Major Land Resource Area 043A
Northern Rocky Mountains

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Description

This MLRA is located in Montana (43 percent), Idaho (34 percent), and Washington (23 percent). It makes up about 31,435 square miles (81,460 square kilometers). It has no large cities or towns. It has many national forests, including the Okanogan, Colville, Kootenai, Lolo, Flathead, Coeur d'Alene, St. Joe, Clearwater, and Kaniksu National Forests. This MLRA is in the Northern Rocky Mountains Province of the Rocky Mountain System. It is characterized by rugged, glaciated mountains; thrust- and block-faulted mountains; and hills and valleys. Steep-gradient rivers have cut deep canyons. Natural and man-made lakes are common. The major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA are: Kootenai-Pend Oreille-Spokane (1701), 67 percent; Upper Columbia (1702), 18 percent; and Lower Snake (1706), 15 percent. Numerous rivers originate in or flow through this area, including, the Sanpoil, Columbia, Pend Oreille, Kootenai, St. Joe, Thompson, and Flathead Rivers. This area is underlain primarily by stacked slabs of layered sedimentary or metasedimentary bedrock. The bedrock formations range from Precambrian to Cretaceous in age. The rocks consist of shale, sandstone, siltstone, limestone, argillite, quartzite, gneiss, schist, dolomite, basalt, and granite. The formations have been faulted and stacked into a series of imbricate slabs by regional tectonic activity. Pleistocene glaciers carved a rugged landscape that includes sculpted hills and narrow valleys filled with till and outwash. Continental glaciation over road the landscape in the northern half of the MLRA while glaciation in the southern half was confined to montane settings. The average annual precipitation is 25 to 60 inches (635 to 1,525 millimeters) in most of this area, but it is as much as 113 inches (2,870 millimeters) in the mountains and is 10 to 15 inches (255 to 380 millimeters) in the western part of the area. Summers are dry. Most of the precipitation during fall, winter, and spring is snow. The average annual temperature is 32 to 51 degrees F (0 to 11 degrees C) in most of the area, decreasing with elevation. In most of the area, the freeze-free period averages 140 days and ranges from 65 to 215 days. It is longest in the low valleys of Washington, and it decreases in length with elevation. Freezing temperatures occur every month of the year on high mountains, and some peaks have a continuous cover of snow and ice. The dominant soil orders in this MLRA are Andisols, Inceptisols, and Alfisols. Many of the soils are influenced by Mount Mazama ash deposits. The soils in the area have a frigid or cryic soil temperature regime; have an ustic, xeric, or udic soil moisture regime; and dominantly have mixed mineralogy. They are shallow to very deep, are very poorly drained to well drained, and have most of the soil texture classes. The soils at the lower elevations include Udivitrands, Vitrixerands and Haplustalfs. The soils at the higher elevations include Dystrocryepts, Eutrocryepts, Vitricryands , and Haplocryalfs. Cryorthents, Cryepts, and areas of rock outcrop are on ridges and peaks above timberline The MLRA is home to diverse coniferous forests. Grand fir, Douglas-fir, western red cedar, western hemlock, western larch, lodgepole pine, subalpine fir, ponderosa pine, whitebark pine, and western white pine are the dominant overstory species, depending on precipitation, temperature, elevation, and landform aspect. The understory vegetation varies, also depending on climatic and landform factors. Some of the major wildlife species in this area are whitetailed deer, mule deer, elk, moose, black bear, grizzly bear, coyote, fox, and grouse. Fish, mostly in the trout and salmon families, are abundant in streams, rivers, and lakes. More than one-half of this area is federally owned and administered by the U.S. Department of Agriculture, Forest Service. Much of the privately-owned land is controlled by large commercial timber companies. The forested areas are used for wildlife habitat, recreation, watershed, livestock grazing, and timber production. Meadows provide summer grazing for livestock and big game animals. Less than 3 percent of the area is cropland.

Ecological site keys

MLRA 43A – Subdivisions

I. Site is North of limit of continental glaciation and/or north of MLRA 44A (Spokane-Pend Oreille Valleys)

A. Site is on glaciated hills and mountains west of Republic Graben and Sanpoil River Valley; LRU01 Okanogan Plateau

B. Site is east of or within Republic Graben and Sanpoil River Valley

1 Site is west of Kettle Crest

i. Site is on hill slopes, terraces and valley floors below 800m elevation (within Republic Graben/Sanpoil River Valley); LRU03 Columbia-Colville Valleys

ii. Site is on hill or mountain slopes at or above 800m elevation

a. Site is on hill or mountain slopes below 1070m elevation; LRU01 Okanogan Plateau

b. Site is on mountain slopes above 1070m elevation; LRU02 Western Selkirk Highlands

2 Site is east of Kettle Crest

i. Site is west of the Kootenai River Valley

a. Site is west of Pend Oreille River

1) Site is on hillslopes and terraces below 800m elevation; LRU03 Columbia-Colville Valleys

2) Site is on mountain slopes and ridges above 800m elevation

a) Site is on mountain slopes and ridges west of Colville River; LRU02 Western Selkirk Highlands

b) Site is east of Colville River; LRU03 Selkirk Mountains

b. Site is east of Pend Oreille River

1) Site is on hill or mountain slopes above 1000m elevation; LRU04 Selkirk Mountains

2) Site is on hill slopes or terraces below 1000m elevation; see MLRA 44A key

ii. Site is east of the Kootenai River Valley

II. Site is South of limit of continental glaciation and/or south of MLRA 44A (Spokane-Pend Oreille Valleys)

A. Site is in canyonlands in the Clearwater River drainage at elevation below 800m; LRU08 Clearwater Canyons

B. Site is north of Clearwater-Lochsa River system and above 800m elevation

1 Site is on hill and low mountain slopes below 1070m elevation

i. Site is on hills and plateaus with basalt bedrock and/or Tertiary sediment deposits; LRU07 Eastern Columbia Plateau Embayments

ii. Site is on hill or low mountain slopes with other geologies; LRU09Western Bitterroot Foothills

2 Site is above 1070m elevation

i. Site is on metasedimentary geology of the Belt Supergroup; LRU11 Bitterroot Metasedimentary Zone

ii. Site is on other granitic or metamorphic geology; LRU10 Clearwater Mountains

III. Site resides in the Purcell or Cabinet Mountains, or the Lewis, Livingston, Swan or Mission ranges. Please go to Key 10.

43A LRU 1-4 mesic/xeric zone - Draft key (4MOS)

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1) depth to SHWT <75cm

a) mineral soil materials

i) water table mostly >24 inches during May-Oct (MWD)…F043AY501WA … F043AY501WA – Warm Mesic Xeric Loamy Foothills, Terraces, High Water Table (Ponderosa Pine/Shrub) Pinus Ponderosa /Symphoricarpos albus, Pinus Ponderosa / Physocarpus malvaceus

ii) Water table <24 inches during May to Oct (PD)…R043AY510ID … R043AY510ID – Poorly Drained Floodplains 23-25" PZ Mesic Columbia-Colville Valleys

b) Organic soil materials…none proposed

2) depth to SHWT >75cm

a) warm-mesic zone…(EX043AESG03)

i) sandy…F043AY509WA … F043AY509WA – Warm, Xeric, Sandy, Outwash Terraces and Plains (Ponderosa Pine/Dry Grass) Pinus ponderosa / Pseudoroegneria spicata , Pinus ponderosa / Festuca idahoensis

ii) not sandy

(1) low awc…F043AY510WA … F043AY510WA – Warm, Xeric, Loamy Hillsides, Low Available Water Capacity (Ponderosa Pine/Dry Grass) Pinus ponderosa / Pseudoroegneria spicata , Pinus ponderosa / Festuca idahoensis

(2) loamy

(a) mixed ash…F043AY511WA … F043AY511WA – Warm, Xeric, Loamy Hillsides, Mixed ash surface (Ponderosa Pine/Dry Grass) Pinus ponderosa / Pseudoroegneria spicata, Pinus ponderosa / Festuca idahoensis

(b) ashy…F043AY512WA … F043AY512WA – Warm, Xeric, Loamy Mountainsides, ashy surface (Ponderosa Pine/Dry Grass) Pinus ponderosa / Pseudoroegneria spicata , Pinus ponderosa / Festuca idahoensis

b) mesic to cool mesic zone

i) mesic

(1) Xeric…none proposed

(2) Dry-xeric

(a) Low Awc…R043AY507WA … R043AY507WA – Cool-Mesic Dry-Xeric Loamy Low AWC (PSSP/FEID/ACNE)

ii) cool-mesic

(1) Xeric or dry-xeric

(a) Dry-xeric…R043AY506WA … R043AY506WA – Cool-Mesic Dry-Xeric Loamy Hills and Mountains (PSSP/FECA/FEID)

(b) xeric…(EX043AESG02)

(i) sandy…F043AY508WA … F043AY508WA – Warm Mesic Xeric Sandy Hill slopes and Outwash terraces (Ponderosa Pine Dry Shrub, Grass) Pinus ponderosa / Purshia tridentata – Festuca idahoensis - Pseudoroegneria spicata

(ii) not sandy

1 low awc…F043AY507WA … F043AY507WA – Warm Mesic Xeric Loamy Foothills/Mountainsides, low AWC subsoils (Ponderosa Pine Dry Shrub, Grass) Pinus ponderosa / Purshia tridentata – Festuca idahoensis - Pseudoroegneria spicata

2 loamy

a. mixed ash…F043AY506WA … F043AY506WA – Warm Mesic Xeric Loamy Foothills/Mountainsides, mixed ash surface (Ponderosa Pine Dry Shrub,

Grass) Pinus ponderosa / Purshia tridentata – Festuca idahoensis - Pseudoroegneria spicata

b. ashy…F043AY505WA … F043AY505WA – Warm Mesic Xeric Loamy Foothills/Mountainsides, ashy surface (Ponderosa Pine Dry Shrub, Grass) Pinus ponderosa / Purshia tridentata – Festuca idahoensis - Pseudoroegneria spicata

(2) moist xeric … F043AY502WA – Warm Mesic Xeric Loamy Foothills, Terraces, mixed ash surface (Ponderosa Pine/Shrub) Pinus Ponderosa /Symphoricarpos albus, Pinus Ponderosa / Physocarpus malvaceus

43A LRU 1-4, frigid/xeric zone - Draft key (4MOS)

A. Cool-frigid…(EX043AESG04)

a. High WT…use F043AY514WA … F043AY514WA – Cool-Frigid, Xeric, Loamy Mountainsides, mixed ash surface (Douglas Fir/Cool Dry Grass) Pseudotsuga menziesii - Calamagrostis rubescens

b. Not High WT

i. Dry-xeric

1 Aspen dominates site…F043AY533WA (aspen-pinegrass) … F043AY533WA – Cool-Frigid, Dry-Xeric, Loamy Mountainsides (Aspen Cool Grass) Populus tremuloides/Calamagrostis rubescens

2 Conifers dominate site

a. Sandy…F043AY516WA … F043AY516WA – Cool-Frigid, Xeric, Sandy Outwash Terraces, mixed ash surface (Douglas-fir/Cool Dry Grass) Pseudotsuga menziesii - Calamagrostis rubescens

b. Loamy

i. Low awc…F043AY515WA … F043AY515WA – Cool-Frigid, Xeric, Loamy Mountainsides, low AWC subsoils (Douglas Fir/Cool Dry Grass) Pseudotsuga menziesii - Calamagrostis rubescens

ii. Loamy

1 Ashy…F043AY513WA … F043AY513WA – Cool-Frigid, Xeric, Loamy Mountainsides, ashy surface (Douglas-Fir/Cool Dry Grass) Pseudotsuga menziesii - Calamagrostis rubescens

2 **Mixed ash…F043AY514WA …** F043AY514WA – Cool-Frigid, Xeric, Loamy Mountainsides, mixed ash surface (Douglas Fir/Cool Dry Grass) Pseudotsuga menziesii - Calamagrostis rubescens

ii. **Moist-xeric**

1 **Sandy…F043AY586WA …** F043AY586WA – Frigid, Xeric, Sandy, Outwash Terraces (Douglas-fir-Grand Fir Cool Shrub)

2 **Loamy**

a. **Mountain sides…F043AY531WA …** F043AY531WA – Cool-Frigid, Moist-Xeric, Loamy Mountainsides, ashy surface (Douglas-fir-Grand Fir Cool Shrub) Douglas-fir-grand fir/low huckleberry-big huckleberry-dwarf huckleberry

b. **Terraces…F043AY532WA …** F043AY532WA – Cool-Frigid, Moist-Xeric, Loamy Terraces, ashy surface (Douglas-fir-Grand Fir Cool Shrub) Douglas-fir-grand fir/low huckleberry-big huckleberry-dwarf huckleberry

B. Frigid or warm-frigid

a. **Warm-frigid**

i. **Aquic Xeric … R043AY513ID …** F043AY513WA – Cool-Frigid, Xeric, Loamy Mountainsides, ashy surface (Douglas-Fir/Cool Dry Grass) Pseudotsuga menziesii - Calamagrostis rubescens

ii. **Other**

1 **Xeric (EX043AESG05)**

a. **High WT …** F043AY534WA – Warm-Frigid, Aquic, Loamy Footslopes and Flood Plains (Aspen Low Shrub) Populus tremuloides/Symphoricarpos albus

b. **No high WT**

i. **Sandy…F043AY585WA …** F043AY585WA – Warm-Frigid, Xeric, Sandy, Outwash Terraces (Douglas-fir Warm Dry Shrub)

ii. **Not sandy**

1 **Low awc…F043AY519WA …** F043AY519WA – Warm-Frigid, Xeric, Loamy Slopes, low AWC subsoils (Douglas-Fir/Warm Dry Shrub) Pseudotsuga menziesii / Physocarpus malvaceus - Symphoricarpos albus

2 **Loamy**

a. **Ashy…F043AY517WA …** F043AY517WA – Warm-Frigid, Xeric, Loamy Foothills/Mountainsides, ashy surface (Douglas-Fir/Warm Dry Shrub) Pseudotsuga menziesii / Physocarpus malvaceus - Symphoricarpos albus

b. **Mixed ash…F043AY518WA …** F043AY518WA – Warm-Frigid, Xeric, Loamy Slopes, mixed ash surface (Douglas-Fir/Warm Dry Shrub) Pseudotsuga

menziesii / Physocarpus malvaceus - Symphoricarpos albus

2 moist-xeric…(EX043AESG06)

a. Low awc…F043AY523WA … F043AY523WA – Warm-Frigid, Moist- Xeric Loamy Foothills/Mountainsides, low AWC subsoils (Grand Fir Warm Dry Shrub) Abies grandis - Pseudotsuga menziesii / Physocarpus malvaceus - Symphoricarpos albus

b. Loamy

i. Ashy…F043AY521WA … F043AY521WA – Warm-Frigid, Moist- Xeric Loamy Foothills/Mountainsides, ashy surface (Grand Fir Warm Dry Shrub) Abies grandis - Pseudotsuga menziesii / Physocarpus malvaceus - Symphoricarpos albus

ii. Mixed ash…F043AY522WA … F043AY522WA – Warm-Frigid, Moist- Xeric Loamy Foothills/Mountainsides, mixed ash surface (Grand Fir Warm Dry Shrub) Abies grandis - Pseudotsuga menziesii / Physocarpus malvaceus - Symphoricarpos albus

b. Frigid

i. Moist-xericABGR/LIBO…none proposed

MLRA 43A PES- Areas of Purcell or Cabinet Mountains, Lewis, Livingston, Mission and Swan Ranges - PES

I. Site Forested

A. Site receives additional effective moisture - Subirrigated Cool-Moist Woodland … F043AP907MT – Subirrigated Cool Moist Woodland Group

B. Site does not receive additional effective moisture

1 Site in moist conditions (25-35 inches mean annual precipitation and 38-42 degrees F mean annual temperature and 70-90 days frost free, 2200-5000 feet elevation). Surface soil texture is gravelly ashy silt loam or gravelly silt loam or gravelly loam.

i. soils ashy - Ashy Cool- Moist Woodland … F043AP902MT – Ashy Cool Moist Woodland Group

ii. Soils not ashy - Upland Cool - Moist Woodland … F043AP910MT – Upland Cool Moist Woodland Group

2 Site in dryer conditions, elevation driven

i. Site in high elevation; cold conditions (35-70 or 50-70 frost free days, 30-60 or 40-0-60 inch mean annual precipitation, 37-43 degrees F mean annual temperature, 4000-8000 feet elevation.

a. soils shallow - Shallow Cold Woodland … F043AP904MT – Shallow Cold Woodland Group

b. Soils not shallow - Upland Cold Woodland … F043AP908MT – Upland Cold Woodland Group

ii. Site mid- to low-elevation (greater than 70 days frost free, less than 30 inches mean annual temperature)

a. Site in moderate elevations; cool conditions (70-90 days frost free, 20-28 inches mean annual precipitation, 40-45 degree F mean annual temperature, 3000-5000 feet elevation).

1 Soils shallow - Shallow Cool Woodland ... F043AP905MT – Shallow Cool Woodland Group

2 Soils not shallow - Upland Cool Woodland ... F043AP909MT – Upland Cool Woodland Group

b. Site in low elevations; warm conditions (70-95 or 75-105 frost free days, 17-25 inches mean annual precipitation, 40-45 degrees F mean annual temperature, 2900-5000 feet elevation).

1 Soils shallow - Shallow Warm Woodland ... F043AP906MT – Shallow Warm Woodland Group

2 Soils not shallow - Upland Warm Woodland ... F043AP911MT – Upland Warm Woodland Group

II. Site not forested

A. Site located in a floodplain - Bottomland (receives additional water, in the aquic soil moisture regime, frigid soil temperature regime, 0-2 percent slopes, 3200-4100 feet elevation). ... R043AP802MT – Bottomland Group

B. Site not located in a floodplain

1 Site receives additional effective moisture - Subirrigated Grassland (has high water table within 100 cm of surface, 20-30 inch mean annual precipitation, 41-45 degree F mean annual temperature, 75-95 days frost free). ... R043AP807MT – Subirrigated Grassland Group

2 Site does not receive additional effective moisture

i. Soils Shallow - Shallow Grassland (14-25 inches mean annual precipitation, 43-46 degrees F mean annual temperature, 70-100 frost free days, 2900-5000 feet elevation). ... R043AP805MT – Shallow Grassland Group

ii. Soils not shallow

a. Site in Alpine Lifezone - Upland Alpine (45-85 inches mean annual precipitation, 32-39 degrees F mean annual temperature, 25-50 days frost free, 5200-8500 feet elevation). ... R043AP809MT – Upland Alpine Group

b. Site not in Alpine - Upland Grassland (14-19 inces mean annual precipitation, 41-45 degrees F mean annual temperature, 90-105 days frost free, 2700-4500 feet elevation). ... R043AP810MT – Upland Grassland Group

43A LRU 1-4, frigid/udic zone - Draft key (4MOS)

I. Warm frigid

A. Aquic ... R043AY512ID – Loamy High Water Table Floodplains 19-24" PZ Frigid Western Bitterroot Foothills

B. Other

a. Dry udic (EX043AESG07)

i. Sandy; … F043AY530WA – Warm-Frigid, Dry-Udic, Sandy Outwash Terraces, mixed ash surface (Grand Fir Moist Herb) Abies grandis/Clintonia uniflora

ii. Loamy

1 .Ashy surface … F043AY529WA – Warm-Frigid, Dry-Udic, Loamy Foothills/Mountainsides, ashy surface (Grand Fir Moist Herb) Abies grandis/Clintonia uniflora

2 Mixed ash; none proposed

b. Udic (EX043AESG08)

i. High Water Table (<75cm) … F043AY527WA – Warm-Frigid, Udic, Loamy Foothills/Valleys, high water table (western redcedar, moist herb) Thuja plicata / Clintonia uniflora

ii. No High Water Table(>75cm)

1 Sandy; none proposed

2 Loamy

a) Low AWC … F043AY528WA – Warm-Frigid, Udic, Loamy Foothills/Mountainsides, low AWC subsoils (western redcedar, moist herb) Thuja plicata / Clintonia uniflora

b) Not Low AWC

i) Ashy surface … F043AY526WA – Warm-Frigid, Udic, Loamy Foothills/Mountainsides, ashy surface (western redcedar, moist herb) Thuja plicata / Clintonia uniflora

ii) Mixed ash; none proposed

II. Frigid or cool frigid

a. Udic (EX043AESG09)

i. High Water Table (<75cm) … F043AY527WA – Warm-Frigid, Udic, Loamy Foothills/Valleys, high water table (western redcedar, moist herb) Thuja plicata / Clintonia uniflora

ii. No High Water Table (>75cm)

1 Sandy; none proposed

2 Loamy

i. Low AWC … F043AY557ID – Ashy Till Mountains and Valleys 30-45" PZ Frigid Bitterroot Metasedimentary Zone

ii. Not as above

a) Ashy surface … F043AY524WA – Frigid, Udic, Loamy, Foothills/Mountainsides, ashy surface (Western Hemlock/Moist Forbes) Tsuga heterophylla / Clintonia uniflora , Tsuga heterophylla / Asarum caudatum

b) Mixed ash … F043AY525WA – Frigid, Udic, Loamy Foothills/Mountainsides, mixed ash surface (Western Hemlock/Moist Forbes) Tsuga heterophylla / Clintonia uniflora , Tsuga heterophylla / Asarum caudatum

b. Moist Xeric

i. Low Awc ... R043AY516ID – Shallow Mountain Slopes 24-30" PZ Frigid Western Selkirk Highlands

ii. Loamy; none proposed

MLRA 43A - ESD Key – LRU 7-11 – Frigid/Xeric Zone - Draft Key

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1 Warm-Frigid

A. Aquic-Xeric ... R043AY513ID – Loamy Poorly Drained Floodplains 19-24" PZ Frigid Western Bitterroot Foothills

B. Other

a. Xeric (EX43AESG13)

i. Sandy ... F043AY540ID – Sandy Mountain Slopes 19-24" PZ Frigid Western Bitterroot Foothills

ii. Loamy

1 Fragipan present…F043AY541ID ... F043AY541ID – Fragipan Foothills 19-24" PZ Frigid Eastern Columbia Plateau Embayments

2 Fragipan not present

a. Low Available Water Capacity…F043AY542ID ... F043AY542ID – Skeletal Mountain Slopes 19-24" PZ Frigid Clearwater Mountains

b. Moderate to High Available Water Capacity

i. Metasedimentary geology

1 Ashy surface…F043AY543ID ... F043AY543ID – Ashy over loamy-skeletal Hills and Mountains 19-24" PZ Frigid Bitterroot Metasedimentary Zone

2 Mixed ash surface…F043AY544ID ... F043AY544ID – Vitrandic Metasedimentary Hills and Mountains 19-24" PZ Frigid Western Bitterroot Foothills

ii. Other geology

1 Seasonal HWT(perched)…use F043AY541ID ... F043AY541ID – Fragipan Foothills 19-24" PZ Frigid Eastern Columbia Plateau Embayments

2 Seasonal HWT not present

a. Basalt geology…F043AY545ID ... F043AY545ID – Ashy Basalt Hills and Canyons 19-24" PZ Frigid Clearwater Canyons

b. Other geology

i. Ashy surface…use F043AY543ID ... F043AY543ID – Ashy over loamy-skeletal Hills and Mountains 19-24" PZ Frigid Bitterroot Metasedimentary

Zone

ii. **Mixed ash surface…F043AY546ID …** F043AY546ID – Ashy Canyons and Mountains 19-24" PZ Frigid Western Bitterroot Foothills

b. **Moist-Xeric (EX43AESG14)**

i. **Fragipan present …** F043AY547ID – Fragipan Foothills 24-30" PZ Frigid Eastern Columbia Plateau Embayments

ii. **Fragipan not present**

A. **Sandy …** F043AY585WA – Warm-Frigid, Xeric, Sandy, Outwash Terraces (Douglas-fir Warm Dry Shrub)

B. **Loamy**

1 **Low Available Water Capacity…F043AY548ID …** F043AY548ID – Loamy-skeletal Hills and Mountains 24-30" PZ Frigid Western Bitterroot Foothills

2 **Moderate to High Available Water Capacity**

a. **Metasedimentary geology**

i. **Ashy surface…F043AY549ID …** F043AY549ID – Ashy over loamy-skeletal Mountains 24-30" PZ Frigid Bitterroot Metasedimentary Zone

ii. **Mixed ash surface…F043AY550ID …** F043AY550ID – Ashy Metasedimentary Hills and Mountains 24-30" PZ Frigid Western Bitterroot Foothills

b. **Other geology**

i. **Basalt geology …** F043AY551ID – Ashy Basalt Hills and Mountains 24-30" PZ Frigid Eastern Columbia Plateau Embayments

ii. **Other geology**

1 **Ashy surface …** F043AY552ID – Ashy Hills and Mountains 24-30" PZ Frigid Western Bitterroot Foothills

2 **Mixed ash surface…F043AY553ID …** F043AY553ID – Vitrandic Hills and Mountains 24-30" PZ Frigid Western Bitterroot Foothills

2 Frigid

MLRA 43A - ESD Key – LRU 7-11 – Mesic/Xeric Zone - Draft Key (4MOS)

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1 Warm-Mesic

a. **Aquic-Xeric …** R043AY509ID – Loamy Floodplains 23-25" PZ Mesic Clearwater Canyons

b. **Non Aquic-Xeric**

i. **Dry-Xeric (PSSP/FEID/ACNE)**

1 Loamy … R043AY503ID – Foothills and Canyons 16-22" PZ Mesic Clearwater Canyons

2 Low AWC … R043AY502ID – Shallow Foothills and Canyons 16-22" PZ Mesic Clearwater Canyons

ii. Xeric… EX43AESG11 (Ponderosa pine/dry grass)

1 Low Available Water Capacity … F043AY536ID – Shallow Canyons and Hillsides 23-25" PZ Mesic Eastern Columbia Plateau Embayments

2 Moderate to High Available Water Capacity … F043AY535ID – Loamy Canyons and Terraces 23-25" PZ Mesic Clearwater Canyons

2 Mesic

a. Dry-xeric

i. Loamy … R043AY504ID – Foothills and Canyons 23-25" PZ Mesic Clearwater Canyons

ii. Low AWC … R043AY505ID – Shallow Foothills 23-25" PZ Mesic Western Bitterroot Foothills

b. Xeric… EX43AESG12

i. Low Available Water Capacity … F043AY537ID – Skeletal Canyons and Hills 23-25" PZ Mesic Eastern Columbia Plateau Embayments

ii. Moderate to High Available Water Capacity

1 Basalt geology … F043AY538ID – Ashy Basalt Canyons and Plateaus 23-25" PZ Mesic Clearwater Canyons

2 Other geology … F043AY539ID – Ashy Canyons and Plateaus 23-25" PZ Mesic Eastern Columbia Plateau Embayments

MLRA 43A - ESD Key – LRU 7-11 – Frigid/Udic Zone - Draft Key (4MOS)

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1) Cool-Frigid/Moist-Udic…Grand Fir Mosaic-2 … F043AY555ID – Acidic Grand Fir Mosaic 30-45" PZ Frigid Clearwater Mountains

2) Frigid or Warm-Frigid

a) Frigid

i) Frigid-Aquic

(1) Organic materials in seeps, depressions and backswamps … R043AY511ID – Organic Depressions 19-24" PZ Frigid Clearwater Mountains

(2) Mineral materials on narrow floodplains … R043AY517ID – Loamy Floodplains 24-30" PZ Frigid Western Bitterroot Foothills

ii) Frigid/Udic

(1) Frangipan not present

(A) Apparent water table within 30 inches of surface some time during Apr-Oct period use ... F043AY560ID – Vitrandic Mountains and Valleys 30-45" PZ Frigid Western Bitterroot Foothills

(B) Water table not as above

(i) Low Available water Capacity ... F043AY557ID – Ashy Till Mountains and Valleys 30-45" PZ Frigid Bitterroot Metasedimentary Zone

(ii) Moderate to High Available Water Capacity

1 Metasedimentary Geology ... F043AY558ID – Ashy Metasedimentary Hills and Mountains 30-45" PZ Frigid Bitterroot Metasedimentary Zone

2 Other Geology

a. Ashy surface ... F043AY559ID – Ashy Mountains and Valleys 30-45" PZ Frigid Western Bitterroot Foothills

b. Mixed ash surface ... F043AY560ID – Vitrandic Mountains and Valleys 30-45" PZ Frigid Western Bitterroot Foothills

(2) Fragipan present ... F043AY556ID – Fragipan Foothills 30-45" PZ Frigid Eastern Columbia Plateau Embayments

b) Warm-Frigid

i) Aquic

(1) Floodplains of large river systems

a. Mineral soils ... F043AY584ID – Poorly Drained Floodplain Step 30-45" PZ Frigid Western Bitterroot Foothills

b. Organic soils ... R043AY511ID – Organic Depressions 19-24" PZ Frigid Clearwater Mountains

(2) Floodplains and terraces foothill drainageways

(a) Somewhat poorly drained to poorly drained sites (high water table during May-Oct = 14 to 30 inches) ... R043AY513ID – Loamy Poorly Drained Floodplains 19-24" PZ Frigid Western Bitterroot Foothills

(b) Poorly to very poorly drained sites (high water table during May-Oct = 0 to 14 inches) ... R043AY512ID – Loamy High Water Table Floodplains 19-24" PZ Frigid Western Bitterroot Foothills

ii) Other

(1) Dry-Udic

(a) Fragipan present ... F043AY561ID – Fragipan Foothills 30-45" PZ Frigid Eastern Columbia Plateau Embayments

(b) Fragipan not present

(i) Low Available Water Capacity ... F043AY562ID – Skeletal Mountains 30-45" PZ Frigid Clearwater Mountains

(ii) Moderate to High Available Water Capacity

1 Metasedimentary Geology

a. Ashy surface ... F043AY563ID – Ashy Metasedimentary Mountains 30-45" PZ Frigid Bitterroot Metasedimentary Zone

b. Mixed ash surface ... F043AY564ID – Vitrandic Metasedimentary Hills and Mountains 30-45" PZ Frigid Western Bitterroot Foothills

2 Other Geology

a. Basalt geology

i. Ashy surface use ... F043AY565ID – Ashy Basalt Hills and Canyons 30-45" PZ Frigid Eastern Columbia Plateau Embayments

ii. Mixed ash surface ... F043AY565ID – Ashy Basalt Hills and Canyons 30-45" PZ Frigid Eastern Columbia Plateau Embayments

b. Other geology

i. Ashy surface ... F043AY566ID – Dry Ashy Hills and Mountains 30-45" PZ Frigid Clearwater Mountains

ii. Mixed ash surface ... F043AY567ID – Vitrandic Hills and Mountains 30-45" PZ Frigid Western Bitterroot Foothills

(2) Other

(A) Udic…EX43AESG17 (Western redcedar/moist herb)

(a) Fragipan present

(i) Ashy Surface ... F043AY568ID – Ashy Fragipan Hills 30-45" PZ Frigid Eastern Columbia Plateau Embayments

(ii) Mixed ash surface ... F043AY569ID – Vitrandic Fragipan Hills 30-45" PZ Frigid Western Bitterroot Foothills

(b) Fragipan not present

(i) Apparent water table within 30 inches of surface some time during Apr-Oct period ... F043AY576ID – Poorly Drained Vitrandic Foothills 30-45" PZ Frigid Western Bitterroot Foothills

(ii) Not as above

1 Metasedimentary geology

a. Ashy Surface ... F043AY570ID – Ashy Metasedimentary Hills and Mountains 30-45" PZ Frigid Western Bitterroot Foothills

b. Mixed ash surface ... F043AY571ID – Vitrandic Metasedimentary Hills and Mountains 30-45" PZ Frigid Western Bitterroot Foothills

2 Other geology

a. Basalt geology

i. Ashy Surface … F043AY572ID – Ashy Basalt Hills and Canyons 30-45" PZ Frigid Eastern Columbia Plateau Embayments

ii. Mixed ash surface … F043AY573ID – Vitrandic Basalt Hills and Canyons 30-45" PZ Frigid Eastern Columbia Plateau Embayments

b. Other geology

i. Ashy Surface … F043AY574ID – Ashy Hills and Mountains 30-45" PZ Frigid Western Bitterroot Foothills

ii. Mixed ash surface … F043AY575ID – Vitrandic Hills and Mountains 30-45" PZ Frigid Western Bitterroot Foothills

(B) Very moist-Udic … F043AY577ID – Ashy Depressions 30-45" PZ Frigid Clearwater Mountains

MLRA 43A - ESD Key – LRU 7-11 – Cryic/Udic Zone - Draft Key (4MOS)

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1 Warm-Cryic

a. Aquic

i. Mineral soils…R043AY514ID … R043AY514ID – Loamy Floodplains 30-45" PZ Cryic Western Bitterroot Foothills

ii. Organic soils…use R043AY515ID … R043AY515ID – Organic Floodplains 30-45" PZ Cryic Okanogan Plateau

b. Not Aquic

i. Dry-Udic… R043AY501ID … R043AY501ID – Subalpine Ashy Exposed Mountain Slopes 30-45" PZ Cryic Bitterroot Metasedimentary Zone

ii. Moist-Udic… EX43AESG18

1 Metasedimentary geology… F043AY578ID … F043AY578ID – Ashy Metasedimentary Mountain Slopes 30-45" PZ Cryic Bitterroot Metasedimentary Zone

2 Other geology

a. Mountain sides… F043AY579ID … F043AY579ID – Ashy Mountain Slopes 30-45" PZ Cryic Clearwater Mountains

b. Avalanche chutes… F043AY580ID … F043AY580ID – Avalanche Chutes 30-45" PZ Cryic Clearwater Mountains

2 Cryic or Cool-Cryic

a. **Cryic**

i. **Moist-Udic…EX43AESG19**

1 **Low Available Water Capacity… F043AY581ID …** F043AY581ID – Skeletal Mountain Slopes 30-45" PZ Cryic Clearwater Mountains

2 **Moderate to High Available Water Capacity**

a. **Metasedimentary geology… F043AY582ID …** F043AY582ID – Ashy Metasedimentary Mountain Slopes 30-45" PZ Cryic Bitterroot Metasedimentary Zone

b. **Other geology… F043AY583ID …** F043AY583ID – Ashy Mountain Slopes 30-45" PZ Cryic Clearwater Mountains

ii. **Cryic/Very Moist-Udic…ABLA/STAM (not proposed)**

b. **Cool-Cryic…PIAL (not proposed)**

43A Areas of Purcell or Cabinet Mountains, Lewis, Livingston, Mission and Swan Ranges

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I. Resides in the Lewis and/or Livingston Ranges in the northeastern most portion of this MLRA.

A. Alpine LifeZone

1 **Treeline - Krummholtz …** F043AX958MT – Alpine Krummholtz Coniferous subalpine fir-whitebark pine/grouse whortleberry Abies lasciocarpa-Pinus albicaulis (Picea engelmannii)/Vaccinium scoparium

2 **Nonforested**

i. **Site has concave shape, vegetation dominated by low growing sedges …** R043AX979MT – Alpine Nivation Hollow Payson's sedge / black alpine sedge -northern singlespike sedge / Drummond's rush (Carex paysonis/ Carex nigricans-Carex scirpoidea/ Juncus drummondii)

ii. **Site experience frost heave action resulting in solifluction lobes …** R043AX971MT – Alpine Solifluction Terrace Dryas octopetala (Arctostaphylos uva-ursi/Salix arctica)

iii. **Site is a steep, unstable to stabilizing colluvial slope …** R043AX962MT – Alpine Unstable Talus rocky ledge penstemon (Penstemon ellipticus)

iv. **Site has shallow soils on a cirque floor …** R043AX972MT – Alpine Shallow Cirque Floors Arctic willow – pink mountainheath-alpine laurel /smallwing sedge -shortstalk sedge (Salix arctica-Phyllodoce empetriformis/Kalmia polifolia/Carex microptera-Carex podocarpa)

v. **Site is a shallow meadow …** R043AX963MT – Alpine Shallow Meadow yellow avalanche-lily-Scouler's St. Johnswort-alpine leafybract aster-Sitka valerian- heartleaf

arnica/Hitchcock's smooth woodrush

B. Subalpine LifeZone

1 Forested

i. Upper subalpine … F043AX954MT – Upper Subalpine Cold Coniferous subalpine fir (Engelmann spruce) /thinleaf huckleberry-rusty menziesia/ Hitchcock's smooth woodrush-beargrass/yellow avalanche lily.

ii. Mid Subalpine

a. Cool dry site conditions … F043AX956MT – Subalpine Coniferous Cool Moderately Dry subalpine fir (Abies lasiocarpa) / Engelmann spruce (Picea engelmannii)

b. Cool, moist site conditions … F043AX955MT – Subalpine Coniferous Cool Moist subalpine fir (Abies lasiocarpa)-Engelmann spruce (Picea engelmannii)

iii. Lower Subalpine

a. Moderately dry site conditions … F043AX951MT – Lower Subalpine Cool Dry Coniferous subalpine fir- Engelmann spruce/ Sitka alder/ thinleaf huckleberry/ common beargrass

b. Moist site conditions … F043AX952MT – Lower Subalpine Cool Moist Coniferous subalpine fir-Engelmann spruce/Rocky Mountain maple-thinleaf huckleberry/thimbleberry

c. Frigid soil temperature regime … F043AX957MT – Lower Subalpine Frigid Coniferous western redcedar (Thuja plicata)-western hemlock (Tsuga heterophylla)

2 Non-forested

i. Site is an avalanche including head, chute and run-out zones. … R043AX961MT – Subalpine Avalanche Rocky Mountain maple-Redosier dogwood Acer glabrum-Conus sericea ssp. sericea-Amelanchier alnifolia

C. Montane LifeZone

1 Forested

i. Site resides on a floodplain … F043AX960MT – Montane Deciduous Alluvial Flood Plain black cottonwood (paper birch)/redosier dogwood Populus balsamifera ssp. trichocarpa (Betula papyrifera)/Cornus sericea ssp. sericea

ii. Site does not reside on a floodplain … F043AX959MT – Montane Warm Dry Coniferous Douglas fir/white spirea-common snowberry/pinegrass

2 Non-forested

i. Riparian areas

a. Soils organic and vegetation dominated by sedges … R043AX973MT – Montane Fen woollyfruit sedge (Carex lasiocarpa)

b. Soils organic and vegetation of shrubs and sedges ... R043AX974MT – Montane Swale Drummond's willow (Salix drummondii)-alderleaf buckthorn (Rhamnus alnifolia)

c. Soils subirrigated and not organic

ii. Non-riparian areas

a. Site is a loamy outwash terrace ... R043AX966MT – Montane Loamy Outwash Terrace Richardson's needlegrass (Achnatherum richardsonii)

b. Site is a stable colluvial slope ... R043AX968MT – Montane Stable Colluvial Slope Saskatoon serviceberry-common snowberry/Sitka alder/ Rocky mountain maple/thimbleberry/mountain brome-Geyer's sedge

II. Site does not reside in the Lewis or Livingston Ranges and is not forested, and resides in the 13-17 or 17-20 inch precipitation range

A. Range site in 13-17" precipitation zone and is listed below, otherwise go to PES key. Sites included here: Gravelly, Droughty, Droughty steep, Shallow Droughty, Very shallow.

1 Moderately deep to very deep soils and skeletal. Soils moderately deep, deep, or very deep (? 20" deep to bedrock, lithic, or paralithic root restrictive layer). Soil skeletal to within 20" of soil surface (averages > 35% rock fragments in the 10"-20" layer)

ii. Droughty Soils Soil loamy-skeletal or clayey-skeletal

a. Steep slopes Slope ? 15% – Droughty Steep (DrStp) ... R043AA038MT – Droughty Steep (Drstp) LRU 43A-A

b. Flat to moderate slopes Slope < 15% – Droughty (Dr) ... R043AA036MT – Droughty (Dr) LRU 43A-A

2 Shallow to very shallow soils

i. Shallow soils Soil shallow (10" – 20" deep to bedrock, lithic, or paralithic root restrictive layer) ... R043AA138MT – Shallow Droughty (Swdr) LRU 43A-A

B. Range site in 17-20" precipitation zone and is listed below, otherwise go to PES key. Sites included here: Droughty, Droughty Steep, Loamy steep, Stony, Shallow Droughty, Thin Loamy.

1 Soils shallow and droughty ... R043AB138MT – Shallow Droughty (Swdr) LRU 43A-B

2 Soils moderately deep to deep Soils moderately deep, deep, or very deep (? 20" deep to bedrock, lithic, or paralithic root restrictive layer)

ii. Not stony surface

a. Soil skeletal to within 20" of soil surface (averages > 35% rock fragments in the 10"-20" layer). Soil loamy-skeletal or clayey-skeletal

1) Slope < 15% – Droughty (Dr) ... R043AB036MT – Droughty (Dr) LRU 43A-B

2) Slope ? 15% – Droughty Steep (DrStp) ... R043AB038MT – Droughty Steep (Drstp) LRU 43A-B

b. Soils not skeletal

1) Soils loamy and steep and mollic epipedon present: Soil not skeletal within 20" of soil surface (averages < 35% rock fragments in the 10"-20" layer) and Slope ?15% and Clay content is < 32% (ribbon < 2" long) in surface mineral 4" ... R043AB040MT – Loamy Steep (Lostp) LRU 43A-B

III. ALL OTHER SITES NOT LISTED ABOVE USE SEPARATE KEY (PES KEY 4)- See separate expanded key for forested and non-forested provisional ecological sites.

43A LRU 1-4, cryic/udic zone - Draft key (4MOS)

A. Warm-cryic…F043AY520WA … F043AY520WA – Warm-Cryic, Moist-Xeric, Loamy, Ashy Mountain Slopes (Subalpine Fir Cool Shrub, low elevation)

B. Cryic

a. Aquic…F043AY589WA … F043AY589WA – Cryic, Aquic, Loamy, Flood Plains (Engelmann spruce/ladyfern)(PIEN/COSE/ATFI)

b. Other

i. Udic EX043AESG19 Cryic,

1 Sandy…use F043AY581ID … F043AY581ID – Skeletal Mountain Slopes 30-45" PZ Cryic Clearwater Mountains

2 Loamy

a. Low AWC…F043AY581ID … F043AY581ID – Skeletal Mountain Slopes 30-45" PZ Cryic Clearwater Mountains

b. Ashy…use F043AY583ID … F043AY583ID – Ashy Mountain Slopes 30-45" PZ Cryic Clearwater Mountains

ii. Other

1 Xeric…none proposed

2 Moist-xeric…R043AY508WA … R043AY508ID – Subalpine Meadows 30-45" PZ Cryic Okanogan Plateau