Western Upper Peninsula Ecoregion

Landscape Context

The Western Upper Peninsula ecoregion encompasses 24,287 square miles and includes all of Baraga, Iron, Houghton, Keweenaw, Ontonagon and Gogebic counties and portions of Menominee, Dickinson and Marquette counties. Landcover in this ecoregion is primarily forested (81%) and wetlands (11%). Agricultural land use covers 2% and urbanization covers approximately 2% of the land area.

The region is underlain by highly resistant igneous and metamorphic bedrock of the Precambrian Shield. Continental glaciers have overridden the section many times, eroding some of the underlying bedrock and redepositing glacial drift upon the bedrock or older underlying glacial deposits. The result is a diverse landscape of glacially scoured bedrock ridges and irregularly overlain glacial features, including moraines, lake beds, and outwash channels and plains. A combination of cold climate, resulting from both the high latitude and high continentality, and relatively nutrient-poor, rocky, acidic soils has resulted in minimal use of most of the ecoregion for agriculture. Most of the region is managed as either private or public forest. Prevalent forest types today include northern hardwoods, aspen, pines (with significant acreage constituting plantation) and lowland conifers.

The ecoregion has a strongly continental climate, with only moderate influence from Lake Superior. Winds are generally from the Great Plains which are southwest of the ecoregion. Temperatures are extremely cold in the winter. Levels of snowfall and rainfall are high in areas adjacent to Lake Superior because moisture-laden air from the lake is forced to rise rapidly over the bedrock uplands at the northern edge of the ecoregion (Eichenlaub et al. 1990, Albert et al. 1986, Eichenlaub 1979, Wisconsin Statistical Reporting Service 1967). Compared to the other sections in the State, this ecoregion has the most extreme winter temperatures and the shortest growing season (87–107 days inland; Albert et al. 1986).

Large exposures of Precambrian bedrock are found throughout the northern part of the ecoregion. Glacial drift thickness is quite variable, with drift thicknesses often greater than 200 feet (Doonan and Hendrickson 1968, Thwaites 1929). Large exposures of bedrock occur in the northwestern portion of the region, where the bedrock knobs consists primarily of granites and gneiss, but also contain the important Negaunee iron formation (Reed and Daniels 1987, Dorr and Eschman 1984). On the Keweenaw Peninsula, Middle Precambrian volcanics, conglomerates, sandstones and shales are exposed. Middle Precambrian volcanics, conglomerates and shales are also exposed on Isle Royale. At the southern edge of the ecoregion, Cambrian sandstone, with some dolomite and shale, underlies the glacial drift (Ostrom 1981). Locally, Cambrian sandstone is within a few feet of the surface (Hole and Germain 1994). The bedrock of the section was abraded by continental glaciation and incorporated into the glacial drift, accounting for the red soils found in much of the ecoregion. Exposed bedrock knobs occur commonly in the northern areas. The most common glacial landforms are ground- and end-moraine ridges, which occur throughout the ecoregion. Clayey glacial lake plains occur near Lake Superior, extending as far as 30 miles inland. The ecoregion contains several extensive outwash plains, including one near Lac Veiux Desert along the Wisconsin–Michigan boundary and another along the Michigamme River in Michigan.

Stony, red, sandy loams are common on the moraines. One to two feet of wind-blown silt (loess) blanket large areas, creating a silt–loam surface soil (Hole and Germain 1994, Albert 1990, Hole 1976); this loess cap becomes thin and discontinuous in northern Wisconsin and Michigan. Both the sandy loam and silt–loam soils tend to be acidic. Lacustrine deposits are generally silt- and clay-rich (Cummins and Grigal 1981, Hole 1976, Veatch 1953); these fine-textured soils are typically somewhat

leached (Hole and Germain 1994). Outwash soils are acidic sand and gravels that have little accumulation of organic material.

Circa 1800, landcover on the thick till soils was primarily northern hardwood forests dominated by sugar maple, eastern hemlock, basswood, yellow birch and occasionally white pine (Comer et al. 1995). This forest type persists over most of the ecoregion. Beech was absent, probably because of extremely low winter minimum temperatures. On thin soils and bedrock knobs, red pine, white pine and red oak were common dominants. On some of the exposed bedrock knobs of the Keweenaw Peninsula, Porcupine Mountains and Isle Royale, a dwarf 'krummholz' forest of red oak occurred. Bedrock exposures also supported unique cliff, glade and lakeshore communities. Fire-tolerant jack pine and northern pin oak grew on the droughty, fire-prone, flat outwash plains.

The highly dissected lacustrine clay plain along Lake Superior supported a diverse hardwood–conifer forest which included white pine, eastern hemlock, balsam fir, northern white cedar, trembling aspen, balsam poplar and paper birch (Comer et al. 1993a). Northern hardwoods and almost pure stands of hemlock or white pine occurred on some upland plateaus on the lake plain.

Wetlands were not extensive, but numerous bogs occurred in the kettle depressions within the end moraines and tamarack–black spruce swamps occurred in the broad valleys between broad ground-moraine ridges. Hardwood–conifer swamp occurred on the poorly drained portions of the lake plain. Larger floodplains were often dominated by American elm, green and black ashes, and occasionally by silver maple. Smaller floodplains were more typically dominated by conifers, especially balsam fir.

Windthrow was the prevalent disturbance in the upland forests (Canham and Loucks 1984). Fire was important on droughty outwash plains, bedrock ridges and conifer-dominated wetlands.

Northern hardwoods remain the prevalent vegetation type within this ecoregion. The region comprises a large part of the deciduous hardwood forest in the northeastern United States. Its forests have been recognized as the major breeding area for a large number of migratory song birds. Bedrock exposures still support unique cliff, glade and lakeshore communities. Open wetlands include bogs, poor fens and wet meadows. The primary land use is forestry. Logging of white and red pines for construction lumber began in the latter part of the 19th century and continued into the early 20th century. Logging of the pines was followed by logging of eastern hemlock for tannin from the bark and later logging of northern hardwoods for furniture and pulp. Damage caused by late 19th- and early 20th-century logging and subsequent slash fires is still much in evidence today; much of the land that was originally forested with northern hardwoods or pine was reforested with aspen and paper birch, species that are still prominent. Logging of northern hardwoods, aspen and jack pine for paper production continues. Severe deer-browse pressure throughout forested systems has resulted in reduced recruitment of cedar and hemlock.

Several iron formations were mined in the past in the Menominee, Penokee, Gogebic and Michigamme ranges. Copper was also mined on the Keweenaw Peninsula and near the Porcupine Mountains. Mining resulted in rapid, early development of the section, through logging for mine timbers, housing and fuel. However, mining is no longer a major industry, and human populations and development have slowed or stopped in most mining areas.

Priority Threats

Ten threats to wildlife and landscape features in this ecoregion were identified as significant by participants at a workshop for this region (see Methods in the Introductory Text & Statewide Assessments section for more information). The greatest threats in this region are social attitudes and non-consumptive recreation. A slightly less severe threat is invasive plants and animals, which includes the spread of established species and introduction of new species not yet found in the region.

The next level of severity includes: industrial, residential and recreational development, lack of scientific information, and forestry practices. Not all forestry practices were evaluated as potential threats; only those practices which significantly altered landscapes or had long-term effects on SGCN were of concern. The remainder of the ten threats (disease, pathogens, & parasites, altered fire regime, fragmentation and other biological interactions) were still significant, but not to the same degree as the first six.

Priority Conservation Actions

The following are conservation actions that were repeated most frequently within each landscape feature category and, therefore, should be considered priorities for the ecoregion, because they will have the most widespread benefits for wildlife conservation in this region (no order implied):

Grassland
- Develop and implement management plans that mimic historic disturbance regimes
- Encourage maintenance of grassland landscape features through private land conservation initiatives (e.g., CRP, CREP); provide sustainable agriculture strategy training to help keep family farms afloat
- Develop local ordinances to discourage conversion of grassland features to residential and industrial development; discourage parcelization and reduction in patch size.

Shrubland
- Develop and enforce recreational use restrictions and promote responsible ATV and ORV use in shrublands
- Develop local ordinances to discourage conversion of shrubland to industrial and residential development and retain larger parcel sizes in shrublands; enforce existing ordinances

Forest
- Develop and enforce/implement best management practicess which address the needs and values of wildlife
- Develop and implement plans for invasive species control and prevention
- Restore natural fire and hydrologic regimes in forested landscape features
- Manage for representation of all successional stages
- Expand and support conservation easements and the purchase of high quality occurences

Inland Wetlands/Water
- Develop and enforce recreational use restrictions and promote responsible ATV, ORV and personal watercraft use
- Develop and implement plans for invasive species control and prevention
- Restore natural hydrologic regimes
- Expand and support conservation easements and the purchase of high quality occurences

Great Lakes/Coastal
- Develop and enforce recreational use restrictions and promote responsible ATV and ORV use
- Develop ordinances to restrict development of wetlands, alvar systems and shorelines on the Great Lakes and retain larger parcel sizes in Great Lakes dune complexes
- Develop and implement plans for invasive species control and prevention
- Expand and support conservation easements and the purchase of high quality occurences