ECOLOGICAL UNITS OF THE NORTHERN REGION: SUBSECTIONS

First Approximation

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INTRODUCTION

Background: This subsection report represents a first approximation of an effort to develop units which integrate information from various disciplines, single-purpose maps, and existing regionalizations. The development of ecological units and descriptive data is an iterative process that will continue as additional information becomes available. Peer review and comments by users of this information is an important part of this process. All ecological mapping and descriptions follow the Forest Service's National Framework for Ecological Units (ECOMAP, 1993).

Development of the Map and Descriptions

Subsections are smaller areas of Sections with similar surficial geology, lithology, geomorphic process, soil groups, subregional climate, and potential natural communities (ECOMAP, 1993). Each subsection has landscape components that differentiate it from adjacent subsections. The differentia used to place lines on the map include geologic materials, geomorphic features, and climate. There are other components that are used to describe each subsection, but are not used to delineate the units. These are called accessory characteristics and include soils and vegetation.

Geologic materials affect ecosystem processes. The physical and chemical properties of bedrock and surficial materials influence such processes as weathering, soil formation, vegetation distribution, and stream chemistry. Landscape features such as elevation, aspect, and slope influence the distribution of solar radiation and precipitation. This affects vegetation patterns, soil formation, hydrologic processes, and animal populations.

The USGS 1:500,000 Albers Conic Equal-Area Maps for the states of Montana, Idaho, and North Dakota were used for the base maps. Geologic materials were determined from 1:500,000 state geology maps with some minor refinements based on additional geologic maps and local knowledge. Geomorphic features were determined using 1:500,000 state topographic and shaded relief maps, and local knowledge. Broad climatic zones were inferred from potential natural vegetation mapping using Kuchler (1964), regional vegetation information, and isohyetal maps.

Uses of the Map and Descriptions

Subsection maps and descriptions are used at the subregion scale for strategic, multi-forest, statewide, and multi-agency analysis and assessment (ECOMAP, 1993). Use of this or any map should be consistent with the scale and methods used to compile it. The subsection map was designed for broad scale ecosystem analysis and should not be used for detailed work. The map was produced at 1:500,000 and is intended to be used at that or a smaller scale. Plotting and using the subsection map at scales larger than 1:500,000 (1:24,000 for example) constitutes a misuse of the map and should not be done. Due to the great amount of variability within the subsections, interpretations for parameters such as erosion were not made. Interpretations at this level must necessarily be based on many assumptions, generalizations, and averages. Such ratings or interpretations generally lack any real value.

LANDSCAPE / CLIMATE OVERVIEW OF THE NORTHERN REGION

The following overview is intended to give the reader a general understanding of the landscapes and climate of the Northern Region. The overview is arranged by

Section or groups of similar Sections.

331A Palouse Prairie -- This Section has a maritime-influenced warm temperate climate with hot, dry summers and cool, moist winters. Columbia River Basalts formed much of the landscape of low relief plateaus and rolling hills dotted with steptoes. Major streams are deeply entrenched into the uplifted highlands forming large canyons. This Section covers 3,243,257 acres.

331D Northwest Glaciated Plains and 331E Northern Glaciated Plains -- These Sections have a cold continental climate with warm, dry summers and cold, dry winters. Large expanses of prairie with scattered highlands characterize these Sections. Glacial drift up to 100 feet thick covers the landscape and glacial knob and kettle topography is typical. Ice damming of major rivers also created areas of lacustrine and delta sediments. These Sections cover 40,078,875 acres.

331F Northwest Great Plains, 331G Powder River Basin, and 342A Bighorn Basin -- These Sections all have cold continental climates with warm to hot, dry summers and cold, dry winters. These non-glaciated plains are typically gently rolling low relief grasslands. Bedrock is Cretaceous marine shale, Tertiary fluvial sediments, and some large sandstone units. Clinker beds or "scoria" from burnt coal seams form colorful resistant beds in Tertiary outcrops. These Sections cover 41,524,948 acres.

332A Northeastern Glaciated Plains and 332B Western Glaciated Plains -- These Sections both have a cold continental climate with warm to hot, humid summers and cold, moist winters. The topography is a rolling, glaciated drift prairie with numerous potholes and moraines. Thick glacial drift covers most of the landscape though lacustrine sediments also occur as a result of glacial ice damming. These Sections cover 16,592,171 acres.

M331A Yellowstone Highlands, M331B Bighorn Mountains, M332C Rocky Mountain Front, M332D Belt Mountains, and M332E Beaverhead Mountains -- These Sections all have cold continental climates with warm, dry summers and cold, dry winters. The topography is dominantly uplifted and faulted mountains and high plateaus with a variety of bedrock. Higher elevations are typically shaped by mountain glaciation and exhibit typical cirqueland features. Steep dipslopes, flatirons, and hogbacks are typical of the Rocky Mountain Front and parts of Bighorn Mountains. Large gravel filled valleys are typical in the Beaverhead Mountains Section of southwest Montana. In central Montana, the mountains occur as widely separated uplifts surrounded and isolated by prairie. These Sections cover 23,835,539 acres.

M332A Idaho Batholith -- This Section has a maritime influenced cool temperate climate with warm, dry summers and cool, moist winters. The batholith is a large, contiguous uplifted area of granitics characterized by large, rounded mountain masses and basin areas. Soils formed in gruss, loess, and volcanic ash. The landscape is deeply cut by the Idaho canyonlands. Mountain glaciation occurred at higher elevations. This Section covers 3,883,095 acres.

M332B Bitterroot Valley and M333D Bitterroot Mountains -- These Sections have maritime influenced cool temperate climates with warm, dry summers and cool, moist winters. Belt rocks (quartzite and argillite) are resistant to weathering and form typical landscapes of steep slopes and incised V-shaped valleys. Talus and rock outcrops are common. The Bitterroot Valley is a large intermontane valley formed in valley fill materials. The higher elevations are typically large U-shaped valleys with abundant rock outcrop, cirques, horns, and other glacial features. Till, outwash, and moraines fill the valley floors. These Sections cover 9,136,505 acres.

M332G Blue Mountains -- This Section has a maritime influenced cool temperate climate with warm, dry summers and cool, moist winters. The landscape is dominated by deeply entrenched major streams. Steep, high relief breaks and narrow valleys are characteristic. Columbia River Basalts and related plateau landscapes also occur in this Section. This Section covers 1,345,904 acres.

M333A Okanogan Highlands, M333B Flathead Valley, and M333C Northern Rockies -- These Sections have maritime influenced cool temperate climates with warm, dry summers and cool, moist winters. The landscape is dominated by rounded landforms that resulted from continental glaciation. Till deposits, often 50 to 100 feet thick, cover the mountainsides and valley floors. A mantle of loess and volcanic ash occurs over most of the glacial deposits. Some metasedimentary Belt rock landscapes remain. The Northern Rockies Section is dominantly metasedimentary mountains that have been characteristically shaped by alpine glaciation. These Sections cover 11,908,199 acres.

SUBSECTION DESCRIPTIONS

331Aa Camas/Weippe Basalt Plateaus

Landscape Characteristics: Weakly dissected basalt plateaus that are overlain by extensive areas of loess and volcanic ash. Elevations range from 800 to 4500 feet. Drainage density is moderate and wetlands are fairly common.

Climate: Mean annual precipitation ranges from 15 to 45 inches, about 40 to 50 percent falling as snow. The soil temperature and moisture regimes are frigid and typic xeric.

Potential Vegetation: Fescue-wheatgrass with Western ponderosa forest at higher elevations and on north aspects.

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Plateaus	Loess underlain by basalt	Argixerolls/Argialbolls/ Udivitriands/Fragiborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly hayland, grazing, and timber harvest.

331Ab Palouse Hills

Landscape Characteristics: Hills covered with deep loess underlain by basalt. Elevations range from 1000 to 5000 feet. Drainage density is low.

Climate: Mean annual precipitation ranges from 10 to 25 inches, most falling as snow in the winter. The soil temperature and moisture regimes are frigid and typic xeric.

Potential Vegetation: Wheatgrass-bluegrass

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Hills	Loess over basalt	Haploxerolls/Argixerolls/ Xerochrepts

Disturbance and Land Use: The primary natural disturbance is wind and fire. Land use is predominantly dryland farming and grazing.

331Ac Clearwater Canyon Breaks

Landscape Characteristics: Stream breaks and steep mountain slopes formed in

basalt. Erosion and mass wasting are the dominant geomorphic processes.

Elevations range from 900 to 3000 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 15 to 25 inches, with only a minor amount falling as snow. The soil temperature and moisture regimes are frigid and typic xeric.

Potential Vegetation: Wheatgrass-bluegrass with Western ponderosa forest on

low terraces or north aspects.

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Breaks Basalt Argixerolls

Canyon floors Alluvium/loess Argixerolls/Haploxerolls/

Xerofluvents

Disturbance and Land Use: The primary natural disturbance is fire and mass wasting. Land use is predominantly livestock grazing.

331Da Rocky Mountain Front Foothills

Landscape Characteristics: Mountain front foothills, moraines, fans and terraces that formed in calcareous shales overlain by till, outwash, alluvium, and terrace deposits. The landscape has been modified by glaciation. Elevations range from 3400 to 6000 feet. Drainage density is low to moderate.

Climate: Mean annual precipitation ranges from 12 to 20 inches, about half falling as snow. The soil temperature and moisture regimes are frigid and typic ustic. Chinook winds are frequent.

Potential Vegetation: Wheatgrass-fescue-needlegrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Foothills/moraines till Haploborolls/Ustorthents

Fans/terraces calcareous outwash Argiborolls/Calciborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing.

331Db Montana Isolated Mountain Ranges

Landscape Characteristics: Mountainsides, foothills, terraces, moraines, and fans that formed in Tertiary volcanics and mixed sedimentary rocks. Continental glaciation influenced these mountain ranges. Elevations range from 2500 to 5500 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 16 to 30 inches, about 70 percent falling as snow. The soil temperature and moisture regimes are frigid (cryic at higher elevations) and typic ustic. Chinook winds are common.

Potential Vegetation: Douglas-fir forest at higher elevations with Foothills prairie on foothill and lower elevations.

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Mountainsides/moraines	Till/volcanics/ mixed sedimentary	Cryoborolls/Cryoboralfs/ Cryochrepts
Foothills	Volcanics/sedimentary	Haploborolls/Paleboralfs
Terraces/fans	Mixed sedimentary	Argiborolls/Haploborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing and some timber harvest.

331Dc Belt Mountain Foothills

Landscape Characteristics: Dissected foothills, plains, fans, and terraces that formed in alluvium and calcareous materials from shale and siltstone. Elevations range from 3500 to 5500 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 15 to 19 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are frigid and typic ustic. Chinook winds are very common.

Potential Vegetation: Foothills prairie

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Foothills	shale/siltstone	Haploborolls/Paleboralfs/ Torriorthents
Plains/terraces/fans	calcareous sediments/	Calciborolls/Haploborolls

alluvium

Disturbance and Land Use: The primary natural disturbance is fire and wind. Land use is mostly livestock grazing with some cropland.

331De Little Belt Foothills

Landscape Characteristics: Foothills, terraces, and fans that formed in shale, siltstone, and terrace deposits. Elevations range from 3500 to 5000 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 15 to 19 inches, about 40 to 50 percent falling as snow. The soil temperature and moisture regimes are frigid and typic ustic.

Potential Vegetation: Foothills prairie/Grama-needlegrass-wheatgrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Foothills Shale/siltstone Haploborolls/Calciborolls/

Argiborolls

Terraces/fans Terrace deposits/ Argiborolls/Calciborolls

alluvium

Disturbance and Land Use: The primary natural disturbance is drought. Land use is predominantly livestock grazing.

331Df Missouri River Breaks

Landscape Characteristics: Steep, dissected river breaks formed in clay shale, sandstone, and siltstone. Erosion is the dominant geomorphic process. Elevations range from 1800 to 4400 feet. Drainage density is high. Fort Peck

Reservoir occurs here.

Climate: Mean annual precipitation ranges from 10 to 15 inches, about 20 to 30 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic.

Potential Vegetation: Eastern ponderosa forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

River breaks Sedimentary Torriorthents

Disturbance and Land Use: The primary natural disturbance is erosion. Land use is predominantly livestock grazing and wildlife habitat.

331Dh Montana Glaciated Plains

Landscape Characteristics: Plains, terraces, fans, and floodplains that formed in glacial till, gravel deposits, and alluvium over clay shale, sandstone, and

siltstone. Elevations range from 1800 to 4400 feet. Drainage density is moderate and glacial potholes are common, especially in the northern part of

subsection.

Climate: Mean annual precipitation ranges from 10 to 15 inches, about 20 to 30 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic.

Potential Vegetation: Grama-needlegrass-wheatgrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains Till/shale Argiborolls/Paleargids

Ustorthents/Torriorthents

Terraces/fans/ gravel deposits/ Torrifluvents/Ustifluvents

floodplains alluvium Ustochrepts

Disturbance and Land Use: The primary natural disturbance is drought. Land use is predominantly livestock grazing with some dryland farming.

331Ea Missouri Coteau

Landscape Characteristics: Hummocky plains, outwash and stream terraces, fans, and floodplains that formed in thin glacial till and river sediments that lie over shale, siltstone, and sandstone. Moraines, kames, kettles, and small lakes also occur. Elevations range from 1650 to 3050 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 10 to 17 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and udic.

Potential Vegetation: Wheatgrass-needlegrass with Northern floodplain forest

along major rivers and streams.

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains till Argiborolls/Haploborolls

Terraces/fans outwash Haploborolls/Natriborolls

Floodplains river sediments Orthents/Fluvents

Disturbance and Land Use: The primary natural disturbance is drought and insects. Land use is predominantly wheat farming and range/pasture.

331Fb Shale Scablands

Landscape Characteristics: Dissected shale plains formed in calcareous shale, claystone, and sandstone. Elevations range from 2650 to 4100 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 11 to 15 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic.

Potential Vegetation: Wheatgrass-needlegrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Dissected plains Calcareous Torriorthents/Camborthids/

sedimentary Natrargids

Disturbance and Land Use: The primary natural disturbance is drought. Land use is predominantly livestock grazing.

331Fc Pierre Shale Plains

Landscape Characteristics: Rolling plains and low hills, floodplains, fans,

and terraces that formed in alluvium and colluvium weathered from shale and sandstone. Badlands and river breaks occur along the lower Yellowstone and Powder rivers. Elevations range from 1000 to 3500 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 10 to 14 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. Summers are usually dry.

Potential Vegetation: Wheatgrass-needlegrass and Grama-needlegrass-wheatgrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains/hills Shale/sandstone Torriorthents/Ustorthents/
Camborthids/Ustochrepts

Terraces Alluvium Haplargids/Haploborolls/
Torrifluvents/Camborthids

Fans/floodplains Alluvium Camborthids/Torrifluvents

River breaks Alluvium/colluvium Torriorthents

Disturbance and Land Use: The primary natural disturbance is drought and wind. Land use is predominantly livestock grazing with some dryland farming.

331Fd Missouri Plateau

Landscape Characteristics: Plains, fans, and terraces that formed in alluvium and residuum from shale, siltstone, and sandstone. Elevations range from 1000 to 3500 feet. Drainage density is low to moderate.

Climate: Mean annual precipitation ranges from 10 to 14 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and typic ustic. Summers are usually dry.

Potential Vegetation: Wheatgrass-needlegrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains/terraces Sedimentary Haploborolls/Argiborolls/
Ustorthents/Ustochrepts

Fans/floodplains Alluvium Ustochrepts/Ustifluvents

Disturbance and Land Use: The primary natural disturbance is drought. Land use is predominantly livestock grazing and dryland farming.

331Fe Missouri Breaks

Landscape Characteristics: Hilly plains, river breaks, terraces, and floodplains that formed in alluvium, sedimentary rocks, and some glacial till.

Elevations range from 1700 to 2000 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 10 to 14 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and typic ustic.

Potential Vegetation: Wheatgrass-needlegrass and Northern floodplain forest.

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains Sedimentary Ustochrepts/Ustorthents/ Haploborolls

Breaks/terraces Alluvium/till Ustochrepts/Argiborolls/ Ustorthents

Floodplains Alluvium Ustifluvents

Disturbance and Land Use: The primary natural disturbance is erosion. Land use is predominantly grazing and recreation.

331Fg Little Missouri Badlands

Landscape Characteristics: Badlands and river breaks that formed in shale. Erosion is the major geomorphic process. Elevations range from 1950 to 3300 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 14 to 16 inches, about 40 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. The Killdeer Mountains also occur here.

Potential Vegetation: Wheatgrass-needlegrass with Northern floodplain forest and some Eastern ponderosa forest along drainageways.

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

badlands/breaks shale Torriorthents/rock outcrop

Disturbance and Land Use: The primary natural disturbance is erosion. Land use is predominantly livestock grazing.

331Ga Montana High Plains and Foothills

Landscape Characteristics: Dominantly plains and foothills with some terraces and fans that formed in sandstone and shale. Elevations range from 2900 to 6000 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 12 to 20 inches, about 35 percent falling as snow. The soil temperature and moisture regimes are frigid and tyic ustic/aridic ustic. Chinook winds are frequent.

Potential Vegetation: Grama-needlegrass-wheatgrass and Foothills prairie.

Some Eastern ponderosa forest also occurs at higher elevations.

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains/foothills Sandstone/shale Ustorthents/Haploborolls

Argiborolls/Haplargids

Terraces/fans Alluvium Calciorthids/Argiborolls

Disturbance and Land Use: The primary natural disturbance is drought. Land use is predominantly livestock grazing with some dryland farming.

331Gb Montana Shale Plains

Landscape Characteristics: Dissected plains, hills, terraces, fans, and floodplains that formed in shale, siltstone, and sandstone. Elevations range from 1500 to 3500 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 10 to 14 inches, about 30 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. Summers are dry.

Potential Vegetation: Grama-needlegrass-wheatgrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains/hills Sedimentary Torriorthents/Camborthids/

Ustochrepts/Argiborolls

Terraces/fans/ alluvium Camborthids/Natrargids/

floodplains Argiborolls/Torrifluvents

Disturbance and Land Use: The primary natural disturbance is drought and erosion. Land use is predominantly livestock grazing with some dryland

farming.

331Gc Powder River Basin/Breaks/Scoria Hills

Landscape Characteristics: Dissected plains and hills, terraces, and fans with some river breaks and badlands that formed in alluvium and colluvium from

sandstone, shale, and siltstone. Elevations range from 2100 to 4980 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 10 to 14 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. Summers are dry.

Potential Vegetation: Grama-needlegrass-wheatgrass with some Eastern ponderosa

forest along river breaks and higher elevations.

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains/hills Sedimentary Ustorthents/Argiborolls/

Torriorthents/Camborthids

Terraces/fans Alluvium Haplargids/Haploborolls/

Torrifluvents

Breaks/badlands Alluvium/colluvium Torriorthents

Disturbance and Land Use: The primary natural disturbance is drought and erosion. Land use is predominantly livestock grazing.

331Gd Wolf Mountains

Landscape Characteristics: Strongly rolling hills and plains that formed in shale and sandstone. Elevations range from 3500 to 5000 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 15 to 19 inches, about 40 percent falling as snow. The soil temperature and moisture regimes are frigid and typic ustic. Summers are dry.

Potential Vegetation: Eastern ponderosa forest and Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Hills/plains Sedimentary Ustochrepts/Ustorthents/

Haploborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing. A small amount of timber is harvested.

331Ge Montana Sedimentary Plains

Landscape Characteristics: Plains and hills formed in residuum and alluvium from shale and sandstone. Some lacustrine sediments also occur. Elevations range from 2100 to 4150 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 10 to 14 inches, about 30 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. Summers are dry.

Potential Vegetation: Grama-needlegrass-wheatgrass with Eastern ponderosa

forest on higher elevation hills.

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains/hills Sedimentary Camborthids/Haplargids/

Haploborolls/Ustochrepts

Disturbance and Land Use: The primary natural disturbance is fire and drought. Land use is predominantly livestock grazing with a small amount of dryland

farming.

332Aa Glaciated Drift Plains

Landscape Characteristics: Till plains, terraces, fans, and floodplains formed in glacial till. Elevations range from 1000 to 2000 feet. Drainage density is moderate and glacial potholes are common.

Climate: Mean annual precipitation ranges from 15 to 20 inches, about 20 to 30 percent falling as snow. The soil temperature and moisture regimes are frigid and udic.

Potential Vegetation: Wheatgrass-bluestem-needlegrass with Northern floodplain

forest along major rivers and streams. Some Oak savannah also occurs.

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains till Argiborolls/Ustorthents/
Haploborolls

Terraces till/outwash Argiborolls/Haploborolls

Fans/floodplains outwash/alluvium Ustochrepts/Ustifluvents

Disturbance and Land Use: The primary natural disturbance is drought. Land use is evenly split between wheat farming and range/pasture.

332Ab Souris Basin

Landscape Characteristics: Glacial lake plain resulting from sedimentation on the floor of glacial Lake Souris. Some glacial potholes also occur. Elevations range from 1000 to 1500 feet. Drainage density is low.

Climate: Mean annual precipitation ranges from 15 to 18 inches, about 30 percent falling as snow. The soil temperature and moisture regimes are frigid and udic.

Potential Vegetation: Wheatgrass-bluestem-needlegrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plain Lacustrine sediment Argiborolls/Haploborolls/
Calciaquolls/Haplaquolls

Disturbance and Land Use: The primary natural disturbance is drought. Land use is predominantly cropland.

332Ac Glaciated Outwash Plains

Landscape Characteristics: Glacial outwash plains with some till plains and moraines. Elevations range from 1000 to 1700 feet. Drainage density is low.
Glacial potholes are common.

Climate: Mean annual precipitation ranges from 15 to 20 inches, about 40 percent falling as snow. The soil temperature and moisture regimes are frigid and udic.

Potential Vegetation: Wheatgrass-bluestem-needlegrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains Outwash/till Argiborolls/Haploborolls/

Calciaquolls/Haplaquolls

Disturbance and Land Use: The primary natural disturbance is drought. Land use is predominantly dryland farming.

332Ad Souris Sand Deltas

Landscape Characteristics: Outwash plains and fans that formed in aeolian sands, river sediments, and glacial outwash. Elevations range from 1000 to 1500 feet. Drainage density is low. Glacial potholes also occur.

Climate: Mean annual precipitation ranges from 15 to 18 inches, about 40 percent falling as snow. The soil temperature and moisture regimes are frigid and udic.

Potential Vegetation: Wheatgrass-bluestem-needlegrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains/fans Glacial outwash/ Argiborolls/Haploborolls/

river sediments Calciaquolls/Argialbolls

Disturbance and Land Use: The primary natural disturbance is drought. Land use is predominantly dryland farming.

332Ae Turtle Mountains

Landscape Characteristics: Hummocky hills and plains that formed in glacial till. Elevations range from 2000 to 3000 feet. Drainage density is moderate.

Glacial potholes also occur.

Climate: Mean annual precipitation ranges from 15 to 19 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are frigid and udic.

Potential Vegetation: Oak savannah

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Hills/plains Glacial till Eutroboralfs/Argiborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly grazing and dryland farming.

332Ba Central Black Glaciated Plains

Landscape Characteristics: Glacial lake plain formed in glacial lacustrine sediments. Elevations range from 650 to 985 feet. Drainage density is low.

Climate: Mean annual precipitation ranges from 19 to 22 inches, about 40 percent falling as snow. The soil temperature and moisture regimes are frigid and udic.

Potential Vegetation: Wheatgrass-bluestem-needlegrass

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Lake plain lacustrine sediments Argiborolls/Haploborolls/

Haplaquolls

Disturbance and Land Use: The primary natural disturbance is drought and insects. Land use is predominantly dryland farming.

M331Aa Absaroka/Gallatin Mountains

Landscape Characteristics: Steep, dissected mountains that formed in Tertiary volcanic flows and associated pyroclastic deposits. Islands of gneiss and

schist also occur. Elevations range from 6500 to 10600 feet. Drainage density is moderate. Lakes occur in high elevation cirques.

Climate: Mean annual precipitation ranges from 50 to 110 inches, about 65 percent falling as snow. The soil temperature and moisture regimes are cryic and typic

ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest with Alpine meadows and barren at the highest elevations.

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Mountainsides/ ridges	Rhyolite/basalt/ andesite	Cryochrepts/Cryoboralfs/ Cryoborolls

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease and mass wasting. Land use is predominantly recreation with some grazing, timber harvest, and mining.

M331Af Yellowstone Volcanic Plateau

Landscape Characteristics: High elevation mountain plateau formed in rhyolite flows and tuff. Some surficial deposits of alluvium, glacial till, and landslide deposits also occur. Elevations range from 7500 to 9200 feet. Drainage density is moderate to high. There are numerous geysers, lakes, and wetlands.

Climate: Mean annual precipitation ranges from 60 to 90 inches, about 65 percent falling as snow. The soil temperature and moisture regimes are cryic and udic.

Potential Vegetation: Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Plateau	Rhyolite	Cryochrepts/Cryorthents

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and geothermal activity. Land use is predominantly recreational development and tourist activities.

M331Ag Northern Absaroka Volcanic Mountains

Landscape Characteristics: Steep mountains and ridgetops that formed in andesitic rocks. Elevations range from 5300 to 12000 feet. Drainage density is high.

Wetlands and riparian areas are common. Lakes occur in some high elevation cirques.

Climate: Mean annual precipitation ranges from 40 to 110 inches, about 65 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Moutainsides/ ridges	Andesite	Cryoboralfs/Cryoborolls/ Cryochrepts
Valleys/foothills	Andesite	Cryoborolls/Cryochrepts

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and mass wasting. Land use is predominantly recreational development. Some timber harvest and mining activities also occur.

M331Ah Beartooth Mountains

Landscape Characteristics: Steep, dissected mountains and narrow valleys that formed in gneiss and schist. Elevations range from 6500 to 11300 feet. Drainage density is moderate to high. Some lakes occur at higher elevations.

Climate: Mean annual precipitation ranges from 40 to 110 inches, about 55 percent falling as snow. The soil temperature and moisture regimes are cryic and udic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest with some Alpine meadows and barren at higher elevations.

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Mountainsides/ ridgetops	Gneiss/schist	Cryochrepts

Disturbance and Land Use: The primary natural disturbances are fire, insects, and disease. Land use is predominantly livestock grazing, timber harvest, and mining.

M331Ai Absaroka Sedimentary Mountains

Landscape Characteristics: Steep mountains with narrow valleys that formed in sedimentary and volcanic rocks. Elevations range from 5000 to 11000 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 40 to 80 inches, about 55 percent falling as snow. The soil temperature and moisture regimes cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges Rhyolite/shale/ Cryochrepts/Cryoborolls/
limestone Cryoboralfs

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and mass wasting. Land use is predominantly recreational activities
and development, and some timber harvest and mining.

M331Ak West Yellowstone Valley

Landscape Characteristics: Intermontane valley formed by the Madison River in valley fill, terrace deposits, and some glacial drift. Elevations range from
6500 to 7000 feet. Drainage density is moderate. Hebgen Lake is in this
subsection.

Climate: Mean annual precipitation ranges from 45 to 55 inches, about 45 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Valley/terraces/ Alluvium Cryochrepts/Cryorthents
floodplains

Disturbance and Land Use: The primary natural disturbances are fire and flooding. Land use is predominantly recreational development with some mining,
grazing, and timber harvest.

M331Al Upper Yellowstone Valley

Landscape Characteristics: Valley floor, terraces, toeslopes, and foothills that formed in alluvium and Tertiary sedimentary and volcanic rocks. Elevations range from 4500 to 7500 feet. Drainage density is moderate and

wetlands are fairly common.

Climate: Mean annual precipitation ranges from 15 to 40 inches, about 55 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic.

Potential Vegetation: Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Valley floor/terraces Alluvium Haploborolls/Camborthids

Foothills/toeslopes Tertiary volcanics Argiborolls/Haploborolls

Disturbance and Land Use: The primary natural disturbance is flooding. Land use is predominantly recreational development, with some agriculture and

livestock grazing.

M331Am Gallatin Foothills/Spanish Breaks

Landscape Characteristics: Steep, dissected mountains and rolling foothills that formed in sedimentary and metamorphic rocks. Elevations range from 5000 to 10500 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 20 to 100inches, about 60 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountains Sandstone/shale/ Cryochrepts/Cryoboralfs

limestone

Foothills Gneiss/schist Cryoborolls/Argiborolls/

Fluvaquents

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and some mass wasting. Land use is predominantly timber harvest,

livestock grazing, and ranching.

M331Ap Madison Mountains

Landscape Characteristics: Steep mountains that formed in predominantly sedimentary rock with some included volcanic rock. Elevations range from 7500 to 11200 feet. Drainage density is moderate. Lakes occur in the high

elevation cirque basins.

Climate: Mean annual precipitation ranges from 50 to 100 inches, about 65 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest with some

Alpine meadows and barren at the highest elevations.

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges Sandstone/shale/ Cryochrepts/Cryoboralfs/

limestone/diorite Cryoborolls

Disturbance and Land Use: The primary natural disturbances are fire, insects, and disease. Land use is predominantly timber harvest, mining, and some

livestock grazing.

M331Ar Beartooth Front

Landscape Characteristics: Rolling to steep, dissected foothills and mountain fronts that formed in gneiss and schist. Elevations range from 5000 to 11300 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 20 to 50 inches, about 45 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Foothills prairie/Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountain fronts/ Gneiss/schist Cryoborolls/Cryochrepts
foothills

Disturbance and Land Use: The primary natural disturbances are fire, insects, and disease. Land use is predominantly livestock grazing, agriculture, and
some timber harvest and mining.

M331Ba Bighorn Sedimentary Mountains

Landscape Characteristics: Mountainsides, foothills, fans, and terraces that formed in limestone, sandstone, and shale. Some landslide deposits also occur.
Elevations range from 5000 to 10500 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 15 to 35 inches, about 40 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides Sedimentary Cryoborolls/Cryoboralfs

Foothills Sedimentary Argiborolls/Haploboralfs

Fans/terraces Sedimentary Cryoborolls/Argiborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing and timber harvest.

M332Aa Lochsa/Salmon Breaklands

Landscape Characteristics: Highly dissected stream breaklands formed in gneiss, schist, and granitic rocks. Volcanic ash influenced loess covers some
areas. Elevations range from 1400 to 7000 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 20 to 60 inches, about 60 percent

falling as snow. The soil temperature and moisture regimes are frigid and typic xeric.

Potential Vegetation: Western ponderosa forest/Grand fir-Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Stream breaklands	Loess/Schist/Gneiss granite	Udivitrands/Haploxerolls/ Haplumbrepts
Valley floor/terraces	Alluvium	Xerofluvents/Udivitrands/ Haploxerolls

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and mass wasting. Land use includes livestock grazing, mining, and timber harvest.

M332Ab Central Idaho Glaciated Mountains

Landscape Characteristics: Glaciated mountain slopes, ridges, and cirquelands that formed in quartz monzonite, gneiss, and granite. Many surface soils are influenced by volcanic ash. Elevations range from 3000 to 8500 feet. Drainage density is moderate. Lakes occur in cirque basins and on glacial valley floors.

Climate: Mean annual precipitation ranges from 35 to 70 inches, about 60 to 70 percent falling as snow. The soil temperature and moisture regimes are cryic and udic.

Potential Vegetation: Western spruce-fir forest/Grand fir-Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Valleys/terraces/ moraines	Alluvium/loess	Vitricryands/Cryaquepts/ Cryochrepts
Glaciated mountain slopes and ridges	Granitic rocks/till	Cryochrepts/Cryoboralfs/ Vitricryands
Cirqueland	Granitic rocks	Cryochrepts

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and mass wasting. Since much of the subsection is either roadless or

designated wilderness, human disturbances are slight.

M332Ac Central Idaho Mountains and Basins

Landscape Characteristics: Uplands, broad basins, and breaklands that formed gneiss, schist, and granitic rocks. Volcanic ash caps occur throughout the area. Elevations range from 1600 to 8200 feet. Drainage density is moderate to high. Wetlands occur throughout the subsection associated with glacial till. Lakes occur in high elevation cirques.

Climate: Mean annual precipitation ranges from 25 to 80 inches, about 60 percent falling as snow. The soil temperature and moisture regimes are cryic and udic.

Potential Vegetation: Western spruce-fir forest/Grand fir-Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Uplands/cirquelands	Granitic rocks/till	Cryochrepts/Vitricryands/ Dystrochrepts/Cryoboralfs
Basins/terraces/ floodplains	Till/colluvium/ alluvium	Aquands/Cryands/Cryochrepts Dystrochrepts
Breaklands	Granitic rocks/ colluvium	Dystrochrepts/Haploxerolls

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and mass wasting. Land use is predominantly timber harvest and mining.

M332Ba Bitterroot Glaciated Canyons

Landscape Characteristics: Glaciated mountains with numerous heavily glaciated parallel canyons. The dominant parent material is till derived from quartz monzonite, granodiorite, gneiss, and schist. Elevations range from 4000 to 10000 feet. Drainage density is moderate. Numerous lakes occur in high elevation cirques.

Climate: Mean annual precipitation ranges from 14 to 70 inches, about 60 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic (udic at higher elevations).

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Cirquelands/moraines/ Till/talus/ Cryochrepts/Cryaquepts
trough walls granitic rocks

Moraines/terraces/ Till/alluvium Cryochrepts/Cryaquepts/
floodplains Cryaquents

Dipslopes Granitic rocks Argiborolls/Cryochrepts

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly wilderness. Some timber harvest and grazing occurs on the eastern dipslope.

M332Bb Bitterroot/Frenchtown Valleys

Landscape Characteristics: Intermontane valleys that formed in alluvium, outwash, and lacustrine sediments. Elevations range from 3000 to 4400 feet. Drainage density is slight. Wetlands occur along both the Clark Fork and
Bitterroot rivers.

Climate: Mean annual precipitation ranges from 11 to 25 inches, about 40 to 60 percent falling as snow. The soil temperature and moisture regimes are frigid and typic ustic.

Potential Vegetation: Foothills prairie/Western ponderosa forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Foothills Valley fill Eutroboralfs

Terraces/fans Alluvium/outwash Argiborolls/Haploborolls

Floodplains Alluvium Udifluvents/Endoaquents/
Haplaquolls/Endoaquolls

Disturbance and Land Use: The primary natural disturbances are flooding and fire. Land use is predominantly extensive urban/suburban development and agricultural activities.

M332Bc South Anaconda/Bitterroot Mountains

Landscape Characteristics: Mountains that formed in granitic rocks with some glaciation at higher elevations. Elevations range from 3800 to 8800 feet. Drainage density is moderate. Lakes occur in a few high elevation cirques.

Climate: Mean annual precipitation ranges from 16 to 55 inches, about 60 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Mountainsides/ ridges	Granitic rocks/ colluvium	Argiborolls/Cryochrepts/ Cryoboralfs/Ustochrepts
Cirquelands	Granitic rocks/talus	Cryochrepts
Floodplains/terraces	Alluvium/outwash	Cryochrepts/Cryaquents

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly timber harvest, grazing, and some mining.

M332Bd Anaconda/Flint Creek Mountains

Landscape Characteristics: Glaciated fault block mountains that formed from complexly folded and faulted sedimentary and igneous rocks. Elevations range from 4000 to 10200 feet. Drainage density is moderate to high. Lakes are common in cirque basins.

Climate: Mean annual precipitation ranges from 11 to 50 inches, about 55 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Foothills prairie

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Ridges/Cirqueland	Mixed sedimentary/ metasedimentary/ granite	Cryochrepts/Cryorthents
Mountainsides/benches	Mixed sedimentary/ metasedimentary/ volcanic	Cryoborolls/Cryoboralfs/ Cryochrepts

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly timber harvest, grazing, mining, and suburban development.

M332Be Flint Creek/Upper Willow Creek Basins

Landscape Characteristics: Structural basins and low relief uplands that formed in lacustrine deposits, alluvium, metasedimentary, and volcanic rocks.

Elevations range from 4000 to 7000 feet. Drainage density is moderate.

Wetlands are fairly common within the basins.

Climate: Mean annual precipitation ranges from 11 to 20 inches, about 30 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic. Frigid temperatures occur at lower elevations.

Potential Vegetation: Douglas-fir forest/Foothills prairie

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Basins/terraces/ fans/floodplains	Alluvium/colluvium	Cryoborolls/Cryoboralfs/ Argiborolls/Haploborolls
Uplands	Quartzite/argillite/ limestone	Cryoboralfs/Cryochrepts/ Haploborolls/Argiborolls

Disturbance and Land Use: The primary natural disturbances are fire and flooding. Land use is predominantly mining, timber harvest, grazing, hay production, and suburban development.

M332Bg Garnet/Sapphire Mountains

Landscape Characteristics: Mountains, hills, moraines, and valleys that formed in till, sedimentary, and igneous rocks. Glaciation has modified parts of this subsection. Elevations range from 3200 to 8800 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 13 to 55 inches, about 50 to 60 percent falling as snow. The soil temperature and moisture regimes are cryic and tpic ustic. Frigid temperatures occur at lower elevations.

Potential Vegetation: Douglas-fir forest/Western ponderosa forest

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Glaciated uplands/ cirquelands	Gneiss/quartzite/ argillite/talus	Cryochrepts
Mountainsides/ridges	Limestone/igneous	Cryoboralfs/Cryochrepts/

Ustochrepts

Moraines/foothills Till/alluvium Eutroboralfs/Ustochrepts/

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly timber harvest, grazing, mining, and recreational development.

M332Bk Rattlesnake/Blackfoot/South Swan Mountains

Landscape Characteristics: Mountains and moraines that formed in quartzite, argillite, and till. Elevations range from 5000 to 8500 feet. Drainage density is moderate to high. Lakes occur in the glacial knob and kettle

topography. Some high elevation cirque lakes also occur.

Climate: Mean annual precipitation ranges from 35 to 80 inches, about 60 percent falling as snow. The soil temperature and moisture regimes are cryic (frigid at the lower elevations) and typic ustic/udic.

Potential Vegetation: Western ponderosa forest/Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges Quartzite/argillite Cryochrepts/Cryoboralfs

Moraines/knob and Till/outwash Eutroboralfs/Eutrochrepts

kettle topography

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly timber harvest and recreational development.

M332Bp Avon/Nevada Valleys

Landscape Characteristics: Intermontane valleys that formed in glacial outwash, alluvium, and till. Elevations range from 3200 to 5000 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 15 to 19 inches, about 40 percent falling as snow. The soil temperature and moisture regimes are frigid and typic ustic.

Potential Vegetation: Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Floodplains/terraces/ Outwash/alluvium/ Haplaquolls/Haploborolls/

ground moraines till Argiborolls

Disturbance and Land Use: The primary natural disturbance is flooding. Land use is predominantly agriculture and livestock grazing.

M332Ca North Rocky Mountain Front

Landscape Characteristics: Thrust faulted mountains that formed from argillite, siltite, and quartzite. Elevations range from 5000 to 10800 feet. Drainage density is high. High mountain lakes are common and their are

existing glaciers. This subsection drains into Hudson Bay.

Climate: Mean annual precipitation ranges from 27 to 90 inches, about 50 to 70 percent falling as snow. The soil temperature and moisture regimes are cryic and udic (typic ustic at lower elevations). Chinook winds are common

along the mountain front.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/moraines/ Argillite/siltite/ Cryocrepts/Cryoborolls

outwash terraces till

Cirquelands Argillite/siltite/ Cryorthents

till/talus

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly recreation since this subsection is within Glacier National

Park.

M332Cb Middle Rocky Mountain Front

Landscape Characteristics: Thrust faulted and folded mountains that formed from mudstone, sandstone, and lesser amounts of limestone and dolomite. Elevations range from 5000 to 9000 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 20 to 60 inches, about 50 to 70 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic. Chinook winds are common along the mountain front.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest with

Foothills prairie on drier south and west lower slopes.

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/moraines/ Mudstone/sandstone/ Cryochrepts/Cryoboralfs/
outwash terraces till Cryoborolls

Cirquelands Mudstone/sandstone Cryorthents

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly recreational activities.

M332Cc South Rocky Mountain Front

Landscape Characteristics: Faulted mountains that formed from limestone, dolomite, and quartzite. Argillite and diorite sills occur. Elevations range from 5400 to 9000 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 22 to 60 inches, about 50 to 70 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/moraines/ Limestone/dolomite/ Cryochrepts/Cryoboralfs
outwash terraces till

Cirquelands Limestone/dolomite Cryorthents

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly recreational activities.

M332Da Snowy Foothills

Landscape Characteristics: Rolling foothills and associated valleys that formed in sandstone and shale. Elevations range from 3500 to 5000 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 15 to 19 inches, about 60 percent falling as snow. The soil temperature and moisture regimes are frigid and typic ustic.

Potential Vegetation: Eastern ponderosa forest/Foothill prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Foothills Sandstone/shale Argiborolls/Haploborolls

Floodplains/terraces Alluvium Ustifluvents/Haploborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing.

M332Db Little Belt/Snowy/Judith Mountains

Landscape Characteristics: Uplifted mountains that formed predominantly in limestone, sandstone, and shale. Igneous rocks intrude into the uplifted

limestone and are exposed at higher elevations. Elevations range from 3500 to 9200 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 13 to 42 inches, about 40 to 60 percent falling as snow. The soil temperature and moisture regimes are cryic (frigid at lower elevations) and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/fans/ Limestone/sandstone/ Cryoboralfs/Cryochrepts

ridges shale

Alpine slopes/ridges/ Igneous/metamorphic Cryochrepts

talus

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly timber harvest, mining, and recreational development.

M332Dc Crazy Mountains

Landscape Characteristics: Uplifted mountains that formed in sandstone and mudstone with a central core of igneous intrusive rock. Elevations range from 6000 to 11000 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 15 to 60 inches, about 70 percent falling as snow. The soil temperature and moisture regimes are cryic and typic

ustic.

Potential Vegetation: Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Structural uplands sandstone/mudstone/ Cryoboralfs
till

Cirquelands Igneous rock/till Cryochrepts

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly timber harvest and suburban development.

M332De Continental Divide Foothills

Landscape Characteristics: Foothills that formed in metasedimentary and volcanic rocks. Elevations range from 4500 to 7100 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 12 to 25 inches, about 30 percent falling as snow. The soil temperature and moisture regimes are frigid (cryic at higher elevations) and typic ustic.

Potential Vegetation: Douglas-fir forest/Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Foothills Metasedimentary/ Haploborolls/Cryoborolls/
volcanic Argiborolls/Eutroboralfs

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing and timber harvest.

M332Dg Big Belt Foothills

Landscape Characteristics: Foothills and lower slopes of the Big Belt mountains that formed in limestone. Elevations range from 3500 to 5000 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 10 to 25 inches, about 40 percent falling as snow. The soil temperature and moisture regimes are frigid (cryic at higher elevations) and typic ustic.

Potential Vegetation: Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Foothills Limestone Ustochrepts/Haploborolls

Mountainsides Limestone Cryochrepts/Cryoborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly grazing and timber harvest.

M332Dh Big Belt Mountains

Landscape Characteristics: Mountains that formed in limestone, shale, and granite. The granite intrusions have been glaciated. Elevations range from 4000 to 9500 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 15 to 40 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges/ Limestone/shale/ Cryoboralfs/Cryochrepts/

terraces granite Argiborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing, timber harvest, and mining.

M332Dj Boulder/Elkhorn Mountains

Landscape Characteristics: Mountains that formed in granitic and volcanic bedrock. Much of the area has been glaciated. Elevations range from 4500 to 9400 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 13 to 30 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid (cryic at higher elevations) and typic ustic.

Potential Vegetation: Douglas-fir forest/Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides Granitic/Volcanic Cryochrepts/Cryoboralfs/
Argiborolls/Haploborolls

Glaciated uplands/ Till/Granite Cryochrepts/Cryoboralfs
troughs

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly grazing, timber harvest, mining, and suburban development.

M332Dk Central Montana Broad Valleys

Landscape Characteristics: Broad intermontane valleys that formed in Tertiary sediments and Quaternary alluvial deposits derived from volcanic rocks, shale, and sandstone. Elevations range from 3750 to 6800 feet. Drainage density is low.

Climate: Mean annual precipitation ranges from 10 to 25 inches, about 30 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic.

Potential Vegetation: Foothills prairie/Grama-needlegrass-wheatgrass/
Sagebrush steppe

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Terraces/Fans/ Alluvium Argiborolls/Haploborolls/
Foothills Calciorthids/Haplargids

Floodplains Alluvium Haplaquolls/Fluvaquents

Disturbance and Land Use: The primary natural disturbances are fire and flooding. Land use is predominantly livestock grazing, crop production, and urban/suburban development.

M332Dm South Elkhorn Mountains

Landscape Characteristics: Mountains and foothills that formed in limestone, dolomite, argillite, andesite, sandstone, and quartzite. Elevations range from 4500 to 7500 feet. Drainage density is low.

Climate: Mean annual precipitation ranges from 12 to 22 inches, about 30 percent

falling as snow. The soil temperature and moisture regimes are frigid (cryic at higher elevations) and aridic ustic.

Potential Vegetation: Foothills prairie/Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges Mixed sedimentary/ Cryoborolls/Cryochrepts

metamorphic

Foothills/Terraces Mixed sedimentary/ Calciorthids/Torriorthents/

metamorphic Argiborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing and timber harvest.

M332Dn North Tobacco Root Mountains and Foothills

Landscape Characteristics: Complex faulted mountains and foothills that formed in gneiss, volcanic, and a variety of sedimentary bedrock. Elevations range from 4200 to 8000 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 10 to 25 inches, about 35 percent falling as snow. The soil temperature and moisture regimes are frigid (cryic at higher elevations) and aridic ustic.

Potential Vegetation: Douglas-fir forest/Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges Sedimentary/ Cryoboralfs/Cryochrepts/

Metasedimentary Cryoborolls

Foothills Gneiss/volcanic/ Ustochrepts/Argiborolls/

Metasedimentary Haploborolls/Camborthids

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing and timber harvest.

M332Dp Bridger Mountains and Foothills

Landscape Characteristics: Mountains and foothills that formed in sedimentary and

metasedimentary bedrock. Elevations range from 5000 to 9000 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 25 to 80 inches, about 60 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest/

Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges Sandstone/shale/ Cryoborolls/Cryoboralfs/

limestone/volcanics/ Cryochrepts

conglomerate

Foothills Sandstone/shale/ Cryoborolls/Cryoboralfs/

limestone Cryochrepts/Argiborolls

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly timber harvest, mining, grazing, and recreational development.

M332Ea Continental Divide Uplands

Landscape Characteristics: Block faulted mountains that formed in a variety of igneous, sedimentary, and metasedimentary rocks. Elevations range from 5300 to 10200 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 10 to 30 inches, about 15 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Foothills prairie/Alpine meadows and

barren

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountain slopes/ Gneiss/limestone/ Cryoboralfs/Cryoborolls/

foothills granite Cryochrepts

Alpine ridges/plateaus/ Gneiss/schist/ Cryorthents/Cryochrepts

cirquelands granite

Disturbance and Land Use: The primary natural disturbances are fire and mass wasting. Land use is predominantly livestock grazing, mining, timber harvest,

and recreational use and development.

M332Eb East Pioneer Mountains

Landscape Characteristics: Block faulted mountains that formed predominantly in limestone. Alpine glaciation has modified much of the landscape. Elevations range from 6000 to 9500 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 10 to 20 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest/

Alpine meadows and barren

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ Limestone/granite/ Cryoborolls/Cryochrepts/

uplands volcanics Cryoboralfs

Alpine slopes/ridges Limestone/granite/ Cryoborolls/Cryochrepts/

volcanics Cryorthents

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly timber harvest and livestock grazing.

M332Ec Deerlodge Valley

Landscape Characteristics: Intermontane valley that formed in Tertiary sedimentary rocks and recent stream deposits. Elevations range from 4400 to 6000 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 11 to 16 inches, about 20 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic.

Potential Vegetation: Sagebrush steppe/Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Floodplains Alluvium Haplaquolls/Argiborolls/

Haploborolls

Terraces Alluvium Argiborolls/Calciborolls/

Haploborolls

Alluvial fans/ Sedimentary rock Argiborolls/Haploborolls

pediments

Disturbance and Land Use: The primary natural disturbances are flooding and mass wasting. Land use is predominantly agriculture, livestock grazing, and

urban/suburban development.

M332Ee West Pioneer Mountains

Landscape Characteristics: Block faulted mountains that formed in granite, gneiss, and a variety of sedimentary and metasedimentary rocks. Elevations range from 5500 to 10200 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 15 to 30 inches, about 35 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest/

Sagebrush steppe

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides Granite/gneiss/ Cryoborolls/Cryochrepts/

argillite Cryoboralfs

Cirqeland Granite/gneiss/talus Cryochrepts

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing, timber harvest, and mining.

M332Eg Anaconda Mountains

Landscape Characteristics: Block faulted mountains that formed in monzonite and granodiorite. Alpine glaciation has altered the landscape. Elevations range from 6000 to 10900 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 20 to 30 inches, about 35 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest/

Alpine meadow and barren

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges Till/granitics Cryochrepts/Cryorthents/

Cryoboralfs

Cirquelands Till/granitics Cryochrepts

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing, timber harvest, and rural development.

M332Eh Beaverhead Mountains

Landscape Characteristics: Fault block mountains that formed in Belt metasedimentary rocks. These mountains have been modified by alpine

glaciation. Elevations range from 6800 to 10600 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 20 to 30 inches, about 35 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest/

Alpine meadows and barren

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Troughs/terraces/ Outwash/alluvium Cryaquepts/Cryofibrists/

valley floors Cryoborolls/Cryochrepts

Mountainsides/ridges/ Till/quartzite/ Cryorthents/Cryochrepts/

moraines argillite Cryoborolls/Cryoboralfs

Cirquelands Till/quartzite Cryochrepts/Cryorthents

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing, mining, and timber harvest.

M332Ej Southwest Montana Intermontane Basins and Valleys

Landscape Characteristics: Intermontane basins and broad valleys that formed in alluvium, glacial deposits, and Tertiary volcanic materials. Elevations range

from 4700 to 7600 feet. Drainage density is low.

Climate: Mean annual precipitation ranges from 9 to 20 inches, about 10 percent falling as snow. The soil temperature and moisture regimes are frigid and aridic ustic. Parts of the Red Rock Basin and Big Hole Valley have cryic

temperature regimes.

Potential Vegetation: Sagebrush steppe

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Valley floor Alluvium Haploborolls/Calciorthids/

Torriorthents/Cryaquolls

Terraces/foothills Alluvium/till/ Cryoborolls/Cryochrepts

volcanic deposits

Disturbance and Land Use: The primary natural disturbances are flooding and fire. Land use is predominantly livestock grazing, agriculture, and urban/

suburban development.

M332Ek Ruby/Tobacco Root Mountains

Landscape Characteristics: Fault block mountains that formed in gneiss, quartzite, granite, shale, sandstone, and limestone. Alpine glaciation has

modified much of the landscape. Elevations range from 5000 to 10600 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 13 to 35 inches, about 60 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest/

Alpine meadows and barren

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges/ Till/limestone/shale/ Cryochrepts/Cryoborolls

foothills sandstone/gneiss

Cirquelands Limestone/gneiss/ Cryochrepts/Cryoborolls

granitic materials

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly timber harvest, livestock grazing, mining, and recreation.

M332En Gravelly/Snowcrest Mountains

Landscape Characteristics: Block faulted mountains that formed in shale, siltstone, sandstone, and a variety of deposited materials. The landscape has been modified by glaciation and mass wasting. Elevations range from 5800 to 10600 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 14 to 30 inches, about 60 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Western spruce-fir forest/Alpine meadows and barren

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Valley floors/terraces	Alluvium/colluvium/ limestone/shale	Cryoborolls/Cryaquolls/ Cryochrepts
Mountainsides	Till/colluvium/shale/ limestone	Cryoborolls/Cryoboralfs/ Paleboralfs
Alpine ridges/plateaus	Till/colluvium/shale limestone	Cryochrepts/Cryoborolls

Disturbance and Land Use: The primary natural disturbances are fire and mass wasting. Land use is predominantly livestock grazing and mining.

M332Ep Blacktail Mountains

Landscape Characteristics: Block faulted mountains that formed in a variety of igneous, metamorphic, and sedimentary rocks. Some higher elevations were glaciated. Elevations range from 6900 to 8500 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 14 to 20 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Sagebrush steppe

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges Schist/gneiss/ Cryochrepts/Cryoborolls/
limestone/volcanics Cryoboralfs

Disturbance and Land Use: The primary natural disturbance is fire. Land use is predominantly livestock grazing, timber harvest, and mining.

M332Er Southern Beaverhead Mountains

Landscape Characteristics: Block faulted mountains that formed in a variety of igneous, metamorphic, and sedimentary rocks. Alpine glaciation and mass
wasting have altered the landscape. Elevations range from 7000 to 10200 feet. Drainage density is low to moderate.

Climate: Mean annual precipitation ranges from 20 to 40 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are cryic and typic ustic.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides Limestone/shale/ Cryoborolls
volcanics, colluvium

Cirquelands Limestone/shale/ Cryoborolls/Cryorthents
volcanic materials

Disturbance and Land Use: The primary natural disturbances are fire and mass wasting. Land use is predominantly livestock grazing and recreation.

M332Gd Snake River Mountains and Canyonlands

Landscape Characteristics: Steep, dissected mountains and stream breaks that formed in basalt, limestone, slate, and minor amounts of granite. Most of the
higher elevation lands were glaciated. Elevations range from 1000 to 9400 feet. Drainage density is low to moderate.

Climate: Mean annual precipitation ranges from 15 to 45 inches, about 70 percent falling as snow in the higher elevations. The soil temperature and moisture regimes are mesic and typic xeric (cryic and udic at higher
elevations).

Potential Vegetation: Western ponderosa forest/Grand fir-Douglas-fir forest/ Wheatgrass/bluegrass

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Cirqueland/moraines	Till/basalt	Cryochrepts/Cryumbrepts
Mountainsides/breaks	Colluvium/loess/ basalt	Argixerolls/Haploxerolls

Disturbance and Land Use: The primary natural disturbances are fire, insects and disease, and mass wasting. Land use is predominantly livestock grazing, timber harvest, and recreation.

M333Aa Pend Oreille/Selkirk Low Mountains and Valleys

Landscape Characteristics: Low mountains, hills, and valleys that formed in quartzite, siltite, argillite, and granitic rocks. Thick layers of volcanic ash form the surface of most soils. Elevations range from 2100 to 6300 feet. Drainage density is low to moderate.

Climate: Mean annual precipitation ranges from 25 to 50 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are mesic and typic xeric (cryic and udic at higher elevations). Rain on snow events occasionally occur during the winter months.

Potential Vegetation: Cedar-hemlock-pine forest/Western ponderosa forest

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Valley floors/fans terraces/toeslopes	Alluvium/outwash	Udivitrands/Aquands
Mountainsides/uplands	Quartzite/siltite/ argillite/granitics	Udivitrands/Dystrochrepts
Mountaintops/ridges	Colluvium/quartzite/ siltite	Haplocryands/Cryochrepts/ Fulvicryands/Cryumbrepts

Disturbance and Land Use: The primary natural disturbance is fire, insects and disease, and mass wasting. Land use is predominantly intensive timber harvest, rural development, and agricultural activities.

M333Ab Selkirk Mountains

Landscape Characteristics: Glaciated mountains that formed in granitic, gneiss, schist, quartzite, argillite, and phyllite rocks. Volcanic ash layers occur on the soil surface over much of the area. Elevations range from 1800 to 7700 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 25 to 70 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are cryic and udic (frigid and xeric at lower elevations). Rain on snow events are

fairly common.

Potential Vegetation: Cedar-hemlock-pine forest/Douglas-fir forest/

Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Valleys/wetlands Alluvium/till Aquands/Vitrands/Cryands

Mountainsides/ridges Till Udivitrands/Haplocryands/

Cryochrepts/Xerochrepts

Cirquelands Granitic/gneiss/ Cryochrepts/Haplocryands/

schist/till Cryumbrepts/Fulvicryands

Disturbance and Land Use: The primary natural disturbances are fire, flooding, insects and disease, and mass wasting. Land use is predominantly intensive timber harvest and livestock grazing.

M333Ac Northern Idaho Valleys

Landscape Characteristics: Wide valleys, outwash plains, and terraces that formed in alluvium, glacial outwash, and lacustrine sediments. Elevations range from 1400 to 4000 feet. Drainage density is low to moderate.

Climate: Mean annual precipitation ranges from 15 to 40 inches, about 30 percent falling as snow. The soil temperature and moisture regimes are frigid and typic xeric.

Potential Vegetation: Cedar-hemlock-pine forest/Western ponderosa forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Terraces/outwash plains Lacustrine sediments/ Xerochrepts/Haploxeralfs/

outwash Haploxerolls

Floodplains Alluvium Haploxerolls/Vitraquands/

Haplaquolls/Fluvaquents

Disturbance and Land Use: The primary natural disturbances are fire and flooding. Land use is predominantly agriculture and urban/suburban development.

M333Ba Purcell/North Cabinet Mountains

Landscape Characteristics: Glaciated mountains that formed primarily in quartzite, siltite, and argillite. Granitic intrusions also occur. Fairly thick volcanic ash layers occur on most soil surfaces. Elevations range from 1800 to 7700 feet. Drainage density is moderate. Lakes are common

in this subsection.

Climate: Mean annual precipitation ranges from 25 to 70 inches, about 70 percent falling as snow. The soil temperature and moisture regimes are cryic and udic. Rain on snow events occur frequently.

Potential Vegetation: Douglas-fir forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Valleys/wetlands Alluvium/till Umbrepts/Aquands/

Cryands/Fluvents

Mountainsides/ridges Till/metasedimentary Dystrochrepts/Udivitrands/

bedrock Cryochrepts/Haplocryands

Cirquelands Metasedimentary Cryochrepts/Haplocryands/

bedrock/till Cryumbrepts/Fulvicryands

Disturbance and Land Use: The primary natural disturbances are fire, insects and disease, and mass wasting. Land use is predominantly intensive timber harvest and livestock grazing.

M333Bb Salish Mountains

Landscape Characteristics: Glaciated mountains that formed in argillite, siltite, quartzite, and dolomite. Some volcanic ash layers remain, mostly on

ridgetops. Elevations range from 2500 to 7600 feet. Drainage density is low to moderate.

Climate: Mean annual precipitation ranges from 20 to 50 inches, about 70 percent falling as snow. The soil temperature and moisture regimes are cryic (frigid at lower elevations) and udic.

Potential Vegetation: Douglas-fir forest/Western ponderosa forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Valley floors Alluvium/outwash Eutrochrepts/Cryoboralfs/
Udifluvents

Mountainsides/ moraines Till/quartzite/ argillite Cryoboralfs/Cryochrepts/ Eutroboralfs/Eutrochrepts

Disturbance and Land Use: The primary natural disturbances are fire and insect epidemics. Land use is predominantly timber harvest and rural/suburban development.

M333Bc Flathead River Valley

Landscape Characteristics: Intermontane basin that formed in alluvium, glacial outwash, and lacustrine sediments underlain by argillite, siltite, and dolomite. Elevations range from 2300 to 4500 feet. Drainage density is low to moderate.

Climate: Mean annual precipitation ranges from 14 to 25 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are frigid and typic xeric.

Potential Vegetation: Foothills prairie/Western ponderosa forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Floodplains/terraces Alluvium Haploxerolls/Ustifluvents/
Haploborolls

Foothills/moraines Lacustrine sediments/ Xerochrepts/Ustochrepts/
outwash Ustipsamments

Disturbance and Land Use: The primary natural disturbances are fire and flooding. Land use is predominantly agriculture, rural/suburban development, and some timber harvest.

M333Be Cabinet Mountains

Landscape Characteristics: Glaciated mountains that formed in argillite, siltite,

quartzite, and dolomite. Volcanic ash deposits occur throughout most

of the subsection. Elevations range from 2100 to 8700 feet. Drainage density is low to moderate. Lakes occur in some of the cirque basins.

Climate: Mean annual precipitation ranges from 25 to 100 inches, about 70 percent falling as snow. The soil temperature and moisture regimes are cryic and udic.

Potential Vegetation: Cedar-hemlock-pine forest/Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/moraines Till/argillite/ Cryochrepts/Dystrochrepts

quartzite/dolomite

Cirquelands/ridges Argillite/quartzite/ Cryochrepts

dolomite

Disturbance and Land Use: The primary natural disturbances are fire and insect epidemics. Land use is predominantly timber harvest and recreation.

M333Ca Livingston Mountains

Landscape Characteristics: Thrust faulted mountains formed from argillite, siltite, and dolomite and strongly shaped by alpine glaciation. Glacial till covers much of the landscape. Volcanic ash deposits also occur. Elevations range from 3200 to 10100 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 20 to 110 inches, about 80 percent falling as snow. The soil temperature and moisture regimes are cryic and udic.

Potential Vegetation: Douglas-fir forest and Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides Till/volcanic ash Cryoboralfs

Alpine ridges/ Argillite/dolomite/ Cryochrepts

cirquelands till

Valley floors Alluvium/outwash Eutrochrepts/Udifluvents/

Cryoboralfs

Disturbance and Land Use: The primary natural disturbances are fire, mass

wasting, insects, and windthrow. This subsection is almost entirely within Glacier National Park; therefore, human disturbances are very limited.

M333Cb Whitefish/Swan Mountains

Landscape Characteristics: Block faulted mountains that formed from argillite, siltite, and dolomite and strongly shaped by alpine glaciation. Glacial till covers much of the landscape. Some volcanic ash deposits also occur. Elevations range from 2900 to 8000 feet. Drainage density is moderate. Lakes occur in glacial cirques and in glacial valleys.

Climate: Mean annual precipitation ranges from 20 to 110 inches, about 80 percent falling as snow. The soil temperature and moisture regimes are cryic and udic.

Potential Vegetation: Douglas-fir forest and Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides Till/volcanic ash Cryoboralfs/Eutroboralfs

Alpine ridges/ Argillite/dolomite/ Cryochrepts

cirquelands till

Valley floors Alluvium/outwash Eutrochrepts/Udifluvents/

Cryoboralfs

Disturbance and Land Use: The primary natural disturbances are fire, insects, and windthrow. Land use is predominantly rural and suburban development. Some

timber harvest also occurs.

M333Cc Mission/Swan Valley and Mountains

Landscape Characteristics: Large intermontane valley with adjacent block faulted mountains that formed in valley fill, till, and metasedimentary rock. Volcanic ash influences most soils. Alpine glaciation has strongly shaped the landscape. Elevations range from 2900 to 9300 feet. Drainage density is moderate. Wetlands and lakes occur frequently in this subsection.

Climate: Mean annual precipitation ranges from 20 to 110inches, about 80 percent falling as snow in the mountains. The soil temperature and moisture regimes are cryic and udic.

Potential Vegetation: Douglas-fir forest and Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Valley Alluvium/outwash Eutrochrepts/Cryoboralfs/

lacustrine sediments Udifluvents

Mountainsides Till/volcanic ash Cryoboralfs/Eutroboralfs

Alpine ridges/ argillite/siltite/ Cryochrepts

cirquelands dolomite/till

Disturbance and Land Use: The primary natural disturbances are fire, insects, and windthrow. Land use is predominantly rural and suburban development and

some timber harvest.

M333Ce Flathead Thrust Faulted Mountains

Landscape Characteristics: Thrust faulted mountains that formed from shale, sandstone, limestone, and conglomerate. These mountains have been strongly

shaped by alpine glaciation. Elevations range from 3680 to 8500 feet. Drainage density is moderate. A few lakes occur in glacial cirque basins.

Climate: Mean annual precipitation ranges from 20 to 90 inches, about 80 percent falling as snow. The soil temperature and moisture regimes are cryic and udic.

Potential Vegetation: Douglas-fir forest and Western spruce-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides Till/volcanic ash Cryoboralfs/Eutroboralfs

sedimentary rock

Valleys Alluvium/outwash Eutrocrepts/Cryoboralfs/

Udifluvents

Alpine ridges/ Sedimentary rock/till Cryochrepts

cirquelands

Disturbance and Land Use: The primary natural disturbances are fire, insects, and windthrow. This subsection is almost entirely wilderness, therefore, human

disturbances are very minor.

M333Da Coeur d'Alene Mountains

Landscape Characteristics: Faulted, low relief mountains formed from quartzite, argillite, and siltite. Some basalt occurs on the western edge of the subsection and granitic rocks occur on the east and north sides of Hayden Lake and on the south end of Lake Pend Oreille. Alpine glaciation has shaped the upper

one-quarter of most drainages. Volcanic ash influences most surface soils. Elevations range from 2150 to 6500 feet. Drainage density is moderate. Hayden, Fernan, Coeur d'Alene, and Pend Oreille lakes occur in or directly adjacent to this subsection. Lakes also occur in a few of the high elevation cirque basins.

Climate: Mean annual precipitation ranges from 20 to 75 inches, about 70 percent falling as snow. The soil temperature and moisture regimes are frigid (cryic at higher elevations) and udic.

Potential Vegetation: Cedar-hemlock-pine forest with some Douglas-fir forest at higher elevations.

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Mid-elevaton mountain slopes/ridges	Quartzite/siltite/ argillite	Udivitrands/Dystrochrepts
High-elevation mountain slopes/ridges/cirques	Quartzite/siltite	Haplocryands/Fulvicryands/ Cryochrepts/Dystrochrepts
Valley floors/terraces/ fans	Alluvium	Aquands/Cryands/Aquepts/ Boralfs

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and flooding. Land uses include intensive timber harvest, rural and suburban development, and heavy mining and smelter operations in the Silver Valley.

M333Db St.Joe/Bitterroot Mountains

Landscape Characteristics: Faulted mountains formed from quartzite, siltite, and argillite. Intrusions of granite occur near the Idaho batholith as well as borderzone materials. Elevations range from 2200 to 7800 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 25 to 80 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are frigid (cryic at higher elevations) and udic. Rain on snow events occur.

Potential Vegetation: Cedar-hemlock-pine forest with Douglas-fir forest at higher elevations.

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Mountainsides	Metasedimentary	Udivitrands/Cryandepts

Glaciated ridges/slopes/ Metasedimentary Haplocryands/Fulvicryands
cirquelands

Valley floors/fans/ Alluvium Vitrands/Aquands/Aquepts/
terraces Boralfs

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and flooding. Land use is predominantly intensive timber harvest and mining.

M333Dc Clark Fork Valley and Mountains

Landscape Characteristics: Mountains formed from quartzite and argillite. Elevations range from 2300 to 7500 feet. Drainage density is moderate. Some lakes occur in high elevation cirques.

Climate: Mean annual precipitation ranges from 25 to 80 inches, about 50 percent falling as snow. The soil temperature and moisture regimes are frigid and typic ustic. Some cryic/udic regimes occur at higher elevations.

Potential Vegetation: Western ponderosa forest/Douglas-fir forest

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Mountainsides/ridges Quartzite/argillite Xerochrepts/Eutrochrepts/
Vitrandepts

Valley floor/fans Alluvium Xerochrepts/Eutrochrepts/
terraces Vitrandepts

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and flooding. Land use is predominantly urban/suburban development, timber harvest, mining, and some grazing.

M333Dd North Idaho Hills and Valleys

Landscape Characteristics: Hills and low relief mountains the formed dominantly from quartzite, argillite, and siltite. Intrusions of Idaho batholith granitics and Columbia River basalts also occur. Volcanic ash influenced loess covers much of the area. Elevations range from 2200 to 5500 feet. Drainage density is moderate to high.

Climate: Mean annual precipitation ranges from 30 to 55 inches, about 60 to 70 percent falling as snow. The soil temperature and moisture regimes are frigid and

udic in the east half of the subsection, grading to frigid and typic xeric in the west half. Cryic temperature regimes occur at high elevations.

Potential Vegetation: Cedar-hemlock-pine forest/Western ponderosa forest

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Valley floors/fans/ terraces	Alluvium	Vitrands/Aquands/ Aquepts/Boralfs
Hills/low mountains	Loess	Udivitrands
High elevation slopes/ ridges	Loess	Haplocryands/Fulvicryands

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, and flooding. Land use is predominantly intensive timber harvest, rural/suburban development, farming/ranching, and mining.

M333De Clearwater Mountains and Breaks

Landscape Characteristics: Low relief mountains and stream breaklands that formed in highly weathered Idaho Batholith granitics. Volcanic ash deposits are common and influence many soils. Elevations range from 2000 to 6500 feet. Drainage density is high.

Climate: Mean annual precipitation ranges from 35 to 80 inches, about 40 to 50 percent falling as snow. Rain on snow events are common below 4500 feet. The soil temperature and moisture regimes are Frigid and Udic. Some cryic temperatures occur at the higher elevations. This subsection is influenced by a maritime climate.

Potential Vegetation: Cedar-hemlock-pine forest with Western spruce-fir forest at higher elevations.

Relationships of Dominant Map Unit Components:

Landform	Geology	Soil Taxa
Mountainsides	Granite	Fulvicryands/Haplocryands/ Udivitrands
Stream Breaks	Granite	Dystrochrepts/Udivitrands
High elevation ridges	Granite	Haplocryands/Cryochrepts

Disturbance and Land Use: The primary natural disturbances are fire, insects, disease, windthrow, and mass wasting. Land use is predominantly timber harvest and related activities.

342Ad Bighorn Intermontane Basin

Landscape Characteristics: Dissected plains, hills, terraces, and fans that formed in shale, siltstone, and sandstone overlain by some alluvium and

lacustrine sediment. Elevations range from 3700 to 4700 feet. Drainage density is moderate.

Climate: Mean annual precipitation ranges from 5 to 12 inches. The soil temperature and moisture regimes are mesic and ustic aridic. Winters are very dry.

Potential Vegetation: Sagebrush steppe with some Foothills prairie

Relationships of Dominant Map Unit Components:

Landform Geology Soil Taxa

Plains/hills sedimentary Torriorthents/Camborthids

Fans/terraces alluvium Camborthids/Calciorthids

Disturbance and Land Use: The primary natural disturbance is drought. Land use is predominantly livestock grazing and irrigated cropland.

SUBSECTION ACRES

Subsection Acres Number of Polygons

331Aa 728,027 2

331Ab 1,793,288 2

331Ac 721,942 1

331Da 2,040,563 1

331Db 1,512,751 4

331Dc 488,863 1

331De 841,265 1

331Df 1,655,619 1

331Dh 17,925,132 2

331Ea 15,614,682 1

331Fb 417,135 1

331Fc 2,400,691 1

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331Fd 12,210,346 2
331Fe 2,136,832 4
331Fg 1,623,611 1

331Ga 3,498,342 1
331Gb 2,411,965 1
331Gc 2,102,060 1
331Gd 581,179 1
331Ge 13,846,942 1

332Aa 12,697,638 1
332Ab 773,695 1
332Ac 1,539,631 1
332Ad 799,566 1
332Ae 290,446 1

332Ba 491,195 1

M331Aa 1,217,591 1
M331Af 1,124,175
M331Ag 1,041,921 1
M331Ah 693,979 1
M331Ai 420,704 1
M331Ak 132,481 1
M331Al 178,628 1
M331Am 392,925 1
M331Ap 473,663 1
M331Ar 524,484 1

M331Ba 660,565 1

M332Aa 1,297,211 2
M332Ab 830,336 5
M332Ac 1,755,548 4

M332Ba 450,712 1
M332Bb 407,651 1
M332Bc 729,657 1
M332Bd 670,441 1
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M332Be 247,421 1
M332Bg 1,185,779 1
M332Bk 1,069,316 1
M332Bp 225,199 1

M332Ca 475,328 1
M332Cb 508,740 1
M332Cc 449,506 1

M332Da 1,370,953 1
M332Db 1,978,690 2
M332Dc 332,144 1
M332De 433,262 2
M332Dg 516,304 1
M332Dh 378,384 1
M332Dj 883,612 1
M332Dk 2,646,330 1
M332Dm 170,881 1
M332Dn 224,838 1
M332Dp 313,076 1

M332Ea 672,022 1
M332Eb 390,737 1
M332Ec 176,147 1
M332Ee 430,626 1
M332Eg 225,887 1
M332Eh 354,714 1
M332Ej 2,097,837 4
M332Ek 412,257 1
M332En 809,777 1
M332Ep 312,070 1
M332Er 410,301 1

M332Gd 1,345,904 1

M333Aa 992,148 1
M333Ab 1,131,763 1
M333Ac 972,811 3
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M333Ba 875,779 1

M333Bb 2,443,060 1

M333Bc 1,679,192 1

M333Be 468,665 1

M333Ca 610,341 1

M333Cb 1,523,827 1

M333Cc 690,014 1

M333Ce 520,599

M333Da 1,321,043 1

M333Db 1,363,689 1

M333Dc 1,444,859 1

M333Dd 1,807,880 1

M333De 940,573 1

342Ad 295,845 1

GLOSSARY OF SELECTED TERMS

The definitions listed are taken from the Glossary of Landforms in the USDA Natural Resources Conservaton Service National Soil Survey Handbook and from the American Geological Institute Glossary of Geology.

Alluvium--Unconsolidated clastic material deposited by running water, including gravel, sand, silt, clay, and various mixtures of these.

Cirque--Semicircular, concave, bowl-like area with steep face primarily resulting from erosive activity of a mountain glacier.

Cirqueland--Areas dominated by cirques and related glacial features, rock, and rubbleland.

Colluvium--Unconsolidated, unsorted earth material being transported or deposited on sideslopes and/or at the base of slopes by mass movement (e.g. direct gravitational action) and by local, unconcentrated runoff.

Ecological Unit--A mapped landscape unit designed to meet management objectives, comprised of one or more ecological types.

Floodplain--The nearly level plain that borders a stream and is subject to inundation under flood-stage conditions unless protected artificially. It is usually a constructional landform built of sediment deposited during overflow and lateral migration of streams.

Fluvial--Of or pertaining to rivers; produced by river action.

Intermontane Basin--A generic term for wide structural depressions between mountain ranges that are partly filled with alluvium and called "valleys" in the vernacular. Intermontane basins may be drained internally (bolsons) or externally (semi-bolson).

Lacustrine deposit--Clastic sediments and chemical precipitates deposited in lakes.

Landscape--A collection or related, natural landforms; usually the land surface which the eye can comprehend in a single view.

Loess--Fine-grained, wind-deposited material, dominantly of silt size.

Metasediment--A sediment or sedimentary rock that shows evidence of having been subjected to metamorphism.

Moraine--A mound, ridge, or other distinct accumulation of unsorted, unstratified glacial drift, predominantly till, deposited chiefly by direct action of glacier ice, in a variety of topographic landforms that are independent of control by the surface on which the drift lies.

Outwash--Stratified detritus (chiefly sand and gravel) removed or "washed out" from a glacier by melt-water streams and deposited in front of or beyond the end moraine or the margin of an active glacier.

Potential Vegetation--The biotic community that would be established if all successional sequences of its ecosystem were completed without additional human-caused disturbance under present environmental conditions.

Residuum--Unconsolidated, weathered or partly weathered mineral material that accumulates by disintegration of bedrock in place.

Section--An ecological unit in the subregion planning and analysis scale of the National Hierarchical Framework corresponding to subdivisions of a Province having broad areas of similar geomorphic process, stratigraphy, geologic origin, drainage networks, topography, and regional climate. Such areas are often inferred by relating geologic maps to potential natural vegetation groupings as mapped by Kuchler (1964).

Soil Great Group--A category of soil classification where soils are placed together based on close similarities in kind, arrangement, and degree of

expression of horizons; close similarities in soil moisture and temperature regimes; and similarities in base status.

Soil Moisture Regime--Classes of soil moisture that are based on the assumption that the soil supports whatever vegetation it is capable of supporting. Moisture regimes are defined in terms of the ground-water level and in terms of the presence or absence of water held at a tension of <15 bars in the moisture control section by periods of the year.

Soil Temperature Regime--The characteristic temperature regime of a soil that is described by the mean annual soil temperature, the average seasonal fluctuations from that mean, and the mean warm or cold seasonal soil temperature gradient within the main root zone, which is the zone from a depth of 5 to 100 centimeters.

Subsection--An ecological unit in the subregion planning and analysis scale of the National Hierarchical Framework corresponding to subdivisions of a Section into areas with similar surficial geology, lithology, geomorphic process, soil great groups, subregional climate, and potential vegetation.

Till--Dominantly unsorted and unstratified drift, deposited by a glacier, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders.

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