



DESIGNATION ORDER

USDA Forest Service, Eastern Region
Chequamegon-Nicolet National Forest
Medford-Park Falls Ranger District
Price County, Wisconsin

Foulds Creek

RESEARCH NATURAL AREA

Designation Order

By virtue of the authority vested in me by the Secretary of Agriculture in accordance with 7 CFR 2.42, 36 CFR 251.23, and 36 CFR Part 219, I hereby establish the Foulds Creek Research Natural Area. It shall be comprised of 1,393 acres (564 hectares) of land in Price County, in the state of Wisconsin, on the Medford-Park Falls District of the Chequamegon-Nicolet National Forest, as described in the section of the Establishment Record entitled "Location" [and in the Land and Resource Management Plan for the Chequamegon-Nicolet National Forest map]

Approved by:



Kathleen Atkinson
Regional Forester



Date

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Foulds Creek

Research Natural Area

Chequamegon-Nicolet National Forest

Price County, Wisconsin

The undersigned certify that all applicable land management planning and environmental analysis requirements have been met and that boundaries are clearly identified in accordance with FSM 4063.21, Mapping and Recordation, and FSM 4063.41, Establishment Record Content, in arriving at this recommendation.

Prepared by: Marjory E. Brzeskiewicz Date 11/25/2013
Marjory E. Brzeskiewicz, Botanist, Chequamegon-Nicolet National Forest

Draft by: /s/ Dawn Heinbaugh Date: 2005
Dawn Heinbaugh, WI DNR

Recommended by: Bob Hennes Date 1/8/14
Robert Hennes, District Ranger, Medford-Park Falls District

Recommended by: Paul I.V. Strong Date 1/23/14
Paul I.V. Strong, Forest Supervisor, Chequamegon-Nicolet National Forest

Concurrence of: Michael T. Rains Date 3.6.2014
Michael T. Rains, Station Director, Northern Research Station



United States
Department of
Agriculture

Forest
Service

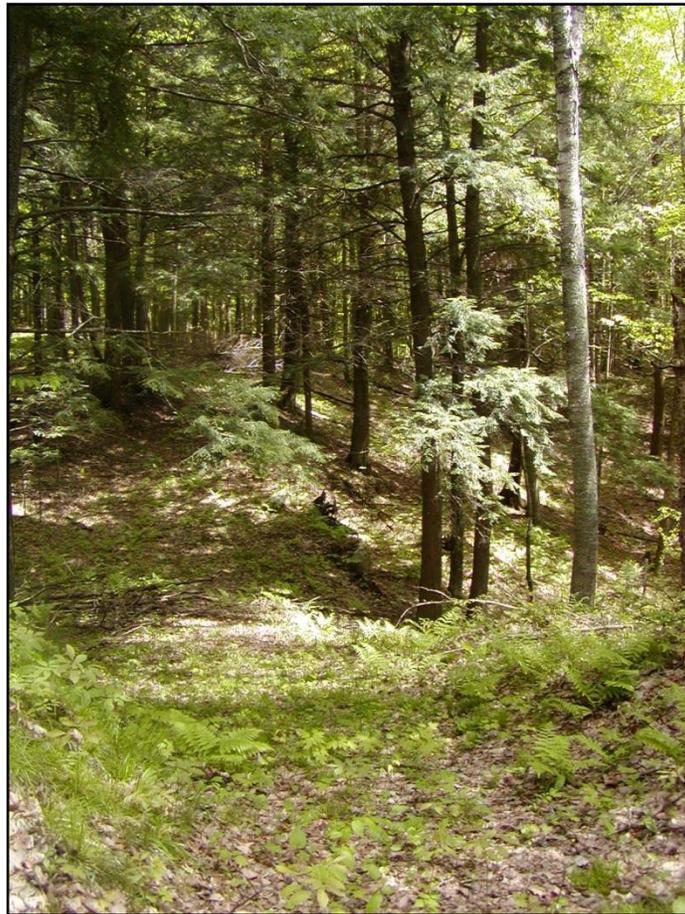
Sept 2013



TITLE PAGE

Establishment Record for **Foulds Creek** Research Natural Area

**Chequamegon-Nicolet National Forest,
Medford-Park Falls District,
Price County, Wisconsin**



Cover Photo: Atop a glacier-formed esker, one of the most outstanding geologic features within Foulds Creek RNA. [Linda Parker 2004]

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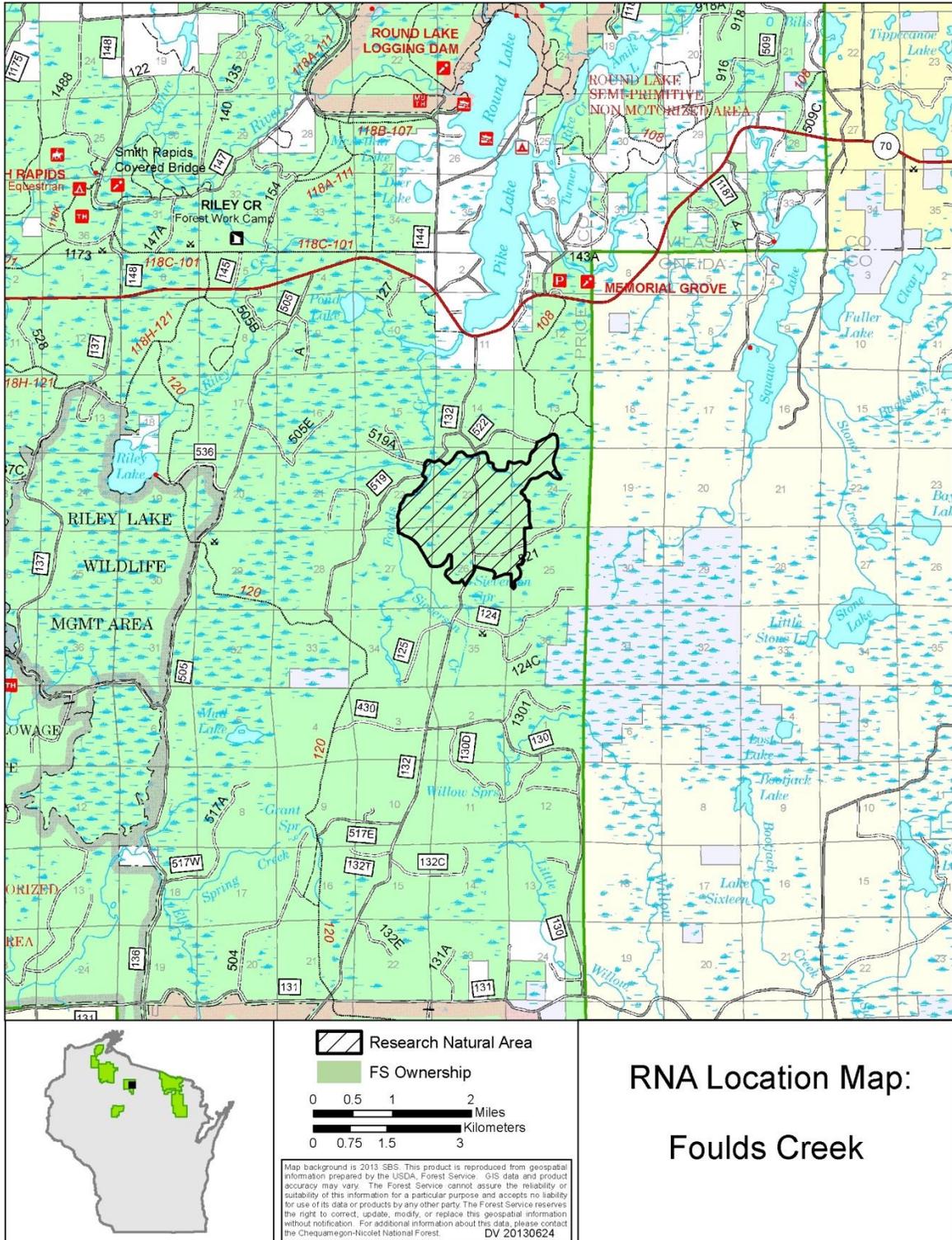
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Note: The Alpha/Numeric ordering in this document follows that within Forest Service Manual direction (FSM 4063) for Establishment Records.

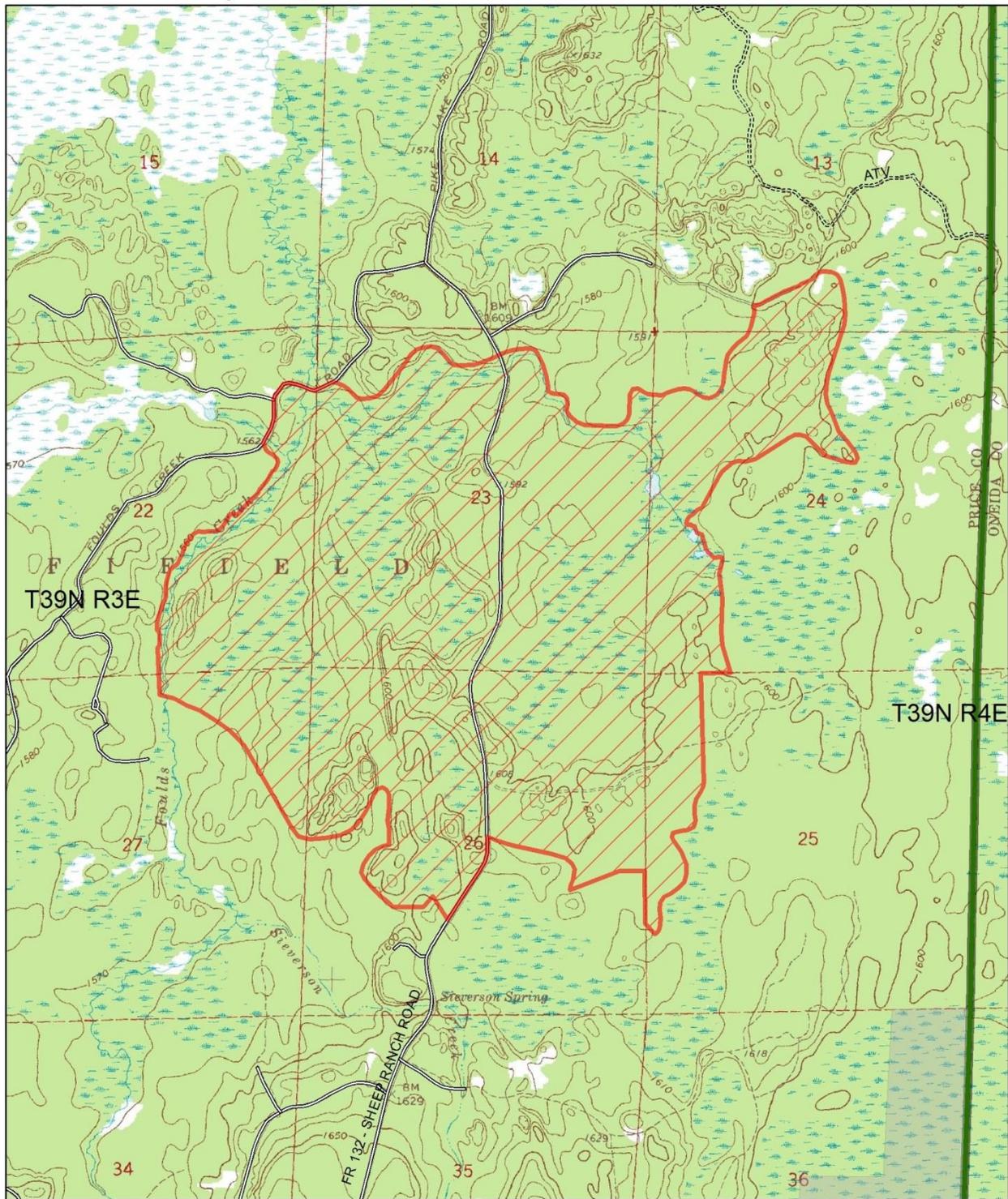
1. IDENTIFICATION SECTION

Location Map

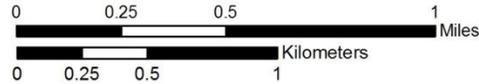


Boundary Map

RNA Boundary Map: Foulds Creek



- Research Natural Area
- Open Road
- Trail
- NonFS ownership



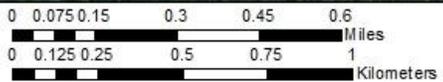
DV 20140417
Acres: 1393

Landscape Overview Foulds Creek RNA



 RNA Boundary

ESRI Basemap World Imagery
MB 2013



Legal Description

The legal description of Foulds Creek RNA is attached as Appendix 6. GIS data of the perimeter boundary are on file at the Chequamegon-Nicolet National Forest Supervisor's office.

2. ADMINISTRATIVE SECTION

This Establishment Record has been prepared pursuant to Forest Service Manual direction (FSM 4063). Establishment of the Foulds Creek RNA is documented with a signature page and a Designation Order which are a separate documents accompanying this document (FSM 4063.41.2) (USDA Forest Service 2004c).

The Station Director of the Northern Research Station (NRS) in consultation with the Chequamegon-Nicolet Forest (CNNF) Supervisor, Medford-Park Falls District Ranger, and NRS RNA Coordinator(s) will approve and coordinate research conducted in the RNA.

Requests to conduct research are referred to the Station Director, Northern Research Station, who will coordinate a review of the application. The Director or NRS RNA Designate will approve research proposals, and prior to the initiation of any projects, will coordinate the project or activity with the District Ranger. Any plant, animal, vegetation, or soil specimen(s) collected in the course of research conducted in the RNA are to be housed at a location designated by the Forest or approved by the Station Director.

Hard copies of research data files will be maintained in the following offices:

Chequamegon-Nicolet National Forest
1170 4th St. South
Park Falls, WI 54552

Station Director
c/o Station RNA Field Representative
Northern Research Station
5985 Highway K
Rhineland, WI 54501

3. BODY OF ESTABLISHMENT RECORD

a. INTRODUCTION

Foulds Creek Research Natural Area (RNA) is located on the Chequamegon-Nicolet National Forest (CNNF) in Price County, Wisconsin approximately 20 miles (32 km) southeast of Fifield. The 1,393-acre (565 ha) RNA is located on the Medford-Park Falls Ranger District and is entirely on National Forest Land.

The Foulds Creek RNA is a complex of forested and non-forested areas with a good to excellent representation of late successional forest communities in mature status (Spickerman and Brzeskiewicz 1995). Throughout the site are older forested wetland communities surrounded by northern dry-mesic (Figure 1) and mesic forests with eastern hemlock (*Tsuga canadensis*), sugar maple (*Acer saccharum*), red pine (*Pinus resinosa*), northern white cedar (*Thuja occidentalis*) and super canopy white pine (*Pinus strobus*). A prominent glacial *esker* runs in a southeast to northwest direction with several springs originating from its base and flowing through the adjacent swamp (Krause and Spickerman 1996). Foulds Creek, a cold water stream, flows through the site. A pair of nesting northern goshawks (*Accipiter gentilis*) and a wolf (*Canis lupus*) denning site have been reported within the area. Other notable species include an active great blue heron (*Ardea herodias*) rookery in 2003.

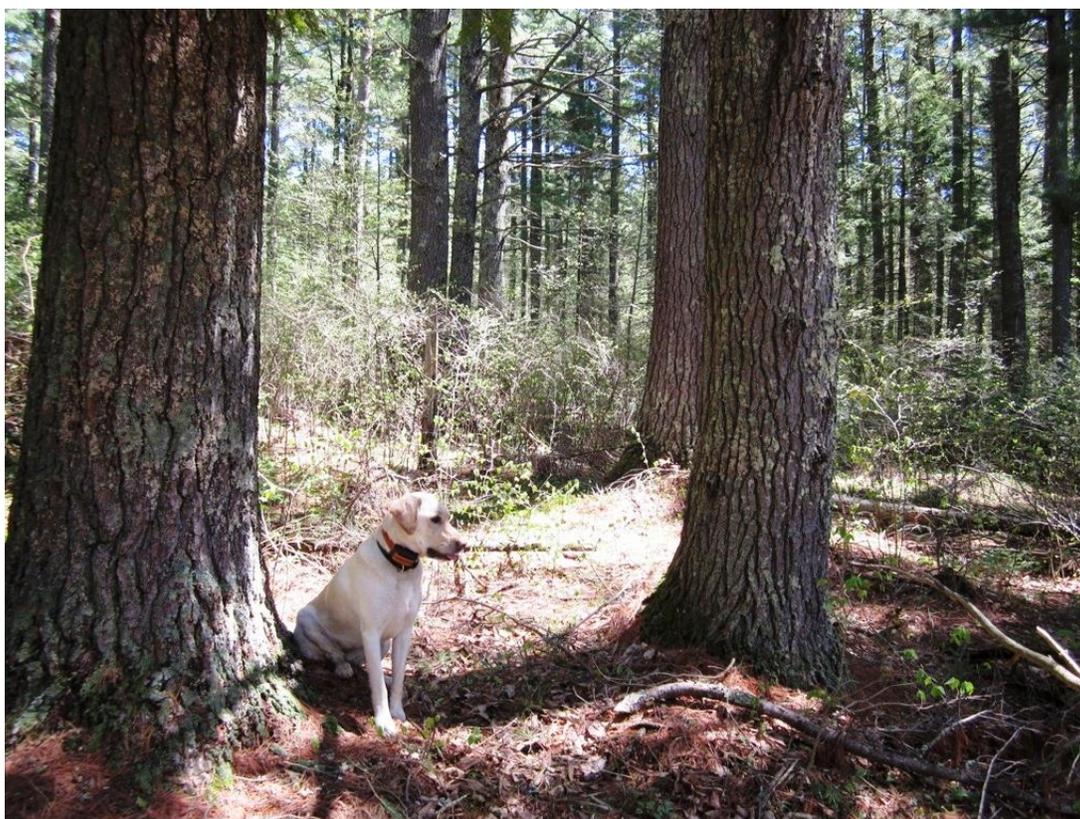


Figure 1. A dry-mesic community on the north end of Foulds Creek RNA showing large diameter white pine of 20-28 inches (50-71 cm) DBH. Yellow Labrador “Elky” indicates scale. [Brzeskiewicz 2013]

Historical Background - Native American tribes have lived on the lands that make up the CNNF for thousands of years with a long and complex history. They hunted, fished, gathered food, and obtained forest products for shelter, moved plants from other areas, and sometimes used fire to manipulate the land. Ojibwe tribes entered into session treaties with the United States in which rights to hunt, fish and gather were reserved by these tribes. The Reservation of the Lac du Flambeau Band of Ojibwe is approximately five miles (8 km) to the northeast of the RNA. See Section 4 d.(2) Cultural/Heritage for further explanation of Native American history.

Alexander Anderson surveyed the township (T39N-R3E) in 1865 and his notes for this area are interesting: “*This township is most all Swamp unfit for anything. What timber there are is of very poor quality with the exception of Sugar orchards of which there are a number used at present by Indians*” (BCPL 2004).

Northern Wisconsin was extensively logged in the late 1800s, virtually clear cutting much of this part of the state. Catastrophic wildfires burned the logging slash across the region. The area that contains the RNA then became National Forest in the 1930s. The year of origin for much of the RNA is listed as late 1800s in the CNNF database. Timber harvests within the site since it became National Forest have been mainly selection cutting of hardwoods that took place in decade of the 1980s. The site includes some small stands of early successional paper birch (*Betula papyrifera*) (Figure 5). Current recreational use within the RNA includes mainly hiking, hunting, and fishing. Motorized recreation is not allowed but occurs on local open roads outside the RNA.

Ownership & Administration - Foulds Creek RNA is owned outright by the USDA Forest Service. Administration and protection of the RNA is the responsibility of the Forest Supervisor of the CNNF or designate. The Medford-Park Falls Ranger District, Chequamegon-Nicolet National Forest, provides day-to-day protection and maintenance of the area. The Foulds Creek RNA does not occur within any other administratively or congressionally designated areas. Refer to Appendix 1: *Ecological Evaluation* d. (1) *Research/Education Use* for an explanation of co-designation as a Wisconsin State Natural Area.

b. JUSTIFICATION SECTION

(1) JUSTIFICATION STATEMENT

Foulds Creek RNA features a mosaic of high quality plant communities including northern mesic and wet-mesic forest, northern wet forest, open bog, alder (*Alnus incana*) thicket and spring runs (Curtis 1959). The RNA contains a high concentration of good to excellent quality community occurrences that represent late successional forest types in mature status with the oldest trees over 100 years old (Spickerman and Brzeskiewicz 1995). There is an excellent representation of the *esker* glacial feature and its associated plant communities and the site also includes most of the eastern hemlock forest types found within the larger Medford-Park Falls District (Krause and Spickerman 1996).

All ecological values and functions unique to maturing forest, especially size, are met. The oldest stands regenerated from widespread cutting in the late 1890s. It is also significant that few large, relatively intact native plant and animal communities such as those found here exist on the larger CNNF and opportunities to protect remaining large areas are rapidly diminishing (Spickerman and Brzeskiewicz 1995). The site is developing old growth forest characteristics such as large course

woody debris (Figure 2) and large standing dead trees important to many species. Rare and uncommon bird species include northern goshawk, great blue heron, and yellow-bellied flycatcher (*Empidonax flaviventris*). All three species are sensitive to human disturbance and require relatively large expanses of forested habitat and/or large trees for nesting.

Foulds Creek is co-designated a Wisconsin State Natural Area. Over the past 40 years of collaboration with the U.S. Forest Service, the Wisconsin Department of Natural Resources has assumed a significant investment in the co-designation of natural areas on the Chequamegon-Nicolet National Forest (CNNF). These areas on the Forest contribute to the state's Natural Area Network ecosystem representation goals. Management goals are compatible with RNA status.

(2) PRINCIPAL DISTINGUISHING FEATURES

Foulds Creek RNA is an aggregation of forested and non-forested communities which span the continuum of moisture and nutrient gradients from northern mesic forests to wet-mesic to bogs and streams (Spickerman and Brzeskiewicz 1995). One of the primary plant communities of Foulds Creek RNA are large patches of lowland conifer swamp with numerous good quality stands of northern white cedar. Associated wetland communities include a black spruce (*Picea mariana*)-tamarack (*Larix laricina*) bog, alder thicket, hard-water spring runs, and a cold, slow, hard-water stream.



Figure 2. A clump of recently wind-thrown eastern hemlock trees adds to the old-growth character of Foulds Creek RNA. The root mass will decompose into a large mound providing slightly dryer microhabitat required by some plants. [Brzeskiewicz 2013]

Surrounding the lowlands are extensive areas of northern mesic and wet-mesic forest of eastern hemlock, upland northern white cedar, and super canopy white pine. The forest is recovering well from intense historic logging disturbances in the 1890s and regaining old growth features such as snags, tip-and-mound (cradle-knoll) topography, and large downed trees (Figure 13).

Rising above the surrounding glacial till plain and organic peat deposits is a prominent *esker* running through the site's interior (Figure 6 and cover photo). Eskers were formed when glacial melt water ran through the ice, depositing debris as it flowed. When the glacier retreated it left behind a long, sinuous ridge of unsorted material. The esker is oriented in a southeast to northwest direction, which is unusual on the CNNF. This "knife-like" ridge is forested with a high quality example of upland northern mesic forest with eastern hemlock, northern white cedar, and large diameter super-canopy red pine, and white pine (Krause and Spickerman 1996). Several springs originate at the base of the esker and flow through an adjoining conifer swamp.

Small patches of northern hardwood forest occur among the wetlands throughout the site. Some areas have a mature stand structure and still retain a residual conifer and yellow birch (*Betula alleghaniensis*) component. Foulds Creek forms a natural site boundary on the northern and western edges of the site (Figure 3). The formerly threatened gray timber wolf has a denning site within the area and the northern goshawk, a species that requires large trees for nesting, has been found within the site. A great blue heron rookery was active here but last observed in 2003. Foulds Creek also provides important breeding and stopover habitat for many neotropical migrant birds.

(3) OBJECTIVES

The Foulds Creek RNA will be managed to meet the education and research objectives of the national RNA program. The specific management objectives of Foulds Creek RNA are to serve as a reference area for the study of succession as well as a control area for comparing results from manipulative research and resource management techniques executed elsewhere. The genetic diversity is maintained in a complex of lowland and



Figure 3. Foulds Creek in May with high water due to spring rains. The creek banks within the RNA are mostly shrub or sedge. [Brzeskiewicz 2013]

upland habitats where researchers can measure ecological changes. Here succession will occur naturally following community-changing events such as wind throw. It will protect populations of uncommon and rare species. Upland areas that contain eastern hemlock or large pine components contribute to the diverse mosaic represented by this RNA and will provide a seed source for future generations.

c. LAND MANAGEMENT PLANNING

Foulds Creek RNA was recommended as a candidate RNA in the 2004 Chequamegon and Nicolet National Forest's Land and Resource Management Plan (hereinafter referred to as "2004 CNNF Forest Plan") and is incorporated by reference per the page citations that occur in this Establishment Record (USDA Forest Service 2004a pg 3-50). The alternative effects on RNA establishment were analyzed and disclosed in the Final Environmental Impact Statement (USDA Forest Service 2004b pg 3-110) and Record of Decision (USDA Forest Service 2004c pg 9). Foulds Creek RNA is part of a national network of ecological areas designated in perpetuity for research and education, and to provide important components of biological diversity for the Forests. The RNAs and candidate RNAs on the Forests have been assigned to a management prescription (8E) that is consistent with RNA objectives (USDA Forest Service 2004c pg 9).

Management Area 8E is characterized by ecologically significant natural features and representative ecosystems. It includes a broad array of community types occurring on the range of landforms and soil types that occur on the Chequamegon-Nicolet National Forest. Plant communities are generally of an older age class and contain all or most species characteristic of that community in the region (Appendix 3 - *Forest Management Area Direction* and USDA Forest Service 2004a pg 3-50).

d. MANAGEMENT PRESCRIPTION

The management prescription for the Foulds Creek RNA is embodied in the management area direction and guidance presented in the 2004 CNNF Forest.

The CNNF has not developed an individual site management plan for Foulds Creek RNA. When developed, such a plan will provide more specific detail of management needs and ensure that the objectives for which the RNA was created are met. In general, the management objectives are to allow natural processes to drive the structure and function of the ecosystems. Any site plans will be coordinated with the state as this is also a State Natural Area and as such has compatible management goals. The CNNF non-native invasive plant strategy will detect, manage and prevent invasive plants (USDA Forest Service 2009). Research Natural Areas are high priority for monitoring and controlling invasives.

Refer to Appendix 1, section f.(1) *Potential or existing conflicts* to reference unique management issues that should be addressed for this RNA.

e. USE OR CONTROL OF FIRE AND GRAZING

Fire is not generally used as a management tool in these mesic forest community types. Fire is allowed if needed for specific objectives however, fire has not been identified as a management need.

Occasional wildfires do occur in dry years, but they are most often small in size - usually less than one acre (0.4 ha), limited by lack of fuel, and easily suppressed. Spring fires that occasionally occur in wetlands can be as large as 100 acres. Wildfire suppression within the RNA would employ those methods that cause the least disturbance

There is currently no grazing on the Chequamegon-Nicolet National Forest, nor is grazing allowed in RNAs per 2004 CNNF Forest Plan standard.

f. APPENDICES

4. APPENDIX 1 ECOLOGICAL EVALUATION

The following ecological evaluation is included as an appendix to the establishment record and tiers to the 2004 CNNF Forest Plan (USDA Forest Service 2004a) and to the Final Environmental Impact Statement (USDA Forest Service 2004b). This evaluation provides the initial baseline information

for the Research Natural Area, serves as a source of data for reports on the Research Natural Area program, and provides information to researchers seeking research sites or projects. More specific information on research sites can be obtained from the Forest RNA Coordinator.

a. PHYSICAL SITE DESCRIPTION AND CLIMATIC CONDITIONS

(1) LOCATION

Foulds Creek RNA is located on the Medford-Park Falls Ranger District of the Chequamegon-Nicolet National Forest, Price County, in the state of Wisconsin. The USGS Quad is Pike Lake SE. The site is contained within T 39N R3E Sections 13, 14, 22, 23, 24, 25, 26 & 27.

The RNA's Mercator coordinates are 45° 51' N latitude and 90° 04' W longitude.

See Identification Section for *Boundary Certification*, *Location Map* and *Boundary Map*. Geographic Information Systems (GIS) shapefiles are available on request from the CNNF RNA coordinator.

(2) SIZE IN ACRES/HECTARES

The RNA is comprised of 1,393 acres (564 hectares).

(3) ELEVATION RANGE

Elevations range from 1,560 ft. (475 m) along Foulds Creek channel to 1,660 ft. (506 m) above sea level. For comparison, the highest point in Wisconsin, Timm's Hill, is 1,951 feet (595 m) located in Price County approximately 30 miles (48 km) south of the RNA.

(4) ACCESS TO THE SITE

The RNA can be accessed from Fifield, Wisconsin. From the intersection of State Hwy 70 and State Hwy 13 in Fifield head east on Hwy 70 for 17 miles (27 km), then south on Sheep Ranch Road (Forest Road 132) for approximately 2 miles (3 km). The site is located on both sides of the road. An esker on the west side of the road provides good upland access to the interior of the western portion of site (see Identification Section - *Location Map* and *Boundary Map*).

(5) CLIMATIC DATA

The Wisconsin climate and that of Foulds Creek RNA is typically continental with warm summers and cold, snowy winters. The weather station nearest to the Foulds Creek RNA is DNR Headquarters in Park Falls (Station no. 476398), which is approximately 22 miles (35 km) northwest of the RNA and experiences the same weather and climate. This station has recorded temperature, precipitation, snow, and growing season data since 1910 (Midwestern Regional Climate Center 2003). In northern Wisconsin, thunderstorms average about 30 events per year. The area is also subject to occasional hail, wind, tornado, and lightning damage.

Table 1. Temperature and Precipitation Records for Park Falls, Wisconsin weather station from 1971 to 2000

Temperature	°F	°C
Mean annual	40.9	4.8
Mean April through September	57.9	14.4
Mean October through March	23.8	-4.6
Average daily maximum	50.5	10.3
Average daily minimum	31.1	-0.5
Record high	106.0	41.1
Record low	-45.0	-43.0
Precipitation	in	mm
Mean annual precipitation	32.1	815.0
Mean April through September	3.7	93.5
Mean October through March	1.7	42.2
Mean annual snowfall	41.2	1046.0

b. ECOLOGICAL DESCRIPTION

Nomenclature for flora follows the USDA PLANTS database (USDA, NRCS. 2013); nomenclature for birds follows AOU Checklist (1983); nomenclature for vertebrates follows Watermolen & Murrell (2001). In Wisconsin, commonly used references for describing ecosystems include Forest Habitat Types (Kotar 2002) and Natural Communities (Curtis 1959).

(1) ECO-REGION (TO THE LOWEST LEVEL OF DETAIL CURRENTLY AVAILABLE).

Foulds Creek RNA is located in the Laurentian Mixed Forest Province, Southern Superior Upland Section, Subsection Northern Highlands Pitted Outwash and Glidden Loamy Drift Plain of the Ecological Units of the Eastern United States (Cleland et al. 2007). It includes Land Type Associations (LTA) Xa03 Chequamegon Washed Till and Outwash and a very small section of Xb01 Northern Highland Outwash Plains. This information is available from the CNNF RNA Coordinator.

(2) PLANT COMMUNITY TYPES

The plant communities of Foulds Creek RNA include northern mesic forest, northern wet-mesic forest, northern wet forest, open bog, and alder thicket (Hoffman 1998). Dominant trees of the upland mesic forest include eastern hemlock (*see Table 4 for scientific names for plants*), yellow birch, and sugar maple. Associated species include basswood, white pine, and red pine (Spickerman 1998). The understory is fairly open in much of this type due to the dense overstory (Figure 4).



Figure 4. A young hardwood/hemlock forest within Foulds Creek RNA showing how eastern hemlock commonly occurs in the moister bases of slopes and how the dense canopy creates an open understory. [Parker 2004]

Eastern hemlock dominates the wet-mesic forests with associated species that include white pine, yellow birch, red maple, northern white cedar, white spruce, and balsam fir. The dominant shrub is American fly honeysuckle. Other shrubs include early low blueberry and mountain maple. Ground flora is dominated by American starflower, bunchberry, wood sorrel, Canada mayflower, and wild sarsaparilla.

Black spruce and tamarack make up the canopy of wet forest communities occurring in small and large lowland areas. Here the shrub layer is variable in density but dominated by Labrador tea and blueberry. Sphagnum moss is the main ground cover. There are large wet forests of mixed conifer where the composition is varied and some stands of almost pure northern white cedar. The mid-story of these areas is mostly balsam fir which can be dense in places.

Table 2. Natural vegetation community types within Foulds Creek RNA using common classification systems for Wisconsin (Curtis 1959 and Kotar et al. 2002) and NGDC (2012)

Community Type (Curtis 1959)	Habitat types (Kotar et al. 2002)	Dominant Species	NVCS Associations (NGDC 2012)*
Northern mesic forest	ATM	eastern hemlock, yellow birch, sugar maple	Tsuga canadensis - Acer saccharum - Betula alleghaniensis Forest CEGLO05044 or CEGLO02457
Northern mesic forest	TMC	eastern hemlock, northern white cedar, red pine, and white pine	Tsuga canadensis - (Betula alleghaniensis) Forest CEGLO02598 (most likely) or CEGLO02590
Northern mesic forest - transitional	ATM	paper birch, balsam fir	undetermined -likely succeeding to white pine, sugar maple, eastern hemlock
Northern wet-mesic forest	TMC	eastern hemlock, northern white cedar, yellow birch, white pine	Tsuga canadensis - Betula alleghaniensis Saturated Forest CEGLO05003
Northern wet forest	N/A	tamarack & black spruce	Picea mariana - (Larix laricina) / Ledum groenlandicum / Sphagnum spp. Forest CEGLO05271 or CEGLO05218
Northern wet forest	N/A	black ash, red maple	Fraxinus nigra - Mixed Hardwoods - Conifers / Cornus sericea / Carex spp. Forest CEGLO02105 or CEGLO02071
Alder thicket	N/A	Tag alder (<i>Alnus incana</i>)	Alnus incana Swamp Shrubland CEGLO02381
Sedge meadow	N/A	tussock sedge, other grasses and sedges	undetermined
Open bog	N/A	Labrador tea, leatherleaf	Chamaedaphne calyculata - Ledum groenlandicum - Kalmia polifolia Bog Dwarf-shrubland CEGLO05278
Spring run- hard	N/A	not applicable	not applicable
Stream: cold, slow, hard – Fould’s Creek	N/A	not applicable	not applicable

* These National Vegetation Classification System associations are initial approximations.

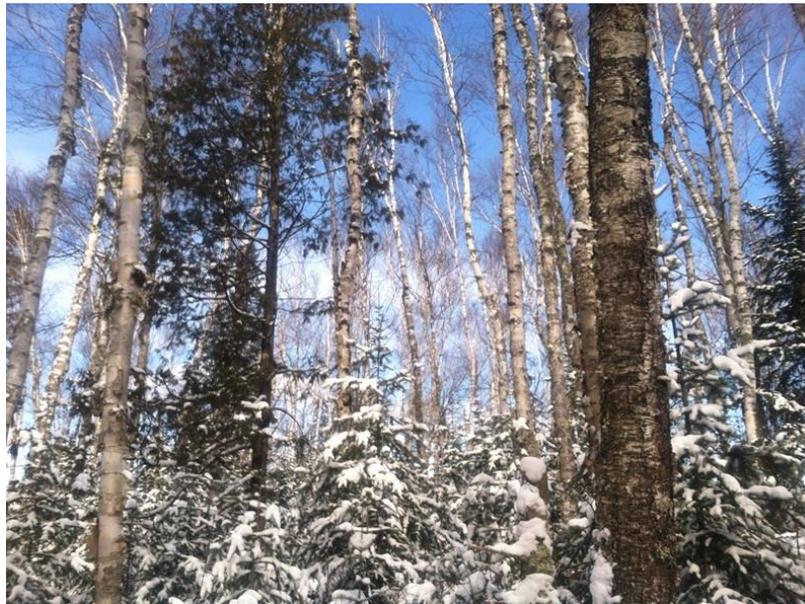


Figure 5. Small patches of early successional paper birch (*Betula papyrifera*) regenerate on the exposed mineral soil in areas of wind or fire disturbance. [Brzeskiewicz 2013]

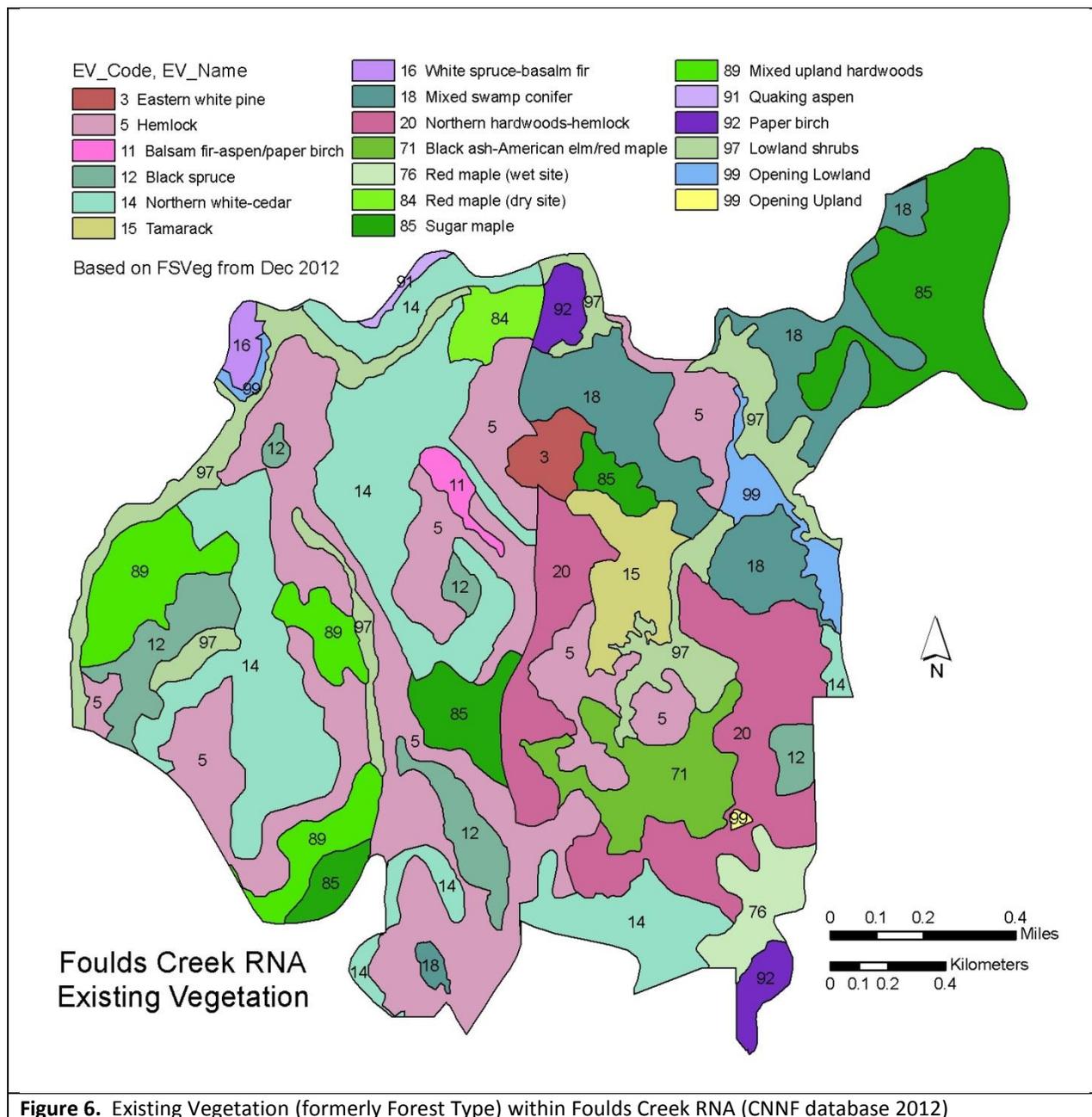


Table 3. Existing Vegetation (as dominant tree cover) and area in Foulds Creek RNA and key to Figure 6

EV CODE	Existing Vegetation Type (EV)	Acres	Hectares
3	Eastern white pine	14.7	6.0
5	Eastern Hemlock	324.4	131.3
11	Balsam fir-aspen/paper birch	7.7	3.1
12	Black spruce	60.3	24.4
14	Northern white-cedar	253.3	102.5
15	Tamarack	34.3	13.9

16	White spruce-balsam fir	7.1	2.9
18	Mixed swamp conifer	118.3	47.9
20	Northern hardwoods-eastern hemlock	135.5	54.8
71	Black ash-American elm/red maple	47.1	19.1
76	Red maple (wet site)	24.5	9.9
84	Red maple (dry site)	15.4	6.2
85	Sugar maple	125.5	50.9
89	Mixed upland hardwoods	70.2	28.4
91	Quaking aspen	3.1	1.2
92	Paper birch	20.1	8.1
97	Lowland shrubs	109.5	44.2
99	Opening Upland	0.9	0.3
99 - blue	Opening Lowland	4.6	8.4
Grand Total		1392.7	563.5

(3) DESCRIPTION OF THE VALUES OF THE RESEARCH NATURAL AREA.

(A) FLORA LIST

Plant surveys are incomplete. The flora list in the table below represents only the upland eastern hemlock/hardwood mesic forest type.

Table 4. Flora of Foulds Creek RNA (names per USDA PLANTS 2012)

FOULDS CREEK Vascular Plant List*	
Scientific Name	Common Name
<i>Abies balsamea</i>	Balsam fir
<i>Acer rubrum</i>	Red maple
<i>Acer saccharum</i>	Sugar maple
<i>Aralia nudicaulis</i>	Wild sarsaparilla
<i>Betula alleghaniensis</i>	Yellow birch
<i>Betula papyrifera</i>	Paper birch
<i>Brachyelytrum erectum</i>	Long-awned wood grass
<i>Carex intumescens</i>	Swollen sedge
<i>Carex pedunculata</i>	Long stalk sedge
<i>Circaea lutetiana</i>	Enchanter's nightshade
<i>Coptis trifolia</i>	Three-leaved gold-thread
<i>Cornus canadensis</i>	Bunchberry
<i>Dryopteris intermedia</i>	Intermediate wood fern
<i>Dryopteris carthusiana</i>	Spinulose wood fern
<i>Gaultheria hispidula</i>	Creeping snowberry
<i>Gymnocarpium dryopteris</i>	Common oak fern
<i>Huperzia lucidula</i>	Shining club-moss
<i>Larix laricina</i>	Tamarack
<i>Linnaea borealis</i>	Twinflower
<i>Lonicera canadensis</i>	American fly honeysuckle

FOULDS CREEK Vascular Plant List*	
Scientific Name	Common Name
<i>Lycopodium lagopus</i>	One-cone club-moss
<i>Maianthemum canadensis</i>	Canada mayflower
<i>Mitchella repens</i>	Partidgeberry
<i>Oryzopsis asperifolia</i>	Rough-leaved rice grass
<i>Osmunda claytoniana</i>	Interrupted fern
<i>Oxalis montana</i>	Mountain wood sorrel
<i>Phegopteris connectilis</i>	Narrow beech fern
<i>Picea glauca</i>	White spruce
<i>Picea mariana</i>	Black spruce
<i>Pinus resinosa</i>	Red pine
<i>Pinus strobus</i>	White pine
<i>Sorbus americana</i>	American mountain ash
<i>Thuja occidentalis</i>	Northern white cedar
<i>Tilia americana</i>	Basswood
<i>Trientalis borealis</i>	American starflower
<i>Tsuga canadensis</i>	Eastern Hemlock
<i>Vaccinium angustifolium</i>	Early low blueberry

* (Spickerman & Brzeskiewicz 1995)

(B) FAUNA LIST

Foulds Creek has not had a detailed faunal inventory although beaver (*see Table 5 for scientific names*), muskrat, and mink are found along the stream (Sather and Busch 1983). Four rare or uncommon species are known to inhabit Foulds Creek RNA: timber wolf, Northern Goshawk, Yellow-bellied Flycatcher and Great Blue Heron rookery [see sections (G) and (H) below]. The formerly federally threatened timber wolf has a denning site within the area. A pair of Northern Goshawks and an alternate nest site was located during a field survey in 1995. Breeding birds were surveyed annually from 1992 to 2011 by the University of Minnesota-Duluth (Danz et al 2008).

Table 5. Fauna observed or known from the area of Foulds Creek RNA (Spickerman 1995)

Foulds Creek RNA Fauna List (2003)	
Common Name	Scientific Name
beaver	<i>Castor canadensis</i>
muskrat	<i>Ondatra zibethicus</i>
mink	<i>Mustela vison</i>
timber wolf	<i>Canis lupis</i>
white tailed deer	<i>Odocoileus virginianus</i>
black bear	<i>Ursus americanus</i>
red squirrel	<i>Tamiasciurus hudsonicus</i>
brook trout	<i>Salvelinus fontinalis</i>

Table 6. Birds of Foulds creek RNA (from Spickerman & Brzeskiewicz 1995 and Danz et al 2008)

FOULDS CREEK RNA Bird list	
Common Name	Scientific Name
Canada Goose	<i>Branta canadensis</i>
Mallard	<i>Anas platyrhynchos</i>
Ruffed Grouse	<i>Buteo platypterus</i>
Barred Owl	<i>Strix varia</i>
Northern goshawk	<i>Accipiter gentilis</i>
Common Snipe	<i>Gallinago gallinago</i>
Raven	<i>Corvus corax</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>
Hairy Woodpecker	<i>Picoides villosus</i>
Downy Woodpecker	<i>P. pubescens</i>
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>
Least Flycatcher	<i>Empidonax minimus</i>
Olive-sided Flycatcher	<i>Contopus borealis</i>
Yellow-bellied flycatcher	<i>Empidonax flaviventris</i>
Winter Wren	<i>Troglodytes troglodytes</i>
Ruby-crowned Kinglet	<i>Regulus calendula</i>
Golden-crowned Kinglet	<i>R. satrapa</i>
Brown Creeper	<i>Certhia americana</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>
Red-breasted Nuthatch	<i>Sitta canadensis</i>
Black-capped Chickadee	<i>Parus atricapillus</i>
Wood Thrush	<i>Hylocichla mustelina</i>
Hermit Thrush	<i>Catharus guttatus</i>

FOULDS CREEK RNA Bird list	
Common Name	Scientific Name
Veery	<i>Catharus fuscescens</i>
American Robin	<i>Turdus migratorius</i>
Yellow-throated Vireo	<i>Vireo flavifrons</i>
Warbling Vireo	<i>V. gilvus</i>
Black-and-White Warbler	<i>Mniotilta varia</i>
Black-throated Green Warbler	<i>Dendroica virens</i>
Chestnut-sided Warbler	<i>D. pensylvanica</i>
Blackburnian Warbler	<i>D. fusca</i>
Magnolia warbler	<i>D. magnolia</i>
Northern parula	<i>Parula americana</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Northern Waterthrush	<i>S. noveboracensis</i>
Nashville warbler	<i>Vermivora ruficapilla</i>
Canada Warbler	<i>Wilsonia canadensis</i>
Common Yellowthroat	<i>Geothlypis trichas</i>
Blue Jay	<i>Cyanocitta cristata</i>
American Goldfinch	<i>Carduelis tristis</i>
Pine Siskin	<i>Carduelis pinus</i>
Purple Finch	<i>Carpodacus purpureus</i>
Song Sparrow	<i>Melospiza melodia</i>
Swamp Sparrow	<i>M. georgiana</i>
White-throated Sparrow	<i>Zonotrichia albicollis</i>

(C) GEOLOGY

The geology of northern Wisconsin was shaped by long periods of cooling climate and expansion of glaciers; the last expansion is known as the Wisconsin Glaciation. This glacial advance began about 26,000 years ago when the Laurentide Ice Sheet spread across the continent. As this glacier retreated, till deposition and glacial melt-water formed an irregular landscape of hills pocked with depressions that later became lakes and wetlands (WGNHS 2011).

The most notable glacial feature in this site is a two mile (3 kilometer) long *esker*, a winding, narrow ridge of sand, gravel, and boulders deposited by a stream flowing on, within, or beneath the stagnant glacier. This material is often mined elsewhere for gravel and forested eskers are becoming rarer. The other main geologic feature is the undulating, hilly surface formed of *washed till* and *outwash* a mixture of sorted and unsorted debris of all sizes worked over by the glacier melt-water.



Figure 7. A view looking downslope from the top of a glacial esker; one of the most notable features within the RNA. [Brzeskiewicz 2009]

Bedrock of the area includes igneous, metamorphic, and volcanic rock (WI DNR 2003). Bedrock of the Northern Highland Outwash Plains LTA is greater than 100 feet from the land surface. On the Chequamegon side of the CNNF over 70% of this Land Type has bedrock within 5 feet (1.5 m) of the land surface.

(D) SOILS

Soils within Foulds Creek RNA are quite varied and range from deep, acid, poorly drained soils to well-drained loamy sand soils (USDA NRCS 2003). Peaty acid soils generally occur in depressions and drainage-ways (0-2% slope) with sphagnum mosses, and woody and herbaceous plants comprising the organic source material. Soils in low areas are very poorly drained. The water table in bogs is generally at the surface throughout the year and existing vegetation is usually lush.

On nearly level to undulating topography (0-5% slope) are loamy sand soils over medium and coarse sands. These soils are well-drained. Less well-drained soils also present as sandy loam soils over medium and coarse sands. Both loamy sand and sandy loam soils have a sandy loam, fine sandy loam, or silt loam surface texture with underlying medium and coarse sands. The underlying sands may have some gravel mixed in, but a layer that is predominantly gravel is usually less than 2 feet (0.6 m) thick.

Some areas of sandy loam soils occur as outwash flats between glacial till uplands and depressional areas dominated by organic soils. Areas of 5-15% slope contain loamy sand over sand and gravel outwash material. These soils are well to excessively drained and contain greater than 30% gravel.

(E) TOPOGRAPHY

Landform of the Chequamegon Washed Till and Outwash Land Type Association (LTA) is rolling collapsed glacial moraine and outwash plain complex (WI DNR 2003). There are areas of steep topography along the esker ridge (Figure 7) that rise 40 feet (12 meters) above the surrounding low bogs. A very small portion of the RNA lies within the Northern Highland Outwash Plains LTA. Landform of this LTA is undulating pitted and unpitted outwash plain with swamps, bogs, and lakes common.

The pitted outwash landform is characterized by rolling hills forming a horizontal plain, giving the appearance of depressional or “pitted” topography rather than that of hills protruding from the surface.

(F) AQUATIC/RIPARIAN

Foulds Creek runs through the RNA and flows north into Pike Lake, which is a part of the South Fork Flambeau River system (Sather and Busch 1983). Foulds Creek is a Class II trout stream. Streams in this classification may have some natural reproduction, but not enough to utilize available food and space. Therefore, stocking is required to maintain a desirable sport fishery. These streams have good survival and carryover of adult brook trout (*Salvelinus fontinalis*), often producing some larger than average size fish (WI DNR 2002). There is a spring pond within the RNA surrounded by sedge meadow (Figure 8). This area of Price County, WI has numerous springs and spring-fed streams.



Figure 8. Sedge meadow surrounding a spring pond on the northeast corner of Foulds Creek RNA [Brzeskiewicz 2013]

(G) RARE, THREATENED, ENDANGERED, OR SENSITIVE SPECIES

Much of Foulds Creek RNA has yet to be surveyed for rare plants. However, there is habitat potential for rare sedges, orchids, and wetland species on the Wisconsin Natural Heritage working list (WI DNR 2012). Ginseng (*Panax quinquefolius*) and spreading woodfern (*Dryopteris expansa*) are likely in the uplands as they are known from within a few miles of the site.

Rare fauna (Table 7) include the timber wolf which began a natural population recovery in the state following complete extirpation in the 1960s (USFWS 2013). See Section C.(6)-*Wildlife* for further discussion of wolves. There is an historic great blue heron rookery within the site that when last observed in 2003 consisted of several nests in large white pine trees.

Table 7. Rare or special concern fauna species of Foulds Creek RNA

Common Name	Scientific Name	Global and State rank	State Status
Timber Wolf (gray wolf)	<i>Canis lupus</i>	G4 S4	SC/P
Northern Goshawk	<i>Accipiter gentilis</i>	G5 S2B,S2N	SC/M
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	G5 S3S4B	SC/M
Great Blue Heron	<i>Ardea herodias</i>	G5 S4B	SC/M

* see Appendix 4: *Wisconsin Natural Heritage Working List – Rank Definitions*

(H) LIST OF RARE ELEMENTS AND RARE PLANT COMMUNITIES

A great blue heron rookery, last observed active in 2003, is protected by this RNA. Also the glacial esker geologic feature with mature eastern hemlock/hardwood forest occurs infrequently on the Forest. Elsewhere in the state many eskers are logged or mined for gravel. None of the plant communities are especially rare in Wisconsin but their rankings are noted below. The combined assemblage of upland and lowland habitats in good condition is uncommon in the state.

Table 8. Plant Communities within Foulds Creek RNA, Global and State Rank and State Status (WI DNR 2012)

Element Name	Global Rank, State Rank *	State Status
Bird Rookery (Great Blue Heron)	G5, SU	Special Concern
Northern mesic forest	G4, S4	N/A
Northern wet-mesic forest	G3?, S3S4	N/A
Northern wet forest	G4, S4	N/A
Open bog	G5, S4	N/A
Alder thicket	G4, S4	N/A
Stream – Slow, Hard, Cold	GNR, SU	N/A
Springs and Spring Runs, Hard	GNR, S4	N/A

* see Appendix 4: *Wisconsin Natural Heritage Working List – Rank Definitions*

c. RESOURCE INFORMATION

This section discusses resources that occur in the RNA framed *within the context of potentially conflicting uses*. Foulds Creek RNA is owned outright by the United States government and is administered by the USDA Forest Service, Chequamegon-Nicolet National Forest. It is bounded entirely by Forest Service land.

(1) MINERALS

The mineral estate within the RNA (1,427 acres*) is both federally owned and reserved. Reserved and federally-owned minerals are open to hardrock prospecting within the Research Natural Area and the Forest Service must allow access to the surface to the mineral owner. There is potential for hardrock prospecting activity within RNA based on geology and recent hardrock prospecting permit activity in the County compared to other parts of the CNNF. The state of the knowledge of the bedrock geology and where actual ore bodies may be found (if they exist and are commercial) is not precise enough to say the potential for prospecting is “high” or “low” within the RNA (Knight pers comm 2013). Mineral ownership does not preclude use of the site for research but if prospecting took place disturbance to localized areas could occur. To date there has been no hardrock prospecting permit activity in the RNA.

Table 9. Mineral resources within Foulds Creek RNA (CNNF Forest data, 2005)

Township-Range	Section	Acres*	Hectares	Mineral Ownership	Comments
39N 3E	22,24,26,25	all	all	Federally owned	
	23	40	16	Reserved	Balance is Federally owned
	27	40	16	Reserved	Balance is Federally owned

Definitions of terms in Table 9:

Reserved: The surface land owner owned the mineral rights and retained those mineral rights when they sold the surface land to the National Forest. These mineral rights are subject to Secretary of Agriculture Rules & Regulations and State laws based on date of land purchase. Forest Service must allow access to the surface to the mineral owner.

Federally owned: Mineral estate is administered by Bureau of Land Management and are open for prospecting.

All: Means the total acreage within the RNA boundary in that section.

Balance: Means the remaining acreage minus the listed acres within the RNA boundary in that section.

***Acres:** This represents only a rough estimate of the number of acres within the proposed RNA boundary. Mineral ownership acreage is estimated because RNA boundaries are meander lines and mineral ownership is a legal description.

(2) GRAZING

There is currently no grazing on the Chequamegon-Nicolet National Forest, nor is grazing allowed in RNAs per Forest Plan standard. Forest Road 132 is called “Sheep Ranch Road” because there was a sheep ranch a few miles south of this site back in the early 1900s.

(3) PLANTS (INCLUDING TIMBER AND SPECIAL FOREST PRODUCTS)

The total forested acreage in the RNA is about 1,260 (510 hectares). Approximately 57 percent is upland forest and 43 percent lowland forest types (Figure 6; Table 3). Due to concerns of low of reproduction, northern white cedar, black spruce, and eastern hemlock are not harvested on the CNNF.



Figure 9. Forest on the steep esker slopes tend to be drier and are dominated by eastern hemlock, red pine, white pine, and some northern white cedar. [Brzeskiewicz 2009]

The 2004 CNNF Forest Plan includes a guideline that prohibits gathering of Special Forest Products for personal use or commercial sale within RNAs (USDA Forest Service 2004a pg 3-50). When the CNNF issues a permit to gather products such as club moss or firewood, the permittee is provided with a map of areas, including RNAs, which are off-limits to harvesting. The CNNF supplement to the Forest Handbook (FSH2409.18) states that “gathering small amounts of fruit, nuts, berries, and fungi (mushrooms) for personal use is allowed”. There is evidence in Foulds Creek RNA of harvest of northern white cedar bark (seen by author in 2007).

This new RNA [unless it is Tucker, South Branch, or Waupee] has not as yet been designated as a Tribal RNA (Tribal-USDA MOU) which would limit tribal gathering. The CNNF is continuing to work with the Tribes to protect these unique features and to provide for the exercise of treaty-reserved hunting and gathering rights. See Section d.(2) -*Cultural/Heritage* for further discussion.

(4) WATERSHED VALUES

Foulds Creek RNA is entirely within the Upper South Fork Flambeau River watershed (WI DNR 2013). The RNA designation will positively affect the watershed by protecting the water quality of Foulds Creek, which flows north into Pike and Round Lakes, and the South Fork of the Flambeau River. This river corridor on the Forest has portions that are eligible for designation as federal *Scenic, Wild, or Recreational* (USDA Forest Service 2004a pg 3-49). The site protects the entire length of a small un-named creek which drains two spring ponds on the east side (Figure 8). This creek flows into Foulds creek within the RNA.

(5) RECREATION USE

The overall impact of recreation is unclear. No motorized recreation is allowed within the RNA. Hunting and fishing do occur but no use figures are available. Both activities are expected to continue in the future and are compatible with RNA status. In fact deer hunting may be necessary to reduce the over-browsing effects of high deer populations. Hunter camp sites does damage vegetation in small areas during hunting season in late fall (Spickerman and Brzeskiewicz 1995). Camping within RNAs is not encouraged on the CNNF and regular RNA monitoring will identify if areas have to be closed to this activity.

The RNA is expected to provide good opportunities amateur and professional botanists, birders, and researchers who are attracted to the area because of the diversity of plant and animal life. Some visitors hike and snowshoe the scenic esker that runs north/south on the west side of Sheep Ranch Road but there is no designated trail here nor any designated parking areas.

(6) WILDLIFE

One of the important features of Foulds Creek RNA is the secluded habitat provided for area sensitive species such as the timber wolf and northern goshawk. Timber wolves migrated to this area very early in their recovery in the state. The presence of large predators is a good indicator of ecosystem health and natural process functioning because carnivores greatly influence the entire food web. The RNA and the adjacent land east of this site make up a large roadless matrix of lowlands interspersed with uplands very suited to timber wolves.

Animals inhabiting the area that are commonly hunted, trapped, or fished include white tailed deer (*see Table 5 for scientific names*), black bear, red squirrel, ruffed grouse, mink, beaver, muskrat, and brook trout. A large eastern hemlock stand east of the road was known a deer yard since the 1030s when white tailed deer were known to “yard-up” during the deep snows of winter. This led to protection of the stand very early in CNNF history.

Watchable wildlife is abundant and represented by most birds (Table 6) and mammals known from northern Wisconsin.

(7) TRANSPORTATION/ROAD SYSTEM

Forest Road 132 (Sheep Ranch Road) bisects the RNA north to south and is a permanent forest road. This is a gravel-surfaced, road maintained by the Town of Fifield and is plowed in winter. It receives a low amount of traffic; on the order of ten to twenty vehicles per day. Old collector roads and skid trails are sometimes visible on the ground but are rapidly growing in. Other more visible old roads occur in the site but are closed to motorized vehicles per the 2012 Motorized Vehicle Use Map Decision Notice (USDA Forest Service 2012). The 2004 CNNF Forest Plan and Forest Service Manual prohibit construction of new roads and trails within RNAs as well as the use of horses, bicycles, and motorized vehicles (US Forest Service 2004a pg 3-53). Roads left over from past management needs will be treated if necessary to restore hydrologic, geomorphic, and ecological processes and properties as stated in 2004 CNNF Forest Plan Standards and Guidelines (Appendix 3- *Forest Management Area Direction*). RNAs are also a high priority area for road decommissioning and restoration efforts (US Forest Service 2004b pg 3-37).

d. HISTORICAL INFORMATION

(1) RESEARCH/EDUCATION USE AND INTEREST: HISTORY OF ESTABLISHMENT

Research / Education Use: see section E (1) *Any Permanent Research Plots and/or Photo Points*

History of establishment: The CNNF began a forest-wide ecological inventory to identify high quality ecological features in the early 1990s (Parker 1999). Foulds Creek RNA was one of the highest ranking sites based on its ecological values. It was assigned a high conservation priority and deferred from management activity. About the same time, the Forest Service Eastern Region and Northern Research Station undertook a gap analysis of high-quality examples of alliances (ecological communities) within each subsection (Tyrrell et al 2000). This site filled a cell in that gap analysis.

The Natural Heritage Inventory Section of the Wisconsin DNR Bureau of Endangered Resources worked closely with Forest ecologists in evaluating this site, making numerous field visits and assisting with ecological inventory and evaluation. They completed a *Site Evaluation* and recommended Foulds Creek for protection (Hoffman 1998).

The Wisconsin Department of Natural Resources is also interested in achieving ecosystem representation within the State Natural Area Network. They signed a Memorandum of Understanding (MOU) in 2008 with the CNNF to co-designate all current and future RNAs and CNNF Special Management Areas (SMAs) as State Natural Areas. This designation does not restrict

the goals of research and education for the site. This site was designated as a State Natural Area in 2008.

Foulds Creek area was identified as a Candidate RNA in the Draft Forest Plan and analyzed in the Environmental Impact Statement. It was recommended for designation as a Research Natural Area in the 2004 CNNF Forest Plan Record of Decision (USDA Forest Service 2004c).

A 2008 region-wide analysis was conducted in conjunction with the Northern Research Station to evaluate all candidate RNAs in the Eastern Region. Based on this analysis, the Eastern Regional Office recommended Foulds Creek candidate RNA for establishment.

(2) CULTURAL/HERITAGE

Cultural resources within Foulds Creek RNA include a deteriorated foundation of unknown age (USDA Forest Service 2003b).

Ojibwe tribes retained the right to hunt, fish, and gather on lands that make up the CNNF through a series of session treaties. The Forest Service (and Eastern Region, Northern Research Station and USFS Law Enforcement) recognizes treaty rights through a “Memorandum of Understanding” with eleven sovereign and federally recognized tribes of Ojibwe Indians (Tribal-USDA MOU). Today, these treaty rights are being exercised by Ojibwe Indian tribes under rules promulgated and enforced by the tribes. One of these rules recognizes twelve existing RNAs on the CNNF as “Tribal Research Natural Areas” because it is important to protect the unique features that these areas provide. The rule prohibits gathering in Tribal RNAs except for tribally-permitted ceremonial use.

Since Foulds Creek RNA has not been adopted as an Ojibwe Tribal RNA as of 2013; tribal members may exercise these rights here. The CNNF is continuing to work with the Tribes to protect these unique features and to provide for the exercise of treaty-reserved rights. The 2004 CNNF Forest Plan includes an objective (USDA Forest Service 2004c p. 1-7) that “nothing in this Forest Plan or its implementation (i.e. establishing the RNA) is intended to modify, abrogate, or otherwise adversely affect tribal reserved or treaty guaranteed rights applicable within the CNNF”.

(3) DISTURBANCE HISTORY

Historic extraction logging occurred in the late 1800’s followed by several more recent harvests in the 1980s. Several upland wildlife openings were maintained by strip thinning of hardwoods adjacent to riparian zones in the 1980s (visible on the *Landscape Overview Map* in the southeastern portion See the Identification Section), a practice later discontinued. Some small wildlife openings were created but have not been maintained since 1990 and are filling in with trees. There is an historic deer wintering *yard* on both sides of Sheep Ranch Road (FR132) where a large eastern hemlock stand provides winter thermal cover. Collector roads and skid trails are still visible through much of the site but are rapidly re-vegetating on their own. Other more recently used roads are closed to motorized vehicles including Forest Road 521 on the south end.

Despite the disturbance listed above, Foulds Creek RNA has maintained its ecosystem structure and function. Course woody debris is again evident in the older eastern hemlock and white pine stands. Non-native plants are infrequent and mainly restricted to the road corridors.

(4) OCCURRENCE OF EXOTIC SPECIES

The CNNF developed an invasive plant strategy that utilizes adaptive pest management to discover, prioritize, and control non-native invasive plants wherever they occur (USDA Forest Service 2009). There are no known occurrences of non-native invasive plants within the RNA as of 2012. The CNNF has treated small patches of spotted knapweed (*Centaurea stoebe ssp. micranthos*), and Canada thistle (*Cirsium arvense*) along Forest Road 132. Both these species require open sunny habitat and are not expected to spread into the forest community. They are listed as a high priority species to treat on the CNNF and will continue to be controlled with methods that avoid damage to native plants.

e. OTHER INFORMATION

(1) ANY PERMANENT RESEARCH PLOTS AND/OR PHOTO POINTS

Beginning in 1990, the CNNF established an extensive set of long-term monitoring plots on the western portion of the forest. The intent was to provide baseline data and a means by which managed forests could be rigorously compared to unmanaged forests for forest health and biodiversity indicators (Vora 1997). Foulds Creek RNA contains a control (unmanaged) plot. Information on this monitoring is available from the CNNF RNA coordinator at Park Falls.

Foulds Creek was the site of one of John T Curtis's permanent vegetation plots for the "Vegetation of Wisconsin" (Curtis 1959). The plot was again remeasured in 2005 (Bushman 2006).

A deer/rabbit exclosure was constructed in section 23 at the south end of the ridge by Wisconsin Department of Natural Resources in 1964 and was maintained until about 1990. It was used for a number of research projects including: *Deer populations and the widespread failure of hemlock regeneration in northern forests* (Alverson and Waller 1997) and *Forests too deer: edge effects in northern Wisconsin* (Alverson et al. 1988). Information on the history of the exclosure can also be obtained at the Park Falls office.

A hemlock regeneration study by the Forest Service established a plot in 1991 in a large eastern hemlock stand on the east side of FR 132 in section 23.

There are several Chequamegon Breeding Bird Survey routes within the site measured annually since 1992. This monitoring program was designed to provide an accurate estimate of population change for forest bird species on the Chequamegon National Forest (in addition to the two National Forests in Minnesota) (Niemi et al in press).

Information on all these studies is housed at the Park Falls Supervisor's office of the Forest.

(2) BIBLIOGRAPHY

A listing of citations used in this document, useful references, reports, and journal articles that resulted from studies within this RNA are listed in Appendix 2 – *Bibliography*.

(3) POTENTIAL RESEARCH TOPICS

This would be a good area for research requiring a large, unbroken, mosaic of upland mixed hardwood, eastern hemlock, and pine forests interspersed with forested swamp conifer and open

heath or sedge wetlands. Possible research topics: wolves and denning, forest bats, trout, great blue heron rookery, invasive earthworms, birds, and white tailed deer wintering.

The Northern Research Station along with the Chequamegon-Nicolet National Forest shall encourage the use of this RNA by scientists and educators. This site has been co-designated by the State of Wisconsin as a State Natural Area and as such appears on their web site (WI DNR 2011).

f. EVALUATION OF SPECIFIC MANAGEMENT RECOMMENDATIONS ON THE RESEARCH
NATURAL AREA

(1) POTENTIAL OR EXISTING CONFLICTS; PRINCIPAL MANAGEMENT ISSUES

Lands surrounding Foulds Creek RNA are designated for Uneven-Aged Northern Hardwoods: Interior Forest (2B), Old-Growth (8G), and Uneven-Aged Northern Hardwoods (2A) in the 2004 CNNF Forest Plan (USDA Forest Service 2004b). The majority of the adjacent land is in Management Area 2B- *Northern Hardwood Interior Forest Restoration Emphasis* is described as an *Alternative Management Area*- emphasizing larger diameter trees and longer harvest rotations.

Standards and Guidelines for management are outlined in the 2004 CNNF Forest Plan and are intended to reduce conflicts. Principal management issues involve uncontrolled recreation, non-native invasive species, and decommissioning of old roads. All Terrain Vehicle use is increasing in popularity locally and the CNNF will monitor the RNA and stop any illegal off-road use if it is noted.

(2) SPECIAL MANAGEMENT AREA IF THE RESEARCH NATURAL AREA IS WITHIN ONE

Foulds Creek RNA is not located within or adjacent to any congressionally designated area.

g. PHOTOGRAPHS

All photographs used in this Establishment Record are the property of the Chequamegon-Nicolet National Forest but not copyrighted. Older slides from the 1990s exist and are with the site file housed in the Park Falls office of the Forest. An electronic file is part of this establishment record.



Figure 10. Foulds Creek flows south as it enters the north boundary of the RNA. [Brzeskiewicz 2013]



Figure 11. Sparse ground flora under a canopy of white pine. [Brzeskiewicz 2013]



Figure 12. Typical forest within the RNA - hundred-year-old hemlock with younger hardwoods forming a dense canopy with open understory. [Brzeskiewicz 2013]



Figure 13. The base of a large eastern hemlock with old growth features of an old stump and nurse log (right side of photo). [Brzeskiewicz 2013]

APPENDIX 2 BIBLIOGRAPHY

Below is all literature cited in this establishment record, references useful for researchers, and journal articles or publications that have resulted from study conducted on the site.

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APPENDIX 3 FOREST MANAGEMENT AREA DIRECTION

Management prescription for the Foulds Creek and all RNAs, 2004 Forest Plan, Management Area 8E - Existing and Candidate Research Natural Areas (USDA Forest Service 2004a pg 3-50):

MA 8E Existing and Candidate Research Natural Areas (RNA)

Theme

In this document, the term RNA will refer to both Existing and Candidate Research Natural Areas. MA 8E is characterized by ecologically significant natural features, representative ecosystems, and/or unique areas managed as Candidate or Existing Research Natural Areas. A broad representation of Forest community types is included in this MA. In combination with other RNAs in the nation, they form a national network of ecological areas for research, monitoring, education, and maintenance of biological diversity.

Landscape Description

MA 8E is characterized by nearly level to steep topography with slope gradients ranging from 0 to 30%. Glacial landforms include drumlin ground moraine, collapsed and uncollapsed outwash plains, washed moraines and eskers. The soils range from sandy to silty in the surface over loamy to sandy sediments. Soil moisture regimes range from dry to mesic and nutrient status ranges from poor to rich. A broad array of Forest Habitat Types and LTAs are represented in this MA.

Desired Future Condition

Landscape Composition and Structure

RNAs are chosen as high quality representatives of ecological communities found on the Forest. In general, they exhibit minimal evidence of past human disturbance, and contain all or most species characteristic of that community in the region. They may range in size from less than 100 acres to thousands of acres. They are generally well buffered from incompatible activities on nearby lands. RNAs are meant to include a representation of ecological types and vegetative cover across the Forest. However, composition results primarily from natural ecological processes rather than human-caused activities. As a result, late-successional upland types such as northern hardwoods, northern hardwood/hemlock, and mixed-conifers dominate the MA. A variety of wetland types may be present, from small isolated ponds and bogs to large (over 1000 acre) wetland complexes.

Site-Level Composition and Structure

Compositional diversity typically reflects late successional mature conditions. Dominant upland tree species are sugar maple, hemlock, yellow birch, basswood, and American beech. Lowland areas support tree species such as black spruce, northern-white cedar, and tamarack. Shade-intolerant species such as aspen, white birch, and jack pine are uncommon, limited to areas affected by natural disturbance such as windfall. Ground flora reflects the full diversity of native upland and lowland communities, and is generally unaffected by invading exotics. Structural diversity is complex, with features such as super-canopy trees, snags, den trees, downed woody debris, and canopy gaps commonly found.

Disturbance Regime

Natural ecological processes and natural disturbances shape the landscape-level and site-level vegetation composition. Components of the natural disturbance regime include individual tree throw and infrequent larger scale blowdown, infrequent low-intensity fire, insect damage, and beaver flooding. Timber harvesting does not occur.

The following section is copied from the CNNF 2004 Land and Resource Management Plan section on Management Area Standards and Guidelines (Pages 3-51 to 3-53).

Standards and Guidelines

Minerals

Standard:

- Prohibit the development of new sources of common variety minerals.

Guidelines:

- Surface disturbing mineral activities and will be approved or disapproved on a case-by- case basis where minerals are federally owned. Whenever possible surface disturbance will be limited.
- When surface disturbing mineral exploration and development of reserved and outstanding mineral rights is proposed, consider reasonable alternatives that minimize impacts to RNA values.
- Acquisition of reserved and outstanding mineral rights will be considered on a willing seller / willing buyer basis.
- Existing common variety minerals developments may be utilized. Consider RNA values if full utilization requires vegetation disturbance.

Biological Diversity

Guideline:

- Use native plant species for restoration activities. Use non-native plant species only if they are needed to prevent irreversible resource damage.

Vegetation

Standard:

- Prohibit domestic livestock grazing.

Guidelines:

- Vegetation management is not permitted unless the desired vegetation type would be lost or degraded without treatment. Management practices will approximate the vegetation and processes that govern natural succession.
- Hazard trees may be cut but not removed.

Special Forest Products

Guideline:

- Prohibit the gathering of special forest products for personal use or commercial sale.

Wildlife and Fish

Guideline:

- Wildlife and fish habitat manipulation will not be permitted unless it's consistent with RNA objectives and is needed to maintain the character or purpose of the area.

Fire Management

Guidelines:

- Allow prescribed fire within a prescription designed to accomplish specific RNA objectives where it is part of the natural disturbance regime, where it is needed to maintain or restore ecosystems, and where it is called for in the establishment record.
- Minimize the disturbance of soil and water resources by designing fire suppression activities to fit each individual situation.

Insects and Disease

Guideline:

- Minimize the disturbance of soil and water resources. Minimize control actions against native insects and diseases, and native plant and animal pests. Allow limited control actions to protect adjacent resources or the features for which the research natural area was established.

Recreation

Standard:

- Prohibit recreational use that threatens or interferes with the objectives or purposes for which the RNA was established.

Guidelines:

- Do not install signs or construct trails or other improvements unless they contribute to RNA objectives or area protection.
- Prohibit the use of horses, bicycles, and motorized vehicles on RNA trails.

Heritage Resources

Guideline:

- Protect significant heritage resources by dispersing or limiting public use of RNAs.

Lands

Guideline:

- Clearly identify RNA boundaries, monument corners, and turning points.

Special Uses

Standard:

- Prohibit the establishment of new facilities and corridors for utility rights-of-way.

Guideline:

- Do not issue special use permits except as mandated by law or agreement. Exceptions may be made for research or educational activities. Phase out existing special use permits when feasible.

Facilities

Guideline:

- Do not construct buildings unless they are needed to meet RNA objectives. Existing structures may be maintained.

Transportation Systems

Guidelines:

- Do not construct new roads.
- Restore all decommissioned roads to some level of landscape restoration.

Research

Standard:

- Permit educational and research use as long as it will not result in unacceptable impacts to RNA values.

APPENDIX 4 WISCONSIN NATURAL HERITAGE WORKING LIST - RANK DEFINITIONS

The Wisconsin NHI Working List records which elements are tracked in the state. The working list is revised as species' populations change (increase or decrease) and as knowledge about their status and distribution in Wisconsin increase. The Working List presented here was revised in 2012. Definitions of ranks are provided below, along with definitions for other abbreviations used in the Working List.

US Status: Current federal protection status designated by the Office of Endangered Species, U.S. Fish and Wildlife Service indicating the biological status of a species in Wisconsin. LE = listed endangered; LT = listed threatened; PE = proposed as endangered; NEP = nonessential experimental population; C = candidate for future listing; CH = critical habitat

State Status: Protection category designated by the Wisconsin DNR. END = Endangered; THR = Threatened; SC = Special Concern.

WDNR and federal regulations regarding Special Concern species range from full protection to no protection. The current categories and their respective level of protection are as follows: SC/P = fully protected; SC/N = no laws regulating use, possession, or harvesting; SC/H = take regulated by establishment of open closed seasons; SC/FL = federally protected as endangered or threatened, but not so designated by WDNR; SC/M = fully protected by federal and state laws under the Migratory Bird Act.

Special Concern species are those species about which some problem of abundance or distribution is suspected but not yet proved. The main purpose of this category is to focus attention on certain species before they become threatened or endangered.

Global Element Ranks

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 = Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single state or physiographic region), or because of other factor(s) making it vulnerable to extinction throughout its range; typically 21-100 occurrences.

G4 = Uncommon but not rare, (although it may be quite rare in parts of its range, especially at the periphery) and usually widespread. Typically >100 occurrences.

G5 = Common, widespread, and abundant (although it may be quite rare in parts of its range, especially at the periphery). Not vulnerable in most of its range.

GH = Known only from historical occurrence throughout its range, with the expectation that it may be rediscovered.

GNR = Not ranked. Replaced G? rank and some GU ranks

GU = Currently unrankable due to lack of data or substantially conflicting data on status or trends. Possibly in peril range-wide, but status is uncertain.

GX = Presumed to be extinct throughout its range (e.g. Passenger pigeon) with virtually no likelihood that it will be rediscovered.

Species with a questionable taxonomic assignment are given a "Q" after the global rank.

Subspecies and varieties are given subranks composed of the letter "T" plus a number or letter. The definition of the second character of the subrank parallels that of the full global rank. (Examples: a rare subspecies of a rare species is ranked G1T1; a rare subspecies of a common species is ranked G5T1.)

State Element Ranks

S1 = Critically imperiled in Wisconsin because of extreme rarity, typically 5 or fewer occurrences and/or very few (<1000) remaining individuals or acres, or due to some factor(s) making it especially vulnerable to extirpation from the state.

S2 = Imperiled in Wisconsin because of rarity, typically 6 to 20 occurrences and/or few (1000-3000) remaining individuals or acres, or due to some factor(s) making it very vulnerable to extirpation from the state.

S3 = Rare or uncommon in Wisconsin, typically 21-100 occurrences and/or 3000-10,000 individuals.

S4 = Apparently secure in Wisconsin, usually with >100 occurrences and >10,000 individuals.

S5 = Demonstrably secure in Wisconsin and essentially ineradicable under present conditions.

SNA = Accidental, non-native, reported, but unconfirmed, or falsely reported.

SH = Of historical occurrence in Wisconsin, perhaps having not been verified in the past 20 years, and suspected to be still extant. Naturally, an element would become SH without such a 20-year delay if the only known occurrence were destroyed or if it had been extensively and unsuccessfully looked for.

SNR = Not Ranked, a state rank has not yet been assessed.

SU = Currently unrankable. Possibly in peril in the state, but status is uncertain due to lack of information or substantially conflicting data on status or trends.

SX = Apparently extirpated from the state.

State Ranking of Long-Distance Migrant Animals

Ranking long distance aerial migrant animals presents special problems relating to the fact that their non-breeding status (rank) may be quite different from their breeding status, if any, in Wisconsin. In other words, the conservation needs of these taxa may vary between seasons. In order to present a less ambiguous picture of a migrant's status, it is necessary to specify whether the rank refers to the breeding (B) or non-breeding (N) status of the taxon in question. (e.g. S2B,S5N).

(http://dnr.wi.gov/org/land/er/wlist/06_2011_Working_List.pdf Last Revised: May 31, 2012)

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APPENDIX 6 LEGAL DESCRIPTION

Foulds Creek RNA is Located on the Medford-Park Falls Ranger District (Park Falls landbase) of the Chequamegon-Nicolet National Forest in Price County, in the State of Wisconsin, T 39 N, R 3 E, Sections 13, 22, 23, 24, 25, 26 and 27. The boundary is delineated as follows:

Commencing at the Northwest Corner of Section 23, thence South along the West line of Section 23, approximately 995 feet to the North ROW of FR 519 which is the **Point of Beginning**,

Thence northeasterly along the north ROW of FR 519, 301.7 feet,

Thence easterly the following courses:

Direction	Distance (feet)
S 73 E	62.7
S 73 E	112.3
S 51 E	105.7
S 45 E	105.0
S 45 E	75.9
S 78 E	76.1
N 86 E	119.9
N 74 E	146.2
N 43 E	163.6
N 39 E	261.0
N 36 E	215.3
N 34 E	184.4
N 51 E	111.5
N 72 E	78.2
N 81 E	154.7
S 73 E	112.3
S 44 E	113.8
S 38 E	147.0
S 54 E	97.3
S 83 E	103.9
N 88 E	202.3
N 72 E	104.4
N 70 E	232.4
N 60 E	133.1
N 73 E	151.4
N 79 E	147.2

Direction	Distance (feet)
N 88 E	119.7
S 87 E	93.0
S 43 E	78.9
S 27 E	180.9
S 16 E	189.2
S 9 E	179.7
S 0 W	82.6
S 63 E	64.6
S 85 E	128.5
S 82 E	62.5
S 39 E	79.3
S 8 E	87.6
S 9 W	100.4
S 29 E	109.0
S 52 E	135.3
S 68 E	129.4
S 87 E	210.9
S 87 E	152.9
N 90 E	144.5
N 66 E	99.7
N 45 E	87.6
N 17 E	99.2
N 2 E	293.1
N 30 E	99.7
N 82 E	87.5
S 56 E	95.1

Direction	Distance (feet)
S 66 E	81.2
S 85 E	91.2
S 86 E	124.0
N 69 E	92.7
N 71 E	180.8
N 82 E	91.6
S 81 E	79.4
S 63 E	73.8
S 54 E	76.6
S 62 E	98.0
S 77 E	89.0
N 66 E	140.3
N 37 E	103.1
N 24 E	103.5
N 4 E	111.6
N 6 E	220.2
N 13 E	114.1
N 39 E	117.4
N 45 E	145.9
N 50 E	166.9
N 24 E	144.2
N 15 E	218.2
N 2 W	128.4
N 80 E	10.5

to the South ROW of FR 522,

Thence northeasterly along the south ROW of FR 522, 810.2 feet,

Thence Southwesterly the following courses:

Direction	Distance (feet)
N 65 E	28.1
N 65 E	158.4
N 44 E	148.8
N 81 E	79.3
S 84 E	112.1
S 67 E	94.2
S 35 E	85.8
S 15 E	128.2
S 9 E	175.7
S 4 E	260.5
S 5 W	157.4
S 20 W	202.2
S 17 W	578.3
S 14 W	157.2
S 5 W	182.2
S 11 E	151.2
S 23 E	148.1
S 22 E	315.5
S 40 E	225.7
S 37 E	191.4

Thence S 74° W, 800 feet,

Thence S 38° E, 1270 feet,

Thence Southerly the following courses:

Direction	Distance (feet)
S 12 W	211.4
S 7 E	395.2
S 2 W	524.5
S 6 E	203.2
S 16 E	542.0
S 19 E	488.7

Thence N 89° W, 365 feet,

Thence S 01° E, 1865 feet,

Thence Southwesterly the following courses:

Direction	Distance (feet)
S 35 W	100.8
S 14 W	106.1
S 2 E	132.1
S 9 E	108.5
S 18 W	104.4
S 65 W	86.8
S 80 W	125.5
S 74 W	120.2
S 15 W	64.1
S 27 E	73.8
S 34 E	189.9

Direction	Distance (feet)
S 21 E	105.8
S 28 W	70.2
S 87 W	74.4
N 82 W	116.7
N 72 W	291.0
N 47 W	84.7
N 45 W	221.8
N 42 W	122.6
N 79 W	105.2
S 87 W	78.5
S 63 W	110.8
S 57 W	599.6
S 78 W	156.2
N 86 W	132.3
S 68 W	88.9
S 49 W	201.9
S 34 W	89.2
S 19 W	257.9
S 15 W	269.1
S 9 W	179.9

Thence Northwesterly the following courses:

Direction	Distance (feet)
S 47 W	78.9
N 41 W	228.2
N 46 W	143.1
N 53 W	165.0
N 80 W	142.5

Thence N 05° E, 900 feet,

Thence S 67° E, 1195 feet,

Thence Northwesterly the following courses:

Direction	Distance (feet)
N 16 W	77.0
N 6 E	74.7
N 22 E	98.1
N 9 E	162.9
N 23 W	94.2
N 50 W	134.8
N 73 W	215.5
N 78 W	638.9
N 72 W	246.6
N 67 W	167.4

to the West ROW of FR 132,

Thence Southeasterly along the West ROW of FR 132, 1200 feet.

Thence N 61° W, 525 feet,

Thence S 22° W, 285 feet,

Thence northwesterly the following courses:

Direction	Distance (feet)
N 40 W	322.2
N 32 W	219.9
S 25 W	118.1
S 18 W	173.6
S 62 W	88.6
N 85 W	103.5
N 53 W	129.6
N 43 W	213.2
N 42 W	143.2
N 25 W	109.0
N 14 E	136.1
N 31 E	159.2
N 50 E	128.9

Direction	Distance (feet)
N 62 E	131.1
N 80 E	100.4
N 0 E	247.5
N 11 W	130.3
N 8 E	212.3
N 1 W	202.2
N 27 W	83.2
N 62 W	70.2
S 72 W	65.3
S 72 W	21.6

to west ROW of FR 132L,

Thence northwesterly along the west ROW of FR 132L 828.3 feet,

Thence Northwesterly the following courses:

Direction	Distance (feet)
S 68 W	19.3
S 65 W	118.9
S 81 W	226.0
S 87 W	235.5
N 79 W	176.4
N 37 W	170.8
N 30 W	1462.8
N 43 W	157.6
N 46 W	213.1
N 54 W	233.6
N 59 W	310.9
N 69 W	207.7
N 60 W	229.3
N 76 W	268.3

Thence N 79 W 67.2 feet which is a point on the west side of Foulds Creek,

Thence following the west side of Foulds creek Northeasterly to the Southeast ROW of FR 519,

Thence Northeasterly along the Southeast ROW of FR 519, approximately 200 feet to the **point of Beginning**.

The RNA contains approximately 1,393 acres (565 ha).

/s/ Randy Erickson _____ March 18, 2013
Randy Erickson Date
Land Surveyor, Chequamegon-Nicolet National Forest