrass - annuals

This plant community is dominated by cheatgrass and other annuals. Root sprouting shrubs such as rabbitbrush and horsebrush can be present, dependent upon, how frequent, fire has occurred. Some soil loss has occurred. This state has developed due to frequent fires and improper grazing management (T1A) from plant community 1.2, State 1 or with frequent fires and/or improper grazing management (T1B) from plant community 1.3, State 1. The site has crossed a threshold. It is generally not economically feasible to move this state back to State 1 with accelerated practices.

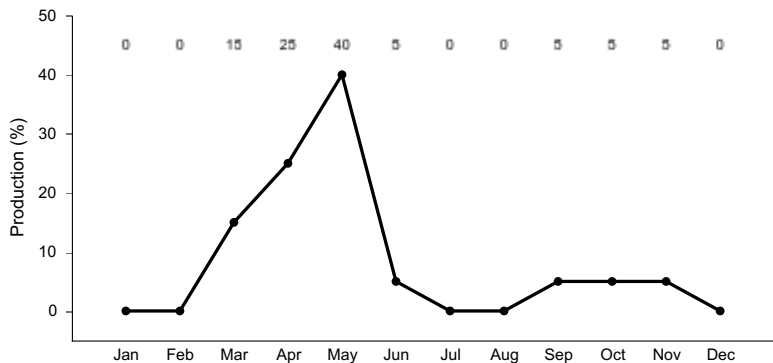


Figure 7. Plant community growth curve (percent production by month). ID0211, POSE/BRTE-ANNUALS. State 2.

State 3
Seeded

Community 3.1
Seeding

Rangeland seeding. This plant community may be introduced species or a mixture of native species that mimic the Reference Plant Community.

State 4
Unknown or New Site

Community 4.1
Unknown or new site

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				390–720	
	bluebunch wheatgrass	PSSPS	<i>Pseudoroegneria spicata ssp. spicata</i>	165–300	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	25–40	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	0–30	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	15–25	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	10–25	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	15–25	–
	needle and thread	HECO26	<i>Hesperostipa comata</i>	0–15	–
	sedge	CAREX	<i>Carex</i>	0–5	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	0–5	–
Forb					
2	Forb			100–180	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	35–60	–
	lupine	LUPIN	<i>Lupinus</i>	20–35	–
	aster	ASTER	<i>Aster</i>	0–20	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0–10	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–5	–
	longleaf phlox	PHLO2	<i>Phlox longifolia</i>	0–5	–
Shrub/Vine					
3	Shrub			160–300	
	basin big sagebrush	ARTRT	<i>Artemisia tridentata ssp. tridentata</i>	115–210	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	15–30	–
	rubber rabbitbrush	ERNA10	<i>Ericameria nauseosa</i>	0–30	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0–25	–
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	0–10	–

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This rangeland ecological site provides diverse habitat for many native wildlife species. Large herbivore use of this ecological site is dominated by mule deer and pronghorn antelope. Important seasonal habitat is provided for resident and migratory animals including western toad, sagebrush lizard, western rattlesnake, shrews, bats, jackrabbits, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark and western meadowlark. Changes in the plant community composition can reduce the number and diversity of wildlife species in the area. With reduced shrub cover, shrub obligate avian and mammal species become rare including brewer's sparrow, sage sparrow, sage grouse, sage thrasher and pygmy rabbits. Encroachment of noxious and invasive plant species (cheatgrass and medusahead) can replace native plant species which provide critical feed, brood-rearing and nesting cover for a variety of native wildlife. Water features are sparse provided by seasonal streams, artificial water catchments and springs.

State 1 Phase 1.1 - Basin Big Sagebrush/ Bluebunch Wheatgrass Reference Plant Community (RPC): The RPC provides a diversity of grasses, forbs and shrubs, used by native insect communities who assist in the pollination

process for the plant community. The reptile and amphibian community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink, western rattlesnake, western toad, boreal chorus frog and northern leopard frog. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Spring developments that capture all available water would preclude the use of these sites by amphibians. The plant community supports a variety of migratory and resident avian species that utilize both the grasses and shrubs for food, brood-rearing and nesting cover. Shrub-steppe obligate avian species of concern include the Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Sage-grouse may use the site for brood rearing. The plant community supports seasonal (spring, early summer and winter) needs of mule deer and antelope, providing food and cover. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots and pygmy rabbits would utilize the site.

State 1 Phase 1.2 - Basin Big Sagebrush/ Sandberg Bluegrass/ Bottlebrush Squirreltail Plant Community: This phase has developed due to improper grazing management and a lack of fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. Grasses, forbs and shrubs, are used by native insects that assist in pollination but the reduced herbaceous understory results in lower diversity and numbers of insects. You can expect a decrease in populations and diversity of reptiles due to the reduced diversity and canopy cover of herbaceous vegetation. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Key shrub-steppe obligate avian species include Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. The site has poor brood-rearing habitat for sage-grouse due to fewer insects and forbs. Winter habitat for mule deer and antelope is present. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots and pygmy rabbits would utilize this plant community.

State 1 Phase 1.3 - Bluebunch Wheatgrass/ Sandberg Bluegrass Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no basin big sagebrush, provides less vertical structure, limiting use by shrub obligate animals. Insect diversity would be reduced but a diverse native forb plant community would still support select pollinators. An increase in rabbitbrush would provide fall pollinator habitat. Reptile use, including short horned lizard, sagebrush lizard and western rattlesnakes, would be limited or excluded due to the absence of sagebrush. The dominance of herbaceous vegetation with little sagebrush canopy cover would limit use of these areas for nesting by Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. This plant community provides brood-rearing habitat for sage grouse when adequate cover of sagebrush is nearby. Winter habitat for sage-grouse would be lost. The herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Seasonal forage would be available for mule deer and antelope. The plant community would offer poor thermal cover to large herbivores. Small mammal diversity would be reduced, favoring grass seed eating species. The plant community would not provide suitable habitat for pygmy rabbits.

State 2.1 – Sandberg Bluegrass/ Cheatgrass Plant Community: This state has developed due to frequent fires and improper grazing management. The reduced forb component in the plant community would support a very limited population of pollinators although an increase in rabbitbrush would provide fall pollinator habitat. Most reptilian species would not be supported with food, water or cover. The plant community would not support the habitat requirements for sage-grouse, sage thrasher, Brewer's sparrow or sage sparrow. Grassland avian species would also avoid these areas due to poor cover and prey base. 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 Sandberg bluegrass and invasive annuals (cheatgrass) would be more palatable. At other times of the year large mammals would not regularly utilize these areas due to its poor food and cover conditions. The populations of small mammals would be dominated by open grassland species. Protection for small mammals from predators would be poor.

State 3.1 - Range Seeding Plant Community: The proposed seeding mixture (native or non-native) would determine the animal species that would utilize the area. A diverse seed mixture of grasses and forbs would provide similar habitat conditions as in the herbaceous plant community described in State 1 Phase 1.3. A diverse seed mixture of grasses, forbs and shrubs would provide similar habitat conditions as described in State 1 phase 1.1 or 1.2. A monoculture of non-native grass species would not support diverse populations of insects, reptiles, avian or mammals. Sagebrush obligate animal species would not be supported with a monoculture of grass species. Grassland animal species including western meadowlark, horned lark, savannah sparrow, deer mouse, kangaroo rat and elk would utilize this site for nesting and/or foraging. Birds of prey including hawks and falcons may range throughout these areas looking for prey species.

Grazing Interpretations.

This site is most suitable for livestock grazing in the spring, early summer, or fall. Extreme caution must be exercised when grazing these sites to ensure adequate vegetative cover for soil protection from wind erosion. 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 C. When the hydrologic conditions of the vegetative cover are good the natural erosion hazard is slight from water.

Recreational uses

The site has limited value for recreation but does provide some hunting, hiking, and photography opportunities.

Wood products

None.

Other products

None.

Other information

Field Offices

Weiser, ID

Emmett, ID

Mountain Home, ID

Meridian, ID

Cascade, 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

Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho

Jim Cornwell, Range Management Specialist, IASCD

Leah Juarros, Resource Soil Scientist, NRCS, Idaho

Lee Brooks, Range Management Specialist, IASCD

Type locality

Location 1: Ada County, ID	
General legal description	Boise Front.

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".

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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.

Contributors

Dave Franzen And Jacy Gibbs

Approval

Kirt Walstad, 3/10/2025

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	06/24/2009
Approved by	Kirt Walstad
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:** rills rarely occur on this site. If they do occur they are most likely to be on slopes greater than 15% and immediately following wildfire.

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

- Number and height of erosional pedestals or terracettes:** both are rare on this site. In areas of greater than 15% slopes where flow patterns and/or rills are present, a few pedestals and terracettes may be expected.

- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not**

bare ground): bare ground is expected to range from 30-40 percent.

5. **Number of gullies and erosion associated with gullies:** gullies do not occur on this site.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** blowouts and depositional areas are usually not present. The light textured soils can blow following a fire and evidence may be found in mounded soil deposition in the crowns of bunchgrass.
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7. **Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces may move up to 2 feet or further following a significant wind or run-off event. Coarse litter generally does not move.
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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** values should range from 4 to 6.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A or A1 horizon is typically 1 to 6 inches thick. Structure ranges from weak fine granular to strong thin platy. Soil organic matter (SOM) needs to be determined.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** bunchgrasses, especially deep-rooted perennials, slow run-off and increase infiltration. Shrubs accumulate snow in the interspaces. Terracettes provide a favorable micro-site for vegetative establishment, which further increases infiltration.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** not present.
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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant: 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):** basin 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):** 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 950 lbs. per acre in a year with normal precipitation and temperatures. Perennial grasses produce 55-65 percent of the total, forbs 10-20 percent, and shrubs 20-30 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, rush skeletonweed, scotch thistle, and spotted and diffuse knapweed. Russian thistle and kochia can invade at lower elevations.
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17. **Perennial plant reproductive capability:** all functional groups have the potential to reproduce in normal years.
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