USDA Natural Resources
Conservation Service

Ecological site R013XY050ID
Riparian Wet Meadow SALIX/CAREX

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.

MLRA notes

Major Land Resource Area (MLRA): 013X–Eastern Idaho Plateaus

Land Resource Region: B (Northwestern Wheat and Range)
MLRA: 13 (Eastern Idaho Plateaus)

EPA EcoRegion: Level III (Middle Rockies)

LRU notes

013X-Eastern Idaho Plateaus

Additional moisture site.
https://soils.usda.gov/survey/geography/mlra/index.html

Classification relationships

none.

Ecological site concept

Site receives additional water.
Soils are:
not saline or saline-sodic.
Deep to very deep, not skeletal within 20” of soil surface.
Season water table <12” along seeps and springs
Not strongly or violently effervescent in surface mineral 10”.
Slope is < 30%.
Clay content is = <35% in surface mineral 4”.
Site does not have an argillic horizon with > 35% clay.

Associated sites

R013XY039ID	**Dry Meadow PONE-PHAL2**
R013XY053ID	**Wet Meadow CAREX-JUNCUS**

Similar sites

R013XY039ID	**Dry Meadow PONE-PHAL2**

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on level and nearly level flats, terraces and flood plains on valley floors along streams. Slopes range from 0 to 4 percent on all aspects. The site also occurs around localized seeps and springs. The surface is not flat, but slightly undulating with small depressions and high spots. Elevations range between 4500 to 7000 feet (1375 to 2150 meters).

Table 2. Representative physiographic features

Landforms	(1) Valley floor (2) Flat (3) Flood plain
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	None to frequent
Elevation	4,500–7,000 ft
Slope	0–4%
Water table depth	0–48 in
Aspect	Aspect is not a significant factor

Climatic features

MLRA 13, the Eastern Idaho Plateaus, is part of the Northwestern Wheat and Range Region. Its elevation ranges from 4209 to 9331 feet above sea level, with an average elevation of 5787 feet. The average annual precipitation is 16.41 inches, with a range of 13.56 to 18.75 inches, based on ten long term climate stations located throughout the MLRA. A spike in precipitation amount often occurs in late spring, usually in May.

Temperatures vary widely in the MLRA throughout the year. A maximum temperature of 103° Fahrenheit occurred at the McCammon climate station (# 105716; elevation 4770 feet), while a minimum of -41° was recorded at the Kilgore station (#104908). At all stations temperatures throughout the year are usually below the national average. Kilgore also recorded the greatest annual snowfall amount of 217 inches. The average temperature is 41.4 degrees F. with an average high of 55.3 degrees and an average low of 27.5 degrees.

The frost-free period ranges from 64 to 90 days, while the freeze-free period can be 98 to 123 days.

Table 3. Representative climatic features

Frost-free period (average)	90 days
Freeze-free period (average)	123 days
Precipitation total (average)	19 in

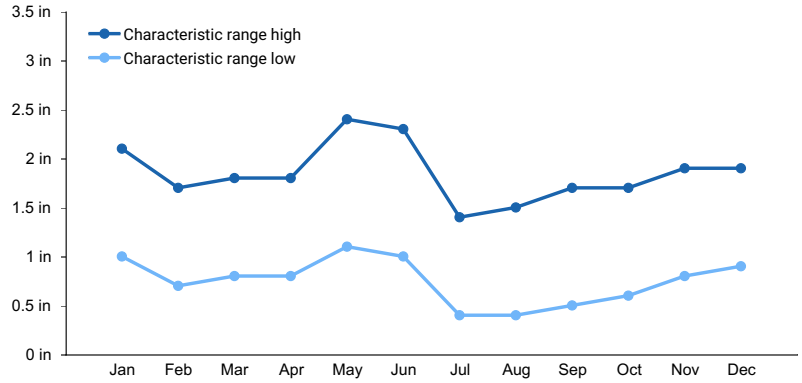


Figure 1. Monthly precipitation range

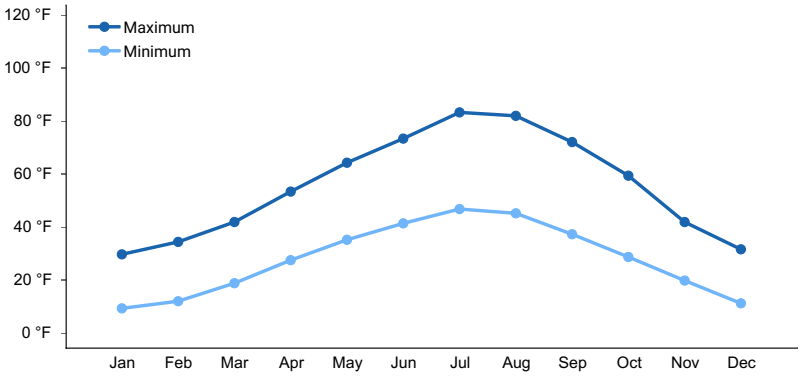


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

This site has a permanent watertable at 12 inches or less.

Soil features

The soils on this site have a dark colored surface and are mainly silty clay loams, silt loams, and loams over 60 inches deep, alluvial in origin and may have some gravels. The available water holding capacity (AWC) is low to moderate and is supplemented by upward capillary movement from the shallow water table. The effective rooting depth is limited by the high water table. The soils are very poorly to somewhat poorly drained and have a water table at or near the surface at the beginning of the growing season and down to10 to 25 inches deep by the end of it. Flooding is rare to frequent during snowmelt and just after snowmelt. Ponding can occur in small depression areas during this time period. The plant community is dependent on nearly saturated or saturated soils during a major portion of the growing season. The water table is influenced by seasonal flooding, stream flows, seeps or springs, or from run-on from adjacent sites. The soils are characterized by an aquic soil moisture regime and either a frigid or cryic soil temperature regime.

Soil Series Correlated to this Ecological Site:

Cedron
Furniss
Inkom
Tonks
Zohner

Table 4. Representative soil features

Surface texture	(1) Silty clay loam (2) Silt loam (3) Loam

Drainage class	Poorly drained to somewhat poorly drained
Permeability class	Very slow to moderately rapid
Soil depth	60 in
Surface fragment cover <=3"	0–5%
Available water capacity (0-40in)	4.9–9.2 in
Calcium carbonate equivalent (0-40in)	0–40%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–10
Soil reaction (1:1 water) (0-40in)	4.5–9
Subsurface fragment volume <=3" (Depth not specified)	0–30%

Ecological dynamics

The dominant visual aspect of this site is grasses and forbs with scattered clusters of shrubs. This site is commonly in complex with semi-wet meadow and wet meadow range sites in the riparian zone. Composition by weight is approximately 45-55 percent grass, 5-10 percent forbs, and 25-35 percent shrubs.

During the last few thousand years, this site has evolved in a semi-arid climate characterized by dry summers and cold, wet winters. The site has evolved on flood plains that have occasional to frequent and brief to very brief flooding. This flooding scours some areas and deposits sediment in others. This disturbance is necessary to provide exposed moist mineral soil with full sunlight to germinate willow seedlings. Deposition areas can bury parts of limbs and twigs to start new plants. Scouring also can expose existing tree roots that will sprout. A water table at one foot or less is necessary to provide season long moisture for the growth of the shrub (willow) species.

Herbivory has historically occurred on this site at low levels of utilization. Herbivores include mule deer, Shira’s moose, and Rocky Mountain elk.

Fire has played a role in maintaining the plant community by also providing bare mineral soil with full sunlight to germinate the willow species. Fire can cause sprouting of trees to provide regeneration. The fire frequency on the site is dependent on the frequency of fire on adjacent range sites and moisture in the fuels on the site. The normal fire frequency is 25-100 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 an overstory of the following willow species: Geyer’s, Booth’s, Wolf’s, and Drummond’s. The herbaceous layer is dominated by beaked sedge, water sedge, Baltic rush, and western polemonium. The plant species composition of Phase A is listed later under “Reference Plant Community Phase Plant Species Composition”.

The total annual production is 2800 pounds per acre (3200 kilograms per hectare) in a normal year. Structurally, grasses are very dominant followed by shrubs being more dominant than perennial forbs.

FUNCTION:

This site is suited for livestock grazing in summer and fall. This site is typically heavily used by livestock, particularly in the summer. Prescribed grazing must be planned to avoid degradation of the site. Special management should be used to protect the adjacent water courses and the associated values. This is an important site for wildlife for

food and cover. If the site is associated with perennial streams, a fisheries resource could also be present. Degradation of the site can occur with improper grazing management and down cutting of the adjacent stream course or upper watershed conditions that alter the flood frequency or duration. Hikers and fisherman often traverse the edges of this site. Picnickers and campers frequent the site in late summer and early fall.

Impacts on the Plant Community.

Influence of fire:

This site usually does not burn from wildfire. If a fire occurs, it usually does not affect the plant community adversely. Most plants including shrubs sprout back with sufficient moisture and during the next growing season.

Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be very detrimental to this site. Fall use, year after year, will result in excessive utilization on the willow regeneration. This may lead to a single age class stand of shrubs. Willows will develop a “tunneled” appearance. Uncontrolled beaver populations may eliminate the overstory component. Due to improper grazing management grasses, forbs and shrubs can all decline in the plant community. Shrubs usually increase initially, but with continued improper management, will decline.

Continued improper grazing management will result in a stand of forbs and Kentucky bluegrass with reduced vigor. The ability of the community to withstand seasonal flooding is reduced and down cutting of adjacent streams can result. This down cutting will lower the water table and thus reduce the potential of the site. This site is particularly difficult to manage because animals seek out the site for shade and it is usually adjacent to water.

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. Upstream watershed conditions must be maintained to have normal run-off events including moderate flooding.

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. The overall production can be influenced adversely with prolonged drought. Prolonged drought can increase fire frequency. 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 run-off and flooding. An early, hard freeze can occasionally kill some plants. An early frost can stop the growth of shrubs.

Influence of insects and disease:

Periodic disease and insect outbreaks can affect vegetation health. An outbreak of a particular insect is usually influenced by weather but no specific data for this site is available.

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. There are several noxious or invasive species that are adapted to this site.

Influence of wildlife:

This site is important for many species of mammals and birds for food and life cycles. Total numbers are seldom high enough to adversely affect the plant community. 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.

Watershed:

The largest threat to degradation of this site is the lowering of the water table and changes in flooding characteristics either from incised channels or upstream conditions. Off-site conditions can affect the gradient of adjacent stream channels that can affect the water table. If the perennial grass, sedge and shrub cover is depleted, 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, sedges, and shrubs. 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. Reducing the frequency of flooding can adversely affect the regeneration of willow, leading to a decadent overstory of older shrubs with no younger shrubs for replacement.

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.

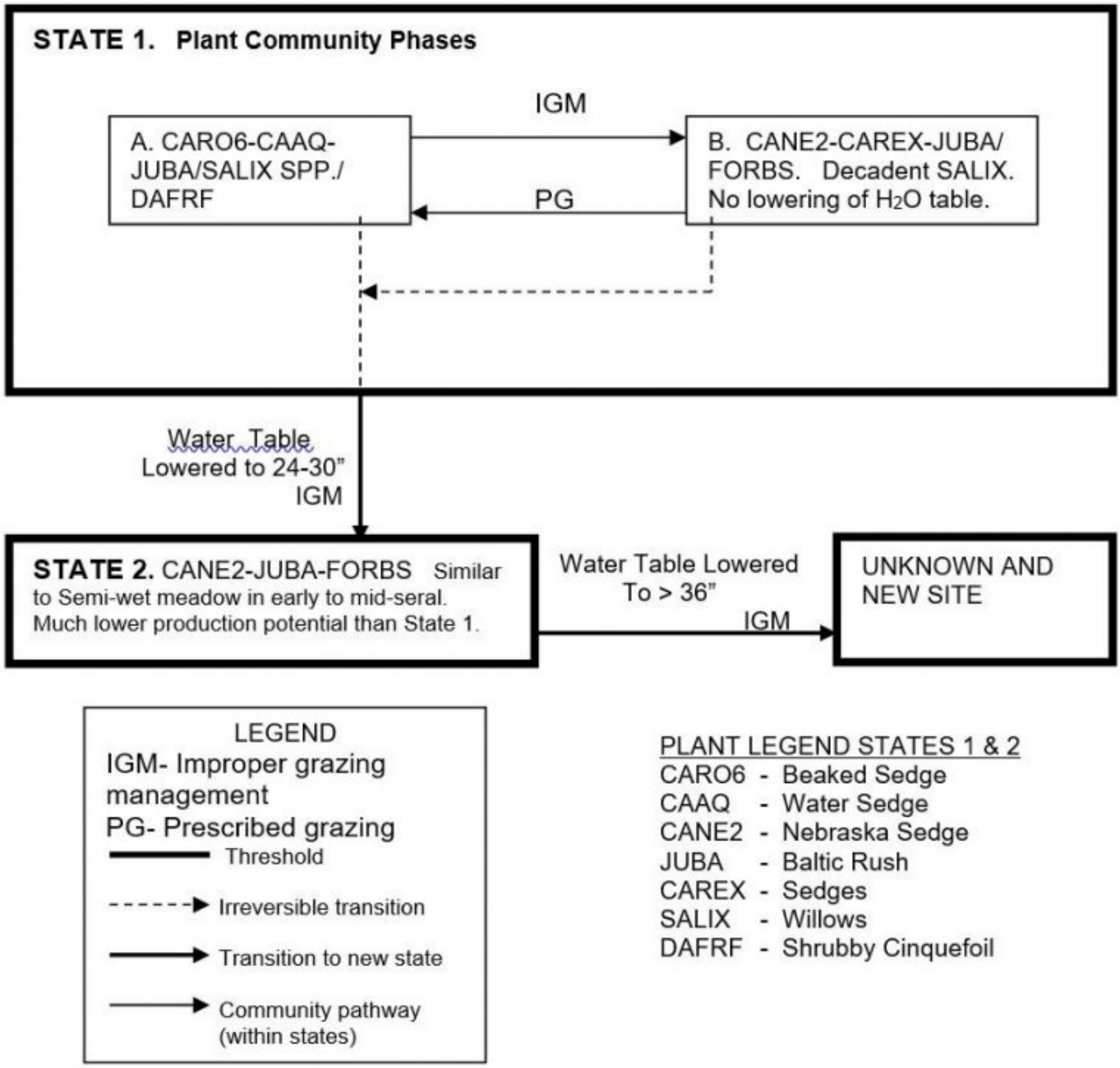
State 1 to State 2. Develops through permanently lowering the late growing season water table to 24-30 inches. This can occur with continued improper grazing management. It may also occur with proper grazing on the site, but channel erosion may continue if poor off-site conditions cause frequent and/or severe flooding. This site has crossed the threshold. It will not return to Sate 1 without raising the water table.

State 2 to unknown site. Results from continued lowering of the water table to greater than 36 inches through down cutting of the stream channel. The site has crossed the threshold and retrogressed 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.

Practice Limitations.

There are moderate to severe seeding limitations on this site due to difficulty in preparing an adequate seedbed. Elimination of existing vegetation prior to planting is difficult in wet seasons and high water table periods. 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 might also be a consideration.

State and transition model



State 1
State 1 Phase A

Community 1.1
State 1 Phase A

Reference Plant Community Phase. This plant community has beaked sedge, water sedge, and Baltic rush dominant in the herbaceous layer. Other grasses and grass-likes include tufted hairgrass, Nebraska sedge, slender wheatgrass, and bluejoint reedgrass. There is a variety of perennial forbs but none comprise a high percentage of the plant community. Salix species and shrubby cinquefoil are present in the overstory and make up 25-35% percent of the community.

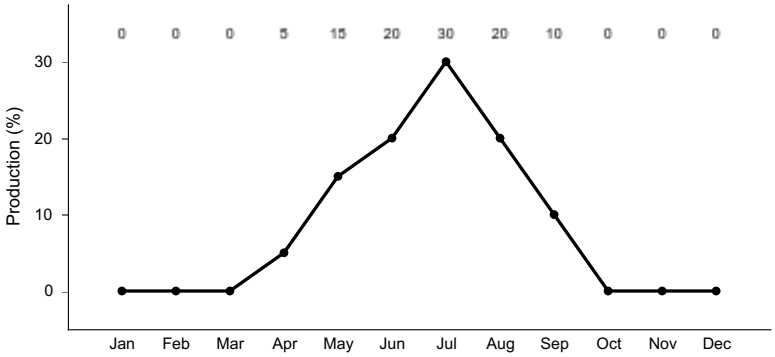


Figure 3. Plant community growth curve (percent production by month). ID0814, MEADOW.

State 2
State 1 Phase B

Community 2.1
State 1 Phase B

This plant community is dominated by Nebraska sedge and other sedges and baltic rush. Forbs have increased in the community and Kentucky bluegrass may have invaded. The willows have a “tunneled” appearance and are even-aged. This phase has developed due to improper grazing management. The water table has not been lowered from that of Phase A.

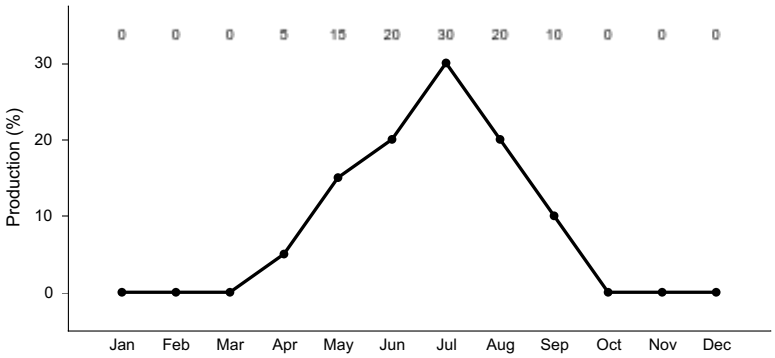


Figure 4. Plant community growth curve (percent production by month). ID0814, MEADOW.

State 3
State 2

Community 3.1
State 2

This plant community is dominated by Nebraska sedge and other sedges and Baltic rush 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. Kentucky bluegrass, redtop bentgrass and meadow foxtail may have invaded the community. This state developed due to continued improper grazing management and a permanent lowering of the water table from 12 inches to 24-36 inches below the surface. This state can be similar to Semi-wet Meadow. 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 “hard” structures or bio-engineered structures, but the plant community may take many years to approach the plant community in State 1.

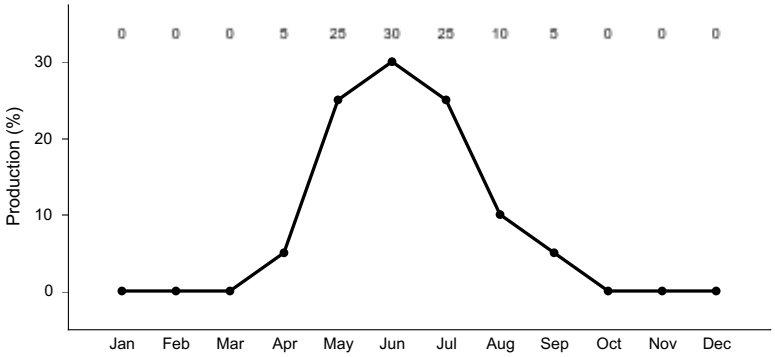


Figure 5. Plant community growth curve (percent production by month). ID0815, B13 DRY MEADOW.

State 4
State 3

Community 4.1
State 3

Unknown new site: This plant community has gone over the threshold to a new site. Site potential has been reduced. Significant loss of available soil moisture has occurred due to further lowering of the water table. Some soil loss from the surface has occurred. This state has developed due to continued improper grazing management and lowering of the water table. The new site may be similar to upland sites such as Loamy Bottom, Clay Basin 12-16, or other Loamy sites. This state cannot be returned to State 1 or 2 without raising the water table.

Additional community tables

Animal community

Wildlife Interpretations.
Animal Community – Wildlife Interpretations

This riparian wet meadow ecological site provides diverse habitat for wetland and upland wildlife species. The long duration hydrology results in abundant forage, attracting invertebrate and vertebrate animals to the site. Important seasonal habitat is provided for over 80% of resident and migratory animals occupying adjacent rangeland 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 this ecological site includes mule deer, elk, and moose. Native reptiles and amphibians are reliant on these meadow sites throughout the year. Streams are typically associated with this site providing habitat for native fish, beaver, muskrat, and benthic organisms. Loss of site hydrology significantly reduces habitat value on this site and the adjacent ecological sites. Open water is seasonal being provided by streams, runoff, ponding, flooding, seasonal high water table, and natural springs.

State 1 Phase 1.1 – Beaked Sedge/ Water Sedge/ Baltic Rush/ Willow Species/ Shrubby Cinquefoil Reference Plant Community (RPC): The RPC provides a diversity of sedges, rushes, forbs, shrubs, and trees used by native insect communities who assist in pollination of the plant community. The insects are prey for the many predator species utilizing the site. The reptile and amphibian community is represented by western rattlesnake, western toad, rubber boa, boreal chorus frog, and northern leopard frog. A diverse amphibian population is a key indicator of good ecological health on this site. Loss of hydrology will limit or exclude amphibians from this ecological site. Sage-grouse utilize the meadows as summer and fall brood-rearing habitat. Woody vegetation adds horizontal and vertical structure used for nesting and roosting sites by resident and migratory avian species. Bird species can include black-capped chickadee, MacGillivray's warbler, fox sparrow, song sparrow, common snipe, long-billed curlew, and a variety of waterfowl that utilize the plant community for breeding, resting, and/or nesting cover. The willow plants provide year-long browse for mule deer, elk, and moose. The dominant herbaceous plant community is not preferred forage for mule deer and elk. Thermal and young of year cover for ungulates is provided by woody vegetation within the plant community. Small mammal populations include deer mouse, montane vole, meadow vole, and western jumping mouse.

State 1 Phase 1.2- Nebraska Sedge/ Sedges/ Baltic Rush/ Forbs Plant Community: This plant community is the result of improper grazing management. The quality of insect habitat maybe enhanced with an increase in forbs. Hydrologic conditions would be similar to those in Phase 1.1, amphibian use would occur and prey species for amphibians would be available. With improper grazing management, the quality of habitat cover for reptiles and amphibians would be reduced. The plant community provides summer and fall brood-rearing habitat for sage-grouse when adjacent to sagebrush cover. Bird species can include warbling vireo, black-capped chickadee, MacGillivray's warbler, fox sparrow, song sparrow, common snipe, and long-billed curlew. Limited thermal cover for ungulates is provided with isolated patches of woody vegetation. The dominant plant community is preferred forage for deer and elk, but with improper grazing management available forage would be reduced in the summer and fall. Thermal and young of year cover for ungulates is provided by woody vegetation within the plant community. Small mammal populations and diversity would be reduced under an improper grazing management scenario reducing vertical structure and increasing vulnerability to predators.

State 2 –Nebraska Sedge/ Baltic Rush/ Forbs Plant Community: This state has developed due to a permanent lowering of the water table and improper grazing management. Loss of historic hydrology has reduced the habitat value for many animals present in State 1. With proper grazing management the increase in forbs would support a similar diversity and population of insects as in State 1 Phase 1.2. The loss of historic hydrology will limit or exclude use of the site by amphibians and many reptiles. Suitable habitat for the northern leopard frog, a species of concern, would not be provided. With continued improper grazing management the loss of vertical and horizontal structure would reduce the diversity and populations of birds identified in State 1. The site would be more suitable for killdeer, western meadowlark, and horned lark. Birds of prey (northern harrier and ferruginous hawk) may range throughout this area looking for prey species. With proper grazing management, the increase in grasses may increase the quality of the forage for ungulates. Small mammal diversity would shift toward grass seed eating species (deer mouse) due to increased grass species in the plant community. Predation on small mammals would increase due to poor quality cover.

Grazing Interpretations.

This site is best adapted to summer and fall grazing by domestic livestock.
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

no data.

Recreational uses

This site presents an aesthetically pleasing view of lush vegetation consisting primarily of grasses and grass-like plants. When livestock or big game are grazing or browsing on the site it presents a pleasant pastoral panorama. Hikers and fisherman often traverse the edges of this site. Picnickers and campers frequent the site in late summer and early fall as sometime adjacent shaded wooded areas become less pleasant on cool days. Vehicular use can be very detrimental to this site, especially during wet weather and high water table conditions.

Wood products

none.

Other products

none.

Other information

Field Offices

American Falls, ID
Blackfoot, ID
Burley, ID
Driggs, ID
Fort Hall, ID
Idaho Falls, ID
Malad, ID
Pocatello, ID
Rexburg, ID
Soda Springs, ID
St. Anthony, ID

Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. Those involved in developing this site description include:
Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC
Jacy Gibbs, co-owner, Intermountain Rangeland Consultants, LLC
Jim Cornwell, Range Management Specialist, IASCD
Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho
Kristen May, 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.
USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service, Agricultural Research Service; Interpreting Indicators of Rangeland Health. Technical Reference 1734-6; Version 4-2005.

Approval

Kendra Moseley, 9/23/2020

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

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Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709

Date	05/15/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** rills do not occur on this site.

2. **Presence of water flow patterns:** water flows over and through the plant community due to frequent flooding. Flows can scour the soil surface or deposit sediments. Rarely are flows detrimental to the shrub components of the plant community. These plants have adapted or evolved with this occurrence. Understory species can be damaged, removed, or buried.

3. **Number and height of erosional pedestals or terracettes:** neither occurs on this site as classically defined. Scouring can expose some roots. Shrub species have evolved with this occurrence and will sprout from the roots. As stated, terracettes do not occur as classically defined, but deposition areas can give a hummocky appearance to the surface.

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 2 -10 percent. Immediately following a significant flood event, bare ground may be as high as 10-20 percent.

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:** do not occur from wind. Scouring and deposition areas do occur from flooding.

7. **Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces may move 6 feet or more or off the site due to seasonal flooding. Coarse litter can move within the site or off the site due to flooding. Some debris may hang up or be deposited in piles within the site.

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 1 to 2 but needs to be tested.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** structure ranges from weak fine, moderate fine and medium and strong very fine granular to weak thin and moderate medium and thick platy to moderate very fine and fine subangular blocky to moderate very fine and fine angular blocky. Soil organic matter (SOM) ranges from 3 to 12 percent, but can reach 60 to 95 percent. The soils may not show distinct horizons due

to poorly developed soils. Surface color ranges from black, very dark gray and very dark grayish brown. The A or A1 horizon is typically 2 to 13 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:** a stand of mixed age shrubs is needed to slow run-off and increase infiltration. The plant community is more dependent on moisture from the water table than on infiltration. The water table controls rooting depth.

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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):** may develop if grazing occurs when soils are wet.

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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: perennial grasses and grass-likes

    Sub-dominant: shrubs

    Other: forbs

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** normal mortality of grass, grass-like, and forbs occur with scouring and deposition from flooding. Some mortality can occur in the herbaceous layers as shrub canopy closes. Decadence and mortality of the willow component can occur with age, disease, and beaver activity.

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14. **Average percent litter cover (%) and depth (in):** additional litter cover data is needed but is expected to be ___percent to a depth of 0.5-1.5 inches at the end of the growing season. A majority of the litter may be removed following flooding events.

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 2880 pounds per acre (3200 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses and sedges produce 45-55 percent of the total production, forbs 5-10 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: includes whitetop, leafy spurge, dock, Canadian thistle, reed canarygrass, foxtail barley, perennial pepperweed, and teasel. Other invasive species may include meadow foxtail, redtop, and Kentucky bluegrass.

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