USDA Natural Resources Conservation Service

Ecological site F043AY584ID
Poorly Drained Floodplain Step 30-45" PZ Frigid Western Bitterroot Foothills

Last updated: 10/14/2020
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): 043A–Northern Rocky Mountains

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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 – 043A09 - Western Bitterroot Foothills

Others where occurring: 043A07 - Eastern Columbia Plateau Embayments

This LRU is composed predominantly of foothills, low mountains and valleys. The soils tend to be loamy andisols, alfisols, mollisols and inceptisols, with mixed to thick ash surfaces. Residuum and colluvium from metasedimentary rock, metamorphics or granite are the dominant parent materials. Soil climate is a mesic or frigid temperature regime and a xeric or udic moisture regime with average annual precipitation around 895 mm (35 inches).

Classification relationships

This ES fits into the National Vegetation Standard’s Northern Rocky Mountain Riparian Forest Alliance.

Ecological site concept

Ecological Site Concept:

This ES is found on somewhat poorly to very poorly drained floodplains and basins of river valleys. A water table is present within 30 inches of the surface during the May-Oct period. They have frigid temperatures and a mature plant community dominated by black cottonwood, aspen and birch with an understory of grasses, Baltic rush and shrubs. They are loamy and may have layers of volcanic ash or organic material. Some sites have been impacted

by alluvially transported mine spoil.

Table 1. Dominant plant species

Tree	(1) *Populus balsamifera ssp. trichocarpa* (2) *Populus tremuloides*
Shrub	(1) *Cornus sericea* (2) *Salix*
Herbaceous	(1) *Carex* (2) *Deschampsia cespitosa*

Physiographic features

Physiographic Features
This ecological site occurs mainly on floodplains and backswamps. Parent materials are mixed alluvium with a mantle of volcanic ash and loess.

Landscapes: River Valleys
Landforms: flood plains, depressions, backswamps, flood-plain steps

Elevation:
Total range = 650 to 685 m
(2,125 to 2,250 feet)
Central tendency = 650 to 665 m
(2,125 to 2,175 feet)

Slope (percent):
Total range = 0 to 3 percent
Central tendency = 0 to 1 percent

Water Table Depth:
0 to 100 cm; median = 15 cm
(0 to 40 inches; median = 6 inches)

Flooding:
Frequency: occasional to frequent
Duration: brief to long

Ponding:
Frequency: None
Duration: None

Aspect: NA

Table 2. Representative physiographic features

Landforms	(1) River valley > Flood plain (2) River valley > Depression (3) River valley > Backswamp (4) River valley > Flood-plain step
Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Occasional to frequent
Elevation	2,125–2,175 ft
Slope	0–1%
Water table depth	0–6 in

Aspect	Aspect is not a significant factor

Table 3. Representative physiographic features (actual ranges)

Flooding duration	Brief (2 to 7 days) to long (7 to 30 days)
Flooding frequency	Occasional to frequent
Elevation	2,125–2,250 ft
Slope	0–3%
Water table depth	0–40 in

Climatic features

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 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. 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 and 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 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 = 110 to 130 days
Central tendency = 120 to 125 days

Mean annual precipitation (cm):
Total range = 590 to 870 mm
(23 to 34 inches)
Central tendency = 645 to 735 mm
(25 to 29 inches)

MAAT (C)
Total range = 8.0 to 8.8
(46 to 48 F)
Central tendency = 8.4 to 8.7
(47 to 48 F)

Climate stations: none

Influencing water features

Water Table Depth:
0 to 100 cm; median = 15 cm
(0 to 40 inches; median = 6 inches)

Flooding:
Frequency: occasional to frequent
Duration: brief to long

Ponding:
Frequency: None
Duration: None

Soil features

Representative Soil Features
This ecological site is associated with the Aeric Fluvaquents, Aquandic Endoaquepts, Bellslake, Miesen, and Ramsdell components. The soils are Aeric Fluvaquents, Aquandic Endoaquepts, Aquandic Humaquepts, Vitrandic Dystrudepts, and Vitrandic Humudepts. These soils have developed in mixed alluvium. Most sites have a surface influenced by volcanic ash and loess and some sites have layers developed in organic material. Sites along the Coeur D'Alene River can be impacted by flood deposited mine spoil.

Parent Materials:
Kind: volcanic ash, loess, organics
Origin: mixed
Kind: alluvium, mine spoil
Origin: mixed

Surface Texture: (<2mm fraction)
(1) Ashy-Silt Loam
(2) Very Fine Sandy Loam

Table 4. Representative soil features

Parent material	(1) Volcanic ash (2) Loess (3) Organic material (4) Alluvium (5) Mine spoil or earthy fill
Surface texture	(1) Ashy silt loam (2) Very fine sandy loam
Drainage class	Somewhat poorly drained to poorly drained
Permeability class	Moderate
Depth to restrictive layer	0 in
Surface fragment cover <=3"	0%

Surface fragment cover >3"	0%
Available water capacity (0-40in)	7.5 in
Calcium carbonate equivalent (0-60in)	0%
Electrical conductivity (0-60in)	0 mmhos/cm
Sodium adsorption ratio (0-60in)	0
Soil reaction (1:1 water) (0-60in)	5.8
Subsurface fragment volume <=3" (10-60in)	0%
Subsurface fragment volume >3" (10-60in)	0%

Table 5. Representative soil features (actual values)

Drainage class	Somewhat poorly drained to poorly drained
Permeability class	Moderately slow to moderate
Depth to restrictive layer	0 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	6.7–10.3 in
Calcium carbonate equivalent (0-60in)	0%
Electrical conductivity (0-60in)	0–3 mmhos/cm
Sodium adsorption ratio (0-60in)	0
Soil reaction (1:1 water) (0-60in)	5–6.5
Subsurface fragment volume <=3" (10-60in)	0–15%
Subsurface fragment volume >3" (10-60in)	0%

Ecological dynamics

State and transition model

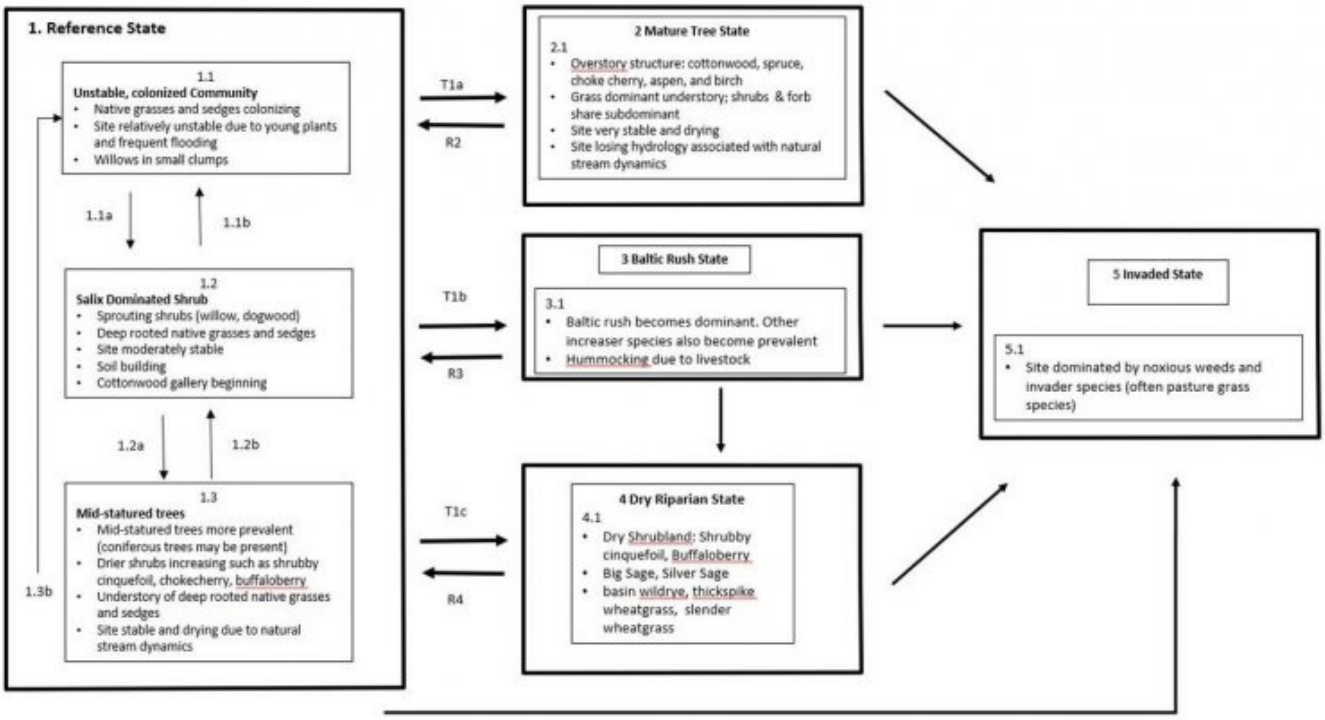

Figure 1. STM

1 Reference State (as represented by active floodplain). Due to active stream dynamics, no one community can describe the reference state and it is common for multiple communities to exist in a relatively small area.

1.1 This plant community is primarily composed of colonizing grasses and sedge and is relatively unstable due to shallow rooted plants and frequent flooding. Willows may exist on site but are typically in small clumps or as single plants

1.1a Site becomes more stable over time, deeper rooted plants increase

1.1b Site experiences flooding that exceeds rooting strength of plant community, heavy grazing reduces shrub component

1.2 This plant community contains a high diversity of willows, dogwood, sedges (beaked, Nebraska, and water), and grasses (tufted hairgrass, American and fowl mannagrass, reedgrass). There are several other grasses and grasslikes (bearded wheatgrass, meadow barley, American sloughgrass, and Baltic rush), along with a variety of forbs. Slight variations in climate and elevation may cause some minor shifting of the willow species. This site is moderately stable and typically can withstand occasional flooding

1.2a Site becomes more stable over time, stream dynamics change (possibly man made structure) causing floodplain to shift to a drier site

1.2b Site experiences catastrophic flooding often associated with extreme weather event and/or ice jam

1.3 Mid-statured trees become more prevalent with interspersed coniferous trees possible. Site is very stable but drying due to natural stream dynamics. Willows remain the primary shrub however buffaloberry, chokecherry, and buffaloberry are increasing. Grasses and sedges remain as the understory.

1.3b Site experiences catastrophic flooding often associated with extreme weather event and/or ice jam

2.1 Mature Tree Dominated state where large cottonwood, spruce, chokecherry, aspen, and birch trees comprise overstory. Grasses often control the understory with dry shrubs. Site is very stable, drying, and has lost nearly all of its stream dynamic (often associated with a down cutting of the stream or loss of stream meandering)

T1a Long term stability created by nearly complete lack of wild flooding (either natural or man created), Improper grazing promotes grass growth.

R2 Site experiences catastrophic flooding often associated with extreme weather events and/or ice jams; Brush management, grazing management will also be necessary

3.1 Wetland characteristics of site altered. Baltic rush and increaser species become prevalent. Site drying due to stream downcutting. Hummocking by livestock possible

T1b Improper grazing (overgrazing or repeated spring grazing), extended drought.

R3 Improved grazing practices (change of season of use, conservative stocking rates), tree/shrub establishment, water impoundments (beaver dams, log jams, or dam analogs)

4.1 Dry riparian site: Site is typically dominated by native grasses such as basin wildrye, thickspike wheatgrass, and slender wheatgrass. Shrubby cinquefoil, buffaloberry, Big sagebrush, and silver sagebrush are dominant shrubs. Site loses hydrology due to downcutting of stream or stream meandering.

T1c Natural stream dynamics creates a dry site that was once wetter. Improper grazing creates accelerated stream downcutting

T3a Drying of system as a result of loss of hydrology and increase in drier shrub species encroaching.

R4 Grazing management (timing and amount to improve shrub and tree establishment), brush management to remove unwanted drier species

5.1 Invaded State: This includes many non-native species that have come to dominate riparian areas. Some species may include: orchard grass, timothy, Kentucky bluegrass, non-native thistles, Russian olive, leafy spurge, spotted knapweed, houndstounge, foxtail barley, whitetop mustard. Often sites are a combination both pasture grasses and invading weeds. Site is often a terminal state; meaning these sites are likely to never return to Reference regardless of management

T1d, T2a, T3b, T4a 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.

Figure 2. Narrative

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.

Contributors

Stephanie Shoemaker
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Approval

Curtis Talbot, 10/14/2020

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	05/10/2025
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):**

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

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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:

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

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

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

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:**
