DRAFT 2
Summary Table: Characteristics of the Ecoregions of Montana (continued)
Second Edition

41. CANADIAN ROCKIES

Level IV Ecoregion		Physiography		Geology	Soil			Climate			Potential Natural Vegetation*	Land Cover and Land Use
	Area (square miles)		Elevation/ Local Relief (feet)	Surficial and Bedrock	Order (Great Group)	Common Soil Series	Temperature/ Moisture Regimes	Precipitation Mean annual (inches)	Frost Free Mean annual (days)	Mean Temperature January min/max; July min/max (°F) or Seasonality	*Source: Ross, R.L., and Hunter, H.E., 1976	
41a. Northern Front	592	Glaciated. Forested mountains east of the Continental Divide are in the rainshadow of the Rocky Mountains and are underlain mostly by Precambrian Belt Formations. Hummocky morainal areas with pothole lakes, wetlands, and poorly developed drainage networks occur.	4500-7700/ 400-2000	Quaternary glacial drift, alluvium, and colluvium. Cretaceous undifferentiated sedimentary rock; also thrust-faulted, Precambrian argillaceous rock, siltite, and quartzite of the Grinnell and Appekunny formations and Precambrian Altyn Limestone. Rock outcrops.	Alfisols (Cryoboralfs), Inceptisols (Cryochrepts), Mollisols (Cryoborolls)	Loberg, Garlet, Evaro, Mikesell, Whitore, Mord, Helmville, Cowood, Cheadle, Tibson	Cryic/ Ustic, Udic	20-90	30-70	Long cold winters, moist springs	Subalpine fir and Douglas-fir forests.	Recreation is the major land use within Glacier National Park; elsewhere, logging, recreation, rural residential development, and wildlife habitat.
41b. Crestal Alpine–Subalpine Zone	1379	Glaciated. High mountains and crests characterized by large amounts of precipitation, active glaciers, lakes, rockland - talus, and a mixed high elevation climax vegetation.	5000-10500/ 1000-5000	Quaternary glacial drift, ash, and colluvium. Underlying rock type varies. Rock outcrops are common.	Inceptisols (Cryochrepts, Cryandepts), Mollisols (Cryoborolls)	Cowood, Cheadle, Evaro, Coerock, Phillcher, Holloway, Starley, Dryadine	Cryic/ Ustic, Udic	60-100+	25-50	Long cold winters, moist springs, very short summers	High elevation forests, alpine, and Krummholz areas. In cirques: mixed subalpine fir, whitebark pine, mountain hemlock, and alpine larch forests. Above timberline: alpine vegetation. In windswept areas between forest and alpine zones: Krummholz vegetation. Rock type varies and influences vegetation.	Recreation and wildlife habitat.
41c. Western Canadian Rockies	3604	Glaciated. High, wet, forested mountains west of the Continental Divide that are commonly mantled by volcanic ash and dotted by lakes.	3500-8800+/ 600-3500	Quaternary glacial drift, ash, and colluvium. Precambrian argillites, argillaceous rocks, quartzite, and carbonate-rich rocks of the Grinnell Argillite and Piegan, Ravalli, Missoula groups. Rock outcrops.	Alfisols (Cryoboralfs), Inceptisols (Cryochrepts, Cryandepts, Eutrochrepts), Entisols (Cryorthents)	Bata, Waldbillig, Phillcher, Loberg, Garlet, Evaro, Worock, Holloway, Coerock, Courville	Cryic/ Ustic, Udic	20-100+	30-70	Long cold winters, moist springs	Subalpine fir, Douglas-fir, grand fir, and Engelmann spruce forests.	Recreation and wildlife habitat within Glacier National Park; elsewhere, logging, recreation, wildlife habitat, and rural residential development.
41d. Southern Carbonate Front	1126	Glaciated. High, forested mountains east of the Continental Divide in the rainshadow of the Rocky Mountains are underlain by carbonate-rich rock which influences water quality, available water quantity, soils, and aquatic biota.	4700-8900/ 600-3200	Quaternary glacial drift, alluvium, and colluvium. Thrust faulted and folded, often limestone or dolomite-rich, undivided Mesozoic and Paleozoic formations and undivided Cretaceous conglomerate, sandstone, and mudstone. Rock outcrops.	Inceptisols (Cryochrepts), Mollisols (Cryoborolls), Alfisols (Cryoboralfs), Entisols (Cryorthents)	Starley, Garlet, Whitore, Tropal, Swifton, Helmville, Garlet. Soils on limestone are typically well to excessively drained.	Cryic/ Ustic, Udic	20-55	50-70	Long cold winters, moist springs	Subalpine fir and Douglas-fir forests; foothills prairie on the lower, drier eastern slopes.	Recreation.
41e. Flathead Thrust Faulted Carbonate-Rich Mountains	567	Glaciated. High, wet, forested mountains west of the Continental Divide are mantled by volcanic ash and often underlain by carbonate-rich rock, which influences water quality, available water quantity, soils, and aquatic biota. Lakes occur.	3800-8600/ 1000-3500	Quaternary drift, colluvium, and ash. Thrust-faulted, undivided Paleozoic limestones, shales, sandstones, conglomerates, and quartzites; also narrow north to south trending strips of Precambrian argillites, argillaceous rock, quartzites, and limestone of the Missoula Group. Rock outcrops.	Inceptisols (Cryochrepts, Cryandepts, Eutrochrepts), Alfisols (Cryoboralfs), Entisols (Cryorthents)	Holloway, Coerock, Bata, Phillcher. Soils on limestone are often well to excessively drained.	Cryic, Frigid/ Udic	20-90	30-70	Long cold winters, moist springs	Subalpine fir, Douglas-fir, grand fir, and Engelmann spruce forests.	Wilderness recreation and wildlife habitat.

42. NORTHWESTERN GLACIATED PLAINS

Level IV Ecoregion		Physiography		Geology	Soil			Climate			Potential Natural Vegetation*	Land Cover and Land Use
	Area (square miles)		Elevation/ Local Relief (feet)	Surficial and Bedrock	Order (Great Group)	Common Soil Series	Temperature/ Moisture Regimes	Precipitation Mean annual (inches)	Frost Free Mean annual (days)	Mean Temperature January min/max; July min/max (°F) or Seasonality	*Source: Kuchler, 1964	
42b. Collapsed Glacial Outwash	116	Glaciated. Irregular, gravelly and sandy glacial outwash plains are interspersed with wildlife-rich wetlands and broad, shallow, brackish lakes.	1930-2100/ 10-75	Quaternary outwash deposits underlain by sedimentary rocks of the Tertiary Fort Union Formation are extensive.	Mollisols (Haploborolls, Argiborolls), Vertisols (Endoaquerts)	Manning, Wabek, McKenzie, Lihen, Dooley, Parshall	Frigid/ Ustic	12-16	105-110	-4/18; 55/86	Wheatgrass–needlegrass.	On deep soils: small grains, sunflowers, alfalfa, and corn farming. On shallow soils over gravel: grazing. Lakes attract birds preferring large areas of open water (e.g. white pelicans, black terns, and Forster’s terns) and those preferring brackish water (e.g. avocets and tundra swans.)
42d. Northern Missouri Coteau	46	Glaciated. Very hummocky, low relief, stagnation moraine studded with ponds and pothole wetlands. Lacks significant stream drainage.	2000-2300/ 10-150	Mankato glacial drift deposits are underlain by the Lebo Member of the Tertiary Fort Union Formation.	Inceptisols (Ustochrepts), Mollisols (Argiborolls, Epiaquolls)	Zahill, Williams, Dimmick. Dark brown soils are common.	Frigid/ Ustic	12-16	100-110	-4/18; 55/84	Wheatgrass–needlegrass. Willow and aspen at wetland margins.	Dryland agriculture and grazing.
42i. Glaciated Dark Brown Prairie	6922	Glaciated. Rolling, glacial drift plains are punctuated by undissected gravel benches and scattered paleodunes. Loess occurs.	1900-3000/ 50-200	Quaternary drift, alluvium, terrace deposits, and loess underlain primarily by the Lebo, Sentinel Butte, Tullock, Slope, and, especially, Tongue River members of the Tertiary Fort Union Formation. Tertiary Flaxville Gravels on scattered benches.	Mollisols (Argiborolls, Haploborolls), Entisols (Ustorthents), Inceptisols (Ustochrepts)	Vida, Williams, Zahill, Farnuf, Cabba, Lambert, Turner, Tally, Farland, Dooley, Parshall, Reeder. Dark brown soils are derived from drift. Saline soils occur in lower Big Muddy area.	Frigid/ Ustic	11-16	100-130	-6/24; 54/88. 100-125 chinooks per 100 years	Wheatgrass–needlegrass.	Mosaic of cropland and rangeland. Oil production locally.
42j. Glaciated Northern Grasslands	11549	Glaciated. Dissected, rolling to strongly rolling drift plains are characterized by many seasonal impoundments.	1990-4000/ 50-600	Quaternary glacial drift deposits are underlain primarily by Cretaceous Bearpaw Shale; also the Judith River Formation, Claggett Formation, Hell Creek Formation, and the Fox Hills Sandstone of Cretaceous age as well as the Tongue River Member of the Fort Union Formation and the Flaxville Gravels of Tertiary age.	Alfisols (Eutroboralfs, Natrustalfs), Mollisols (Argiborolls, Haploborolls), Entisols (Ustorthents, Ustipsamments), Inceptisols (Ustochrepts), Vertisols (Haplusterts)	Phillips, Elloam, Scobey, Vida, Sunburst, Telstad, Thoeny, Joplin, Hillon, Bearpaw, Zahill, Fleak, Williams, Wabek, Tinsley, Cabba, Cabbart, Delpoint, Neldore, Bascovy, Kevin. Brown soils are derived from drift.	Frigid/ Ustic, Aridic	11-14	110-130	-6/28; 52/90. 100-175 chinooks per 100 years	Grama–needlegrass–wheatgrass.	Mostly rangeland with some farming on scattered, undissected benches and on alluvial, often irrigated, soils of the Milk River Valley. Oil production occurs locally.
42k. Coteau Lakes Upland	398	Glaciated. Typically, hummocky morainal area with lakes, ponds, wetlands and mostly internal drainage.	2040-2575/ 25-350	Glacial drift deposits of Mankato age are underlain by the Tertiary Fort Union Formation.	Mollisols (Argiborolls, Epiaquolls), Inceptisols (Ustochrepts), Vertisols (Haplusterts)	Williams, Zahill, Dimmick, Savage, Marias	Frigid/ Ustic	12-14	100	-4/20; 54/86	Wheatgrass–needlegrass.	Hilly areas are normally rangeland but elsewhere, wheat, barley, oats, and hay farming is common.
42l. Sweetgrass Uplands	183	Glaciated. Rolling to hummocky, treeless, end moraine area that contains a high density of seasonal pothole lakes and impoundments.	3600-4800/ 40-1000	Glacial drift is underlain by the Cretaceous Claggett Formation, Colorado Group, Judith River Formation, and Eagle Sandstone.	Mollisols (Argiborolls)	Williams, Bearpaw, Vida	Frigid/ Ustic	11-16	90-100	2/26; 48/80	Grama–needlegrass–wheatgrass.	Mostly rangeland with some agriculture. Local oil production.
42m. Cherry Patch Moraines	941	Glaciated. Undulating to strongly sloping terrain characterized by bouldery knolls, gravelly ridges, and many seasonal kettle lakes and wetlands. Stream drainage is largely absent or rare. A prominent end moraine is present.	2300-3600/ 50-375	Quaternary drift underlain by the Cretaceous Judith River and Claggett formations, Bearpaw Shale, Fox Hills Sandstone, and Flaxville Gravels.	Mollisols (Argiborolls), Entisols (Ustorthents)	Scobey, Kevin, Hillon. Brown clay loam soils are common and derived from glacial drift.	Frigid/ Ustic, Aridic	11-13	110-125	0/25; 54/84	Grama–needlegrass–wheatgrass; shrubs limited to moister depressional areas.	Mostly rangeland but cereal farming occurs where slopes are gentle.
42n. Milk River Pothole Upland	251	Hummocky, treeless, terminal moraine area contains kettles, glacial drift deposits, and nonintegrated drainage.	3700-4350/ 100-550	Quaternary till underlain by the Cretaceous Two Medicine Formation and Virgelle Sandstone.	Mollisols (Argiborolls, Calciborolls)	Scobey, Kevin, Zahl	Frigid/ Ustic, Aridic	11-14	90-100	6/28; 48/80	Grama–needlegrass–wheatgrass and foothills prairie.	Rangeland and agriculture. Oil production occurs in the ecoregion.
42o. North Central Brown Glaciated Plains	11338	Glaciated. Broad, treeless, nearly level to hilly, agricultural till plains and extensive, nearly level, often poorly drained proglacial lake plains. Small saline plains, alluvial areas, ponds (often seasonal), impoundments, and stabilized sand dunes occur.	2500-4200/ 20-500	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 (Argiborolls), Entisols (Ustorthents), Vertisols (Haplusterts)	Scobey, Kevin, Hillon, Telstad, Joplin, Bearpaw, Vida, Ethridge, Marias, Pendroy, Linnet. Brown soils predominate and are derived from drift.	Frigid/ Ustic, Aridic	11-15	100-135	2/34; 48/88. 125-200 chinooks per 100 years	Mostly grama–needlegrass–wheatgrass. Northern floodplain forest on the broad sandy, alluvial Missouri River Valley southwest of Great Falls. Also flat areas with vegetation that is saline tolerant.	Important grain farming area. Oil wells are common locally.
42q. Rocky Mountain Front Foothill Potholes		NOT FINISHED										
42r. Foothill Grassland	xxxxx	Mostly treeless foothills with scattered buttes. Perennial streams issue from mountains.	Mostly 3500-5500; isolated buttes to 8200/ Mostly 150-2000	Quaternary drift, alluvium, and colluvium. A variety of mostly non-carbonate rocks including Tertiary clay and sandstone of the Willow Creek Formation, Cretaceous Colorado Shale, Cretaceous undifferentiated rock, and Cretaceous clay of the Saint Mary River and Two Medicine formations.	Mollisols (Haplustolls, Argiustolls, Argicryolls), Entisols (Ustorthents)	Castner, Cabba, Delpoint, Cabbart, Work, Absarokee, Michelson, Fairfield, Reeder, Redchief, Marmarth, Farnuf, Regent	Frigid-Cryic/ Ustic	11-22	less than 70-135	2/34; 44/86; 150-200 chinooks per 100 years; near the Sweetgrass Hills and the Highwood, Mountains, 200+ chinooks per 100 years.	Mostly foothills prairies of wheatgrasses and fescues. Shrub- and tree- covered canyons often descend into Ecoregion 42r from adjacent high mountains.	Grazing. Ranches are common.

43. NORTHWESTERN GREAT PLAINS

Level IV Ecoregion		Physiography		Geology	Soil			Climate			Potential Natural Vegetation*	Land Cover and Land Use
	Area (square miles)		Elevation/ Local Relief (feet)	Surficial and Bedrock	Order (Great Group)	Common Soil Series	Temperature/ Moisture Regimes	Precipitation Mean annual (inches)	Frost Free Mean annual (days)	Mean Temperature January min/max; July min/max (°F)	*Source: Kuchler, 1964	
43a. Missouri Plateau	3425	Unglaciated (or not significantly modified by glaciation). Rolling hills and gravel-covered benches are extensive. Some areas are particularly subject to wind erosion.	2000-3550/ 50-500	Quaternary terrace deposits. Primarily, Tongue River and Slope members of the Tertiary Fort Union Formation, and Tertiary Flaxville Gravels.	Mollisols (Argiborolls, Calciborolls, Haploborolls), Entisols (Torriorthents, Ustorthents, Ustipsamments)	Chama, Morton, Bainville, Flasher, Farnuf, Turner, Lambert, Beaverton, Arnegard, Moreau, Midway, Regent, Wibaux, Cabbart, Cabba	Frigid/ Ustic	11-16	100-130	0/26; 54/90	Wheatgrass–needlegrass.	Mosaic of rangeland and farmland; spring wheat, hay, barley, and oats are common.
43b. Little Missouri Badlands	73	Unglaciated. Highly dissected erosional landscape within the watershed of the Little Missouri River. Conical hills, mass wasting, and slumping are common. Incised ephemeral streams and “flashy” hydrographs are typical. Flowing streams carry heavy sediment loads.	2800-3300/ 125-400	Primarily, Cretaceous Hell Creek Formation; also Slope and Ludlow members of the Tertiary Fort Union Formation.	Entisols (Ustorthents, Ustipsamments), Inceptisols (Ustochrepts)	Badland, Cabbart, Cherry, Fleak	Frigid/ Ustic, Aridic	12-15	120	0/28; 56/88	Sparse wheatgrass, needlegrass, little bluestem, and prairie sandreed. On north-facing hillslopes: clumps of Rocky Mountain juniper. Along the drainage ways: northern floodplain forest.	Grazing and recreation are the ecoregion’s dominant land uses. The dissected topography, wooded draws, and uncultivated areas provide a haven for wildlife.
43c. River Breaks	4320	Unglaciated. Rugged, very highly dissected terrain bordering major rivers. Erodible, clayey (“gumbo-like”) soils are common on bottomlands. They exhibit slow water absorption and high runoff; more gravelly soils occur elsewhere especially on slopes.	1900-3450/ 200-500	Primarily Tongue River, Lebo, Slope, and Tullock members of the Tertiary Fort Union Formation; also Cretaceous Hell Creek Formation, Pierre Shale, and Fox Hills Sandstone.	Entisols (Ustorthents, Ustifluvents),Inceptisols (Ustochrepts), Mollisols (Haploborolls),Vertisols (Haplusterts)	Lambert, Cabbart, Cambeth, Neldore, Bascovy, Lisam, Dilts, Lonna, Dimyaw, Norbert, Abor, Vanda, Kremlin, Cabba, Lohler, Havrelon, Neldore, Bascovy, Sunburst	Frigid/ Aridic, Ustic	11-16	110-135	-2/28; 54/90	On heavier bottom land soils: sparse western wheatgrass. On flat bottomed drainages: buffalo grass. On gravelly soils: threadleaf sedge, needle and thread. On north facing slopes of draws (especially): junipers and deciduous trees.	Primarily grazing. Steep slopes and heavy, sticky, “gumbo-like” soils are not well suited to spring pasture and scarcity of stock water discourages summer grazing. Land cover is mostly native grasses but remnant woodlands grow in draws on north facing slopes and on some alluvial flats. Breaks and wooded draws and slopes provide wildlife habitat.
43d. Forested Buttes	191	Unglaciated. Prominent, mostly forested buttes with steep sides and grassy toe slopes are characteristic. Headwater areas are typically marked by springs.	3250-4250/ 250-850	Resistant, Tertiary sediments of the Sentinel Butte Member of the Fort Union Formation and Tertiary Arikaree, Chadron, and Brule formations (undivided). Rock outcrops.	Mollisols (Argiborolls, Haploborolls), Inceptisols (Ustochrepts), Entisols (Ustorthents)	Reeder, Barvon, Mowbray, Cabba	Frigid/ Ustic	14-18	less than 120	4/26; 56/88	Ponderosa pine and ponderosa pine–savannah common; also snowberry, Rocky Mountain juniper, and boxelder in the draws.	Logging and understory grazing.
43e. Sagebrush Steppe	4621	Unglaciated. Nearly level to rolling, erosion-prone plains with occasional eroded buttes, badlands, scoria (burnt coal) mounds, and salt pans. Streams are typically ephemeral or intermittent. Many impoundments occur.	2300-4200/ 50-600	Quaternary alluvium along channels. Sedimentary units including the Colorado Group, Pierre Shale, Hell Creek Formation, and Fox Hills Sandstone of Cretaceous age and the Fort Union, Arikaree, Chadron, and Brule formations of Tertiary age. In Carter County: mostly, Cretaceous Pierre Shale.	Vertisols (Haplusterts), Entisols (Torriorthents, Ustorthents), Mollisols (Argiborolls),Aridisols (Camborthids - Natrargids), Inceptisols (Ustochrepts)	Marvan, Neldore, Gerdrum, Vanda, Abor, Volborg, Zatoville, Sumatra. Clayey, alkali-rich soils are common, are prone to erosion, and tend to “melt” during rain storms.	Frigid/ Aridic, Ustic	12-16	115-120	4/28; 56/90	Wheatgrass–needlegrass. The sparse vegetative cover is often dominated by big sagebrush, Nuttall saltbush, and short grass prairie.	Mostly rangeland; extensive areas have been overgrazed and have experienced resultant erosion. Some farming occurs especially in the larger valleys. Areas of good wildlife habitat occur.
43g. Semiarid Pierre Shale Plains	46	Unglaciated. Rolling plains with ephemeral or intermittent streams are typical.	3200-3675/ 100-350	Quaternary alluvium along channels. Cretaceous Pierre Shale, Niobrara Shale, Carlile Shale, Belle Fourche Shale, Mowry Shale.	Entisols (Torriorthents, Ustorthents), Vertisols (Haplusterts), Aridisols (Haplargids), Mollisols (Haplustolls)	Orella, Epsie, Winler, Ulm, Maggin, Louviers	Mesic/ Aridic, Ustic	12-17	115-120	6/32; 56/88	Wheatgrass–needlegrass.	Mostly rangeland. Clay mining locally.
43k. Dense Clay Prairie	39	Unglaciated. Rolling, dissected plains with ephemeral or intermittent streams.	3250-3625/ 100-200	Quaternary alluvium along channels. Primarily Cretaceous Pierre Shale.	Vertisols (Haplusterts),Entisols (Ustorthents)	Winler, Lismas, Swanboy. Clayey	Mesic/ Ustic, Aridic	13-16	120	4/28; 56/88	Wheatgrass–needlegrass; riparian woodland absent from draws and stream corridors.	Sheep and cattle ranching. Very sparse vegetative cover. Needs careful management to avoid soil erosion by wind.
43l. Missouri Breaks Woodland–Scrubland	3200	Very highly dissected badland terrain that descends to the Missouri River is characterized by steep slopes and is ordinarily covered with woodland or scrubland.	2250-4000/ 200-750	Cretaceous Bearpaw Shale, Hell Creek Formation, Judith River Formation, Colorado Group, and Claggett Formation. Rock outcrops.	Entisols (Ustorthents), Vertisols (Haplusterts), Inceptisols (Ustochrepts)	Neldore, Bascovy, Dilts, Cabbart, Delpoint. Erodible, clayey soils are common.	Frigid/ Ustic bordering on Aridic	11-15	90-135	4/32; 52/90	Scrub ponderosa pine–Rocky Mountain juniper woodland, Douglas-fir (on north facing slopes), grassland, and shrubland.	Lightly and partially grazed. Breaks, wooded draws, and slopes provide wildlife habitat. Some irrigated farmland near the Missouri River.
43m. Judith Basin Grassland	2982	Unglaciated. Nonforested benches, plains, and foothills are characteristic.	3400-5700/ 175-1000	Extensive Quaternary terrace deposits; also Cretaceous Bearpaw Shale, Colorado Group, Hell Creek Formation, Judith River Formation, Claggett Formation.	Inceptisols (Ustochrepts), Entisols (Ustorthents), Mollisols (Argiborolls, Haploborolls, Calciborolls)	Crago, Musselshell, Yawdim, Orinoco, Amherst, Doney, Winifred, Windham, Tamaneen, Judith, Roy, Utica, Danvers, Utica, Savage, Maginnis, Absarokee	Frigid/ Ustic	12-16	90-135	8/34; 44/88	Grama–needlegrass–wheatgrass and foothills prairie.	Dryland farming and rangeland. Better sites on undissected terrain are mostly used for grain farms; other areas of native grassland are very productive rangeland. Precipitation, soil productivity, grass density, and carrying capacity are lower to the south of the Big and Little Snowy mountains than north.
43n. Montana Central Grasslands	22917	Unglaciated. Dissected, rolling plains are studded with buttes. Areas of gravel and clinker capping locally affect physiography; scattered salt flats also occur. Streams are usually ephemeral or intermittent and impoundments occur locally. Sheetwash and gully erosion are pronounced in some places.	2200-5000/ 125-600	Quaternary terrace deposits and, along channels, alluvium. Primarily, Tullock, Lebo, Tongue River, Ludlow, and Slope members of the Tertiary Fort Union Formations; also the Cretaceous Lance Formation, Hell Creek Formation, Niobrara Formation, Carlile Shale, Pierre Shale, Colorado Group.	Entisols (Torriorthents, Ustorthents), Aridisols (Camborthids, Haplargids), Inceptisols (Ustochrepts), Mollisols (Haploborolls, Argiborolls), Vertisols (Haplusterts, Chromusterts), Alfisols (Natrustalfs)	Midway, Remmit, Ringling, Cabba, Cabbart, Lisam, Lonna, Yamacall, Degrand, Delpoint, Kremlin, Cambeth, Thedalund, Cherry, Busby, Keiser, Pierre, Lismas, Kyle, Doney, Reeder, Bainville, Abor, Keiser, Thebo, Neldore, Wanetta, Twilight, Evanston, Absarokee, Gerdrum, Doney, Winifred	Frigid/ Ustic, Aridic	10-16	100-135	0/36; 56/90. Chinook frequency is 150-200 per 100 years in the northwest, 100-150 per 100 years in the north, and 100 per 100 years elsewhere	Grama–needlegrass–wheatgrass.	Primarily rangeland. Farming is much less common than in Ecoregion 43m but irrigated and unirrigated farms do occur especially near the Yellowstone River. Coal mining occurs near Colstrip. Local oil production.
43o. Unglaciated Montana High Plains	3776	Unglaciated. High plains that become hilly toward mountains. High winds can affect much of the area and are an erosion threat. Undrained basins and deflation hollows occur locally and contain seasonal or permanent wetlands and lakes that are refuges for wildlife.	3600-5650/ 125-600	Tertiary - Cretaceous shale, siltstone, and sandstone. The shale is slowly-permeable; it is prone to both surface runoff and dissection if vegetal cover is sparse. Wells drilled into the shale often have low yields of poor quality water. Sandstone aquifers can produce adequate amounts of ground water for both domestic and stock purposes but insufficient amounts for irrigation.	Mollisols (Argiborolls, Argiustolls), Entisols (Torriorthents, Ustorthents), Alfisols (Eutroboralfs), Aridisols (Haplargids, Aquisalids), Vertisols (Endoaquerts),Inceptisols (Ustochrepts)	Tanna, Rentsac, Bonfri, Cushman, Bainville, Wormser, Lavina, Yawdim, Cabbart, Delpoint, Bainville, Travessilla, Absarokee, Work, Sinnigam. In poorly drained, saline rich, closed basins: Lardell, McKenzie	Frigid/ Ustic, Aridic	12-15	90-130	6/36; 48/90	Mostly grama–needlegrass–wheatgrass; also foothills prairie.	Rangeland and farmland.
43p. Pine Scoria Hills	5258	Unglaciated. Rugged, broken land and stony rough hills.	2600-5200/ 250-1000	Quaternary alluvium along channels. Chiefly sandstone, shale, coal, and clinker of the Tongue River Member of the Tertiary Fort Union Formation; also Tullock Member of the Tertiary Fort Union Formation, Tertiary Wasatch Formation, and the Cretaceous Lance and Hell Creek formations. Rock outcrops.	Entisols (Torriorthents, Ustorthents), Mollisols (Haploborolls), Aridisols (Haplocalcids), Alfisols (Eutroboralfs), Inceptisols (Ustochrepts)	Thedalund, Clapper, Searing Ringling, Cabba, Campspass, Barvon, Midway, Wayden, Delpoint, Yamacall, Cabbart, Bainville, Shambo, Bitton, Birney, Lamedeer, Ringling, Yawdim	Frigid, Mesic/ Aridic, Ustic	12-19	90-120	6/36; 50/88	Eastern ponderosa forest and pine–savannah with extensive patches of grassland.	Logging, grazing, and scattered coal mining. Grazing use is limited by the rough topography and lack of stock watering facilities. Open forest areas have a heavy understory of grasses and are found, especially, in higher, more rugged areas.
43q. Mesic Dissected Plains	850	Unglaciated. Dissected, rolling plains.	3400-5000/ 120-600	Quaternary alluvium along channels. Chiefly, Tertiary Wasatch Formation and the Tertiary Tongue River Member of the Fort Union Formation.	Entisols (Torriorthents, Ustorthents), Vertisols (Haplusterts), Mollisols (Argiborolls)	Thedalund, Kyle, Midway, Wibaux, Wayden, Regent	Mesic/ Ustic	13-18	100-110	6/36; 52/88	Grama–needlegrass–wheatgrass.	Mostly rangeland.
43s. Non-calcareous Foothill Grassland	6511	Mostly treeless foothills with scattered buttes. Perennial streams issue from mountains.	Mostly 4000-7000/ 150-2000	Quaternary alluvium and colluvium. A variety of mostly non-carbonate rocks including Tertiary water laid volcanic material of the Livingston Formation, Tertiary clay, shale, and sandstone of the Fort Union Formation, Cretaceous sandstone and shale of the Montana Group, Cretaceous shale of the Colorado Group, and Cretaceous sandstone of the Judith River Formation.	Mollisols (Argiustolls, Haplustolls), Entisols (Ustorthents)	Absarokee, Castner, Cabba, Hilger, Work, Big Timber, Sweetgrass, Wayden, Fairfield, Timberg, Norbert, Borky, Winifred	Frigid/ Ustic, Aridic	12-22	70-135	8/36; 46/88. 150-200 chinooks per 100 years. Near Crazy Mountains: 200+ chinooks per 100 years.	Mostly foothills prairies composed of wheatgrasses and fescues. Shrub- and tree- covered canyons often descend into Ecoregion 43s from adjacent high mountains.	Grazing. Ranches are common.
43t. Shield–Smith Valleys	1714	Broad, mostly treeless, intermontane valleys and hills.	4500-7300/ 175-2000	Quaternary alluvium. Late-Cretaceous water-laid volcanics of the Livingston Formation and undifferentiated Tertiary sedimentary rocks; also Mesozoic and Paleozoic sedimentary rocks, and Precambrian Belt rocks.	Mollisols (Haploborolls, Argiborolls, Calciborolls, Cryoborolls), Inceptisols (Ustochrepts)	Castner, Savage, Sweetgrass, Regent, Chama, Coben, Work, Big Timber, Martinsdale, Owen Creek, Fairfield, Reeder, Ashlo, Musselshell, Cetrack, Prospect, Crago, Bridger, Anaconda	Cryic, Frigid/ Ustic, Aridic	12-20	70-110	4/34; 48/86	Mostly sagebrush steppe. In the Paradise Valley: foothills prairie and/or sagebrush steppe.	Livestock grazing; also some agriculture. Recreational, rural residential, and commercial activity occur.
43u. Limy Foothill Grassland	1254	Largely treeless foothills with mountain-fed streams that are underlain by carbonate-rich rocks which affect stream water quality and aquatic biota.	4000-7800/ 200-2800	Mesozoic and Paleozoic sedimentary rocks that include carbonates; also some intrusions of Tertiary igneous rock.	Mollisols (Cryoborolls, Argiborolls, Haploborolls), Inceptisols (Cryochrepts, Ustochrepts), Alfisols (Haplustalfs)	Libeg, Monad, Hanson, Scravo, Thess, Amesha, Cheadle, Darret, Fergus, Teton, Skaggs, Trapps, Whitore, Castner, Whitecow, Doney, Reeder	Frigid, Cryic/ Udic, Ustic, Aridic	10-20	70-120	6/32; 46/84	Foothills prairie.	Grazing. Ranches are common. Gravel quarrying occurs.
43v. Pryor–Big Horn Foothills	1975	Semiarid, largely treeless, dissected, sedimentary foothills and high benches. Streams often originate in adjacent carbonate-rich mountains which strongly affects their water quality and aquatic biota.	3200-6600/ 75-1400	Quaternary alluvium and colluvium. Paleozoic and Mesozoic carbonate-rich sedimentary rock (Pennsylvanian Tensleep and Amsden formations, Jurassic Swift, Rierdon, and Piper formations), Triassic and Jurassic undifferentiated rock, and various Cretaceous sedimentary units.	Entisols (Ustorthents, Torriorthents), Mollisols (Argiborolls, Calciborolls, Haploborolls, Natriborolls), Aridisols (Haplocalcids)	Wayden, Xavier, Belfield, Lap, Armington, Harvey, Danvers, Judith, Spearfish, Pultney, Stormitt, Wayden, Castner, Absarokee, Maginnis, Midway, Travessilla, Hilger, Castner	Frigid/ Ustic	10-19	70-100	8/36; 44/88	Foothills prairie. Shrub and tree covered canyons descend into Ecoregion 16i from the Pryor and Big Horn mountains.	Grazing and ranches are common.

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