



Location of MLRA 102A in Land Resource Region M.

102A—Rolling Till Prairie

This area is mostly in Minnesota (58 percent) and South Dakota (42 percent). A small part is in North Dakota. This MLRA makes up about 16,545 square miles (42,870 square kilometers). It includes the cities or towns of Fergus Falls, Marshall, Montevideo, and Morris, Minnesota, and Brookings, Milbank, and Watertown, South Dakota. The town of Willmar, Minnesota, is on the southeast boundary of the area. Interstates 29 and 94 cross parts of the MLRA. The Pipestone National Monument is in the part of this area in Minnesota. The eastern edge of the Central Flyway and the western edge of the Atlantic Flyway are in this MLRA, so numerous migrating waterfowl occur in the area. The MLRA has many public wildlife areas.

Physiography

Most of this area is in the Western Lake Section of the Central Lowland Province of the Interior Plains. The center of the Prairie Coteau, in northeastern South Dakota, is in the Dissected Till Plains Section of the same province and division. This MLRA is an area of nearly level to rolling topography that has many depressions and ill-defined drainages. “Prairie pothole” lakes and ponds are common. The steeper slopes occur on the sides of drainages and on breaks adjacent to

some of the larger tributaries. Elevation generally ranges from 1,000 to 1,350 feet (305 to 410 meters) on lowlands and from 1,350 to 1,650 feet (410 to 505 meters) on uplands. Isolated highs on the Prairie Coteau, in northeastern South Dakota, are at an elevation of more than 2,000 feet (610 meters). The Prairie Coteau is one of the more prominent landforms in North America. The northern tip of this wedge-shaped highland is in North Dakota. This high area split the last continental ice sheet into the Des Moines and James Lobes.

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Minnesota (0702), 42 percent; Missouri-Big Sioux (1017), 25 percent; Red (0902), 17 percent; James (1016), 10 percent; Mississippi Headwaters (0701), 5 percent; and Des Moines (0710), 1 percent. The headwaters of the Red River of the North (draining into Hudson Bay) and the Minnesota River (draining into the Mississippi River) are in this area. The part of the Minnesota River in the southeast corner of this area is a National Wild and Scenic River. Some of the major tributaries to the Red River are the Sand Hill, Poplar, Marsh, Wild Rice, Buffalo, Otter Tail, Mustinka, and Bois de Sioux Rivers. The major tributaries to the Minnesota River are the Chippewa, Pomme de Terre, Whetstone, Lac qui Parle, Yellow Medicine, and Cottonwood Rivers. The Big Sioux River begins in this area, near Watertown, South Dakota. Lake Traverse and Big Stone Lake are on the border between South Dakota and Minnesota. These lakes are on the continental divide where streams drain either north to Hudson Bay or south to the Gulf of Mexico. Lakes, ponds, and marshes are common in the area.

Geology

The dominant landforms in this area are stagnation moraines, end moraines, glacial outwash plains, terraces, and flood plains. The MLRA is dominated by till-covered moraines. The stagnation moraines are gently undulating to steep and have many depressions and poorly defined drainages. The steepest slopes are on escarpments adjacent to some of the larger tributaries. Small outwash areas are adjacent to the watercourses. The Cretaceous Pierre Shale underlies the till in most of the area. Precambrian rocks also occur at depth. Granite is quarried at Milbank, South Dakota, and outcrops of Sioux Quartzite are common. Layers of silt in the quartzite near Pipestone, Minnesota, were quarried by Native Americans, and the stone was carved for pipe bowls.

Climate

The average annual precipitation in this area is 19 to 29 inches (485 to 735 millimeters). Half or more of the precipitation falls during the growing season. Rainfall typically occurs as high-intensity, convective thunderstorms during the summer. Precipitation in winter occurs mostly as snow. The average annual temperature is 38 to 45 degrees F (4 to 7 degrees C). The freeze-free period averages about 155 days and ranges from 140 to 175 days. In the western part of the MLRA, rainfall is less abundant and is not always adequate for full maturation of crops.

Water

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

Public supply—surface water, 2.4%; ground water, 11.7%

Livestock—surface water, 0.4%; ground water, 11.1%

Irrigation—surface water, 34.9%; ground water, 30.2%

Other—surface water, 1.0%; ground water, 8.3%

The total withdrawals average 145 million gallons per day (550 million liters per day). About 61 percent is from ground water sources, and 39 percent is from surface water sources.

Precipitation is the principal source of moisture for crops. In some years it is inadequate for maximum crop production. Small ponds and shallow wells are the principal sources of water for livestock. Both surface water and ground water are used for some irrigation in the area. Many natural glacial lakes are in the northern part of the area, and many of the larger ones are used for recreation. The water in the lakes and larger streams is generally suitable for all uses. The quality of the water in the smaller streams is generally poor. The water is slightly saline at low flows.

Shallow wells in glacial outwash deposits, primarily sand and gravel, provide water for livestock, domestic use, and irrigation in this area. This water is hard but is of good quality. The median level of total dissolved solids is 350 parts per million (milligrams per liter). Ground water also is available in deep wells in the Precambrian bedrock in this area or in the Dakota Sandstone. These aquifers are seldom utilized in this area because of an abundance of shallow glacial

deposits and surface water.

Soils

The dominant soil order in this MLRA is Mollisols. The soils in the area dominantly have a frigid 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 formed in loamy till (Barnes, Forman, and Hokans series), in loess or silty drift over till (Kranzburg, Poinsett, and Waubay series), in eolian deposits (Egeland and Embden series), and in glacial outwash (Arvilla, Fordville, and Renshaw series) on till plains and moraines. Calciudolls (Buse and Balaton series) formed in loamy till on rises and ridges. Argiaquolls (Parnell and Badger series) formed in loamy till and colluvial and alluvial sediment in swales and depressions. Argialbolls (Tonka series) and Endoaquolls formed in colluvial and alluvial sediment in depressions (Quam series) and in alluvial sediment on flood plains (Lamoure and Rauville series). Calciaquolls (Marysland and Moritz series) formed in alluvial sediments on flood plains.

Biological Resources

This area supports true prairie vegetation characterized by big bluestem, little bluestem, porcupinegrass, and green needlegrass. Needleandthread and prairie dropseed are important species on the steeper soils. Prairie cordgrass commonly grows in wet areas.

Some of the major wildlife species in this area are white-tailed deer, beaver, muskrat, mink, pheasant, gray partridge, giant Canada goose, mallard, blue-winged teal, wood duck, northern shoveler, pintail, ruddy duck, widgeon, redhead, canvasback, chestnut-collared longspur, marbled godwit, and upland plover. The species of fish in the area include walleye, northern pike, yellow perch, black crappie, white crappie, white bass, catfish, black bullhead, bluegill, carp, white sucker, buffalo, redhorse, and bait minnow.

Land Use

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

Cropland—private, 66%

Grassland—private, 17%; Federal, 1%

Forest—private, 3%

Urban development—private, 3%

Water—private, 4%

Other—private, 6%

Most of this area is in farms, and about two-thirds is

cropland used for crops grown for sale or for feeding livestock. The principal crops are corn, soybeans, alfalfa, spring wheat, and oats. Wooded areas generally occur as narrow bands along streams and rivers or as shelterbelts around farmsteads. Recreational hunting and fishing are important land uses around the many natural lakes in the northern part of the area.

The major soil resource concerns are wind erosion, water erosion, maintenance of the content of organic matter and productivity of the soils, soil wetness, and management of soil moisture.

Conservation practices on cropland generally include systems of crop residue management, especially no-till or other conservation tillage systems that conserve moisture and contribute to soil quality. Other practices include terraces, vegetative wind barriers, grassed waterways, and nutrient management.