Summary Table: Characteristics of Ecoregions of Montana (continued)

41. CANADIAN ROCKIES

Level IV Ecoregion	Area (square miles)	Physiography	Elevation Local Relief (feet)	Geology	Soil	Climate	Potential Natural Vegetation	Land Use and Land Cover
41a. Northern Front	775	Extended Paleozoic mountains east of the Continental Divide yet in the orientation of the Rocky Mountains and are underlain mostly by Precambrian Belt Formation. Horizontally bedded strata with pinkish hues, bedrock, and poorly developed drainage networks occur.	4000-7500 / 400-2000	Quaternary glacial drift, alluvium, and colluvium. Cretaceous undifferentiated sedimentary rock: also dense-leaded, Precambrian argillaceous rock; shale, and quartzite of the Grinnell and Appekunny formations and Precambrian Altyn Limestone. Rock outcrops.	Mollisols (Cryoboralfs), Inceptisols (Cryochrepts), Mollisols (Cryoboralfs)	Loiling, Gable Front, Blanchard, Whitlash, Mach, Rimrock, Cornwall, Cheadle, Tibron	Cryic: Frigid, Udic	20-40	30-70	Long cold winters, moist springs	Douglas-fir and Douglas-fir forests	Recreation is the major land use within Glacier National Park: attractions, logging, recreation, rural residential development, watershed, and wildlife habitat.
41b. Central Alpine - Subalpine Zone	1175	Extended High mountains and occur characterized by large amounts of precipitation, active glaciers, lakes, wildland valleys, and a mixed high-elevation climax vegetation.	5000-10000 / 1000-5000	Quaternary glacial drift, talus, and colluvium. Precambrian argillite, argillaceous rocks, quartzite, and carbonate rock rocks of the Grinnell Appekunny and Piegan Revett, Missoula groups. Rock outcrops.	Inceptisols (Cryochrepts, Cryumbrepts, Mollisols (Cryoboralfs)	Centerville, Chesaka, Evans, Cosmos, Mallomar Mallomar, Surface, Swaddlea	Cryic: Frigid, Udic, Alfic	40-100+	25-50	Long cold winters, moist springs, very short summers	High elevation forests, alpine, and Krummholtz zone. Subalpine mixed coniferous forests and aspen groves. Krummholtz vegetation. Rock outcrops and talus and talusless vegetation.	Watershed, recreation, and wildlife habitat.
41c. Western Canadian Rockies	1600	Extended High, wet, forested mountains west of the Continental Divide but still relatively rounded by volcanic ash and minority talus.	3500-6000+ / 400-1500	Quaternary glacial drift, talus, and colluvium. Precambrian argillite, argillaceous rocks, quartzite, and carbonate rock rocks of the Grinnell Appekunny and Piegan Revett, Missoula groups. Rock outcrops.	Inceptisols (Cryochrepts, Cryumbrepts, Haplorthods) Entisols (Cryorthents)	Alma, Hoadley, Dickstone, Ludwig, Eagle Creek, Walsh, Hallowag, Cutbank, Cascade	Cryic: Udic, Udic	20-100+	30-70	Long cold winters, moist springs	Subalpine fir, Douglas-fir, grand fir and Engelmann spruce forests.	Recreation, timber harvest, and residential utilities (Glacier National Park, recreation, logging, recreation, recreation, timber harvest, and rural residential development).
41d. Southern Carbonate Front	1120	Extended High forested mountains east of the Continental Divide in the orientation of the Rocky Mountains are underlain by carbonate-rich rock which influences water quality, available water quantity, soils, and aquatic biota.	3500-8000 / 400-2500	Quaternary glacial drift, alluvium, and colluvium. Paleozoic limestone and dolomite, shale, sandstone, conglomerate, and quartzite, also marine rocks in south-trending strips of Precambrian argillite, argillaceous rock, quartzite, and limestone of the Missoula Group. Rock outcrops.	Inceptisols (Cryochrepts, Haplorthods (Cryorthods), orthents (Cryorthents), Entisols (Cryorthents)	Starbird, Gable, Whitlash, Frogan, Swaddlea, Sawtooth, Garden Creek or limestone are typically well to excessively drained	Cryic: Udic - Udic	20-35	30-70	Long cold winters, moist springs	Subalpine fir and Douglas-fir forests, lodgepole pinyon on the forest, drier western slopes	Recreation.
41e. Flathead Flower Feather Carbonate-Rich Mountains	917	Extended High, wet, forested mountains east of the Continental Divide in the orientation of the Rocky Mountains are underlain by carbonate-rich rock which influences water quality, available water quantity, soils, and aquatic biota. Karst topography occurs.	3000-8000 / 1000-2500	Quaternary glacial drift, alluvium, and colluvium. Paleozoic limestone and dolomite, shale, sandstone, conglomerate, and quartzite, also marine rocks in south-trending strips of Precambrian argillite, argillaceous rock, quartzite, and limestone of the Missoula Group. Rock outcrops.	Inceptisols (Cryochrepts, Haplorthods (Cryorthods), orthents (Cryorthents), Entisols (Cryorthents)	Starbird, Gable, Whitlash, Frogan, Swaddlea, Sawtooth, Garden Creek or limestone are typically well to excessively drained	Cryic: Udic - Udic	20-35	30-70	Long cold winters, moist springs	Subalpine fir and Douglas-fir forests, lodgepole pinyon on the forest, drier western slopes	Recreation.

42. NORTHWESTERN GLACIATED PLAINS

Level IV Ecoregion	Area (square miles)	Physiography	Elevation Local Relief (feet)	Geology	Soil	Climate	Potential Natural Vegetation	Land Use and Land Cover
42a. Collapsed Glacial Outwash	214	Glaciated, irregular, gravelly and sandy glacial outwash plains are interspersed with kettle and outlands and broad shallow bedrock basins.	3000-3500 / 10-70	Quaternary outwash deposits underlain by sedimentary rocks of the Tertiary Fort Union Formation, as concave.	Mollisols (Haploborolls, Argiboralfs), Aquolls (Endoaquolls)	Manning, Walsh, McKenzie, Urban, Dooley, Fairhaff	Frigid: Udic	22-34	100-150	40-50, 25-80	Wheatgrass - needlegrass.	On dune soils, wind power, needlegrass, alfalfa and corn farming. On flatter soils with more gravel, grazing. Lakes shown here, producing large areas of open water (e.g. white pelicans, black terns, and Forster's terns) and these performing bitterns nesting (e.g. avocets and stilts) and ducks.
42b. Northern Glaciated Grassy	40	Glaciated, Very hummocky, low relief, stagnation moraine studded with ponds and potholes containing Early significant stream drainage.	2000-2500 / 10-150	Glacial, glacial drift deposits are underlain by the Late Member of the Tertiary Fort Union Formation.	Aquolls (Endoaquolls), Mollisols (Argiboralfs, Aquolls) (Endoaquolls)	Amiell, Williams, Glenwood, Dark Brown soils are common.	Frigid: Udic	12-24	100-150	40-50, 25-80	Wheatgrass - needlegrass. Willow and aspen at wetland margins.	Dryland agriculture and grazing.
42c. Glaciated Dark Brown Prairie	8017	Glaciated, Rolling, glacial till plains are punctuated by undissected gravel benches and scattered pothole basins occur.	2000-3000 / 10-100	Quaternary till, alluvium, terrace deposits, and wave-underlain primarily by the Late, Scotland Bank, Pollock, Hoge, and, especially, Dragon River members of the Tertiary Fort Union Formation. Tertiary Pierre Shale or scattered benches.	Mollisols (Argiboralfs, Haploborolls), Entisols (Orthentics), Inceptisols (Cryochrepts)	Vida, Williams, Glenwood, Dark Brown soils are common. Scott, Lohman, Fairhaff, Hamilton, Dark Brown soils are derived from Late, Scotland Bank, Pollock, Hoge, and, especially, Dragon River members of the Tertiary Fort Union Formation. Tertiary Pierre Shale or scattered benches.	Frigid: Udic	0-10	100-150	40-50, 25-80, 100-150 (thinnedy per 100 years)	Wheatgrass - needlegrass.	Mostly cropland and rangeland. Oil production locally.
42d. Glaciated Northern Grasslands	1110	Glaciated Grassland rolling to strongly rolling drift plains are characterized by many seasonal impoundments.	2000-2600 / 50-300	Quaternary glacial, wave deposits are underlain primarily by Cretaceous Bearpaw Shale also the Judith River Formation, Claggett Formation, Bull Creek Formation, and the Pierre Shale Sandstone of Cretaceous age as well as the Tongue River Member of the Fort Union Formation and the Flaxville Gravels of Tertiary age.	Aquolls (Endoaquolls), Natraquolls, Mollisols (Argiboralfs, Haploborolls), Entisols (Cryorthents, Cryopsamments, Inceptisols (Cryochrepts), Natraquolls (Haploborolls)	Phillips, Hillsdale, Scobey, Vida, Sunburst, Tetonal, Thorne, Joplin, Milton, Brusveen, Zahill, Plead, Williams, Wabek, Tonsita, Cabba, Cabbart, Hodgson, Hillsdale, Barcelo, Barcelo, Barcelo, Brown soils are derived from shale	Frigid: Udic - Aridic	0-10	100-150	40-50, 25-80, 100-150 (thinnedy per 100 years)	Grasses - needlegrass - sheatgrass.	Mostly cropland with some farming on nonstony undissected benches and on flatter, other uniform, mixed, soils of the Milk River Valley. Oil production occurs locally.
42e. Canyon Lakes Upland	448	Glaciated, Typically, moderately dissected area with lakes, ponds, wetlands and mostly internal drainage.	2000-2500 / 20-200	Glacial drift deposits or terraces are are underlain by the Tertiary Fort Union Formation.	Mollisols (Argiboralfs), Entisols (Orthentics), Aquolls (Endoaquolls), Natraquolls (Haploborolls)	Williams, Bearpaw, Vida	Frigid: Udic	12-24	100	35-50, 50-80	Grasses - needlegrass - sheatgrass.	Mostly cropland with some agriculture. Local oil production.
42f. Glaciated Plains	1811	Glaciated Rolling to hummocky, broken, and moraine area that contains a high density of numerous potholes, lakes and marshes.	2000-2600 / 40-400	Glacial drift is underlain by the Cretaceous Claggett Formation, Colorado Group, Judith River Formation, and Bearpaw Sandstone.	Mollisols (Argiboralfs)	Williams, Bearpaw, Vida	Frigid: Udic	12-24	100-200	35-50, 50-80	Grasses - needlegrass - sheatgrass.	Mostly cropland but natural farming occurs where slopes are steeper.
42g. Glaciated Dry Prairie Northern	783	Glaciated, Undulating to strongly sloping terrain characterized by boulder knolls, periodic ridges, and many seasonal bottle lakes and wetlands. Stream drainage is largely absent or now is permanent and stream is present.	2000-2600 / 20-175	Quaternary drift underlain by the Cretaceous Judith River and Claggett formations, Bearpaw Shale, Fox Hills Sandstone, and Flaxville Gravels.	Mollisols (Argiboralfs), Entisols (Orthentics)	Scobey, Barnes, Hillsdale, Barcelo, Barcelo, Barcelo, Barcelo, Brown soils are common and derived from glacial drift.	Frigid: Udic - Aridic	0-15	100-125	30-35, 50-80	Grasses - needlegrass - sheatgrass.	Mostly cropland but natural farming occurs where slopes are steeper.
42h. Milk River Pothole Upland	201	Dissectedly, hummocky, terrainal terrainn area contains hollow glacial drift deposits and disorganized drainage.	2500-4200 / 100-500	Quaternary till underlain by the Cretaceous Two Medicine Formation and Virgelle Sandstone.	Mollisols (Argiboralfs), Entisols (Orthentics)	Scobey, Barnes, Hillsdale, Barcelo, Barcelo, Barcelo, Barcelo, Brown soils are common and derived from glacial drift.	Frigid: Udic - Aridic	0-15	100-150	30-35, 50-80	Grasses - needlegrass - sheatgrass.	Rangeland and agriculture. Oil production occurs in the ecoregion.
42i. North Central Brown Glaciated Plains	1110	Glaciated, Broad, undulate, nearly level to hilly, agricultural, oil plains and numerous, nearly level, often poorly drained peripheral lake plains. Broad valley plains, alluvial areas, ponds (often seasonal), impoundments, and stabilized sand dune areas.	2500-4200 / 20-100	Quaternary glacial drift, glaciolacustrine, and alluvial deposits are underlain primarily by the Cretaceous Judith River Formation and Colorado Group also Eagle Sandstone, Virgelle Sandstone, Two Medicine Formation, and Claggett Formation of Cretaceous age.	Mollisols (Argiboralfs), Entisols (Orthentics), Aquolls (Haploborolls)	Scobey, Barnes, Hillsdale, Scobey, Joplin, Hoadgate, Vida, Hillsdale, Marias, Pendroy, Lamont, Brown soils are common and are derived from drift.	Frigid: Udic - Aridic	0-15	100-125	2-24, 40-80, 100-200 (thinnedy per 100 years)	Grasses - needlegrass - sheatgrass. Shortbrush-Gardebrush found on the lower nearly affected Missouri River Valley; southwest of Great Falls. Also the areas with vegetation that is taller (shrub).	Impromptu grain farming area. Oil wells are common locally.

43. NORTHWESTERN GREAT PLAINS

Level IV Ecoregion	Area (square miles)	Physiography	Elevation Local Relief (feet)	Geology	Soil	Climate	Potential Natural Vegetation	Land Use and Land Cover
43a. Missouri Plateau	3420	Unglaciated, or not significantly modifiedby glaciation. Rolling hills and gravel-covered terraces are common. Some areas are particularly subject to wind erosion.	2000-2700 / 50-500	Quaternary terrace deposits. Formerly, Tongue River and Hagen members of the Tertiary Fort Union Formation and Tertiary Flaxville Gravels.	Mollisols (Argiboralfs), Cambisols, Haploborolls), Entisols (Torriorthents, Cryorthents, Cryopsamments)	Chester, Shelby, Scobey, Flaxville, Flaxville Gravel, Turner, Lambert, Harmonica, Amiegard, Marias, Medicine, Regent, Williams, Cabbart, Cabbe	Frigid: Udic	12-16	100-150	40-50, 50-80	Wheatgrass - needlegrass.	Growth of rangeland and farmland; spring wheat, hay, barley, and oats are common.
43b. Lower Missouri Badlands	18	Unglaciated. Highly dissected erosional landscape exists for remarkable of the Little Missouri River. Central hills, more rounding, and changing an extreme formed sphericoid domes and "Hardy" topographic are typical. Forming streams carry heavy sediment loads.	2000-2300 / 125-400	Primarily Cretaceous Hell Creek Formation also Tongue and Cadelton members of the Tertiary Fort Union Formation.	Entisols (Cryorthents, Cryopsamments), Inceptisols (Ustochrepts)	Badlands Cantlon, Cherry, Peak	Frigid: Udic - Aridic	12-35	150	40-50, 50-80	Sparse wheatgrass, needlegrass, little bluestem, and prairie cordgrass. On north facing hillslopes, change of Rocky Mountain juniper. Along the drainage more numerous Ponderosa Pines.	Grazing and recreation are the managed's dominant land uses. The dominant topography, wooded shores, and uncultivated areas provide a haven for wildlife.
43c. River Breaks	6100	Unglaciated. Rugged, very highly dissected terrain flanking major rivers. Badlits, classic "Cannon-Ball" soils are common on footslopes. They exhibit slow water absorption and high runoff, more generally with more abundant especially on flatter.	2000-3000 / 200-500	Primarily Tertiary Fort Union Group, and Tertiary members of the Tertiary Fort Union Formation, also Cretaceous Bull Creek Formation, Pierre Shale, and Fox Hills Sandstone.	Entisols (Cryorthents, Cryofluvents), Mollisols (Haploborolls), Vertisols (Haploxerets)	Lambert, Cabbart, Cantlon, Neldon, Bascoy, Lane, Otto, Lonna, Shanyon, Surface, Shoe Shade, Scobile, Cabbe, Lohbar, Harmon, Neldon, Bascoy, Sanitant	Frigid: Aridic - Udic	12-16	100-150	35-50, 20-50	On mesas bottom and area, upon western wheatgrass. On the bottomed footslopes, buffalo grass. On generally north, bluestem and needle and thread. On north facing slopes of down (xerophytic) prairie and deciduous trees.	Primarily grazing, hay, grain and heavy, niche, "gumbo-like" soils are not well suited to spring pasture and variety of dark tones discourages summer grazing. Land cover is mostly native grasses but remnant woodlands grow in draws on north facing slopes and on some alluvial bots. Shrubs and isolated draws and slopes provide suitable habitat.
43d. Foothill Buttes	131	Unglaciated. Prominent, mostly forested buttes and many color and grassy on slopes are characteristic. Bluffstone areas are typically marbled by springs.	2000-4000 / 250-850	Relictual, Tertiary remnants of the Sentinel Butte Member of the Fort Union Formation and Tertiary sediments, Cheatlem, and Sioux formations (undivided). Rock outcrops.	Mollisols (Argiboralfs, Haploborolls), Inceptisols (Cryochrepts), Entisols (Orthentics)	Rocky, Harvin, Shortbrush, Cabbe	Frigid: Udic	16-30	Area Bank 150	40-50, 50-80	Ponderosa pine and ponderosa pine-juniper communities, also sometimes, Rocky Mountain juniper, and hardwoods in the draws.	Logging and moderately grazing.
43e. Sagebrush Steppe	4612	Unglaciated. Gently level to rolling, western grass plains with occasional eroded buttes, badlands, scarps (basin and remnants, and salt pans. Streams are typically ephemeral or intermittent. Many impoundments occur.	2000-4200 / 50-400	Quaternary alluvium along streams. Sedimentary units including the Colorado Group, Pierre Shale, Bull Creek Formation, and Fox Hills Sandstone of Cretaceous age and the Fort Union, Ardmore, Cheatlem, and Sioux formations of Tertiary age. In Carter County, mostly, Cretaceous Pierre Shale.	Aridisols (Argiboralfs), Entisols (Torriorthents, Cryorthents), Mollisols (Argiboralfs), Inceptisols (Ustochrepts)	Marvan, Neldon, Gerdrum, Sunda, Alva, Nelling, Lakeville, Sunsetto, Chesty, Albert clay soils are common, and soils on scarps, and soils on "mud" during rain storm.	Frigid: Aridic - Udic	12-40	125-150	40-50, 50-80	Wheatgrass - needlegrass.	The native vegetation cover is often dominated by big sagebrush. Shadscale saltbush and thickspike grass. Mostly rangeland, but some farmed. Some irrigated and have experienced woodland erosion. Some farming occurs especially in the larger valleys, those of great Falls's Sulphur creek.
43g. Semiarid Prairie Shale Plains	46	Unglaciated. Rolling plains with occasional or mountain streams are typical.	2000-3600 / 100-300	Quaternary alluvium along streams. Cretaceous Pierre Shale, Northern Shale Carter Shale, Bell Fourche Shale, thinly shale.	Entisols (Torriorthents, Cryorthents), Vertisols (Haploxerets, Haploborolls), Mollisols (Haploborolls)	Shelby Shale, Winifred, Tiber, Haugan Lonesome	Mixed: Aridic - Udic	10-27	125-150	40-50, 20-50	Wheatgrass - needlegrass.	Mostly rangeland. Clay mining locally.
43h. Dense Clay Prairie	18	Unglaciated. Rolling, dissected plains with occasional or intermittent streams.	2000-3600 / 100-300	Quaternary alluvium along streams. Primarily Cretaceous Pierre Shale.	Vertisols (Haploxerets), Entisols (Cryorthents)	Winifred, Lonesome, Swanson, Chesty	Mixed: Aridic - Udic	12-16	150	40-50, 20-50	Wheatgrass - needlegrass, sagebrush and shrubs from fence and stream isolation.	Grazing and cattle ranching, hay meadow, irrigation crops. Wind-caused management is actual and already by mine.
43i. Missouri Breaks Shortland - Scrubland	2000	Very highly dissected badland terrain that borders on the Missouri River is characterized by steep slopes and is sparsely covered with shortland or scrubland.	2000-4000 / 200-750	Quaternary Sweetgrass Shale, Bull Creek Formation, Judith River Formation, Colorado Group, and Claggett Formation. Rock outcrops.	Entisols (Cryorthents), Mollisols (Haploborolls), Inceptisols (Ustochrepts)	Varvan, Bascoy, Dale, Cabbart, Delgrade, Eroslike, clayey soils are common.	Frigid: Udic - Aridic (bordering on Aridic)	12-35	50-125	40-50, 20-50	Scrub ponderosa pine - Rocky Mountain juniper woodland. Douglas-fir on north facing slopes, grassland, and shortland.	Lightly and partially grazed. Rocky, wooded shores, and slopes provide wildlife habitat. Some irrigated farmland near the Missouri River.
43m. Judith Basin Grassland	1900	Unglaciated. Undulating plains are bordered by Cretaceous Sweetgrass Shale, Bull Creek Formation, Judith River Formation, Claggett Formation.	4000-5500 / 125-1000	Extensive Quaternary terrace deposits also Cretaceous Sweetgrass Shale, Cretaceous Shale, Bull Creek Formation, Judith River Formation, Claggett Formation.	Mollisols (Argiboralfs, Haploborolls), Inceptisols (Ustochrepts), Entisols (Cryorthents)	Danvers, Stanwood, Fortelle, Danvers, Amiesta, Dorsey, Winifred, Windham, Tanamera, Smith Bay, Elton Dancers, Elton Springs, Megarita, Shoeshin	Frigid: Udic	12-16	50-125	40-50, 20-50	Grasses - needlegrass - sheatgrass and foothills prairie.	Grazing, farming and irrigated. Some alfalfa and grain. Some irrigated farmland and soils are common. Precipitation, soil productivity, grass density, and carrying capacity are lower to the south of the Big and Little Snowy mountains than north.
43n. Central Grassland	2317	Unglaciated. Dissected rolling plains are marked with buttes. Areas of gravel and shales containing locally affect topography; scattered sub-lake also occur. Streams are mostly ephemeral or intermittent and impoundments occur locally. Black soils and gully erosion are pronounced in some places.	2000-3000 / 125-400	Quaternary terrace deposits and along channels, alluvium. Primarily Tertiary Fort Union Formation, also the Cretaceous Lower Formation, Bull Creek Formation, Bearpaw Formation, Cadin Shale, Pierre Shale Colorado Group.	Entisols (Torriorthents, Cryorthents, Aquolls (Cryoborolls), Inceptisols (Ustochrepts), Mollisols (Haploborolls, Argiboralfs, Natraquolls, Cambisols)	Mellvin, Bearpaw Rangling, Cabbe, Cabbart, Lonna, Lonna, Stanwood, Dogwood, Delavina, Rosedale, Cardwell, Thickwood, Cherly, Shelby, Kolmar Phillips, Lonna, Kyle, Dicken, Rosedale, Rosedale, Rosedale, Lonna, Kolmar, Dubois, Neldon, Shoeshin, Twilight, Fortelle, Shoeshin, Gerdrum, Dancy, Winifred	Mixed: Aridic - Udic	16-30	100-150	40-50, 20-50, Frequency is 150-300 per 100 years in the northern, 100-150 per 100 years in the southern, 100-150 per 100 years in the south, and 100 per 100 years elsewhere	Grasses - needlegrass - sheatgrass	Primarily rangeland. Farming is much less extensive than in Ecoregion (this has irrigated and rangeland farms in some regions), since the Yellowstone River Coal mining occurs near Colstrip. Least of production.
43o. Unglaciated Montana High Plains	5736	Unglaciated. Highly dissected terrain with several escarpments. High steep-cut effect much of the area and are accentuated by dissected channels and deflation/erosion. Some lakes and ponds occurred in permanent wetlands and lakes that are refuges for wildlife.	2000-3600 / 125-400	Terrace - Cretaceous-aged terraces and alluvium. Primarily Tertiary Fort Union Formation, also Tertiary Flaxville Gravels, also in parts to both surface rock and dissection of original cover is scarce. Soils skilled into the shale-shore have low yields of poor quality water. Sandstone aquifers can produce adequate amounts of ground water for both domestic and stock purposes but significant amounts for irrigation.	Mollisols (Argiboralfs), Aridisols (Haploborolls), Aridisols (Haplogypsids, Argiaquolls), Vertisols (Haploxerets), Inceptisols (Ustochrepts)	Danvers, Danvers, Danvers,