

Ecological site R010XA007ID Shallow Stony Loam 8-16 PZ

Last updated: 9/23/2020
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General information

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

Classification relationships

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

Ecological site concept

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

R010XA004ID	Loamy 12-16 PZ ARTRV/FEID-PSSPS
R010XA009ID	South Slope Gravelly 12-16 PZ
R010XA020ID	Mixed Shrub 12-16 PZ
R010XA021ID	South Slope Fractured 12-16 PZ
R010XA025ID	South Slope Loamy 11-13 PZ ARTRW8/PSSPS
R010XA026ID	Loamy 11-13 PZ ARTRW8/PSSPS
R010XA038ID	Stony Clayey 8-16 PZ ARAR8/PSSPS

Similar sites

R010XA038ID	Stony Clayey 8-16 PZ ARAR8/PSSPS
R010XA011ID	Clayey North 16-22 PZ

Table 1. Dominant plant species

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

Physiographic features

This site occurs on foothills, terraces, and mountain sideslopes. It occurs on all aspects on slopes less than 30 percent slopes. The elevation ranges from 3000 to 8500 feet (900-2575 meters).

Table 2. Representative physiographic features

Landforms	(1) Hill
Elevation	914–2,591 m
Slope	1–30%

Climatic features

The Big and Little Wood River Foothills and Plains, proposed as MLRA 10A, has a mean elevation of 5310 feet above sea level, and varies from 3600 to 9235 feet. In general, average annual precipitation is greatest on the western side, with the southeast area being the driest. The average annual precipitation, based on 7 long term climate stations located throughout the MLRA, is 15.39 inches, with a range of 12.5 to 18 inches. Monthly precipitation is generally greatest at the end of the year, diminishes steadily until a low in July and August, then increases rapidly in the autumn. Monthly temperatures can vary considerably. Highs of up to 102° and lows down to -52° Fahrenheit have been recorded. The average annual temperature is 42.9°. The frost-free period ranges from 75 to 98 days. The freeze-free period is a bit longer: 106 to 133 days.

Both morning and afternoon average relative humidity values peak in the winter, and reach their low in July and August. The average number of sunny, cloud-free days is above average for the summer months, but below average for the period from November through February.

Table 3. Representative climatic features

Frost-free period (average)	98 days
Freeze-free period (average)	133 days
Precipitation total (average)	457 mm

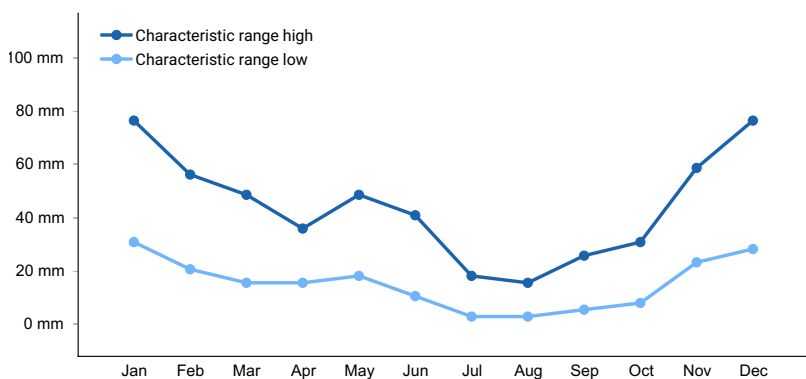


Figure 1. Monthly precipitation range

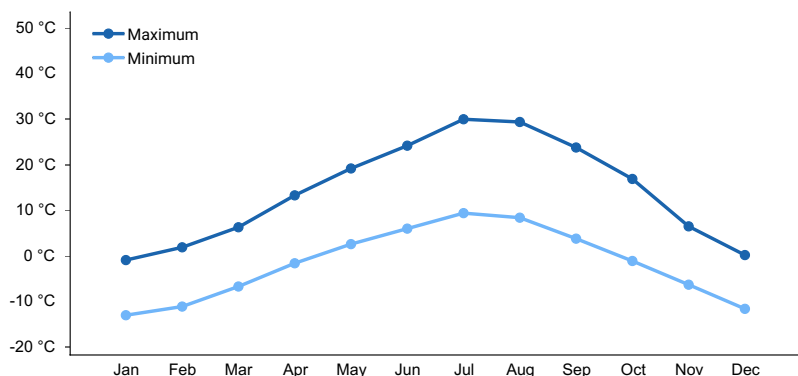


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

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

Soil features

The soils are less than 20 inches deep to bedrock. The soils have a very gravelly, very cobbly, or very stony to extremely gravelly fine sandy loam, loam or silty clay surface layers. They have very stony, extremely stony, very gravelly, very cobbly, and extremely cobbly loams or clay loam subsoil. The soils are well to somewhat excessively drained and have slow to moderate permeability in the subsoil. The available water holding capacity (AWC) is very low to moderate. The soils have an aridic or aridic bordering on xeric soil moisture regime. The soil temperature regime is mesic to frigid

Table 4. Representative soil features

Parent material	(1) Colluvium–basalt (2) Alluvium–quartzite (3) Residuum–rhyolite
Surface texture	(1) Very gravelly fine sandy loam (2) Very cobbly loam (3) Very stony silty clay loam
Drainage class	Well drained to somewhat excessively drained
Permeability class	Moderate
Soil depth	25–152 cm
Surface fragment cover ≤3"	0–40%
Surface fragment cover >3"	0–30%
Available water capacity (0-101.6cm)	1.27–16.76 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	5.6–8.4
Subsurface fragment volume ≤3" (Depth not specified)	0–45%
Subsurface fragment volume >3" (Depth not specified)	0–30%

Ecological dynamics

The dominant visual aspect of this site is low sagebrush and bluebunch wheatgrass. Composition by weight is approximately 45 to 55 percent grasses, 15-20 percent forbs and 25 to 35 percent shrubs.

During the last few thousand years, this site has evolved in a semi-arid climate characterized by warm, dry summers and cold winters. Herbivory has historically occurred on the site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, Rocky Mountain elk sage grouse, lagomorphs, and small rodents.

Fire has historically occurred on this site every 80 to 100 years. Fire occurs only in years with above normal precipitation.

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 1.1. This plant community is dominated by bluebunch wheatgrass and low sagebrush. Sandberg bluegrass is the subdominant grass species. Other prominent species in the plant community include Thurber's needlegrass, arrowleaf balsamroot, biscuitroot, longleaf phlox, lupine and some antelope bitterbrush. The plant species composition of Phase 1.1 is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 400 pounds per acre (448 Kg/ha) in a normal year. Production in a favorable year is 600 pounds per acre (672 Kg/ha). Production in an unfavorable year is 300 pounds per acre (336 Kg/ha). 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 grazing by livestock in spring, early summer, and fall. It also provides habitat for mule deer, pronghorn antelope, small game, sage grouse, small birds, and rodents in the spring, summer, and fall. The site provides limited recreational opportunities including hunting, hikig and early spring flower observation.

This site is not easily degraded by improper grazing management when the surface is stony which limits livestock access. Inherent low production on the site makes it susceptible to accelerated degradation due to erosion. Infiltration and production can be maintained with a mixed stand of deep-rooted perennial bunchgrasses and shrubs. Runoff potential is medium to rapid and the erosion hazard is slight to moderate.

Impacts on the Plant Community.

Influence of fire:

This site historically had a very low fire frequency, approximately every 80-100 years. Most of the shrubs evolved in the absence of fire, therefore they can be severely damaged or killed when burned. Thurber's needlegrass in the community can be lost with a fire. Rabbitbrush species can increase with fire. Cheatgrass and medusahead can be troublesome invaders on this site after fire, preventing perennial grass and shrub re-establishment and increasing the fire frequency. Sandberg bluegrass is usually maintained in the community.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be detrimental to this site. This type of management leads to reduced vigor of bluebunch wheatgrass and other deep-rooted perennial bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an increase in low sagebrush and invasive species.

Continued improper grazing management influences fire frequency by increasing fine fuels. If cheatgrass and/or medusahead increase due to improper grazing management and become 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. A planned grazing system can be developed to intentionally accumulate fine fuels in preparation for a prescribed burn. Any brush management should be carefully planned, as a reduction in shrubs without a suitable understory of perennial grasses, can increase cheatgrass and/or medusahead which can lead to more frequent fire intervals.

Weather influence:

Above normal precipitation in March, April and May can dramatically increase total annual production. These weather patterns can also increase viable seed production of desirable species to provide for recruitment. Extended periods of drought significantly impact this site due to the low water holding capacity and shallow soil. Extended drought reduces vigor of the perennial grasses and shrubs. Extreme drought may cause plant mortality.

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. An outbreak of a particular insect is usually influenced by weather but no specific data is available for this site.

Influence of noxious and invasive plants:

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. Cheatgrass and medusahead can be a very invasive species on this site, especially after fire. Once they become established the fire frequency increases. As a result, the shrub component can be lost.

Influence of wildlife:

Relatively low numbers of wildlife use this site and have little impact on it. Pronghorn antelope is the dominant large herbivore using the site. They use the site yearlong but prefer it in the spring, fall, and early winter. Sage grouse use the site for strutting grounds and they may use the site during the winter. Winter and spring use by mule deer occasionally occurs.

Watershed:

Decreased infiltration and increased runoff on slopes greater than 10 percent occur when low sagebrush is removed with frequent fires. The increased runoff also increases sheet and rill erosion. The long-term effect is a transition to a different state. When hydrologic condition of the vegetative cover is good, natural erosion hazard is slight.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.

Phase 1.1 to 1.2. Develops with fire. Fire only occurs in above normal precipitation about every 80-100 years.

Phase 1.1 to 1.3. Develops under improper grazing management and no fire.

Phase 1.2 to 1.1. Develops under prescribed grazing management program and no fire.

Phase 1.3 to 1.1. Develops from prescribed grazing management and no fire.

Phase 1.3 to 1.2. Develops with fire.

State 1, Phase 1.2 to State 2. Results from continued improper grazing management and/or frequent fire. This site has crossed the threshold. It is not economical to return this site to State 1 with accelerating practices.

State 2 to Unknown Site. Excessive soil loss and changes in the hydrologic cycle caused by continued improper grazing management and fire causes this state to cross a threshold and retrogress to a new site with reduced potential. It is not economical to return this site to State 1 with accelerating practices.

Practice Limitations:

Moderate limitations exist for implementing vegetation management practices due to surface stones. Early spring grazing should be avoided when soils are wet. Moderate limitations exist for implementing facilitating practices on this site. Shallow and stony soils present severe limitations for range seeding by ground moving equipment and is not generally economically feasible due to low production potential.

State and transition model

R010AY007ID – Shallow Stony Loam 12-16 ARARL/PSSPS

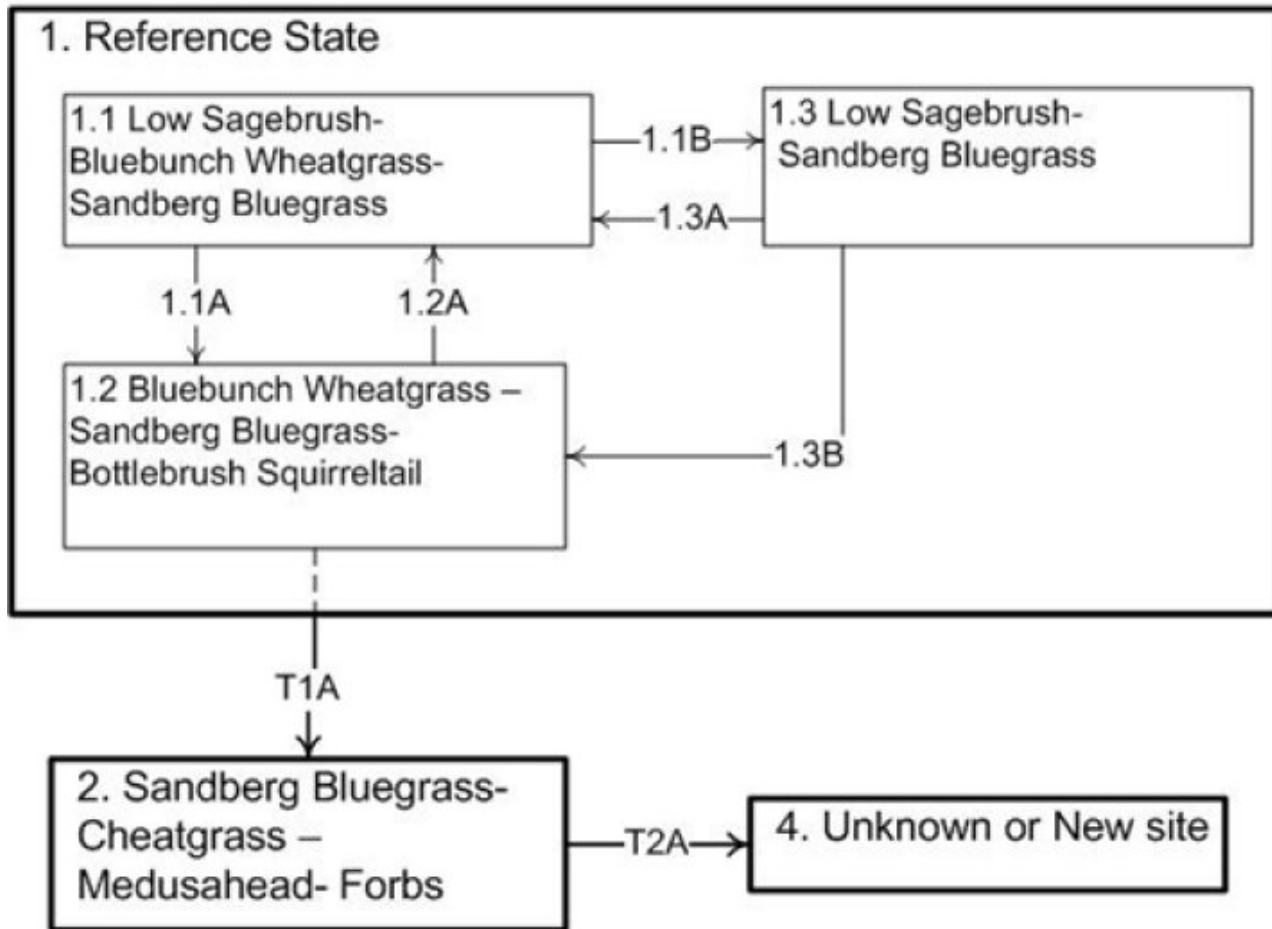


Figure 3. R010AY007ID

State 1
Reference State

Community 1.1
Reference Plant Community

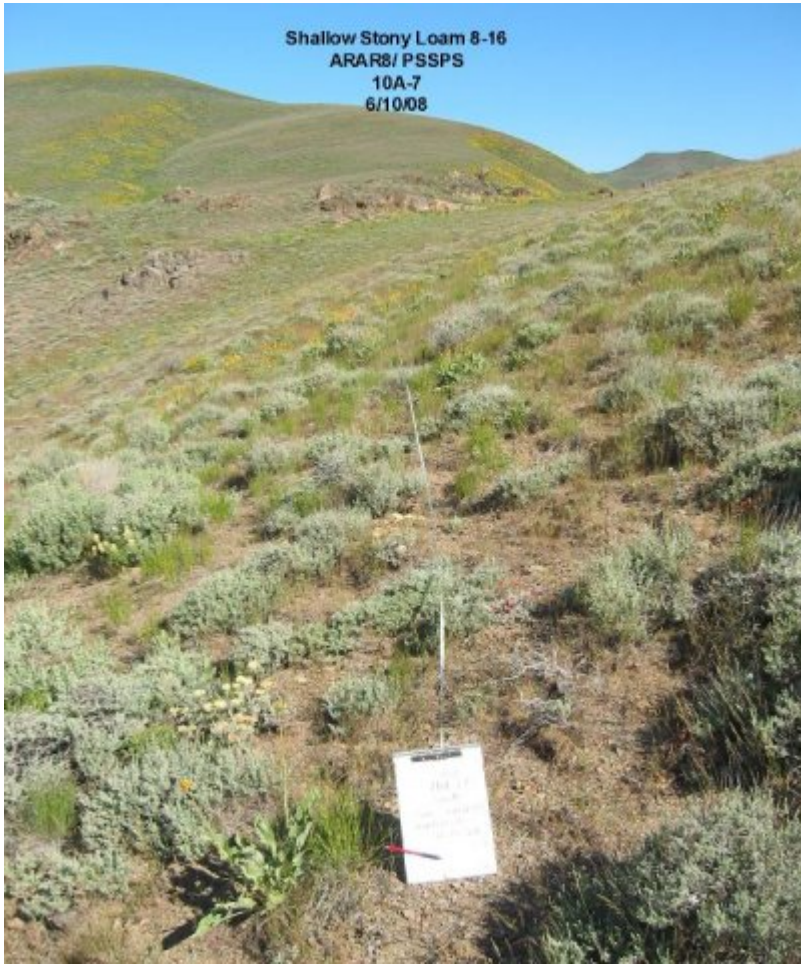


Figure 4. Reference State

Reference Plant Community Phase. This plant community is dominated by low sagebrush and bluebunch wheatgrass. Sandberg bluegrass is the subdominant grass species. Other prominent species in the plant community include Thurber's needlegrass, arrowleaf balsamroot, biscuitroot, longleaf phlox, lupine and some antelope bitterbrush. A large variety of forbs are present but each represents a small amount in the community. Rabbitbrush can be a subdominant shrub species. The natural fire frequency is about 80-100 years.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	168	224	336
Shrub/Vine	101	135	202
Forb	67	90	135
Total	336	449	673

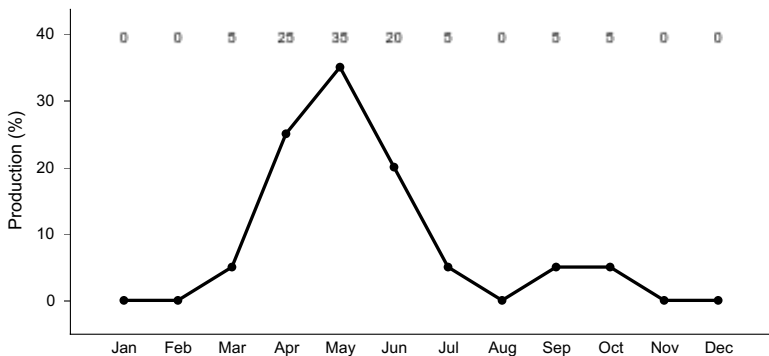


Figure 6. Plant community growth curve (percent production by month). ID0310, ARARL/FEID/ PSSPS. State 1.

Community 1.2 Bluebunch Wheatgrass with sprouting shrubs

This plant community is dominated by bluebunch wheatgrass and Sandberg bluegrass. Several species of rabbitbrush are present. Bottlebrush squirreltail has increased. Some Thurber's needlegrass may have died due to fire. Most forbs are maintained in the plant community. This phase has developed due to fire.

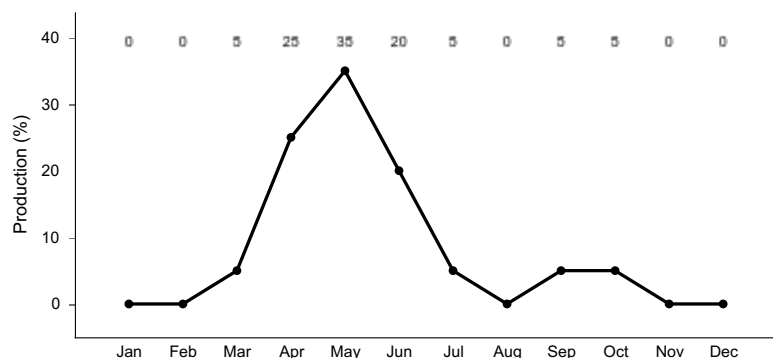


Figure 7. Plant community growth curve (percent production by month). ID0310, ARARL/FEID/ PSSPS. State 1.

Community 1.3 Low Sagebrush with low vigor bunchgrasses

This plant community is dominated by low sagebrush with Sandberg bluegrass in the understory. Bluebunch wheatgrass and other deep-rooted perennial bunchgrasses are present but in reduced amounts and in low vigor. This phase has developed due to improper grazing management and no fire.

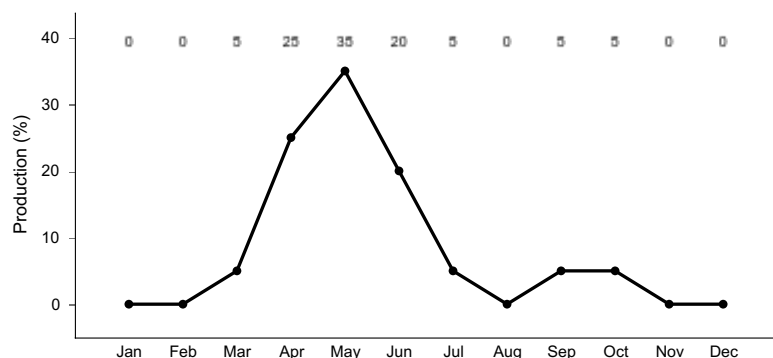


Figure 8. Plant community growth curve (percent production by month). ID0310, ARARL/FEID/ PSSPS. State 1.

State 2 Sandberg Bluegrass - Annuals

Community 2.1 Sandberg Bluegrass - Annuals

This plant community is dominated by Sandberg bluegrass, cheatgrass, medusahead and a variety of annual forbs. Some perennial forbs are present. The community has developed due to continued improper grazing management and/or frequent fire. Some soil loss has occurred. This site has crossed the threshold. It is not economical to return this site to State 1 with accelerating practices.

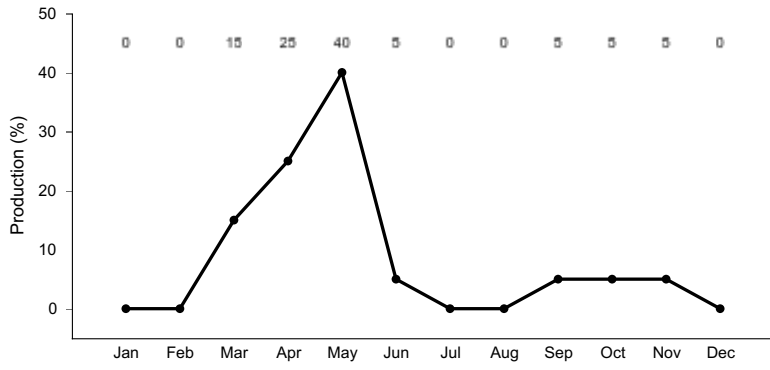


Figure 9. Plant community growth curve (percent production by month). ID0311, POSE/BRTE-ANNUALS . State 2.

**State 3
Unknown Site**

**Community 3.1
Unknown Community**

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				168–336	
	bluebunch wheatgrass	PSSP6	<i>Pseudoroegneria spicata</i>	84–168	–
	Sandberg bluegrass	POSE	<i>Poa secunda</i>	34–67	–
	Thurber's needlegrass	ACTH7	<i>Achnatherum thurberianum</i>	11–28	–
	squirreltail	ELEL5	<i>Elymus elymoides</i>	11–22	–
	prairie Junegrass	KOMA	<i>Koeleria macrantha</i>	0–11	–
	Indian ricegrass	ACHY	<i>Achnatherum hymenoides</i>	0–6	–
	western needlegrass	ACOC3	<i>Achnatherum occidentale</i>	0–6	–
Forb					
2				67–135	
	arrowleaf balsamroot	BASA3	<i>Balsamorhiza sagittata</i>	17–34	–
	desertparsley	LOMAT	<i>Lomatium</i>	11–22	–
	lupine	LUPIN	<i>Lupinus</i>	11–22	–
	longleaf phlox	PHLO2	<i>Phlox longifolia</i>	11–22	–
	pussytoes	ANTEN	<i>Antennaria</i>	0–17	–
	common yarrow	ACMI2	<i>Achillea millefolium</i>	0–11	–
	cutleaf balsamroot	BAMA4	<i>Balsamorhiza macrophylla</i>	0–11	–
	tapertip hawksbeard	CRAC2	<i>Crepis acuminata</i>	6–11	–
	onion	ALLIU	<i>Allium</i>	0–6	–
	broomrape	OROBA	<i>Orobanche</i>	0–6	–
	beardtongue	PENST	<i>Penstemon</i>	0–6	–
	silverleaf phacelia	PHHA	<i>Phacelia hastata</i>	0–6	–
	biennial wormwood	ARBI2	<i>Artemisia biennis</i>	0–6	–
	sandwort	ARENA	<i>Arenaria</i>	0–6	–
	woollypod milkvetch	ASPU9	<i>Astragalus purshii</i>	0–6	–
	aster	ASTER	<i>Aster</i>	0–6	–
	milkvetch	ASTRA	<i>Astragalus</i>	0–6	–
	yellow Indian paintbrush	CAFL7	<i>Castilleja flava</i>	0–6	–
	mariposa lily	CALOC	<i>Calochortus</i>	0–6	–
	Indian paintbrush	CASTI2	<i>Castilleja</i>	0–6	–
	stonecrop	SEDUM	<i>Sedum</i>	0–6	–
	foothill deathcamas	ZIPA2	<i>Zigadenus paniculatus</i>	0–6	–
Shrub/Vine					
3	Shrubs			101–202	
	little sagebrush	ARAR8	<i>Artemisia arbuscula</i>	84–168	–
	yellow rabbitbrush	CHVI8	<i>Chrysothamnus viscidiflorus</i>	0–22	–
	antelope bitterbrush	PUTR2	<i>Purshia tridentata</i>	0–22	–
	spineless horsebrush	TECA2	<i>Tetradymia canescens</i>	0–6	–
	matted buckwheat	ERCA8	<i>Eriogonum caespitosum</i>	0–6	–
	parsnipflower buckwheat	ERHE2	<i>Eriogonum heracleoides</i>	0–6	–
	threetip sagebrush	ARTR4	<i>Artemisia tripartita</i>	0–6	–

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This rangeland ecological site provides diverse habitat for many native wildlife species. Large herbivore use of the historic climax plant community is dominated by mule deer, pronghorn antelope, and elk. The rangeland ecological site provides important seasonal habitat 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 over time can reduce the numbers and diversity of wildlife species in the area. With reduced shrub cover, shrub obligate avian and mammal species can become rare and include sage-grouse, brewer's sparrow, sage thrasher and pygmy rabbits. In isolated areas encroachment of noxious and invasive plant species (cheatgrass and medusahead) have replaced native plant species which provide critical feed, brood-rearing and nesting cover for a variety of native wildlife. The loss of herbaceous understory vegetation has had a negative impact on ground nesting birds, while the loss of shrub cover has negatively affected both ground and shrub nesting avians. Water is limited, being provided only by seasonal runoff, artificial water catchments and spring sites. The rangeland ecological site is interspersed with pre-historic lava flows which provide unique cave habitats for several sensitive animal species, including the Blind Cave Leiodid Beetle, Cave Obligate Mite, Bats and Cave Obligate Harvestman.

State 1 Phase 1.1 – Low Sagebrush/ Bluebunch Wheatgrass/ Sandberg Bluegrass Plant Community (RPC): This plant community provides a diversity of grasses, forbs and shrubs, used by native insect communities that assist in pollination. 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. Native shrub-steppe obligate avian species utilizing the habitat include the Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Critical habitats (winter cover and winter food) for sage grouse are provided by this diverse plant community. Low sagebrush is a preferred winter food for sage-grouse. The plant community provides limited seasonal forage needs for large mammals including mule deer, antelope, and elk. A diverse small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots, and pikas (when adjacent to talus slopes) utilize this community.

State 1 Phase 1.2- Bluebunch Wheatgrass/ Sandberg Bluegrass/ Bottlebrush Squirreltail Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no sagebrush provides less vertical structure for animals. Insect diversity would be reduced but a diverse native forb plant community would still support select pollinators. Cave dwelling insects and mammals from adjacent habitats would be supported by this plant community. Diversity and populations of reptiles would be limited or excluded due to the loss of shrub cover. The dominance of herbaceous vegetation with little sagebrush canopy would prevent use of these areas for nesting by Brewer's sparrow, sage sparrow, sage thrasher, and sage-grouse. This plant community provides limited brood-rearing habitat for sage-grouse if site is adjacent to sagebrush cover. Winter cover and winter food for sage-grouse is eliminated. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). Large mammal (mule deer, antelope, and elk) use would be seasonal and offer little thermal cover and young of year cover. Small mammal diversity would be reduced and the plant community would not provide suitable habitat for pygmy rabbits.

State 1 Phase 1.3 – Low Sagebrush/ Sandberg Bluegrass Plant Community:

This plant community is the result of improper grazing management and no fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. Grasses, forbs and shrubs, are used by native insects that assist in pollination but the reduced herbaceous understory results in less diversity and numbers of insects. The reptile community is represented by leopard lizard, short horned lizard, sagebrush lizard, western skink and western rattlesnake. The reduced diversity and populations of insects will reduce reptile diversity and populations. This plant community supports a variety of migratory and resident avian species with food, brood rearing and nesting cover. Reduced herbaceous understory is a key factor in limiting the use of this plant community by avian species. Shrub-steppe avian obligates include Brewer's sparrow, sage sparrow, sage thrasher and sage-grouse. Critical habitat

(winter cover and winter food) for sage-grouse is available. The plant community supports limited seasonal habitat for large mammals including mule deer, antelope, and elk. A small mammal population including golden-mantled ground squirrels, chipmunks, yellow-bellied marmots, and pikas utilize this plant community.

State 2 - Sandberg Bluegrass / Cheatgrass / Medusahead/ Forbs Plant Community:

This plant community is the result of continued improper grazing management and/or frequent fire. The plant community does not support a diverse insect community. The reduced forb and shrub component in the plant community would support a very limited population of pollinators. Most reptilian species are not supported with food, water or cover. This plant community does not support the habitat requirements for sage-grouse, sage thrasher, Brewer's sparrow or sage sparrow. Diversity of grassland avian species is reduced due to poor cover and available food. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Large mammals may utilize the herbaceous vegetation in the early part of the year when the invasive annuals (cheatgrass) are more palatable. At other times of the year large mammals would not regularly utilize these areas due to poor food and cover conditions. Bats may be impacted by the loss of the native plant species and reduction of population and diversity of insects. The diversity and populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

Grazing Interpretations:

This site is suited for grazing by livestock in spring, early summer, and fall. Early spring grazing should be avoided when soils are wet.

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.

Hydrological functions

The soils in this site are in hydrologic group D.

Recreational uses

Colorful spring and early summer blooming forbs provide excellent opportunities for photography and nature study. Hunting opportunities for pronghorn antelope and sage grouse exist.

Wood products

None

Other products

None

Other information

Field Offices.

Mountain Home, ID
Gooding, ID
Fairfield, ID
Shoshone, ID
Rupert, ID
Arco, 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

Type locality

Location 1: Idaho County, ID	
Township/Range/Section	T2N R22E S21
Location 2: Idaho County, ID	
Township/Range/Section	T1N R18E S7
General legal description	N 430 24.321 W 113o 45.384 near Fish Creek reservoir.

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

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	03/28/2007

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

Indicators

1. **Number and extent of rills:** Rills: are rare on this site. If rills are present they are likely to occur on slopes greater than 10 percent and immediately following a wildfire or high intensity storm. Rills are most likely to occur on soils with silt loam or clay loam surface texture. Surface stones reduce rill development.

2. **Presence of water flow patterns:** Water-Flow Patterns: are rare on this site. They are most likely to occur on slopes greater than 10 percent. When they do occur they are short and disrupted by cool season grasses, shrubs and surface stones. They are not extensive.

3. **Number and height of erosional pedestals or terracettes:** Pedestals and/or Terracettes: Pedestals are common on the site where flow patterns are present and the surface soils have a high clay content. Do not mistake frost-heaving for pedestals. Terracettes occur occasionally.

4. **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 25-35 percent.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** Wind-Scoured, Blowouts, and/or Deposition Areas: usually not present in the HCPC.

7. **Amount of litter movement (describe size and distance expected to travel):** Litter Movement. Fine litter in the interspaces may move up to 3 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):** Soil Surface Resistance to Erosion: values should range from 3 to 5 .

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil Surface Loss or Degradation: the A or A1 horizon is typically 2 to 14 inches thick. Structure ranges from weak and moderate fine granular to weak thin or moderate thick platy to moderate medium subangular blocky. Soil organic matter (SOM) ranges from 0.5 to 3 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 runoff and increase infiltration. Surface stones aid in slowing water movement and increasing infiltration. Medium height shrubs accumulate some snow in the interspaces.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Compaction Layer: not present. The site can develop a compaction layer due to the clay in the subsoil from severe livestock use when the soils are wet. Do not mistake an increase in clay content in the subsoil as a compaction layer.
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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: Functional/ Structural Groups: cool season deep-rooted perennial bunchgrasses > medium shrubs > perennial forbs > shallow rooted bunchgrasses.
- Sub-dominant:
- Other:
- Additional:
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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Plant Mortality/ Decadence: very little mortality or decadence is expected on this site. Mortality of shallow rooted grasses may occur due to extended periods of drought.
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14. **Average percent litter cover (%) and depth (in):** Litter Amount: additional data is needed but is expected to be low and at a shallow depth.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Annual Production: is 400 pounds per acre (448 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 45-55 percent of the total production, forbs 15-20 percent and shrubs 25-35 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:** Invasive Plants: include cheatgrass, medusahead, Vulpia species, bulbous bluegrass, annual mustards, and rush skeletonweed.
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17. **Perennial plant reproductive capability:** Reproductive Capability of Perennial Plants: all functional groups have the

potential to reproduce in favorable years.
