



Location of MLRA 109 in Land Resource Region M.

109—Iowa and Missouri Heavy Till Plain

This area is in Missouri (65 percent) and Iowa (35 percent). It makes up about 15,895 square miles (41,185 square kilometers). It includes the towns of Bethany, Chillicothe, Memphis, and Plattsburg, Missouri, and Ottumwa, Fairfield, Mt. Pleasant, and Centerville, Iowa. Interstate 35 crosses the northwestern part of this area.

Physiography

This area is in the Dissected Till Plains Section of the Central Lowland Province of the Interior Plains. It is an area of rolling hills interspersed with uniformly level upland divides and level alluvial lowlands. Dendritic drainage patterns characterize the area. The northeastern part of the area consists of flat, tablelike uplands with steep or hilly land occurring only near the margins of stream valleys. Other parts of the area are more dissected, have less extensive upland divides, and consist mostly of hillslopes. Nearly level, broad valley floors are along a few large rivers. Elevation ranges from 660 feet (200 meters) in the lowest valleys to 980 feet (300 meters) on the highest ridges. Local relief is mainly 10 to 20 feet (3 to 6 meters), but valley floors can be 80 to 160 feet (25 to 50 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: Chariton-Grand (1028), 65 percent; Des Moines (0710), 14 percent; Upper Mississippi-Salt (0711), 9 percent; Lower Missouri (1030), 5 percent; Upper Mississippi-Iowa-Skunk-Wapsipinicon (0708), 4 percent; and Missouri-Nishnabotna (1024), 3 percent. The Grand, Thompson, and Chariton Rivers, which are tributaries of the Missouri River, begin in the part of this area in Iowa and flow south into Missouri. The Whitebreast and Des Moines Rivers also occur in the northern part of the area. The Locust River, in the southern part of the area, is another major tributary of the Missouri River.

Geology

Loess covers the surface of almost all of the uplands in this MLRA. Glacial drift that is high in content of clay underlies the loess. Alluvial clay, silt, sand, and gravel deposits are in all of the stream and river valleys. They can be extensive in the major river valleys. Mississippian shale and limestone bedrock lies beneath the glacial and alluvial deposits.

Climate

The average annual precipitation in most of this area is 34 to 41 inches (865 to 1,040 millimeters). About two-thirds of the precipitation falls as high-intensity, convective thunderstorms during the freeze-free period. The low amount of precipitation in winter occurs as snow. The average annual temperature is 49 to 54 degrees F (9 to 12 degrees C). The freeze-free period averages 190 days and ranges from 175 to 210 days.

Water

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

Public supply—surface water, 10.8%; ground water, 5.9%
 Livestock—surface water, 3.9%; ground water, 4.3%
 Irrigation—surface water, 0.0%; ground water, 1.5%
 Other—surface water, 71.0%; ground water, 2.7%

The total withdrawals average 220 million gallons per day (835 million liters per day). About 14 percent is from ground water sources, and 86 percent is from surface water sources. In most years the favorably distributed, moderate precipitation provides enough

water for crops. The many small perennial streams and a few large streams are additional sources of water. Since the ground water is highly mineralized, many communities in the area rely on surface water for their supply of drinking water. The streamflow fluctuates widely and frequently, so storage is required to maintain any public supplies.

Ground water supplies from glacial drift are small, undependable, and of poor quality. This water is naturally high in total dissolved solids, commonly exceeding the national drinking water standard of 1,000 parts per million (milligrams per liter). Some ground water is pumped for irrigation from alluvial deposits along the larger rivers in the area.

Soils

The dominant soil orders in this MLRA are Alfisols and Mollisols. The soils in the area dominantly have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed or smectitic mineralogy. They generally are very deep, well drained to poorly drained, and loamy or clayey. Hapludalfs formed in loess and/or pedisediment over till (Armster, Armstrong, and Keswick series), loess (Weller series), and till (Gara and Lindley series) on uplands. Epiaqualfs (Pershing series) and Argialbolls (Edina series) formed in loess on uplands and benches. Argiaquolls (Clarinda series) formed in till on uplands. Argiudolls formed in loess (Grundy series), till (Lamoni and Shelby series), and loess and/or pedisediment over till (Lagonda series) on uplands. Endoaquolls (Zook series) formed in alluvium on flood plains and stream terraces.

Biological Resources

This area supports grassland vegetation. Big bluestem, Indiangrass, little bluestem, and switchgrass are the major species. The natural drainageways and the lowlands interspersed throughout the area support forest vegetation, mainly oaks and hickories. Most of the native grasses have been removed by cultivation and overgrazing. Naturalized bluegrass is prevalent in uncultivated areas.

Some of the major wildlife species in this area are white-tailed deer, raccoon, skunk, opossum, muskrat, cottontail, mink, squirrel, and quail. The species of fish in the area include bullhead, carp, bass, bluegill, and catfish.

Land Use

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

Cropland—private, 53%

Grassland—private, 26%

Forest—private, 14%

Urban development—private, 3%

Water—private, 2%

Other—private, 2%

Nearly all of this area is in farms, and more than one-half is cropland. Corn, soybeans, other feed grains, and hay are the principal crops. About one-fourth of the area supports introduced and native grasses. Beef cattle and swine are important sources of income on many farms.

The major resource concerns are water erosion, depletion of the 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 management, nutrient management, grassed waterways, terraces, manure management, pasture and hayland planting, and grade-stabilization structures. These practices help to control erosion, flooding, and sedimentation.