



DESIGNATION ORDER

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

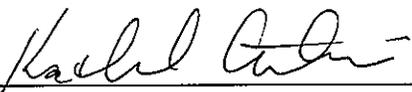
BEAR CREEK

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 Bear Creek Research Natural Area. It shall be comprised of 1,034 acres (418 hectares) of land in Taylor 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

3/11/14

Date

SIGNATURE PAGE

for

RESEARCH NATURAL AREA ESTABLISHMENT RECORD

Bear Creek

Research Natural Area

Chequamegon-Nicolet National Forest

Taylor 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 11/22/2013

Marjory E. Brzeskiewicz, Botanist, Chequamegon-Nicolet National Forest

Draft by:

/s/ Dawn Heinbaugh

Date: 2005

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Date 1/14/14

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



TITLE PAGE

United States
Department of
Agriculture

Forest
Service

September 2013



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

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



Cover photo: An ephemeral pond within eastern hemlock-hardwood forest of Bear Creek RNA.
Photo by Stephen White, CNNF Plant Ecologist, 2012.

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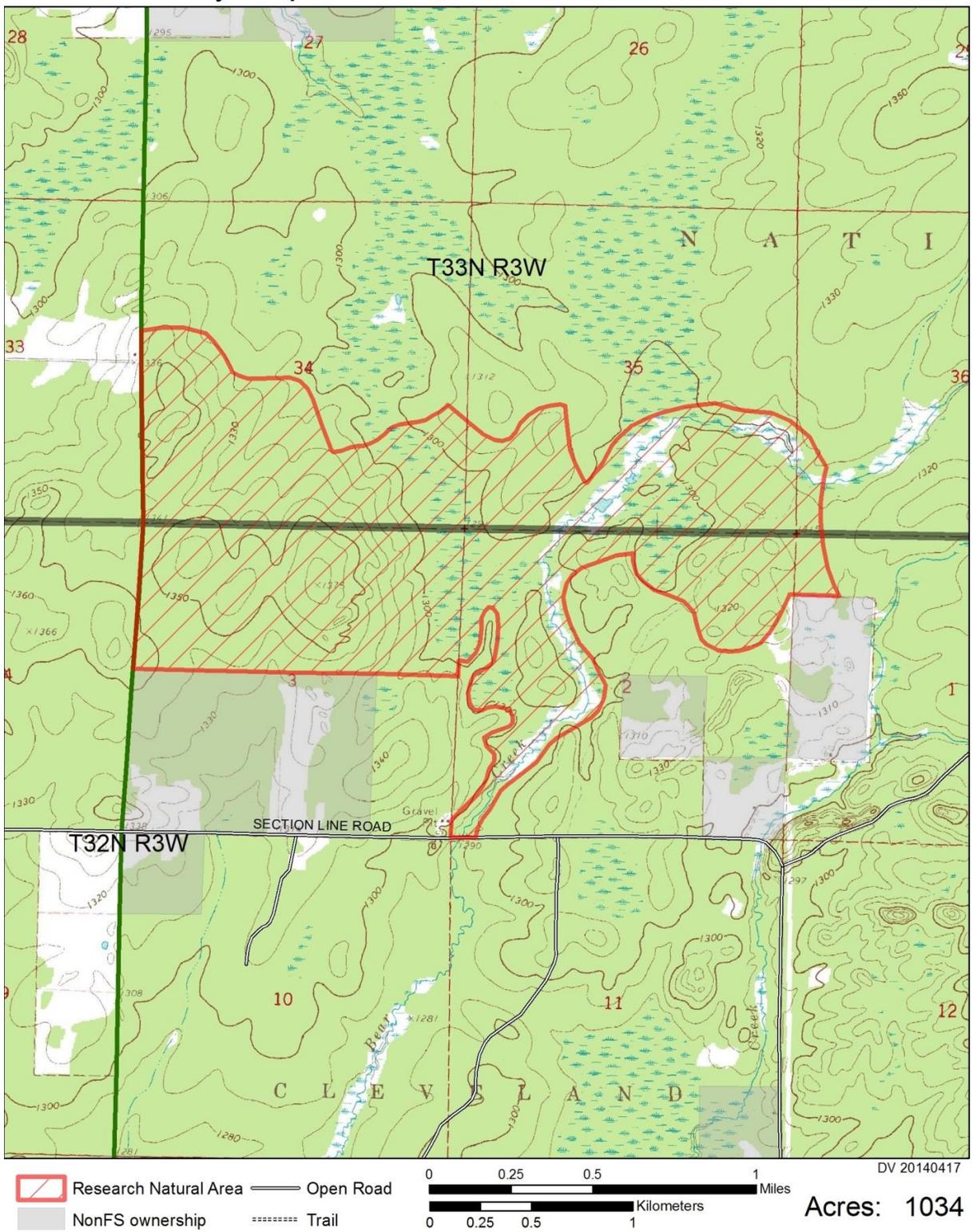
1. IDENTIFICATION SECTION

Location Map

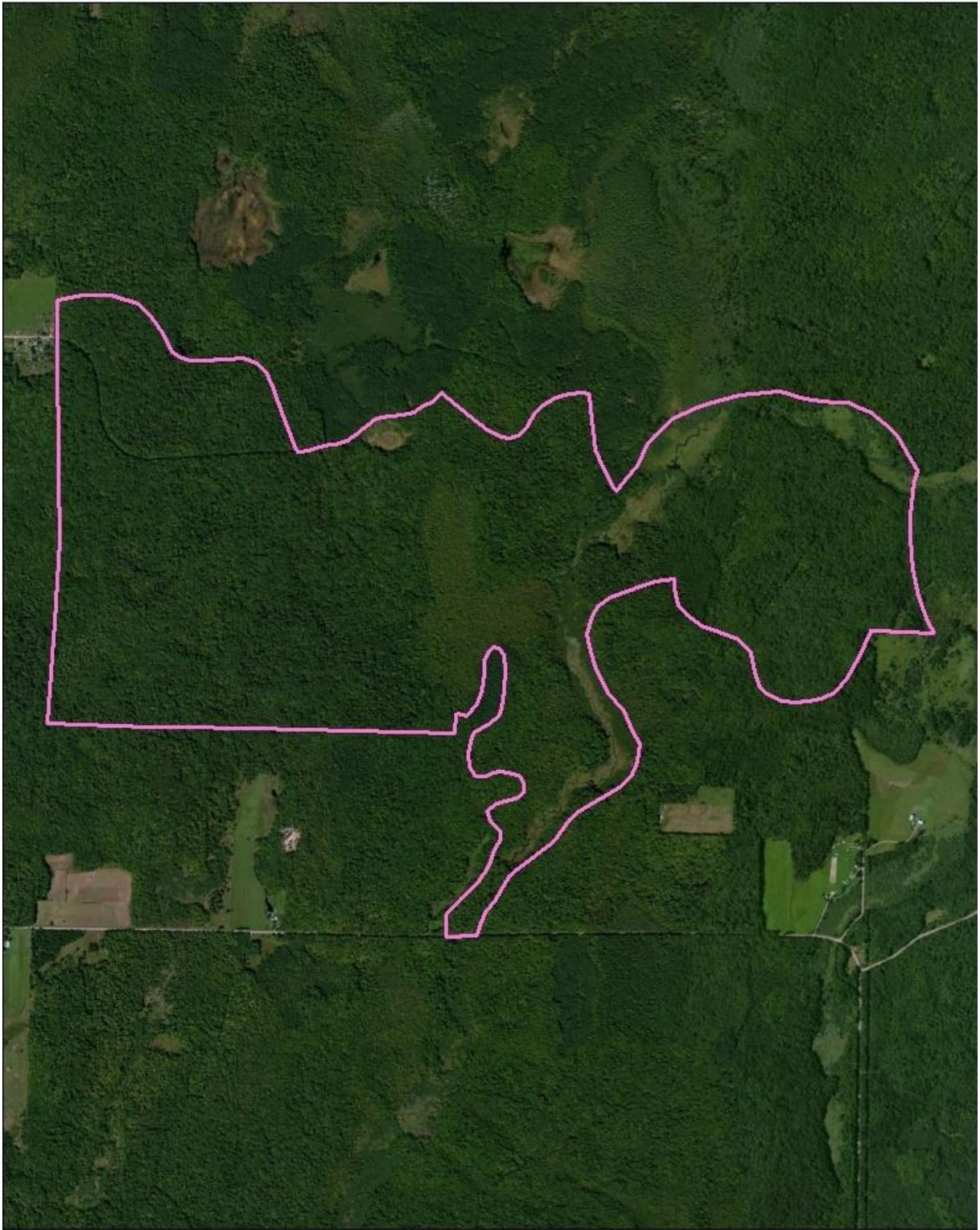


BOUNDARY MAP

RNA Boundary Map: Bear Creek

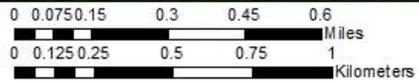


LANDSCAPE OVERVIEW BEAR CREEK RNA



 RNA Boundary

ESRI Basemap World Imagery
MB 2013



LEGAL DESCRIPTION

The legal description of Bear 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 Bear Creek RNA is documented with a signature page and a Designation Order which is a separate document 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

The 1,034-acre (418-ha) Bear Creek Research Natural Area (RNA) is located on the Chequamegon-Nicolet National Forest (CNNF), Medford-Park Falls District, in Taylor County Wisconsin approximately 36 miles (58 km) northwest of Medford (Identification Section - *Location Map and Boundary Map*). The RNA is located within an area designated on the CNNF as *Bear Creek Semi-Primitive Non-Motorized Area* and is entirely on National Forest Land.

Bear Creek contains a mosaic of high-quality community types plus a remnant old-growth white pine (*Pinus strobus*) forest. The site contains some of the oldest eastern hemlock (*Tsuga canadensis*)-hardwood stands remaining on the Medford-Park Falls District of the Chequamegon-Nicolet National Forest. Also significant is a two-mile (3 km) stretch of Bear Creek and associated high quality wetlands, contained within the RNA (Brzeskiewicz 1995). This area was identified during the Chequamegon-Nicolet National Forest's Landscape Analysis and Design project as part of the 2004 CNNF Forest Plan revision. Present recreational use is light and includes hiking and hunting.

Historical Background - [See Section d (1) *Research/Education Use and Interest: History of Establishment* for how this site was chosen as a Research Natural Area.]

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. See Section 4 d.(2) *Cultural/Heritage* for further explanation of Native American history.

Of historical interest are the 1860s General Land Survey Notes (BCPL 2004):

T33N R3W, "This township contains several swamps and some of considerable extent. The meadow and alder bottoms are good for hay. This township is heavily timbered and is chiefly composed of hemlock and yellow birch on low land, on upland it is sugar, linden, white pine, balsam, and elm. The undergrowth is generally thick and composed of hemlock, hazel, and balsam. Elm and balsam line the margins of the meadows and alder bottoms and also most of the streams."

The bearing tree map from the 1860s survey shows a patch of wind-thrown forest approximately one-fourth to one-half mile wide by three miles (5 km) long through the site (Krause et al. 1995).

Northern Wisconsin was extensively logged in the late 1800s, virtually clear cutting much of the area. Catastrophic wildfires burned the logging slash across the region. This area containing the RNA then became National Forest in the 1930s. Much of the site has had no harvest since. Timber harvests within the site in the decades 1950-1980 were mainly selection cutting of hardwoods and clearcutting small acreages of paper birch (*Betula papyrifera*).

Ownership & Administration - Bear 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

Chequamegon-Nicolet National Forest, or designate. The Medford-Park Falls Ranger District, CNNF, provides day-to-day protection and maintenance of the area.

The Northern Research Station Director, or his or her designee, will be responsible for any studies or research conducted in the RNA. The Northern Research Station Director, or his or her designee, will evaluate research proposals and coordinate all studies and research in the area with the Chequamegon-Nicolet RNA Coordinator and District Ranger.

Congressionally Designated Areas - Bear 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

Bear Creek features an eastern hemlock-hardwood-white pine forest on rather hummocky recessional moraine. The forest comprising the RNA may be the closest thing to true old-growth found on the Medford-Park Falls District and contain some of the oldest eastern hemlock-hardwood stands remaining (Fields 1997). Bear Creek is representative of the LTA Xd05 Jump River Ground Moraine, filling a niche within the national RNA network [see Ecological Units section 4 B (1)].

The two old-growth eastern hemlock (*Tsuga canadensis*) stands are significant since very few eastern hemlock-hardwood stands in this later stage of development occur on this Ecological Land Type (Krause et al. 1995). Additionally, one of the upland eastern hemlock stands represents an unusual assemblage of plant species for this community type. Floral diversity is high and includes several uncommon orchid species. Red-shouldered hawks (*Buteo lineatus*), a state-threatened species, have been seen within Bear Creek RNA and have been known to nest in the surrounding area.

(2) PRINCIPAL DISTINGUISHING FEATURES

Bear Creek RNA encompasses a range of forest types (Figure 4), topography, and moisture regimes (Fields 1997). Bear Creek and its associated sedge-bluejoint grass meadows, alder thickets, and hardwood swamps separates an area of glacial recessional moraine on the west from the ground moraine to the east. A soft water drainage stream, Bear Creek is part of the Yellow River watershed (Haanpaa et al. 1970) and a two-mile (3 km) stretch meanders through the area in a southerly direction, draining both hardwood and conifer swamps.

Of primary importance at this site are two old-growth stands of eastern hemlock-dominated forest located near Bear Creek (Krause et al. 1995). Structurally, both stands contain a number of well-developed old growth attributes, including the presence of very large diameter, super-canopy white pine (*Pinus strobus*), canopy gaps, and course woody debris (Figure 1). The first stand, which borders an extensive wet meadow with alder (*Alnus incana*) thickets on Bear Creek, has a relatively simple species composition typical of lowland eastern hemlock forests found throughout the ground moraine.



Figure 1. Old growth eastern hemlock forest showing course woody debris. (photo: Doug Fields 1997)

The second eastern hemlock stand is adjacent to a glacial geologic feature known as an *ice-walled-lake plain* [description in section B(3)(c)] and is associated with an area of recessional moraine with an unusually rich species composition. Super-canopy white pine (to 41 in. or 104 cm dbh) tower over a high quality mixed forest of eastern hemlock, yellow birch (*Betula alleghaniensis*), sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), and basswood (*Tilia americana*). Snags, coarse woody debris, and tip-up mounds are common. Ground flora vegetation is especially noteworthy, with high abundance of rich site indicator plants in addition to those species more typical of upland eastern hemlock-hardwood forests. Ground flora includes Virginia water-leaf (*Hydrophyllum virginianum*), bloodroot (*Sanguinaria canadensis*), cut-leaved toothwort (*Cardamine concatenata*), and woodland phlox (*Phlox divaricata*). Spring ephemeral plants are abundant.

The upland forest grades down into an equally diverse mixed black ash (*Fraxinus nigra*)-cedar (*Thuja occidentalis*) swamp. This swamp has high numbers of orchid species compared to similar communities elsewhere on the CNNF which includes moccasin flower (*Cypripedium acaule*), large-

flowered yellow lady's-slipper (*C. parviflorum* var. *pubescens*), and lesser purple fringed orchid (*Platanthera psycodes*). Associated tree species include red maple (*Acer rubrum*), yellow birch, and balsam fir (*Abies balsamea*).

The eastern half of the site is glacial ground moraine supporting an eastern hemlock-hardwood forest on level to gently rolling topography. Bordering the lowlands along Bear Creek is a high quality eastern hemlock-dominated stand with numerous surface boulders and a developing old-growth structure. Super-canopy white pine are frequent. Much of the ground moraine surface is level and damp. Eastern hemlock and yellow birch are common along with sugar maple, and red maple (*Acer rubrum*) in lower areas. Ground layer species include three-leaved goldthread (*Coptis trifolia*), bunchberry (*Cornus canadensis*), mountain wood sorrel (*Oxalis montana*), and Canada mayflower (*Maianthemum canadense*). Hazel (*Corylus spp.*) brush is common in places.

Large, older snags and trees within the uplands provide nesting sites for pileated woodpeckers (*Dryocopus pileatus*), flying squirrels (*Glaucomys sabrinus*), and porcupines (*Erethizon dorsatum*). They are also likely roosting sites for bats that are now of conservation concern due to a disease known as white nose syndrome. Rare bird species include the state-threatened red-shouldered hawk.

(3) OBJECTIVES

The Bear Creek RNA will be managed to meet the research and education objectives of the National RNA program. Specifically this RNA will preserve a complex of communities, including a large contiguous old growth forest, which is representative of the ecosystems that were common on this landscape prior to the extensive logging of the 1800s. Many similar rich sites have been converted to farmland. Bear Creek RNA is large enough to maintain genetic diversity and can serve as a control area for comparing other areas manipulated by timber harvest and salvage as well as agriculture. Large trees in various stages of life and decay will provide habitat for species of concern such as rare birds and bats.

c. LAND MANAGEMENT PLANNING

Bear Creek RNA was recommended for RNA designation 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). Bear 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 Forest 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. See Appendix 3 - *Forest Management Area Direction* (USDA Forest Service 2004a pg 3-50).

d. MANAGEMENT PRESCRIPTION

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

The CNNF has not developed an individual site management plan for Bear 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 (USDA Forest Service 2009) directs efforts to detect, manage and prevent invasive plants. 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 hardwood and wetland 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.

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

Bear Creek RNA is located on the Medford-Park Falls Ranger District of the Chequamegon-Nicolet National Forest, Taylor County, in the state of Wisconsin. The boundary includes sections 2, 3 of T32N R3W and Sections 34, 35, 36 of T33N R3W. The USGS Quad is Jump River Fire Tower SW. The RNA's Mercator coordinates are 45° 17' N latitude and 90° 43' W longitude. See Establishment Record Identification Section for *Location Map* and *Boundary Map*. See Appendix 6 for *Boundary Certification*.

(2) SIZE IN ACRES/HECTARES

The RNA is comprised of 1,034 acres (418 hectares).

(3) ELEVATION RANGE

Elevations range from 1,290 feet (393m) to 1,375 feet (419 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 25 miles northeast of Bear Creek RNA.

(4) ACCESS TO THE SITE

From Medford WI take State Highway 64 west 22 miles (35 km). Head north on State Highway 73 for 11 miles (18 km); then east on FS 114 (Konsala Rd) approximately 3 miles (4.8 km) to a gated gravel pit on the north side of the road. Park here and walk north about one mile (1.6 km) into the site (Identification Section - *Location Map* and *Boundary Map*). It can also be accessed from the west via Venus Ave off of County Rd M which becomes FR 1521 beyond the gate.

(5) CLIMATIC DATA

The weather station nearest to the Bear Creek RNA is Jump River 1 ESE (station no. 474080, latitude 45° 22' N, longitude 90° 46' W). The station is about 4 mi (6.4 km) north of the RNA and

experiences the same weather. This station recorded temperature data from 1962 and precipitation data from 1948 (Midwestern Regional Climate Center 2003). Mean annual summer temperature is 58°F while the mean winter temperature is 24°F (Table 1).

The RNA is situated on the edge of a climatic *Tension Zone* in Wisconsin where more southern forest types meet northern deciduous/conifer forest types (Curtis 1959).

Table 1. Temperature and Precipitation Data for Jump River, Taylor County Wisconsin from 1962 to 2001

Temperature	°F	°C
Mean annual	41.0	5.30
Mean April through September	58.0	14.0
Mean October through March	24.0	-4.0
Average daily maximum	52.4	11.3
Average daily minimum	29.8	-1.2
Record high	100.0	38.0
Record low	-47.0	-44.0
Precipitation	in	cm
Mean annual rainfall	33.0	8.4
Mean April through September	3.9	99.0
Mean October through March	1.6	4.0
Mean annual snowfall	56.9	144.5

b. ECOLOGICAL DESCRIPTION

Nomenclature for flora follows the USDA PLANTS database (USDA, NRCS. 2012); 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).

Bear Creek RNA is located in the Laurentian Mixed Forest Province, 212X Northern Highland Section, Subsection Xd Central NW Wisconsin Loess Plain of the Ecological Units of the Eastern United States (Cleland et al. 2007). It includes Land Type Association (LTA) Xd05 Jump River Ground Moraine.

(2) PLANT COMMUNITY TYPES

Bear Creek RNA features a large mosaic of natural communities encompassing a complete community gradient from lowland to upland. Two older-growth stands of eastern hemlock with super-canopy white pine contain a number of well-developed old growth attributes including coarse woody debris, numerous tip-up mounds, and snags throughout. Ground flora is diverse (Figure 2) with a high abundance of rich site indicator species such as Virginia waterleaf (*Hydrophyllum virginiana*), bloodroot (*Sanguinaria canadensis*), cut-leaved toothwort (*Dentaria laciniata*), and woodland phlox (*Phlox divaricata*) (Fields 1997). Lower elevation areas contain an

equally diverse community of black ash-cedar swamp and a dense and diverse mix of shrub and ground layer species with several uncommon orchids present (Krause et al. 1995). Species indicative of a high nutrient wetland include yellow lady's-slipper (*Cypripedium parviflorum* var. *pubescens*), skunk cabbage (*Symplocarpus foetidus*), wood nettle (*Laportea canadensis*), and poison ivy (*Toxicodendron radicans*).



Figure 2. A diverse herbaceous ground flora typical of the rich soils found within hardwood forest on the ice-walled lake plain glacial feature (photo: D. Fields 1997)

Located within the Yellow River watershed, Bear Creek supports an emergent aquatic community and meanders southerly through the site draining both ash and spruce swamps. A bluejoint grass- (*Calamagrostis canadensis*) dominated wet meadow (Figure 3C) borders the creek and grades into alder thicket, and later to lowland forest. The creek supports a few emergent and submerged aquatics including alpine pondweed (*Potamogeton alpinus*) and aquatic mosses.

Toward the uplands, older eastern hemlock, northern white cedar, and yellow birch occupy the moister edges which grade into high quality maple, eastern hemlock, red oak (*Quercus rubra*), white ash forest with bitternut hickory (*Carya cordiformis*) and American elm (*Ulmus americana*). These uplands support a diverse plant community. Where hardwoods are dominant, intermediate wood fern (*Dryopteris intermedia*), wild sarsaparilla (*Aralia nudicaulis*), yellow blue-bead lily (*Clintonia borealis*), and American starflower (*Trientalis borealis*) are common features of the ground layer. Spring ephemeral plants are common.

Table 2. Natural Vegetation community types within Bear Creek RNA using systems commonly utilized in Wisconsin (Curtis 1959 and Kotar et al. 2002)

Community Type (Curtis 1959)	Forest Habitat Types (Kotar et al. 2002)	Dominant Species	NVCS Associations (NGDC 2012)*
Northern mesic forest	AH/ATM	eastern hemlock, yellow birch (white Pine)	Tsuga canadensis - (Betula alleghaniensis) Forest C EGL002598
Northern mesic forest	AH	eastern hemlock sugar maple, white ash (red oak)	Acer saccharum - Betula alleghaniensis - (Tilia americana) Forest C EGL002457 or C EGL002062
Northern mesic forest	ATM/AH (wet phase)	eastern hemlock, red maple, yellow birch	Tsuga canadensis - Acer saccharum - Betula alleghaniensis Forest C EGL005044
Northern mesic forest	ATM	paper birch (succeeding to sugar maple, white ash, red oak)	seral-stage
Northern wet-mesic forest	ATM	eastern hemlock, yellow birch red maple, white cedar	Tsuga canadensis - Betula alleghaniensis Saturated Forest C EGL005003
Northern wet forest	N/A	tamarack, black spruce	Thuja occidentalis - Larix laricina / Sphagnum spp. Forest C EGL005225
Northern Hardwood Swamp	N/A	black ash	Fraxinus nigra - Mixed Hardwoods - Conifers / Cornus sericea / Carex spp. Forest C EGL002105
Northern Sedge Meadow	N/A	<i>Calamagrostis canadensis</i> , <i>Carex spp.</i> , and <i>Scirpus cyperinus</i>	Calamagrostis canadensis - Eupatorium maculatum Herbaceous Vegetation C EGL005174
Alder thicket	N/A	<i>Alnus incana</i>	undetermined
Emergent aquatic	N/A	<i>Potamogeton spp.</i>	undetermined

* National Vegetation Classification System, National Geographic Data Committee 2012. Determination is preliminary.



A. Dwarf ginseng (*Panax trifolia*), a spring ephemeral, is found on mesic soils within a hardwood forest.



B. Porcupines (*Erethizon dorsatum*) utilize dead and dying trees for a den in old growth forest.



C. Sedge meadow along Bear Creek with joe-pye weed (*Eupatorium maculatum*)

Figure 3. A, B, C The matrix of plant communities in Bear Creek RNA support a diverse flora and fauna. (CNNF photos)

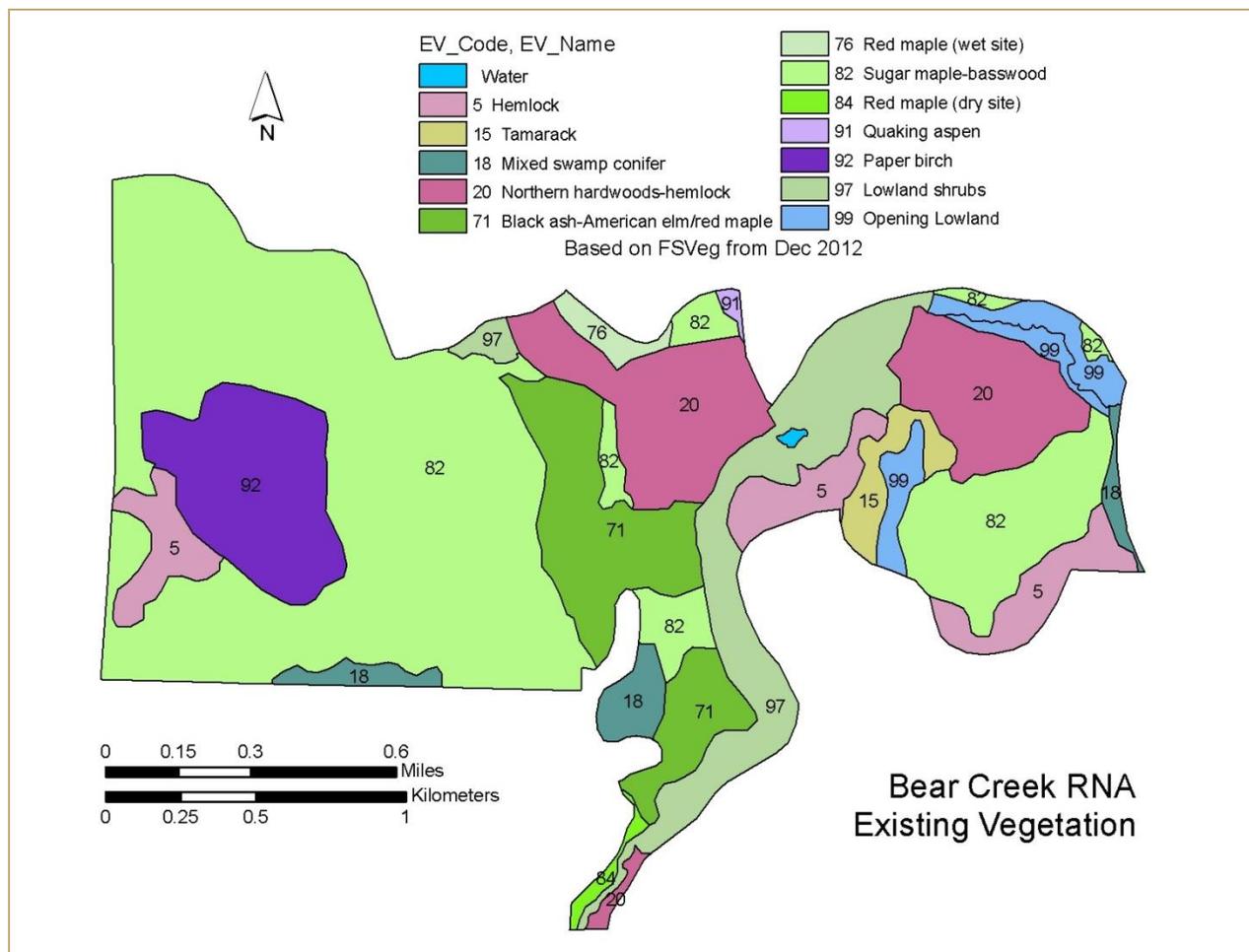


Figure 4. Existing Vegetation (EV) , formerly known as Forest Type, within Bear Creek RNA (CNNF data, D Veen 2012)

Table 3. Existing Vegetation (as dominant tree cover) in Bear Creek RNA , acres, hectares and key to Figure 4.

EV Code	Existing Vegetation	Acres	Hectares
5	Eastern hemlock	65.6	26.5
15	Tamarack	17.1	6.9
18	Mixed swamp conifer	25.7	10.4
20	Northern hardwoods-hemlock	127.8	51.7
71	Black ash-American elm/red maple	93.3	37.7
76	Red maple (wet site)	8	3.2
82	Sugar maple-basswood	480.6	194.3
84	Red maple (dry site)	4.3	1.7
91	Quaking aspen	1.8	0.7
92	Paper birch	79.7	32.3
97	Lowland shrubs	97.6	39.5
99	Opening Lowland	31.7	12.8
(blank)	Water	0.9	0.4
Grand Total		1,034.1	418.1

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

(A) FLORA LIST

A flora of observed plants is included as Appendix 7. Below are some notable species that are locally uncommon.

- Large flowered yellow lady's-slipper (*Cypripedium parviflorum* var. *pubescens*)
- Lesser purple-fringed orchid (*Platanthera psycodes*)
- American ginseng (*Panax quinquefolius*)
- Wild blue phlox (*Phlox divaricata*)
- Lance-leaved grape fern (*Botrychium lanceolatum*)
- Silvery spleenwort (*Deparia acrostichoides*)

(B) FAUNA LIST

There has not been a thorough faunal survey for this RNA. The mature upland forests of Bear Creek RNA provide nesting sites for pileated woodpeckers (*see Table 4 for scientific names*) and northern flying squirrels and are valuable habitat for other species that require large trees for nests and dens. Seven species of bats occur on the CNNF although there has been no survey for bats in this area. All Wisconsin bats (even cave-dwellers) rely at one time or another on a matrix of older forests and water such as this RNA provides. Large trees in older forests with open understory are more often selected, and bats especially rely on deep tree cavities, loose bark, and lightning strike crevices for roosts (Heeringa pers. comm.). Because of the ephemeral nature of such structures, the successional changes within the RNA will continue to provide these essential habitat characteristics over time.

White-tailed deer exist here in high numbers as evidenced by the extensive browse on trees and shrubs. The low road density within the RNA allows wildlife to move freely from one community to another. The state-threatened red-shouldered hawk has been seen and heard calling within the area. Although nesting has not been recorded in Bear Creek RNA, the species is known to nest nearby in other northern mesic forest stands located on the Medford-Park Falls Ranger District. A breeding bird and woodland raptor survey are needed to document breeding within this RNA.

Table 4. Fauna observed in Bear Creek RNA (by D. Fields 1997)*

Bear Creek Fauna	
Common Name	Scientific Name
Mallard	<i>Anas platyrhynchos</i>
Broad-winged Hawk	<i>Buteo platypteros</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Pileated Woodpecker	<i>Corvus corax</i>
Hermit Thrush	<i>Picoides pubescens</i>
Wood Thrush	<i>Hylocichla mustelina</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>
Eastern Wood Pewee	<i>Contopus virens</i>
Ovenbird	<i>Seiurus aurocapillus</i>
Black-capped Chickadee	<i>Parus atricapillus</i>
Red squirrel	<i>Tamiascurius hudsonicus</i>

Bear Creek Fauna	
Common Name	Scientific Name
Northern flying squirrel	<i>Glaucomys sabrinus</i>
White-tailed deer	<i>Odocoileus virginianus</i>
American toad	<i>Bufo americanus</i>
Spring peeper	<i>Pseudacris crucifer crucifer</i>
Wood frog	<i>Rana sylvatica</i>
Walleye**	<i>Stizostedion vitreum</i>
Northern pike**	<i>Esox lucius</i>
Largemouth bass**	<i>Micropterus salmoides</i>
Smallmouth bass**	<i>Micropterus dolomieu</i>

*Names: AOU Checklist 1983; Watermolen & Murrell 2010; **fish list from: Haanpaa et al. 1970

(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 *ice-walled lake plain* glacial feature found on the eastern side of the RNA was formed as the glacier retreated. A wall of stagnant ice trapped the outwash sediments, creating a plateau of debris that was later covered with fine wind-borne *loess* deposits. The soils that developed were rich in nutrients and support a diverse plant community (Figure 2).

Carbonates make up the bedrock of this LTA, which is between 100 feet and 50 feet of the land surface (WIDNR 2003). Geomorphologic processes are till and glacial meltwater deposition. Land surface is till plain with outwash terraces.

(D) SOILS

The soils of Bear Creek RNA fall into the Freer-Almena-Auburndale Series. They are generally moderately well to poorly drained loamy and silty soils with a silt loam surface over non-calcareous sandy loam dense till. Freer soils formed in a silty mantle of loess or lacustrine deposits and dense loamy glacial till on drumlins or moraines, while Almema and Auburndale soils formed mostly in loess or silty alluvium and in the underlying loamy till on ground moraines (USDA Forest Service, 2003a). Very poorly drained nonacid organic soils are also present. Post-glacial sediments are in lowland stands and along Bear Creek. Nutrient status is medium to rich (Fields 1997).

(E) TOPOGRAPHY

The characteristic landform of the LTA is undulating glacial moraine and stream terraces (Wisconsin Department of Natural Resources 2003). Within the RNA, the landform is ground moraine basal till and recessional moraine with ice-walled lake plain lacustrine deposits.

The western half of the site contains the recessional moraine of the Chippewa Lobe of the Wisconsin Glacial period with rolling-hilly topography similar to the end moraine a few miles to the southeast (Fields 1997). There are many small wet pockets. The eastern half is gently rolling to nearly level, tending to be damp and poorly drained. See Identification Section - *Boundary Map*.

(F) AQUATIC/RIPARIAN

Located within the Yellow River watershed, Bear Creek (Figure 5) is a warm-water stream that flows south into the Chequamegon Waters Impoundment. The water is slightly stained with tannic acid from the swamp origins. Fish species that are recorded from this system are: walleye, northern pike (), largemouth bass, and smallmouth bass (Haanpaa et al. 1970).

This creek is shallow and slow-moving. Spring rains swell the creek in April and May but in late August, it can be nearly dry in some places making it essentially non-navigable (Fields 1995).

The banks are dominated by either alder shrub (*Alnus incana*) and meadowsweet (*Spirea tomentosa*) or hummocky sedge meadow.

The RNA designation will positively affect the watershed by protecting water quality of both the creek and Chequamegon Waters Impoundment downstream. These waters eventually make their way to the Mississippi River WI DNR 2013.



Figure 5. The warm, slow-moving water of Bear Creek is bordered by sedge meadow and alder thicket. (CNNF Photo 1997)

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

Table 5. Species of Concern in Bear Creek RNA, State status and Natural Heritage rank

Common Name	Scientific Name	State Status, Heritage Rank ¹	Notes
Red-shouldered Hawk	<i>Buteo lineatus</i>	THR, S3S4,S1N	
American ginseng	<i>Panax quinquefolius</i>	none	Regional Forester Sensitive, of conservation concern on CNNF

¹ see Appendix 4: *Wisconsin Natural Heritage Working List – Rank Definitions*

(H) LIST OF RARE ELEMENTS AND RARE PLANT COMMUNITIES

It is rare in Wisconsin to find the geologic feature known as an *ice-walled lake plain* with an intact forest community, as this type of rich outwash soil elsewhere was mostly converted to agricultural crops. Another larger such element can be found in the Yellow River Ice-walled Lake Plain Forest Special Management Area a few miles southeast. Large contiguous acreages of old forests are also unique in this unit of the CNNF. The plant communities found here are globally secure.

c. RESOURCE INFORMATION

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

(1) MINERALS

The mineral estate (1,034 acres) within Bear Creek is federally owned. Federal-owned minerals are open to hardrock prospecting and the Forest Service must allow access to the surface to the mineral estate administered by Bureau of Land Management. The RNA has high potential for hardrock prospecting activity based on geology and recent hardrock prospecting permit activity in the general area. There are currently no active hardrock prospecting permits within Bear Creek RNA. Mineral ownership does not preclude use of the site for research but if prospecting took place disturbance to localized areas could occur.

Table 6. Mineral resource ownership within Bear Creek RNA (CNNF Forest data, 2005)

Township-Range	Section	Acres*	Hectares	Mineral ownership	Comments
33N 3W	34, 35, 36	all	all	federally owned	Mineral estate is administered by Bureau of Land Management (BLM)
32N 3W	1, 2, 3	all	all	federally owned	Mineral estate is administered by BLM

*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 no grazing on the Chequamegon-Nicolet National Forest. The 2004 CNNF Forest Plan has a standard that prohibits grazing in Research Natural Areas (Appendix 3 - *Forest Management Area Direction*).

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

The total *forested* acreage in the RNA is 896 (363 hectares) of the 1,034 total acres. This includes 85% upland hardwoods (including eastern hemlock) and 15% lowland swamp forest (Table 3). According to the 2004 CNNF Forest Plan, eastern hemlock is reserved in all hardwood stands or is infrequently managed on the Medford landbase due to regeneration concerns (USDA Forest Service 2004a pg 2-8). In other situations, eastern hemlock is only harvested to benefit or maintain habitat

for species of viability concern (USDA Forest Service 2004a pg 2-13). Lowland forest types are not typically harvested on the CNNF (mixed swamp conifer and black ash-American elm/red maple). There are no outstanding timber rights on any of the tracts.

The 2004 CNNF Forest Plan includes a guideline that prohibits gathering 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” in RNAs.

This new RNA has not 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

The RNA designation will positively affect the watershed by buffering the creek which drains into Chequamegon Waters Impoundment, an important fishery. The creek does support game fish (see section 3 (A) *Aquatic/riparian values*) but does not receive much angling pressure. There will be no conflict with boaters as the creek is effectively unnavigable.

(5) RECREATION USE

Light recreational use (hunting, hiking, horse-back riding) occurs but no use figures are available. These activities will be monitored and controlled if resource damage occurs. Hunting is expected to continue into the future and may be important in maintaining a balance between vegetation and white-tailed deer populations. Additionally, the RNA is expected to positively impact amateur and professional botanists, birders, and researchers who are attracted to the area because of the diversity of plant and animal life. Bear Creek is not used for recreational boating.

Conflict has occurred due to illegal motorized vehicle users. Although the Bear Creek RNA is located within a semi-primitive non-motorized area, ATV operators are going around the gate on the west end of FR 1521 and creating their own trails as of 2011. Garlic mustard (*Alliaria petiolata*) has been found within the RNA along these trails but is being controlled. Refer to Appendix 1, section f(1) *Potential or existing conflicts* for unique management issues that should be addressed for this RNA.

(6) WILDLIFE

Bear Creek RNA protects valuable habitat for birds and animals requiring large trees for nests and dens. As large trees die or are blown down, more habitat will be created. The site's low road density allows wildlife to freely move from one community to another. The state-threatened red-shouldered hawk may use the RNA for nesting or foraging. A calling adult was seen and heard during a field survey in 1997 but not in subsequent years during RNA checkups. This species requires large blocks of forest for breeding and RNA designation will help protect potential habitat. The wetlands and stream provide important habitat for fish, invertebrates, reptiles, and herptiles.

(7) TRANSPORTATION/ROAD SYSTEM

Bear Creek RNA is currently within the Bear Creek Semi-Primitive Non-Motorized Area. Standards and guidelines do not allow the use of horses, bicycles, and motorized vehicles on RNA trails. Forest plan guidelines state that decommissioned roads will be restored to some level of landscape restoration (Appendix 3- *Forest Management Area Direction*). Current old road corridors (visible in the *Landscape Overview Map* in the Identification Section) left over from past management needs will be treated if necessary to restore hydrologic, geomorphic, and ecological processes and properties and will be posted as closed to horses, bicycles, and motorized vehicle use. There are no special use permits through the RNA to access private lands.

The current rule guiding motorized access is contained in the Travel Management Project Decision Notice via a Motorized Vehicle Use Map (USDA Forest Service 2012). This map shows roads available for motorized use. No roads or trails are identified within the RNA.

d. HISTORICAL INFORMATION

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

There has been no research use of the site as of 2013.

History of establishment:

The CNNF began a forest-wide ecological inventory to identify high quality ecological features in the early 1990s (Parker 1999). Bear Creek 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 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 Wisconsin Department of Natural Resources is also interested in achieving ecosystem representation within the State Natural Area Network (WI DNR 2011). 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.

Bear Creek was identified as a Candidate RNA in the Draft CNNF 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 Bear Creek for establishment.

(2) CULTURAL/HERITAGE

Bear Creek RNA contains an historic logging camp within the complex (USDA Forest Service 2003b). There were four earthen foundations visible in 1982, a low log cribbing wall, and a few metal and glass artifacts.

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 Bear 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

The bearing tree map from the 1860s survey shows a patch of wind-thrown forest approximately one-fourth to one-half mile wide by three miles (5 km) long through the site (Krause et al. 1995). Some commercial thinning and shelterwood establishment harvests occurred in the late 1970s with the most recent in the late 1980’s (Dassow 2013). Stumps are common throughout the RNA and charred stumps have been found in a few places. Older eastern hemlock stands have had a minimal level of past disturbance, except for elm salvage operations, which heavily impacted small, localized areas in the 1970s. Older harvest units all have a closed canopy. Old skid road corridors are present throughout, and two gravel-surfaced roads were developed in the 1970s but are gated (Fields 1997). These roads are visible on the *Location Map* and *Landscape Overview Map* in the Identification Section. Specific locations of past disturbance can be obtained from the CNNF RNA coordinator.

Despite its non-motorized status, illegal ATV use occurs within some areas of the RNA, possibly for baiting deer and bear. Some evidence of illegal horseback riding was noted in 2011. An increase in these types of activities could alter natural systems by bringing in invasive plants and impact potential research conditions and habitat for sensitive species. These activities will be monitored and controlled if necessary.

(4) OCCURRENCE OF EXOTIC SPECIES

The Forest has developed an invasive plant strategy (USDA Forest Service 2009) and a forest-wide project to discover, prioritize, and control non-native invasive plants wherever they occur. Garlic mustard occurs within the RNA on Forest Road 1521 in section 34. This site has been treated with herbicide, hand-pulled, and continuously monitored since 2008 as garlic mustard is a high-priority

invasive plant on the Forest. Non-native earthworm species have infested much of the area. The only management for earthworm infestation is protection of pristine forest.

e. OTHER INFORMATION

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

There are no permanent research plots within the RNA as of 2012. Photo records are of a general nature with no monumented photo points.

The Station Director shall establish and maintain a system for archiving data and reports from the RNA in a manner that will facilitate the exchange and transfer of information among Stations and scientists. Research data files are maintained by the following office: Chequamegon-Nicolet National Forest, 1170 Fourth Avenue South, Park Falls WI 54552.

Plant collections will be housed at a herbarium located at the University of Wisconsin-Madison Herbarium or a place approved by the Station Director. All animal specimens collected in the course of research will be properly preserved and maintained within the Chequamegon-Nicolet National Forest Supervisor's office or designated university.

(2) BIBLIOGRAPHY

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

(3) POTENTIAL RESEARCH TOPICS

The large size of this site and intact gradient through various plant communities make it ideal for research in many aspects of forest ecology. In light of global climate change, its position on the edge of the climatic *Tension Zone* in Wisconsin makes it a valuable location to study forest adaptation to temperature and moisture changes. The presence of large, old trees allows for study of historical climate patterns on forest growth.

A small geologic ice-walled lake plain feature (an area of recessional moraine with an unusually rich species composition) with intact forest cover is a unique element for study as most of these elsewhere have been converted to agriculture.

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.

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

(1) POTENTIAL OR EXISTING CONFLICTS; PRINCIPAL MANAGEMENT ISSUES

The district ranger in consultation with the Forest Supervisor and RNA coordinator will work out conflicts. Of highest management priority are eliminating illegal motorized use and control of the non-native invasive garlic mustard. The garlic mustard appeared along a closed road that was still being accessed by ATVs and the seed may have been brought in that way. Control and monitoring of both these issues will continue.

Land surrounding Bear Creek RNA includes Forest Service land and private lands. The southern half of the western boundary is industrial forest land owned by Pukall Lumber Company as of 2012. The remainder of the western boundary and three quarters of a mile (1.2 km) of the southern boundary is private lands which are partly wooded or in hay or pasture and contain some residences.

All of the U.S. Forest Service Lands surrounding Bear Creek RNA are designated as MA 2A with an emphasis on Uneven-Aged Northern Hardwoods in the 2004 CNNF Forest Plan. This will be managed for a relatively continuous mid to late-successional uneven age forest of northern hardwoods with patch sizes in the thousands of acres. Edge habitat will be limited and temporary patches made small [under 40 acres (16 ha)]. Buffer zones immediately adjacent to the RNA could be created that would have a higher basal area.

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

The Bear Creek RNA is does not include any lands designated by congress in any special management category.

g. PHOTOGRAPHS

All photographs used in this Establishment Record are the property of the Chequamegon-Nicolet National Forest but not copyrighted. A digital file is updated with newer photos taken during RNA *check-ups*. Older slides were scanned and are with the site file housed in the Park Falls office of the Forest. An electronic file is part of this establishment record.

APPENDIX 2 BIBLIOGRAPHY

Below is all literature cited in this establishment record as well as 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

The management prescription for the Bear Creek RNA is embodied in the management area (MA) direction and guidance presented in the Chequamegon-Nicolet National Forests 2004 Land and Resource Management Plan under Management Area 8E - Existing and Candidate Research Natural Areas (USDA Forest Service 2004b pg 3-50). A copy of that management prescription follows:

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

MAs 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.

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 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)

APPENDIX 5 CONTRIBUTORS

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APPENDIX 6 LEGAL DESCRIPTION

Bear Creek is Located on the Park Falls – Medford District of the Chequamegon-Nicolet National Forest in Taylor County, Wisconsin. T 32 N, R 03 W, Sections 1, 2, and 3 and T 33 N, R 03 W, Sections 34, 35, and 36. The boundary is delineated as follows:

Beginning at the Southwest corner of Section 34, T 33 N, R 03 W,

Thence north along the West line of Section 34, approximately 2640 to the West ¼ corner of Section 34,

Thence north along the West line of Section 34, 512.0 feet,

Thence Southeasterly the following courses:

Direction	Distance (ft)
N 81 E	17.9
N 81 E	325.0
N 90 E	349.3
S 75 E	369.5
S 44 E	202.5
S 36 E	285.0

Direction	Distance (ft)
S 26 E	279.7
S 60 E	112.6
S 72 E	154.7
N 90 E	132.7
N 88 E	342.6
N 88 E	202.7

Direction	Distance (ft)
S 72 E	161.3
S 47 E	182.8
S 28 E	181.3
S 19 E	422.0
S 20 E	446.4
S 33 E	58.8

to the South ROW of Forest Road #1521,

Thence along the South ROW of Forest Road #1521, 2,062.6 feet,

Thence Southeasterly the following courses:

Direction	Distance (ft)
S 50 E	112.3
S 50 E	337.2
S 51 E	287.9
S 64 E	209.4
S 80 E	120.6
N 72 E	132.5
N 41 E	148.5
N 28 E	165.6
N 46 E	182.9
N 58 E	182.2
N 74 E	181.3
N 83 E	175.9
S 76 E	86.3
S 4 E	189.2
S 6 E	273.7
S 8 E	267.8

Direction	Distance (ft)
S 23 E	234.8
S 27 E	281.1
S 45 E	79.1
N 39 E	179.0
N 38 E	238.8
N 27 E	306.3
N 39 E	134.2
N 48 E	331.3
N 65 E	293.7
N 69 E	254.2
N 77 E	372.8
N 83 E	324.0
N 85 E	168.3
S 78 E	99.9
S 72 E	183.4
S 78 E	164.4

Direction	Distance (ft)
S 85 E	301.7
S 88 E	167.8
S 66 E	137.6
S 65 E	184.3
S 52 E	214.0
S 49 E	212.9
S 27 E	259.3
S 31 E	285.1
S 15 W	159.4
S 8 W	422.8
S 0 W	300.4
S 6 E	393.3
S 11 E	370.0
S 21 E	329.5
S 27 E	169.1

to a point on the North 1/16 line of Section 1,

Thence west along the North 1/16 line 807.3 feet to the North 1/16 corner between Sections 1 and 2,

Thence Southwesterly the following courses:

Direction	Distance (ft)
S 24 W	386.6
S 31 W	300.8
S 42 W	242.4
S 64 W	178.1
S 77 W	193.2
S 84 W	140.5
N 84 W	189.8
N 64 W	209.3
N 45 W	128.5
N 18 W	205.5
N 13 W	243.9
N 41 W	232.7
N 68 W	278.9
N 71 W	236.4

Direction	Distance (ft)
N 52 W	238.9
N 41 W	158.3
N 14 W	208.4
N 0 E	125.7
S 84 W	266.9
S 70 W	282.9
S 70 W	311.5
S 54 W	199.8
S 33 W	166.5
S 14 W	230.4
S 12 E	206.8
S 18 E	227.5
S 26 E	356.2
S 40 E	317.6

Direction	Distance (ft)
S 27 E	281.1
S 27 E	196.9
S 8 W	225.7
S 23 W	212.8
S 48 W	178.1
S 59 W	626.5
S 49 W	158.4
S 36 W	354.9
S 53 W	578.3
S 49 W	158.4
S 29 W	344.0
S 38 W	194.1
S 29 W	159.5
S 14 W	169.6

to the South line of Section 2,

Thence West along the South line of Section 2, 405.3 feet to the Southwest corner of Section 02,

Thence north along the west line of Section 2, 277.0 feet,

Thence northerly the following courses:

Direction	Distance (ft)
N 30 E	40.2
N 45 E	237.0
N 46 E	261.8
N 37 E	219.4
N 25 E	146.8
N 14 E	143.9
N 32 E	156.9
N 0 E	118.9
N 45 W	177.7
N 18 W	139.1
N 56 E	151.2

Direction	Distance (ft)
N 72 E	293.8
N 48 E	84.0
N 0 E	118.7
N 30 W	97.1
N 61 W	87.5
N 80 W	156.2
S 83 W	112.6
S 63 W	109.4
S 90 W	90.8
N 76 W	57.6
N 29 W	128.2

Direction	Distance (ft)
N 8 W	155.2
N 11 E	185.0
N 27 E	124.9
N 61 E	200.2
N 53 E	174.6
N 15 E	108.5
N 9 E	233.1
N 5 E	252.3
N 6 W	196.7
N 36 W	120.2
N 79 W	71.2

Thence southwesterly the following courses:

Direction	Distance (ft)
S 42 W	103.9
S 25 W	115.6
S 2 E	167.7
S 7 W	225.2
S 21 W	172.6

Direction	Distance (ft)
S 42 W	207.6
N 77 W	128.8
S 60 W	17.4

to the West line of Section 2,

Thence south along the west line of Section 2, 250.7 feet to the West $\frac{1}{4}$ corner of Section 2,

Thence west along the East-West $\frac{1}{4}$ line of Section 3, approximately 5280 feet to the West $\frac{1}{4}$ corner of Section 3,

Thence north along the West line of Section 3, approximately 2,350 feet to the **Point of Beginning**.

Area described contains approximately 1,034 acres (418 hectares).

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

APPENDIX 7 FLORA LIST

Ecological Surveyor: Douglas Fields 1997. Nomenclature follows USDA, NRCS PLANTS database accessed 2012

Flora of Bear Creek RNA (D. Fields 1997)	
Scientific name	Common Name
<i>Abies balsamea</i>	balsam fir
<i>Acer rubrum</i>	red maple
<i>Acer saccharum</i>	sugar maple
<i>Acer spicatum</i>	mountain maple
<i>Actaea pachypoda</i>	white baneberry
<i>Actaea rubra</i>	red baneberry
<i>Adiantum pedatum</i>	maidenhair fern
<i>Agrimonia gryposepala</i>	tall hairy agrimony
<i>Alliaria petiolata</i>	garlic mustard
<i>Allium tricoccum</i>	wild leek
<i>Alnus rugosa</i>	speckled alder
<i>Amphicarpaea bracteata</i>	hog peanut
<i>Anemone quinquefolia</i>	woods anemone
<i>Aralia hispida</i>	bristly sarsaparilla
<i>Aralia nudicaulis</i>	wild sarsaparilla
<i>Aralia racemosa</i>	spikenard
<i>Arceuthobium pusillum</i>	eastern dwarf mistletoe
<i>Arisaema triphyllum</i>	jack-in-the-pulpit
<i>Asarum canadense</i>	wild ginger
<i>Aster lateriflorus</i>	calico aster
<i>Aster macrophyllus</i>	big-leaf aster
<i>Aster umbellatus</i>	flat-top aster
<i>Betula alleghaniensis</i>	yellow birch
<i>Betula papyrifera</i>	paper birch
<i>Botrychium lanceolatum</i>	lance-leaved grapefern
<i>Botrychium matricariifolium</i>	daisy-leaved grapefern
<i>Botrychium virginianum</i>	rattlesnake fern
<i>Brachyelytrum erectum</i>	northern shorthusk
<i>Calamagrostis canadensis</i>	bluejoint grass
<i>Caltha palustris</i>	marsh marigold
<i>Campanula aparinoides</i>	marsh bellflower
<i>Cardamine concatenata</i>	cut-leaf toothwort
<i>Cardamine pensylvanica</i>	Pennsylvania bittercress
<i>Carex arctata</i>	drooping woodland sedge
<i>Carex bromoides</i>	brome-like sedge
<i>Carex brunnescens</i>	brownish sedge
<i>Carex crawfordii</i>	Crawford's sedge
<i>Carex crinita</i>	fringed sedge
<i>Carex echinata</i>	star sedge
<i>Carex gracillima</i>	graceful sedge
<i>Carex gynandra</i>	nodding sedge

Flora of Bear Creek RNA (D. Fields 1997)	
Scientific name	Common Name
<i>Carex intumescens</i>	greater bladder sedge
<i>Carex leptalea</i>	bristly-stalked sedge
<i>Carex limosa</i>	mud sedge
<i>Carex pedunculata</i>	long-stalked sedge
<i>Carex rosea</i>	rosy sedge
<i>Carex stipata</i>	awl-fruit sedge
<i>Carex stricta</i>	tussock sedge
<i>Carex trisperma</i>	three-seeded sedge
<i>Carpinus caroliniana</i>	American hornbeam
<i>Carya cordiformis</i>	bitternut hickory
<i>Caulophyllum thalictroides</i>	blue cohosh
<i>Chamaedaphne calyculata</i>	leatherleaf
<i>Chrysosplenium americanum</i>	American golden saxifrage
<i>Cicuta bulbifera</i>	bulblet water hemlock
<i>Cicuta maculata</i>	spotted water hemlock
<i>Cinna latifolia</i>	drooping woodreed
<i>Circaea alpina</i>	Dwarf enchanter's nightshade
<i>Circaea lutetiana ssp. canadensis</i>	Enchanter's nightshade
<i>Cirsium muticum</i>	swamp thistle
<i>Claytonia virginiana</i>	spring beauty
<i>Clintonia borealis</i>	blue-bead lily
<i>Coptis trifolia</i>	goldthread
<i>Cornus alternifolia</i>	alternate-leaved dogwood
<i>Cornus canadensis</i>	bunchberry
<i>Cypripedium acaule</i>	pink lady's-slipper
<i>Cypripedium calceolus</i>	yellow lady's-slipper
<i>Deparia acrostichoides</i>	silvery glade fern
<i>Dicentra cucullaria</i>	Dutchman's breeches
<i>Dichanthelium xanthophyllum</i>	slender rosette grass
<i>Diphasiastrum digitatum</i>	northern running pine
<i>Dryopteris carthusiana</i>	toothed wood fern
<i>Dryopteris cristata</i>	crested wood fern
<i>Dryopteris intermedia</i>	fancy wood fern
<i>Elymus hystrix</i>	eastern bottlebrush grass
<i>Elymus virginicus</i>	Virginia wild rye

Flora of Bear Creek RNA (D. Fields 1997)	
Scientific name	Common Name
<i>Equisetum arvense</i>	field horsetail
<i>Equisetum sylvaticum</i>	woodland horsetail
<i>Eriophorum virginicum</i>	tawny cotton grass
<i>Erythronium americanum</i>	trout lily
<i>Eupatorium maculatum</i>	spotted joe-pye wed
<i>Eupatorium perfoliatum</i>	boneset
<i>Fragaria virginiana</i>	strawberry
<i>Fraxinus americana</i>	white ash
<i>Fraxinus nigra</i>	black ash
<i>Galium asprellum</i>	rough bedstraw
<i>Galium trifidum ssp. trifidum</i>	three-petal bedstraw
<i>Galium triflorum</i>	sweet-scented bedstraw
<i>Geranium maculatum</i>	spotted geranium
<i>Geum canadense</i>	white avens
<i>Geum rivale</i>	purple avens
<i>Glyceria canadensis</i>	rattlesnake manna-grass
<i>Glyceria striata</i>	fowl manna-grass
<i>Gymnocarpium dryopteris</i>	oak fern
<i>Hepatica nobilis var. acuta</i>	sharp-lobed hepatica
<i>Huperzia lucidula</i>	shining club-moss
<i>Hydrophyllum virginianum</i>	Virginia waterleaf
<i>Ilex mucronata</i>	catberry
<i>Ilex verticillata</i>	common winterberry
<i>Impatiens capensis</i>	jewelweed
<i>Impatiens pallida</i>	pale touch-me-not
<i>Juglans cinerea</i>	butternut
<i>Juncus effusus</i>	common rush
<i>Juncus tenuis</i>	path rush
<i>Kalmia polifolia</i>	bog laurel
<i>Laportea canadensis</i>	Canadian wood nettle
<i>Ledum groenlandicum</i>	Labrador tea
<i>Leersia oryzoides</i>	rice cutgrass
<i>Lonicera canadensis</i>	American fly honeysuckle
<i>Luzula acuminata</i>	hairy wood rush
<i>Lycopodium annotinum</i>	bristly club-moss
<i>Lycopodium clavatum</i>	running club-moss
<i>Lycopodium dendroideum</i>	northern tree club-moss
<i>Lycopodium obscurum</i>	rare club-moss
<i>Lysimachia ciliata</i>	fringed loosestrife
<i>Lysimachia thysiflora</i>	tufted loosestrife
<i>Maianthemum canadense</i>	wild lily-of-the-valley
<i>Maianthemum trifolium</i>	three-leaf false

Flora of Bear Creek RNA (D. Fields 1997)	
Scientific name	Common Name
	Solomon's-seal
<i>Matteuccia struthiopteris</i>	ostrich fern
<i>Mitchella repens</i>	partridgeberry
<i>Mitella diphylla</i>	two-leaf miterwort
<i>Mitella nuda</i>	naked miterwort
<i>Monotropa uniflora</i>	Indian pipe
<i>Onoclea sensibilis</i>	sensitive fern
<i>Osmorhiza claytoniana</i>	sweet cicely
<i>Osmunda cinnamomea</i>	cinnamon fern
<i>Osmunda claytonii</i>	interrupted fern
<i>Osmunda regalis</i>	royal fern
<i>Ostrya virginiana</i>	ironwood
<i>Oxalis montana</i>	mountain wood sorrel
<i>Packera aurea</i>	golden ragwort
<i>Panax quinquefolius</i>	ginseng
<i>Panax trifolius</i>	dwarf ginseng
<i>Parthenocissus quinquefolia</i>	Virginia creeper
<i>Penthorum sedoides</i>	ditch stonecrop
<i>Phegopteris connectilis</i>	northern beech fern
<i>Phlox divaricata</i>	forest phlox
<i>Phryma leptostachya</i>	lop-seed
<i>Picea glauca</i>	white spruce
<i>Picea mariana</i>	black spruce
<i>Pilea sp.</i>	clearweed
<i>Pinus strobus</i>	white pine
<i>Platanthera hyperborea</i>	northern bog orchid
<i>Platanthera psycodes</i>	lesser purple-fringed orchid
<i>Poa alsodes</i>	bluegrass
<i>Polygonatum biflorum</i>	greater Solomon's-seal
<i>Polygonatum pubescens</i>	hairy Solomon's-seal
<i>Polygonum arifolium</i>	halberd-leaved tear-thumb
<i>Polygonum cilinode</i>	fringed black bindweed
<i>Polygonum punctatum</i>	dotted smartweed
<i>Polygonum sagittatum</i>	arrow-leaved tear-thumb
<i>Populus tremuloides</i>	trembling aspen
<i>Potamogeton alpinus</i>	alpine pondweed
<i>Prunella vulgaris</i>	self-heal
<i>Pyrola elliptica</i>	elliptic shinleaf
<i>Pyrola secunda</i>	sidebells
<i>Quercus rubra</i>	red oak
<i>Ranunculus abortivus</i>	little-leaf buttercup
<i>Ranunculus pensylvanicus</i>	Pennsylvania buttercup
<i>Rhamnus alnifolia</i>	alderleaf buckthorn
<i>Ribes cynosbati</i>	prickly gooseberry
<i>Ribes glandulosum</i>	skunk currant

Flora of Bear Creek RNA (D. Fields 1997)	
Scientific name	Common Name
<i>Ribes triste</i>	swamp red currant
<i>Rubus idaeus</i>	red raspberry
<i>Rubus pubescens</i>	dwarf red blackberry
<i>Rubus spp.</i>	dewberry species
<i>Rudbeckia laciniata</i>	cutleaf coneflower
<i>Rumex orbiculatus</i>	greater water dock
<i>Sagittaria latifolia</i>	broadleaf arrowhead
<i>Salix spp.</i>	willow
<i>Sanguinaria canadensis</i>	bloodroot
<i>Saxifraga pensylvanica</i>	swamp saxifrage
<i>Schizachne purpurascens</i>	false melic
<i>Scirpus atrovirens</i>	green bulrush
<i>Scirpus cyperinus</i>	woolgrass
<i>Scutellaria lateriflora</i>	blue skullcap
<i>Smilacina racemosa</i>	false Solomon's-seal
<i>Solidago gigantea</i>	giant goldenrod
<i>Solidago uliginosa</i>	bog goldenrod
<i>Sparganium emersum</i>	narrow-leaved bur-reed
<i>Spiraea alba</i>	steeplebush
<i>Spiraea tomentosa</i>	hardhack
<i>Stachys tenuifolia</i>	smooth hedgenettle
<i>Stellaria longifolia</i>	longleaf starwort
<i>Streptopus lanceolatus v. longipes</i>	rosy twisted stalk

Flora of Bear Creek RNA (D. Fields 1997)	
Scientific name	Common Name
<i>Symplocarpus foetidus</i>	skunk cabbage
<i>Thalictrum dioicum</i>	early meadow rue
<i>Thelypteris palustris</i>	eastern marsh fern
<i>Thuja occidentalis</i>	northern white cedar
<i>Tilia americana</i>	basswood
<i>Toxicodendron radicans</i>	poison ivy
<i>Triadenum virginicum</i>	Virginia marsh St. John's-wort
<i>Trientalis borealis</i>	starflower
<i>Trillium cernuum</i>	nodding trillium
<i>Trillium grandiflorum</i>	large-flowered trillium
<i>Tsuga canadensis</i>	eastern hemlock
<i>Typha latifolia</i>	cattail
<i>Ulmus americana</i>	American elm
<i>Urtica dioica</i>	stinging nettle
<i>Utricularia vulgaris</i>	common bladderwort
<i>Uvularia grandiflora</i>	large-flowered bellwort
<i>Uvularia sessilifolia</i>	sessile bellwort
<i>Vaccinium myrtilloides</i>	velvet-leaf blueberry
<i>Viola cucullata</i>	marsh blue violet
<i>Viola macloskeyi</i>	smooth white violet
<i>Viola pubescens</i>	downy yellow violet
<i>Viola selkirkii</i>	Selkirk's violet