

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

*Grand Island*



Grand Island

WO

4060 Research Facilities

January 14, 1977

Grand Island Research Natural Area

Regional Forester, R-9  
Station Director, NC

Enclosed is your copy of the approved Establishment Report and the signed Designation Order for the Grand Island Research Natural Area located on the Hiawatha National Forest in Michigan. A set of these documents has been retained in Timber Management Research, WO.

The Region should take action to protect the area from mineral entry through initiation of withdrawal procedures. The Research Natural Area should also be recorded in the Region's Land Status Record and noted in the plans and maps of the Ranger District.

A local press release should be prepared jointly by you. Please send information copies to this office. The WO will periodically issue a national press release to describe new RNA's and the entire RNA program, and will send copies to Regions and Stations.

for

*Carl M. Berntsen*  
CARL M. BERNTSEN, Director  
Timber Management Research

Enclosure

*Copy to Ed Crowl  
R-9 w/ Establishment  
Report. Crowl will draft  
and have a copy sent w/ NC.  
per  
2/1/77*

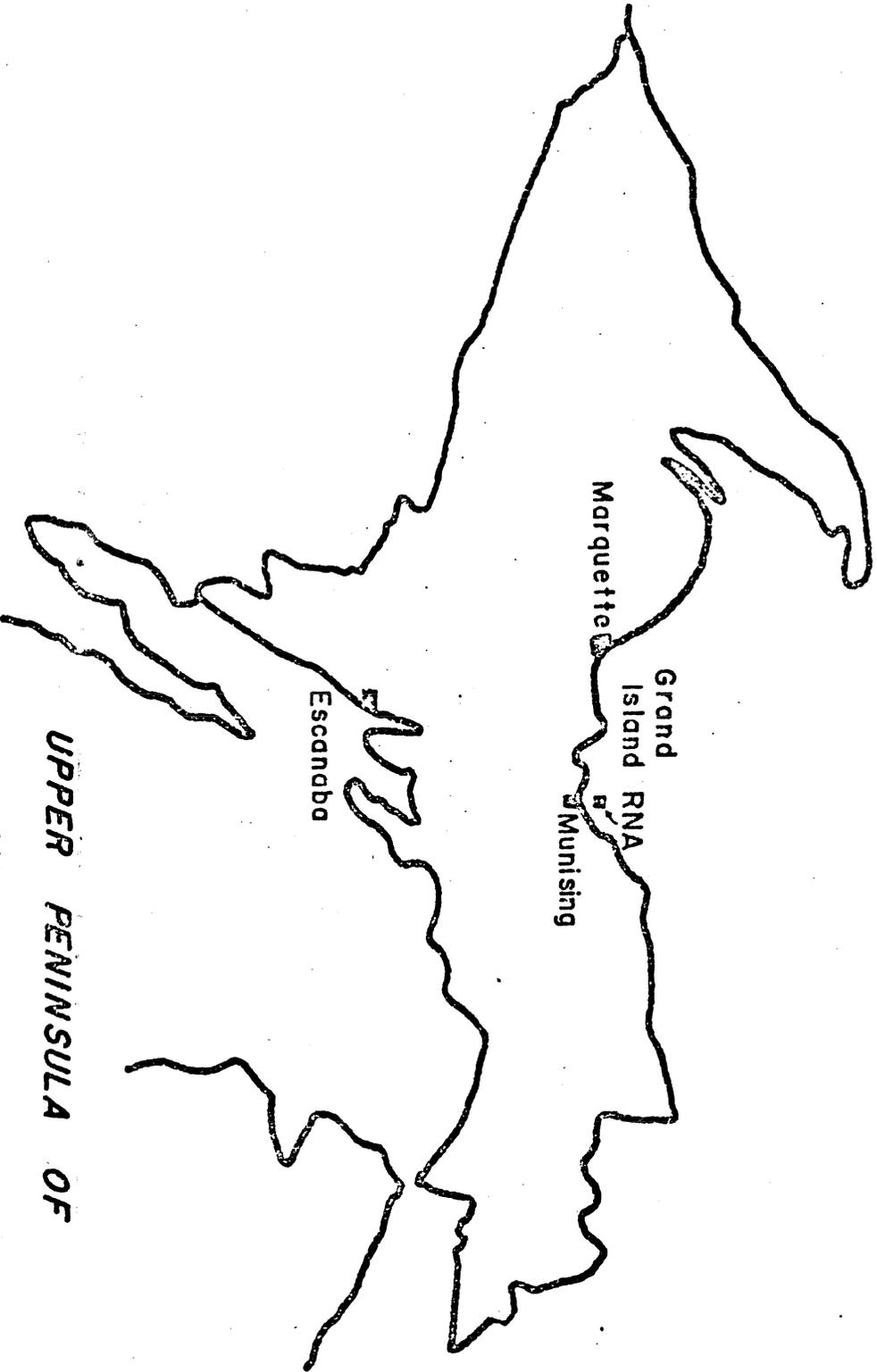
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*per*

**GRAND ISLAND RESEARCH NATURAL AREA**



**UPPER PENINSULA OF  
MICHIGAN**

DESIGNATION ORDER

By virtue of the authority vested in me by the Secretary of Agriculture under Title 36, Section 251.23 of the Code of Federal Regulations, I hereby designate as the Grand Island Research Natural Area, the lands described in the following report by Frederick T. Metzger, dated June 13, 1974; Said lands shall hereafter be administered as a research natural area subject to the said regulations and instructions thereunder.

JAN 12 1977

(Date)

John McGinnis

Chief

June 13, 1974

THE GRAND ISLAND RESEARCH NATURAL AREA

MUNISING DISTRICT

HIAWATHA NATIONAL FOREST

Principal Distinguishing Features

The Grand Island Research Natural Area is a small 23.7 hectares (58.7 acres) tract of undisturbed northern hardwoods at the north end of Grand Island in Lake Superior. The tract has apparently never passed into private ownership. Until recently it was part of the site of North Point Light House, which was built in 1868. Its long history of federal ownership and current stand structure indicate a lack of major disturbance in recent time.

In addition to being undisturbed, the site has other features of ecological interest. The island's climate is strongly influenced by Lake Superior. Temperatures, length of growing season, moisture stress and snowfall vary from inland areas in the region, making this tract useful in comparative studies on the effects of climate upon natural stands.

Beech (Fagus grandifolia) is a major component of the tract's plant communities. The tract is near the northwestern limit of beech in North America. Its importance diminishes rapidly in stands only 32 kilometers (20 miles) west of the tract and it is absent in forests over 64 kilometers (40 miles) west. The area will be useful in expanding our knowledge of the silvics of this species, and its relationship to other species in the community.

Location

Algonquin County

The tract is on the north shore of Grand Island, 15 kilometers (9 miles) north of Munising, Michigan, and at latitude  $46^{\circ}E\ 33'N$  longitude  $86^{\circ}\ 40'W$ . More specifically, it is all of government lots 3 and 4, Section 15, T48N, R19W, Michigan Principal Meridian (fig. 1), containing 23.7 hectares (58.7 acres). It is administered by the Munising Ranger District, Hiawatha National Forest; and is the only parcel of National Forest land on the island.

The island is located along the south shore of Lake Superior at the broadest expanse of the Lake. The Canadian shore is 217 kilometers (135 miles) north. The north shore of the island is exposed to Lake Superior through almost  $180^{\circ}$ .

The tract is best reached by a primitive road that generally follows the island shore, beginning at Williams Landing. Williams Landing is on the south shore of the island 11 miles from the RNA via the road along the eastern coast. At present the road is eroded on the east slope of Echo Lake Creek and a barricade to vehicle travel was installed, to prevent entry onto that section of road, about 2 kilometers (1 mile) east of the tract. It is necessary to transport vehicles to the island on a privately operated tug and barge. Arrangements for this service can be made through the Munising District Ranger. In the winter it is possible to travel to the tract by snowmobile along the same route. Ice in Munising Bay is normally safe to cross through much of the winter. Boat access direct to the tract is possible but not practical. The minimum distance is 18

kilometers (11 miles) and the route crosses much open water. Changes in wave conditions are frequent and quick on Lake Superior. There is no natural harbor features near the tract and boats would have to be beached.

Area by cover types

Northern Hardwoods (SAF type 25: Sugar maple-beech-yellow birch)	16 hectares	(40 acres)
Hemlock-Hardwoods (SAF type 24: Hemlock-yellow birch)	7 hectares	(18 acres)
Total	23 hectares	(58 acres)

### Climatic conditions

Lake Superior has a great effect on the climate of the island. The Lake's water temperatures change slowly, delaying the seasons, and dampening diurnal extremes. This results in a long but delayed frost-free season of 150 days from May 15 to October 15. Temperatures normally exceed  $32^{\circ}\text{C}$  ( $90^{\circ}\text{F.}$ ) only 6 days of the year and go below  $-18^{\circ}\text{C}$  ( $0^{\circ}\text{F.}$ ) only 21 days per year. High relative humidities are also common in the vicinity of the lake. These climatic conditions are expected to create minimal moisture stress on the vegetation.

Precipitation at the Munising weather station <sup>2 miles (3.2 km) north of the PNA</sup> averages 85.1 cm (33.5 inches) per year, with 24.3 cm (9.6 inches) falling from June through August and with 343 cm (135 inches) of snowfall. Mean annual temperature is  $5.3^{\circ}\text{C}$  ( $41.6^{\circ}\text{F.}$ ) with mean daily maximums and minimums for January of  $-3.3^{\circ}\text{C}$  ( $26.0^{\circ}\text{F.}$ ) and  $-12.2^{\circ}\text{C}$  ( $10.1^{\circ}\text{F.}$ ) and for July of  $25.2^{\circ}\text{C}$  ( $77.4^{\circ}\text{F.}$ ) and  $11.2^{\circ}\text{C}$  ( $52.2^{\circ}\text{F.}$ ).<sup>1/</sup>

### Description of values

#### (1) Flora

The prominent plant community within the natural area is a northern hardwood type (SAF type 25). The wet bottomlands alongside Echo Lake Creek support a conifer community of hemlock, white cedar, balsam fir and hardwoods (SAF type 24). Other minor, distinctive communities occur in special situations but are too small to be mapped. Along the forest border at the beach and rock cliff is a community that

<sup>1/</sup> Eichmeier, A. H. 1966. Climate of Michigan by Stations. Michigan Weather Service cooperation with Weather Bureau, U.S. Dept. of Commerce.

seldom exceeds 20 meters (1 chain) in width that has mountain-ash, paper birch and mountain maple as well as the more typical hardwoods forest components. On especially shallow or sandy soils white or red pine may be found in this fringe. The rock cliffs support lichen and moss communities.

The northern hardwood communities occur on the better drained, west slope of Echo Lake Creek. The primary overstory components of the stand are beech, sugar maple, red maple, hemlock and yellow birch. The larger individuals are normally hemlock and yellow birch.

This forest community is a part of Braun's<sup>2/</sup> hardwood and hemlock-hardwood forests of eastern Upper Michigan, a component of the hemlock-white pine northern hardwood region. The present stand is considered climax in this area. Future and past development of the stand is of interest because of the high proportion of beech.

Lands surrounding the tract are held by a large mining company. They are managed under a partial cutting system with approximately 7 to 9 square meters per hectare (30 to 40 square feet per acre) of basal area  being left after logging in residual overstory trees. The adjacent areas appear to have been logged within the last 5 years.

## (2) Geology

Much of the shore is a sand beach but in the northwest corner it gives way to a rock cliff over 30 meters (100 feet) high. Echo Lake Creek flows north to Lake Superior through the eastern portion of the

<sup>2/</sup> Braun, E. L. 1904. Deciduous Forests of Eastern North America. Hafner Publishing Co., New York pp. 353-363.

tract. Most of the natural area is actually on the west slope of the creek and varies in elevation from 184 to 238 meters (605 to 780 feet) above MSL. *include all this*

The prominent rock cliffs and underlying bedrock are Jacobsville sandstone. It is suspected to be a Cambrian deposit formed in a lacustrine environment from locally derived materials. Approximately 75 percent of the mineral matrix is composed of rounded to subangular quartz grains. The balance is composed of siltite and illite. The underlying bedrock are presumably Precambrian formations.

During the late Valdres glacial period, the tract was inundated by Lake Algonquin. Later, post glacial Lake Nipissing covered portions of the tract and the present island existed as three islands. As a result, the island is covered with lacustrine deposits of varying thickness, composed of well sorted, permeable sands.

Soils on the tract have not been mapped and classified. The northern hardwood soils are suspected to be Munising series, which has spodic and argillic horizons plus fragipan.

### (3) Fauna

Animals typical of the northern forests should be found on the island. Several points on the island are within a mile of the mainland and ice bridges the gap through much of the winter, providing access to the island for many species. Game species have been regularly hunted for about 10 years, and hunting is expected to continue.

(4) Minerals

There does not appear to be any potential for mineral exploitation on the island. Forest Service mineral examiners have examined the area and no commercial mining is underway nearby. There are no records of conveyance in the county court house so it is presumed that the United States has the mineral rights.

(5) Recreation

The island has potential for recreational use. It is opposite the Pictured Rocks National Lake Shore. Restoration of a nearby light house may make the area an attraction to boaters visiting Pictured Rocks. There are no breakwalls or natural harbors nearby to protect boats on visits to the beach or light house. This limits boaters to mostly short stops when seas are calm. Longer stops are jeopardized by the uncertainties of Lake Superior and the vast expanse of open water at this location. Automobile using recreationists are not a problem since the mining company does not offer public access and the road to the tract is in poor conditions. However, the public has access to the island by snowmobile in the winter. Off roadway travel by snowmobilers is not anticipated and should cause no problem.

(6) Water use

Most of the surface runoff and ground waters drain into Echo Lake Creek before flowing into Lake Superior.

(7) Administration and Protection

Administration and protection of the tract is the responsibility of the Forest Supervisor of the Hiawatha National Forest, Escanaba, Michigan. The tract is a portion of the Munising Ranger District, Munising, Michigan, the local administrative unit of the forest.

Research on the tract is the responsibility of the director of the North Central Forest Experiment Station. He also bears the responsibility to assure that management of the tract is conducive to function as a research natural area. Material related to research activities, as data, biological and physical samples and related materials are maintained at the Northern Hardwoods Laboratory, Marquette, Michigan.

The director and forest supervisor shall continue efforts to create a buffer zone on private land surrounding the tract through cooperative agreement, easement or purchase. Withdrawal from mineral entry should be undertaken after natural area status is approved. Property lines should be marked with paint and experimental area signs. Nothing should be done locally to promote or attract the general public into the area as a means of avoiding vandalism.

The road is currently blocked to wheeled vehicles and as long as no erosion problems develop, natural revegetation processes should be allowed to proceed. Major erosion control measures, as water diverters and planting with non-native species shall not be used.

Prompt fire suppression is important to preserve this small relic stand and because fire is not typically natural in these types. Suppression with hand tools is preferred. Disease and insect control measures are seldom employed in northern hardwoods and their need for maintaining these ecosystems is not anticipated.

Recommendation

The Grand Island site is suited for ecological research on the basis of its undisturbed communities, abundance of beech at the northwestern extent of its range and lake dominated environment. It adds to the range of environments northern hardwood natural areas are found in. The area is smaller than the suggested minimum size, however, its exposure to the lake is highly desired and anticipated management of the adjoining private lands should continue to provide a buffer of partially stocked northern hardwoods. It is recommended that the tract be designated as the Grand Island Research Natural Area.

April 26, 1976  
Date

Fred J. Metzger  
Reporting Officer

5/3/76  
Date

[Signature]  
Director, North Central Forest  
Experiment Station

January 20, 1975  
Date

Mervyn O. Reed  
Supervisor, Hiawatha National  
Forest

April 15, 1976  
Date *acting*

Curtis L. Smith  
Regional Forester