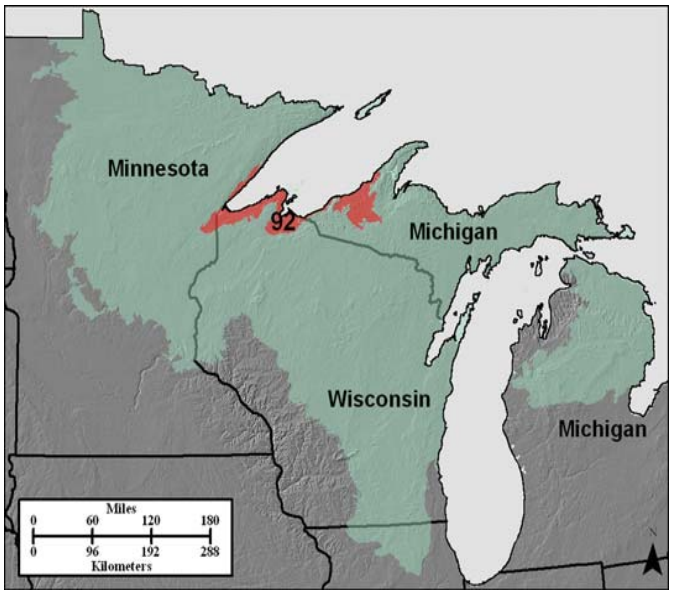

Location of MLRA 92 in Land Resource Region K.

92—Superior Lake Plain

This area is in Wisconsin (48 percent), Michigan (39 percent), and Minnesota (13 percent). It makes up about 2,920 square miles (7,570 square kilometers). The cities of Duluth, Minnesota, Superior, and Ashland, Wisconsin, and Ontonagon, Michigan, are in this MLRA. Interstate 35 ends in Duluth. A large part of the Ottawa National Forest is in the eastern half of this area. The Ontonagon, Bad River, and Red Cliff Indian Reservations are in the area. Numerous State parks and State forests are throughout the area. The Apostle Islands National Lakeshore is in this MLRA.

Physiography
All of this area is in the Superior Upland Province of the Laurentian Upland. The area is characterized by a till plain mixed with lake plains, lake terraces, beaches, flood plains, swamps, and marshes. Some rocky knobs, hills, and low mountains make up part of this nearly level lake plain. Elevation ranges from 600 to 1,400 feet (185 to 425 meters), increasing gradually from the lakeshore inland. Local relief on the lake plain is only 3 to 6 feet (1 to 2 meters), but the adjoining hills and low mountains rise sharply from 85 feet (25 meters) to more than 330 feet (100 meters) above the plains.

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Western Lake Superior (0401), 60 percent, and Southern Lake Superior-Lake Superior (0402), 40 percent. Some of the streams crossing this area and emptying into Lake Superior are the Bois Brule, Nemadji, Whittlesey, Montreal, Black, Presque Isle, and Ontonagon Rivers in Wisconsin and Michigan and numerous steep-gradient streams along the north shore of Minnesota.

Geology
This area has been glaciated, and most of the surface deposits are fine textured till derived from glacial lake sediments. The bedrock in the area is a mixture of late Precambrian and Cambrian sandstones and shales and mafic igneous rocks. It is known as the Keweenawan Group in Wisconsin and Minnesota. The bedrock units in Michigan are known as the Freda and Jacobsville sandstones, Nonesuch shale, the Portage Lake volcanics, and the Copper Harbor conglomerate.

Climate
The average annual precipitation in this area is 27 to 37 inches (685 to 940 millimeters). It is lowest along the lakeshore and highest in inland areas. The maximum precipitation occurs as high-intensity, convective thunderstorms in summer, and the lowest precipitation occurs in midwinter. Precipitation in winter occurs as snow. The average annual temperature is 38 to 42 degrees F (4 to 6 degrees C). The freeze-free period averages about 155 days and ranges from 125 to 190 days.

Water
Following are the estimated withdrawals of freshwater by use in this MLRA:
Public supply—surface water, 3.4%; ground water, 0.0%
Livestock—surface water, 0.7%; ground water, 0.4%
Irrigation—surface water, 0.0%; ground water, 0.0%
Other—surface water, 95.5%; ground water, 0.0%

The total withdrawals average 155 million gallons per day (585 million liters per day). Almost 100 percent is from surface water sources. Precipitation is adequate for crops and pasture. Drainage of level areas of wet soils is needed for good growth of crops. The area has few inland lakes, but much of the area has access to Lake Superior for water supply and recreation. Most of the “other” water use in this area is for the wood and paper products industries. Iron ore, limestone, and dolomite are shipped from the Great Lakes harbors at Duluth, Minnesota, and

Superior, Wisconsin, and some surface water is used in handling those materials. The surface water is of good quality. It is hard but is suitable for most uses with little or no treatment.

Two sources of ground water occur in this area. One is the isolated pockets of unconsolidated sand and gravel in the glacial drift. The other is the Lake Superior Sandstone and Precambrian Lava Flows aquifer. Water from both of these aquifers is moderately hard to very hard and is typically very low in total dissolved solids, having less than 300 parts per million (milligrams per liter). About 30 percent of all the wells tested in these aquifers had iron and manganese concentrations that exceeded the national secondary standards for drinking water. These standards are for esthetics and do not affect human health. Staining and scale-buildup in pipes and on appliances occur when high amounts of iron and manganese occur in water.

Soils

The dominant soils in this MLRA are Alfisols, Spodosols, Inceptisols, and Entisols. The soils in the area have a frigid soil temperature regime, a udic or aquic soil moisture regime, and mixed or isotic mineralogy. The major soils formed in clayey to loamy till in some areas with a sandy mantle. Some soils, primarily along the edges of the MLRA, have stratified silty and clayey lacustrine deposits. The soils in some areas along the shore of Lake Superior formed in organic material or in sandy beach deposits.

Glossudalfs on till plains formed in very deep clayey or loamy till (Miskoaki, Amnicon, Cuttre, Odanah, Sanborg, Badriver, Watton, Flintsteel, and Big Iron series) or in clayey till that is deep to loamy or sandy lacustrine deposits (Anton, Borea, Cornucopia, Portwing, and Herbster series). Haplorthods formed in clayey till mantled with loamy material (Superior, Ubly, and Belding series), in clayey till mantled with sandy material (Manistee, Kellogg, and Ashwabay series), and in loamy till mantled with sandy material (Menominee and Morganlake series) on till plains and remnant beaches; in silty lacustrine deposits (Sporley and Fence series) on lake plains and remnant beaches; in sandy beach, dune, or lacustrine deposits (Rousseau, Neconish, Vilas, Croswell, Sultz, and Cublake series) on remnant beaches and dunes; and in clayey, loamy, and sandy deposits over sandstone bedrock (Lapoin, Abbaye, Brownstone, and Redrim series) in bedrock-controlled areas along Lake Superior. Epiaquepts formed in very deep clayey or loamy till (Bergland, Pickford, and Munuscong series); in clayey till that is deep to loamy and sandy lacustrine material (Lerch and Happyhollow series); or in clayey till mantled with sandy material (Wakeley series) in depressions on till plains. Haplohemists (Rifle series) formed in organic deposits in marshes along Lake Superior, and Haplosaprists (Seelyeville, Cathro, Lupton, Dorval, and Tawas series) formed in organic deposits in inland swamps and in side-hill seep areas. Udipsamments (Grayling, Wurtsmith, and Meehan series) formed in sandy beach and dune deposits on active beaches. Udifluvents formed in silty alluvium (Moquah series) or sandy alluvium (Pelkie and Dechamps series) on flood plains.

Biological Resources

This area supports deciduous and evergreen trees. Boreal forests (aspen, white birch, balsam fir, white spruce, white pine, red pine, white cedar, and tamarack) and mixed deciduous and coniferous forests (hemlock, sugar maple, yellow birch, red pine, and white pine) are dominant. Swamp conifers and lowland brush commonly grow on the wetter soils.

Some of the major wildlife species in this area include black bear, white-tailed deer, coyote, snowshoe hare, timber wolf, ruffed grouse, tree squirrel, bald eagle, and Canada goose. The species of fish in the area include northern pike, perch, walleye, largemouth bass, smallmouth bass, brook trout, steelhead trout, and panfish.

Land Use

Following are the various kinds of land use in this MLRA:
Cropland—private, 10%
Grassland—private, 4%
Forest—private, 68%; Federal, 12%
Urban development—private, 3%
Water—private, 1%
Other—private, 2%
More than three-fourths of this area is forested, and about two-thirds is privately owned forestland used for timber production and recreation. About one-tenth of the MLRA is cropland used mainly for small grains and hay for dairy cattle and other livestock. Apples, blueberries, trefoil seed, and other specialty crops are important cash crops in some areas. Only a small part of the land is used for pasture.

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, and grassed waterways. Surface drainage systems are needed to remove surface water from wet areas.