

Ecological site R043BY378WY

Wetland (WL)

15-19" Foothills and Mountains East Precipitation Zone

Accessed: 09/24/2026

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.

Associated sites

R043BY330WY	Overflow (Ov) 15-19" Foothills and Mountains East Precipitation Zone Overflow
R043BY374WY	Subirrigated (Sb) 15-19" Foothills and Mountains East Precipitation Zone Subirrigated

Similar sites

R032XY378WY	Wetland (WL) 10-14" East Precipitation Zone Wetland 10-14" Foothills and Basins East P.Z., 032XY378WY has lower production.
-------------	---

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site normally occurs in depressions or on level to nearly level bottomlands or adjacent to perennial streams or near springs, seeps and sloughs.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Stream terrace
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)

Flooding frequency	Occasional to frequent
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	Frequent
Elevation	1,830 – 2,740 m
Slope	0 – 10 %
Ponding depth	0 – 30 cm
Water table depth	0 – 50 cm
Aspect	Aspect is not a significant factor

Climatic features

Annual precipitation ranges from 15-19 inches per year. June is generally the wettest month. July, August, and September are somewhat less with daily amounts rarely exceeding one inch.

Snowfall is quite heavy in the area. Annual snowfall averages about 150 inches.

Because of the varied topography, the wind will vary considerably for different parts of the area. The wind is usually much lighter at the lower elevations and in the valleys as compared with the higher terrain. The average winter wind velocity is 8.5 mph while the summer wind velocity averages 7.5 mph. Winds during storms and on ridges may exceed 45 mph.

Growth of native cool-season plants begins about May 1 to May 15 and continues to about October 10.

The following information is from the "Crandall Creek" climate station, at the lower end of this precipitation zone:

Minimum Maximum 5 yrs. out of 10 between

Frost-free period (days): 16 80 July 8 – August 20

Freeze-free period (days): 37 120 June 17 – September 5

Mean Annual Precipitation (inches): 10.24 21.23

Mean annual precipitation: 14.90 inches

Mean annual air temperature: 38.16 F (21.88 F Avg. Min. to 54.66 F Avg. Max.)

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/> website. There are no other climate station(s) known to be representative of this precipitation zone.

Table 3 Representative climatic features

Frost-free period (average)	80 days
Freeze-free period (average)	120 days
Precipitation total (average)	480 mm

Influencing water features

Stream type: C (Rosgen)

Soil features

This site consists of deep to very deep poorly drained soils formed in alluvium with a water table above the surface for part but not all of the growing season. They are on nearly level to slightly depressed areas with poor surface drainage. In some places, the surface layers have high organic matter content. The soil characteristics having the most influence on the plant community are depth to a water table at or near the surface for all of the growing season and high organic content.

Table 4. Representative soil features

Surface texture	(1) Mucky clay (2) Clay loam (3) Loam
Family particle size	(1) Loamy
Drainage class	Poorly drained
Permeability class	Slow to moderate
Soil depth	50 – 150 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	5.59 – 16.76 cm
Calcium carbonate equivalent (0-101.6cm)	0 – 20 %
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	0 – 10

Soil reaction (1:1 water) (0-101.6cm)	6.6 – 8.4
Subsurface fragment volume <=3" (Depth not specified)	Not specified
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Potential vegetation on this site is dominated by plants that can tolerate soils which have a water table above the surface for part of the growing season. Significant vegetation includes mid grass-like species, tall and mid cool season grasses, and a variety of riparian shrubs and forbs. The expected potential composition for this site is about 70% grasses, 15% forbs and 15% woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.

As this site deteriorates species such as low-growing sedges, Baltic rush and willows increase. Grasses and grass-like species such as Nebraska sedge, northern reedgrass, and tufted hairgrass will decrease in frequency and production. As the site further deteriorates annual grasses such as foxtail barley and forbs increase and will become dominant.

Beaver can play a critical role in the maintenance or development of this site. By modifying the water level through dams, the water table can be significantly increased and diverted water can replenish off channel areas such as oxbows. Modifying water levels also promotes the establishment of wetland species or control emergent vegetation, which can become overabundant. Removal of beaver in areas has resulted in lowering of the water tables and channelization of waterways. Recently, reintroducing beaver to areas to stabilize riparian areas and create wetlands has gained popularity.

The Historic Climax Plant Community (description follows the plant community diagram) has been determined by study of rangeland relic areas, or areas protected from excessive disturbance. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

The following is a State and Transition Model Diagram that illustrates the common plant communities (states) that can occur on the site and the transitions between these communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.

State and transition model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
Grass/Grasslike					
1				925-1541	
	Nebraska sedge	CANE2	<i>Carex nebrascensis</i>	925-1541	–
2				925-1541	
	northern reedgrass	CASTI3	<i>Calamagrostis stricta ssp. inexpansa</i>	925-1541	–
3				616-1541	
	tufted hairgrass	DECE	<i>Deschampsia cespitosa</i>	616-1541	–
4				0-616	
	slough sedge	CAOB3	<i>Carex obnupta</i>	0-616	–
5				0-616	

	water sedge	CAAQ	<i>Carex aquatilis</i>	0-616	–
6				0-308	
	Grass, perennial	2GP	<i>Grass, perennial</i>	0-308	–
	Macoun's reedgrass	CACAM	<i>Calamagrostis canadensis var. macouniana</i>	0-308	–
	dunhead sedge	CAPH2	<i>Carex phaeocephala</i>	0-308	–
	sedge	CAREX	<i>Carex</i>	0-308	–
	rush	JUNCU	<i>Juncus</i>	0-308	–
Forb					
7				0-925	
	Forb, perennial	2FP	<i>Forb, perennial</i>	0-308	–
	monkshood	ACONI	<i>Aconitum</i>	0-308	–
	pale agoseris	AGGL	<i>Agoseris glauca</i>	0-308	–
	white marsh marigold	CALE4	<i>Caltha leptosepala</i>	0-308	–
	water hemlock	CICUT	<i>Cicuta</i>	0-308	–
	horsetail	EQUIS	<i>Equisetum</i>	0-308	–
	geranium	GERAN	<i>Geranium</i>	0-308	–
	iris	IRIS	<i>Iris</i>	0-308	–
	wild mint	MEAR4	<i>Mentha arvensis</i>	0-308	–
	tall fringed bluebells	MECI3	<i>Mertensia ciliata</i>	0-308	–
	American bistort	POBI6	<i>Polygonum bistortoides</i>	0-308	–
	cinquefoil	POTEN	<i>Potentilla</i>	0-308	–
	blue-eyed grass	SISYR	<i>Sisyrinchium</i>	0-308	–
	marsh hedgenettle	STPA	<i>Stachys palustris</i>	0-308	–
	groundsel	TEPHR3	<i>Tephroseris</i>	0-308	–
	arrowgrass	TRIGL	<i>Triglochin</i>	0-308	–
Shrub/Vine					
8				0-616	
	willow	SALIX	<i>Salix</i>	0-616	–
9				0-616	
	Shrub (>.5m)	2SHRUB	<i>Shrub (>.5m)</i>	0-308	–
	bog birch	BEP4	<i>Betula pumila</i>	0-308	–
	redosier dogwood	COSE16	<i>Cornus sericea</i>	0-308	–
	alpine laurel	KAMI	<i>Kalmia microphylla</i>	0-308	–
	currant	RIBES	<i>Ribes</i>	0-308	–

Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 8. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 9. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 10. Community 6.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Table 11. Community 7.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
-------	-------------	--------	-----------------	----------------------	------------------

Animal community

Animal Community – Wildlife Interpretations Nebraska Sedge/Tufted Hairgrass Plant Community (HCPC): The predominance of grasses and grasslikes in this plant community favors grazers and mixed-feeders, such as deer, moose, bison, elk, and antelope. Suitable thermal and escape cover for these species may be limited due to the low quantities of woody plants. These sites are also important corridors within the foot slopes of mountains and between valuable water sources for many wildlife species. When found adjacent to sagebrush dominated states, this plant community may provide brood rearing/foraging areas for sage grouse, as well as lek sites. Other birds that would frequent this plant community include Other birds that would frequent this plant community include nesting species, blue grouse, American kestrel, hawks, and golden eagle.. As these sites are adjacent to water, bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers can be found frequenting the site. Many small mammals occur included water species such as muskrat, beaver and river otter. Tufted Hairgrass/Willow Plant Community: The combination of an overstory of shrubs and an understory of grasses, grasslikes, and forbs provides a very diverse plant community for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. Consequently, many large mammals use this state for foraging and cover year-round. These sites are also important corridors within the foot slopes of mountains and between upland sites and valuable water sources for many wildlife species. It provides important winter habitat for sage grouse. Other birds that would frequent this plant community include Other birds that would frequent this plant community include nesting species, blue grouse, American kestrel, hawks, and golden eagle.. As these sites are adjacent to water, bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers can be found frequenting the site. Many small mammals occur included water species such as muskrat, beaver and river otter. Dense Shrub/Nebraska Sedge Plant Community: The combination of an overstory of shrubs and an understory of grasses and forbs provides a very diverse plant community for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. Consequently, many large mammals use this state for foraging and cover year-round. These sites are also important corridors within the foot slopes of mountains and between upland sites and valuable water sources. It provides important winter foraging habitat for sage grouse. Other birds that would frequent this plant community include Other birds that would frequent this plant community include nesting species, blue grouse, American kestrel, hawks, and golden eagle.. As these sites are adjacent to water, bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers can be found frequenting the site. Many small mammals occur included water species such as muskrat, beaver and river otter. Slough Sedge/Baltic Rush/ Willows Plant Community: The combination of an overstory of shrubs and an understory of grasses and forbs provides a very diverse plant community for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. Consequently, many large mammals use this state for foraging and cover year-round. These sites are also important corridors within the foot slopes of mountains and between upland sites and valuable water sources. It provides important foraging habitat for sage grouse. Other birds that would frequent this plant community include Other birds that would frequent this plant community include nesting species, blue grouse, American kestrel, hawks, and golden eagle.. As these sites are adjacent to water, bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, and waterfowl can be found frequenting the site. Many small mammals occur included water species such as muskrat, beaver and river otter. Dense Shrub Plant Community: The increase in the overstory of shrubs provides for increase in year round cover and browsing selections for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. However, due to the lack of herbaceous production and diversity of mid cool season grasses and grasslikes, this site is less beneficial to grazers. These sites are important corridors within the foot slopes of mountains and between upland sites and valuable water sources for many wildlife species. It provides important winter, nesting, brood-rearing, and foraging habitat for sage grouse. Other birds that would frequent this plant community include Other birds that would frequent this plant community include nesting species, blue grouse, American kestrel, hawks, and golden eagle. As these sites are adjacent to water, bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers can be found frequenting the site. Many small mammals occur included water species such as muskrat, beaver and river otter. Foxtail Barley/Annual Plant Community: The lack of tall or mid growing shrubs does not provides cover for many species. As these areas tend to greens-up sooner in the spring, these sites provide early new growth for foraging large and small mammals. Generally, these are not target plant communities for wildlife habitat management. Dense Shrub/Bluegrass Sod Plant Community: The increase in the overstory of shrubs provides for increase in year round cover and browsing selections for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. However, due to the lack of herbaceous production and diversity of mid cool season grasses and grasslikes, this site is less beneficial to grazers. These sites are important corridors within the foot slopes of mountains and between upland sites and valuable water sources for many wildlife species. It provides important winter, nesting, brood-rearing, and foraging habitat for sage grouse. However, as the hydrology of the area has been significantly altered less water dependent species frequent the site. In addition, with the shift to more upland plants more upland species may be present. Animal Community – Grazing Interpretations The following table lists suggested stocking rates for cattle under continuous season-long grazing under normal growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using this information along with animal preference data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies can result in an increased carrying capacity. If distribution problems occur, stocking rates must be reduced to maintain plant health and vigor.

Plant Community Production Carrying Capacity* (Lb./ac) (AUM/ac) Nebraska Sedge/Northern Reedgrass 4500-6500 3.0 Tufted Hairgrass/Willow 4300-6200 2.5 Dense Shrub/Nebraska Sedge 4000-6000 2.0 Slough Sedge/Baltic Rush/Willow 3500-5200 1.5 Dense Shrub 3200-4800 1.0 Foxtail Barley/Annual 2500-3200 1.0 Dense Shrub/Bluegrass Sod 750-1500 0.8 * - Continuous, season-long grazing by cattle under average growing conditions. Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide yearlong forage for cattle, sheep, or horses. During the dormant period, the forage for livestock use needs to be supplemented with protein because the quality does not meet minimum livestock requirements.

Hydrological functions

Climate is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group D. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group and water table. Runoff will be high on this site since the soil are saturated. (Refer to Part 630, NRCS National Engineering Handbook for detailed hydraulic information. Rills and gullies should not typically be present. Water flow patterns should be barely distinguishable if at all present. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogamic crusts are present, but only cover 1-2% of the soil surface.

Recreational uses

This site provides hunting opportunities for upland game and water species. Sites adjacent to perennial stream provide opportunities for fishing and water activities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors. Other recreational uses may included hiking, camping, mountain biking, and in the winter snowshoeing and cross-country skiing.

Wood products

No appreciable wood products are present on the site.

Other products

None noted.

Inventory data references

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel was also used. Those involved in developing this site include: Chris Krassin, Range Management Specialist, James Haverkamp, Range Management Specialist, Steven Gullion, Range Management Specialist, James Mischke, District Conservationist, and Everet Bainter, State Range Management Specialist. Other sources used as references include USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

Contributors

J. Haverkamp

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)	Ray Gullion, E. Bainter
Contact for lead author	ray.gullion@wy.usda.gov 307-347-2456
Date	05/01/2008
Approved by	

Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. Number and extent of rills: Rare to nonexistent.

2. Presence of water flow patterns: Water flow patterns sometimes evident in floodplain zone where this site occurs.

3. Number and height of erosional pedestals or terracettes: Rare to nonexistent.

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):
Bare ground is typically less than 1%.

5. Number of gullies and erosion associated with gullies: Active gullies should not be present.

6. Extent of wind scoured, blowouts and/or depositional areas: Minimal to nonexistent.

7. Amount of litter movement (describe size and distance expected to travel): Herbaceous litter exhibits slight movement only associated with water flow patterns.

8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values): Soil Stability Index ratings are typically 6.0

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness): Soil surface variable, typically an A-horizon up to 14 inches (35 cm) colors with a chroma of 2 or less and OM of 10-20%. Sometimes the A-horizon is overlain or replaced by an O-horizon of up to 30 inches (76 cm) with 40-60% OM.

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff: Plant community consists of 70-90% grasses, 10% forbs, and 0-20% shrubs. Dense plant canopy (>95%) and litter, despite slow to moderate infiltration rates, results in no runoff for this site. Basal cover is typically 20-30% for this site and effectively reduces runoff on this site as well.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): No compaction layer exists.
-

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: mid-size, cool season bunchgrasses>rhizomatous grass-likes>>perennial forbs=perennial shrubs>cool season rhizomatous grasses

Sub-dominant:

Other:

Additional:

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): Minimal decadence, typically associated with shrub component.
-

14. Average percent litter cover (%) and depth (in): Litter ranges from 0-5% of total canopy measurement with total litter (including beneath the plant canopy) from 90-100% expected. Herbaceous litter depth typically ranges from 20-35 mm. Woody litter can be up to a couple inches (4-6cm).
-

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production): English: 4500-6500 lb/ac (5500 lb/ac average); Metric: 5040 - 7280 kg/ha (6160 kg/ha average).
-

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: Bare ground greater than 15% and presence of noxious weeds or creeping meadow foxtail are the most common indicators of a threshold being crossed. Baltic rush, low growing sedges, and willows are common increasers. Canada thistle and foxtail barley are common invasive species.
-

17. Perennial plant reproductive capability: All species are capable of reproducing, except in drought years.
-