USDA Natural Resources
Conservation Service

# Ecological site R043AY517ID
# Loamy Floodplains 24-30" PZ Frigid Western Bitterroot Foothills

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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
43A10 – Clearwater Mountains
43A11 - Bitterroot Metasedimentary Zone

## Classification relationships

This ES fits into the National Vegetation Standard’s Western Montane-Subalpine Riparian & Seep Shrubland Group (Compare to previous Idaho range sites: R009XY018ID, MEADOW and R043BY011, RIPARIAN)

## Ecological site concept

This ES is found on somewhat poorly drained to poorly drained, loamy sites on floodplains. A water table can be present and is within 61 cm (24 inches) of the surface during the May-Oct period. They have frigid temperatures and a plant community that varies from riparian woody species to sedges and grasses. These are montane wetlands dominated by short to tall (0.5-15 m) cold-deciduous shrubs with multiple stems, occurring as narrow bands of shrubs lining streambanks and alluvial terraces in narrow to wide, low-gradient valley bottoms and floodplains with sinuous stream channels.

**Table 1. Dominant plant species**

| | |
|---|---|
| Tree | Not specified |
| Shrub | (1) *Alnus incana*<br>(2) *Cornus sericea* |
| Herbaceous | (1) *Carex*<br>(2) *Calamagrostis canadensis* |

## Physiographic features

This ecological site occurs mainly on range floodplains and stream terraces. Parent materials are mixed alluvium.

Landscapes: Floodplains, stream terraces
Landforms: Foothills, hills

Elevation:
Total range = 655 to 1105 m
(2150 to 3,625 feet)
Central tendency = 820 to 935 m
(2,690 to 3,070 feet)

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

Water Table Depth: 2 – 75 cm
(1 - 30 inches; median = 17 inches)

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

Ponding:
Frequency: None
Duration: None

Aspect: NA

**Table 2. Representative physiographic features**

| | |
|---|---|
| Landforms | (1) Foothills > Flood plain<br>(2) Foothills > Stream terrace |
| Flooding duration | Brief (2 to 7 days) |
| Flooding frequency | Occasional |
| Elevation | 2,690–3,070 ft |
| Slope | 0–2% |
| Water table depth | 17 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 | 2,150–3,625 ft |

| | |
|---|---|
| Slope | 0–4% |
| Water table depth | 1–30 in |

## 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 = 83 to 123 days
Central tendency = 96 to 113 days

Mean annual precipitation (cm):
Total range = 720 to 1265 mm
(28 to 50 inches)
Central tendency = 880 to 1030 mm
(35 to 41 inches)
MAAT (C)
Total range = 5.7 to 8.4
(42 to 47 F)
Central tendency = 6.7 to 7.4
(44 to 45 F)

Climate stations: none

## Influencing water features

Water Table Depth: 2 – 75 cm
(1 - 30 inches; median = 17 inches)

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

Ponding:
Frequency: None
Duration: None

## Soil features

This ecological site is associated with the soil components Pokey and Aquandic Endoaquepts. These components can be grouped into the soil subgroups Aquandic Endoaquepts and Vitrandic Humixerepts. These soils are often composed of mixed alluvium.

Parent Materials:
Kind: volcanic ash
Origin:
Kind: alluvium
Origin: mixed

Surface Texture:
(1) Ashy-Silt Loam

**Table 4. Representative soil features**

| | |
|---|---|
| Parent material | (1) Volcanic ash<br>(2) Alluvium |
| Surface texture | (1) Ashy silt loam |
| Drainage class | 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) | 6.5 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) | 5.1 |
| Subsurface fragment volume <=3" (10-60in) | 0% |
| Subsurface fragment volume >3" (10-60in) | 0% |

**Table 5. Representative soil features (actual values)**

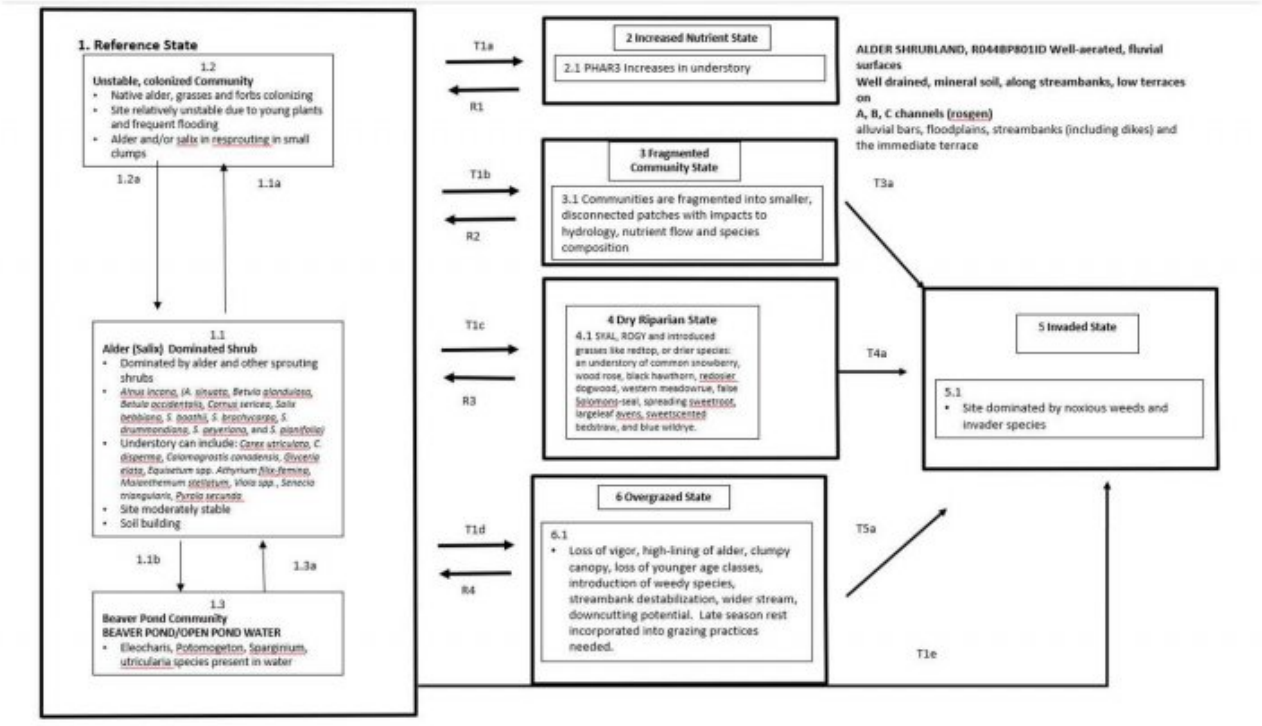
| | |
|---|---|
| Drainage class | Somewhat poorly drained to poorly drained |
| Permeability class | Moderately slow to moderate |
| Depth to restrictive layer | 0 in |
| Surface fragment cover <=3" | 0% |
| Surface fragment cover >3" | 0% |
| Available water capacity (0-40in) | 5.5–6.5 in |
| Calcium 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) | 4.5–7.3 |
| Subsurface fragment volume <=3" (10-60in) | 0–70% |
| Subsurface fragment volume >3" (10-60in) | 0–25% |

## Ecological dynamics

The site is a dominated by a variety of willow species with a mixed forb, grass, and sedge understory. This site may occur in complex with dry meadow and meadow range sites in the flood plain. Composition is approximately 30 to 40 percent grass, 5 to 15 percent forbs, and 50 to 60 percent shrubs. Fire has played a minimum role in maintaining the plant community. When fire does occur, almost all species resprout from the roots or crowns. The normal fire frequency is 50 to 100 years. Most of the shrubs adapted to the site are root-sprouting plants and regenerate rapidly. The herbaceous layer is mostly rhizomatous species and will resprout. Fire can provide some areas of exposed mineral soil for willows to establish new plants. Improper grazing management will result in a stand of forbs and Kentucky bluegrass with reduced vigor. The ability of the community to withstand seasonal flooding is reduced and down cutting of an adjacent stream channel can result.

## State and transition model

**1 Reference State** The reference community is a stabilized, persistent shrubland dominated by thinleaf alder (Alnus incana) that withstands occasional flooding.
**1.1** This plant community contains an abundance of alder, with few other shrubs including willow species and an understory of grasses, forbs and sedges. 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 shrub component 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 Beavers build dam that holds water, flooding area and creating a pond.
1.2a Site becomes more stable over time, deeper rooted plants increase such as thinleaf or Sitka alder and lesser birch species and willow species.
1.3a Beavers extirpated from site. Site dries out if beaver dam removed and ponded water reabsorbed into the vegetation community and soil. Site returns to the mineral soil with pioneering herbaceous community.
**1.2** Pioneering herbaceous species establish on mineral soil deposited after flooding.
**1.3** Beaver dam and resulting pond with aquatic species present such as potomogeton, Eleocharis, spartigeum and utriculata.
**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 Improper grazing creates accelerated stream downcutting, 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. 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.
**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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## 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 | 05/11/2025 |
| 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:**

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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:**

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