no latitude
Longitude yet

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 McCormick Research Natural Area, the lands described in the preceding report by F. Bryan Clark, dated April 24, 1970; Said lands shall hereafter be administered as a research natural area subject to the said regulations and instructions thereunder.

January 21, 1971 (Date)

Edward P. Cliff Chief

McCormick / Ottawa

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

ESTABLISHMENT REPORT

for

McCORMICK RESEARCH NATURAL AREA

WITHIN THE

OTTAWA NATIONAL FOREST

Marquette County,

Michigan

North Central Forest Experiment Station

St. Paul, Minnesota

U.S. GOVERNMENT PRINTING OFFICE : 1968 O—298-607

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ESTABLISHMENT REPORT
FOR
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Michigan

Principal distinguishing features

The Research Natural Area includes about 3,675 acres in the northeast corner of the Cyrus H. McCormick Experimental Forest. The Area contains examples of virgin northern hardwood-white pine, an increasingly rare type in the northern hardwood group. Mature stands of the northern hardwood climax growing on sandy soil are also exceedingly rare and much of the Area contains examples of this.

The topography and soils are distinctly varied. Combinations of aspect and elevation lead to large changes in the microenvironment. In the western and northeastern portions there are relatively flat sandy outwash plains separated by a rugged escarpment about 3/8-mile wide. Cataracts occur on both the main and west branches of the Yellow Dog River in the escarpment area. The hilly terrain of the southern portion includes the Area's highest point, 1,860 feet, located on the divide between the Yellow Dog River and Lake Margaret. In the rugged sections the glacial till is often so thin that bedrock is exposed. The lowest point (1,480 feet) is at the exit of the Yellow Dog River at the northeast corner.

The main and west branch of the Yellow Dog River pass through the Natural Area. Almost all of the drainage basin for these streams lies within the Experimental Forest and much of the watershed also is within the Natural Area. There are 5-1/2 miles of stream in the Area, a small lake (5 acres), and Lake Margaret (120 acres).

Location

The proposed Natural Area is about 30 miles northwest of Marquette, Michigan. The boundaries coincide with those of the Experimental Forest along the east and north sides. Along the west side, the boundary lies along the Old Huron Mountain Trail from the north Forest line to a divide just north of Bulldog Lake, around the east end of this lake and south around Lake Margaret. The southern boundary follows the south side of Sections 32 and 33 to the east property line.

The area's legal description is:

Section	Subdivision
17	S1/2
18	SE1/4 NE1/4; and portion of S1/2 east of the Old Huron Mountain Trail
19	E1/2; and portion of W1/2 east of the Old Huron Mountain Trail
20	Entire section
21	W1/2 NW1/4; NW1/4 SW1/4
29	Entire section
30	Portions east of Old Huron Mountain Trail, and north of divide through SE1/4
31	SE1/4 NE1/4; E1/2 SE1/4
32	Entire section
33	W1/2; SW1/4 SE1/4

All sections are within Township 50 North, Range 29 West. The entire Natural Area is in federal ownership.

The Area can be reached by boat over White Deer and Bulldog Lakes. Temporary access is also possible over spur logging roads on private lands along the north and east boundaries. Within the Area itself, there are about 14 miles of lightly-used trails that provide good access to much of the tract.

Area by cover types

A timber type map has been prepared at the scale of 4 inches per mile based on aerial photos (fig. 2). These are of the EMP series dated June 25, 1964. Approximate areas by cover types are:

Type	Acres
Northern hardwood (old growth)	2,460
Northern hardwood (second growth)	90
Northern hardwood-conifer (old growth)	230
Northern conifer (old growth)	125
Lowland conifer (poles)	500
Lowland conifer (seedling-sapling)	5
Swamp (Non-commercial shrubs)	140
Water (Groves Lake and Lake Margaret)	125
TOTAL	3,675

The northern hardwoods types are dominated by sugar maple (SAF type 27-sugar maple). The mixed hardwood and conifer types include varying amounts of white pine and hemlock. Black spruce dominates in the lowland conifer type (SAF type 12).

Physical and climatic conditions

The Natural Area is within 20 miles of Lake Superior, within its drainage basin, and on the divide between Lake Superior and Lake Michigan. However, the maritime climate associated with the Lakes is significantly altered within this distance. Two inland stations at Champion and Alberta Park have climates more typical of the Area than does the Big Bay Station on Lake Superior. In 1968 a station was established at Herman, Michigan, 19 miles west of the Natural Area and on the same divide. This station should provide the best available record of the climate in the Natural Area.

One of the most impressive climatic features of the Area is that snowfall from cyclonic storms is supplemented by snow squalls originating over Lake Superior. Snowfall generally is increased inland after orographic uplift, so it should be even greater than the 150 inches per year at Alberta Park or Champion. The potential difference is indicated by the 300-inch snowfall that fell at Herman in the first recorded year.

Lake Superior probably has little effect on length of the frost-free period at the Natural Area. This period is expected to be between 60 and 75 days. At the Champion and Alberta Park stations, frost has been recorded in every month of the year. At Champion there has been frost in July in 4 of the 17 years of record.

June through August precipitation averages about 4 inches per month at the nearest weather stations. From December through February, however, it averages less than 2 inches per month. Summer precipitation is most variable, falling below 2 inches per month about one-sixth of the time.

Mean monthly temperatures vary from 12-14° F. in the January-February period to 60-65° F. in the June-August period at Champion and Alberta Park. Maximum temperatures have not exceeded 100° F. and the record minimum for the stations is -40° F.

Description of Values

(1) Flora

The plant community descriptions and developmental series described by Braun[1/] for the Huron Mountains and Baraga County are applicable to the Natural Area. Forest types are either climatic or edaphic climaxes. Early seral communities of elm-black ash and maple-elm-basswood-yellow birch are small in area.

Plant communities in the Area are relatively undisturbed; no cutting has occurred for more than 50 years. Much of the tract appears to be in its original state, but light cutting may have taken place in a small area close to Bulldog Lake.

The occurrence of the northern hardwood types over a variety of soils, aspects and elevations provides the opportunity for a variety of ecological studies. Mature and untouched examples of these types on such a wide variety of soil and microenvironment are now very rare.

The Natural Area is large enough to provide an adequate isolation zone. Such a zone is needed on the northern and eastern boundaries only. Anticipated research activities outside of the Natural Area on the west and south will not conflict.

1/ Braun, E. L. 1964. Deciduous forests of eastern North America. Hafner Publishing Co., New York. p. 365-371.

Vegetation within the Natural Area is comparable with that on much of the northern half of the Experimental Forest. The vegetation is also representative of types and subtypes common throughout the region.

(2) Geology

Glaciation last occurred in the area during the Valders substage, about 10,000 years ago.[2/] Surface features and soils are derived from deposits of glacial till and outwash. The tills, however, are usually shallow and depth to bedrock has greatly influenced surface and soil conditions.

Much of the bedrock is gneiss of various forms deposited early in the Precambrian Era.[3/] Diabase dikes and irregularly shaped bodies of metadiabase and metagabbro extensively cut the older bedrock. These features are oriented east-west along their main axes. At the northern end of the area the rock is from middle Precambrian time. These rocks are metasedimentary and metavolcanic and contain slates, graywache and a thin iron formation. Detailed mapping has not been done in the Area.

2/ Martin, H. M. 1957. Map of surface formations of the Northern Peninsula of Michigan. Mich. Geol. Surv. Div. Publ. 49.

3/ Case, J. E., and J. E. Gair. 1965. Aeromagnetic maps of parts of Marquette, Dickinson, Alger, and Schoolcraft Counties, Michigan and its geologic interpretation. U.S. Geol. Surv. Geophysical Inv. Map GP-467. 10 p. + 3 maps.

Podzolic soils predominate (soils map attached). The prominent series within the area are Karlin, Champion and Michigamme. Smaller amounts of Kalkaska and Pence are present. Carbondale-Linwood organic soils are limited to depressions and stream bottoms. The parent material for the Karlin and Kalkaska series is light colored sand, possibly of outwash origin. The Champion and Michigamme soils are derived from darker colored loamy sands to sandy loams. Important distinguishing features of these soils are:

Series	Feature	Depth
Michigamme	Bedrock	20-40"
Champion	Weakly developed fragipan	28-32"
Karlin	Textural bands	42-60"
Kalkaska and Pence	No obstruction	-

The variability of the soils (from deep sands to shallow to bedrock soils) supporting mature climax forest gives a unique opportunity to compare the influence of variations in soil factors on the ecology of northern hardwoods within a limited area.

(3) Fauna

Because of its size and the variety of habitats included, the proposed Natural Area offers opportunities to study many species of small animals and birds in relatively undisturbed conditions. The 5-1/2 miles of stream within the area may also make research feasible on several furbearers. Animals as porcupines, sapsuckers, and seed-eating rodents, all considered forest pests, also could be studied in an undisturbed environment.

(4) Minerals

Major mining activity occurs 15 miles south of the Natural Area at the Humboldt open pit iron mine and beneficiating plant. A recent aeromagnetic survey[3/] shows that the boundary of the ore deposits is about 14 miles south of the Area. An anomoly in the magnetic field indicative of ore deposits was also located 3/4 mile north of the Natural Area.

Exploration has recently been conducted for gold in the Yellow Dog Plains northeast of the Natural Area. The potential for future development of this mineral is unknown.

Economic bodies of ore are not known to exist within the Natural Area boundaries. Future development is not considered likely.

3/ See footnote 3 on page 7.

(5) Recreation

With the recreation research planned on the Experimental Forest, the Natural Area will remain isolated and have only light use. It is situated far from existing driveable roads and contains no fishing lakes. Expected users of the Natural Area include hunters, stream fishermen, hikers and trappers. Potential indiscriminate use of snowmobiles may create problems that justify their exclusion from the Area.

(6) Water use

Streamflow through part of the Natural Area is regulated by a dam at the outlet of Bulldog Lake. During the spring, water is impounded to raise the levels of the lakes and make the flowage between Bulldog and White Deer Lakes navigable. In the fall, the water level usually has been lowered to prevent ice damage to existing shoreline structures.

Natural streamflow on the Yellow Dog River through the Natural Area could be obtained either by removing the dam or by permanently maintaining the high lake levels. Other problems of water regulation, diversion or pollution are not anticipated as most of the watershed of these streams is in the Experimental Forest.

(7) Other uses

The relative remoteness of the area may make it suitable for collection of air pollution data for comparative purposes.

Recommendation

The proposed Research Natural Area contains good examples of the virgin northern hardwood-white pine type and of the northern hardwood type growing on sandy soils. The Area will be valuable for scientific and educational use and is large enough to provide the essentially undisturbed conditions necessary for long-term ecological studies. It is recommended that the area described in this report be established and designated as the "McCormick Research Natural Area."

4/24/70
Date

F. Bryan Clark
Reporting Officer

4/27/70
Date

D. B. King
Director, North Central Forest Experiment Station

5/12/70
Date

Supervisor, Ottawa National Forest

6/18/70
Date

Geo. A. James
Regional Forester

Approval

10/24/70
Date

Approved Richard Loosley
Director, Division of Recreation

OCT 22 1970
Date

Approved R Keith Arnold
Deputy Chief, Research