



Location of MLRA 90A in Land Resource Region K.

90A—Wisconsin and Minnesota Thin Loess and Till, Northern Part

This area is in Wisconsin (69 percent), Minnesota (26 percent), and Michigan (5 percent). It makes up about 17,535 square miles (45,440 square kilometers). It includes the cities and towns of Frederic, Ladysmith, Park Falls, Crandon, and Wittenberg, Wisconsin; Cloquet, Hinckley, and Milaca, Minnesota; and Iron River, Michigan. Interstate 35 crosses the part of this MLRA in Minnesota, and U.S. Highway 8 crosses much of the area from east to west. Parts of the Chequamegon, Nicolet, and Ottawa National Forests and numerous State parks are in this area. Parts or all of the St. Croix Chippewa Communities, Lac Court Oreilles, Lac Du Flambeau, Menominee, Potawatomi, Stockbridge, and Mole Lake Indian Reservations are in the area.

Physiography

The part of this area in Minnesota is mostly in the Western Lake Section of the Central Lowland Province of the Interior Plains. Nearly all of the parts in Wisconsin and Michigan are in the Superior Upland Province of the Laurentian Upland. Three distinct lobes of the Laurentian Ice Sheet (Superior, Chippewa, and Green Bay) played major roles in shaping the landscape in this area. The landscape is characterized by gently undulating to rolling, loess-mantled till plains, drumlin fields, and end moraines mixed with outwash plains associated with major glacial drainageways, swamps, and bogs. In some

areas lake plains and ice-walled lakes are significant. Steeper areas occur mostly as valley side slopes along flood plains and as escarpments along the margins of lakes. Lakes are common, and streams generally have a dendritic pattern. Elevation ranges from 1,100 to 1,950 feet (335 to 595 meters). Local relief is mainly less than 10 feet to 20 feet (3 to 6 meters), but some major valleys and hills are 200 feet (60 meters) above the adjacent lowland.

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Chippewa (0705), 29 percent; St. Croix (0703), 24 percent; Northwestern Lake Michigan (0403), 23 percent; Mississippi Headwaters (0701), 13 percent; Wisconsin (0707), 8 percent; and Western Lake Superior (0401), 3 percent. The major rivers crossing this area are the Chippewa, St. Croix, Mississippi, and Wisconsin Rivers. The St. Croix and Wolf Rivers in Wisconsin have been designated National Scenic Rivers. The Pine and Popple Rivers in Wisconsin and the Rum and Kettle Rivers in Minnesota have been designated as National Wild and Scenic Rivers. Lakes, ponds, and marshes are common throughout the area.

Geology

Precambrian-age bedrock underlies most of the glacial deposits in this MLRA. The bedrock is a complex of folded and faulted igneous and metamorphic rocks. The bedrock terrain has been modified by glaciation and is covered in most areas by Pleistocene deposits and windblown silts. The glacial deposits form an almost continuous cover in most areas. The drift is as much as several hundred feet thick in many areas. Loess covered the area shortly after the glacial ice melted.

Climate

The average annual precipitation in this area is 26 to 34 inches (660 to 865 millimeters). The precipitation is fairly well distributed throughout the year but reaches a slight peak in spring. Rainfall commonly occurs as convective thunderstorms during the growing season. Snowfall generally occurs from October through April. The average annual temperature is 38 to 45 degrees F (3 to 7 degrees C). The freeze-free period averages about 145 days and ranges from 110 to 180 days.

Water

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

Public supply—surface water, 14.5%; ground water, 8.3%

Livestock—surface water, 2.1%; ground water, 3.1%

Irrigation—surface water, 1.5%; ground water, 6.9%

Other—surface water, 63.2%; ground water, 0.5%

The total withdrawals average 205 million gallons per day (775 million liters per day). About 19 percent is from ground water sources, and 81 percent is from surface water sources. The moderate precipitation generally is adequate for crops and pasture, but in years of little or no precipitation, crops on sandy soils are damaged by a shortage of moisture. Drainage of most of the soils on wet lowlands is needed for good crop and forage production. Surface water and ground water are abundant and readily available. The sources of surface water are the many lakes and streams. This water is used mostly for recreational activities, partly for watering livestock, and occasionally for irrigation. Water quality is generally good. Landlocked lakes and lakes and streams that border bogs and swamps are more acid than the other surface water in the area. Spring-fed lakes have the highest pH value. The water is very soft in most of the lakes, but hard water occurs in the spring-fed lakes and in streams.

Ground water is abundant in deep glacial deposits in most of this area. It also occurs in sedimentary and volcanic rocks in the western part of the area. It is scarce in areas where the layer of drift is thin. The water meets the domestic, agricultural, municipal, industrial, rural, and irrigation needs in the area. The content of dissolved solids in the ground water from all the various aquifers in this area is low, typically about 200 parts per million (milligrams per liter), and the water generally is moderately hard or hard. The level of total dissolved solids in some of the water can be much higher because of a high content of limestone in some of the glacial deposits. Most of this area obtains ground water from unconsolidated glacial sand and gravel deposits on or very near the surface. Some wells tap the Cambrian sandstone in the southwestern part of the area, in Wisconsin.

In northwest Wisconsin (Ashland and Bayfield Counties), where the glacial deposits do not occur, and in much of the part of this area in Minnesota, ground water from sedimentary and volcanic rock aquifers is used. This water is of very good quality, but many soils have very porous layers that are poor filters of domestic waste and agricultural chemicals, so there is a risk of contamination from development and agriculture. Minor problems may be caused by hardness and in some areas by high concentrations of iron. About 65 percent of the wells in the part of this area in Michigan had water with more than 1,500 parts per billion (micrograms per liter) iron. Yields of water from the glacial deposits vary. Glacial drift consisting mainly of sand and gravel yields 100 to more than 1,000 gallons per minute (380 to more than 3,785 liters per minute). Glacial till yields generally less than 100 gallons per minute (380 liters per minute).

Soils

The dominant soil orders in this MLRA are Alfisols, Entisols, Histosols, and Spodosols. The soils in the area have a frigid soil temperature regime, a udic or aquic soil moisture regime, and mixed mineralogy.

Glossudalfs (Amery, Brennyville, Freeon, Frogcreek, Glendenning, Haugen, Magnor, Milaca, Mora, Stinnett, and Santiago series) formed in a thin, discontinuous silty mantle over firm or friable till. Glossudalfs formed in outwash mantled with silty material (Antigo, Sconsin, Billyboy, and Ossmer series) or in outwash mantled with loamy material (Rosholt, Scoba, Scott Lake, Chetek, and Oesterle series). Udipsamments (Grayling, Mahtomedi, and Friendship series) formed in sandy outwash on outwash plains and stream terraces. Haplorthods formed in sandy loam or loamy sand till mantled with silty material (Beaverbay, Chequamegon, Mudlake, Wabeno, and Soperton series) or entirely in till (Newot, Newood, Pesabic, Kennan, Sarona, Sarwet, Keweenaw, Parkfalls, and Stanberry series). Haplorthods are on outwash plains. They formed in outwash mantled with silty material (Stambaugh, Vanzile, and Spiderlake series), in outwash mantled with loamy material (Padus, Pence, Tipler, and Manitowish series), or in sandy outwash (Vilas, Lindquist, Crosswell, and Chinwhisker series). Glossaqualfs (Cebana series) formed in till mantled with silty material. They are in swales. Epiaqualfs (Capitola and Wozny series)

formed in sandy loam or loamy sand till in depressions on moraines. Haplosaprists (Lupton, Cathro, Loxley, and Beseman series) formed in organic deposits in basins and depressions. Fluvaquents (Fordum series) formed in loamy alluvium on flood plains.

Biological Resources

This area is in a conifer-hardwood forest. Sugar maple, basswood, yellow birch, white ash, red oak, white oak, aspen, eastern hemlock, red pine, and white pine are the dominant trees. Poorly drained soils 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, eastern gray wolf, ruffed grouse, sharp-tailed grouse, woodcock, fox squirrel, gray squirrel, snowshoe hare, ducks, and geese. Red fox, bobcat, coyote, muskrat, fisher, mink, otter, raccoon, and beaver are the main furbearers. A small herd of elk was released in this area, and the number of elk is increasing. State wildlife areas and substantial national and county forests provide good wildlife habitat. Fishing occurs in constructed impoundments, flowages, lakes, and rivers. The species of fish in the area include rainbow trout, brook trout, walleye pike, largemouth bass, smallmouth bass, bluegill, black crappie, yellow perch, musky, and northern pike.

Land Use

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

Cropland—private, 10%

Grassland—private, 7%; Federal, 3%

Forest—private, 58%; Federal, 7%

Urban development—private, 3%

Water—private, 5%; Federal, 2%

Other—private, 5%

This area has a significant acreage of public and private forestland used to support the paper and lumber industry. Sap collection from sugar maple and syrup production are important forestry enterprises. Agricultural enterprises include row crops, dairy farms, and beef operations. Crops include corn, soybeans, oats, wheat, and alfalfa. Tourism, recreation, and wildlife management are important. Because of the abundance of water, the many acres of national and county forests, and public hunting grounds, hunting, fishing,

snowmobiling, hiking, and skiing are popular activities.

The major soil resource management concerns are water erosion, 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.