

Eastern Upper Peninsula Ecoregion

Landscape Context

The Eastern Upper Peninsula ecoregion encompasses 17,114 square miles and includes all of Chippewa, Mackinac, Luce, Schoolcraft, Delta and Alger counties and portions of Menominee, Dickinson and Marquette counties. Landcover in this ecoregion is primarily forested (67%) and wetlands (20%). Agricultural land use covers 4% and urbanization covers about 2%. The remaining landcover consists of open grasslands, sparsely vegetated areas, beaches and rock areas.

The region is characterized by relatively flat topography with large expanses of swamp forest and low-productivity peatland. Most of the landscape remains forested, with the exception of pasture lands on both clay lake plain and loamy ground moraine.

Most air masses cross the Great Lakes before entering this ecoregion, which causes climatic differences with the surrounding continent. Large amounts of lake-effect snow and rain characterize portions of the region near the Great Lakes shorelines, especially along the Lake Superior shoreline. The average length of the growing season is 109 days (Albert et al. 1986).

The ecoregion is underlain by Cambrian sandstone and Paleozoic limestone, shale and dolomite (Dorr and Eschman 1984). Sandstone is exposed along and near the Lake Superior shoreline and along the western edge of the ecoregion. Limestone and dolomite are exposed along the Lake Michigan and Lake Huron shorelines and in localized inland areas. In the interior of the region, thick glacial drift covers bedrock. The entire region was covered by late Wisconsinan glaciation; common glacial landforms include lake plain, outwash plain, end moraine and ground moraine. Glacial lake plain covers the largest part of the ecoregion. Most of the lake plains are sandy, but a large area of clay lake plain occurs near the eastern edge of the ecoregion. Broad outwash plains are located along the entire northern edge of the preglacial lakes. Ground moraine is extensive at the western edge of the region. End moraine is common along the northern edge of the ecoregion near Lake Superior. On the sand lake plains, common postglacial landforms include transverse dunes, sand spits, beach ridges and large deltas. Large sand dunes, formed during the Lake Nipissing high-water period (approximately 4,000 years ago), occur along portions of the Lake Michigan and Lake Superior shorelines. In addition, extensive series of parallel beach ridges or wooded dune and swale complexes occur along former embayments of the postglacial Great Lakes shoreline.

The soils of the sand and clay lake plain, which are quite extensive in the ecoregion, tend to be poorly drained, and therefore support extensive peatlands and swamp forests. Lacustrine clays, resulting from the glacial abrasion of limestone and dolomite, are common in this ecoregion. The soils of the extensive outwash plains are generally excessively drained sands. The sandy and loamy tills near the southern edge of the region are quite variable in drainage class and depth to underlying bedrock. Sandy tills and outwash occur at the northern edge of the ecoregion, near Lake Superior.

Circa 1800, the forests included northern hardwood forest, white pine–red pine forest, jack pine barrens, hardwood–conifer swamp, conifer swamp, and muskeg (Comer et al. 1995, Comer et al. 1994). Open bogs occurred on kettle lakes within end moraines and pitted outwash. Locally, where bedrock was exposed or near the surface, alvar grassland and glade vegetation was present. Unique bedrock communities also occurred along the lakeshore. Extensive marshes and wooded dune and swale complexes occurred along the Great Lakes shoreline. Northern hardwood forests, commonly with sugar maple and beech as dominant species, were concentrated on end moraines, ground moraines and drumlin fields. Jack pine forests grew on extensive, fire-prone outwash plains, along with red pine–white pine forests where fires were less severe. The sandy lake plain supported extensive, open peatlands (patterned fen and muskeg) dominated by sedges and shrubby black spruce, tamarack and

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occasionally jack pine (Comer et al. 1993a). Extensive swamps of northern white cedar occurred near the margins of the lake plain. On the clay lake plain, forests were a diverse mix of hardwood and conifer species, including white spruce, balsam fir, white pine, eastern hemlock, trembling aspen, balsam poplar and red maple. The natural disturbance regime in this region was dominated by fire and wind. Fire was prevalent on the jack pine plains and in the red pine–white pine forests. Windthrow occurred in both upland and lowland forests.

Most of the ecoregion remains forested, with the exception of the clay lake plains, which are used for pasture and forage crops. Intensive logging for white pine occurred in the latter half of the 19th century, causing major changes in forest composition. Eastern hemlock was also logged for the tanning industry and northern hardwoods were harvested for multiple uses. Prevalent forest types today include northern hardwoods, aspen, pines (with significant acreage constituting plantation) and lowland conifers. Early successional forest types are more prevalent today because of past and current management. Severe deer-browse pressure throughout forested systems has resulted in reduced recruitment of cedar and hemlock. This ecoregion also contains significant areas of extensive open wetlands (northern fen, patterned fen, muskeg, Great Lakes marsh) and numerous unique bedrock communities (alvar grassland, alvar glade, bedrock lakeshore).

Priority Threats

Ten threats to wildlife and landscape features in this ecoregion were evaluated as significant by participants at a technical workshop for this region (see Methods chapter in the Introductory Text & Statewide Assessments section for more information). The greatest threat in this region is invasive species, which includes both the spread of established species and introduction of new species not yet found in the region. Slightly less severe threats include non-consumptive recreation 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 next level of severity included: social attitudes, incompatible natural resource management, altered hydrologic regimes and altered fire regimes. The remainder of the ten threats (disease, pathogens, & parasites, fragmentation, industrial, residential & recreational development, and lack of scientific knowledge) 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

- Manage to approximate natural disturbance regimes by using prescribed fire, restoring water flow patterns, and implementing managed grazing, mowing and haying plans
- Institute invasive species monitoring, prevention and control programs
- Work with municipalities to promote planning and zoning that ensures adequate protection for grassland landscape features

Shrubland

- Institute invasive species monitoring, prevention and control programs
- Manage to approximate natural disturbance regimes by using prescribed fire and restoration of water flow patterns
- Work with municipalities to promote planning and zoning that ensures adequate protection for shrubland systems

Forest

- Manage to approximate natural disturbance regimes by using prescribed fire and restoring water flow patterns
- Develop and implement forestry best management practices which address the value of forested systems for wildlife
- Institute invasive species monitoring, prevention and control programs
- Manage for representation of all successional stages
- Expand and support conservation easements and the purchase of high quality occurrences

Inland Wetlands/Water

- Institute invasive species monitoring, prevention and control programs
- Work with land and watershed managers to develop priorities for inland wetland/water landscape feature restoration and management
- Work with municipalities to promote planning and zoning that ensures adequate protection for inland wetland/water landscape features
- Expand and support conservation easements and the purchase of high quality occurrences

Great Lakes/Coastal

- Develop and enforce regulations to curtail recreational activities that cause significant damage
- Institute invasive species monitoring, prevention and control programs
- Promote responsible ATV, ORV, and personal watercraft use