USDA Natural Resources
Conservation Service

Ecological site R010XY024ID
Dry Meadow PONE3-PHAL2

Last updated: 9/23/2020
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

No Data.

Associated sites

R010XY023ID	**Meadow DECA18-CANE2**
R010XY029ID	**Wet Meadow Carex-Juncus**
R025XY001ID	**ASPEN THICKET**

Similar sites

R025XY028ID	**LOAMY BOTTOM 12-16**
R010XY023ID	**Meadow DECA18-CANE2**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Poa nevadensis* (2) *Phleum alpinum*

Physiographic features

This site occurs on nearly level to undulating topography in small stream and high mountain valleys. Slopes are generally less than 5 percent. The site is frequently criss-crossed by old stream courses. Elevation ranges from 2000 to 5000 feet (610-1530 meters).

Table 2. Representative physiographic features

Landforms	(1) Stream
Flooding duration	Brief (2 to 7 days)
Flooding frequency	Very rare to rare
Ponding duration	Very brief (4 to 48 hours)
Ponding frequency	Rare
Elevation	2,000–5,000 ft
Slope	0–5%

Ponding depth	0–12 in
Water table depth	0–40 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

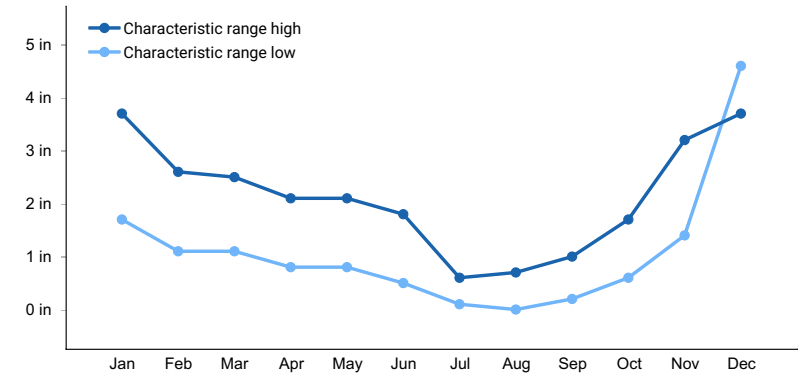


Figure 1. Monthly precipitation range

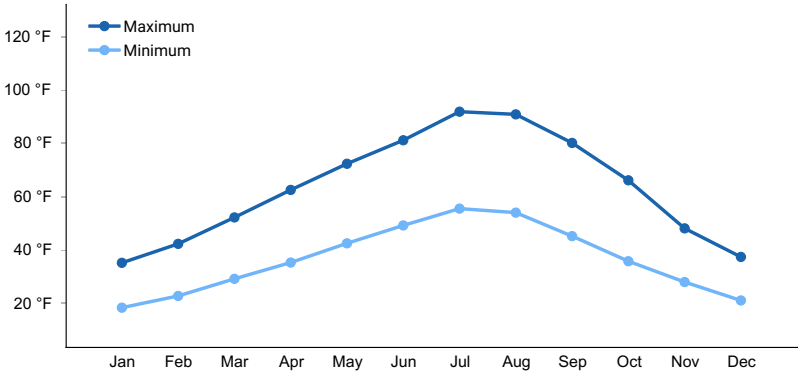


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

This site is influenced by adjacent wetlands, streams or run on.

Soil features

These deep to very deep soils are formed from local alluvium. The soils on this site are moderately well drained and have moderate to moderately slow permeability. The available water holding capacity (AWC) ranges from low to high and is supplemented by upward capillary movement of water from the water table. The water table fluctuates from the surface down to 40 inches during the growing season, restricting most deep-rooted shrubs. Run-off is ponded or very slow and depressional areas usually accumulate local sediment instead of eroding. Severe removal of vegetation can cause channel cutting, which may cause a lowering of the water table. Reactions range from neutral to moderately alkaline. The surface is usually dark and high in organic matter. The surface textures range from fine sandy loams to clay loams.These soils are characterized by an aquic or xeric moisture regime. Soil temperature regime is frigid or cryic.

Ecological dynamics

The dominant visual aspect of this site is a plant community dominated by Nevada bluegrass, alpine timothy and meadow barley. Shrubs are normally not present, however several willow species can be found in small amounts. Composition by weight is approximately 80-90 percent grasses and grass-likes and 10-20 percent forbs. The soil surface of the site is typically slightly undulating causing small depressions and high spots with variable soil moisture characteristics. This site is commonly found in complex with the following sites:

1. Marsh site. Deeper depressions with water slightly above the surface. This site is dominated by Northwest territory sedge, common spikerush, broadleaf cattail, hardstem bulrush, common threesquare, and beaked sedge.

2. Wet Meadow site. Shallow depressions with the water table at or near the surface for the entire growing season. This site is dominated by Northwest territory sedge and beaked sedge.

3. Meadow site. Slightly higher areas that are drier during the growing season. This site is dominated by tufted hairgrass, Nebraska sedge and alpine timothy.

The soils within any complex of meadow sites are highly variable. Factors that affect the determination of the site include depth to water table at end of growing season, micro-topography, and drainage class. Depth to water table and micro-topography are measurable features. Determination of drainage class requires the use of soil interpretation tables. Other interpretive factors that may be used for site determination are ponding frequency, depth and duration and flooding frequency, timing and duration.

Micro-topography is a feature that has a dramatic effect on depth to water table and the resulting plant communities. A few inches of change in surface elevation changes species composition and/ or production. Slightly undulating topography is common in meadow complexes, therefore, more than one site should be expected.

An infinite number of combinations of factors that influence the ecology of potential plant communities exist. For practical purposes, four plant communities where the depth to the water table drives the vegetative composition have been described. They are:
Dry meadow Water table at >40” at end of growing season
Meadow Water table at 20-40” at end of growing season
Wet meadow Water table at 10-20” at end of growing season
Marsh Water at surface to <10” at end of growing season

Most wetland species have a wide range of tolerance for variations in soil moisture. Most species occur in more than one site, although most are dominant on just one site.
The following table shows the amplitude of wetland species that occur on the four sites.

The Reference State (State 1) moves through many phases depending on the natural and man-made forces that impact the community over time. The Reference Plant Community Phase of this site is dominated by Nevada bluegrass, alpine timothy and meadow barley. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase A. The plant species composition of Phase A is listed later under

“Reference Plant Community Phase Plant Species Composition”.

In the last few thousand years, this site has evolved in an arid climate characterized by dry summers and cold, wet winters. Flooding and high water table have also influenced the development of this site. Herbivory has historically occurred on this 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 the site at intervals of 20-40 years. Fire has had little influence on the development of the site. This site normally burns in conjunction with an adjacent upland site.

Total annual production is 1300 pounds per acre (1444 kilograms per hectare) in a normal year. Production in a favorable year is 2000 pounds per acre (2222 kg/ha). Production in an unfavorable year is 800 pounds per acre (888 kg/ha). Structurally, cool season deep-rooted perennial grasses are very dominant, followed by perennial forbs.

This site is suitable for big game and livestock grazing in the late spring, summer and fall. Wet soils can limit grazing opportunities, particularly early in the year.

This site can be used for hiking, access to fishing, hunting, viewing wildlife and plants, and horseback riding. The wet soils can limit access. Motorized vehicles can be very detrimental to the site especially when soils are saturated to the surface.

Due to the deep soils, fertility, inherent high productivity, and relatively flat slopes, it is fairly resistant to disturbances that can potentially degrade it. Site degradation is usually the result of a lowering of the water table. This can occur with down cutting of adjacent stream channels or significant run-off following prolonged drought. It can also result from on-site improper grazing or off-site conditions in the upper watershed. Once adjacent streams down-cut, concentrated flows will lower the water table.

Impacts on the Plant Community.

Influence of fire:

When this site burns, it usually does not adversely affect the plant community. Most plants, including shrubs, will begin to sprout back immediately with sufficient soil moisture and will continue and/or complete their recovery during the next growing season. Fires typically occur from mid-summer into fall.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be very detrimental to this site. The grasses in the plant community will decline in the stand and sedges, rushes and forbs will increase. Continued improper grazing management will result in a stand of forbs and Kentucky bluegrass with sedges and rushes. The reduced ability of the community to withstand seasonal flooding results from continued improper grazing management and/or the potential down cutting of adjacent streams. If downcutting or the initiation of headcuts occurs, both will lower the water table level and thus reduce the potential of the site.

Proper grazing management that addresses frequency, duration, and intensity of grazing can maintain the integrity of the plant community and the water table on which it is dependent.

Weather influences:

Because of the deep soils, the influence of the water table, seasonal flooding and run-on, the production of this site changes little during wet or dry precipitation years. Ephemeral streams commonly occur on this site. Prolonged drought may adversely affect the frequency of ephemeral streams and the plant community that relies on them. 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.

Influence of Insects and disease:

Periodic disease and insect outbreaks can affect vegetation health. Mormon crickets 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:

Annual and perennial invasive species can compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

Influence of wildlife:

This site is important for many species of mammals for food and life cycles. The site is primarily used in the late spring, summer, and fall by big game. Many birds use the site for food, nesting or brood rearing in the late spring, summer, and fall. Sage grouse use the site for brood rearing and forage.
Total numbers are seldom high enough to adversely affect the plant community.

Watershed:

The largest threat to degradation of this site is the lowering of the water table. Off-site conditions can affect the gradient of adjacent stream channels that can affect the water table. If the perennial grass and sedge cover is depleted or the perched watertable is lost, down cutting can be accelerated within the site. High run-off events from the adjacent uplands can severely damage or change the normal stream channel on the site. As the water table is lowered, productive potential is lost. Eventually the water table is below the root zone of the adapted perennial grasses. These are ultimately replaced by perennial forbs and shallow rooted grasses. Extreme down cutting and lowering of the water table can move the site across the threshold to a new, less productive site. Severe down-cutting can result in a plant community that resembles an upland site.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.
Phase A to B. Develops with improper grazing management.
Phase B to A. Results from prescribed grazing.

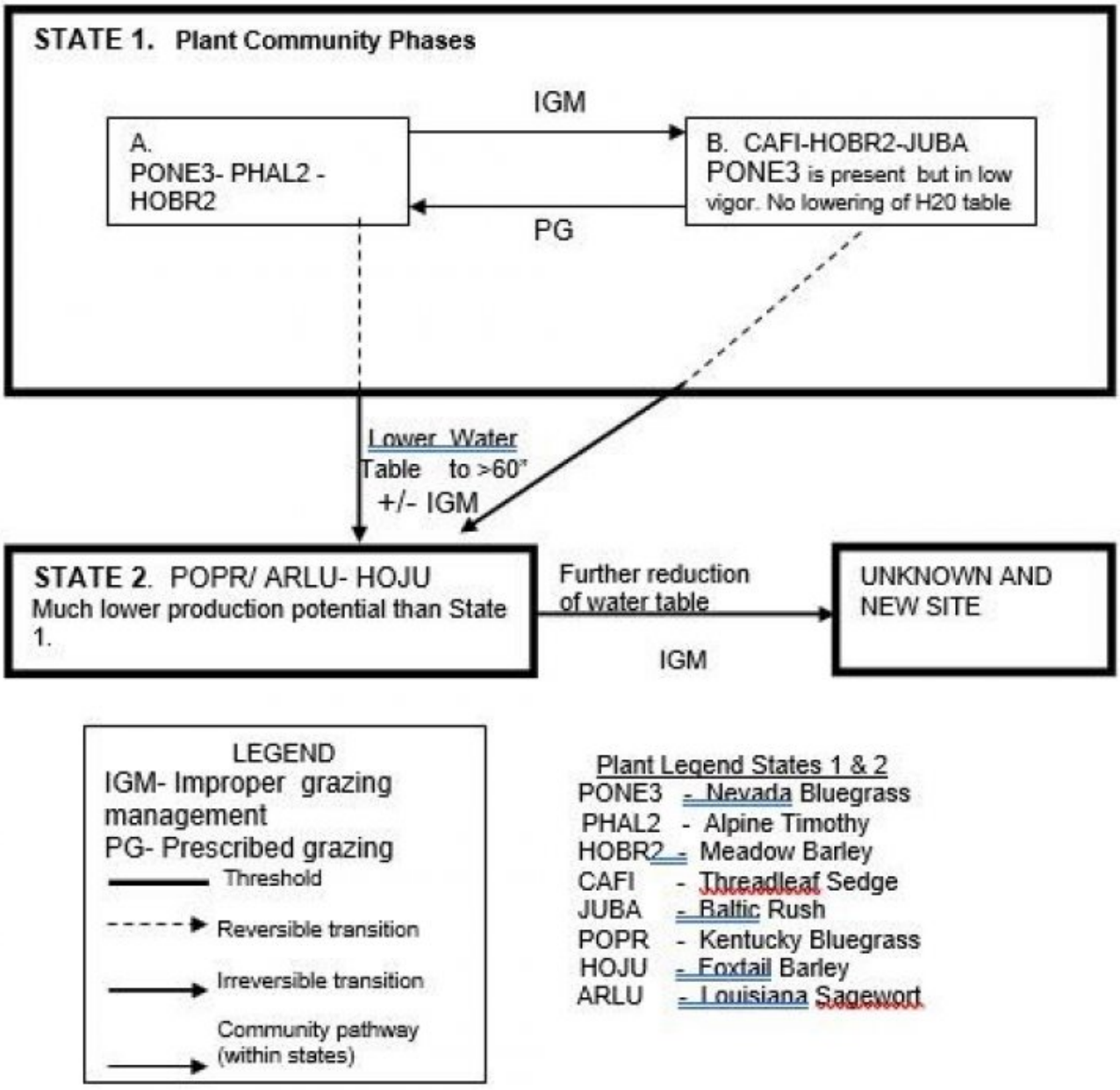
State 1 Phase A or B to State 2. Develops through permanently lowering the late growing season water table to more than 60 inches. This can occur with continued improper grazing management. It may also occur with proper grazing on the site, but channel erosion may continue if poor off-site conditions cause frequent and/or severe flooding. The site has crossed the threshold. This state cannot be returned to State 1 without raising the water table.

State 2 to unknown site. Results from continued lowering of the water table through down cutting of the stream channel. The site retrogresses to a new site with reduced potential due to significant loss of available soil moisture from the lowered water table. It occurs with continued improper grazing management or repeated significant run-off events. The site has crossed the threshold. This state cannot be returned to State 1 without raising the water table.

Practice Limitations.

There are moderate seeding limitations on this site due to difficulty in preparing adequate seedbed due to water table. Elimination of existing vegetation prior to planting is difficult in wet seasons and high water table periods. There are moderate to severe limitations for brush management using chemicals due to the proximity to water bodies. Grade stabilization structures may be needed to prevent further down-cutting of the channel. Other options for rehabilitation may include application of fertilizer, prescribed grazing and off-site livestock water development. Fencing of the site for better livestock control may also be considered.

State and transition model



State 1
State 1 Phase A

Community 1.1
State 1 Phase A

This plant community has Nevada bluegrass, alpine timothy and meadow barley in the herbaceous layer. There is a variety of perennial forbs but none comprise a high percentage of the plant community.

Table 4. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%

Biological crusts	0%
Litter	80-90%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

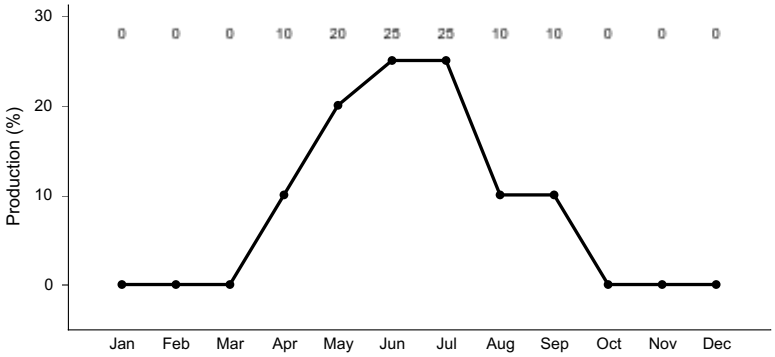


Figure 3. Plant community growth curve (percent production by month). ID0215, B10 Dry Meadow. State 1.

State 2
State 1 Phase B

Community 2.1
State 1 Phase B

This plant community is dominated by threadleaf sedge, meadow barley and Baltic rush. Forbs such as Rocky Mountain iris and white sagebrush have increased in the community and Kentucky bluegrass may have invaded. Nevada bluegrass is present but in low vigor. A compaction layer has likely developed. This phase has developed due to improper grazing management. The water table has not been lowered from that of Phase A.

Table 5. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	80-90%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

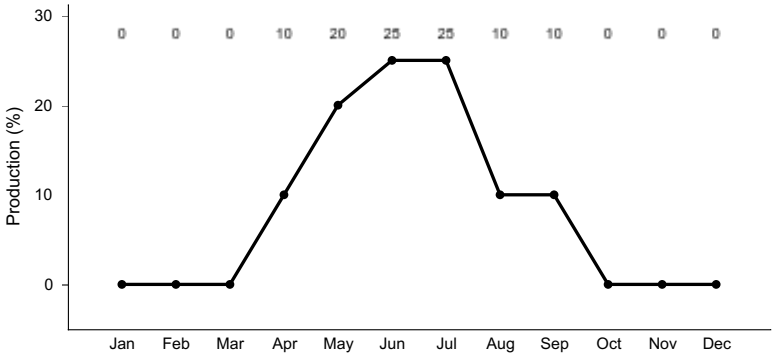


Figure 4. Plant community growth curve (percent production by month). ID0215, B10 Dry Meadow. State 1.

State 3
State 2

Community 3.1
State 2

This plant community is dominated by Kentucky bluegrass and white sagebrush but the overall production potential of the site is much lower than State 1. There is an increase in forbs and grasses that require less soil moisture. Foxtail barley, bottlebrush squirreltail, and Sandberg bluegrass may have invaded or increased in the community. This state developed due to continued improper grazing management and a permanent lowering of the water table. The site has crossed the threshold. This state cannot be returned to State 1 without raising the water table. This might be done over time using structures or bio-engineering practices, but the plant community may take many years to approach the plant community in State 1.

Table 6. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	80-90%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

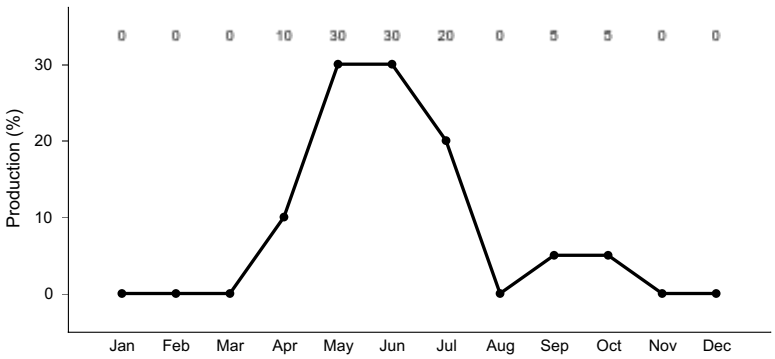


Figure 5. Plant community growth curve (percent production by month). ID0213, POPR/ARLU. STATE2.

State 4
State 3

Community 4.1
State 3

Table 7. Ground cover

Tree foliar cover	0%
Shrub/vine/liana foliar cover	0%
Grass/grasslike foliar cover	0%
Forb foliar cover	0%
Non-vascular plants	0%
Biological crusts	0%
Litter	80-90%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

Additional community tables

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This dry meadow ecological site provides diverse habitat value for wetland and upland wildlife species. The seasonal hydrology results in abundant forage and seasonal water attracting invertebrate and. Important seasonal habitat is provided for over 80% of rangeland resident and migratory animals including western toad, western rattlesnake, shrews, bats, jackrabbits, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark and western meadowlark. Large herbivore use of the ecological site includes mule deer, pronghorn antelope and elk. Native reptiles and amphibians are reliant on these dry meadow sites throughout the year. Loss of site hydrology significantly reduces habitat value of the adjacent ecological sites. Open water is seasonal, only being provided by seasonal runoff, ponding, seasonal high water table and natural springs.

State 1 Phase 1.1 - Nevada Bluegrass/ Alpine Timothy/ Meadow Barley Reference Plant Community (RPC): The RPC provides a diversity of grasses and forbs used by native insect communities that assist in pollination of the plant community. The insects provide feed for the many predator species utilizing the site. The reptile and amphibian community is represented by leopard lizard, western skink, rubber boa, western rattlesnake, western toad, boreal chorus frog and northern leopard frog. A diverse amphibian population is a key indicator of good ecological health on this site. Sage-grouse utilize the meadows as summer and fall brood-rearing habitat. The plant community supports summer and fall forage needs of large mammals (antelope, mule deer and elk.). Limited thermal cover for ungulates is available due to the lack of woody vegetation in the plant community. A diverse small mammal population including deer mouse, golden-mantled ground squirrels, chipmunks, and yellow-bellied marmots would utilize the habitat on a seasonal basis.

State 1 Phase 1.2 - Threadleaf Sedge/ Meadow Barley/ Baltic Rush Plant Community: This phase has developed due to improper grazing management. Insect populations would be reduced due to the plant community change and

reduced vigor of forbs. Quality of amphibian habitat would be reduced due to a more open, shorter plant structure and reduced insect diversity. The plant community provides summer and fall brood-rearing habitat for sage-grouse when sagebrush cover is nearby. The dominant plant community is preferred forage for ungulates but the improper grazing management would reduce available forage in the summer and fall. Small mammal populations and diversity would be reduced due to reduced vertical structure and increased vulnerability to predators.

State 2 –Kentucky Bluegrass/ Louisiana Sagewort/ Foxtail Barley Plant Community: This state developed due to continued improper grazing management and a permanent lowering of the water table. Pollinators would be supported by forbs requiring less moisture than plants in State 1. The loss of historic hydrology will limit or exclude use of the site by amphibians and many reptiles. Suitable habitat cover for the northern leopard frog, a species of concern, would not be provided. Grassland avian species would also avoid these areas. Birds of prey (northern harrier and Cooper's hawk) may range throughout these areas looking for prey species. Ungulates will utilize the herbaceous vegetation in the summer and fall. Small mammal populations and diversity would be reduced due to reduced vertical structure and vulnerability to predators.

Grazing Interpretations.

This site is suitable for grazing in late spring after soils have dried sufficiently to prevent trampling and in the summer and fall. Natural water supplies are likely to be limited or absent on the site in late summer and fall. Estimated initial stocking rate will be determined with the landowner or decision-maker. They will be based on the inventory which includes species, composition, similarity index, production, past use history, season of use and seasonal preference. Calculations used to determine estimated initial stocking rate will be based on forage preference ratings

Hydrological functions

Soils on this site are in hydrologic groups B, C, and D.

Recreational uses

This site has some value for aesthetics and natural beauty due to several spring and early summer blooming forbs and shrubs. Some hunting for sage grouse, rabbits, elk, and deer occurs. Hikers and fishermen may traverse the edge of the site where it is adjacent to streams.

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
Jim Cornwell, Range Management Specialist, IASCD
Chris Hoag, Wetland Specialist, NRCS, Idaho
Dan Ogle, Plant Materials Specialist, NRCS, Idaho
Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho
Leah Juarros, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Range Management Specialist, IASCD

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.
USDA, NRCS. 1992. Major Land Resource Area 25, Owyhee High Plateau, Nevada Site Descriptions, Reno, Nevada.

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

DF

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.

Author(s)/participant(s)	Dave Franzen and Jacy Gibbs Intermountain Range Consultants 17700 Fargo Rd. Wilder, ID 83676
Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	03/24/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Are not common on this site. If the site is degrading due to gully down-cutting, rills may occur on the side slopes of the gully.

2. **Presence of water flow patterns:** Are common on this site. When they occur they are long, often running the length of the site and disrupted by cool season grasses. Water flow patterns are also common from run-in from the adjacent uplands.

3. **Number and height of erosional pedestals or terracettes:** Are rare on this site.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Data is not available. On sites in mid-seral status bare ground may range from 20-30 percent but more data is needed.

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

6. **Extent of wind scoured, blowouts and/or depositional areas:** Usually not present.

7. **Amount of litter movement (describe size and distance expected to travel):** Fine litter in the interspaces may move more than 6 feet or even off the site following a significant flooding or run-off event.

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 3-5 but needs to be tested.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** The A or A1 horizon is typically 40 inches thick. Structure ranges from weak thin platy to strong fine granular. Soil organic matter (SOM) needs to be determined.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Deep-rooted perennial grasses and grass-likes slow run-off and increase infiltration.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** Normally not present. A compaction layer can develop if grazing occurs when the soils are wet.

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 grasses and grass-likes.

Sub-dominant: Cool season deep-rooted perennial grasses and grass-likes.

Other:

Additional:

---

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Most of the grasses and grass-likes on this site will become decadent in the absence of fire and ungulate grazing. Decadence or low vigor is a result of litter buildup in the crowns of the plants.

---

14. **Average percent litter cover (%) and depth (in):** Additional litter cover data is needed but is expected to be 35 to 50 percent to a depth of 0.2 inches. Under mature shrubs and basin wildrye, litter is >0.5 inches deep and is 90-100 percent ground cover.

---

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 1300 pounds per acre (1444 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 80-90 percent of the total production and forbs 10-20 percent.

---

16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** include cheatgrass, leafy spurge, whitetop, perennial pepperweed, rush skeletonweed, Canada, musk and scotch thistle and diffuse and spotted knapweed.

---

17. **Perennial plant reproductive capability:** all functional groups have the potential to reproduce in most years.
