



Location of MLRA 90B in Land Resource Region K.

90B—Wisconsin and Minnesota Thin Loess and Till, Southern Part

This area is in Wisconsin (79 percent) and Minnesota (21 percent). It makes up about 8,935 square miles (23,155 square kilometers). The cities of River Falls, Marshfield, Wausau, Rice Lake, and St. Croix Falls, Wisconsin, and North St. Paul, Forest Lake, White Bear Lake, Stillwater, and Foley, Minnesota, are in this MLRA. Interstates 35, 94, and 694 cross parts of the MLRA. The area has no Federal land and has only a few State parks. It has numerous State wildlife areas, including the Paul J. Olson, George W. Mead, Dewey Marsh, Sportsman Lake, Ackley, and McMillan Marsh State Wildlife Areas.

Physiography

The smaller, separate part of this area in Minnesota is in the Western Lake Section of the Central Lowland Province of the Interior Plains. Most of the larger part of the area is in the Wisconsin Driftless Section of the same province and division. The northern edges of the part of the MLRA in Wisconsin are in the Superior Upland Province of the Laurentian Upland. This MLRA is characterized by ground moraines, outwash plains, valley trains, glacial lakes, and sandstone hills. Much of the area is gently undulating to rolling. The steepest areas are adjacent to river valleys. Natural lakes, bogs, swamps, flood plains, and depressions are fairly extensive. Elevation ranges from about 675 feet (205 meters) at the St. Croix River near Prescott,

Wisconsin, to about 1,550 feet (470 meters) just north of Medford, Wisconsin. Local relief is commonly 10 to 20 feet (3 to 6 meters) but can be more than 300 feet (90 meters) along the St. Croix River.

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Chippewa (0705), 34 percent; Wisconsin (0707), 28 percent; St. Croix (0703), 15 percent; Mississippi Headwaters (0701), 12 percent; and Upper Mississippi-Black-Root (0704), 11 percent. The Mississippi River and some of its major tributaries, including the Chippewa, Black, Wisconsin, and St. Croix Rivers, drain this MLRA. The Rum River is a National Wild and Scenic River that crosses the small, separate part of the area in Minnesota. The reaches of the St. Croix and Lower St. Croix Rivers, on the border between Minnesota and Wisconsin, are National Scenic Rivers.

Geology

This MLRA was most recently glaciated during a period that straddled the Early Wisconsin Ice Age (early St. Croix and early Chippewa phases) and other earlier glaciations (Baldwin, Dallas, Hamburg, and Nasonville phases). The glacial drift in this area was probably deposited 790,000 to 16,000 years ago and is dominantly from a Superior basin origin with no carbonates. It may, however, be underlain by older glacial drift that is from a western source and contains carbonates. This older drift was deposited 790,000 to 2,500,000 years ago. Outwash is generally confined to those river valleys that previously carried glacial meltwater. Ice-walled lakes and other glacial lakes are common in this MLRA, and they have distinctive landforms with smooth slopes and silty and clayey soils. The sandstone hills are dominantly weak Cambrian sandstones locally named the Tunnel City, Wonewoc, Eau Claire, and Mount Simon Formations. A mantle of loess is in most areas of the MLRA. It ranges from a few inches (50 millimeters) to more than 6.5 feet (2 meters) in thickness.

Climate

The average annual precipitation in this area is 27 to 33 inches (685 to 840 millimeters). Most of the rainfall occurs as convective thunderstorms during the growing season. The annual snowfall ranges from about 35 to 50 inches (90 to 125 centimeters).

It generally occurs from October through April. The average annual temperature is 40 to 46 degrees F (4 to 8 degrees C). The freeze-free period averages about 160 days and ranges from 135 to 180 days.

Water

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

Public supply—surface water, 5.4%; ground water, 5.3%

Livestock—surface water, 0.2%; ground water, 0.3%

Irrigation—surface water, 0.2%; ground water, 1.5%

Other—surface water, 81.1%; ground water, 6.0%

The total withdrawals average 1,140 million gallons per day (4,315 million liters per day). About 13 percent is from ground water sources, and 87 percent is from surface water sources. Both surface water and ground water are abundant. Surface water occurs as ponds, lakes, streams, rivers, and flowages. It generally is of good quality, but it is mainly hard or very hard. It is used mainly for public supply, industry, power generation, recreation, fish habitat, sewage disposal, and livestock watering.

Ground water is used to meet some of the domestic, irrigation, and municipal needs in this MLRA. Most of the ground water in the eastern part of the area comes from unconsolidated sand and gravel aquifers in glacial deposits. In western Wisconsin and eastern Minnesota, the ground water also is obtained from Cambrian sandstone and dolomite aquifers. Precambrian crystalline rock provides some ground water for domestic use and livestock in the far western part of this area. The Prairie du Chien-Jordan aquifer in the part of this area in southeastern Minnesota is one of the most heavily used aquifers in the State. The ground water from all of the aquifers generally is moderately hard or hard. Water in the Cambrian sandstone in western Wisconsin may have some high concentrations of iron, manganese, and sulfides that limit its use. All of the aquifers typically have water with less than 500 parts per million (milligrams per liter) total dissolved solids. Nitrates have been detected in a majority of the wells.

Wells in the Cambrian formation yield less than 100 gallons per minute (380 liters per minute). The sand

and gravel aquifer and the Prairie du Chien-Jordan aquifer yield 100 to more than 1,000 gallons per minute (380 to more than 3,785 liters per minute). Glacial till yields are generally less than 100 gallons per minute (380 liters per minute). The Precambrian formation is not dependable and yields generally less than 20 gallons per minute (75 liters per minute). The flow of the ground water generally is towards the local streams and rivers. The regional flow at depth is toward the Wisconsin and Chippewa Rivers.

Soils

The soil orders in this MLRA are dominantly Entisols, Alfisols, Histosols, Spodosols, and Inceptisols. Mollisols occur to a much lesser extent. The soil temperature regime is dominantly frigid but is mesic in a few soils along the St. Croix River. The soils in the area have a udic or aquic soil moisture regime. Mineralogy is dominantly mixed but is siliceous in a few areas. The soils generally are moderately deep to very deep, well drained to very poorly drained, and sandy to loamy. Thin to thick layers of loess are throughout the area. The thicker layers generally are closer to the St. Croix River. Alluvium is sandy to silty.

Most of the soils on ground moraines are Glossudalfs (Almena, Alstad, Branstad, Freeon, Loyal, Magnor, Spencer, and Withee series). Most of the soils that are in glacial lakebeds and formed mostly in silty and clayey sediments are Glossudalfs (Comstock, Crystal Lake, Grasston, and Longsiding series) and Hapludalfs (Dalbo series). The soils on outwash plains and valley trains commonly are Glossudalfs or Hapludalfs (Anigon, Brill, Antigo, Langlade, Brander, Blackriver, Ribriver, Rosholt, and Chetek series) that formed in silty or loamy alluvium over outwash or Udipsamments (Menahga and Mahtomedi series) that formed entirely in outwash. The major soils on sandstone hills are Glossudalfs (Dobie series) that formed in a thin loess mantle over loamy residuum, Hapludalfs (Hayriver series) that formed in loamy slope alluvium and loamy residuum, and Psamments (Twinmound series) that formed in sandy slope alluvium and sandy residuum. Typic Haplosaprists (Seelyeville series) and Terric Haplosaprists (Markey series) formed mostly in organic material underlain by outwash, till, alluvium, or lacustrine sediments. They are in bogs and swamps. The soils on flood plains throughout the area are Dystrudepts

(Moppet series) and Fluvaquents (Fordum series) that formed in loamy and sandy alluvium. The soils on flood plains that drain loess-mantled areas are Endoaquolls (Vancecreek series) that formed dominantly in silty alluvium.

Biological Resources

This area is in the southern part of the conifer-hardwood forest. Oak savanna, prairie, and lowland swamps also occur in the area. Sugar maple, basswood, yellow birch, white ash, red oak, white oak, aspen, eastern hemlock, red pine, and white pine are the dominant trees. Swampy areas support black ash, green ash, silver maple, red maple, swamp white oak, black spruce, tamarack, and speckled alder.

Some of the major wildlife species in this area are white-tailed deer, black bear, ruffed grouse, wild turkey, woodcock, fox squirrel, gray squirrel, cottontail rabbits, ducks, and geese. Red fox, bobcat, coyote, muskrat, mink, otter, raccoon, and beaver are the main furbearers. Grassy lowlands and old pastures provide scattered habitat for prairie chickens and gray partridge. The numerous State wildlife areas and the substantial acreage of county forestland provide good wildlife habitat and opportunities for recreational hunting. Fishing occurs in constructed impoundments, flowages, and rivers. The species of fish in the area include rainbow trout, brook trout, walleye pike, largemouth bass, smallmouth bass, bluegill, yellow perch, and northern pike.

Land Use

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

Cropland—private, 43%

Grassland—private, 14%

Forest—private, 28%

Urban development—private, 8%

Water—private, 2%

Other—private, 5%

Cropland and forestland are the major land uses in this area. Lumber and pulp production is an active industry. Agricultural enterprises include row crops, dairy farms, and livestock operations. The major crops are corn, soybeans, oats, barley, and alfalfa. A small acreage is used for specialty crops, including sweet corn, potatoes, peas, snap beans, strawberries, apples, and ginseng. Tourism, recreation, and wildlife management are important. Damming of the Wisconsin River has formed Lake Dubay. Because of the abundance of water and the many acres of county forest and public hunting grounds, hunting and fishing are popular activities. The major soil resource management concerns are water erosion, excessive soil wetness, soil fertility, and soil tilth. Conservation practices on cropland generally include crop rotations, conservation tillage systems (especially no-till systems), contour farming, contour stripcropping, and grassed waterways. A combination of surface and subsurface drainage systems is needed in most areas of poorly drained soils.