



Location of MLRA 108C in Land Resource Region M.

108C—Illinois and Iowa Deep Loess and Drift, West-Central Part

This area is entirely in Iowa. It makes up about 9,805 square miles (25,405 square kilometers). The towns of Newton, Oskaloosa, Pella, Marshalltown, Iowa City, and Washington are in this MLRA. Interstate 80 crosses the center of the MLRA from east to west. This area includes many State parks and the Sac and Fox and Mesquakie Indian Reservations.

Physiography

This area is in the Dissected Till Plains Section of the Central Lowland Province of the Interior Plains. Locally, it is within a landform region called the Southern Iowa Drift Plain. As the section name implies, this area is a dissected till plain. Slopes are mostly rolling to hilly, but some broad ridgetops are nearly level to undulating and areas bordering the major stream valleys are steep. A few large rivers have nearly level, broad valley floors. Elevation ranges from 505 feet (155 meters) in the lowest valleys to 1,110 feet (340 meters) on the highest ridges. Local relief is mainly 10 to 20 feet (3 to 6 meters), but valley floors can be 80 to 200 feet (25 to 60 meters) below the adjacent uplands. Also, some upland flats and valley floors have local relief of only 3 to 6 feet (1 to 2 meters).

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Upper Mississippi-Iowa-Skunk-Wapsipinicon (0708), 95 percent, and Des Moines (0710), 5 percent. The Des Moines, Skunk, Iowa, and Cedar Rivers cross this area. These watersheds have more than 10,600 miles of streams and associated wetlands that drain to the Mississippi River.

Geology

This area is underlain by dense pre-Illinoian till, which was deposited more than 500,000 years ago and has since undergone extensive erosion and dissection. The till surface is covered by a mantle of Peoria Loess on the hillslopes and by Holocene alluvium (DeForest Formation) in the drainageways. The till is generally less than 150 feet (45 meters) thick in the southern half of the area but ranges from 150 to 350 feet (45 to 105 meters) in thickness in the northern half. It is underlain by Paleozoic bedrock consisting dominantly of limestone, shale, and mudstones. The bedrock includes dolomite in the northeastern part of the area.

Climate

The average annual precipitation in this area is 33 to 38 inches (840 to 965 millimeters). Most of the rainfall occurs as convective thunderstorms during the growing season. About 10 inches (25 centimeters) of the precipitation occurs as snow in the winter. The average annual temperature is 46 to 51 degrees F (8 to 11 degrees C). The freeze-free period averages about 185 days and ranges from 170 to 205 days.

Water

Following are the estimated withdrawals of freshwater by use in this MLRA:

Public supply—surface water, 4.8%; ground water, 45.3%

Livestock—surface water, 4.2%; ground water, 17.1%

Irrigation—surface water, 0.0%; ground water, 0.5%

Other—surface water, 1.1%; ground water, 27.0%

The total withdrawals average 90 million gallons per day (340 million liters per day). About 90 percent is from ground water sources, and 10 percent is from surface water sources. In most years lack of water is not a problem for agricultural production. Large rivers provide some surface water for livestock, irrigation, industry, and public supplies. The Coralville Reservoir provides municipal and industrial water to areas along the Iowa River. Some water for livestock is stored in small ponds

and reservoirs. The surface water is of fair quality and is suitable for most uses with treatment. Contamination from sediment, nutrients, and pesticides from agricultural activities and wastewater discharges from cities cause some water-quality problems.

Good-quality ground water is abundant in this area. The principal sources of ground water in the area are glacial drift aquifers, buried channel aquifers, alluvial aquifers, and Paleozoic bedrock. Glacial drift aquifers supply many rural homeowners with small quantities of domestic water and some livestock water. Alluvial deposits provide much greater quantities of water for domestic use, livestock, public supply, and some limited irrigation. Buried channels typically consist of glacial outwash deposits that filled preglacial valleys and then were covered by glacial drift. Large quantities of water can be obtained from this aquifer in the limited areas where it occurs. This aquifer can provide water for domestic use, livestock, irrigation, and some public and municipal supply. All of these surficial aquifers have good-quality water. The water is very hard, but the median level of total dissolved solids is very near the national secondary drinking water standard of 500 parts per million (milligrams per liter).

Paleozoic bedrock aquifers are heavily utilized in this area. The Silurian-Devonian aquifer underlies the northern half of the area, the Mississippian aquifer underlies the southern half, and the Jordan aquifer underlies all of the area. The Jordan aquifer is the most extensively used aquifer in Iowa. It consists of sandstone and dolomite of Ordovician and Cambrian age. Well yields from this aquifer are very high. The water from this aquifer is suitable for most uses, but the median level of total dissolved solids typically exceeds 800 parts per million (milligrams per liter) and radium-226 levels can exceed the national standard for drinking water. The Silurian-Devonian aquifer consists of limestone and dolomite. It is close to the surface in this area, and it has the best water quality of all the principal aquifers in Iowa. Where this aquifer is buried by younger bedrock deposits, its use is limited by the level of total dissolved solids and naturally high levels of sulfate. The Mississippian aquifer consists of limestone and dolomite that is very

close to the surface in this area. Its water quality is between that of the other two bedrock aquifers. In some areas it has very high levels of total dissolved solids and thus cannot be used. Wells in this aquifer produce low yields, so the aquifer is not used unless no other water sources are available. Water from the Jordan and Silurian-Devonian aquifers is used for domestic purposes, livestock, irrigation, public and municipal supply, and industry.

Soils

The dominant soil orders in this MLRA are Mollisols and, to a lesser extent, Alfisols, Entisols, and Inceptisols. Most of the soils are Udolls or Udalfs. Some Aquolls are on the flatter interfluves and on nearly level, broad valley floors. The soils in the area dominantly have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed mineralogy. They generally are very deep, well drained to poorly drained, and silty, loamy, or clayey. The soils on uplands include somewhat poorly drained, nearly level Argiudolls (Mahaska series) and Hapludolls (Muscatine series); moderately well drained, gently sloping to strongly sloping Argiudolls (Otley series); well drained or moderately well drained, moderately sloping to strongly sloping Eutrudepts (Killduff series); poorly drained, nearly level Endoaquolls (Garwin series) and Argiaquolls (Taintor series); well drained or moderately well drained, gently sloping to strongly sloping Argiudolls (Tama and Dinsdale series); and well drained, strongly sloping to steep Hapludalfs (Fayette, Downs, Ladoga, Armstrong, and Clinton series). Somewhat poorly drained Hapludolls (Lawson series) and moderately well drained Udifluvents (Nodaway series) formed in silty alluvium on flood plains. Poorly drained Endoaquolls (Colo and Zook series) formed in clayey alluvium on flood plains.

Biological Resources

Prairies in this area are dominated by tall grasses. Xeric mid and short grasses occur on steep slopes, ridges, and sandy soils. Grama, muhly, lovegrass, dropseed, wild rice, threeawn, and wheatgrass may occur in the prairies, along with the dominant bluestems, Indiangrass, switchgrass, prairie cordgrass, and wildrye. The forbs in the area include pale and round-stemmed false foxgloves, Virginia snakeroot, golden corydalis, kittentails, shooting star, foxglove penstemon, cleft phlox, eastern and western prairie fringed orchid, blackeyed Susan, sneezeweed, puccoon, wild geranium, slender mountain mint, and bottle gentian. Wooded areas on uplands commonly support red oak, white oak,

hackberry, and shagbark, mockernut, butternut, and bitternut hickories. Wooded areas on bottom land commonly support swamp white oak, pin oak, river birch, sycamore, cottonwood, willow, redbud, white ash, green ash, silver maple, and American elder.

The wildlife species on the prairies in this area include plains leopard frog, tiger salamander, ornate box turtle, six-lined racerunner, slender glass lizard, smooth green snake, bull snake, western hognose, prairie king snake, massasauga rattlesnake, long-eared owl, northern harrier, wild indigo dusky wing, Baltimore checkerspot, regal fritillary, plains pocket mouse, spotted skunk, and bald eagle. The wildlife species in the wooded areas include the great-crested flycatcher, prothonotary warbler, ovenbird, Acadian flycatcher, scarlet tanager, Indiana bat, western fox snake, western worm snake, and Fowler's toad. This MLRA has 91 threatened or endangered species or species of special concern. The watersheds in the area provide habitat for many rare and declining species, such as the least tern, piping plover, lake sturgeon, pirate perch, blacknose and Topeka shiners, pallid sturgeon, grass pickerel, bluntnose darter, pugnose minnow, freckled madtom, sheepnose, round pigtoe, spectacle case, yellow sandshell, strange floater, pistol grip, central newt, Blanding's turtle, yellow mud turtle, and common musk turtle.

Land Use

Following are the various kinds of land use in this MLRA:

Cropland—private, 76%

Grassland—private, 9%; Federal, 1%

Forest—private, 6%

Urban development—private, 5%

Water—private, 1%

Other—private, 2%

In the mid-1800s, about 75 percent of this area was prairie. Forests made up 18.5 percent of the area; savannas, 5 percent; shrub lands, 1 percent; wetlands, 0.4 percent; and streams, 0.1 percent.

Farms currently make up nearly all of this area. They produce cash crops, grain crops, and livestock.

The major resource concerns are water erosion, depletion of organic matter in the soils, and poor

water quality. Conservation practices on cropland generally include systems of crop residue management (especially no-till, strip-till, and mulch-till systems), cover crops, pest and nutrient management, grassed waterways, terraces, manure management, pasture and hayland planting, and grade-stabilization structures.