

Ecological site R011XY019ID Meadow DECA18-CANE2

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: Additional moisture site

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 receive additional moisture

Soils are:

Not saline or saline sodic

Somewhat poorly drained, with fluctuating water table from surface to 20-40"

Moderately deep to very deep, with <35% coarse fragments (by volume). Not skeletal

not strongly or violently effervescent in the surface mineral 10"

Textures range from silty clay loam to clay in the surface mineral 4"

Slope is <30%

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

Associated sites

R011XY015ID	Loamy Bottom 8-14 PZ ARTRT/LECI4
R011XY020ID	Dry Meadow POSE-PHAL2

Similar sites

R011XY020ID	Dry Meadow POSE-PHAL2
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site generally occurs on gently sloping to nearly level stream valleys and high mountain valleys on flood plains with slopes of 0 to 4 percent. It also occurs around localized seeps and springs. This site is frequently dissected by old stream courses, oxbows, and potholes. The surface is generally not flat but slightly undulating with small depressions and high spots. Elevations range between 2000-5000 feet (600-1550 meters).

Table 2. Representative physiographic features

Landforms	(1) Hill
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Occasional
Ponding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Ponding frequency	Occasional
Elevation	2,000–5,000 ft
Slope	0–4%
Ponding depth	2–6 in
Water table depth	0–40 in
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)	12 in

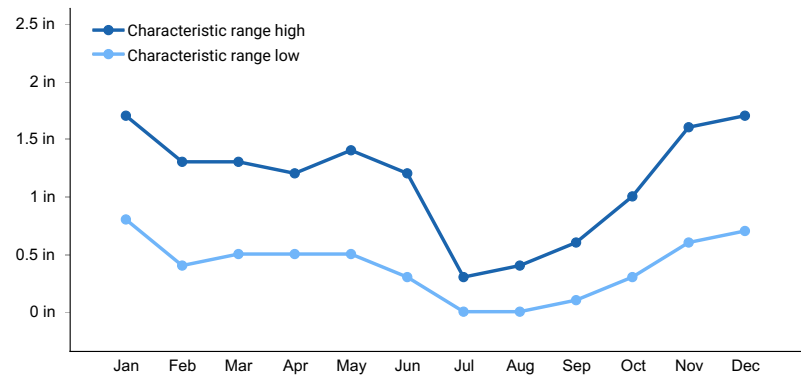


Figure 1. Monthly precipitation range

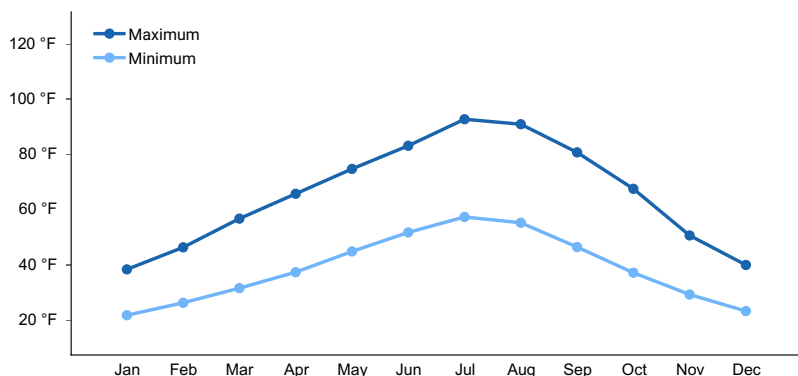


Figure 2. Monthly average minimum and maximum temperature

Influencing water features

The meadow site is influenced by additional water from either adjacent streams through seasonal flooding, water table, seeps or springs, or from run-on from adjacent sites. The site may include the following wetlands and stream types.

Soil features

Soils on this site are mainly clays, clay loams, or silty clay loams over 20 inches (50 cm.), moderately deep to deep, alluvial in origin, and may be somewhat stony or gravelly. The soils range from slightly alkaline to slightly acid in pH. The available water holding capacity (AWC) is moderate to high and is supplemented by upward capillary movement from the shallow water table. The effective rooting depth is limited by the water table.

Erosion hazard is slight, however, the peaty and high organic soils tend to hummock severely from trampling. These soils are susceptible to gully formation which intercepts normal overflow patterns and results in site degradation. The soils are somewhat poorly drained and have a water table at or near the surface at the beginning of the growing season and down to a depth of 20-40 inches by the end of the growing season. Flooding occurs occasionally during snowmelt and just after snowmelt. Ponding can occur in small depressional areas during this time period. The plant community is dependent on nearly 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. Soil characteristics, flooding, and water table can vary across the complex of meadow sites.

Soil Series Correlated to this Ecological Site -

No data

Ecological dynamics

The dominant visual aspect of this site is grass and sedges with scattered forbs and shrubs. The dominant plant community has tufted hairgrass, Nebraska sedge and other *Carex* species as major components. The site usually occurs within a complex of wetland sites. The soil surface of the site is typically slightly undulating causing small depressions and high spots with variable soil moisture regimes. The plant communities found on these areas are sites within the complex. The dominant species in these included plant communities are as follows:

1. Marsh site. Deeper depressions with the water table at or near the surface or slightly above the surface for the entire growing season. This site is dominated by broadleaf cattail, hardstem bulrush, and common threesquare.
2. Wet Meadow site. Shallow to depression areas with the water table at or near the surface for the entire growing season. This site is dominated by *Carex* spp. and *Junus* spp.
3. Dry Meadow site. Slightly higher areas that are drier during the growing season and the water table is > 40 inches deep by the end of the growing season. The plant community is dominated by Nevada bluegrass and alpine timothy.

Composition by weight is 80-90 percent grasses and grass-like, 5-15 percent forbs, and 0-10 percent shrubs. The depressional plant communities are inclusions and may have sedges and rushes making up nearly 100 percent of the community.

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 deep alluvial soils that are saturated to the surface in the beginning of the growing season and move down to about 20 – 40 inches deep by the end of the growing season. Herbivory has historically occurred on this site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, moose, and Rocky Mountain elk.

Fire has had some influence on the development of the site. Wildfires can occur mid-summer to early fall and are more likely to happen following consecutive drought years. When fires do occur they are usually a result of an adjacent site burning.

The conditions for the plant community of this site are highly variable due to a wide variation of soils, duration and frequency of flooding, water table fluctuations, air and soil temperatures, and competition between mostly rhizomatous plants. These conditions can vary within the site at a given location. At any one point within the site, one species can occupy nearly 100 percent of a small area. Another point nearby, may have another species fully occupying that area. Due to these situations, the plant community in this ESD is written broadly.

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 the frequency and duration of flooding and the depth, frequency, and duration of ponding.

Micro-topography is a feature that has a dramatic affect 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 (4) 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 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 tufted hairgrass and Nebraska sedge. There are a wide variety of grasses and grass-like species and forbs that may occur in minor amounts. Some of these species may be dominant in small areas due to soil and water variations as stated above. Willows and shrubby cinquefoil can occur in small amounts. The plant species composition of Phase A is listed later under "Reference Plant community Phase Plant Species Composition".

The total annual production is 3600 pounds per acre (4032 kilograms per hectare) in a normal year. Production in a favorable year is 4500 pounds per acre (5040 kilograms per hectare). Production in an unfavorable year is 2500 pounds per acre (2800 kilograms per hectare). Structurally, cool season deep-rooted perennial grasses and sedges are very dominant, followed by perennial forbs being more dominant than shrubs.

FUNCTION:

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

Impacts on the Plant Community:

Influence of fire:

This site usually does not burn from wildfire. If a fire occurs, it usually does not adversely affect the plant community. 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. 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 is reduced and down cutting of adjacent streams can result or initiation of headcuts can occur. This down cutting will lower the water table 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. The overall plant production can be adversely influenced with prolonged drought. 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 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 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 plant community. The plants on this site are very competitive against potential invasive species.

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 raising 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, 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 and grass-like sedges and rushes. 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.

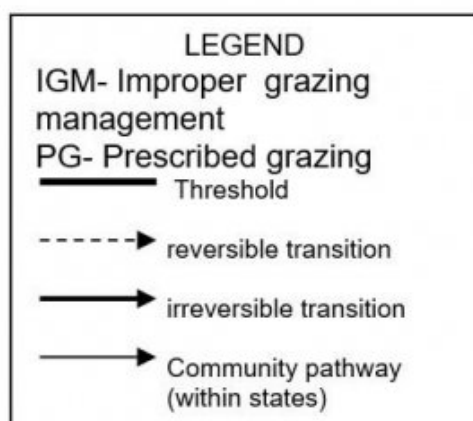
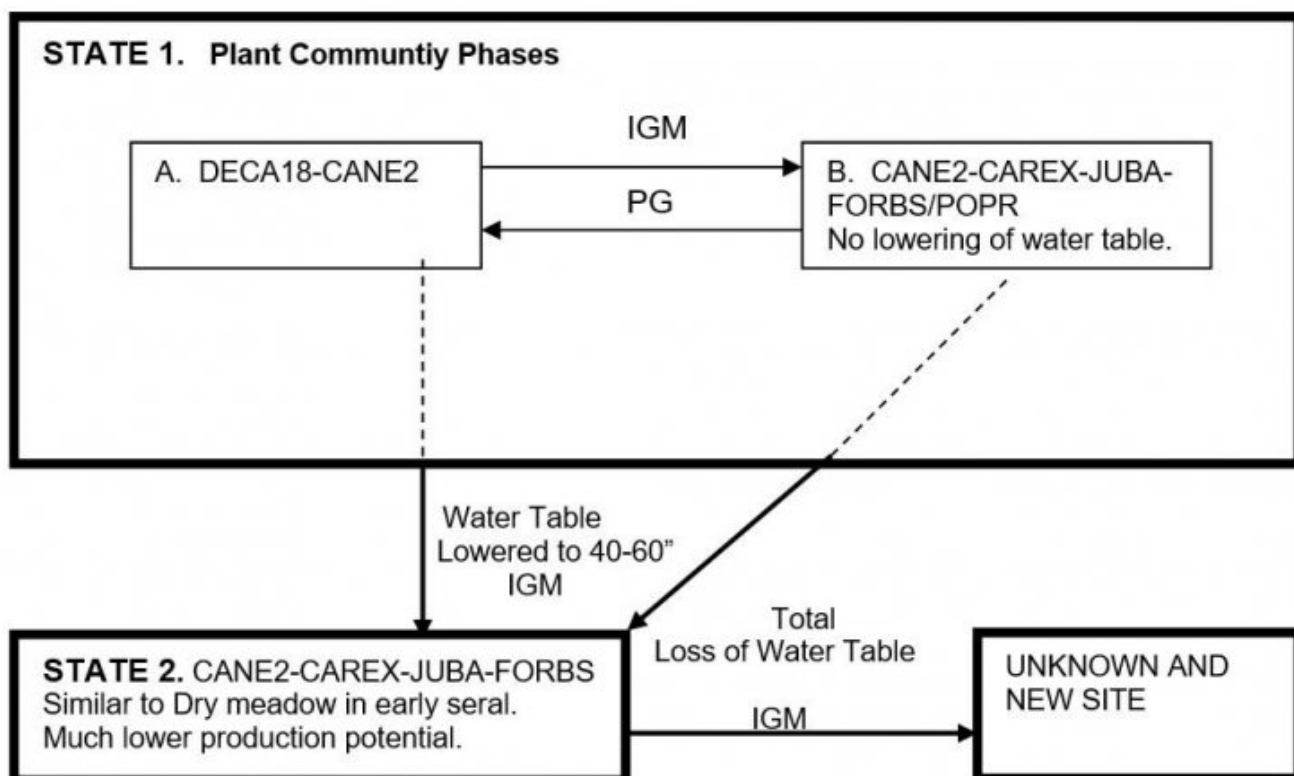
State 1 Phase A or B to State 2. Develops through permanently lowering the late growing season water table to 40 to 60 inches. This can occur with continued improper grazing management. It may also occur with proper grazing on the site, but channel erosion may continue if poor off-site conditions cause frequent and/or severe flooding. The site has crossed the threshold. This state cannot be returned to State 1 without raising the water table. 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.

State 2 to unknown site. Results from permanently losing the water table in the soil profile through down cutting of the stream channel. The site crosses the threshold and retrogresses to a new site with reduced potential due to significant loss of available soil moisture from the loss of the water table. It occurs with continued improper grazing management or repeated significant run-off events. 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.

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



PLANT LEGEND STATES 1 & 2

DECA18- Tufted Hairgrass
CANE2 - Nebraska Sedge
CAREX - Sedges
JUBA - Baltic Rush
POPR - Kentucky Bluegrass

State 1

State 1 Phase A

Community 1.1

State 1 Phase A

Reference Plant Community Phase. This plant community has tufted hairgrass and Nebraska sedge as co-dominants in the herbaceous layer. There are a wide variety of grasses and grass-like species and forbs that may occur in minor amounts. Some of these species may be dominant in small areas due to soil and water variations as stated in the "Ecological Dynamics of the Site". Willows and shrubby cinquefoil can occur in small amounts.

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	90-95%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

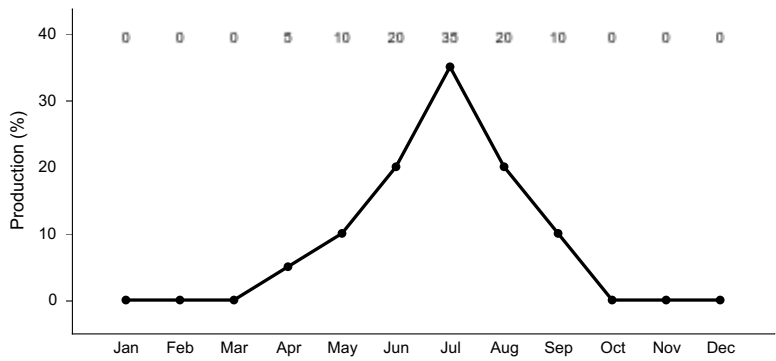


Figure 3. Plant community growth curve (percent production by month). ID0414, MEADOW. State 1.

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. 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	90-95%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

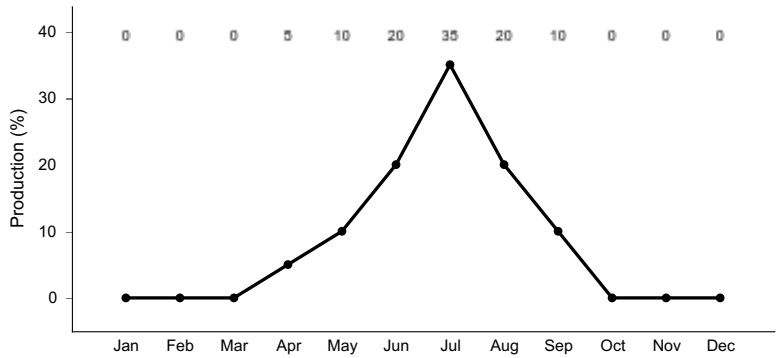


Figure 4. Plant community growth curve (percent production by month). ID0414, MEADOW. State 1.

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 20-40 inches to 40-60 inches below the surface. This state can be similar to Dry Meadow in early seral state. 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	90-95%
Surface fragments >0.25" and <=3"	0%
Surface fragments >3"	0%
Bedrock	0%
Water	0%
Bare ground	0%

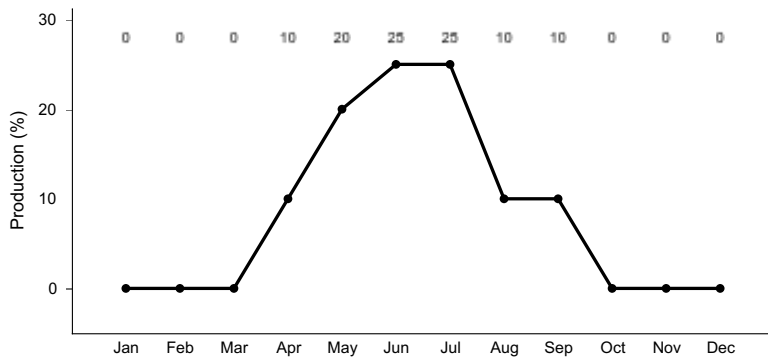


Figure 5. Plant community growth curve (percent production by month).
ID0415, DRY MEADOW - early to mid seral. State 2.

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 the loss of the water table. Some soil loss from the surface has occurred. This state has developed due to continued improper grazing management and loss of the water table. The new site may be similar to upland sites such as Loamy Bottom other loamy sites in early seral state. 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.

Additional community tables

Animal community

Wildlife Interpretations.

Animal Community – Wildlife Interpretations

This meadow ecological site provides diverse habitat for wetland and upland wildlife species. The seasonal hydrology results in abundant forage attracting invertebrate and vertebrate animals to this ecological site. Important seasonal habitat is provided for over 80% of adjacent 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 this ecological site includes mule deer, pronghorn antelope, and elk. Native reptiles and amphibians are reliant on these meadow sites throughout the year. Open water is seasonal, only being provided by seasonal runoff, ponding, seasonal high water table, and natural springs.

State 1 Phase 1.1 –Tufted Hairgrass/ Nebraska Sedge Reference Plant Community (RPC): The RPC provides a diversity of grasses and forbs used by native insect communities who assist in pollination of the plant community. The insects are food 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. Loss of hydrology will limit or exclude amphibians from this ecological site. Water loving birds including ducks, geese, cranes, and shorebirds may utilize the available habitat for nesting and feeding. Sage-grouse utilize the meadows as summer and fall brood-rearing habitat. Isolated patches of woody vegetation add horizontal and vertical structure for nesting and roosting sites for resident and migratory avian species. Bird species can include warbling vireo, black-capped chickadee, MacGillivray's warbler, fox sparrow, song sparrow, and long-billed curlew. The plant community supports seasonal (spring, summer and fall) forage needs of antelope, mule deer, and elk. The dominant plant community is preferred forage for the ungulates utilizing the site. Limited thermal cover for ungulates is provided by isolated patches of woody vegetation within the plant community. A diverse small mammal population including deer mouse, montane vole, and western jumping mouse may utilize available habitat on a

seasonal basis.

State 1 Phase 1.2- Nebraska Sedge/ Sedges/ Baltic Rush/ Forbs/ Kentucky Bluegrass Plant Community: This plant community is the result of improper grazing management. The new plant community would have similar insect diversity and populations to the reference plant community or possibly greater with the increase in forbs. With the hydrologic conditions similar to Phase 1.1, and proper management similar amphibian habitat would be available and prey species would be abundant. Continued improper grazing management would reduce the value of habitat for reptiles and amphibians. The plant community provides summer and fall brood-rearing habitat for sage-grouse when sagebrush cover is nearby. Large mammal (antelope, mule deer, and elk) use would be seasonal. The dominant plant community provides reduced amounts of quality forage for ungulates. 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/ Sedges/ Baltic Rush/Forbs/Grasses Plant Community: This state developed due to continued improper grazing management and a permanent lowering of the water table. Loss of historic hydrology has reduced the habitat value for many animals present in State 1. 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. With improper grazing management the loss of vertical and horizontal structure would reduce diversity and populations of all species of birds. The site would be more suitable for killdeer, western meadowlark, and horned lark. Birds of prey (northern harrier and Cooper's hawk) may range throughout these areas looking for prey species. With continued improper grazing management forage for ungulates would be available for a shorter duration in the summer and fall. Small mammal populations and diversity would be reduced under an improper grazing management scenario reducing vertical structure and increasing vulnerability to predators.

Grazing Interpretations.

This site is best suited for livestock grazing in the late spring, summer, and fall. Wet soils can limit grazing opportunities, particularly in the late spring.

Estimated initial stocking rate will be determined with the landowner or decision-maker. They will be based on the inventory, past use history and type, condition of vegetation, production, season of use, and seasonal preference. Calculations used to determine estimated initial stocking rate will be based on forage preference ratings.

Hydrological functions

Soils in this site are generally grouped in hydrologic group D. When hydrologic condition of the vegetative cover is good, natural erosion hazard is slight.

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

Meridian, ID
Caldwell, ID
Mountain Home, ID
Marsing, ID
Payette, ID
Weiser, ID
Emmett, ID
Gooding, ID
Twin Falls, ID
Jerome, ID
Shoshone, ID
Burley, ID
Rupert, 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, Plant Materials Specialist, Acting State Rangeland Management Specialist, NRCS, Idaho
Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho
Chris Hoag, Wetland Plant Ecologist, NRCS, Idaho
Leah Juarros, Resource Soil Scientist, NRCS, Idaho
Lee Brooks, Range Management Specialist, IASCD

Other references

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USDA, Forest Service. 2004. (www.fs.fed.us/database/feis/plants.)
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, 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

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

2. **Presence of water flow patterns:** would be rare. Water flows over and through the plant community. Rarely are flows detrimental to the plants. The plants have adapted or evolved with this occurrence.

3. **Number and height of erosional pedestals or terracettes:** neither occurs on this site. Some plants may be hummocked due to trampling damage.

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.

5. **Number of gullies and erosion associated with gullies:** gullies do not occur.

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

7. **Amount of litter movement (describe size and distance expected to travel):** fine litter in the interspaces may move 6 feet or more due to seasonal flooding. Litter accumulates on the surface. There is little or no coarse litter developed on the site, and it will be removed from the site following seasonal flooding.

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 to 5 but needs to be tested.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** structure ranges _____. Soil organic matter (SOM) needs to be determined. The A or A1 horizon is typically _____ inches thick.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** deep rooted perennial grasses and sedges slow run-off and increase infiltration. The total vegetation cover should be >60 percent to optimize infiltration. The plant community does not depend on water

infiltration alone, but on the water table. The water table controls rooting depth.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** is not present. Compaction layers can develop under stock trails made by livestock going to and from water or from long-term repetitive heavy grazing.
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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: deep rooted perennial grasses and sedges

Sub-dominant: perennial forbs

Other: shrubs

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** normal mortality of grass and grass-like is slow and occurs as aging plants. This will go unnoticed due to regeneration from roots, seeds or other new plants filling the spaces.
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14. **Average percent litter cover (%) and depth (in):** additional litter cover data is needed but is expected to be 45-60 percent to a depth of 0.5-1.5 inches. Litter accumulates on the soil surface.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 3600 pounds per acre (4032 Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses and sedges produce 80-90 percent of the total production, forbs 5-15 percent and shrubs 0-10 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.
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