DESIGNATION ORDER

By virtue of the authority vested in me by the Secretary of Agriculture under regulations 7 CFR 2.42 and 36 CFR 251.23, this is my Designation Order to establish the Memorial Grove Hemlocks Research Natural Area. The Memorial Grove Hemlocks Research Natural Area shall be comprised of lands described in the section of the Establishment Record entitled "Location."

Regional Forester Floyd J. Marita recommended the establishment of the Memorial Grove Hemlocks Research Natural Area in the Chequamegon National Forest Land and Resource Management Plan dated August 11, 1986, which is incorporated into this document by reference. That recommendation was the result of an analysis of the factors listed in 36 CFR 219.25 and Forest Service Manual 4063.41. The results of the Regional Forester's analysis are documented in the Final Environmental Impact Statement for the Chequamegon National Forest Land and Resource Management Plan and the Establishment Record for the Memorial Grove Hemlocks Research Natural Area which are available to the public.

The Memorial Grove Hemlocks Research Natural Area will be managed in compliance with all relevant laws, regulations, and Manual direction regarding Research Natural Areas. The Memorial Grove Hemlocks Research Natural Area will be administered in accordance with the management direction identified in the Establishment Record. The Chequamegon National Forest Land and Resource Management Plan is hereby amended to be consistent with the management direction identified in the Establishment Record and this Designation Order. This direction will remain in effect unless amended pursuant to 36 CFR 219.10. This is a non-significant amendment of the Chequamegon National Forest Land and Resource Management Plan.

Based on the Environmental Analysis documented in the Chequamegon National Forest Land and Resource Management Plan, the Environmental Impact Statement, and the Establishment Record, I find that designation of the Memorial Grove Hemlocks Research Natural Area is not a major Federal action significantly affecting the quality of the human environment.

The Forest Supervisor of the Chequamegon National Forest shall notify the public of this amendment and will mail a copy of the Designation Order and amended direction to all persons on the Chequamegon National Forest Land and Resource Management Plan mailing list.

Chief

8/3/89
Date

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

TMJ 5
00208

ESTABLISHMENT RECORD FOR THE MEMORIAL GROVE HEMLOCKS

RESEARCH NATURAL AREA WITHIN THE CHEQUAMEGON

NATIONAL FOREST, PRICE COUNTY, WISCONSIN

U. S. GOVERNMENT PRINTING OFFICE : 1980 O - 309-842

FS-6200-7 (10/73)

FOREST SERVICE

PHOTOGRAPHIC RECORD

PHOTOGRAPHER: Eric Epstein

EXHIBIT 5

HEADQUARTERS UNIT: Chequamegon NF

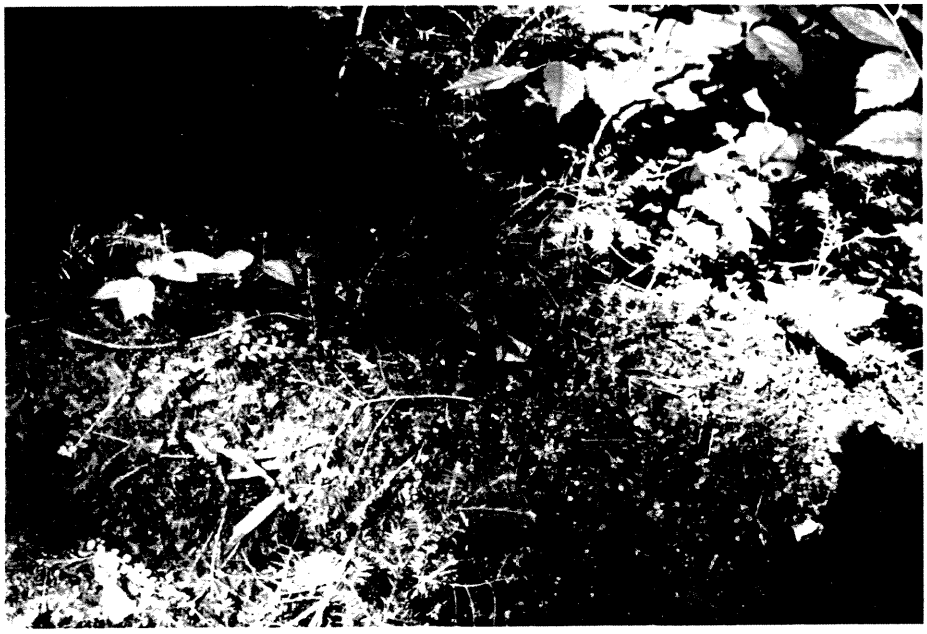
LOCATION: Park Falls, Wisconsi

DATE SUBMITTED: April 4, 1988

INSTRUCTIONS: Submit to Washington Office in quadruplicate. Permanent numbers will be assigned and the forms will be distributed as follows: (1) Washington Office, (2) RO or Station, (3) Forest or Center and (4) Photographer.

TEMP. NO. (1)	PERMANENT NO. (To be filled in by the RO) (2)	SELECTED FOR W.O. PHOTO LIBRARY (3)	DATE OF EXPOSURE (4)	LOCATION (State and National Forest or County) (5)	DESCRIPTION OF VIEW (6)	NEGATIVE SIZE (7)
1.			June 86	Wisconsin Price T.39N,R3E Sec 1 NESW,SESW, NWSE,SWSE	Small canopy gap within old growth hemlock forest. Species filling the gap include mountain maple (Acer spicatum) and sugar maple.	
2.			June 86	Wisconsin T39N,R3E Sec 1 NESW,SESW, NWSE,SWSE,	Well rotted, moss covered deadfall supporting seedling sized hemlock.	
3.			June 86	Wisconsin T39N,R3E Sec 1 NESW,SESW, NWSE,SWSE,	Old growth forest dominated by yellow birch and hemlock, SAF cover type no. 24.	
4.			June 86	Wisconsin T39N,R3E Sec 1 SESW,SESW, NWSE,SWSE,	Groundlayer under old growth hemlock dominated by small enchanters nightshade (Circaea alpina), Canada mayflower, (Maianthemum canadensa) and sugar maple seedlings.	

1. Memorial Grove Hemlocks RNA - Small canopy gap within old growth hemlock forest. Species filling the gap include mountain maple (Acer spicatum) and sugar maple.



2. Memorial Grove Hemlocks RNA - Well rotted, moss covered deadfall supporting seedling sized hemlock.

3. Memorial Grove Hemlocks RNA - Old growth forest dominated by yellow birch and eastern hemlock, SAF cover type no. 24.

4. Memorial Grove Hemlocks RNA - Ground layer under old growth hemlock dominated by small enchanters nightshade (Circaea alpina), Canada mayflower (Maianthemum canadensa) and sugar maple seedlings.

SIGNATURE PAGE

FOR

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

MEMORIAL GROVE HEMLOCKS RESEARCH NATURAL AREA

CHEQUAMEGON NATIONAL FOREST

PRICE COUNTY WISCONSIN

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met in arriving at this recommendation.

Prepared by: Ron Herman Date 8-16-88
Ron Herman, Forester

Recommended by: John R Ward Date 8-16-88
John Ward, District Ranger, Park Falls District

Recommended by: John C Wolter Date 8-17-88
John C. Wolter, Forest Supervisor, Chequamegon National Forest

Recommended by: Jim Jordan Date 8-26-88
Floyd J. Marita, Regional Forester, Eastern Region

Recommended by: R. D. Lindmark Date 10/7/88
Ronald D. Lindmark, Station Director
North Central Forest Experiment Station

TITLE PAGE

ESTABLISHMENT RECORD FOR THE MEMORIAL GROVE HEMLOCKS
RESEARCH NATURAL AREA WITHIN THE CHEQUAMEGON
NATIONAL FOREST, PRICE COUNTY, WISCONSIN

ESTABLISHMENT RECORD FOR MEMORIAL GROVE HEMLOCKS RESEARCH NATURAL AREA WITHIN THE CHEQUAMEGON NATIONAL FOREST PRICE COUNTY, WISCONSIN

INTRODUCTION

The significant natural qualities of the Memorial Grove Hemlocks RNA were recognized by the Forest Service when it was purchased from Anna Caro a local landowner in 1935.

The 64 acre (25.6 ha) RNA is located entirely on lands owned by the Chequamegon National Forest in eastern Price County, Wisconsin. A topographic map, vegetative map and color photographs (Exhibit 5) are attached to this report. (Maps 3,5)

In 1979 the RNA was inspected by Wisconsin Department of Natural Resources (WDNR) botanist Robbin Moran, who recommended it for State Scientific Area status. Field surveys conducted by biologists of WDNR's Natural Heritage Program the summer of 1986 confirmed that the Memorial Grove Hemlocks Research Natural Area (RNA) would merit RNA status. The WDNR has given this biotic natural area a state wide significance classification, which is their highest classification level. The RNA contains an excellent example of old-growth forest dominated by eastern hemlock (*Tsuga canadensis*) and yellow birch (*Betula alleghaniensis*), Society of American Foresters (SAF) Hemlock-Yellow Birch cover type no. 24, Kuchler cover type no. 98, Northern Hardwood-Spruce Forest.

Data was collected on the structure and floristic composition of the stand, and a breeding bird survey was completed. (Exhibits 1,2)

The RNA has a short trail to a small memorial shelter. High risk dead trees next to the trail have been cut. Otherwise, no cutting has occurred in the grove. There is a paved access road on the south boundary of the grove, which also serves as a winter snowmobile trail. This RNA is located in a high visibility area being adjacent to Highway 70.

On Memorial Day 1947, 80 acres (32 ha) of virgin timber and a shelter with a plaque were publicly dedicated to four Forest Service men killed in World War II. They are Edward S. Kafka, Arnold A. Lundstrom, Steve J. Namjestnik, and Maurice L. Blair, all killed in battle. The memorial has stood forty one years in silent memory of the men.

Memorial Grove Hemlocks RNA was included in the Chequamegon National Forest Plan. A field survey of the site conducted in 1986 confirmed that the RNA site exhibited no signs of past logging disturbance, during the past 50-75 years.

LAND MANAGEMENT PLANNING

The Memorial Grove Hemlocks RNA comes under Management Goal 8 (Exhibit 4) in the Regional Guide for the Eastern Region which emphasizes the preservation of unique ecosystems for scientific purposes.

The Memorial Grove Hemlocks RNA is included in Goal 8.4 (Exhibit 3) of the

Chequamegon National Forest Forest Plan. Forest-wide standards, and Goal 8.4, Management and Prescriptions, are designed to protect the character of the RNA and provide opportunity for education and scientific research in RNA's.

OBJECTIVES

The objectives of establishing research natural areas are to:

1. Preserve a spectrum of pristine representative area that typify important hemlock forest, for research, study, observation, monitoring, and those educational activities that maintain unmodified conditions.
2. Serve as reference areas for the study of succession.
3. Serve as baseline areas for measuring long-term ecological changes.

JUSTIFICATION

Establishment of Memorial Grove Hemlocks RNA will protect one of the finest remnant stands of old-growth hemlock, (Photos 1,3) SAF cover type no. 24, in northern Wisconsin. Because this area has not been subjected to significant alteration, it will afford research opportunities available in few other areas within the Chequamegon. The RNA will not only serve as a reference area for succession, but serves as a baseline for measuring long-term ecological changes. Research opportunities exist with the University establishment and the WDNR Bureau of Endangered Resources. Presently, this type is not well represented within Wisconsin's State Natural Areas. No examples of this type are formally recognized and protected on either the Chequamegon or Nicolet National Forests, or on other federal lands within Wisconsin. Memorial Grove Hemlocks RNA is an excellent representative of this cover type and deserves its' RNA designation.

PRINCIPAL DISTINGUISHING FEATURES

Memorial Grove Hemlock RNA features an old growth hemlock forest exhibiting very little evidence of human disturbance. Only a few, very old, rotted stumps are present. The largest living trees exceed 30" d.b.h. (80 cm). Approximately 65 percent of the canopy is composed of eastern hemlock (*Tsuga canadensis*), with sugar maple (*Acer saccharum*) and yellow birch (*Betula alleghaniensis*) the commonest associates. The understory composition is very typical of an old, hemlock-dominated stand. (Photos 2,4) Details may be found in the section on flora. Exhibit 2 is a list of vascular plants in the RNA's boundary. Nomenclature follows Fernald (1950) Gleason and Cronquist (1963), or Little (1979). No endangered or threatened plant or animal species are known to occur on the tract.

The topography is an excellent example of pitted glacial moraine with numerous kettles present.

LOCATION

Memorial Grove Hemlocks RNA is located on the Park Falls Ranger District of the Chequamegon National Forest in Price County, Wisconsin. The Forest Supervisor's office is at Park Falls, Wisconsin. The legal description starts at Section corners 01 and 12, T40N, R3E, and Section corners 6, 7, T40N, R4E, thence
39 39

N88°W, 1320', to point of beginning, thence N7°W, 627', thence N39°W, 957', thence N79°W, 495', thence N90°W, 990', thence S33°W, 396', thence S25°E, 561', thence S42°W, 396', thence N64°W, 231', thence S65°W, 132', thence SØ°W, 264', thence N88°E, 1221', thence N60°E, 99', thence S82°E, 433', to point of beginning. Additional details of location may be found on the attached topographic quadrangle (USGS 7.5' series, Pike Lake, Wis. 1971). (Map 1) The location of the RNA is Latitude 45° 53'30" N, longitude 90° 03'12" W. The Elevation is 1560 ft. to 1590 ft. (475 m to 485 m).

The 64 acre (25.6 ha) RNA lies on the north side of State Highway 70, 1/4 mi. (.4 km) west of the Oneida County line. To access the RNA, take Highway 70, 18 miles (28.8 km) east of the Village of Fifield, then 1/8 mi (.2 km) north on FR 143.

AREA BY COVER TYPES

1. Society of American Foresters Cover Types (Map 2)

   This stand falls within SAF hemlock yellow birch type.

   SAF no. 24: Hemlock-Yellow Birch. 64 acres (25.6 ha)

2. Kuchler Cover Type

   This stand falls into the Northern Hardwoods-Spruce Forest of Kuchler's "Potential Natural Vegetation of United States," 1969.

   Kuchler no. 99: Northern Hardwoods-Spruce Forest 64 acres (25.6 ha)

PHYSICAL AND CLIMATIC CONDITIONS

1. Physical

   The area is a relatively level to rolling topography segment of a pitted outwash plain. It is well drained.

2. Climate

   The climate is continental, characterized by long, snowy, often severely cold winters and relatively short summers with warm days and cool nights. Spring and fall are often short, with the transition from winter to summer and summer to winter quite rapid. Changes in weather from late fall to early spring can be expected every few days as frequent storms pass through the area along the Colorado and Alberta weather tracts. Prevailing winds are northwest to westerly late fall to early spring and from the south the rest of the year. Snowfall of over one inch (2.5 cm) can be expected on the average by the second week of November, and there is a 90 percent probability of snow on the ground during the winter months. Although occasional deep snow years occur, the major snow belt lies to the north along the Penokee Range and Lake Superior.

   Frost can be expected occasionally during any of the summer months, especially in low-lying areas. The average date of the last freeze is the last week in May to the first week in June and the first freeze of the fall occurs in the last week in August to the first week in September.

The annual average precipitation is 33.9 in. (84.8 cm) of which 70 in. (175 cm) is snowfall.

The nearest weather station is in Park Falls, Wisconsin, approximately 22 miles (35.2 km) to the west northwest. Their weather data is based on the previous 20 years of actual measurement.

DESCRIPTION OF VALUES

1. Flora

The forest canopy is dominated by eastern hemlock (*Tsuga canadensis*), with sugar maple (*Acer saccharum*) and yellow birch (*Betula alleghaniensis*) the most common associates. (Photo 3) The largest trees exceed 30" d.b.h. (75 cm). Other tree species present include basswood (*Tilia americana*), white ash (*Fraxinus americana*), black ash (*Fraxinus nigra*), paper birch (*Betula papyrifera*) and balsam fir (*Abies balsamea*). Sugar maple is reproducing vigorously in canopy gaps caused by windthrow, disease or senescence. Seedling-sized hemlock are frequent on down, well-rotted tree trunks but are not reaching sapling size. This appears to be due primarily to browsing by deer.

The shrub layer is sparse. Characteristic species are mountain maple (*Acer spicatum*), fly honeysuckle (*Lonicera canadensis*), beaked hazelnut (*Corylus cornuta*) and red elder (*Sambucus pubens*). Canada yew (*Taxus canadensis*) is present but very rare, probably due to browsing by deer.

Herb layer dominants are intermediate wood fern (*Dryopteris intermedia*), small enchanter's nightshade (*Circaea alpina*), Canada mayflower (*Maianthemum canadense*), wild sarsaparilla (*Aralia nudicaulis*), shining clubmoss (*Lycopodium lucidulum*) and wood sorrel (*Oxalis montana*). (Photo 4)

Exhibit 2 is a list of vascular plants in the RNA's boundary. Nomenclature generally follows Gleason and Cronquist (1963), Fernald (1950), or Little (1979). No endangered or threatened plant species are presently known to occur on the tract.

In the most heavily shaded portions of the stand, 30-40 percent of the ground is bare.

2. Fauna

Exhibit 1 is a list of the birds known to inhabit the RNA. Red Squirrels (*Tamiasciurus hudsonicus*) and white-tailed deer (*Odocoileus virginianus*) are among the most common mammals utilizing the area. Resident birds include the Blackburnian Warbler (*Dendroica fusca*), Black-throated Green Warbler (*Dendroica virens*), Solitary Vireo (*Vireo solitarius*), Golden-crowned Kinglet (*Regulus satrapa*) and Brown Creeper (*Certhia familiaris*). Nomenclature generally follows Robbins, Bruun and Zim (1966), and Whitaker (1988). No endangered or threatened animal species are presently known to inhabit the RNA.

3. Geology

This RNA is on glacial deposits from the Woodfordian substage of the

Wisconsin ice advance. The site is an excellent example of pitted moraine, Paull and Paull (1977).

4. Soils

This landform is dominated by clean outwash sands and gravels, and has a few areas of glacial till. The surface textures range from loamy sand to sand loam underlaid by sand or sand and gravel. The soil is closest to the Vilas Loamy Sand Series. The soils range from somewhat poorly drained to excessively drained. The water holding capacity is low on this area and the inherent fertility is low to medium.

5. Lands

The 64 acre (25.6 ha) RNA was acquired in 1935 from the owner under the Weeks Act. The Forest Service does not own the mineral rights. It is not known if mineral resources are present.

6. Cultural Resources

A cultural resource inventory has not been completed for the area and no cultural resource sites have been identified. Completing an inventory of this area is a low priority, as there will be no ground disturbing activities occurring in the area. Eventually, all areas of the Forest will be inventoried.

IMPACTS AND POSSIBLE CONFLICTS

1. Mineral Resources

All mineral rights are held either with the vendor or are under 3rd party agreements. We would not attempt to acquire the mineral rights unless there is a compelling reason. There are no mining or exploration activities in the area. It is unknown if minerals are present on the RNA.

2. Grazing

There is no grazing resource in or close to the RNA. No fencing is necessary for the protection of the RNA from grazing.

3. Timber

Sixty four acres (25.6 ha) of commerical forest land will be withdrawn from timber production, thereby reducing the harvestable timber now and in the future.

Past timber harvest was extremely light and did not alter the structure or composition of the stand. Any past cutting occured greater than 50 years ago.Timber harvest practices that benefit white tailed deer will be discouraged in areas adjacent to Memorial Grove Hemlocks. Excessive deer browsing is having a deleterious impact on hemlock (and possibly yellow birch) reproduction.

Any activities occurring in stands adjacent to the RNA will be designed to protect the RNA.

4. Watershed Values

The RNA is a part of the Pike Lake watershed. Pike Lake is less than 1/4 mile (.4 km) west of RNA, and Squaw Creek is less than 1/4 mile (.4 km) northeast of the RNA. Conifer swamps and lowland brush generally surround the RNA.

5. Recreation

The original, winding interpretive hiking trail is no longer being maintained. The small memorial shelter still stands and is accessed by a short trail. Any limbs and other blow-down material on the trail to the memorial shelter will be cut and scattered. The shelter and public recreation will not detract from the educational and scientific values of the RNA.

There was a wayside with a well, toilets, access road, and small parking lot on the south edge of the RNA. The toilets and tables have been removed and the well capped.

Some snowmobilers use the access road and parking area on the south edge of the RNA.

The Memorial Grove Hemlocks RNA is used by hunters.

6. Wildlife and Plant Values

The area provides habitat for a good variety of forest songbirds and other animals. The plant community is essentially unmanipulated and is composed of native species characteristic of old-growth hemlock-dominated forests. (Exhibits 1,2)

7. Wilderness, Wild and Scenic River or National Recreation Area Values

The RNA is not in any congressionally designated wilderness area. Wilderness legislation was passed for Wisconsin in 1984. The Forest Plan has not identified any potential wildernesses.

The Forest Plan has identified three study rivers, none of which are located in or near the RNA.

The Forest Plan does not identify any potential Natural Recreation areas in the Chequamegon National Forest.

8. Transportation Plans

Highway 70 lies along the south edge of the Memorial Grove RNA. A gravel road, FR 143, runs through the western portion of the RNA. It may be necessary to occasionally cut dead high risk trees that jeopardize the public traveling FR 143. FR 143 accesses privately owned homes and cottages north of the RNA.

MANAGEMENT PLAN

The Chequamegon National Forest Plan has the following Forest-wide standards for existing RNA's.

1. Prohibit all management activities except fire suppression and protection from insect and disease epidemics using the least destructive means.
2. Allow natural processes of ecological change to continue.
3. Prohibit public use that threatens to modify area natural processes.
4. Encourage no-impact types of research studies through cooperative agreements with educational institutions.

The Management Prescription 8.4 will be used as a guideline. Specific Standards and guidelines will be developed.

Fire suppression and insect and disease control using the least destructive means will occur if needed to achieve the management objectives for the area.

The adjacent areas will be managed as to have no adverse impact on the RNA.

Protection of the RNA requires no manipulation of the vegetation.

Light public recreation will be tolerated, but not encouraged in the area.

The Chequamegon National Forest Land and Resource Management Plan was issued in 1986, under Record of Decision dated August 11, 1986. Management prescription 8, Special Areas, provides for designation of unique areas for their scientific and biological significance. This is one of the ten areas identified in the Forest Plan. The ten areas are also State of Wisconsin research natural areas.

ADMINISTRATIVE RECORDS AND PROTECTION

The administrator and protector of this area is:

District Ranger
Chequamegon National Forest
1170 4th Avenue South
Park Falls, Wisconsin 54552

The research coordinator of this area is:

Director
USDA-Forest Service
North Central Forest Experiment Station
1992 Folwell Avenue
St. Paul, Minnesota 55108

The research data file is maintained by:

Wisconsin Department of Natural Resources
Bureau of Endangered Resources
Natural Heritage Section
Box 7921
Madison, Wisconsin 53707

Director
USDA-Forest Service
North Central Forest Experiment Station
1992 Folwell Avenue
St. Paul, Minnesota 55108

Forest Supervisor
USDA-Forest Service
Chequamegon National Forest
1170 4th Avenue South
Park Falls, Wisconsin 54552

REFERENCES

Curtis, J. T. 1959. Vegetation of Wisconsin. University of Wisconsin Press, Madison, Wisconsin.

Eyre, F. H. 1980. Forest Cover Types of United States and Canada, Society of American Foresters, 5400 Grosvenor Lane, Washington, DC 20014.

Fernald, M. L. 1950. Gray's Manual of Botany. American Book Co. New York, New York.

Gleason, H. A. and A. Cronquist. 1963. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. Van Nostrand Co. New York, 810 pp.

Little, Elbert L. Jr. 1979. Checklist of United States Trees (Native and Naturalized), Agriculture Handbook No. 541, Forest Service, U.S. Department of Agriculture.

Kuchler, A. W. 1964. Potential Natural Vegetation of the Conterminous United States, American Geographical Society, New York, New York.

Paull, R. A. and R. K. Paull. 1977. Geology of Wisconsin and Upper Michigan. Kendall Hunt Publishing Company, Dubuque, Iowa.

Robbins, C.S., Bruun, B., Zim, H.S., 1966. A Guide to Field Identification of Birds of North America, Golden Press, 340 pp.

Whiteaker, John Jr., 1988. The Audubon Society Field Guide to North American Mammals, Published by Alfred Knopf Inc. N.Y., 745 pp.

1986 Land and Resource Management Plan, Chequamegon National Forest, Park Falls, Wisconsin.

SCIENTIFIC NAME	COMMON NAME
Abies balsamea	Balsam Fir
Acer saccharum	Sugar Maple
Acer spicatum	Mountain Maple
Actaea pachypoda	White Baneberry
Actaea rubra	Red Baneberry
Adiantum pedatum	Northern Maidenhair Fern
Anemone quinquefolia	Wood Anemone
Aralia nudicaulis	Wild Sarsaparilla
Aralia racemosa	Spikenard
Arisaema triphyllum	Jack-in-the-pulpit
Aster macrophyllus	Big Leaved Aster
Athyrium angustum	Northeastern Lady Fern
Betula alleghaniensis	Yellow Birch
Betula papyrifera	Paper Birch
Carex arctata	
Carex intumescens	Swollen Sedge
Carex pensylvanica	Pennsylvania Sedge
Circaea alpina	Small Enchanter Nightshade
Circaea quadrisulcata	Enchanters Nightshade
Clintonia borealis	Bluebead
Coptis trifolia groenlandica	Goldthread
Corallorhiza maculata	Spotted Coral Root
Cornus canadensis	Bunchberry
Corylus cornuta	Beaked Hazelnut
Diervilla lonicera	Bush Honeysuckle
Dirca palustris	Leatherwood
Dryopteris intermedia	Glandular Wood Fern
Dryopteris spinulosa	Spinulose Wood Fern
Equisetum sylvaticum	Woodland Horsetail
Fraxinus americana	White Ash
Fraxinus nigra	Black Ash
Galium triflorum	Sweet Scented
Gaultheria hispidula	Creeping Snowberry
Geum canadense	White Avens
Gymnocarpium dryopteris	Oak Fern
Hepatica americana	Round Lobed Hepatica
Hieracium aurantiacum	Orange Hawkweed
Impatiens biflora	Orange Jewelweed
Laportea canadensis	Wood Nettle
Linnaea borealis	Twinflower
Lonicera canadensis	American Fly Honeysuckle
Luzula acuminata	Hairy Wood Rush
Lycopodium annotinum	Stiff Clubmoss
Lycopodium clavatum	Running Clubmoss
Lycopodium dendroideum	Round-branched Clubmoss
Lycopodium lucidulum	Shining Clubmoss
Maianthemum canadense	Canada Mayflower
Matteuccia struthiopteris pensylvani	Ostrich Fern
Mitchella repens	Partridge Berry
Mitella diphylla	Bishop's Cap
Mitella nuda	Small Bishop's Cap
Monotropa uniflora	Indian Pipe
Oryzopsis asperifolia	Rough-leaved Rice Grass
Osmorhiza claytoni	Hairy Sweet Cicely
Osmunda cinnamomea	Cinnamon Fern

SCIENTIFIC NAME	COMMON NAME
Oxalis montana	Wood Sorrel
Panax quinquefolius	Ginseng
Phegopteris connectilis	Long Beech Fern
Picea glauca	White Spruce
Pinus strobus	White Pine
Polygonatum pubescens	Downy Solomon's Seal
Polygonum scandens	Climbing False Buckwheat
Pteridium aquilinum latuisculum	Bracken Fern
Pyrola elliptica	Large-leaved Shinleaf
Ranunculus abortivus	Small-flowered Buttercup
Ranunculus recurvatus	Hooked Buttercup
Rhamnus alnifolia	Alder Buckthorn
Ribes cynosbati	Prickly Wild Gooseberry
Ribes lacustre	Bristly Black Currant
Rubus hispidus	Swamp Dewberry
Rubus parviflorus	Thimbleberry
Rubus pubescens	Dwarf Raspberry
Sambucus pubens	Red-berried Elder
Schizachne purpurascens	False Melic Grass
Smilacina racemosa	False Solomon's Seal
Streptopus roseus longipes	Twisted Stalk
Taxus canadensis	Canadian Yew
Thuja occidentalis	Arbor Vitae
Tilia americana	Basswood
Trientalis borealis	Starflower
Trillium cernuum	Nodding Trillium
Tsuga canadensis	Hemlock
Uvularia sessilifolia	Sessile Bellwort
Vaccinium angustifolium	Early Low Blueberry
Viburnum acerifolium	Maple-leaved Arrow-wood
Viola macloskeyi pallens	Smooth White Violet
Viola pubescens	Downy Yellow Violet

EXHIBIT 2

SUMMARY SHEET – BREEDING BIRD SURVEY
Department of Natural Resources
Scientific Areas Preservation Council
Box 7921 Madison, Wisconsin 53707

Observer's Name: Eric Epstein · WDNR
Address:
Phone #:

Area: Memorial Grove Hemlocks
Date: 26 June 1980
Total # Species: 21
Total # Individuals: 81

USE BACK FOR MORE COMMENTS

WEATHER: See back of this sheet for categories.

	Start	Finish
Temperature F.	68	74
Wind Speed	1	3
Sky	0	0
Time	0612	0720

Species	Visit	A	B	C	D
Common Loon					
Pied-billed Grebe					
Double-cr. Cormorant					
Great Blue Heron					
Green Heron					
Great Egret					
Black-cr Night Heron					
Eastern Least Bittern					
American Bittern					
Canada Goose					
Black Duck					
Mallard					
Gadwall					
Pintail					
Green-winged Teal					
Blue-winged Teal					
Northern Shoveler					
Wood Duck					
Redhead					
Ring-necked Duck					
Lesser Scaup					
Common Goldeneye					
Ruddy Duck					
Hooded Merganser					
Common Merganser					
Red-breast. Merganser					
Turkey Vulture					
Goshawk					
Sharp-shinned Hawk					
Cooper's Hawk					
Red-tailed Hawk					
Red-shouldered Hawk					
Broad-winged Hawk		2			
Bald Eagle					
Marsh Hawk (Harrier)					
Osprey					
American Kestrel					
Ruffed Grouse					
Prairie Chicken					
Sharp-tailed Grouse					
Bobwhite					
Ring-necked Pheasant					
Gray Partridge					
Sandhill Crane					
King Rail					
Virginia Rail					
Sora Rail					
American Coot					
Killdeer					
American Woodcock					
Common Snipe					
Upland Sandpiper					
Spotted Sandpiper					
Herring Gull					
Ring-billed Gull					
Bonaparte's Gull					
Forster's Tern					
Common Tern					
Caspian Tern					
Black Tern					
Rock Dove					
Mourning Dove					

Species	Visit	A	B	C	D
Yellow-billed Cuckoo					
Black-billed Cuckoo					
Screech Owl					
Great Horned Owl					
Barred Owl					
Whip-poor-will					
Common Nighthawk					
Chimney Swift		2			
Ruby-thr. Hummingbird					
Belted Kingfisher					
Common Flicker		1			
Pileated Woodpecker					
Red-bell. Woodpecker					
Red-headed Woodpecker					
Yellow-b. Sapsucker					
Hairy Woodpecker		3			
Downy Woodpecker					
Eastern Kingbird					
Crested Flycatcher		1			
Phoebe					
Yellow-b. Flycatcher					
Acadian Flycatcher					
Willow Flycatcher					
Alder Flycatcher					
Least Flycatcher		4			
Wood Pewee		2			
Olive-sided Flycatcher					
Horned Lark					
Tree Swallow					
Bank Swallow					
Rough-winged Swallow					
Barn Swallow					
Cliff Swallow					
Purple Martin					
Gray Jay					
Blue Jay		2			
Northern Raven					
American Crow		1			
Black-capped Chickadee					
Tufted Titmouse					
White-breast. Nuthatch					
Red-breasted Nuthatch					
Brown Creeper		5			
House Wren					
Winter Wren		4			
Marsh Wren					
Sedge Wren					
Gray Catbird					
Brown Thrasher					
American Robin		2			
Wood Thrush					
Hermit Thrush		1			
Veery		2			
Eastern Bluebird					
Blue-gray Gnatcatcher					
Golden-crowned Kinglet		1			
Ruby-Cr. Kinglet					
Cedar Waxwing					
Loggerhead Shrike					
Starling					
White-eyed Vireo					
Yellow-throated Vireo					

Species	Visit	A	B	C	D
Solitary Vireo		3			
Red-eyed Vireo		13			
Warbling Vireo					
Black & White Warbler					
Prothonotary Warbler					
Golden-winged Warbler					
Blue-winged Warbler					
Nashville Warbler					
Northern Parula					
Yellow Warbler					
Magnolia Warbler					
Yellow-Rumped Warbler					
Bl.-thr. Green Warbler		3			
Cerulean Warbler					
Blackburnian Warbler		10			
Chestnut-sided Warbler					
Pine Warbler					
Ovenbird		13			
Northern Waterthrush					
La. Waterthrush					
Kentucky Warbler					
Mourning Warbler					
Common Yellowthroat					
Canada Warbler					
American Redstart					
House Sparrow					
Bobolink					
E. Meadowlark					
W. Meadowlark					
Yellow-head. Blackbird					
Red-winged Blackbird					
Northern Oriole					
Brewer's Blackbird					
Common Grackle					
Br.-headed Cowbird					
Scarlet Tanager		1			
Cardinal					
R-breasted Grosbeak					
Indigo Bunting					
Dickcissel					
Evening Grosbeak					
Purple Finch					
American Goldfinch					
Red Crossbill					
R-sided Towhee					
Savannah Sparrow					
Grasshopper Sparrow					
Henslow's Sparrow					
Vesper Sparrow					
Lark Sparrow					
Northern Junco					
Chipping Sparrow					
Clay-colored Sparrow					
Field Sparrow					
White-throated Sparrow					
Lincoln's Sparrow					
Swamp Sparrow					
Song Sparrow					
Additional Species:					

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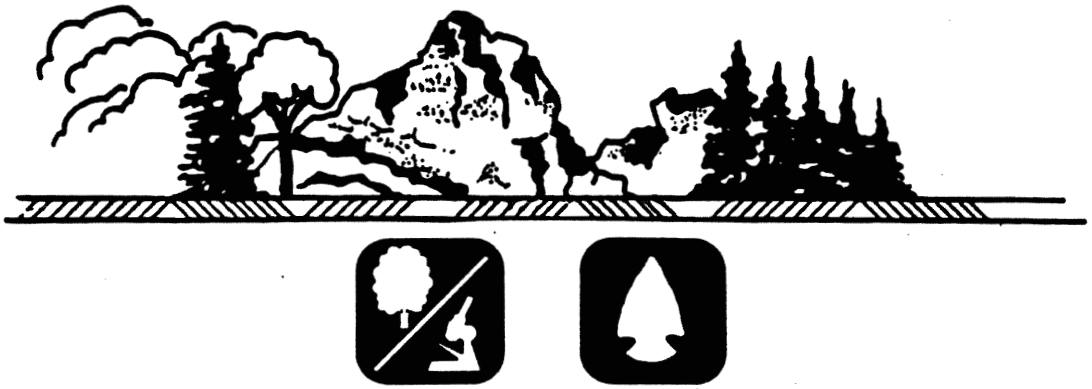

MANAGEMENT PRESCRIPTION 8.4

The purposes of Management Prescription 8.4 are to:

- Preserve the natural character of the Moquah Research Natural Area
- Provide opportunities for education and scientific research. (Ref. Forest Service Manual 4063)
- Provide management opportunities for all 10 candidate Research Natural Areas and for all future Research Natural Areas designated by the Chief of the Forest Service.

AREA LANDFORM DESCRIPTION

The Moquah Research Natural Area (T48N, R7W, S.23 is primarily pitted outwash. The topography is rolling to hilly. Slope gradients are 5-20% but can range up to 35%. Topographic relief is due to depression "pits" in the plain. The soils are very sandy.

8.4

DESIRED CONDITION OF THE LAND

The Moquah Research Natural Area is characterized by undulating topography and droughty soils. The prescription for this area will result in the dominant tree species of aspen, jack pine, and northern red oak. Tree sizes range from seedlings to mature trees. A few small, natural openings are present.

Forest visitor density in this area is low. Forest management activities are not permitted except for fire protection activities. Facilities, structures, and utility corridors are not present.

The Moquah Research Natural Area is bisected by Forest Road 236. Forest Road 407 cuts the southwest corner of the area, and is open to vehicular travel. The area is in a roaded natural setting.

STANDARDS AND GUIDELINES FOR PRESCRIPTION 8.4

1900 Land and Resource Management Planning	
Vegetative Management	Vegetative composition will evolve through natural succession.
2200 Range Management	Grazing is not permitted.
2300 Recreation Management	
Recreation Use Administration	Feature semi-primitive, nonmotorized recreation opportunities.
Visual Resources	Meet the visual quality objective of preservation.
7700 Transportation Systems	Develop no additional roads. Maintain or upgrade existing local roads as needed to comply with special area management objectives.

8.4

EXHIBIT 4

Management Goal 8

This goal will emphasize the following:

a) The preservation of unique ecosystems for scientific purposes

b) Areas to conduct research to improve the benefits of forests and rangeland

c) The protection of unique areas of national significance

These areas will include a wide range of ecosystems for designated research natural areas, experimental forests, wild and scenic rivers, and other unique areas of national significance.

A system of roads and trails may provide access for administrative purposes and recreation activities if compatible with the purpose of the area. Management of these systems will depend on the objective of the area, with motorized and nonmotorized access often being regulated. Facilities and structures will be present and will be designed to be compatible with the natural surroundings. Evidence of human activities will vary, but generally will be controlled to reduce its effect on the area.

The size of the areas will vary, depending on the intended purpose.

STANDARDS AND GUIDELINES FOR MANAGEMENT GOAL 8

1900 LAND AND RESOURCE MANAGEMENT PLANNING

Vegetative Management

Vegetative management will be governed by the special area management objectives.

2100 ENVIRONMENTAL MANAGEMENT

Air Quality

Forests will advise the Regional Forester of areas where redesignation to Class I air-quality area is necessary to protect wilderness or other unique National Forest System lands.

2200 RANGE MANAGEMENT

Forage management will comply with the special area management objectives.

2300 RECREATION MANAGEMENT

Recreation Opportunities

Location of recreational developments will be determined with priority given to correcting health and safety problems, protecting the environment, complementing prescribed recreation opportunities, and meeting public demand.

Feature the ROS classes that are consistent with the special area management objectives.

Trails

Trails will be consistent with the special area management objectives.

Off-Road Vehicles (ORV)

ORV use will be restricted to designated roads and trails, unless otherwise provided for by law, regulation, or the special area management objectives for each area.

Cultural Resources

Forest will set priorities for and will schedule evaluation of cultural resources for the National Register of Historic Places.

STANDARDS AND GUIDELINES FOR MANAGEMENT GOAL 8

Assess the nature and degree of damage to cultural resources caused by vandalism, visitor use, and natural deterioration and identify protective measures to be implemented.

Areas having unique cultural resource values of national significance will be identified for special management, including enhancement and interpretation. Cultural resource interpretation in other special management areas will be consistent with each area's purpose.

Visual Quality

Visual quality objectives will be consistent with special area management objectives.

2400 TIMBER MANAGEMENT

Silvicultural Systems

Even-aged or uneven-aged systems may be used on experimental forests. On unique areas other than experimental forest, Forest or area management plans will specify the systems to be used.

Harvest Cutting Methods

Harvest cutting methods must be consistent with the objectives stated for this Regional goal and as shown in the table titled: Harvest Cutting Methods in the Eastern Region by Forest Types, Regional Management Goals and Subregion, Appendix C.

Clearcutting will be used only where it is the optimum method to meet the goal objectives. Forest Plans will specify conditions and situations for variation from the appropriate harvest cutting method specified in Appendix C.

Temporary Openings Created by the Application of Even-Aged Silviculture

The maximum size of temporary openings created by even-aged management is 40 acres, except as provided in 1-4 below:

1. 370 acres in jack pine type for Kirtland's Warbler habitat on the Huron-Manistee National Forest

2. 200 acres in aspen, birch, conifer types within areas managed for moose habitat on the Superior National Forest

3. 300 acres in designated special management areas on the Hiawatha, Ottawa, Chequamegon, and Huron-Manistee National Forests for sharp-tailed grouse and sandhill crane

4. Exceptions in the NFMA regulations, which are:

   a) On an individual sale basis after 60 days public notice and review by the Regional Forester

   b) As a result of natural catastrophic condition, such as fire, insect and disease attack, or windstorm

Creation of temporary openings and definition of their sizes will be further governed by the special area management objectives.

Management Intensity and Utilization

For the purpose of determining harvest levels, the utilization standards in Table 3-2 will apply.

Forests will consider a range of management intensities when developing prescriptions, yields, and output values. When determining intensity levels, the following practices will be considered: site preparation, seeding, planting, prescribed fire, precommercial and commercial thinning, release, fertilization, and integrated pest management. Practices will be employed when cost efficient and needed to meet the objectives of the relevant Regional goal.

Silvicultural standards will incorporate genetic improvement principles and practices.

Forest Plans will specify management practices to be used to obtain desired conditions for each time type to be harvested.

Minimum stand size for timber production normally will be 10 acres. Forests will specify exceptions.

2500 WATER AND SOIL RESOURCE MANAGEMENT

Manage riparian areas using practices that are consistent with resource conditions, management objectives, and designated water use.

STANDARDS AND GUIDELINES FOR MANAGEMENT GOAL 8

Construction and rehabilitation of structures and facilities will preserve the beneficial values of floodplains and wetlands, will protect public safety, and will be cost efficient.

Heavily disturbed areas, such as borrow pits and mineral developments, when restored, will meet the objectives of this goal. Water bodies may be created when surface runoff and soil conditions permit.

Control measures to mitigate erosion will be commensurate with the soil characteristics, expected use, and management objectives of the area.

2600 WILDLIFE HABITAT MANAGEMENT

Wildlife

Protect existing spring seeps and other water areas that are critical to wintering wildlife. Each Forest will identify sites that require protection prior to implementing adjacent resource management activities.

Favor selective treatment of transmission line rights-of-way vegetation to improve wildlife forage.

Wildlife habitat management will comply with special area management objectives.

Fish

Fish habitat management will comply with special area management objectives.

Endangered, Threatened, and Sensitive Species

Identify and manage potential nest trees (2-3) within active and potential bald eagle or osprey nesting areas.

2700 SPECIAL USES MANAGEMENT

Utility Transmission Corridors

NOTE: See also 7700 Transportation System, Corridors.

Permit only those facilities that are required to serve recreational or administrative facilities. Exceptions will be considered on an individual basis.

STANDARDS AND GUIDELINES FOR MANAGEMENT GOAL 8

Utility Distribution Systems

Approval of application for distribution systems crossing National Forest System lands (such as utility rights-of-way serving individual residences) will be determined individually, consistent with the standards and guidelines for this Regional management goal.

2800 MINERALS AND GEOLOGY

Mineral Exploration

Surface-disturbing exploration (including core drilling) will be permitted wherever it is compatible with the management objectives of the area.

Mineral Development

USDA consent to mineral extraction plans will be determined individually, based on the relative value of the surface/subsurface resources and on consistency with the standards and guidelines in this Regional management goal.

5100 FIRE MANAGEMENT

Prescribed fire may be used to establish or maintain vegetation under established resource management prescriptions.

Activity fuels will be managed at a level commensurate with the allowable fire intensity and rate of spread that meets resource objectives in established prescriptions. Treatment along highways and adjacent properties will meet applicable State laws.

Fuelbreak management will be addressed in the development of management prescriptions, with locations and size based on analysis of probable fire locations, expected fire intensities, and potential versus allowable net resource value change.

Wildfire prevention, detection, and suppression, as well as fuels management, including fuelbreaks and hazard reduction, will be planned, based on an analysis of probable fire location, expected fire intensities, potential net resource value change, and risk to health and safety, and will be addressed in the development of management prescriptions.

STANDARDS AND GUIDELINES FOR MANAGEMENT GOAL 8

5400 LANDOWNERSHIP

Surface Ownership

Avoid encumbering land available for exchange with land uses that compromise land exchange opportunities.

7300 BUILDINGS AND STRUCTURES

Limit buildings and structures to those needed to support the special area management objectives.

7400 PUBLIC HEALTH AND POLLUTION CONTROL ACTIVITIES

Water Supply

Drinking water may be provided. If provided, it must meet Federal and State regulations and be protected to ensure its continued quality.

Solid Waste

Landfill disposal sites may be allowed only as permitted by the special area management objectives.

7700 TRANSPORTATION SYSTEM

Roads

Collectors and local roads will be designed, constructed, and managed for transporting forest products and supporting administrative use.

Provide local roads as needed to comply with special area management objectives.

Roads may be closed to public use or restricted by vehicle type or season of use.

Roads will be maintained to at least maintenance level III if passenger car travel is intended, maintenance level II if passage of vehicles is limited, or maintenance level I if closed to vehicular traffic.

All temporary and short-term roads will be planned and constructed to be revegetated. Revegetation will be accomplished in a reasonable period of time, not to exceed 10 years after termination of the contract, lease, or permit.

STANDARDS AND GUIDELINES FOR MANAGEMENT GOAL 8

Identify all existing roads and determine those needed for administrative and public use. Unnecessary roads will be obliterated.

Corridors

Corridors up to one-half mile wide will be identified for each arterial or collector road (including Forest Highways that meet this definition) to be constructed or reconstructed.