

MICHIGAN

Combining information from many sources, Lee Frelich has calculated that as of 1992, Michigan had 82,058 hectares (roughly 205,000 acres) of primary forest. The breakdown by type is as follows: Northern White-cedar 50,587 ha, northern hardwoods 24,399 ha, Black Spruce-Tamarack 6070 ha, Jack Pine less than 400 ha, White Pine-Red Pine 344 ha, spruce-fir 161 ha, oak-hickory, 68 ha, riverbottom 29 ha. The percentage of primary forest that is old growth is unknown (“old growth” for the purposes of his study was forests composed of long-lived species that are more than 120 years in age). Frelich calculated that presettlement forest in Michigan covered 12,735,300 ha (31,456,191 acres). Thus, in Michigan current primary forest is 0.64% of the presettlement forest.

Frelich further noted that, with the exception of swamp conifers, “nearly all” the primary forest in Michigan, as in the two other Great Lakes states, is in well known wilderness areas and parks. Two Michigan sites are of particular importance. The Porcupine Mountains State Park and Sylvania Wilderness are the largest remaining areas of primary northern hardwood forest in the Lake States. Furthermore, within the Great Lakes states, these areas are the only remaining “presettlement-like upland forest landscapes, on which the species composition, spatial patterns, and disturbance dynamics have changed little” (Frelich 1995).

The US Forest Service (USFS) has begun working on the revision of the forest management plans for the three National Forests in Michigan: the Hiawatha, the Huron-Manistee, and the Ottawa. Each Forest will have its own plan and Environmental Impact Statement, but the three will follow approximately the same timetable. As of early 2003, meetings to involve the public were already taking place. Notices of Intent are scheduled to be issued in September, 2003. USFS hopes to adopt revised plans two years later (Roycraft 2003).

Locations of small old-growth sites include **Tourist Park** in Marquette (Marquette County): some 10 acres of old-growth Red Pine at the entrance to the 40-acre, wooded park (Cornett 2002; Marquette 2002); **Consumers Power Co.** (St. Clair County): 7-20 acres of old-growth oak-hickory on a low ridge within a 69-acre tract owned by Consumer Power Co., but managed by the Michigan Nature Association (Donaldson 2001); **Crawford Red Pines/Dyer Road Pines**, T27N/R1W/30-31, Au Sable State Forest (Crawford County), 17 acres of old-growth Red Pine within a 40-acre oak-pine forest, salvage logged on the edge after a fire (Cornett 2002, Eagle 2001); **Bismarck Creek**, T49N R25W, section 31 (Marquette County) small, scattered stands of virgin Northern White-cedar and hemlock-hardwoods, probably not more than 30 acres in total.

Isle Royale National Park, in Lake Superior

An estimated 50 to 75% of the Park's 133,782 land-based acres, or 66,900 to 100,336 acres, is old growth. The forests have suffered little or no human disturbance since the 1930s, and that disturbance was focused in one corner of the island. Euro-Americans arrived on the island in the 1830s. In the mid- to late-1880s mining

prospectors burned portions of the forest. In 1936 lightning and human activities caused a fire that may have burned as much as 20% of the island. Small-scale logging took place in the mid-1870s, 1890s, and again in the 1930s to support the small settlements, for buildings, or as commercial logging efforts. The acreage impacted by the human-ignited fires and by the logging is not known. Jack Oelfke, Resource Specialist at the Park, thinks it is safe to say that these operations covered less than 25% of the land base, but he is still studying the question.

The National Park Service (NPS) completed a new vegetation map of the Park in the late 1990s. The map includes 52 community types. Those with the greatest acreage (by percent coverage) include: aspen-birch/boreal conifer forest—18.6%; spruce-fir-aspen forest—14.5%; spruce-fir feathermoss forest—13%; Northern White-cedar (mixed conifer)/alder swamp—11.6%; maple-Yellow Birch, northern hardwoods forest—6%; and White Spruce woodland alliance--5.6%

The National Park Service is inventorying developed [sic] portions of the island and rockshore communities for rare species. At present, known federally listed animal species on Isle Royale are the Eastern Timber Wolf and Bald Eagle. Among state-listed animals are the Osprey, Moose, Merlin, and Common Loon. More than 60 plants on the island are state listed or otherwise recognized as rare (Oelfke 2003).

Porcupine Mountain Wilderness State Park, northwest shore of the Upper Peninsula (Ontonagon and Gogebic Counties)

More than 30,000 acres of unlogged forest, mostly or entirely within Porcupine Mountain Wilderness State Park. Frelich and Lorimer describe approximately 36,000 acres (14,500 ha) of "primary, or virgin forest, mostly in one large contiguous block" within the state park (1991). The Michigan Natural Heritage Inventory database refers to 31,000 acres of unlogged northern hardwoods, intermixed with logged forest, balds and cliffs, shrub and conifer swamps, lakes, and wet meadows, a little of the acreage outside the park (1990). The site is considered to be "the most extensive virgin hardwood forest in North America, west of the Adirondacks" (Rob 1993). Sugar Maple, American Basswood, Eastern Hemlock, and Yellow Birch dominate. Burton Barnes states that "most northern hardwood forests, except Porcupine Mountain Wilderness State Park, were culled for eastern white pine" (1989), although Frelich and Lorimer speak of a light culling for White Pine (1991). Excessive deer browsing is hindering the reproduction of Northern White-cedar, Eastern Hemlock, Canada Yew, and Common Juniper (Cornett 1993).

OTTAWA NATIONAL FOREST, in the southwestern Upper Peninsula (Ontonagon, Gogebic, Iron, and Baraga Counties)

--**Sylvania Wilderness Area**, formerly Sylvania National Recreation Area (Gogebic County)

About 15,000 acres (6000 ha) of essentially unlogged forest within a 17,950-acre tract (Frelich and Lorimer 1991). The area is dominated by Sugar Maple, hemlock, and Yellow Birch. When the hemlock dies, Sugar Maple usually replaces it. Other tree species include White Pine, Red Pine, Jack Pine, White Spruce, Red Maple, and Paper Birch (Evans 1990). Balsam Fir is in the understory throughout (MNFI 1990). Evidence of human impact is present primarily as old roads, openings at former building sites, and

campsites and portage trails built by the Forest Service. The 5000-acre Sylvania National Recreation Area Botanical Area occupies part of the tract (USFS [n.d.]).

--**McCormick Tract**, Upper Peninsula (Marquette County). Two hundred thirty acres of mostly old-growth dry-mesic northern forest, in which about 46 acres of White Pine were heavily cut. Also in the McCormick Tract are 2590 acres of old-growth mesic northern hardwoods throughout which White Pine has been cut (MNFI 1990). The McCormick Tract is owned by the US Forest Service and managed by Ottawa National Forest officials but is outside proclamation boundaries. The Bentley Trail connects the Huron Mountains and the McCormick Tract, which are near each other but separated by private land (Rooks 1993). Heavy logging has taken place around the McCormick tract and around the Huron Mountain Club, which has further diminished the connectivity between the two tracts (Cornett 2002).

--**Sturgeon River Gorge Wilderness** (Houghton County). A 50-acre unlogged stand dominated by Eastern Hemlock (Cornett 1993, Palmer 2000).

--**Compartment 67, stand 22**, Ontonagon Ranger District (Ontonagon County). Three hundred and thirty-eight acres of mixed swamp conifer forest in which, according to the US Forest Service (USFS), the trees date back to 1800. Northern White-cedar, Balsam Fir, Eastern Hemlock, Black Spruce, and Tamarack comprise 60% or more of the basal area (Klungness 1992).

--**Compartment 146, stand 19**, Ontonagon Ranger District (Ontonagon County). Seventy-five acres of hemlock-dominated forest with a birth date of 1846.

--**Compartment 97, stand 17**, Ontonagon Ranger District (Houghton County). Fifty-six acres of hemlock-hardwoods with a birth date of 1871. Hemlock comprise 20 to 50% of the basal area; average diameter of stems is 12 inches (Klungness 1992).

--**Trap Hills**,* adjacent to Porcupine Wilderness State Park (Ontonagon County). A 4400-acre area with at least 200 acres of old growth. The Trap Hills host numerous endangered, threatened, and rare species including the Eastern Timber Wolf, Northern Goshawk, Red-Shouldered Hawk, Wood Turtle, and Fairy Bells (*Disporum hookeri*). The North Country Trail traverses the Hills. After a three-year campaign, conservationists succeeded in persuading USFS to withdraw the M-64 Hardwoods timber sale that would have thinned the area's hardwoods. As of 2003, they are campaigning to have the Trap Hills set aside as Wilderness in order to secure its permanent protection (Cornett 1997, 2002; NWR 2003).

Sleeping Bear Dunes National Lakeshore, on the shore of Lake Michigan

Seventy-one thousand acres (57,000 owned by the federal government) within which are two types of old growth. (The Lakeshore is composed of North and South Manitou Islands and a 35-mile strip along the east coast of Lake Michigan.)

--A possible 12,000 acres of old-growth beech-maple forest with some hemlock and White Pine within the 71,000-acre area. Tree ages, based on coring and estimates, range from 80 to 500 years. These statistics appear in Lucy Tyrrell's report on National Park Service lands (1991). The only standard for determining old growth that the respondent, Max Holden, Resource Management Ranger with the National Park Service, reported to Tyrrell was a minimum age of 100 years. Max Holden, Park Biologist, has verified the 12,000-acre estimate. The forest was probably selectively logged over 100 years ago, he states.

--A never-logged stand of Northern White-cedar* in the southwest corner of South Manitou Island. The stand is some 25 to 40 acres in size (Holden 2003).

Mulligan Creek Area (Marquette County)

As of 1993, some 20,000 roadless acres, an estimated 2000 to 3000 acres of which were believed to be old growth. Northern hardwood communities predominate, but hemlock stands are scattered throughout. Communities of White Spruce and Balsam Fir with some White Pine also occur (Cornett 1993). However, most of the acreage was selectively logged for White Pine around 1980 (Knoop 2002). The area is privately owned, with Mead Paper Company, in 1993, in possession of 10,000 acres. Since 1993, Mead has done some logging, but has left part of its land alone and has also sold part of it. The area has a greater number of ownerships, with many of the tracts that are 10 to 250 acres owned by people who want to preserve the land (Cornett 2002). Specific areas of old growth include these:

--**Mulligan Escarpment*** on which old growth includes 600-800 acres that may be preserved under a conservation easement and 2000 acres divided among scattered tracts that, as of 2002, were for sale. The acreage for sale included 1000 acres of a mix of Red Pine and White Pine, particularly valuable as habitat for birds. Some White Pine may have been removed from the Red Pine/White Pine areas, but no stumps can be seen (Knoop 2002).

--**Clark Creek Pines**, T49N R27W, sections 1, 2, and 7; T49N R28W, section 12. Includes a 200-acre virgin White Pine stand, owned by a private individual as the result of a trade by Mead.

--**Stag Lake-Pinnacle Falls,*** T50N R28W, sections 27, 28, 29, 32, 33.

Approximately 500 to 600 acres of virgin hardwoods, dominated by "birdseye" Sugar Maple (Cornett 1993, 2002). The ridges support large Northern Red Oak. The Nature Conservancy holds a conservation easement on 2000 acres, including old-growth hardwoods (Pryor 2002).

--**Island Lake-Rocking Chair Lakes**, T49N R28W, sections 3, 10, and 11.

Approximately 500 to 600 acres of old-growth, most of which are northern hardwoods, dominated by Eastern Hemlock. Scattered through the hemlock are stands of huge White Pine. In some of the valleys, Sugar Maple dominates. A 240-acre Rocking Chair Lakes Natural Area includes "some old growth" dry mesic northern hardwoods forest (MDNR [2002]). As of mid-2002, Redstone Lumber Co. was seeking a buyer for 1700 acres around Island Lake (Cornett 1993, 2002).

Huron Mountains, northwest of Marquette in the UP (Marquette County)

Some 6500 acres (2600 ha) of minimally disrupted old-growth forest constituting the non-lake portion of the 8000-acre Huron Mountain Reserve Area set aside for preservation by its owner, the Huron Mountain Club. The Club also owns an additional 10,000 acres, most of which were clearcut in the 1930s, 40s, and 50s, before the Club had acquired them. In the 1890s some 20% of the land now in the Reserve was selectively cut for White Pine, but White Pine was common on only 100 of these acres. The Reserve has also experienced fire and some road building.

The Reserve is a mosaic of forest communities, chief among them several hemlock-northern hardwood types (49.6%). Within this hemlock-northern hardwoods

group, forest dominated by Eastern Hemlock is most widespread (24.2% of the Reserve). Here Sugar Maple, Yellow Birch, and American Basswood are also in the overstory. The next most prominent group consists of lichen-juniper, pine-oak, and White Pine-hemlock-hardwood (30%). The pine-oak forest, on ridges and steep slopes, grades into and is interrupted by scattered patches of open lichen-juniper community with clumps of Common Juniper providing the sparse tree cover. Pine forests cover 7.3% of the reserve: Jack Pine (5.5%), Red Pine (0.7%), and Red and White Pine (1.1%). Other groups of communities include birch-aspen (2.9%), wet site conifer and conifer-hardwood (2.4%), White Ash and American Elm-Sugar Maple-Basswood (0.2%). The White Ash forest is found in only two locations in the Reserve. White Ash is at the northwestern limit of its range here, but the species forms an almost pure overstory with trees of 10 to 16 inches dbh (diameter at breast height) (Simpson et. al. 1990).

Craig Lake Wilderness State Park (Marquette and Baraga Counties)

A 7600-acre state park, with "a lot of old growth." The forest is hemlock-hardwoods, dominated by hemlock. Virgin stands are scattered through the park, thanks to the park's isolation and rocky terrain; but paper companies own inholdings, which they have cut hard, sometimes by clearcutting (Cornett 1993, Cornett 2002).

North Fox Island, off the northern Lower Peninsula (Leelanau County)

Five hundred thirty-six acres of either "a virgin-overmature or a mixed old-growth/old second-growth hardwood forest, occupying glacial lakeplains and dunes." If the forest was ever logged, it has "essentially recovered." Trees present include Red Maple, Sugar Maple, American Beech, Eastern Hophornbeam, and Mountain Maple. Also on the island, almost all of which is occupied by old growth, are 170 acres of uncut boreal forest and 88 acres of uncut northern swamp. The island is privately owned (MNFI 1990).

Tahquamenon Falls State Park, eastern Upper Peninsula (Chippewa County)

Old-growth hemlock throughout the 36,563-acre State Park, but probably not virgin. Gary Reese believes that the Tahquamenon River area, though sometimes ranked with the huge forests of the western UP as a "large virgin" tract, was extensively logged for White Pine (1990). Included in the old growth from which White Pine was probably removed are about 200 acres of intermingled hemlock and maple around the upper falls (Knoop 2002).

Little Presque Isle, in Escanaba River State Forest, north of Marquette (Marquette County)

Some 3000 acres of state land, with probably 300 to 400 unlogged acres, primarily hemlock-hardwoods. Perhaps one-third of the entire area could be considered old growth, Cornett reports (1993). Knoop says that only a small portion of the area is old growth (Knoop 2002). Cornett named as old growth the following sites within or adjacent to the Little Presque Isle tract. Unless otherwise specified, they are owned by the state (Cornett 1993).

--**Hogback Mountain**. Approximately 245 acres of old growth dominated by stands of Eastern Hemlock and Sugar Maple. Many Yellow Birch are more than 30

inches dbh. White Pine were selectively cut, probably around 1900 (Cornett 1993).

--**Harlow Lake.** A 164-acre site with 124 to 134 acres of virgin forest. Some White Pine and Eastern Hemlock have been removed from the balance of the site, which is along the east side of Harlow Lake. The stand is Eastern Hemlock-Paper Birch-Sugar Maple. Second-growth hardwoods surround it (MNFI 1990, Reese 1990, Cornett 1993).

--**Sugarloaf Mountain.** A 154-acre site, of which approximately 100 acres are virgin. It is dominated by stands of Sugar Maple and Eastern Hemlock (Cornett 1993, Wells 1993). In a damaged area of approximately 10 acres, only a few hardwood trees survive and virtually all the hemlock and White Pine have died, Cornett reported in 2002. He speculated that acid rain and fog may be the cause (Cornett 2002). The County Road Commission owns the site (Cornett 1993, Wells 1993).

--**Eagle's Nest.** 20 acres of privately owned virgin White Pine just north of the Little Presque Isle tract. A wind storm in 1988 blew down the biggest trees.

--**Harlow Creek.** A 16-acre virgin stand with an upland portion dominated by Red Pine, White Pine, and Eastern Hemlock and a lowland portion dominated by White Pine and Black Ash. The stand has several large White Pine with dbhs to 52 inches.

--**Wetmore Pond.** A 13-acre old-growth stand owned by Mead Paper Company, and adjoining the Little Presque Isle tract. The stand is dominated by hemlock and includes scattered large Red and White Pine (Cornett 1993). Mead developed a parking area in a second-growth stand next to the old growth, but they say that they will leave the old growth alone (Cornett 1993, 2002).

HIAWATHA NATIONAL FOREST, central Upper Peninsula

--**Dukes Experimental Forest** (Marquette and Alger Counties). A 7000- to 8000-acre tract devoted to research on northern hardwoods. The bulk of the tract shows old-growth characteristics (Cornett 1993). Hardwoods dominate most of a 280- (Schultz 1993) or 320-acre unlogged control plot, within which Eastern Hemlock and Northern White-cedar dominate small stands (Cornett 1993). Mroz et al. describe the Upper Peninsula Experimental natural area as containing approximately 232 acres of hardwoods, from which American Elm and American Basswood were selectively cut in the early 1900s (1985).

--**A candidate Research Natural Area** (RNA). Eighty acres of uncut, mixed northern hardwoods and Northern White-cedar in an upland site on a slope along sandstone cliffs. The site is very wet and extremely fragile (Schultz 1993).

--**Squaw Creek**, Rapid River Ranger District. A 65-acre stand of Eastern Hemlock (10%), Red Pine (35%), White Pine (10%), other softwoods, aspen, and other hardwoods. According to the US Forest Service (USFS), the stand was logged to some extent during the early 1900s, but contains older trees. The official age is 132 years (Lanasa 1992).

--**Grand Island**, in Lake Superior (Alger County). At the north end of the island, a 59-acre parcel of old-growth hemlock-northern hardwoods. The remainder of the island was logged in the 1960s, except for two small areas of old-growth pine: one predominantly White Pine with some Red Pine and the other, Red Pine. The island is within a National Recreation Area; and the 59 acres are a Research Natural Area (Schultz 1993, Henson 1993).

--**Coalwood**, Munising Ranger District. A 40-acre stand of Eastern Hemlock (75%), American Beech (15%), other hardwoods (8%), and White Pine (2%) with an official age of 110 years. The Forest Service reports that the area was cut selectively in the early 1900s (Lanasa 1992).

--**Murphy Pines** (Schoolcraft County). Thirty-eight acres of Red Pine (30%) and White Pine (60%) (Lanasa 1992). According to stand records, they originated in 1824 (Tyrrell 1998). Other trees present are Black Spruce (5%) and Balsam Fir (5%). The Forest Service says that the area was selectively logged in the early 1900s (Lanasa 1992); and Cornett reports that some trees have been removed in recent years (Cornett 1993). Don Henson describes Murphy Pines as 10 or 12 uncut acres with a buffer (1993).

Pictured Rocks National Lakeshore, on Lake Superior

A reported 1000 acres of old-growth Yellow Birch-Eastern Hemlock within the 73,000-acre Lakeshore. Coring indicates the trees are 150 to 250 years in age. The criteria used in determining the extent of the old growth was a minimum age of 100 years, according to Walter Loope, Park Ecologist (Tyrrell 1991). The old growth was selectively logged in the early 1900s. Approximately half of the acreage in the Lakeshore, including the old growth, is owned by the National Park Service. Up to 80% of the remainder is in the hands of timber companies or the State of Michigan, who log it (Leutscher 2003).

Hog Island Natural Area,* in northern Lake Michigan (off the shore of Emmet County)

Old growth of undetermined extent on a 2075-acre island. The area was nominated in 1995 to become a State Wilderness. The nomination documents describe the island as “largely forested with the higher ground of the north and south separated by areas of swamp, interdunal wetland and submergent and emergent marsh.” The island has no roads, trails, or buildings. Indians may have made limited use of the island for agriculture. Settlers from adjacent islands and Indians also used it for producing maple syrup, fishing, and possibly, in the early 1900s, livestock grazing. Portions may have been logged in the late 19th or early 20th centuries, but they are now mature forest. “Pockets of old-growth northern forest and uncut conifer swamp occur amidst the more disturbed or intolerant forest types” (Eagle 2001). The island/Natural Area is managed by the Beaver Island State Wildlife Research Area (MDNR 2003).

Besser Natural Area,* T33N/R8E/13,24, Mackinaw State Forest, northeastern Michigan (Presque Isle County)

A 134-acre Natural Area, which includes a stand of mature, “virgin” Red and White Pine with cedar, spruce, Balsam Fir, and Paper Birch. It also has more than 4000 feet of undeveloped Lake Huron shoreline. Like other State Natural Areas, the area is protected under Michigan’s Wilderness and Natural Areas legislation (Eagle 2001, MDNR 2003).

Northshore Natural Area,* Mackinaw State Forest (Mackinac County)

Two hundred acres of old-growth, mixed mesic forest bordered by boreal forest along the lake shore within an 817-acre State Natural Area. The site occupies the peninsula on the north side of Bois Blanc Island. Paper Birch dominates toward the

point. Sugar Maple and Northern White-cedar are also important. Two inconspicuous roads run through the tract (MNFI 1990, MDNR 2003).

Allegan State Game Area, in southwestern Michigan (Allegan County)

Within the Game Area, some 3000 acres of savanna-related communities, ranging from near oak forest to dry sand prairie, that include small areas that have had minimal disturbance. Most of the oak barrens have been lightly logged. The area first identified as representative of the natural vegetation is a 100-acre dry oak barrens that did not become overgrown because of such factors as droughty soil and frequent natural fires. Black Oak, White Oak, a diverse herbaceous flora, and patches of lichen are found on the 100 acres (Lerg 1993, Nuzzo 1986). A 160-acre area has become a State Natural Area (MDNR 2003). On the 3000 acres as a whole, White Oak used to be the dominant tree, but Black Oak dominates more of the Game Area now. Much of the savanna became overgrown because of fire suppression from the late 1930s to the present. Burning was reintroduced in 1989. The Game Area is under a mix of private and public ownership. The public land is all administered by the Wildlife Division of the Michigan Department of Natural Resources (Lerg 1993, Nuzzo 1986).

Patterned Peatlands, eastern Upper Peninsula

Selectively logged peatlands in which are embedded islands, some of them unlogged. The eastern UP has approximately a dozen patterned peatlands ranging in size from 150 feet by 300 feet to many square miles. Not all have trees, and, as a general rule, any trees are scattered--Tamarack, Northern White-cedar, and "an occasional unhappy White Pine" (Madsen 1990). Much of the Tamarack have been removed from the peatlands themselves, but several of the islands escaped harvesting (Rooks 1993). The entire two-thirds of the 95,455-acre Seney National Wildlife Refuge that has organic (peat) soils has been cut, but some areas "appear quite natural with large trees and few if any stumps" (Tansy 1993).

--**McMahon Lake area** (Luce County). The Nature Conservancy owns more than 3000 acres with peatland as part of a 15,000-acre wetland complex near McMahon Lake. Black Spruce, Tamarack, and Northern White-cedar grow in saturated peat. Some of the islands embedded in the peatland have never been logged. They bear White Pine, White Pine-Eastern Hemlock, or mixed northern hardwoods (Ewert 1990 and 1993). The 1770-acre McMahon Lake Strangmoor [State] Natural Area in Luce County is presumably within The Nature Conservancy's holding, since it is on The Nature Conservancy Natural Areas Registry (MDNR 2003).

Little Brevort Lake Scenic Site,* T42N/R6W/23-25, in Lake Superior State Forest (Mackinac County)

A 542-acre Natural Area with possible old growth. It was described by the Area Forester in 1974: "Except for the two State Forest Campground Units, the partially developed foot trail and some very light cutting done in Sec. 24, the area is quite wild and unspoiled. It includes nearly every timber type and tree species common to northern Michigan." He noted in particular several stands of large and small hemlock and two hemlock estimated to be over 400 years in age. The area is protected under the State's Wilderness and Natural Areas legislation (Eagle 2001).

Laughing Whitefish Falls Scenic Site (Alger County)

A 360-acre area, much of which is old-growth forest. The old-growth forest includes White Pine stands and hardwood stands. The Michigan Department of Natural Resources State Parks Division oversees the area (Cornett 1993, Knoop 2002). The site is a State Natural Area.

Estivant Pines, the northwestern Upper Peninsula (Keweenaw County)

A 440-acre area centering in 200 acres of near-virgin, dry-mesic to mesic northern hardwoods overtopped in places by White Pine. The hardwoods are Sugar Maple, Yellow Birch, and Northern Red Oak. In the early 1900s the 440 acres were selectively logged in places for White Pine. Today pine is reproducing only in several small areas. The Michigan Nature Association owns the Estivant Pines (Rooks 1993, MNFI 1990, Reese 1990).

Wild Fowl Bay Islands, in Saginaw Bay, in Wild Fowl Bay State Wildlife Area, east-central Lower Peninsula (Huron County)

Three hundred acres of good-quality lowland savanna with Bur Oak, Black Oak, and White Oak (Albert 1993, Selecki 1993). We were unable to learn whether this site or the savanna at Algonac State Park and Crow Island, described below, has been logged (Albert 1993, Selecki 1993).

Two-Hearted River Backus Tract (Swamp Lakes), in the eastern Upper Peninsula (Luce County)

Two hundred acres of steep sandy ridges dominated by old-growth dry-mesic northern forest, in the midst of shallow intermittent wetlands. White Pine and Red Pine dominate the forest. The understory is Northern Red Oak, a tree not common in this part of the UP. The Nature Conservancy has recently acquired the tract.

Most of the forests in the area were logged off around 1900. The Backus tract was spared, perhaps because the pines were too small to be worth cutting, given the terrain. The fires that followed the cutting of areas adjacent to the tract burned through it, opened up the canopy, and allowed the Northern Red Oak, now 80 to 90 years old, to become established (Comer 1992, Clark 1993).

Waterman Preserve,* western Upper Peninsula (Baraga County)

A 920-acre preserve with approximately 400 acres of old-growth Eastern Hemlock-White Pine mix with some oak and maple. The Nature Conservancy purchased the land in 2003 from a lumber company, which had already logged the balance. The preserve is adjacent to the western boundary of the Huron Mountain Club property (Knoop 2003).

Van Riper State Park, Upper Peninsula (Marquette County)

Possibly a couple of hundred acres of old growth within the 1124-acre State Park. The old growth is mainly hardwoods. Next to Lake Michigamme, much of the park is devoted to industrial tourism (Cornett 1993).

Warren Woods Natural Area,* southwestern Michigan (Berrien County)

A 179-acre Natural Area composed of beech-maple forest, which, is described for the National Registry of Natural Landmarks as “virgin,” but according to a local resident was selectively logged between 1882 and 1892. The forest includes trees more than 5 feet in diameter and 125 feet in height. The Natural Area is managed by managers of the 1950-acre Warren Dunes State Park, which is not contiguous to it (Coward 2002, Eagle 2001).

Lake Gogebic State Park, on the southwest shore of Lake Gogebic in the western part of the Upper Peninsula (Gogebic County)

A 170-acre near-virgin mesic northern forest. Windthrows were removed in the past (MNFI 1990, Reese 1990).

Roscommon Red Pines, toward the north of the Lower Peninsula (Roscommon County)

One hundred sixty acres of old-growth Red Pine, the largest known old-growth Red Pine tract in the Lower Peninsula. The Red Pine is mingled with White Pine and is on a sandy outwash plain of secondary Jack Pine. Some of the Red Pine bear fire scars. Many have a dbh of over 70 cm. The tract is partially within the Roscommon Red Pine Nature Study Area (MNFI 1990, Reese 1990)

Algonac State Park, east-central Lower Peninsula (St. Clair County)

A 160-acre good-quality savanna within the State Park. In a wet oak opening grow Pin Oak, Bur Oak, and Swamp White Oak; on the uplands are White Oak, Northern Red Oak, and Black Oak. Prescribed burning is conducted on the prairie and oak opening at the park (Albert 1993, Kafcas 1993, Selecki 1993). A 200-acre area within the State Park with lakeplain prairie and savanna has been nominated for dedication as a State Natural Area (MDNR 2003).

Leelanau State Park* (Leelanau County)

At least 100 acres of mature/old-growth beech-maple forest with scattered large hemlock and White Pine. Other species include red and white oaks and Paper Birch. The old growth borders Lake Michigan, and the northern edge quickly transitions into sand dunes with grasses and scattered Eastern Cottonwood trees. Trails cross the old growth (Ostuno 2000).

Crow Island, east-central Lower Peninsula (Bay County)

Good-quality oak openings covering some 80 to 100 acres of lowland. The vegetation is primarily Bur Oak with some prairie grasses (Albert 1993, Selecki 1993).

Third Bass Lake, T50N R27W, section 35, central Upper Peninsula (Marquette County)

A section with an 80-acre virgin hemlock stand in the north. In the middle are four small, hanging valleys with old-growth hemlock, some virgin and some from which White Pine has been removed. The section is owned by a private company. It is "pretty much all old growth" but the southern two-thirds has been selectively logged (Cornett 1993). There has been logging all around this stand and Little Garlic River below (Cornett 2002).

Deer Lake Trust Property,* north-central Upper Peninsula (Alger County)

Within the 92-acre tract, old-growth northern hardwoods on a steep, rocky, xeric site. Ten acres of forest, on the steepest land, have never been logged. Ten acres are wetlands. Most of the remainder of the site is forest selectively logged for large White Pine by trespassers in the 1970s. It can be considered to be old growth, if one accepts the loss of the pine. Three camps have been built on the site. The land is owned by members of one family (Cornett 2002, NWR 1997).

Little Garlic River, central Upper Peninsula (Marquette County)

A thin strip of land along the river, with approximately 60 acres of old-growth hardwoods and 15 to 20 acres of old-growth White Pine. The state owns this land and has clearcut on both sides of the strip. As of 2002, the site had a lot of dying hemlock and White Pine, perhaps from acid rain (Cornett 2002).

Lower Huron River Metropark* in southeastern Michigan (Wayne County)

Some 60 acres of floodplain forest bordered by 40 acres of upland forest in the northwest corner of the Lower Huron Metropark. The old growth is in a strip along the Huron River. Selective logging may have taken place, but the forest has never been completely cut. The floodplain forest provides habitat for more than 150 species of vascular plants including 55 species of woody plants. As of 1998, it was remarkably free of exotic species. The trees included giant Tulip Trees, Black Maple, Black Walnut 10 to 12 feet in circumference, and a Bur Oak almost 4 feet in diameter. In 1986 the Huron-Clinton Metropolitan Park Authority, which owns the land, decided to make the land part of a golf course. A coalition formed to prevent the destruction of the site, and the golf course was not built (Bogaard 1995, Grese 1998).

Indian Bowl, in the extreme southeast of the state (Berrien County)

A 67-acre relict conifer swamp, with Tamarack and many southern species, in the floodplain of the Saint Joseph River. The area has apparently not been subject to fire or to cutting. The site is "succeeding to southern swamp forest" (Reese 1990).

Hartwick Pines, in Hartwick Pines State Park, north-central Lower Peninsula (Crawford County)

A 59-acre tract, described by the Michigan Natural Features Inventory as the "state's best remaining virgin stand" of White Pine and as having "one of the greatest biomasses of any forest in the world." Nevertheless, there are trails throughout the area, and in the 1930s some understory trees were removed. With the White Pine are a few big Red Pine and hemlocks, also Sugar Maple, Red Maple, and American Beech (MNFI 1990, Reese 1990).

Wells State Park, in the southern Upper Peninsula, close to Wisconsin (Menominee County)

A 55-acre area with a virgin tract of mesic northern hardwoods on a former offshore sand bar, surrounded by a virgin conifer-hardwood stand. The dominant trees are Sugar Maple, American Basswood, and American Beech (MNFI 1990). The state put

in a road and built cabins; the change in the hydrogeology caused the cedars in the area to die. Furthermore, the Department of Natural Resources logs the edges of the forest to get wood for projects in the park, further diminishing natural values (Cornett 1997).

Willow Creek, T49N R27W, sections 27, 35, and 36 (Marquette County)

About 20 acres of large Northern White-cedar, logged around the edges and a 10- to 20-acre virgin White Pine stand. The White Pine stand occurs on an escarpment above a creek, and some of the drainages entering the creek from the escarpment support patches of white-cedar. The sites are privately owned, the White Pine by Mead Paper Company (Cornett 1993). Logging has recently taken place in section 36 (Cornett 2002).

Keweenaw Peninsula* (Keweenaw County)

Pockets of never-logged Northern White-cedar embedded in second-growth forest. The scattered pockets have not been inventoried, and the total old-growth cedar is unknown (Knoop 2002). However, the Michigan Natural Features Inventory surveyed bedrock portions of the shoreline. An example of their findings is a 5-acre old-growth cedar swamp in the bedrock segment known as Portage Lake Ship Canal West. The old growth is “on seepage rich slopes” above 20-40-foot-high cliffs (Albert 1994, Klungness 1998). The portion of the cliffs with the old growth is privately owned and under conservation easement.

The Nature Conservancy (TNC) has purchased 6275 acres at the tip of the Keweenaw Peninsula from International Paper’s Lake Superior Land Company. The state of Michigan is reimbursing The Nature Conservancy for the purchase price and taking ownership of the land, half in 2002 and half in 2003. The purchase connects 2500 acres already owned by the Michigan Department of Natural Resources and 1500 acres owned by TNC (TNC 2002).

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