

Ecological site R011XY010ID Calcareous Loam 7-10 PZ ATCO-PIDE4/ACHY-ACTH7

Last updated: 4/06/2020
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General information

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

MLRA notes

Major Land Resource Area (MLRA): 011X–Snake River Plains

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Precipitation or Climate Zone: 7-10" P.Z.

Classification relationships

Land Resource Region: B (Northwest Wheat and Range)
MLRA: 11 (Snake River Plains)
EPA Eco Region: Level III (Snake River Plain)

Ecological site concept

Site does not receive additional moisture

Soils are:

May be saline or saline sodic

moderately deep to very deep, with >35% coarse fragments (by volume), skeletal
may be strongly or violently effervescent in the surface mineral 10"

Textures are generally loams in the surface mineral 4"

Slope is <30%

Clay content is =<35% in surface mineral 4"

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

Associated sites

R011XY001ID	Loamy 8-12 PZ
R011XY009ID	Silty 7-10 PZ KRLA2/ACHY
R011XY014ID	Sandy Loam 8-12 PZ ARTRW8/ACHY-HECO8

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on nearly level to steep slopes ranging from 0 to 20 percent, but is most common on 1 to 5 percent

slopes. The site occurs on all aspects and the elevations range from 2300-5200 feet (700-1600 meters). This site is associated with fan piedmonts, fan remnants, lava plains, plug domes, calderas, and shield volcanoes.

Table 2. Representative physiographic features

Landforms	(1) Terrace
Flooding frequency	None
Elevation	701–1,585 m
Slope	0–20%
Water table depth	152 cm
Aspect	Aspect is not a significant factor

Climatic features

MLRA 11 is part of Idaho’s Snake River Plain. The elevation ranges from 2,077 to 7,549 feet, with a mean of 3,992 feet. Most of the precipitation falls as rain in the fall, winter and spring. Very little precipitation occurs during the summer months. In general this MLRA receives more sun than the U.S. average during the summer, but less than average during the winter.

The average annual precipitation is 10.01 inches (based on 10 long term climate stations located throughout the MLRA), with minimum and maximum values of 8.38 and 11.62 inches, respectively.

The average annual temperature ranges from 38° to 65° Fahrenheit. With a maximum average temperature of 65 degrees F. and a minimum average of 38 degrees F. The frost free interval ranges from 139 to 165 days and the freeze free interval ranges from 168 to 196 days.

Table 3. Representative climatic features

Frost-free period (average)	165 days
Freeze-free period (average)	196 days
Precipitation total (average)	305 mm

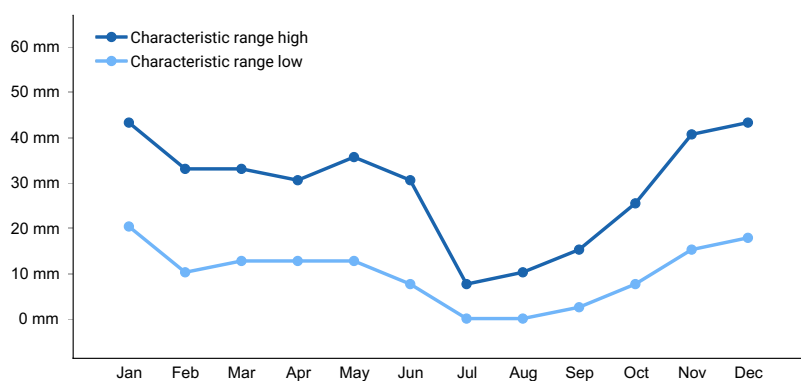


Figure 1. Monthly precipitation range

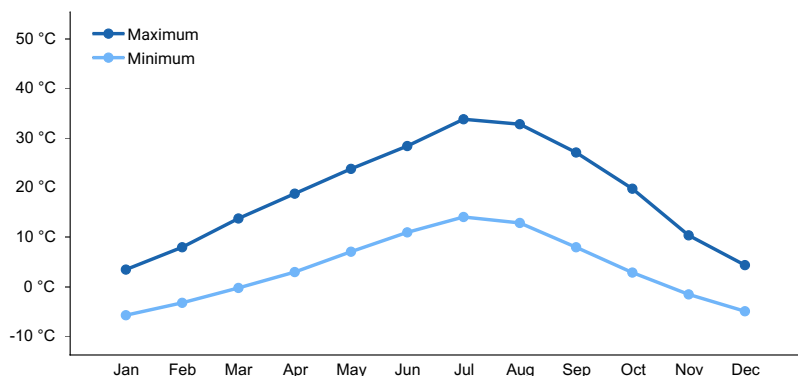


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

This site is not influenced by adjacent wetlands, streams, or run on. This site is occasionally associated with playas that are commonly ponded in the spring.

Soil features

The soils supporting this site are moderately deep to very deep over bedrock or a duripan. They are over 20 inches deep but have either a cemented pan, a strongly contrasting texture, or a high lime concentration within 8-16 inches of the surface which severely limits rooting depth. The soils are well to somewhat excessively drained and have slow to moderately rapid permeability. Runoff is very low to very high. The erosion hazard is slight to moderate by water and moderate to high by wind. These soils have little runoff and erosion except from a few intense summer rainstorms. The available water holding capacity (AWC) is low to moderate. The surface texture is generally gravelly loam. These soils are characterized by an aridic soil moisture regime that borders on xeric. Soil temperature regime is mesic. A variety of shallow rooting restrictions in combination with the limited amount of precipitation, favors shadscale. The rooting restrictions include bedrock, duripans, stratas of sand and gravels, clayey subsoils, or layers with high amounts of calcium carbonates with or without sodium or soluble salts.

Soil Series Correlated to this Ecological Site

Aysees
 Dors
 Garbutt
 Jenor
 Lapped
 Loray
 McKeeth
 Ornea
 Perazzo
 Ratsnest
 Shoofly
 Vanderoff
 Weso

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Stony sandy loam (3) Very gravelly fine sandy loam
Drainage class	Well drained to somewhat excessively drained
Permeability class	Slow to moderately rapid
Soil depth	51–152 cm
Surface fragment cover <=3"	0–17%

Surface fragment cover >3"	0–34%
Available water capacity (0-101.6cm)	4.32–21.08 cm
Calcium carbonate equivalent (0-101.6cm)	0–30%
Electrical conductivity (0-101.6cm)	0–4 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–12
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	0–23%
Subsurface fragment volume >3" (Depth not specified)	0–80%

Ecological dynamics

The dominant visual aspect of this site is Indian ricegrass, bud sagebrush, and shadscale. Composition by weight is approximately 40-50% grass, 5-15% forbs, and 40-50% 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 pronghorn antelope, mule deer, and lagomorphs.

Fire has historically occurred on the site at intervals of 80-100 years. Fire only occurs in favorable years.

The Historic Climax Plant Community (HCPC), the Reference State (State 1), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase A. This plant community is dominated by Indian ricegrass, Thurber's needlegrass, shadscale, and bud sagebrush. Subdominants include bottlebrush squirreltail, scarlet globemallow, and spiny hopsage. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 450 pounds per acre (500 Kg/ha) in a normal year. Production in a favorable year is 600 pounds per acre (666 Kg/ha). Production in an unfavorable year is 200 pounds per acre (222 Kg/ha). Structurally, medium height shrubs are co-dominant with cool season grasses being more dominant than perennial forbs while shallow rooted perennial bunchgrasses are subdominant.

FUNCTION:

This site is suited for livestock grazing in all seasons. Natural water supplies are normally short or absent. Slopes generally do not limit grazing. The site provides good habitat for various upland wildlife. It has low value for aesthetics or recreation.

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

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 when burned. Gardner saltbush, if present, will re-sprout after fire. Thurber's needlegrass is susceptible to mortality after fire. Cheatgrass can be a troublesome

invader at lower elevations on this site after fire, preventing perennial grass and shrub re-establishment and increasing the fire frequency.

Influence of improper grazing management:

Bud sagebrush, winterfat, and spiny hopsage can all be impacted by improper grazing management. Relatively low levels of utilization by cattle and sheep are necessary to maintain the shrub component.

Weather influences:

Extended periods of drought significantly impact this site due to the soils low water holding capacity and shallowness. Extended drought reduces vigor of the perennial grasses and palatable shrubs. Extreme drought may cause plant mortality.

Influence of insects and disease:

Mormon crickets and grasshopper outbreaks occur occasionally. Since defoliation usually occurs only once during the growing season, little mortality occurs.

Shadscale saltbush can be heavily impacted by the scale insect, *Orthezia annae*. It is also called "mealy bug". This insect is moved by ants from one plant to another and feeds on the roots of shadscale saltbush. It can cause stand mortality, especially following a series of drought years.

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 can be an invasive species on this site, especially after fire. Once it becomes 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. Sage grouse may use the site during the winter. Winter and spring use by mule deer occasionally occurs.

Watershed:

Decreased infiltration and increased runoff occurs when bud sagebrush, spiny hopsage, and winterfat is removed with frequent fires, particularly the year following the fire event. The increased runoff also increases sheet and rill erosion. The long-term effect is a transition to a different state.

Plant Community and Sequence:

Transition pathways between common vegetative states and phases:

State 1.

Phase A to B. Develops with fire (approximately every 80-100 years). Fire only occurs in above normal precipitation (favorable) years.

Phase A to C. Develops under improper grazing management and no fire.

Phase C to A. Develops under a good prescribed grazing management program and no fire.

Phase B to A. Develops from prescribed grazing and no fire.

State 1 to State 2.

Develops from Phase B with frequent fire or from Phase C with improper grazing management and fire. This site has crossed the threshold. It is not economical to return this site to State 1 with accelerating practices.

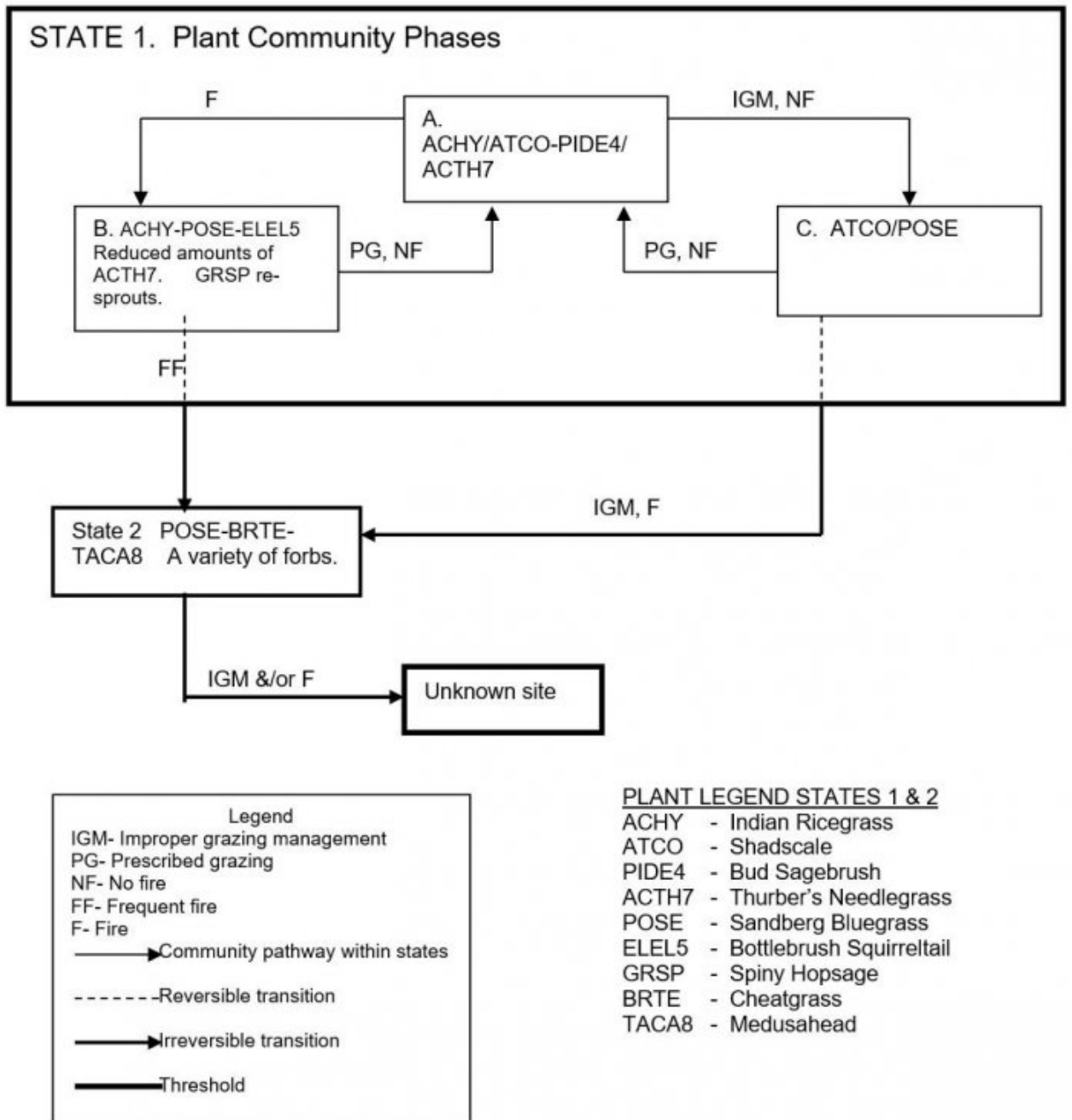
State 2 to Unknown Site.

The site has deteriorated further and soil loss has occurred resulting in a loss of site potential. This has resulted from improper grazing management and/or fires. This site has crossed the threshold. It is not economical to return this site to State 1 with accelerating practices.

Practice Limitations.

Due to the shallow soils and low available water holding capacity (AWC) of the soils, severe limitations exist for range seeding on this site. Low potential production and value to herbivores must be considered if planning brush management.

State and transition model



**State 1
State 1 Phase A**

Community 1.1 State 1 Phase A

Reference Plant Community Phase. This plant community is dominated by Indian ricegrass , shadscale, and bud sagebrush. Thurber's needlegrass is sub-dominant. Small amounts of bottlebrush squirreltail and Sandberg bluegrass may be present. A large variety of forbs are present but each represents a small amount in the community. Spiny hopsage can be present in small amounts. The natural fire frequency is about 80-100 years.

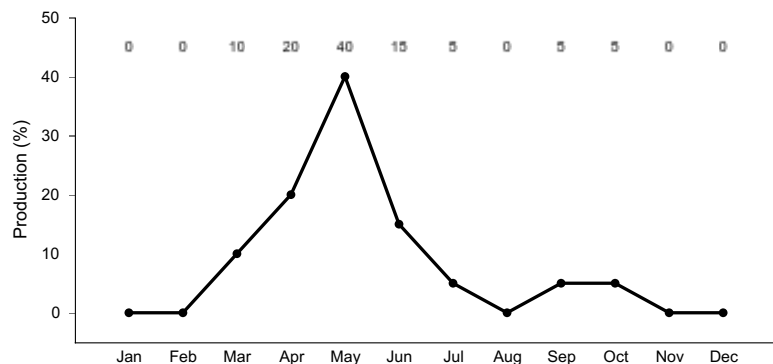


Figure 3. Plant community growth curve (percent production by month). ID0401, KRLA2/ACHY. Reference State.

State 2 State 1 Phase B

Community 2.1 State 1 Phase B

This plant community is dominated by Indian ricegrass , Sandberg bluegrass, and bottlebrush squirreltail. Thurber's needlegrass may be absent or in low vigor. Some annual grasses have invaded. Spiny hopsage and Gardner saltbush, if present, have re-sprouted. This phase has developed due to fire.

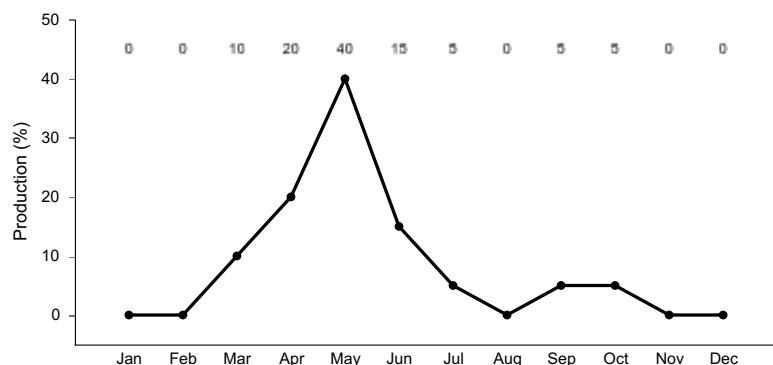


Figure 4. Plant community growth curve (percent production by month). ID0401, KRLA2/ACHY. Reference State.

State 3 State 1 Phase C

Community 3.1 State 1 Phase C

This plant community is dominated by shadscale with Sandberg bluegrass in the understory. Indian ricegrass and Thurber's needlegrass and other deep-rooted perennial bunchgrasses are present but in reduced amounts and in low vigor. Bud sagebrush is heavily hedged and shadscale is increasing. Some annual grasses have invaded. This phase has developed due to improper grazing management and no fire.

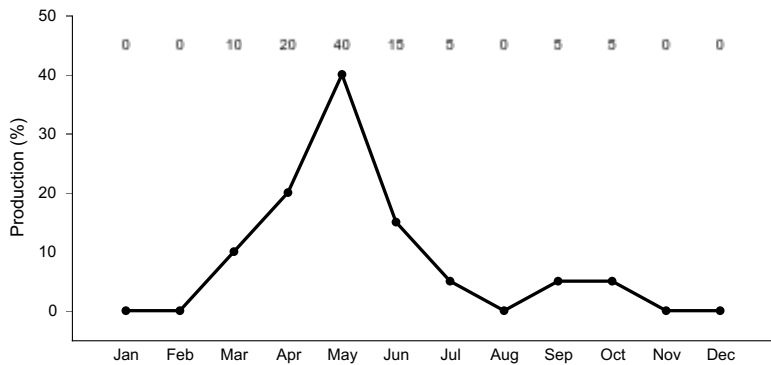


Figure 5. Plant community growth curve (percent production by month). ID0401, KRLA2/ACHY. Reference State.

**State 4
State 2**

**Community 4.1
State 2**

This plant community is dominated by Sandberg bluegrass, cheatgrass, medusahead rye, and a variety of forbs. Some perennial forbs are present. A few remnants of shadscale may be present and spiny hopsage has re-sprouted. The community has developed due to continued improper grazing management and fire from Phase C, State 1 or with frequent fire from Phase B, State 1. 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.

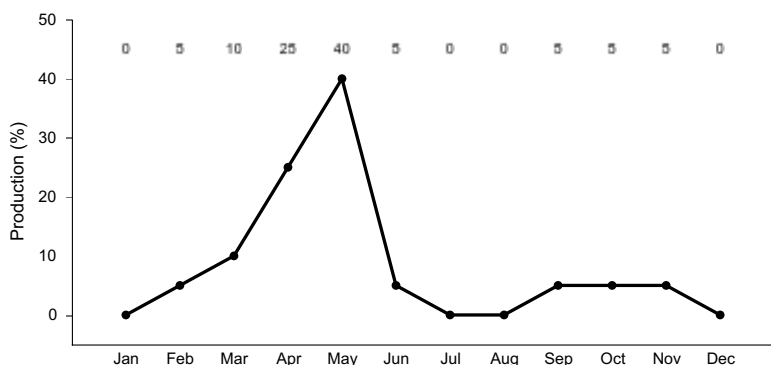


Figure 6. Plant community growth curve (percent production by month). ID0402, POSE-BRTE/ANNUALS. State 2.

**State 5
State 3**

**Community 5.1
State 3**

Unknown Site. This plant community has gone over the threshold to a new site. Site potential has been reduced. Significant soil loss has occurred. Infiltration has been reduced and run-off has become more rapid. This community has developed due to continued improper grazing management and/or fire. This site has crossed the threshold. It is not economical to return this site to State 1 with accelerating practices.

Additional community tables

Animal community

Wildlife Interpretations.

This rangeland ecological site provides a sparse plant community for select native wildlife species. The plant community exhibits low diversity and productivity of grasses, forbs, and shrubs. Insect diversity is limited due to the low number of forb species present. Mule deer and antelope are the large herbivores using the site. The site provides seasonal habitat for resident and migratory animals including sagebrush lizard, shrews, ground squirrels, mice, coyote, red fox, badger, Ferruginous hawk, prairie falcon, horned lark, and western meadowlark. Encroachment of noxious and invasive plant species (cheatgrass, kochia, and Russian thistle) in isolated areas 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 –Indian Ricegrass/ Shadscale/ Bud Sagebrush/ Thurber's Needlegrass Reference Plant Community (RPC) This plant community provides a diversity of grasses, forbs, and shrubs used throughout the growing season by native insect communities that assist in pollination. The reptile community is represented by sagebrush lizard, leopard lizard, and short horned lizard. The plant community provides forage throughout the year for mule deer and antelope. Bud sagebrush provides good spring forage and shadscale provides good spring and winter forage for deer and antelope. Bud sagebrush and shadscale are utilized extensively by rodents, rabbits, birds, and antelope. Rodent populations can be high and provide an excellent prey base for raptors.

State 1 Phase 1.2 –Indian Ricegrass/ Sandberg Bluegrass/ Bottlebrush Squirreltail Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation would provide less vertical structure for animals. Patches of root sprouting shrubs (spiny hopsage and Gardner saltbush) may begin to provide limited vertical structure for wildlife over time. Spiny hopsage and Gardner saltbush provide fair to good feed and cover for large game, birds, and small mammals. Insect diversity would be reduced with the loss of sagebrush and shadscale but native forbs are still present and would support select pollinators. Reptiles including short horned lizard and sagebrush lizard would be limited or excluded on sites where no brush is present. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark and western meadowlark). The loss of shadscale and bud sagebrush would reduce the quality of spring and winter forage for mule deer and antelope. The populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel. Predator hunting success may increase due to the reduction of cover for small mammals.

State 1 Phase 1.3- Shadscale/ Sandberg Bluegrass Plant Community: This plant community is the result of improper grazing management and no fire. An increase in canopy cover of shadscale contributes to a sparse herbaceous understory. The reduced herbaceous understory results in lower diversity and numbers of insects. The reptile community is represented by sagebrush lizard, leopard lizard, and short horned lizard. The reduction of grasses and forbs in the plant community may reduce the available prey species and cover for these resident reptiles. Fewer prey species and a sparse understory results in limited food, brood-rearing, and nesting habitat for birds. Shadscale provides winter and spring forage for mule deer. The fruits provide food for game birds and songbirds. The seeds of shadscale remain on the plant throughout the winter, enhancing its nutritional value

State 2 - Sandberg Bluegrass/ Cheatgrass / Medusahead Plant Community: Frequent fires and/or improper grazing management and fire have caused the degradation from either Phase 1.2 or 1.3 in State 1. The reduced forb and shrub components in the plant community would support a very limited population of pollinators. The loss of forbs may affect butterfly populations due to the loss of host plants used by butterflies. Most reptilian species are not supported with food, water, or cover. This plant community does not support the habitat requirements of sage-grouse. 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. Predator hunting success may increase due to poor cover provided for small mammals and grassland bird 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. The populations of small mammals would be dominated by open grassland species like the Columbian ground squirrel.

Grazing Interpretations.

This site is suited for livestock grazing in all seasons. Natural water supplies are normally short or absent. 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 C. They have moderately high runoff potential.

Recreational uses

This site offers low values for aesthetics and recreational values.

Wood products

None

Other products

None

Other information

Field Offices

Meridian, ID
Caldwell, ID
Mountain Home, ID
Marsing, ID
Payette, ID
Weiser, ID
Emmett, 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
Dan Ogle, Acting State Rangeland Management Specialist, NRCS, Idaho
Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho
Leah Juarros, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Range Management Specialist, IASCD

Type locality

Location 1: Owyhee County, ID	
Township/Range/Section	T2S R2W S8
Location 2: Owyhee County, ID	
Township/Range/Section	T3S R2W S26
Location 3: Owyhee County, ID	
Location 4: Ada County, ID	

Other references

Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Grass Habitat Types of Southern Idaho. University of Idaho, Moscow, Idaho. Bulletin Number "35".

USDA Forest Service, Rocky Mountain Research Station. 2004. Restoring Western Ranges and Wildlands. General Technical Report RMRS-GTR-136-vols. 1-3.

USDA, NRCS.2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, Forest Service, Fire Effects Information Database. 2004. www.fs.fed.us/database.

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

Forty Years of Change in a Shadscale Stand in Idaho. L.A. Sharp, K. Sanders and N. Rimbey. 1990. Rangelands 12(6): 313-328.

Approval

Kendra Moseley, 4/06/2020

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	04/04/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

- Number and extent of rills:** rills rarely occur on this site due to the gravelly to extremely gravelly surface soils.

- Presence of water flow patterns:** water-flow patterns rarely occur on this site. When they do occur they are short and disrupted by cool season grasses, shrubs, and surface gravels. They are not extensive.

- Number and height of erosional pedestals or terracettes:** rarely occur on this site.

- Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** ranges from 15-75 percent but additional data is needed.

5. **Number of gullies and erosion associated with gullies:** does not occur on this site.
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6. **Extent of wind scoured, blowouts and/or depositional areas:** usually not present in the Reference Plant Community Phase.
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7. **Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces typically moves up to three feet primarily by wind. 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 but needs to be tested.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Structure ranges from weak, moderate, or strong thin to medium or thick platy. Soil organic matter (SOM) is 0 to 1 percent. The A or A1 horizon is typically 1 to 6 inches thick.
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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 runoff and increase 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):** 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: medium height shrubs
- Sub-dominant: cool season perennial grasses
- Other: perennial forbs
- Additional: shallow rooted perennial bunchgrasses
-
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** very little mortality or decadence is expected on this site. Mortality of shallow rooted grasses may occur as a result of extended periods of drought.
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14. **Average percent litter cover (%) and depth (in):** 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):** is 450 pounds per acre (500 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 40-50 percent of the total production, forbs 5-10 percent, and shrubs 40-50 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, kochia, halogeton and Russian thistle.
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17. **Perennial plant reproductive capability:** all functional groups have the potential to reproduce in normal and favorable years.
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