

2 – NORTHERN LOWER PENINSULA FOREST HISTORY

As the climate cooled during the most recent ice age and glaciers expanded south, forest communities moved ahead of the glaciers. When the climate warmed again and the glaciers retreated north, a new landscape was exposed and the complicated pattern of rocks, gravel, soil and water left behind by the glaciers provided a foundation for our contemporary Michigan forests. Not all species recolonized at the same rate – refuge location, seed size, germination requirements, competitive ability and dispersal vectors affected how species responded to the changing climate. Spruce and tamarack were likely the first, soon after the ice sheets receded 10,000-12,000 years ago, followed closely by balsam fir, jack pine, red pine and then white pine. Oak and maple were slower to move, not reaching the northern Lower Peninsula until around 9,000 and 6,000 years ago, respectively. The most recent major forest species to colonize northern Michigan appears to be hemlock. Over thousands of years, forested natural communities formed and re-formed across Michigan, influenced by local geology, soils, hydrology and climate. Fluctuations in climate were reflected by changes in the forest communities, including the advance and retreat of the prairie-forest border, with grassland and savannah occasionally entering Michigan. By the early- to mid-1800s, around 95% of Michigan's vegetation is estimated to have been forest. Many boreal wildlife species, such as Canada lynx and woodland caribou were found statewide. Southern wildlife species, such as Virginia opossum, were entirely absent from the region.

Prior to pre-1800 European contact in the northern Lower Peninsula ecoregion of Michigan, human-caused forest impacts were related to the subsistence activities of Native American populations. These relatively minor impacts appear to have been the greatest along water bodies and in fire-susceptible areas, primarily grasslands and pine-dominated communities (Stearns, 1997).

Human populations in the northern Lower Peninsula ecoregion were primarily shaped by the fur trade as the distribution and concentration of Native Americans, explorers, missionaries, trappers and early settlers ebbed and flowed through 1700s. Specific factors influencing populations included the establishment of French trade routes, French-English trade rivalry and wars, international treaties, Indian-white hostilities, inter-tribal alliances, encroachment by settlers and finally by Indian treaties ceding land to state and federal governments (Tanner, 1987). Though the forest remained mostly intact during this period, furbearing species, in particular beaver, were highly impacted. The fur trade boomed through the 1700s, peaking just after the War of 1812.

During the early 1800s, major land purchases and various treaties resulted in vast tracts of federally owned land. The responsibility for disposal and settlement of these lands rested on the Commissioner of Public Lands and the General Land Office. Before land could be disposed of a survey was needed to divide the land into townships and sections. Surveys were conducted in the territory and state of Michigan from 1816 to 1856 by deputy surveyors of the General Land Office. As part of township and section boundary establishment, surveyors established and recorded witness trees, recorded specific trees along section lines (on average, eight to 12 trees per section) and often noted summary information along section lines including tree species (ranked by relative abundance) and general soil character. In addition, recently burned areas, wind throw and beaver floodings were recorded along section lines, as were various cultural features of either Native American or early European settler origin (Comer et. al., 1995).

Ecologists from the Michigan Natural Features Inventory developed a methodology to translate General Land Office notes into a map that has utility for researchers and land managers. Based on these maps, the most common forest types in the northern Lower Peninsula prior to significant European settlement included northern hardwood forest, jack pine barrens, white pine-red pine forest, hardwood-conifer swamp and conifer swamp. Beech-sugar maple-hemlock forest was common on the end and ground moraines and accounted for forty percent of the General Land Office cover type area. Jack pine, along with northern pin oak, dominated the flat, droughty outwash plains which occupy large portions of the ecoregion. Forests of white pine and red pine were located in narrow outwash channels and on the moraines at the edges of the outwash plains, where fires were relatively common, but less intense than on the outwash plains themselves. Conifer and hardwood-conifer swamps covered large parts of the lake plains, but also occurred along drainages throughout the section. Hemlock was the most common tree documented in the northern Lower Peninsula ecoregion, accounting for about one of every six trees recorded along section lines. Documented primary forest disturbances included wind throw and fire. Wind throw was common on both upland hardwood and conifer forests. Fire was important in the jack pine, red pine and white pine dominated forests, but it also occurred infrequently in hardwood forests mainly as understory burns.

By the mid-1800s the northern Lower Peninsula ecoregion was still mostly undeveloped. However, as the rest of country expanded, wood was needed to build cities and towns, provide ties, fuel and bridge material for the railroads and for export to Europe for ship building and construction lumber. From 1840 to the early-1900s Michigan's pine and hardwood forests were harvested and by 1900 nearly all of the state's virgin timber was gone. When the virgin forests ran out and the loggers moved west, many thought the cleared land of the northern Lower Peninsula was ready for farming. To

prepare the land for agriculture, logging slash was cleared through the use of fire. This practice combined with the accidental occurrences, resulted in many devastating wildfires. One of the worst fires in the northern Lower Peninsula was the Metz Burn in Presque Isle County in 1908 that burned 2.4 million acres and killed 43 people. This and other fires also destroyed many of the trees that had previously been spared from the axe. The “white pine era” was over and many towns that relied on lumbering became ghost towns.

By the early 1900s the historic forest conditions (Figure 2.1) were gone and a period of homesteading and agriculture took over. However, in many areas the fires also burned off most of the organic layer leaving poor soil conditions. Attempts to farm these lands failed and much of the land subsequently reverted back to the state and became the foundation of a new state forest system beginning in 1903. Reforestation efforts began in the 1920s became widespread in the 1930s and continued into the 1950s. The current forest composition is shown in Figure 2.2 and is discussed in more detail in Section 3 of this plan.

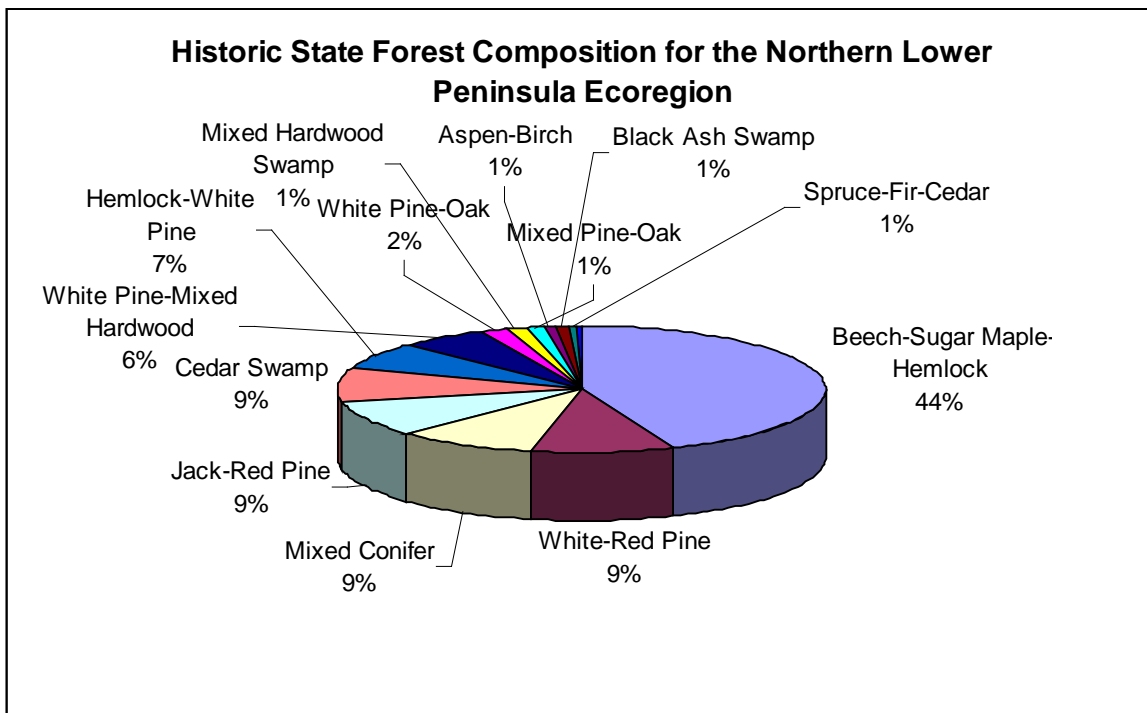


Figure 2.1. Proportional acreage of forest cover types on the historic state forest land in the northern Lower Peninsula ecoregion (1995 Department of Natural Resources data).

Consistent with the history of the northern Lower Peninsula forest through the early 1900s, it is not surprising that the current forest is dominated by early successional forest conditions. These conditions have given rise to habitat that supports white-tailed deer, ruffed grouse and woodcock which are socially and economically important to Michigan. The historical forest on both the greater landscape of the northern Lower Peninsula and the subset of state forest land was dominated by conifer species and primarily by upland conifers. The current state forest is still dominated by upland forest; but both the upland and lowland forests have become dominated by deciduous species. The predominant species that comprise the state forest have also changed over time. The largest acreages of the historic forest (in descending order) were northern hardwoods, white, red and jack pines, mixed upland/lowland conifers, cedar swamp and hemlock-white pine types (Figure 2.1). The current state forest is dominated by (in descending order) aspen, northern hardwoods, oak, jack pine, red pine, lowland deciduous, lowland conifers and cedar (Figure 2.2). Pine and oak barrens and savannahs are now largely absent from the landscape of the state forest. A much greater proportion of the state forest is now likely non-productive lands, although a historic-to-present comparison cannot be accurately made as historic survey records greatly under-estimated the number and extent of these lands.

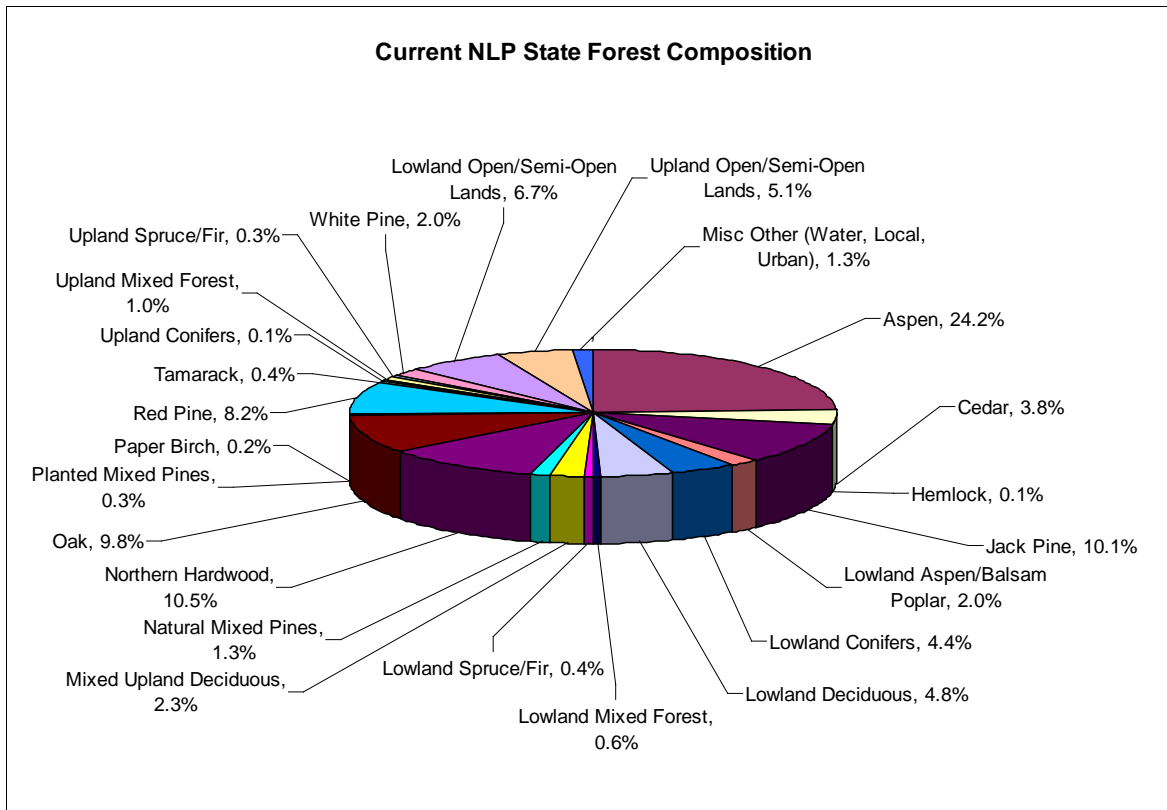


Figure 2.2. Proportional acreage of forest cover types on the current state forest land in the northern Lower Peninsula ecoregion (2012 Department of Natural Resources inventory data).

The forests of Michigan, and specifically the northern Lower Peninsula, have changed forever. We will never again see the vast expanses of hemlock, white pine and red pine mixed with northern hardwoods. The demand for forest products has changed with changing demands of society tempered by what is available on the landscape. Demand has changed from softwood sawlogs and firewood (vast quantities of hardwood firewood were used smelt ore and to fuel steam locomotives) to high quality veneer logs and wood fiber.

Wildlife populations have also changed with the changing forest. Gone are the bison and woodland caribou. Elk and marten disappeared, but have been reintroduced and currently have small isolated populations. Other species that preferred the vast expanses of old late-successional forest have also declined and are present today in lower numbers and density.

Values have changed as well. An economy of recreational pursuits developed around early successional wildlife species that were able to spread north with the changing forest conditions. The most important of these are white-tailed deer, ruffed grouse and woodcock. The regeneration of historic forest conditions is neither possible nor desirable from an ecological, social or economic perspective. The management challenge is to maintain or enhance the current conditions without losing elements associated with old forests that are still present on the landscape.

The current condition of the state forest is described in more detail in Section 3 of this plan.

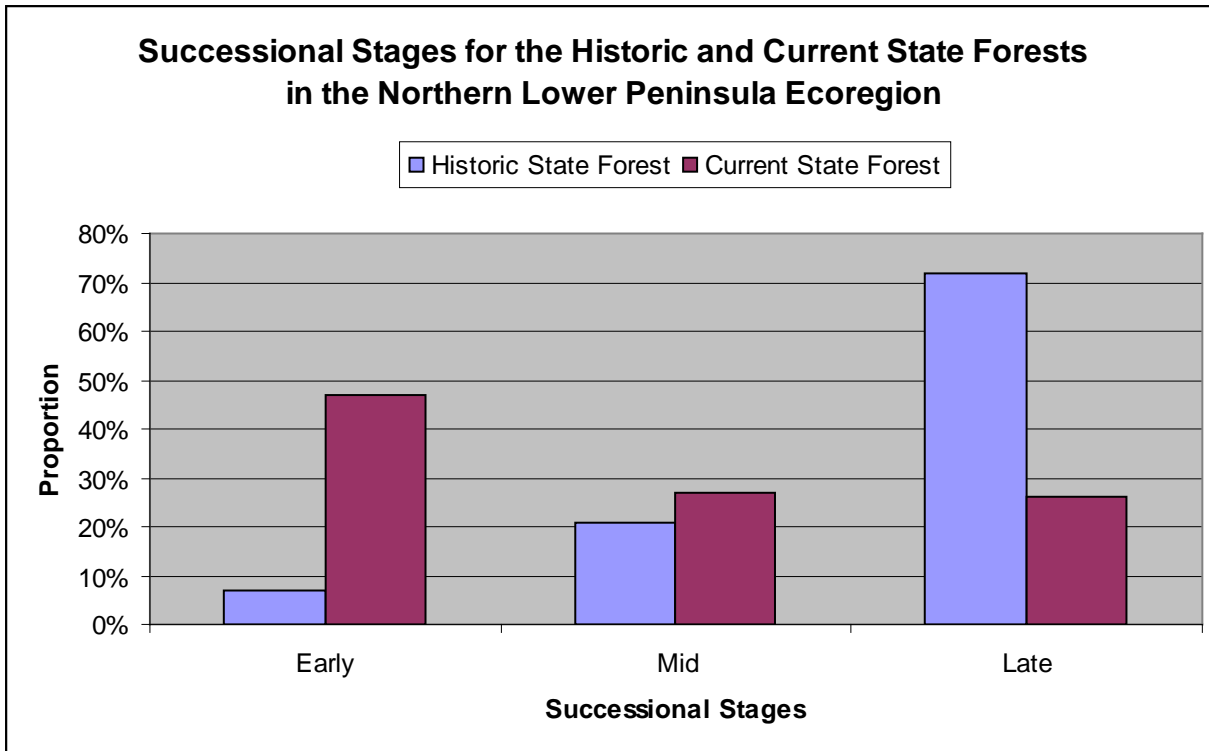


Figure 2.3. Comparisons of successional stages for state forest in the northern Lower Peninsula ecoregion between circa-1800 and the current conditions (Michigan Natural Features Inventory 1995 and 2012 Department of Natural Resources inventory data).