USDA Natural Resources Conservation Service

Ecological site R043AY512ID
Warm-Frigid Aquic-Udic Loamy Flood Plains (Wet) (DECA/CAREX)

Last updated: 10/15/2020
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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): 043A–Northern Rocky Mountains

Description of MLRAs can be found in: United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

Available electronically at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053624#handbook

LRU notes

Major land resource area (MLRA): 043A-Northern Rocky Mountains
Modal LRU – 43A09 Western Bitterroot Foothills

This LRU is composed predominantly of mid-elevation foothills, mountain slopes, ridges, valley walls, plateaus, and low elevation foothills, canyons, structural benches, valleys, and escarpments. The soils tend to be loamy vitrands, and cryands. Quartzite and other metamorphic deposits are the dominant parent materials. Soil climate is a mesic to frigid temperature regime and xeric to udic moisture regime with average annual precipitation around 895 mm (35 inches).

Others where occurring – 43A07 - Eastern Columbia Plateau Embayments
43A11 - Bitterroot Metasedimentary Zone

Classification relationships

This ES group fits into the National Vegetation Standard's Vancouverian-Rocky Mountain Montane Wet Meadow & Marsh. (Compare to previous Idaho range site: R009XY018ID, MEADOW and Washington range site: R009XY601WA, WET MEADOW 16-24 PZ)

Ecological site concept

This ES is found on very poorly and poorly drained loamy mineral soils in drainageways with a water table within 20 inches of the surface and a plant community dominated by grasses, sedges, forbs and some shrubs.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Alnus incana* (2) *Salix*

Herbaceous	(1) *Deschampsia cespitosa* (2) *Carex*

Physiographic features

This ecological site occurs mainly on floodplains and stream terraces. Parent materials are volcanic ash and/or loess over mixed alluvium.

Landscapes: Plateaus, valleys, hill, foothills
Landforms: Flood plains, stream terraces, drainageways

Elevation:
Total range = 500 to 1230 m
(1,640 to 4,035 feet)
Central tendency = 775 to 955 m
(2,540 to 3,135 feet)

Slope (percent):
Total range = 0 to 4 percent
Central tendency = 0 to 2 percent

Water Table Depth: 0 – 77 cm (about 45% of components have a perched water table)
(0 - 30 inches)

Flooding:
Frequency: rare - frequent
Duration: brief – very long

Ponding:
Frequency: None
Duration: None

Aspect: NA

Table 2. Representative physiographic features

Landforms	(1) Foothills > Flood plain (2) Valley > Stream terrace (3) Foothills > Drainageway
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Occasional
Elevation	774–956 m
Slope	0–2%
Water table depth	15 cm
Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Flooding duration	Brief (2 to 7 days) to very long (more than 30 days)
Flooding frequency	Rare to frequent
Elevation	500–1,230 m
Slope	0–4%
Water table depth	0–76 cm

Climatic features

The climate of this portion of the MLRA is controlled by a combination of large-scale and small-scale factors. The large-scale factors here include latitude, relative position on the North American continent, prevailing hemispheric wind patterns, and extensive mountain barriers. Small-scale or local factors include the topographic setting and position (valley, slope, or ridge location), as well as orientation or aspect, and vegetative cover. Elevation may cover various scales. Broadly, the climate is transitional between a northern Pacific coastal type and a continental type. The Pacific influence is noted particularly by the late autumn and winter maximum in cloudiness and precipitation; also in the relatively moderate average winter temperatures, compared with areas east of the Rocky Mountains. Summer is characteristically sunny and dry, though July and August are the only distinct summer months. July and August are thus also the peak fire-danger months. Annual precipitation (rain and melted snow) averages as little as 10 inches at the lowest canyon floors; over 100 inches at the highest elevations. Wettest months are normally November, December, and January. Close to 60 percent of the annual total occurs during the period November through March. A slight, secondary peak in precipitation normally appears in May and June, followed by a sharp decrease in July. Snowfall accounts for more than 50 percent of the total precipitation at elevations above 4,800 ft. Snow cover usually persists in the mid elevation valleys from early December through the end of March. High-elevation snowpack reaches a depth of 5 ft (1.5 m) or more in March and April and may linger into June. The main season of lightning (or thunderstorm) activity extends from late May through August. Storms occur on an average of 3 or 4 days each in June, July, and August. Monthly mean temperatures in populated valley locations range from 24 F (-4 C) in January to 65 F (18 C) in July; these are midpoint values between the average daily maximum and minimum temperatures. The annual mean is 43 F (6 C). A large diurnal range occurs in summer. Extreme temperatures have been as high as 103" to 105" F (about 40" C) and as low as -36" F (-38" C). Temperature inversions are commonplace, particularly on the clear summer and early autumn nights. The frost-free season, defined as the period with minimum temperatures staying above 32" F (0" C), varies widely with elevation and topographic position. The season is generally longer at lower elevation locations and on slope positions in the "thermal belt" around 3,500 ft. The season is shorter in positions affected by cold air drainage and slopes above the “thermal belt” at elevations >5,500 ft. Relative humidity is usually high throughout the day in late autumn and winter, averaging 70 to 80 percent or higher in midafternoon. In July and August, afternoon values average near 35 percent in the mid elevation valleys and 45 percent at 5,500 ft. Summer nighttime humidity in these valleys typically recovers to over 90 or 95 percent by dawn. On the slopes above the temperature inversion, at the same time, humidity may average only 50 to 60 percent. Winds have a prevailing (most frequent) direction from the southwest during all or most of the year. Local terrain effects modify the larger-scale wind that occurs in the adjacent free atmosphere. A nighttime drainage effect is common. Sunshine duration is at a minimum in December, when it may average only 20 percent of the maximum possible. July has close to 80 percent of the maximum possible.

(from Finklin, A. 1983. Climate of Priest River Experimental Forest, Northern Idaho.GTR-INT-159)

Frost-free period (days):
Total range = 63 to 134 days
Central tendency = 95 to 116 days

Mean annual precipitation (cm):
Total range = 515 to 1335 mm
(20 to 53 inches)
Central tendency = 750 to 990 mm
(30 to 39 inches)
MAAT (C)
Total range = 5.6 to 9.4
(42 to 49 F)
Central tendency = 7.1 to 8.0
(45 to 46 F)

Climate stations: none

Influencing water features

Soil features

This ecological site is associated with several soil components (Schnoorson, Lovell, Hoodoo, Porrett, Aquepts, Teneb, Lebaron, Clarkia, Aquolls, Potlatch, Cougarbay). These components can be grouped into the soil subgroups Aeric Fluvaquents, Aquandic Epiaqualfs, Aquandic Humaquepts, Aquandic Palexeralfs, Aquandic Endoaqualfs, Typic Vitraquands, Aquandic Albaqualfs, Fluvaquentic Endoaquolls. These soils are often composed volcanic ash and/or loess over mixed alluvium.

Parent Materials:
Kind: Tephra (volcanic ash)
Origin: mixed
Kind: loess
Origin: mixed
Kind: alluvium
Origin: mixed

Surface Texture:
(1) Ashy-Silt Loam
(2) Silt Loam
(3) Ashy-Loam
(4) Silty Clay Loam
(5) Ashy-Silty Clay Loam

Table 4. Representative soil features

Parent material	(1) Volcanic ash (2) Loess (3) Alluvium
Surface texture	(1) Ashy silt loam (2) Ashy loam (3) Ashy silty clay loam
Drainage class	Poorly drained
Permeability class	Moderately slow to moderate
Depth to restrictive layer	0 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	19.05 cm
Calcium carbonate equivalent (0-152.4cm)	0%
Electrical conductivity (0-152.4cm)	0 mmhos/cm
Sodium adsorption ratio (0-152.4cm)	0
Soil reaction (1:1 water) (0-152.4cm)	6.1
Subsurface fragment volume <=3" (25.4-152.4cm)	0%
Subsurface fragment volume >3" (25.4-152.4cm)	0%

Table 5. Representative soil features (actual values)

Drainage class	Very poorly drained to poorly drained

Permeability class	Slow to moderate
Depth to restrictive layer	30–0 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	13.46–29.97 cm
Calcium carbonate equivalent (0-152.4cm)	0%
Electrical conductivity (0-152.4cm)	0 mmhos/cm
Sodium adsorption ratio (0-152.4cm)	0
Soil reaction (1:1 water) (0-152.4cm)	5.1–6.5
Subsurface fragment volume <=3" (25.4-152.4cm)	0–50%
Subsurface fragment volume >3" (25.4-152.4cm)	0–30%

Ecological dynamics

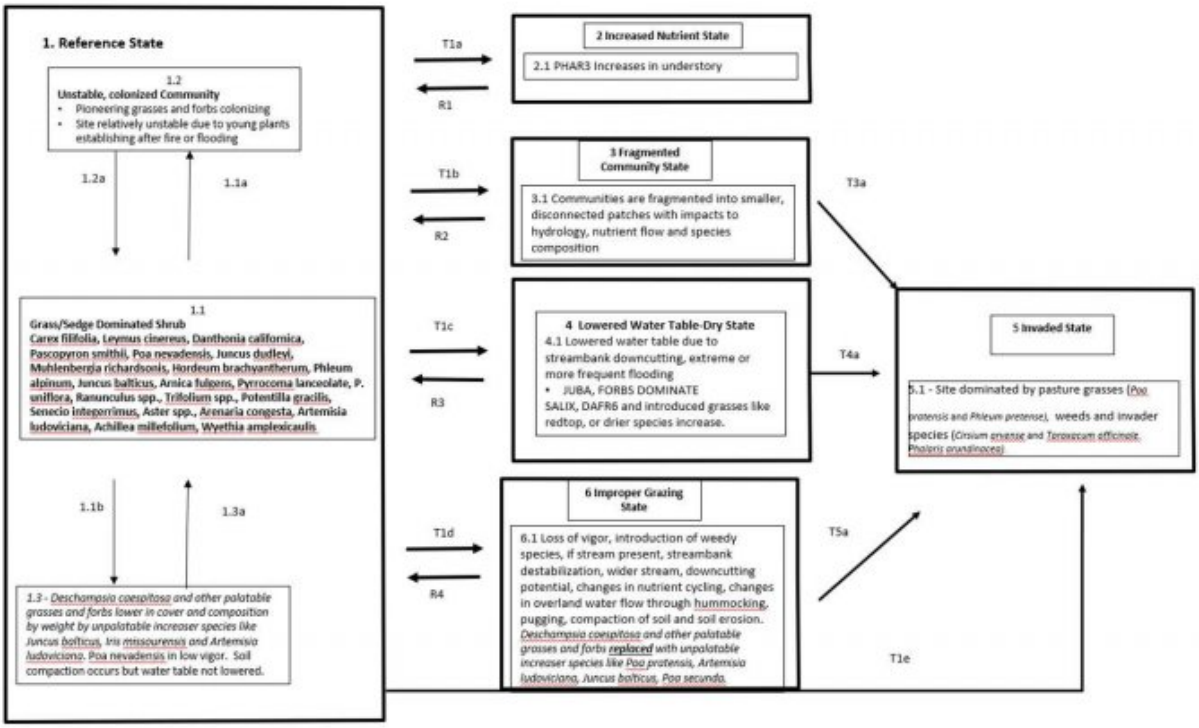
Grass and sedges dominate the site with scattered forbs and shrubs. The major plant community has tufted hairgrass, Nebraska sedge, and other Carex species as major components. The site usually occurs within a complex of wetland sites. The soil surface of the site is typically slightly undulating causing 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 Juncus 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 is 80-90 percent grasses and grass-like, 5-15 percent forbs, and 0-10 percent shrubs. The depressional plant communities may have sedge and rush species making up nearly 100 percent of the community and are inclusions. Fire has had little influence on the development of the site. Rare wildfires can occur following consecutive drought years. If a fire occurs, it usually does not adversely affect the plant community. Most plants including shrubs sprout back with enough soil moisture and/or during the next growing season. 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.

State and transition model

1 Reference State The reference community is a stabilized, persistent sedge dominated herbaceous community with mineral soils that withstands occasional flooding.
1.1 This plant community contains an abundance of sedges, with bluejoint reedgrass and shrubs including willow species on the periphery. This site is stable and typically can withstand occasional flooding.
1.1a Site experiences flooding that exceeds rooting strength of plant community or heavy grazing that reduces vegetation or fire or ice jam or beaver activity or debris flows or slumps that deposit soil and kills vegetation that returns understory community to the pioneering herbaceous community. In periods of extreme drought fire can occur. Fire return interval for surface fires is 50 years, severe fires may be 100 years. All of these disturbances return the site to the mineral soil dominated by pioneering herbaceous species phase.
1.1b Improper grazing management causes palatable species such as Deschampsia caespitosa to be reduced in cover and composition by weight compared to unpalatable species.
1.3a Proper grazing management allows palatable plants to recover back to reference condition in cover and composition by weight.
1.2a Site becomes more stable over time, deeper rooted plants increase such as sedges and bluejoint reedgrass.
1.2 Pioneering herbaceous species establish on mineral soil deposited after flooding.
State 2 Increased nutrient load to system
T1a Increased nutrient load to system causes changes in plant composition and/or production. Site vulnerable to reed canarygrass invasion and dominance and site conversion, if present on site.
R1 Cessation of nutrient load to system, eradication of reed canarygrass stands and restoration efforts needed to restore community.
State 3 Fragmentation of site resulting in patches of non-connected patches of shrubs with altered hydrology, nutrient flow and vegetation propagules and wildlife dispersal altered.
T1b Fragmentation of the intact community and its hydrology and nutrient flows to numerous disconnected patches due to development, dams, extreme grazing practices or ungulate or recreation use.
R2 Improved grazing practices, altered ungulate use, dam and development removal and seeding of shrub species and other restoration practices.
State 4 Dry riparian site: Site is typically dominated by native grasses such as an understory of common snowberry, wood rose, black hawthorn, redosier dogwood, western meadowrue, false Solomons-seal, spreading sweetroot, largeleaf avens, sweetscented bedstraw, and blue wildrye. Site loses hydrology due to downcutting of stream or ditching/draining or site, watershed alterations to hydrology that leads to site drying, extreme prolonged severe drought may cause as well.
T1c Human land uses that lower the water table including dams, roads, channeling, ditching or draining impact the site. Improper grazing can create trampling, hummocking, pugging and compaction of the soil resulting in potential loss of water at the site and accelerated stream downcutting. Improper grazing practices can also lead to changes in the nutrient cycling of the site. Drying of system as a result of loss of hydrology and increase in drier shrub species encroaching.
R3 Return of natural hydrology of site with restoration of dams, roads, other human development and/or prescribed grazing practices or reduced ungulate use or cessation of watershed factors that impact hydrological function of the site.
T3 T4 T5 T1e Introduction and dominance of non-native species and invasive species. Sites are invaded by noxious weeds or introduced pasture grasses. Pasture grasses may be planted or a result of invasion from neighboring sites. Improper grazing may be a trigger for invasion however flooding may transport seeds to freshly deposited alluvium.
State 5 Invaded State: This includes many non-native species that have come to dominate riparian areas such as cheatgrass (Poa pratensis), timothy (Phleum pratensis) and some native increaser species may include: *Juncus arcticus*, *Iris missouriensis*, *Argentea anserina*, and *Dasiphora floribunda* . Often sites are a combination both pasture grasses and invading weeds.
State 6 Overgrazed State: This state develops due to non-prescription, extreme grazing practices in which overgrazing of palatable species exists and increaser species gain dominance in the vegetation community.
T1d Overgrazing causes the plant community to change to increaser species.
R4 Sustainable grazing practices employed, adequate restoration of vegetation community with removal of weedy species, seeding of native palatable species.
T5a The overgrazed state transitions to the weed state with the establishment and dominance of noxious, weedy species.



References

. USNVC [United States National Vegetation Classification]. 2019. United States National Vegetation Classification Database, V2.03. Federal Geographic Data Committee, Vegetation Subcommittee, Washington DC.. USNVC: http://usnvc.org/.

Finklin, A.I. 1983. Climate of Priest River Experimental Forest, northern Idaho. Gen. Tech. Rep. INT-159. U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT. 53.

Jim Cornwell. 2009. NRCS Idaho Draft Range Site Descriptions.

Kovalchik, B.L. and R.R. Clausnitzer. 2004. Classification and Management of Aquatic, Riparian, and Wetland Sites on the National Forests of Eastern Washington: Series Description. General Technical Report PNW-GTR-593. United States Department of Agriculture, Forest Service, Pacific Northwest Research Station. 1–354.

Rocchio, J.F. and R.C. Crawford. 2015. Ecological systems of Washington State. A guide to identification. Washington Department of Natural Resources.. Natural Heritage Report.. Washington Department of Natural Resources, Natural Heritage Program, Olympia, WA. 1–397.

Contributors

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Approval

Curtis Talbot, 10/15/2020

Rangeland health reference sheet

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

Author(s)/participant(s)	
Contact for lead author	
Date	05/17/2024
Approved by	Curtis Talbot
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

2. **Presence of water flow patterns:**

3. **Number and height of erosional pedestals or terracettes:**

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):**

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

7. **Amount of litter movement (describe size and distance expected to travel):**

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

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):**

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

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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):**

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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:

    Sub-dominant:

    Other:

    Additional:

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):**

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):**

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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:**

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17. **Perennial plant reproductive capability:**
