



Location of MLRA 104 in Land Resource Region M.

## 104—Eastern Iowa and Minnesota Till Prairies

This area is in Iowa (74 percent), Minnesota (22 percent), and Wisconsin (4 percent). It makes up about 9,660 square miles (about 25,040 square kilometers). The larger cities and towns in this area are Mason City, Cedar Falls, Waterloo, and Cedar Rapids, Iowa, and Austin, Minnesota. Interstate 90 passes through Austin, Minnesota, in the northern end of the area. The small part of this area that crosses into Wisconsin from Minnesota does so at Red Wing, Minnesota. A few State parks are in the area.

### Physiography

This area is in the Central Lowland Province of the Interior Plains. Almost all of the area is in the Dissected Till Plains Section of the province, but parts of the western edge are in the Western Lake Plain Section, and the small part of the area in Wisconsin is in the Wisconsin Driftless Section. The landscape is a nearly level to gently rolling glaciated plain with long slopes. The natural drainage network is well established and commonly described as dendritic, resulting in few lakes and ponds. Subsurface tile drainage lines are commonly used to

lower water tables and increase crop production. Karst topography is common in this area. Elevation ranges from 985 to 1,310 feet (300 to 400 meters). Local relief is 10 to 20 feet (3 to 6 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), 62 percent; Upper Mississippi-Maquoketa-Plum (0706), 19 percent; Upper Mississippi-Black-Root (0704), 17 percent; and Chippewa (0705), 2 percent. The major rivers that drain the area include the Cannon, Zumbro, Root, and Cedar Rivers in Minnesota and the Beaver, Cedar, Winnebago, Shell Rock, and Wapsipinicon Rivers in Iowa.

### Geology

This area is covered with glacial till and outwash deposits. Recent alluvium consisting of clay, silt, sand, and gravel fills the major river valleys. Paleozoic bedrock sediments, primarily shale and limestone, underlie most of the area. A shallow depth to limestone results in karst topography in much of the area. Some limestone units containing fossils are exposed in road cuts in the northeast corner of the area and along the major rivers in the part of the area in Iowa. Bedrock units also are exposed on the Mississippi River bluffs near Red Wing, Minnesota.

### Climate

The average annual precipitation in most of this area is 29 to 37 inches (735 to 940 millimeters). Most of the rainfall occurs as high-intensity, convective thunderstorms during the summer. More than two-thirds of the precipitation falls during the growing season. Precipitation in winter occurs mainly as snow. The average annual temperature is 44 to 50 degrees F (7 to 10 degrees C). The freeze-free period averages about 180 days and ranges from 160 to 195 days.

### Water

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

Public supply—surface water, 6.5%; ground water, 27.6%  
 Livestock—surface water, 1.6%; ground water, 4.2%  
 Irrigation—surface water, 0.0%; ground water, 0.3%  
 Other—surface water, 36.3%; ground water, 23.4%

The total withdrawals average 365 million gallons

per day (1,380 million liters per day). About 56 percent is from ground water sources, and 44 percent is from surface water sources. Precipitation is generally adequate for crops, but in years when the precipitation is below normal, yields can be reduced. Water is generally abundant in the many rivers in the area. It is of good quality and is suitable for all uses. It is used mainly for public supplies and industry.

The supply of ground water is adequate for the livestock, domestic, municipal, and industrial needs in this area. A number of unconsolidated and bedrock aquifers are in the area. Most of the ground water used in this area is pumped from either the surficial aquifer (buried channels, glacial drift, and alluvium) or the Ordovician and Cambrian sandstone and dolomite in the Jordan, or Prairie du Chien-Jordan, aquifer. The water from both aquifers generally meets Federal and State drinking water standards. The median level of 850 parts per million (milligrams per liter) total dissolved solids in the Jordan aquifer does exceed the secondary (esthetic) standard for drinking water in Iowa. The level of total dissolved solids is much lower in the Prairie du Chien-Jordan aquifer in Minnesota. Water in both aquifers is hard or very hard, and the level of total dissolved solids in the water from the surficial aquifer is about 500 parts per million (milligrams per liter).

### **Soils**

The dominant soil orders in this MLRA are Mollisols and Alfisols. 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 very poorly drained, and loamy. Hapludolls (Floyd, Kenyon, Marquis, Ostrander, and Readlyn series) and Hapludalfs (Bassett, Kasson, and Racine series) formed in loamy sediments over till on uplands. Argiudolls (Dinsdale series) formed in loess over till on uplands. Endoaquolls (Maxfield and Tripoli series) formed in loamy and silty sediments over till on uplands.

### **Biological Resources**

This area supports prairie vegetation. Big bluestem and Indiangrass are dominant on the well drained soils in rolling areas. Switchgrass, prairie cordgrass, and prairie dropseed are better adapted to the somewhat poorly drained soils. Switchgrass, sedges, and rushes grow on poorly drained soils in draws or valleys. Common cattails grow on swampy sites.

Little bluestem, porcupinegrass, and sand lovegrass grow on sandy, rocky, dry sites. Forbs, such as clovers, phlox, sunflower, gayfeather, and goldenrod, grow on the more productive soils. Roundhead lespedeza, spiderwort, and flowering spurge grow on droughty soils. Loosestrife, bedstraw, milkweed, and tickclover are water-tolerant species that grow on wet soils.

Some of the major wildlife species in this area are white-tailed deer, beaver, otter, muskrat, squirrel, mink, pheasant, gray partridge, great blue heron, American egret, mallard, and teal. The species of fish in the area include smallmouth bass, catfish, northern pike, black bullhead, bluegill, sunfish, and rough fish.

### **Land Use**

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

Cropland—private, 80%

Grassland—private, 5%

Forest—private, 6%

Urban development—private, 5%

Water—private, 1%

Other—private, 3%

Nearly all of this area is in farms, and about four-fifths is cropland. Much of the area is drained by tile. Extensive drainage ditches provide outlets for the tile drains. Corn, soybeans, other feed grains, and hay are the major crops. Raising and feeding hogs and beef cattle and dairying are important enterprises. The forestland in the area is mainly on wet bottom land and on steep slopes bordering stream valleys.

The major resource concerns are water erosion, depletion of organic matter in the soils, excess surface and subsurface water, and poor water quality. Many of the wet soils require artificial drainage for good growth of the field crops commonly grown in the area. Conservation practices on cropland generally include systems of crop residue management (especially no-till, strip-till, and mulch-till systems), cover crops, surface and subsurface drainage systems, nutrient and pest management, grassed waterways, terraces, manure management, pasture and hayland planting, and grade-stabilization structures.