

PRIMARY DISTINGUISHING CHARACTERISTICS OF LEVEL III ECOREGIONS OF THE CONTINENTAL UNITED STATES

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1. COAST RANGE

The low mountains of the Coast Range are covered by highly productive, rain-drenched coniferous forests. Sitka spruce forests originally dominated the fog-shrouded coast, while a mosaic of western redcedar, western hemlock, and seral Douglas-fir blanketed inland areas. Today, Douglas-fir plantations are prevalent on the intensively logged and managed landscape. In California, redwood forests are a dominant component in much of the region.

2. PUGET LOWLANDS

This broad rolling lowland is characterized by a mild maritime climate. It occupies a continental glacial trough and is composed of many islands, peninsulas, and bays in the Puget Sound area. Coniferous forests originally grew on the ecoregion's ground moraines, outwash plains, floodplains, and terraces. The distribution of forest species is affected by the rainshadow from the Olympic Mountains.

3. WILLAMETTE VALLEY

Ecoregion 3 contains terraces and floodplains of the Willamette River system, along with scattered hills, buttes, and adjacent foothills. Originally, it was covered by prairies, oak savannas, coniferous forests, extensive wetlands, and deciduous riparian forests. Elevation and relief are lower and the vegetation mosaic differs from the coniferous forests of the surrounding Coast Range (1), Cascades (4), and Klamath Mountains (78). Mean annual rainfall is 37 to 60 inches and summers are generally dry; overall, precipitation is lower than in the surrounding mountains. Today, the Willamette Valley contains the bulk of Oregon's population, industry, commerce, and cropland. Productive soils and a temperate climate make it one of the most important agricultural areas in Oregon.

4. CASCADES

This mountainous ecoregion is underlain by Cenozoic volcanics and much of the region has been affected by alpine glaciation. It is characterized by steep ridges and river valleys in the west, a high plateau in the east, and both active and dormant volcanoes. Elevations range upwards to 14,411 feet. Its moist, temperate climate supports an extensive and highly productive coniferous forest that is intensively managed for logging. Subalpine meadows and rocky alpine zones occur at high elevations.

5. SIERRA NEVADA

The Sierra Nevada is a deeply dissected fault-block mountain range that rises sharply from the arid basin and range ecoregions on the east and slopes gently toward the Central California Valley to the west. The eastern portion has been strongly glaciated and generally contains higher mountains than are found in the Klamath Mountains (78) to the northwest. Much of the central and southern parts of the region is underlain by granite as compared to the mostly sedimentary and metamorphic formations of the Klamath Mountains and the volcanic rocks of the Cascades (4). The higher elevations of this region are largely federally owned and include several national parks. The vegetation grades from mostly ponderosa pine and Douglas-fir at the lower elevations on the west side, pines and Sierra juniper on the east side, to fir and other conifers at the higher elevations. Alpine conditions exist at the highest elevations.

6. SOUTHERN AND CENTRAL CALIFORNIA CHAPARRAL AND OAK WOODLANDS

The primary distinguishing characteristic of this ecoregion is its Mediterranean climate of hot dry summers and cool moist winters, and associated vegetative cover comprising mainly chaparral and oak woodlands; grasslands occur in some lower elevations and patches of pine are found at higher elevations. Most of the region consists of open low mountains or foothills, but there are areas of irregular plains in the south and near the border of the adjacent Central California Valley ecoregion. Large parts of the region are grazed by domestic livestock; relatively little land has been cultivated, although some valleys are or were important agricultural centers.

7. CENTRAL CALIFORNIA VALLEY

Flat, intensively farmed plains having long, hot dry summers and mild winters distinguish the Central California Valley from its neighboring ecoregions that are either hilly or mountainous, forest or shrub covered, and generally nonagricultural. Nearly half of the region is in cropland, about three fourths of which is irrigated. Environmental concerns in the region include salinity due to evaporation of irrigation water, groundwater contamination from heavy use of agricultural chemicals, wildlife habitat loss, and urban sprawl.

8. SOUTHERN CALIFORNIA MOUNTAINS

Like the other ecoregions in central and southern California, the Southern California Mountains has a Mediterranean climate of hot dry summers and moist cool winters. Although Mediterranean types of vegetation such as chaparral and oak woodlands predominate in this region, the elevations are considerably higher, the summers are slightly cooler, and precipitation amounts are greater than in adjacent ecoregions, resulting in denser vegetation and some large areas of coniferous woodlands. Severe erosion problems are common where the vegetation cover has been destroyed by fire or overgrazing.

9. EASTERN CASCADE SLOPES AND FOOTHILLS

The Eastern Cascade Slopes and Foothills ecoregion is in the rainshadow of the Cascade Range. It experiences greater temperature extremes and receives less precipitation than ecoregions to the west. Open forests of ponderosa pine and some lodgepole pine distinguish this region from the higher ecoregions to the west where fir and hemlock forests are common, and the lower dryer ecoregions to the east where shrubs and grasslands are predominant. The vegetation is adapted to the prevailing dry continental climate and is highly susceptible to wildfire. Historically, creeping ground fires consumed accumulated fuel, and devastating crown fires were less common in dry forests. Volcanic cones and buttes are common in much of the region.

10. COLUMBIA PLATEAU

The Columbia Plateau is an arid sagebrush steppe and grassland, surrounded on all sides by moister, predominantly forested, mountainous ecological regions. This region is underlain by basalt up to two miles thick. It is covered in some places by loess soils that have been extensively cultivated for wheat, particularly in the eastern portions of the region where precipitation amounts are greater. During the glaciation of the Pleistocene era, parts of the area were scoured to bedrock by huge floods from breached ice dams.

11. BLUE MOUNTAINS

The Blue Mountains ecoregion is a complex of mountain ranges that are generally lower and more open than the neighboring Cascades (4), Northern Rockies (15), and the Idaho Batholith (16) ecoregions. Like the Cascades, but unlike the Northern Rockies, the region is mostly volcanic in origin. Only the few higher ranges, particularly the Wallowa and Elkhorn Mountains, consist of granitic intrusive and metamorphic rocks that rise above the dissected lava surface of the region. Unlike the bulk of the Cascades, Idaho Batholith, and Northern Rockies, much of this ecoregion is grazed by cattle.

12. SNAKE RIVER PLAIN

This portion of the xeric intermontane western United States is considerably lower and more gently sloping than the surrounding ecoregions. Mostly because of the available water for irrigation, a large percent of the alluvial valleys bordering the Snake River are in agriculture, with sugar beets, potatoes, alfalfa, and vegetables being the principal crops. Cattle feedlots and dairy operations are also common in the river plain. Except for the scattered barren lava fields, most of the plains and low hills in the ecoregion have a sagebrush-grassland vegetation, now used mostly for cattle grazing.

13. CENTRAL BASIN AND RANGE

The Central Basin and Range ecoregion is internally drained and is characterized by a mosaic of xeric basins, scattered low and high mountains, and salt flats. It has a hotter and drier climate, more shrubland, and more mountain ranges than the Northern Basin and Range (80) ecoregion to the north. Basins are covered by Great Basin sagebrush or saltbush-greasewood vegetation that grow in Aridisols; cool season grasses are less common than in the Mollisols of the Snake River Plain (12) and Northern Basin and

Range. The region is not as hot as the Mojave Basin and Range (14) ecoregion to the south and it has a greater percent of land that is grazed.

14. MOJAVE BASIN AND RANGE

This ecoregion contains broad basins and scattered mountains that are generally lower, warmer, and drier, than those of the Central Basin and Range (13). Its creosote bush-dominated shrub community is distinct from the saltbush–greasewood and sagebrush–grass associations that occur to the north in the Central Basin and Range (13) and Northern Basin and Range (80); it also differs from the palo verde–cactus shrub and saguaro cactus that occur in the Sonoran Basin and Range (81) to the south. Most of this region is federally owned and grazing is constrained by the lack of water and forage for livestock. Heavy use of off-road vehicles and motorcycles in some areas has made the soils susceptible to wind and water erosion.

15. NORTHERN ROCKIES

The Northern Rockies ecoregion is mountainous and rugged. Despite its inland position, climate and vegetation are, typically, marine-influenced. Douglas-fir, subalpine fir, Englemann spruce, and ponderosa pine and Pacific indicators such as western red cedar, western hemlock, and grand fir are found in the ecoregion. The vegetation mosaic is different from that of the Idaho Batholith (16) and Middle Rockies (17) which are not dominated by maritime species. The Northern Rockies ecoregion is not as high nor as snow- and ice-covered as the Canadian Rockies (41) although alpine characteristics occur at highest elevations and include numerous glacial lakes. Granitics and associated management problems are less extensive than in the Idaho Batholith.

16. IDAHO BATHOLITH

This ecoregion is a dissected, partially glaciated, mountainous plateau. Many perennial streams originate here and water quality can be high if basins are undisturbed. Deeply weathered, acidic, intrusive igneous rock is common and is far more extensive than in the Northern Rockies (15) or the Middle Rockies (17). Soils are sensitive to disturbance especially when stabilizing vegetation is removed. Land uses include logging, grazing, and recreation. Mining and related damage to aquatic habitat was widespread. Grand fir, Douglas-fir, and, at higher elevations, Engelmann spruce and subalpine fir occur. Ponderosa pine, shrubs, and grasses grow in very deep canyons. Maritime influence lessens toward the south and is never as strong as in the Northern Rockies.

17. MIDDLE ROCKIES

The climate of the Middle Rockies lacks the strong maritime influence of the Northern Rockies (15). Mountains have Douglas-fir, subalpine fir, and Engelmann spruce forests, as well as some large alpine areas. Pacific tree species are never dominant and forests can have open canopies. Foothills are partly wooded or shrub- and grass-covered. Intermontane valleys are grass- and/or shrub-covered and contain a mosaic of terrestrial and aquatic fauna that is distinct from the nearby mountains. Many mountain-fed, perennial streams occur and differentiate the intermontane valleys from the Northwestern Great Plains (43). Granitics and associated management problems are less extensive than in the Idaho Batholith (16). Recreation, logging, mining, and summer livestock grazing are common land uses.

18. WYOMING BASIN

This ecoregion is a broad intermontane basin interrupted by hills and low mountains and dominated by arid grasslands and shrublands. Nearly surrounded by forest covered mountains, the region is somewhat drier than the Northwestern Great Plains (43) to the northeast and does not have the extensive cover of pinyon-juniper woodland found in the Colorado Plateaus (20) to the south. Much of the region is used for livestock grazing, although many areas lack sufficient vegetation to support this activity. The region contains major producing natural gas and petroleum fields. The Wyoming Basin also has extensive coal deposits along with areas of trona, bentonite, clay, and uranium mining.

19. WASATCH AND UINTA MOUNTAINS

This ecoregion is composed of a core area of high, precipitous mountains with narrow crests and valleys flanked in some areas by dissected plateaus and open high mountains. The elevational banding pattern of vegetation is similar to that of the Southern Rockies (21) except that areas of aspen, interior chaparral, and juniper-pinyon and scrub oak are more common at middle elevations. This characteristic, along with

a far lesser extent of lodgepole pine and greater use of the region for grazing livestock in the summer months, distinguish the Wasatch and Uinta Mountains ecoregion from the more northerly Middle Rockies (17).

20. COLORADO PLATEAUS

Ecoregion 20 is an uplifted, eroded, and deeply dissected tableland. Its benches, mesas, buttes, salt valleys, cliffs, and canyons are formed in and underlain by thick layers of sedimentary rock. Precipitous side-walls mark abrupt changes in local relief, often from 1,000 to 2,000 feet. The region contains a greater extent of pinyon-juniper and Gambel oak woodlands than the Wyoming Basin (18) to the north. There are also large low lying areas containing saltbrush-greasewood (typical of hotter drier areas), which are generally not found in the higher Arizona/New Mexico Plateau (22) to the south where grasslands are common. Summer moisture from thunderstorms supports warm season grasses not found in the Central Basin and Range (13) to the west. Many endemic plants occur and species diversity is greater than in Ecoregion 13. Several national parks are located in this ecoregion and attract many visitors to view their arches, spires, and canyons.

21. SOUTHERN ROCKIES

The Southern Rockies are composed of steep, rugged mountains with high elevations. Although coniferous forests cover much of the region, as in most of the mountainous regions in the western United States, vegetation, as well as soil and land use, follows a pattern of elevational banding. The lowest elevations are generally grass or shrub covered and heavily grazed. Low to middle elevations are also grazed and covered by a variety of vegetation types including Douglas-fir, ponderosa pine, aspen, and juniper-oak woodlands. Middle to high elevations are largely covered by coniferous forests and have little grazing activity. The highest elevations have alpine characteristics.

22. ARIZONA/NEW MEXICO PLATEAU

The Arizona/New Mexico Plateau represents a large transitional region between the semiarid grasslands and low relief tablelands of the Southwestern Tablelands (26) in the east, the drier shrublands and woodland covered higher relief tablelands of the Colorado Plateau (20) in the north, and the lower, hotter, less vegetated Mojave Basin and Range (14) in the west and Chihuahuan Deserts (24) in the southeast. Higher, forest-covered, mountainous ecoregions border the region on the northeast (21) and south (23). Local relief in the region varies from a few feet on plains and mesa tops to well over 1000 feet along tableland side slopes.

23. ARIZONA/NEW MEXICO MOUNTAINS

The Arizona/New Mexico Mountains are distinguished from neighboring mountainous ecoregions by their lower elevations and an associated vegetation indicative of drier, warmer environments, which is due in part to the region's more southerly location. Forests of spruce, fir, and Douglas-fir, that are common in the Southern Rockies (21) and the Uinta and Wasatch Mountains (19), are only found in a few high elevation parts of this region. Chaparral is common on the lower elevations, pinyon-juniper and oak woodlands are found on lower and middle elevations, and the higher elevations are mostly covered with open to dense ponderosa pine forests. These mountains are the northern extent of some Mexican plant and animal species.

24. CHIHUAHUAN DESERTS

This desert ecoregion extends from the Madrean Archipelago (79) in southeastern Arizona to the Edwards Plateau (30) in south-central Texas. The physiography is generally a continuation of basin and range terrain that is typical of the Mojave Basin and Range (14) and the Central Basin and Range (13) to the west and northwest, although the patterns of alternating mountains and valleys is not as pronounced as in Ecoregions 13 and 14. Vegetative cover is predominantly desert grassland and shrubland, except on the higher mountains where oak, juniper, and pinyon woodlands occur. The extent of desert shrubland is increasing across lowlands and mountain foothills due to the gradual desertification caused in part by historical grazing pressure.

25. HIGH PLAINS

Higher and drier than the Central Great Plains (27) to the east, and in contrast to the irregular, mostly grassland or grazing land of the Northwestern Great Plains (43) to the north, much of the High Plains is

characterized by smooth to slightly irregular plains having a high percentage of cropland. Grama-buffalo grass is the potential natural vegetation in this region as compared to mostly wheatgrass-needlegrass to the north, Trans-Pecos shrub savanna to the south, and taller grasses to the east. The northern boundary of this ecological region is also the approximate northern limit of winter wheat and sorghum and the southern limit of spring wheat.

26. SOUTHWESTERN TABLELANDS

The southwestern Tablelands flank the High Plains (25) with red hued canyons, mesas, badlands, and dissected river breaks. Unlike most adjacent Great Plains ecological regions, little of the Southwestern Tablelands is in cropland. Much of this region is in sub-humid grassland and semiarid range land. The potential natural vegetation is grama-buffalo grass with some mesquite-buffalo grass in the southeast, juniper-scrub oak-midgrass savanna on escarpment bluffs, and shinnery (midgrass prairie with open low and shrubs) along the Canadian River.

27. CENTRAL GREAT PLAINS

The Central Great Plains are slightly lower, receive more precipitation, and are somewhat more irregular than the High Plains (25) to the west. Once a grassland, with scattered low trees and shrubs in the south, much of this ecological region is now cropland, the eastern boundary of the region marking the eastern limits of the major winter wheat growing area of the United States. Subsurface salt deposits and leaching contribute to high salinity found in some streams.

28. FLINT HILLS

The Flint Hills is a region of rolling hills with relatively narrow steep valleys, and is composed of shale and cherty limestone with rocky soils. In contrast to surrounding ecological regions that are mostly in cropland, most of the Flint Hills region is grazed by beef cattle. The Flint Hills mark the western edge of the tallgrass prairie, and contain the largest remaining intact tallgrass prairie in the Great Plains.

29. CROSS TIMBERS

The Cross Timbers ecoregion is a transition area between the once prairie, now winter wheat growing regions to the west, and the forested low mountains or hills of eastern Oklahoma and Texas. The region does not possess the arability and suitability for crops such as corn and soybeans that are common in the Central Irregular Plains (40) to the northeast. Transitional "cross-timbers" (little bluestem grassland with scattered blackjack oak and post oak trees) is the native vegetation, and presently rangeland and pastureland comprise the predominant land cover, with some areas of woodland. Oil extraction has been a major activity in this region for over eighty years.

30. EDWARDS PLATEAU

This ecoregion is largely a dissected limestone plateau that is hillier in the south and east where it is easily distinguished from bordering ecological regions by a sharp fault line. The region contains a sparse network of perennial streams, but due to karst topography and resultant underground drainage they are relatively clear and cool compared to those of surrounding areas. Originally covered by juniper-oak savanna and mesquite-oak savanna, most of the region is used for grazing beef cattle, sheep, goats, and wildlife. Hunting leases are a major source of income.

31. SOUTHERN TEXAS PLAINS

This rolling to moderately dissected plain was once covered with grassland and savanna vegetation that varied during wet and dry cycles. Following long continued grazing and fire suppression, thorny brush, such as mesquite, is now the predominant vegetation type. Also known as the Tamualipan Thornscrub, or the "brush country", as it is called locally, the subhumid to dry region has its greatest extent in Mexico. It is generally lower in elevation with warmer winters than the Chihuahuan Deserts (24) to the northwest, and it contains a high and distinct diversity of plant and animal life. Oil and natural gas production activities are widespread.

32. TEXAS BLACKLAND PRAIRIES

The Texas Blackland Prairies form a disjunct ecological region, distinguished from surrounding regions by its fine-textured, clayey soils and predominantly prairie potential natural vegetation. This region now

contains a higher percentage of cropland than adjacent regions, and pasture and forage production for livestock is common. Large areas of the region are being converted to urban and industrial uses.

33. EAST CENTRAL TEXAS PLAINS

Also called the Post Oak Savanna or the Claypan Area, this region of irregular plains was originally covered by post oak savanna vegetation, in contrast to the more open prairie-type regions to the north, south, and west and the pine forests to the east. The boundary with Ecoregion 35 is a subtle transition of soils and vegetation. Many areas have a dense, underlying clay pan affecting water movement and available moisture for plant growth. The bulk of this region is now used for pasture and range.

34. WESTERN GULF COASTAL PLAIN

The principal distinguishing characteristics of the Western Gulf Coastal Plain are its relatively flat coastal plain topography and mainly grassland potential natural vegetation. Inland from this region the plains are older, more irregular, and have mostly forest or savanna-type vegetation potentials. Largely because of these characteristics, a higher percentage of the land is in cropland than in bordering ecological regions. Urban and industrial land uses have expanded greatly in recent decades, and oil and gas production is common.

35. SOUTH CENTRAL PLAINS

Locally termed the "piney woods", this region of mostly irregular plains represents the western edge of the southern coniferous forest belt. Once blanketed by a mix of pine and hardwood forests, much of the region is now in loblolly and shortleaf pine plantations. Only about one sixth of the region is in cropland, primarily within the Red River floodplain, while about two thirds of the region is in forests and woodland. Lumber, pulpwood, oil and gas production are major economic activities.

36. OUACHITA MOUNTAINS

The Ouachita Mountains ecological region is made up of sharply defined east-west trending ridges, formed through erosion of compressed sedimentary rock formations. The Ouachitas are structurally different from the Boston Mountains (38), more folded and rugged than the lithologically distinct Ozark Highlands (39), and physiographically unlike the Arkansas Valley (37), South Central Plains (35), and Mississippi Alluvial Plain (73). Potential natural vegetation is oak-hickory-pine forest, which contrasts with the oak-hickory forest that dominates Ecoregion 39 and the northern part of the Boston Mountains (38). Most of this region is now in loblolly and shortleaf pine. Commercial logging is the major land use in the region.

37. ARKANSAS VALLEY

A region of mostly forested valleys and ridges, the physiography of the Arkansas Valley is much less irregular than that of the Boston Mountains (38) to the north and the Ouachita Mountains (36) to the south, but is more irregular than the ecological regions to the west and east. About one fourth of the region is grazed and roughly one tenth is cropland. In the Arkansas Valley, even streams that have been relatively unimpacted by human activities have considerably lower dissolved oxygen levels, and hence support different biological communities, than those of most of the adjacent regions.

38. BOSTON MOUNTAINS

In contrast to the nearby Ouachita Mountains (36) region which comprises folded and faulted linear ridges mostly covered by pine forests, the Boston Mountains ecological region consists of a deeply dissected sandstone and shale plateau, originally covered by oak-hickory forests. Red oak, white oak, and hickory remain the dominant vegetation types in this region, although shortleaf pine and eastern red cedar are found in many of the lower areas and on some south- and west-facing slopes. The region is sparsely populated and recreation is a principal land use.

39. OZARK HIGHLANDS

The Ozark Highlands ecoregion has a more irregular physiography and is generally more forested than adjacent regions, with the exception of the Boston Mountains (38) to the south. Soils are mostly derived from cherty carbonate rocks. Cambrian and Ordovician dolomite and sandstone comprise the dominant bedrock in the interior of the region with Mississippian limestone underlying the western outer regions. Karst features, including caves, springs, and spring-fed streams are found throughout most of the Ozark

Highlands. The majority of the region is forested; oak is the predominant forest type but mixed stands of oak and pine are also common, with pine concentrations greatest to the southeast. Less than one fourth of the core of this region has been cleared for pasture and cropland, but half or more of the periphery, while not as agricultural as bordering ecological regions, is in cropland and pasture.

40. CENTRAL IRREGULAR PLAINS

The Central Irregular Plains have a mix of land use and are topographically more irregular than the Western Corn Belt Plains (47) to the north, where most of the land is in crops. The region, however, is less irregular and less forest covered than the ecoregions to the south and east. The potential natural vegetation of this ecological region is a grassland/forest mosaic with wider forested strips along the streams compared to Ecoregion 47 to the north. The mix of land use activities in the Central Irregular Plains includes mining operations of high-sulfur bituminous coal. The disturbance of these coal strata in southern Iowa and northern Missouri has degraded water quality and affected aquatic biota.

41. CANADIAN ROCKIES

As its name indicates, most of this region is located in Canada. It straddles the border between Alberta and British Columbia in Canada and extends southeastward into northwestern Montana. The region is generally higher and more ice-covered than the Northern Rockies, and portions are strongly influenced by moist maritime air masses. Vegetation is mostly Douglas-fir, Engelmann spruce, subalpine fir, and lodgepole pine in the forested elevations, with treeless alpine conditions at higher elevations. A large part of the region is in national parks where tourism is the major land use. Forestry and mining occur on the nonpark lands.

42. NORTHWESTERN GLACIATED PLAINS

The Northwestern Glaciated Plains ecoregion is a transitional region between the generally more level, moister, more agricultural Northern Glaciated Plains (46) to the east and the generally more irregular, dryer, Northwestern Great Plains (43) to the west and southwest. The western and southwestern boundary roughly coincides with the limits of continental glaciation. Pocking this ecoregion is a moderately high concentration of semi-permanent and seasonal wetlands, locally referred to as Prairie Potholes.

43. NORTHWESTERN GREAT PLAINS

The Northwestern Great Plains ecoregion encompasses the Missouri Plateau section of the Great Plains that is mostly unglaciated. It is a semiarid rolling plain of shale, siltstone, and sandstone punctuated by occasional buttes and badlands. Rangeland is common, but spring wheat and alfalfa farming also occur; native grasslands, persist in areas of steep or broken topography. Agriculture is restricted by the erratic precipitation and limited opportunities for irrigation.

44. NEBRASKA SANDHILLS

The Nebraska Sandhills comprise one of the most distinct and homogenous ecoregions in North America. One of the largest areas of grass stabilized sand dunes in the world, this region is generally devoid of cropland agriculture, and except for some riparian areas in the north and east, the region is treeless. Large portions of this ecoregion contain numerous lakes and wetlands and have a lack of streams. The area is sparsely populated; however, large cattle ranches are found throughout the region.

45. PIEDMONT

Considered the nonmountainous portion of the old Appalachians Highland by physiographers, the northeast-southwest trending Piedmont ecoregion comprises a transitional area between the mostly mountainous ecoregions of the Appalachians to the northwest and the relatively flat coastal plain to the southeast. It is a complex mosaic of Precambrian and Paleozoic metamorphic and igneous rocks, with moderately dissected irregular plains and some hills. The soils tend to be finer-textured than in coastal plain regions (63, 65). Once largely cultivated, much of this region has reverted to successional pine and hardwood woodlands, with an increasing conversion to an urban and suburban land cover.

46. NORTHERN GLACIATED PLAINS

The Northern Glaciated Plains ecoregion is characterized by a flat to gently rolling landscape composed of glacial drift. The subhumid conditions foster a grassland transitional between tall and shortgrass

prairie. High concentrations of temporary and seasonal wetlands create favorable conditions for waterfowl nesting and migration. Although the till soils are very fertile, agricultural success is subject to annual climatic fluctuations.

47. WESTERN CORN BELT PLAINS

Once mostly covered with tallgrass prairie, over 80 percent of the Western Corn Belt Plains is now used for cropland agriculture and much of the remainder is in forage for livestock. A combination of nearly level to gently rolling glaciated till plains and hilly loess plains, an average annual precipitation of 26 to 37 inches, which occurs mainly in the growing season, and fertile, warm, moist soils make this one of the most productive areas of corn and soybeans in the world. Agricultural practices have contributed to environmental issues, including surface and groundwater contamination from fertilizer and pesticide applications as well as concentrated livestock production.

48. LAKE AGASSIZ PLAIN

Glacial Lake Agassiz was the last in a series of proglacial lakes to fill the Red River valley in the three million years since the beginning of the Pleistocene. Thick beds of lake sediments on top of glacial till create the extremely flat floor of the Lake Agassiz Plain. The historic tallgrass prairie has been replaced by intensive row crop agriculture. The preferred crops in the northern half of the region are potatoes, beans, sugar beets, and wheat; soybeans, sugar beets, and corn predominate in the south.

49. NORTHERN MINNESOTA WETLANDS

Much of the Northern Minnesota Wetlands is a vast and nearly level marsh that is sparsely inhabited by humans and covered by swamp and boreal forest vegetation. Formerly occupied by broad glacial lakes, most of the flat terrain in this ecoregion is still covered by standing water.

50. NORTHERN LAKES AND FORESTS

The Northern Lakes and Forests is a region of relatively nutrient-poor glacial soils, coniferous and northern hardwood forests, undulating till plains, morainal hills, broad lacustrine basins, and extensive sandy outwash plains. Soils in this ecoregion are thicker than in those to the north and generally lack the arability of soils in adjacent ecoregions to the south. The numerous lakes that dot the landscape are clearer and less productive than those in ecoregions to the south.

51. NORTH CENTRAL HARDWOOD FORESTS

The North Central Hardwood Forests ecoregion is transitional between the predominantly forested Northern Lakes and Forests (50) to the north and the agricultural ecoregions to the south. Land use/land cover in this ecoregion consists of a mosaic forests, wetlands and lakes, cropland agriculture, pasture, and dairy operations. The growing season is generally longer and warmer than that of Ecoregion 50 and the soils are more arable and fertile, contributing to the greater agricultural component of land use. Lake trophic states tend to be higher here than in the Northern Lakes and Forests, with higher percentages in eutrophic and hypereutrophic classes.

52. DRIFTLESS AREA

The hilly uplands of the Driftless Area easily distinguish it from surrounding ecoregions. Much of the area consists of a deeply dissected, loess-capped, bedrock dominated plateau. The region is also called the Paleozoic Plateau because the landscape's appearance is a result of erosion through rock strata of Paleozoic age. Although there is evidence of glacial drift in the region, its influence on the landscape has been minor compared to adjacent ecoregions. In contrast to adjacent ecoregions, the Driftless Area has few lakes, most of which are reservoirs with generally high trophic states. Livestock and dairy farming are major land uses and have had a major impact on stream quality.

53. SOUTHEASTERN WISCONSIN TILL PLAINS

The Southeastern Wisconsin Till Plains support a mosaic of vegetation types, representing a transition between the hardwood forests and oak savannas of the ecoregions to the west and the tallgrass prairies of the Central Corn Belt Plains (54) to the south. Like Ecoregion 54, land use in the Southeastern Wisconsin Till Plains is mostly cropland, but the crops are largely forage and feed grains to support dairy operations, rather than corn and soybeans for cash crops. The ecoregion has a higher plant hardiness value and a different mosaic of soils than ecoregions to the north and west.

54. CENTRAL CORN BELT PLAINS

Extensive prairie communities intermixed with oak-hickory forests were native to the glaciated plains of the Central Corn Belt Plains; they were a stark contrast to the hardwood forests that grew on the drift plains of Ecoregions 55 and 56 to the east. Ecoregions 40 and 47 to the west were mostly treeless except along larger streams. Beginning in the nineteenth century, the natural vegetation was gradually replaced by agriculture. Farms are now extensive on the dark, fertile soils of the Central Corn Belt Plains and mainly produce corn and soybeans; cattle, sheep, poultry, and, especially hogs, are also raised, but they are not as dominant as in the drier Western Corn Belt Plains (47) to the west. Agriculture has affected stream chemistry, turbidity, and habitat.

55. EASTERN CORN BELT PLAINS

The Eastern Corn Belt Plains ecoregion is primarily a rolling till plain with local end moraines; it had more natural tree cover and has lighter colored soils than the Central Corn Belt Plains (54). The region has loamier and better drained soils than the Huron/Erie Lake Plain (57), and richer soils than the Erie Drift Plain (61). Glacial deposits of Wisconsinan age are extensive. They are not as dissected nor as leached as the pre-Wisconsinan till which is restricted to the southern part of the region. Originally, beech forests were common on Wisconsinan soils while beech forests and elm-ash swamp forests dominated the wetter pre-Wisconsinan soils. Today, extensive corn, soybean, and livestock production occurs and has affected stream chemistry and turbidity.

56. SOUTHERN MICHIGAN/NORTHERN INDIANA DRIFT PLAINS

Bordered by Lake Michigan on the west, this ecoregion is less agricultural than those (54, 55) to the south, it is better drained and contains more lakes than the flat agricultural lake plain (57) to the east, and its soils are not as nutrient poor as Ecoregion 50 to the north. The region is characterized by many lakes and marshes as well as an assortment of landforms, soil types, soil textures, and land uses. Broad till plains with thick and complex deposits of drift, paleobeach ridges, relict dunes, morainal hills, kames, drumlins, meltwater channels, and kettles occur. Oak-hickory forests, northern swamp forests, and beech forests were typical. Feed grain, soybean, and livestock farming as well as woodlots, quarries, recreational development, and urban-industrial areas are now common.

57. HURON/ERIE LAKE PLAINS

The Huron/Erie Lake Plains ecoregion is a broad, fertile, nearly flat plain punctuated by relic sand dunes, beach ridges, and end moraines. Originally, soil drainage was typically poorer than in the adjacent Eastern Corn Belt Plains (55), and elm-ash swamp and beech forests were dominant. Oak savanna was typically restricted to sandy, well-drained dunes and beach ridges. Today, most of the area has been cleared and artificially drained and contains highly productive farms producing corn, soybeans, livestock, and vegetables; urban and industrial areas are also extensive. Stream habitat and quality have been degraded by channelization, ditching, and agricultural activities.

58. NORTHEASTERN HIGHLANDS

The Northeastern Highlands cover most of the northern and mountainous parts of New England as well as the Adirondacks and higher Catskills in New York. It is a relatively sparsely populated region characterized by hills and mountains, a mostly forested land cover, nutrient-poor soils, and numerous high-gradient streams and glacial lakes. Forest vegetation is somewhat transitional between the boreal regions to the north in Canada and the broadleaf deciduous forests to the south. Typical forest types include northern hardwoods (maple-beech-birch), northern hardwoods/spuce, and northeastern spruce-fir forests. Recreation, tourism, and forestry are primary land uses. Farm-to-forest conversion began in the 19th century and continues today. In spite of this trend, alluvial valleys, glacial lake basins, and areas of limestone-derived soils are still farmed for dairy products, forage crops, apples, and potatoes. Many of the lakes and streams in this region have been acidified by sulfur depositions originating in industrialized areas upwind from the ecoregion to the west.

59. NORTHEASTERN COASTAL ZONE

Similar to the Northeastern Highlands (58), the Northeastern Coastal Zone contains relatively nutrient poor soils and concentrations of continental glacial lakes, some of which are sensitive to acidification; however, this ecoregion contains considerably less surface irregularity and much greater concentrations

of human population. Landforms in the region include irregular plains, and plains with high hills. Appalachian oak forests and northeastern oak-pine forests are the natural vegetation types. Although attempts were made to farm much of the Northeastern Coastal Zone after the region was settled by Europeans, land use now mainly consists of forests, woodlands, and urban and suburban development, with only some minor areas of pasture and cropland.

60. NORTHERN ALLEGHENY PLATEAU

The Northern Allegheny Plateau is made up of horizontally bedded, erodible shales and siltstones, and moderately resistant sandstones of Devonian age. It is generally lower and less forested than the adjacent unglaciated North Central Appalachians (62). Its rolling hills, open valleys, and low mountains are covered by till from Wisconsinan Age glaciation and the landscape is a mosaic of cropland, pastureland, and woodland. Historically, the natural vegetation was primarily Appalachian oak forest dominated by white oak and red oak, with some northern hardwood forest at higher elevations. The Northern Allegheny Plateau has more level topography and more fertile, arable land than the more rugged and forested North Central Appalachians (62).

61. ERIE DRIFT PLAIN

Once largely covered by a maple-beech-birch forest in the west and northern hardwoods in the east, much of the Erie Drift Plain is now in farms, many associated with dairy operations. The Eastern Corn Belt Plains (55), which border the region on the west, are flatter, more fertile, and therefore more agricultural. The glaciated Erie Drift Plain is characterized by low rounded hills, scattered end moraines, kettles, and areas of wetlands, in contrast to the adjacent unglaciated ecoregions (70, 62) to the south and east that are more hilly and less agricultural. Areas of urban development and industrial activity occur locally. Lake Erie's influence substantially increases the growing season, winter cloudiness, and snowfall in the northernmost areas bordering the strip of the Eastern Great Lakes Lowland (83) which fringes the lake.

62. NORTH CENTRAL APPALACHIANS

More forest-covered than most adjacent ecoregions, the North Central Appalachians ecoregion is part of a vast, elevated plateau composed of horizontally bedded sandstone, shale, siltstone, conglomerate, and coal. It is made up of plateau surfaces, high hills, and low mountains, which, unlike the ecoregions to the north and west, were largely unaffected by continental glaciation. Only a portion of the Poconos section in the east has been glaciated. Land use activities are generally tied to forestry and recreation, but some coal and natural gas extraction occurs in the west.

63. MIDDLE ATLANTIC COASTAL PLAIN

The Middle Atlantic Coastal Plain ecoregion stretches from Delaware to the South Carolina/Georgia border and consists of low elevation flat plains, with many swamps, marshes, and estuaries. Forest cover in the region, once dominated by longleaf pine in the Carolinas, is now mostly loblolly and some shortleaf pine, with patches of oak, gum, and cypress near major streams, as compared to the mainly longleaf-slash pine forests of the warmer Southern Coastal Plain (75). Its low terraces, marshes, dunes, barrier islands, and beaches are underlain by unconsolidated sediments. Poorly drained soils are common, and the region has a mix of coarse and finer textured soils compared to the mostly coarse soils in the majority of Ecoregion 75. The Middle Atlantic Coastal Plain is typically lower, flatter, more poorly drained, and more marshy than Ecoregion 65. Less cropland occurs in the southern portion of the region than in the central and northern parts.

64. NORTHERN PIEDMONT

The Northern Piedmont is a transitional region of low rounded hills, irregular plains, and open valleys in contrast to the low mountains of Ecoregions 58, 66, and 67 to the north and west and the flatter coastal plains of Ecoregions 63 and 65 to the east. It is underlain by a mix of metamorphic, igneous, and sedimentary rocks, with soils that are mostly Alfisols and some Ultisols. Potential natural vegetation here was predominantly Appalachian oak forest as compared to the mostly oak-hickory-pine forests of the Piedmont (45) ecoregion to the southwest. The region now contains a higher proportion of cropland compared to the Piedmont.

65. SOUTHEASTERN PLAINS

These irregular plains have a mosaic of cropland, pasture, woodland, and forest. Natural vegetation was predominantly longleaf pine, with smaller areas of oak-hickory-pine and Southern mixed forest. The Cretaceous or Tertiary-age sands, silts, and clays of the region contrast geologically with the older metamorphic and igneous rocks of the Piedmont (45), and with the Paleozoic limestone, chert, and shale found in the Interior Plateau (71). Elevations and relief are greater than in the Southern Coastal Plain (75), but generally less than in much of the Piedmont. Streams in this area are relatively low-gradient and sandy-bottomed.

66. BLUE RIDGE

The Blue Ridge extends from southern Pennsylvania to northern Georgia, varying from narrow ridges to hilly plateaus to more massive mountainous areas, with high peaks reaching over 6600 feet. The mostly forested slopes, high-gradient, cool, clear streams, and rugged terrain occur primarily on metamorphic rocks, with minor areas of igneous and sedimentary geology. Annual precipitation of over 100 inches can occur in the wettest areas, while dry basins can average as little as 40 inches. The southern Blue Ridge is one of the richest centers of biodiversity in the eastern U.S. It is one of the most floristically diverse ecoregions, and includes Appalachian oak forests, northern hardwoods, and, at the highest elevations, Southeastern spruce-fir forests. Shrub, grass, and heath balds, hemlock, cove hardwoods, and oak-pine communities are also significant.

67. RIDGE AND VALLEY

This northeast-southwest trending, relatively low-lying, but diverse ecoregion is sandwiched between generally higher, more rugged mountainous regions with greater forest cover. As a result of extreme folding and faulting events, the region's roughly parallel ridges and valleys have a variety of widths, heights, and geologic materials, including limestone, dolomite, shale, siltstone, sandstone, chert, mudstone, and marble. Springs and caves are relatively numerous. Present-day forests cover about 50% of the region. The ecoregion has a great diversity of aquatic habitats and species of fish.

68. SOUTHWESTERN APPALACHIANS

Stretching from Kentucky to Alabama, these open low mountains contain a mosaic of forest and woodland with some cropland and pasture. The eastern boundary of the ecoregion, along the more abrupt escarpment where it meets the Ridge and Valley (67), is relatively smooth and only slightly notched by small, eastward flowing streams. Much of the western boundary, next to the Interior Plateau (71), is more crenulated, with a rougher escarpment that is more deeply incised. The mixed mesophytic forest is restricted mostly to the deeper ravines and escarpment slopes, and the upland forests are dominated by mixed oaks with shortleaf pine. Ecoregion 68 has less agriculture than the adjacent Ecoregion 71. Coal mining occurs in several parts of the region.

69. CENTRAL APPALACHIANS

The Central Appalachian ecoregion, stretching from central Pennsylvania to northern Tennessee, is primarily a high, dissected, rugged plateau composed of sandstone, shale, conglomerate, and coal. The rugged terrain, cool climate, and infertile soils limit agriculture, resulting in a mostly forested land cover. The high hills and low mountains are covered by a mixed mesophytic forest with areas of Appalachian oak and northern hardwood forest. Bituminous coal mines are common, and have caused the siltation and acidification of streams.

70. WESTERN ALLEGHENY PLATEAU

The hilly and wooded terrain of the Western Allegheny Plateau was not muted by glaciation and is more rugged than the agricultural till plains of Ecoregions 61 and 55 to the north and west, but is less rugged and not as forested as Ecoregion 69 to the east and south. Extensive mixed mesophytic forests and mixed oak forests originally grew in the Western Allegheny Plateau and, today, most of its rounded hills remain in forest; dairy, livestock, and general farms as well as residential developments are concentrated in the valleys. Horizontally-bedded sedimentary rock underlying the region has been mined for bituminous coal.

71. INTERIOR PLATEAU

The Interior Plateau is a diverse ecoregion extending from southern Indiana and Ohio to northern Alabama. Rock types are distinctly different from the coastal plain sediments and alluvial deposits of

ecoregions to the west, and elevations are lower than the Appalachian ecoregions (66, 67, 68) to the east. Mississippian to Ordovician-age limestone, chert, sandstone, siltstone and shale compose the landforms of open hills, irregular plains, and tablelands. The natural vegetation is primarily oak-hickory forest, with some areas of bluestem prairie and cedar glades. The region has a diverse fish fauna.

72. INTERIOR RIVER VALLEYS AND HILLS

The Interior River Lowland is made up of many wide, flat-bottomed terraced valleys, forested valley slopes, and dissected glacial till plains. In contrast to the generally rolling to slightly irregular plains in adjacent ecological regions to the north (54), east (55) and west (40, 47), where most of the land is cultivated for corn and soybeans, a little less than half of this area is in cropland, about 30 percent is in pasture, and the remainder is in forest. Bottomland deciduous forests and swamp forests were common on wet lowland sites, with mixed oak and oak-hickory forests on uplands. Paleozoic sedimentary rock is typical and coal mining occurs in several areas.

73. MISSISSIPPI ALLUVIAL PLAIN

This riverine ecoregion extends from southern Illinois, at the confluence of the Ohio River with the Mississippi River, south to the Gulf of Mexico. It is mostly a broad, flat alluvial plain with river terraces, swales, and levees providing the main elements of relief. Soils are typically finer-textured and more poorly drained than the upland soils of adjacent Ecoregions 35 and 74, although there are some areas of coarser, better-drained soils. Winters are mild and summers are hot, with temperatures and precipitation increasing from north to south. Bottomland deciduous forest vegetation covered the region before much of it was cleared for cultivation. Presently, most of the northern and central parts of the region are in cropland and receive heavy treatments of insecticides and herbicides. Soybeans, cotton, and rice are the major crops.

74. MISSISSIPPI VALLEY LOESS PLAINS

This ecoregion stretches from near the Ohio River in western Kentucky to Louisiana. It consists primarily of irregular plains, some gently rolling hills, and near the Mississippi River, bluffs. Thick loess is one of the distinguishing characteristics. The bluff hills in the western portion contain soils that are deep, steep, silty, and erosive. Flatter topography is found to the east, and streams tend to have less gradient and more silty substrates than in the Southeastern Plains ecoregion (65). To the east, upland forests dominated by oak, hickory, and both loblolly and shortleaf pine, and to the west on bluffs some mixed and southern mesophytic forests, were the dominant natural vegetation. Agriculture is now the typical land cover in the Kentucky and Tennessee portion of the region, while in Mississippi there is a mosaic of forest and cropland.

75. SOUTHERN COASTAL PLAIN

The Southern Coastal Plain consists of mostly flat plains, but it is a heterogeneous region containing barrier islands, coastal lagoons, marshes, and swampy lowlands along the Gulf and Atlantic coasts. In Florida, an area of discontinuous highlands contains numerous lakes. This ecoregion is lower in elevation with less relief and wetter soils than the Southeastern Plains (65). It is warmer, more heterogeneous, and has a longer growing season and coarser textured soils than the Middle Atlantic Coastal Plain (63). Once covered by a variety of forest communities that included trees of longleaf pine, slash pine, pond pine, beech, sweetgum, southern magnolia, white oak, and laurel oak, land cover in the region is now mostly slash and loblolly pine with oak-gum-cypress forest in some low lying areas, citrus groves in Florida, pasture for beef cattle, and urban.

76. SOUTHERN FLORIDA COASTAL PLAIN

The frost free climate of the Southern Florida Coastal Plain makes it distinct from other ecoregions in the conterminous United States. This region is characterized by flat plains with wet soils, marsh and swamp land cover with everglades and palmetto prairie vegetation types. Relatively slight differences in elevation and landform have important consequences for vegetation and the diversity of habitat types. Although portions of this region are in parks, game refuges, and Indian reservations, a large part of the region has undergone extensive hydrological and biological alteration.

77. NORTH CASCADES

The terrain of the North Cascades is composed of high, rugged mountains. It contains the greatest concentration of active alpine glaciers in the conterminous United States and has a variety of climatic zones. A dry continental climate occurs in the east and mild, maritime, rainforest conditions are found in the west. It is underlain by sedimentary and metamorphic rock in contrast to the adjoining Cascades (4) which are composed of volcanics.

78. KLAMATH MOUNTAINS

This physically and biologically diverse ecoregion covers the highly dissected ridges, foothills, and valleys of the Klamath and Siskiyou mountains. It also extends south in California to include the mixed conifer and montane hardwood forests that occur in the North Coast Range mountains. The region's mix of granitic, sedimentary, metamorphic, and extrusive rocks contrasts with the predominantly volcanic rocks of the Cascades (4) to the east. It was unglaciated during the Pleistocene epoch, when it served as a refuge for northern plant species. The region's diverse flora, a mosaic of both northern Californian and Pacific Northwestern conifers and hardwoods, is rich in endemic and relic species. The mild, subhumid climate of the Klamath Mountains is characterized by a lengthy summer drought.

79. MADREAN ARCHIPELAGO

Also known as the Sky Islands in the United States, this is a region of basins and ranges with medium to high local relief, typically 3,000 to 5,000 feet. Native vegetation in the region is mostly grama-tobosa shrubsteppe in the basins and oak-juniper woodlands on the ranges, except at higher elevations where ponderosa pine is predominant. The region has ecological significance as both a barrier and bridge between two major cordilleras of North America, the Rocky Mountains and the Sierra Madre Occidental.

80. NORTHERN BASIN AND RANGE

This ecoregion contains tablelands, dissected lava plains, valleys, alluvial fans, and scattered mountains. Overall, it is higher and cooler than the Snake River Plain (12) to the east and has more available moisture and a cooler climate than the Central Basin and Range (13) to the south. The region has more extensive basins and fewer mountain ranges than the Central Basin and Range. Non-mountain areas have sagebrush steppe vegetation; cool season grasses and Mollisols are more common than in the hotter-drier basins of the Central Basin and Range where Aridisols are dominated by sagebrush, shadscale, and greasewood. Ranges are covered in mountain sagebrush, mountain brush, and Idaho fescue at lower and mid-elevations; Douglas-fir, and aspen are common at higher elevations. Soils are less suitable for agriculture than those in the Columbia Plateau (10) and the Snake River Plain. Rangeland is common and dryland and irrigated agriculture occur in eastern basins.

81. SONORAN BASIN AND RANGE

Similar in topography to the Mojave Basin and Range (14) to the north, this ecoregion contains scattered low mountains and has large tracts of federally owned land, a large portion of which is used for military training. However, the Sonoran Basin and Range is slightly hotter than the Mojave and contains large areas of palo verde-cactus shrub and giant saguaro cactus, whereas the potential natural vegetation in the Mojave is largely creosote bush. Winter rainfall decreases from west to east, while summer rainfall decreases from east to west.

82. ACADIAN PLAINS AND HILLS

This mostly forested region, with dense concentrations of continental glacial lakes, is less rugged than the Northeastern Highlands (58) to the west and considerably less populated than Ecoregion 59 to the south. Vegetation here is mostly spruce-fir on the lowlands with some patches of maple, beech, and birch on the hills. Soils are predominantly frigid Spodosols. By contrast, the forests in the Northeastern Coastal Zone (59) to the south are mostly Appalachian oak or northeastern oak-pine and the soils are generally mesic Inceptisols and Entisols.

83. EASTERN GREAT LAKES LOWLANDS

This glaciated region of irregular plains bordered by hills generally contains less surface irregularity and more agricultural activity and population density than the adjacent Northeastern Highlands (58) and Northern Allegheny Plateau (60). Although orchards, vineyards, and vegetable farming are important locally, a large percentage of the agriculture is associated with dairy operations. The portion of this

ecoregion that is in close proximity to the Great Lakes experiences an increased growing season, more winter cloudiness, and greater snowfall.

84. ATLANTIC COASTAL PINE BARRENS

This is a transitional ecoregion, distinguished from the coastal ecoregion (63) to the south by its coarser-grained soils, cooler climate, and Northeastern oak-pine potential natural vegetation. The climate is milder than the coastal ecoregion (59) to the north that contains Appalachian oak forests and some northern hardwoods forests. The physiography of this ecoregion is not as flat as that of the Middle Atlantic Coastal Plain (63), but it is not as irregular as that of the Northeastern Coastal Zone (59). The shore characteristics of sandy beaches, grassy dunes, bays, marshes, and scrubby oak-pine forests are more like those to the south, in contrast to the more rocky, jagged, forested coastline found to the north.

101. ARCTIC COASTAL PLAIN

The northernmost ecoregion in the United States is bounded on the north and the west by the Arctic Ocean and stretches eastward nearly to the international boundary between Alaska and the Yukon Territory, Canada. The poorly drained treeless coastal plain rises very gradually from sea level to the adjacent foothills. The region has an arctic climate, and the entire area is underlain by thick permafrost. Because of poor soil drainage, wet graminoid herbaceous communities are the predominant vegetation cover, and numerous thaw lakes dot the region.

102. ARCTIC FOOTHILLS

This ecoregion consists of a wide swath of rolling hills and plateaus that grades from the coastal plain (101) on the north to the Brooks Range (103) on the south. The east-west extent of the ecoregion stretches from the international boundary between Alaska and the Yukon Territory, Canada, to the Chukchi Sea. The hills and valleys of the region have better defined drainage patterns than those found in the coastal plain to the north and have fewer lakes. The area is underlain by thick permafrost and many ice-related surface features are present. The region is predominantly treeless and is vegetated primarily by mesic graminoid herbaceous communities.

103. BROOKS RANGE

This ecoregion consists of several groups of rugged, deeply dissected mountains carved from uplifted sedimentary rock. The region traverses much of the east-west extent of northern Alaska, from the Canadian border to within 60 miles of the Chukchi Sea. Elevation of mountain peaks ranges from 2600 feet in the relatively low Baird Mountains in the west to 8000 feet in the central and eastern Brooks Range. Pleistocene glaciation was extensive, and small glaciers persist at elevations above 5900 feet. An arctic climatic regime and unstable hillslopes maintain a sparse cover of dwarf scrub vegetation throughout the mountains through some valleys provide more mesic sites for graminoid herbaceous communities.

104. INTERIOR FORESTED LOWLANDS AND UPLANDS

This ecoregion represents a patchwork of ecological characteristics. Region-wide unifying features include a lack of Pleistocene glaciation, a continental climate, a mantling of undifferentiated alluvium and slope deposits, a predominance of forests dominated by spruce and hardwood species, and a very high frequency of lightning fires. On this backdrop of characteristics is superimposed a finer grained complex of vegetation communities resulting from the interplay of permafrost, surface water, fire, local elevational relief, and hillslope aspect.

105. INTERIOR HIGHLANDS

This discontinuous ecoregion is composed of rounded, low mountains, often surmounted by rugged peaks. The highlands primarily sustain dwarf scrub vegetation and open spruce stands, though graminoid herbaceous communities occur in poorly drained areas. Mountains in most parts of this region rise to at least 4000 feet, and many rise higher than 5000 feet. Most of the higher peaks were glaciated during the Pleistocene.

106. INTERIOR BOTTOMLANDS

This ecoregion is composed of flat to nearly flat bottomlands along larger rivers of interior Alaska. The bottomlands are dotted with thaw and oxbow lakes. Soils are poorly drained and shallow, often over

permafrost. Predominant vegetation communities include forests dominated by spruce and hardwood species, tall scrub thickets, and wetlands.

107. YUKON FLATS

The Yukon Flats is a relatively flat, marshy basin floor in east central Alaska that is patterned with braided and meandering streams, numerous thaw and oxbow lakes, and meander scars. Surrounding the basin floor is a variable band of more undulating topography with fewer water bodies. In many respects the ecoregion is similar to the Interior Bottomlands Ecoregion (106), but differs in climatic characteristics. Temperatures tend to be more extreme; summers are warmer and winters are colder than in other areas of comparable latitude. The ecoregion also receives less annual precipitation than the Interior Bottomlands. Forests dominated by spruce and hardwood species, tall scrub communities, and wet graminoid herbaceous communities are the predominant vegetation types.

108. OGILVIE MOUNTAINS

This ecoregion, along the eastern edge of Alaska, consists of flat-topped hills eroded from a former plain and broad pediment slopes built up from mountains that are much subdued from their former stature. Karst topography is common. Mesic graminoid herbaceous communities and tall scrub communities are widespread throughout the region. Forest communities occupy lower hillslopes and valleys.

109. SUBARCTIC COASTAL PLAINS

This ecoregion mainly includes coastal plains of the Kotzebue Sound area and the Yukon and Kuskokwim River delta area. Flat, lake-dotted coastal plains and river deltas are characteristic of the region. Streams have very wide and serpentine meanders. Soils are wet and the permafrost table is shallow, providing conditions for wet graminoid herbaceous communities, the predominant vegetation type. The region is affected by both marine and continental climatic influences.

110. SEWARD PENINSULA

Some of the oldest geologic formations in Alaska provide a backdrop for this predominantly treeless ecoregion. Mesic graminoid herbaceous and low scrub communities occupy extensive areas. The ecoregion is surrounded on three sides by water, yet this has little ameliorating effect on the climate. Winters tend to be long and harsh and summers short and cool.

111. AHKLUN AND KILBUCK MOUNTAINS

Located in southwestern Alaska off Bristol and Kuskokwim Bays, this ecoregion is composed of steep, sharp, often ringlike groupings of rugged mountains separated by broad, flat valleys and lowlands. The mountains were glaciated during the Pleistocene epoch, but only a few small glaciers persist. Dwarf scrub communities are the predominant vegetation cover in the mountains. Tall scrub and graminoid herbaceous communities are common in valleys and on lower mountain slopes. Valley bottoms may support stands of spruce and hardwood species.

112. BRISTOL BAY-NUSHAGAK LOWLANDS

This lowland ecoregion is located in southwestern Alaska off Bristol Bay. The region has rolling terrain, formed from morainal deposits. Soils of the lowlands are somewhat better drained than soils of the Subarctic Coastal Plains Ecoregion (109). Dwarf scrub communities are widespread, but large areas of wetland communities occur. Lakes are scattered throughout the lowlands, but are not nearly as numerous as in the Subarctic Coastal Plains.

113. ALASKA PENINSULA MOUNTAINS

This ecoregion is composed of rounded, folded and faulted sedimentary ridges intermittently surmounted by volcanoes. The mountains were heavily glaciated during the Pleistocene epoch. A marine climate prevails, and the region is generally free of permafrost. Many soils formed in deposits of volcanic ash and cinder over glacial deposits and are highly erodible. Vegetation cover commonly consists of dwarf scrub communities at higher elevations and on sites exposed to wind, and low scrub communities at lower elevations and in more protected sites.

114. ALEUTIAN ISLANDS

This ecoregion in southwestern Alaska is composed of a chain of sedimentary islands (eroded from older volcanic formations) that are crowned by steep volcanoes. Maritime climate prevails. The region is south of the winter sea ice pack and is generally free from permafrost. Vegetation cover mainly consists of dwarf scrub communities at higher elevations and on sites exposed to wind, and of graminoid herbaceous communities in more protected sites.

115. COOK INLET

Located in the south central part of Alaska adjacent to the Cook Inlet, the ecoregion has one of the mildest climates in the State. The climate, the level to rolling topography, and the coastal proximity have attracted most of the settlement and development in Alaska. The region has a variety of vegetation communities but is dominated by stands of spruce and hardwood species. The area is generally free from permafrost. Unlike many of the other nonmontane ecoregions, the Cook Inlet Ecoregion was intensely glaciated during the Pleistocene.

116. ALASKA RANGE

The mountains of south central Alaska, the Alaska Range, are very high and steep. This ecoregion is covered by rocky slopes, icefields, and glaciers. Much of the area is barren of vegetation. Dwarf scrub communities are common at higher elevations and on windswept sites where vegetation does exist. The Alaska Range has a continental climatic regime, but because of the extreme height of many of the ridges and peaks, annual precipitation at higher elevations is similar to that measured for some ecoregions having maritime climate.

117. COPPER PLATEAU

This ecoregion in south central Alaska occupies the site of a large lake that existed during glacial times. The nearly level to rolling plain has many lakes and wetlands. Soils are predominantly silty or clayey, formed from glaciolacustrine sediments. Much of the region has a shallow permafrost table, and soils are poorly drained. Black spruce forests and tall scrub, interspersed with wetlands, are the major types of vegetation communities.

118. WRANGELL MOUNTAINS

This ecoregion consists of steep, rugged mountains of volcanic origin that are extensively covered by ice fields and glaciers. Most slopes are barren of vegetation. Dwarf scrub tundra communities, consisting of mats of low shrubs, forbs, grasses, and lichens, predominate where vegetation does occur. The climate has harsh winters and short summers.

119. PACIFIC COASTAL MOUNTAINS

The steep and rugged mountains along the southeastern and south central coast of Alaska receive more precipitation annually than either the Alaska Range (116) or Wrangell Mountains (118) Ecoregions. Glaciated during the Pleistocene, most of the ecoregion is still covered by glaciers and ice fields. Most of the area is barren of vegetation, but where plants do occur, dwarf and low scrub communities dominate.

120. COASTAL WESTERN HEMLOCK-SITKA SPRUCE FORESTS

Located along the southeastern and south central shores of Alaska, the terrain of this ecoregion is a result of intense glaciation during late advances of the Pleistocene. The deep, narrow bays, steep valley walls that expose much bedrock, thin moraine deposits on hills and in valleys, very irregular coastline, high sea cliffs, and deeply dissected glacial moraine deposits covering the lower slopes of valley walls are all evidence of the effects of glaciation. The region has the mildest winter temperatures in Alaska, accompanied by large amounts of precipitation. Forests of western hemlock and Sitka spruce are widespread.