



DESIGNATION ORDER

USDA Forest Service, Eastern Region
Chequamegon-Nicolet National Forest
Eagle River/Florence Ranger District
Forest County, Wisconsin

Atkins-Hiles Swamp
RESEARCH NATURAL AREA

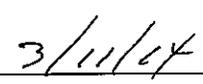
Designation Order

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 Atkins-Hiles Swamp Research Natural Area. It shall be comprised of 2,360 acres (955 hectares) of land in Forest County, in the state of Wisconsin, on the Eagle River/Florence 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

Atkins-Hiles Swamp

Research Natural Area

Chequamegon-Nicolet National Forest

Forest 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: 11/21/2013

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

Draft by:

/s/ Dawn Heinbaugh

Date: 2005

Dawn Heinbaugh, WI DNR

Recommended by:

Jeff Seefeldt

Date 1/24/14

Jeff Seefeldt, District Ranger, Lakewood/Laona 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

July 2013



TITLE PAGE

Establishment Record for **Atkins-Hiles Swamp** Research Natural Area

**Chequamegon-Nicolet National Forest,
Eagle River-Florence District,
Forest County, Wisconsin**



Cover photo: Rose pogonia (*Pogonia ophioglossoides*) is found on the open bog mat of Atkins-Hiles Swamp RNA. Photo by Ian Shackelford, 1997

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

CONTENTS

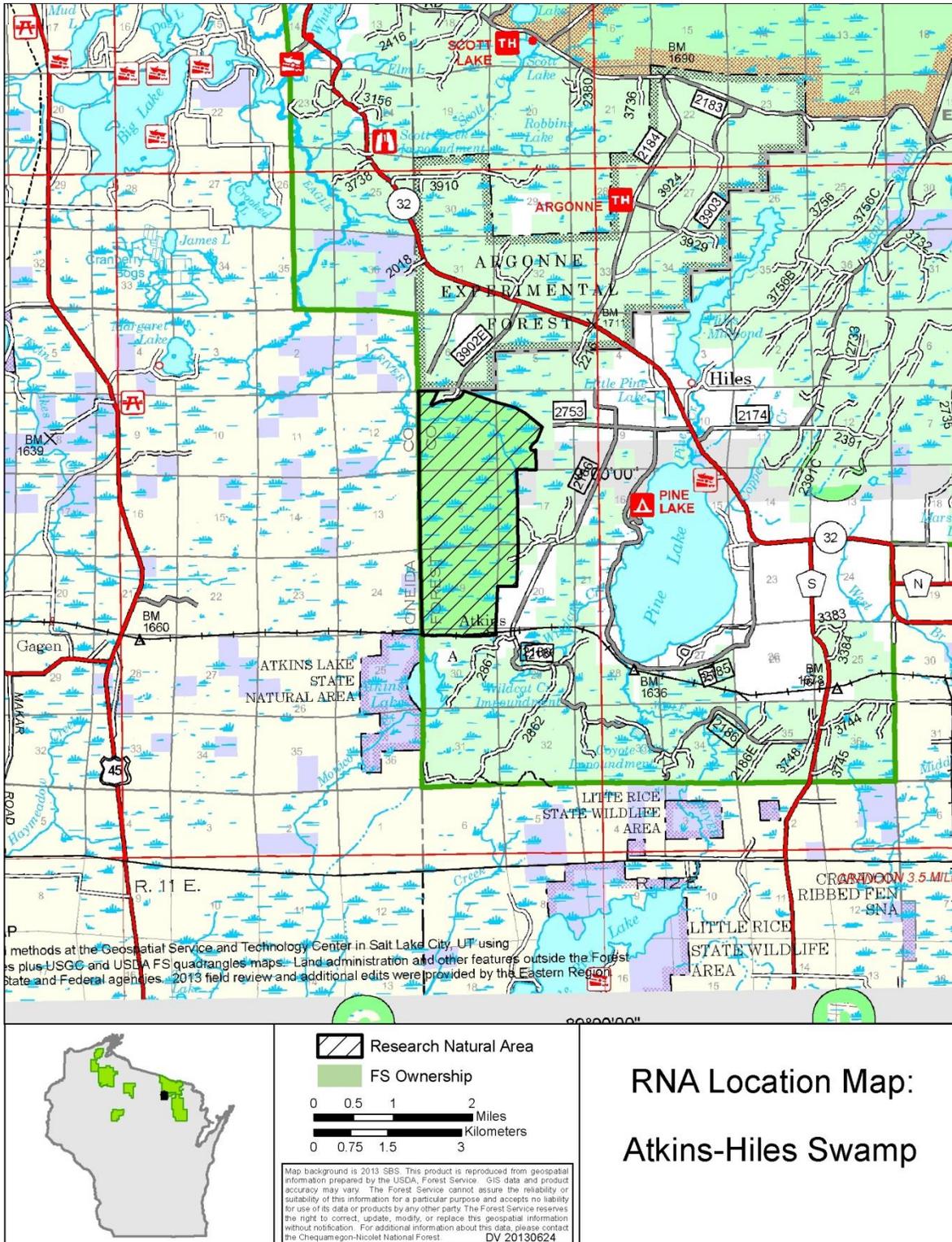
1. IDENTIFICATION SECTION	5
Location Map	5
Boundary Map.....	6
Landscape Overview ATKINS-HILES SWAMP RNA.....	7
Legal Description.....	8
2. ADMINISTRATIVE SECTION.....	10
3. BODY OF ESTABLISHMENT RECORD.....	11
a. INTRODUCTION	11
b. JUSTIFICATION SECTION	12
(1) Justification Statement.....	12
(2) Principal Distinguishing Features	12
(3) Objectives.....	13
c. LAND MANAGEMENT PLANNING	13
d. MANAGEMENT PRESCRIPTION.....	13
e. USE OR CONTROL OF FIRE AND GRAZING.....	14
f. APPENDICES	15
4. Appendix 1 Ecological Evaluation	15
a. PHYSICAL SITE DESCRIPTION AND CLIMATIC CONDITIONS.....	15
(1) Location.....	15
(2) Size in acres/hectares.....	15
(3) Elevation range.....	15
(4) Access to the site.....	15
(5) Climatic data.....	16
b. ECOLOGICAL DESCRIPTION	16
(1) Eco-region.....	16
(2) Plant community types	16
(3) Description of the values of the Research Natural Area.....	20
c. RESOURCE INFORMATION.....	24
(1) Minerals.....	24
(2) Grazing.....	25
(3) Plants (including timber and special forest products)	25
(4) Watershed values	26
(5) Recreation use	26

(6) Wildlife.....	26
(7) Transportation/road system.....	26
d. HISTORICAL INFORMATION.....	27
(1) Research/education use and interest: history of establishment.....	27
(2) Cultural/heritage.....	27
(3) Disturbance history.....	28
(4) Occurrence of exotic species.....	28
e. OTHER INFORMATION.....	28
(1) Any permanent research plots and/or photo points.....	28
(2) Bibliography.....	29
(3) Potential research topics.....	29
f. EVALUATION OF SPECIFIC MANAGEMENT RECOMMENDATIONS ON THE RESEARCH NATURAL AREA.....	29
(1) Potential or existing conflicts; principal management issues.....	29
(2) Special management area if the Research Natural Area is within one.....	29
g. PHOTOGRAPHS.....	30
Appendix 2 Bibliography.....	31
Appendix 3 Forest Management Area Direction.....	34
Appendix 4 Wisconsin Natural Heritage Working List – Rank Definitions.....	37
Appendix 5 Contributors.....	39

Note: the alpha/numeric ordering in this document follows that within Forest Service Manual direction (FSM 4063) for Establishment Records.

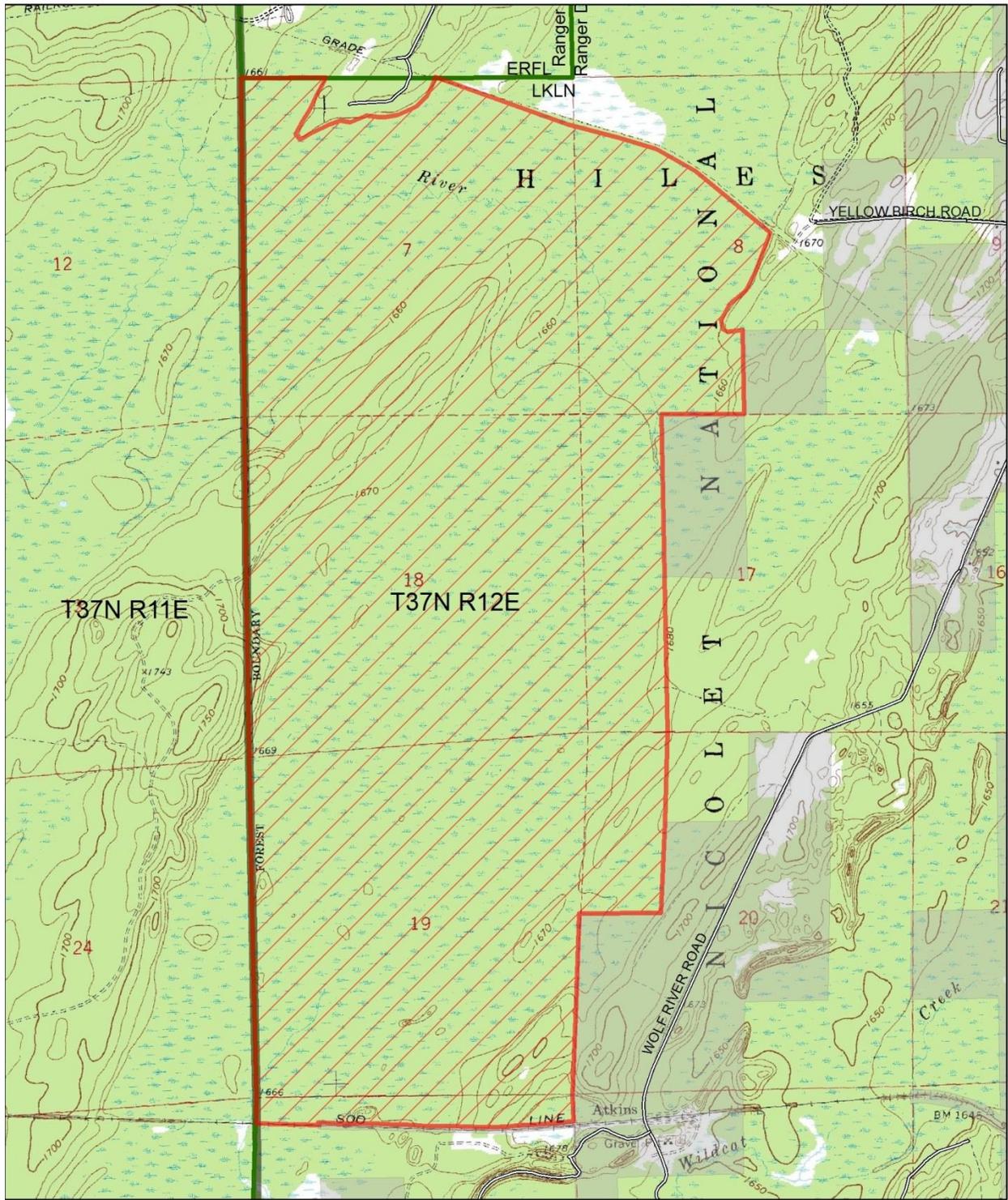
1. IDENTIFICATION SECTION

Location Map



Boundary Map

RNA Boundary Map: Atkins-Hiles Swamp



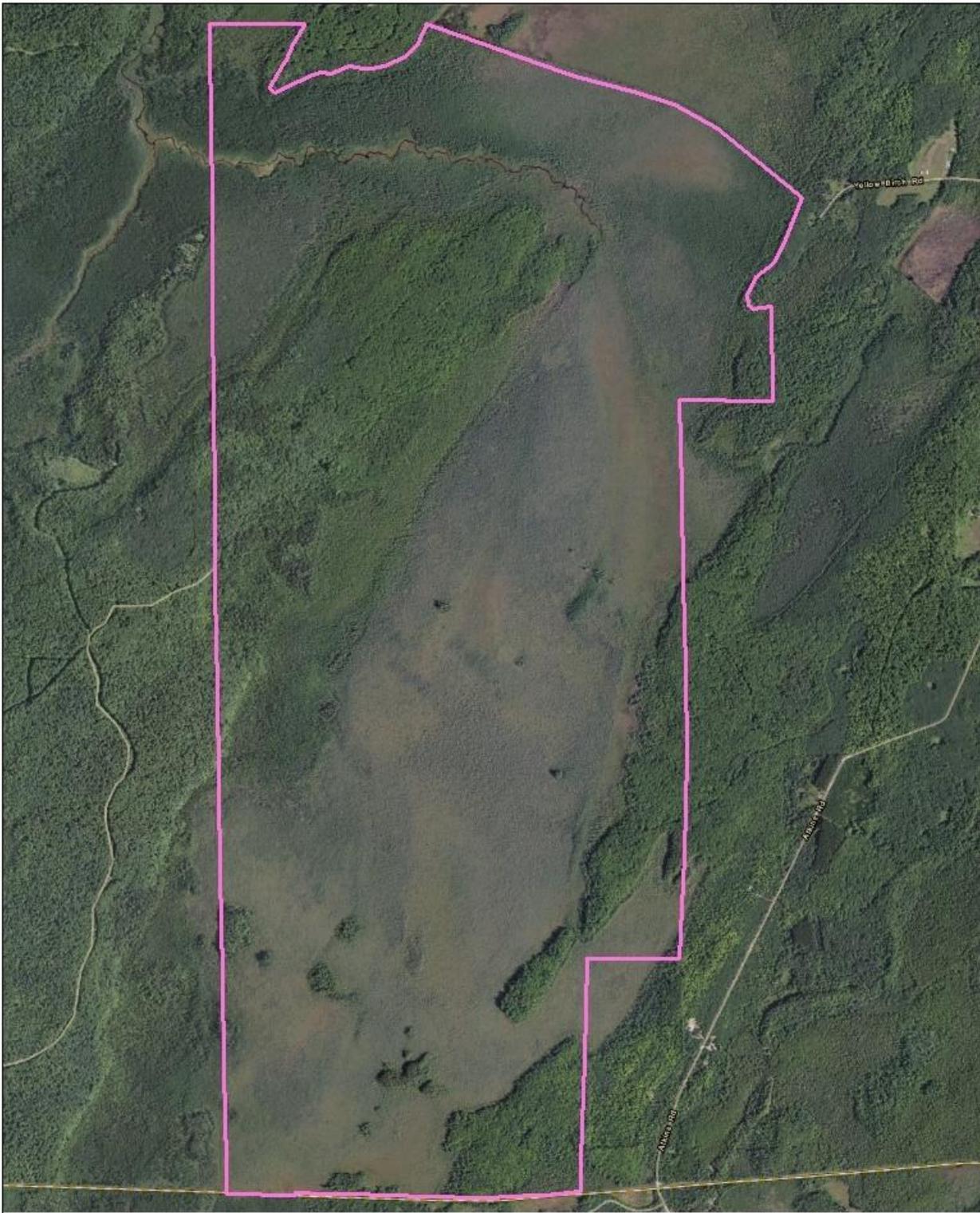
- Research Natural Area
- Open Road
- NonFS ownership
- Trail



DV 20140417

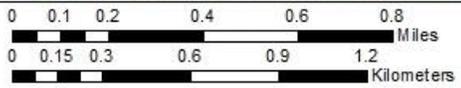
Acres: 2356

Landscape Overview ATKINS-HILES SWAMP RNA



 RNA Boundary

ESRI Basemap World Imagery
MB 2013



Legal Description

The Atkins Hiles Swamp Research Natural Area is located in Forest County, Wisconsin. [Geographic Information System (GIS) data of the perimeter boundary are on file at the Forest offices.] T 37 N, R 12 E, Sections 6, 7, 8, 17, 18, 19, 20 and 30. The boundary is delineated as follows:

Commencing at the Southwest corner of Section 06, thence South along the West line of Section 07, 358.0 feet to the **Point of Beginning**.

Thence N 35° E, approximately 1,200 feet to the South ROW of an old Rail Road Grade,

Thence Southeasterly along the South ROW of old Grade 925.00 feet,

Thence S 37° W, 1,270.0 feet,

Thence S 02° W, 544 feet,

Thence N 61° E, 641 feet,

Thence N 86° E, 1180 feet,

Thence N 48° E, approximately 930 feet to the South ROW of old Rail Road Grade,

Thence following the South ROW of Grade Southeasterly approximately 5,350 feet to the edge of a swamp,

Thence S 33° W, 1,705 feet,

Thence S 16° E, 195 feet,

Thence N 61° E, approximately 250 feet to the Center South 1/16 corner of Section 8,

Thence South along the North-South ¼ line of Section 8, approximately 1,320 feet to the South ¼ corner of Section 8,

Thence West along the South line of Section 8, approximately 1,320 feet to the West 1/16 corner of Sections 8 and 17,

Thence south along the West 1/16 line of Section 17, approximately 2,640 feet to the Center West 1/16 corner of Section 17,

Thence south along the West 1/16 line of Section 17, approximately 2,640 feet to the West 1/16 corner of Sections 17 and 20,

Thence South along the West 1/16 line of Section 20, approximately 2,640 feet to the Center West 1/16 corner of Section 20,

Thence West along the East – West ¼ line of Section 20, approximately 1,320 feet to the West ¼ corner of Section 20,

Thence South along the West line of Section 20, approximately 2,640 feet to the Southwest corner of Section 20,

Thence South along the East line of Section 30, approximately 300 feet to the North ROW of the Rail Road Grade,

Thence Westerly along the North ROW of the Rail Road Grade, approximately 5,300 feet to the West line of Section 30,

Thence North along the West line of Section 30, approximately 300 feet to the Southwest corner of Section 19,

Thence North along the West line of Section 19, approximately 5,280 feet to the Northwest corner of Section 19,

Thence North along the West line of Section 18, approximately 5,280 feet to the Northwest corner of Section 18,

Thence North along the West line of Section 07, approximately 4,922 feet to the **Point of Beginning**.

The Atkins Hiles Swamp Research Natural Area contains approximately 2,360 acres (955 hectares).

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

2. ADMINISTRATIVE SECTION

This Establishment Record has been prepared pursuant to Forest Service Manual direction (FSM 4063). Establishment of the Atkins-Hiles Swamp 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 2005c).

The Station Director of the Northern Research Station (NRS) in consultation with the Chequamegon-Nicolet Forest (CNNF) Supervisor, Lakewood-Laona 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

Atkins-Hiles Swamp Research Natural Area (RNA) is located in the Chequamegon-Nicolet National Forest, Lakewood-Laona Ranger District (CNNF), Forest County, Wisconsin. The 2,360-acre (955 hectares) RNA is located entirely on National Forest Service Land and is approximately 5 miles (8 km) west of Hiles, Wisconsin (Identification Section-*Location Map* and *Boundary Map*).

Atkins-Hiles Swamp RNA is a large wetland complex of black spruce-tamarack swamp and sparsely treed muskeg. There are inclusions of northern poor fen with aspects of open bog, shrub swamp, and scattered small upland islands of hemlock, white pine, red pine, and white spruce. The area is one of the largest and most diverse northern wet forest communities on the Chequamegon-Nicolet National Forest. This site is also co-designated as Atkins Lake *State Natural Area* by the state of Wisconsin which includes additional acres to the west. Refer to Appendix 1: *Ecological Evaluation* d. (1) *Research/education use* for an explanation of co-designation as a Wisconsin State 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.

The Township (T37N-R12E) was surveyed by Alfred Millard in 1858 (BCPL 2004). Of interest are citations within those notes stating: "*Land all swamp, open, wet, and unfit for cultivation. Timber: Spruce, tamarack, cedar...Land low, poor, 2nd rate. Timber w. & y. Birch, Fir, Hemlock, Aspen, and Spruce.*" Much of northern Wisconsin was heavily logged in the late 1800s and large forest fires occurred in subsequent years. This area became National Forest in the 1930s and additional logging took place on some of the uplands prior to the 1970s as these forests matured.

All lowland areas are designated in the 2004 Chequamegon-Nicolet National Forest Land and Resource Management Plan (hereinafter referred to as '2004 CNNF Forest Plan') as non-suitable for timber management (approximately 78% of the forested lands in this RNA are lowland forest). Some of the upland sites have been managed for commercial timber up until the 1970s. Hunting, hiking, bird watching and other forms of non-motorized recreation occur here. There are no designated hiking trails.

Atkins-Hiles Swamp RNA is owned outright by the USDA Forest Service. Administration and protection of Atkins-Hiles Swamp RNA is the responsibility of the Forest Supervisor of the CNNF, or designate. The Lakewood-Laona Ranger District, CNNF, provides day-to-day protection and maintenance of the area.

Atkins-Hiles Swamp RNA does not occur within any other administratively or congressionally designated areas, such as a Wilderness Area or National Recreation Area. 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



Figure 1. Black spruce (*Picea mariana*) & tamarack (*Larix laricina*) forest of Atkins- Hiles Swamp RNA. Photo by Ian Shackleford 1997

The site represents one of the largest high quality complexes of open bog and conifer swamp in the state (Epstein 1986). The muskeg habitat throughout the RNA is of such high quality and extensive range as to warrant protection (Shackleford 1997). Lying within this large forested wetland are upland islands of pine-dominated forest. These islands are small but virtually untouched (Hoffman 1999). Upland glacial features known as *drumlins* border the wetland and contain northern mesic forest with mixed forested swamps along the interface of the wetlands and drumlins. This large northern wet forest continues into adjacent state land (a designated State Natural Area or SNA) and when combined brings the effective size of the complex to over 2,800 contiguous acres (1,133 ha). The State of Wisconsin dedicated the entire site, both state and federal lands, as a State Natural Area in 2008. These areas on the Forest contribute to the state's Natural Area Network ecosystem representation goals which complement the National Forest and RNA goals.

(2) PRINCIPAL DISTINGUISHING FEATURES

The Atkins-Hiles Swamp RNA complex features Hiles Swamp and upland drumlins (Shackleford 1997). Hiles Swamp, the source of the Eagle River, is a large northern wet forest, with over 1,700 (688 ha) contiguous acres included within the complex. Habitats include muskeg of sparse and stunted black spruce (*Picea mariana*), dense wet forest of black spruce and tamarack (*Larix laricina*) (Figure 1), wet forest of pure tamarack, and more or less open bog. The area forms perhaps one of the largest and most diverse Northern Wet Forest communities on the Chequamegon-Nicolet. The swamp is home to several boreal plant and bird species rare in Wisconsin, including sparse-flowered sedge (*Carex tenuiflora*), swamp pink orchid (*Arethusa*

bulbosa), boreal chickadee (*Poecile hudsonicus*), and gray jay (*Perisoreus canadensis*). Also within the swamp are several small islands of pristine white pine (*Pinus strobus*) and red pine (*Pinus resinosa*) habitats known to serve as bald eagle (*Haliaeetus leucocephalus*) and goshawk (*Accipiter gentilis*) nesting sites.

The two glacial geologic features within the complex known as drumlins feature a cover of northern mesic forest with mixed swamps occurring along the drumlin margins. Past of the upland forest resulted in a relatively homogeneous sugar maple (*Acer Saccharum*) overstory and understory, but several older hemlock stands occur including some with super-canopy white pine. Along the drumlin margins are some unique mixed swamp habitats in the transition to northern wet forest.

(3) OBJECTIVES

The management objective of Atkins-Hiles Swamp RNA is to serve as a research and educational reference area, preserve and maintain the RNA's plant and animal communities, including populations of uncommon and rare species. It will protect the extensive, high quality muskeg habitat throughout the complex. Lowland, mixed conifer swamps in much of northern Wisconsin lack northern white cedar (*Thuja occidentalis*) regeneration. RNA status will protect the mature trees. Upland areas, that contain hemlock or large pine components contribute to the diverse mosaic represented by this RNA and will provide a seed source for future generations. In the event of a damaging wind storm, these trees will provide course woody debris for fauna and, as they decompose, become nurse logs for tree seedlings.

c. LAND MANAGEMENT PLANNING

Atkins-Hiles Swamp RNA was recommended for RNA designation in the 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). Atkins-Hiles Swamp 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 (MA 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. These RNAs and candidate RNAs are complexes containing several community types. Plant communities are generally of an older age class and contain all or most species characteristic of that community in the region (Appendix 3 - *Management Area Direction* and USDA Forest Service 2004a pg 3-50).

d. MANAGEMENT PRESCRIPTION

The management prescription for the Atkins-Hiles Swamp 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 Atkins-Hiles Swamp 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) will detect, manage and prevent invasive plants as RNAs are high priority for monitoring and controlling invasives.

Future management concerns include preventing and controlling non-native invasive species and hydrologic effects of the century-old railroad bed (see Section 4 F (1) *Potential or existing conflicts; principal management issues*). Any management plans will be coordinated with the state as this is also a State Natural Area.

e. USE OR CONTROL OF FIRE AND GRAZING

Fire is not generally used as a management tool in the wetland community types (which comprise ninety-eight percent of this site). 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. Fire Management Guidelines in 2004 CNNF Forest Plan are listed in Appendix 3: *Forest Management Area Direction*.

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 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

Atkins-Hiles Swamp RNA is located on the Lakewood-Laona Ranger District of the Chequamegon-Nicolet National Forest, Forest County, in the state of Wisconsin. The RNA's Mercator coordinates are 45° 38-44' N latitude and 89° 2-4' W longitude. The RNA is approximately five miles (8 km) west of Hiles and 35 miles (56 km) east of Rhinelander.

See Establishment Record Identification Section for *Boundary Certification, Location Map* and *Boundary Map*.

(2) SIZE IN ACRES/HECTARES

The Atkins-Hiles Swamp Research Natural Area contains approximately 2,360 acres (955 hectares).

(3) ELEVATION RANGE

Elevations range from 1,650 feet (5.3 meters) to 1,700 feet (518 meters) above sea level.

(4) ACCESS TO THE SITE

This site is from 1.5 to 5 miles to the west and southwest of Hiles, Wisconsin. It is accessible from Highway 32 and Forest Roads 3902E (Brown Landing Rd), 3902W (Nelson Landing Rd), FR 2216, 2753 (Yellow Birch Rd), and 2186 (Atkins Rd) to the north and east, and Highway 45 and unnamed Oneida County roads to the west side (see Establishment Record Identification Section for *Location Map* and *Boundary Map*). An active line of the Canadian National Railroad marks the south boundary of the site. Another abandoned and overgrown railroad bed marks part of the north boundary.

(5) CLIMATIC DATA

The weather station nearest to Atkins-Hiles Swamp RNA is Long Lake Dam (station no. 474829 latitude 45 54' N longitude 89 07' W). The station is about 25 miles (40 km) northeast of the RNA and experiences similar weather. This station recorded temperature and precipitation data since 1908 (Midwestern Regional Climate Center 2003). Climatic Records for Long Lake Dam, Forest County, Wisconsin from the years 1908 to 2000 are given below.

Table 1. Temperature and Precipitation Data for Atkins-Hiles Swamp RNA from 1908 to 2000 (Midwestern Regional Climate Center 2003)

Temperature	°F	°C
Mean annual	39.6	4.2
Mean April through September	56.0	13.3
Mean October through March	23.1	-4.9
Average daily maximum	51.4	10.8
Average daily minimum	27.6	-2.4
Record high	105.0	40.6
Record low	-51.0	-46.1
Precipitation	in	cm
Mean annual rainfall	32.0	81.3
Mean April through September	21.4	54.4
Mean October through March	10.7	27.2
Mean annual snowfall	64.6	164.1

b. ECOLOGICAL DESCRIPTION

(1) ECO-REGION

Atkins-Hiles Swamp RNA is located in the Laurentian Mixed Forest Province (212), Northern Highlands Section (212X). The site is located in the Subsection Brule and Paint Rivers Drumlinized Ground Moraine (212Xc), of the Ecological Units of the Eastern United States (Cleland et al. 2007). It includes Land Type Associations (LTAs) Iron River/Argonne Drumlins (Xc01) and Argonne Outwash Plains (Xc02).

(2) PLANT COMMUNITY TYPES

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).

Atkins-Hiles Swamp RNA includes two general features: a portion of Hiles Swamp and upland glacial drumlin hills. Hiles Swamp is a large northern wet forest, with over 1,700 contiguous acres (688 ha) included within the complex. Black spruce (*Picea mariana*) and tamarack (*Larix laricina*) are the dominant canopy species, ericaceous shrubs are common, and the ground is a sphagnum mat.

Variation occurs in both the coverage and the relative abundance of the plant communities, as can be seen even on satellite images (Identification Section - *Landscape Overview*). A majority of the swamp is a muskeg habitat with stunted and sparse trees, containing both black spruce and tamarack, or just black spruce. Some areas are forested with taller and more abundant spruce and tamarack. The most diverse habitat occurs in predominantly open bog habitat at the north end. Here the sphagnum occurs in large hummocks with water trails in between. Trees are rare; shrubs may be frequent to sparse. Several herbaceous species, such as rose pogonia (*Pogonia ophioglossoides*), grass pink (*Calopogon tuberosus*), swamp pink (*Arethusa bulbosa*), alpine cotton-grass (*Trichophorum alpinum*), sparse flowered sedge (*Carex tenuiflora*), and white beak rush (*Rhynchospora alba*) were observed in this habitat.

Other habitats occur along the margin of Eagle River as it forms and winds its way through the swamp (Figure 2). These include alder thicket and northern sedge meadow, both with abundant wet sphagnum hummocks. Also within the swamp may be found several small islands of intact white pine (*Pinus strobus*) and red pine (*P. resinosa*) habitats, Kotar habitat type PMV (Kotar et al. 2002).

The two glacial drumlins within the complex feature a cover of northern mesic forest with northern wet-mesic forest occurring along the drumlin margins (Shackleford 1997). Most of the upland forest has a homogenous sugar maple overstory and understory. Several older intact eastern hemlock stands occur, some with supercanopy white pine.

The northern wet-mesic forest community includes both black ash (*Fraxinus nigra*) and mixed conifer swamp habitats. These swamps occur along the glacial drumlin margins include some unique habitats in the transition to northern wet forest. The highest quality upland stands within the complex are the pine islands within Hiles swamp.



Figure 2. The Eagle River begins as a tiny stream in the wetlands of Atkins-Hiles Swamp RNA. Photo by M. Brzeskiewicz 2012

Table 2. Natural vegetation community types within Atkins-Hiles Swamp RNA using common classification systems for Wisconsin (Curtis 1959 and Kotar et al. 2002) and NGDC (2013).

Community Type (Curtis 1959)	Habitat Types (Kotar et al. 2002)	Dominant Species	NVCS Associations (NGDC)*
Northern dry-mesic forest	PMV	white pine and red pine	Pinus strobus - (Pinus resinosa) - Quercus rubra Forest CEGLO02480
Northern mesic forest	TMC	hemlock hemlock and sugar maple	Tsuga canadensis - Acer saccharum - Betula alleghaniensis Forest CEGLO05044
Northern mesic forest	ATM	red maple, sugar maple	Acer saccharum - Tilia americana / Ostrya virginiana - Carpinus caroliniana Forest CEGLO02062
Northern mesic forest	ATD	sugar maple	Acer saccharum - Betula alleghaniensis - (Tilia americana) Forest CEGLO02457
Northern mesic forest	ATM	aspen, balsam fir	(Populus spp seral forest)
Northern wet-mesic forest	N/A	black ash, northern white cedar, and balsam fir	Fraxinus nigra - Mixed Hardwoods - Conifers / Cornus sericea / Carex spp. Forest CEGLO02105
Northern wet forest	N/A	black spruce and tamarack	Picea mariana-(Larix laricina)/Ledum groenlandicum/Sphagnum spp Forest CEGLO05271
Alder thicket	N/A	speckled alder	Alnus incana Swamp Shrubland CEGLO02381
Open bog	N/A	leatherleaf, Labrador tea	Chamaedaphne calyculata - Ledum groenlandicum - Kalmia polifolia Bog Dwarf-shrubland CEGLO05278
Northern sedge meadow	N/A	blue-joint grass, spotted joe-pye weed	Calamagrostis canadensis - Eupatorium maculatum Herbaceous Vegetation CEGLO05174 <u>or</u> Carex stricta - Carex spp. Herbaceous Vegetation CEGLO02258
flooded areas and ponds	N/A	Pondweed, Hornwort, Waterweed	Potamogeton spp. - Ceratophyllum spp. Midwest Herbaceous Vegetation CEGLO02282
	N/A	White water lily, bullhead lily - emergent	Nymphaea odorata - Nuphar (microphylla, variegata) Herbaceous Vegetation CEGLO02562

* These National Vegetation Classification System associations are initial approximations - further review needed.

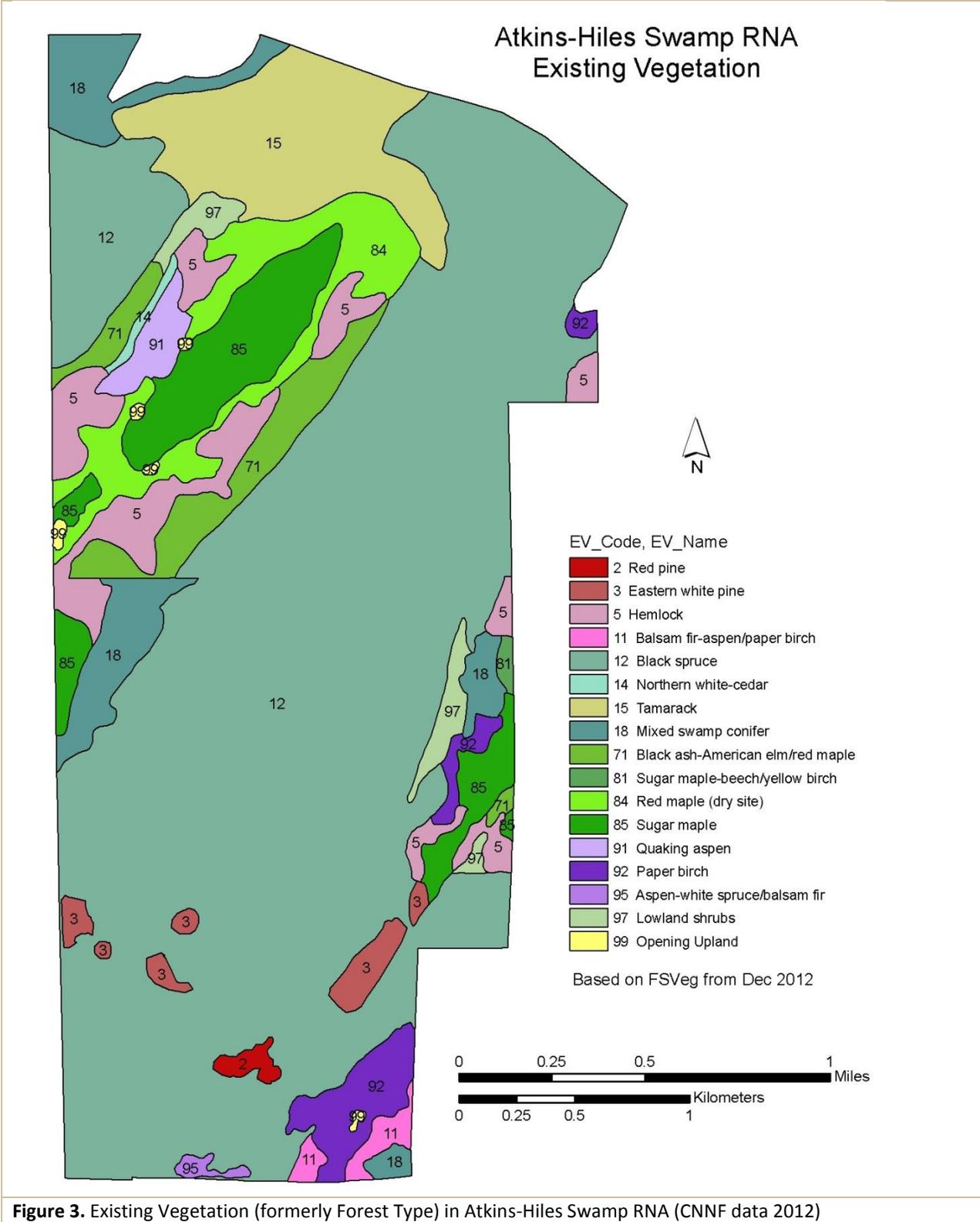


Figure 3. Existing Vegetation (formerly Forest Type) in Atkins-Hiles Swamp RNA (CNNF data 2012)

Table 3. Existing Vegetation (as dominant tree cover) and area in Atkins-Hiles Swamp RNA and key to Figure 3

EV Code	Existing Vegetation (EV)	Acres	Hectares
2	Red pine	7.3	2.9
3	Eastern white pine	29.6	12
5	Eastern Hemlock	124.6	50.4
11	Balsam fir-aspen/paper birch	15.3	6.2
12	Black spruce	1457.7	589.9
14	Northern white-cedar	5.1	2.1
15	Tamarack	167.3	67.7
18	Mixed swamp conifer	109.9	44.4
71	Black ash-American elm/red maple	79.4	32.1
81	Sugar maple-beech/yellow birch	3.7	1.5
84	Red maple (dry site)	107.2	43.4
85	Sugar maple	132.9	53.7
91	Quaking aspen	21.3	8.6
92	Paper birch	54.3	21.9
95	Aspen-white spruce/balsam fir	4.6	1.9
97	Lowland shrubs	30.4	12.3
99	Opening Upland	4.6	1.9
	Grand Total	2355.2	952.9

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

This site is embedded within an area recognized by the Wisconsin Bird Conservation Initiative as an *Important Bird Area* (IBA). Headwaters IBA provides essential habitat to one or more species of breeding or non-breeding birds (Steele 2007). The identification of a site as an IBA carries no legal status or regulatory requirements.

Botanists and ecologists surveyed representative portions of Atkins-Hiles Swamp in the late 1990s and the plants observed are listed in Table 4. This list is fairly complete but there are likely other plants that occur here.

(A) FLORA LIST

Table 4. Atkins/Hiles swamp flora list (compiled from Shackelford, 1997)

ATKINS/HILE SWAMP Vascular Plant List		ATKINS/HILE SWAMP Vascular Plant List	
Scientific name	Common name	Scientific name	Common name
<i>Abies balsamea</i>	balsam fir	<i>Agrostis gigantea</i>	redtop
<i>Acer rubrum</i>	red maple	<i>Alnus incana</i>	speckled alder
<i>Acer saccharum</i>	sugar maple	<i>Andromeda glaucophylla</i>	bog rosemary

ATKINS/HILE SWAMP Vascular Plant List	
Scientific name	Common name
<i>Anemone quinquefolia</i>	Canada anemone
<i>Aralia nudicaulis</i>	wild sarsaparilla
<i>Arethusa bulbosa</i>	swamp pink
<i>Arisaema triphyllum</i>	jack-in-the-pulpit
<i>Athyrium filix-femina</i>	lady fern
<i>Betula alleghaniensis</i>	yellow birch
<i>Betula papyrifera</i>	paper birch
<i>Betula pumila</i>	bog birch
<i>Botrychium virginianum</i>	rattlesnake fern
<i>Brasenia schreberi</i>	water-shield
<i>Calla palustris</i>	wild calla
<i>Caltha palustris</i>	marsh marigold
<i>Calopogon tuberosus</i>	grass pink
<i>Carex brunnescens</i>	sedge
<i>Carex cephalantha</i>	sedge
<i>Carex chordorrhiza</i>	cord-root sedge
<i>Carex crinita</i>	fringed sedge
<i>Carex disperma</i>	two-seeded sedge
<i>Carex interior</i>	sedge
<i>Carex intumescens</i>	swollen sedge
<i>Carex lacustris</i>	lake sedge
<i>Carex lasiocarpa</i>	wooly-fruit sedge
<i>Carex leptalea</i>	sedge
<i>Carex limosa</i>	sedge
<i>Carex magellanica</i>	boreal bog sedge
<i>Carex oligosperma</i>	few-seeded sedge
<i>Carex pauciflora</i>	few-flowered sedge
<i>Carex praegracilis</i>	sedge
<i>Carex projecta</i>	sedge
<i>Carex rostrata</i>	beaked sedge
<i>Carex tenuiflora</i>	sparse-flowered sedge
<i>Carex trisperma</i>	three-seeded sedge
<i>Carex tuckermanii</i>	sedge
<i>Chamaedaphne calyculata</i>	leatherleaf
<i>Chrysosplenium americanum</i>	golden saxifrage
<i>Cirsium palustre</i>	European swamp thistle
<i>Clinopodium vulgare</i>	wild basil
<i>Clintonia borealis</i>	yellow blue-bead lily
<i>Coptis trifolia</i>	goldthread
<i>Corallorhiza maculata</i>	spotted coralroot
<i>Corallorhiza trifida</i>	northern coral-root
<i>Cornus canadensis</i>	bunchberry
<i>Cornus stolonifera</i>	red-osier dogwood
<i>Cypripedium acaule</i>	pink lady's-slipper
<i>Drosera rotundifolia</i>	round-leaved sundew
<i>Dryopteris carthusiana</i>	spinulose wood fern
<i>Eleocharis elliptica</i>	elliptic spike-rush
<i>Epilobium coloratum</i>	eastern willow-herb

ATKINS/HILE SWAMP Vascular Plant List	
Scientific name	Common name
<i>Equisetum fluviatile</i>	river horsetail
<i>Equisetum sylvaticum</i>	woodland horsetail
<i>Eriophorum alpinum</i>	alpine cotton-grass
<i>Eriophorum vaginatum</i>	tussock cotton-grass
<i>Eriophorum viridicarinatum</i>	tall cotton-grass
<i>Fraxinus niger</i>	black ash
<i>Galium trifidum</i>	small bedstraw
<i>Galium triflorum</i>	sweet-scented bedstraw
<i>Gaultheria hispidula</i>	creeping snowberry
<i>Glyceria canadensis</i>	rattlesnake grass
<i>Glyceria striata</i>	fowl manna grass
<i>Gymnocarpium dryopteris</i>	oak fern
<i>Ilex mucronata</i>	mountain holly
<i>Iris versicolor</i>	wild blue flag
<i>Juncus brevicaudatus</i>	narrow-panicle rush
<i>Juncus pelocarpus</i>	brown-fruited rush
<i>Kalmia polifolia</i>	bog laurel
<i>Larix laricina</i>	tamarack
<i>Ledum groenlandicum</i>	labrador tea
<i>Linnaea borealis</i>	twinflower
<i>Listera cordata</i>	heart-leaf twayblade
<i>Lycopodium annotinum</i>	stiff clubmoss
<i>Lysimachia terrestris</i>	swamp candles
<i>Lysimachia thyrsiflora</i>	swamp loosestrife
<i>Maianthemum canadense</i>	Canada mayflower
<i>Malaxis unifolia</i>	adder's mouth
<i>Menyanthes trifoliata</i>	bog buckbean
<i>Mitella nuda</i>	naked miterwort
<i>Moneses uniflora</i>	one-flowered pyrola
<i>Monotropa uniflora</i>	indian pipe
<i>Osmunda cinnamomea</i>	cinnamon fern
<i>Osmunda regalis</i>	royal fern
<i>Oxalis montana</i>	mountain wood-sorrel
<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>Platanthera clavellata</i>	club-spur orchid
<i>Platanthera lacera</i>	ragged fringed orchid
<i>Platanthera obtusata</i>	blunt-leaf orchid
<i>Pogonia ophioglossoides</i>	rose pogonia
<i>Populus tremuloides</i>	trembling aspen
<i>Potentilla palustris</i>	marsh cinquefoil
<i>Pryola secunda</i>	one-sided pyrola
<i>Pteridium aquilinum</i>	bracken fern
<i>Puccinellia pallida</i>	pale false manna grass
<i>Rhynchospora alba</i>	white beak-rush
<i>Rubus pubescens</i>	dwarf red raspberry

ATKINS/HILE SWAMP Vascular Plant List	
Scientific name	Common name
<i>Rubus strigosus</i>	wild red raspberry
<i>Sagittaria latifolia</i>	common arrowhead
<i>Salix pedicellaris</i>	bog willow
<i>Sarracenia purpurea</i>	pitcher plant
<i>Scheuchzeria palustris</i>	arrow-grass
<i>Scirpus cyperinus</i>	wool-grass
<i>Scutellaria galericulata</i>	marsh skullcap
<i>Sium suave</i>	water-parsnip
<i>Smilacina trifolia</i>	false solomon's seal
<i>Spirea tomentosa</i>	steeplebush
<i>Stellaria longifolia</i>	chickweed
<i>Thelypteris phegopteris</i>	beech fern

ATKINS/HILE SWAMP Vascular Plant List	
Scientific name	Common name
<i>Thuja occidentalis</i>	northern white cedar
<i>Trichophorum alpinum</i>	alpine cotton-grass
<i>Trientalis borealis</i>	American starflower
<i>Tsuga canadensis</i>	eastern hemlock
<i>Typha latifolia</i>	broad-leaf cat-tail
<i>Utricularia intermedia</i>	flat-leaved bladderwort
<i>Vaccinium angustifolium</i>	early low blueberry
<i>Vaccinium macrocarpon</i>	cranberry
<i>Vaccinium myrtilloides</i>	velvet-leaf blueberry
<i>Vaccinium oxycoccus</i>	small cranberry
<i>Veronica scutellata</i>	marsh speedwell

(B) FAUNA LIST

A complete animal survey has not been prepared. Wildlife animals that are hunted or trapped are listed in section C(6) "Wildlife". Noteworthy among the resident avifauna are common loon, bald eagle, osprey, American bittern, black tern, and northern harrier. Bald eagles and osprey have been known to nest on the pine islands within Hiles swamp. Several boreal species are found in the conifer swamp and muskeg, most notably palm warbler, Lincoln's sparrow, gray jay, and boreal chickadee (Epstein 1986). The RNA includes the Nicolet Breeding Bird Survey site #103, which has been surveyed every other year since 1989 (Nicolet BBS 2004).

Table 5 . Birds of Atkins-Hiles swamp RNA (Epstein 1986 and Nicolet Breeding Bird Survey, 2004)

ATKINS-HILES SWAMP Bird List	
Common Name	Scientific Name
Pied-billed grebe	<i>Podilymbus podiceps</i>
American black duck	<i>Anas rubripes</i>
Mallard	<i>Anas platyrhynchos</i>
Blue-winged teal	<i>Anas discors</i>
Wood duck	<i>Aix sponsa</i>
Ring-necked duck	<i>Aythya collaris</i>
Ruffed grouse	<i>Bonsa umbellus</i>
Common loon	<i>Gavia immer</i>
Sandhill crane	<i>Grus canadensis</i>
Osprey	<i>Pandion haliaetus</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>
Common snipe	<i>Gallinago gallinago</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
Northern flicker	<i>Colaptes auratus</i>
Downy woodpecker	<i>Picoides pubescens</i>
Alder flycatcher	<i>Empidonax alnorum</i>
Tree swallow	<i>Tachycineta bicolor</i>
Black-capped chickadee	<i>Poecile atricapillus</i>
Red-breasted nuthatch	<i>Sitta canadensis</i>
Winter wren	<i>Troglodytes troglodytes</i>
Sedge wren	<i>Cistothorus platensis</i>

ATKINS-HILES SWAMP Bird List	
Common Name	Scientific Name
Golden-crowned kinglet	<i>Regulus satrapa</i>
Hermit thrush	<i>Catharus guttatus</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
Blue-headed vireo	<i>Vireo solitarius</i>
Grey jay	<i>Perisoreus canadensis</i>
Nashville warbler	<i>Vermivora ruficapilla</i>
Yellow-rumped warbler	<i>Setophaga coronata</i>
Palm warbler	<i>Setophaga palmarum</i>
Yellow warbler	<i>Setophaga petechia</i>
Chestnut-sided warbler	<i>Setophaga pensylvanica</i>
Northern parula	<i>Parula americana</i>
Black-and-white warbler	<i>Mniotilta varia</i>
Mourning warbler	<i>Oporornis philadelphia</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Common grackle	<i>Quiscalus quiscula</i>
Purple finch	<i>Carpodacus purpureus</i>
Savannah sparrow	<i>Passerella sandwichensis</i>
Lincoln's sparrow	<i>Melospiza lincolni</i>
Swamp sparrow	<i>Melospiza georgiana</i>
Song sparrow	<i>Melospiza melodia</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).

Bedrock of the *Iron River/Argonne Drumlins* and *Argonne Outwash Plains* Land Type Associations (LTAs) includes igneous, metamorphic, and volcanic rock that is between 50 and 5 feet from the land surface (Cleland et al. 2007). Geomorphologic processes include till deposition and glacial meltwater deposition. Surficial deposits include kame terraces and drumlin moraines.

(D) SOILS

Soils of the LTAs are very poorly drained nonacid organic soils that are found in the lowland areas along with well-drained loamy and sandy soils with a silt loam or sandy loam surface over non-calcareous gravelly sand (USDA Forest Service 2003a). Also present are moderately drained loamy soils with a silt loam or a fine sandy loam surface over a frangipan over non-calcareous loamy sand till. These soils are associated with the upland areas of the RNA which support upland plant community types such as mesic hardwood forest. Nutrient status is medium to rich and moisture regime is dry-mesic to mesic.

(E) TOPOGRAPHY

Although the topography of the LTA is rolling, most of the RNA consists of a nearly flat, poorly-drained wetland. The landform is undulating pitted and unpitted outwash plain between glacial *drumlin* uplands (Shackleford 1997).

(F) AQUATIC/RIPARIAN

The Eagle River has its origins within the swamp on the north end of the complex and drains north as it winds its way through the swamp for about 2 miles (3 km). Its banks consist of alder thicket and northern sedge meadow, both with abundant wet sphagnum hummocks (Figure 2). An unnamed creek forms in the south end of the complex and drains south into Atkins Lake outside the RNA.

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

Table 6. Threatened, endangered, and unique species in Atkins-Hiles Swamp RNA. State status and Natural Heritage Rank

Common Name	Scientific Name	State Status, Heritage Rank ¹
Swamp pink	<i>Arethusa bulbosa</i>	none, uncommon
Alpine cotton-grass	<i>Trichophorum alpinum</i>	none, uncommon on Forest
Sparse-flowered sedge	<i>Carex tenuiflora</i>	none, (formerly listed)
Common loon	<i>Gavia immer</i>	SC/M S3S4B
Bald eagle	<i>Haliaeetus leucocephalus</i>	SC/P S4B,S4N
Osprey	<i>Pandion haliaetus</i>	SC/M, S4B

Common Name	Scientific Name	State Status, Heritage Rank ¹
Northern harrier	<i>Circus cyaneus</i>	SC/M, S3B, S2N
Blue-winged teal	<i>Anas discors</i>	SC/M, S3S4B
Great-blue heron	<i>Ardea herodias</i>	SC/M, S4B
American bittern	<i>Botaurus lentiginosus</i>	SC/M, S3B
Black tern	<i>Chlidonias niger</i>	SC/M, S2B
Gray jay	<i>Perisoreus canadensis</i>	SC/M, S3B

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

(H) LIST OF RARE ELEMENTS AND RARE PLANT COMMUNITIES

None of the plant communities are particularly rare at this time. It is the large, continuous extent that makes the area unique and well-buffered from effects of external forces.

Table 7. Global and State Ranking of Plant communities present

Community Name	Global Rank	State Rank ¹
Northern dry-mesic forest	G4	S3
Northern mesic forest	G4	S4
Northern wet-mesic forest	G3?	S3S4
Northern wet forest	G4	S4
Alder thicket	G4	S4
Open bog	G5	S4
Northern sedge meadow	G4	S3

¹ 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*. Atkins-Hiles Swamp RNA is owned outright by the United States government and is administered by the USDA Forest Service, Chequamegon-Nicolet National Forest.

(1) MINERALS

Outstanding, Reserved, and Federal-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. The RNA has low to moderate potential for hardrock prospecting activity based on geology and recent hardrock prospecting permit activity in the County. There are currently no active prospecting permits within Atkins-Hiles Swamp RNA.

Table 8. Mineral resources within Atkins-Hiles RNA (CNNF data, 2005)

T.R.	Section	Acres*	Ha	Mineral ownership	Comments
37N 12E	7	120	49	Outstanding	Balance of acres Federal owned
		120	49	Reserved	Balance of acres Federal owned
	8	all	all	Federally owned	

	18	360	146	Reserved	Balance of acres Federal owned
	17	40	16	Reserved	Balance of acres Federal owned
	19	all	all	Federally owned	
	20	80	32	Reserved	Balance of acres Federal owned

Definitions:

Outstanding: Third party (mineral rights were not owned by the surface land owner when the land was sold to the National Forest) mineral ownership rights are described in deed and State Law. Forest Service must allow access to the surface to the mineral owner.

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's 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.

Statement of Mineral Claim was filed by the Forest Service: State of Wisconsin Law provides a way for a surface owner to file for and acquire the Outstanding mineral rights when those rights have become "dormant". Dormant mineral rights are acquired by filing a Statement of Mineral Claim.

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 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 - *Management Area Direction*).

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

The presence of rare plants and animals, particularly those with boreal affinities, makes this area a high priority for designation. The plant communities generally are undisturbed. The total forested acreage in the RNA is approximately 2,320 acres (939 hectares) which includes about 80% lowland and 20% upland forest types. Due to regeneration concerns the CNNF does not managed lowland forest.

The 2004 CNNF Forest Plan has 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 outside of RNAs, the permittee is provided with a map of areas that are off-limits to harvesting including RNAs. 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".

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

(4) WATERSHED VALUES

Hiles Swamp is a source of the Eagle River, a clear, slightly acid river with numerous game fish present. Eagle River connects a series of lakes locally called the Three Lakes Chain, which are highly desirable recreational lakes. Waters within this chain of lakes contribute to the water storage used to augment low flow in the Wisconsin River.

(5) RECREATION USE

The area may see some day-uses such as hiking, hunting, and trapping. Camping is allowed on National Forest lands but would be prohibited within the RNA if it threatened or interfered with the objectives or purposes for which the RNA was established (Appendix 3: *Forest Management Area Direction*). No recreational trails cross the RNA. The road leading in from industrial forest land to the west in section 18 may have to be gated to prevent illegal motorized use.

(6) WILDLIFE

Animals inhabiting the area that are commonly hunted or trapped include muskrat (*Ondatra zibethicus*), mink (*Mustela vison*), beaver (*Castor canadensis*), black bear (*Ursus americanus*), and white-tailed deer (*Odocoileus virginianus*) (Epstein 1986). Abundant waterfowl including loons, wood ducks, and black terns utilize nearby Atkins Lake and surrounding wetlands.

(7) TRANSPORTATION/ROAD SYSTEM

Several roads lead to or into the RNA (Identification Section - *Location and Boundary* maps). There is a short spur of road on the north end, outside the boundary of the RNA that is open to highway legal vehicle travel. Another old road on the west side extends from timber corporation land off the Forest into the upland portion of the RNA and is gated on the corporate land. This road is designated as closed to motorized use on the 2012 motor vehicle use map (USDA Forest Service 2012). No new roads or trails are planned. 2004 CENN Forest Plan Guidelines for RNAs state: 1) do not construct new roads and 2) restore all decommissioned roads to some level of landscape restoration (USDA Forest Service 2004a pg 3-53). An active line of the Canadian National Railroad marks the south boundary of the site (Fig 4).



Figure 4. Active Canadian National rail line that is the south boundary of Atkins-Hiles Swamp RNA. Photo by I. Shackleford 1997

d. HISTORICAL INFORMATION

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

The CNNF began a forest-wide ecological inventory to identify high quality ecological features in the early 1990s (Parker 1999). Atkins-Hiles Swamp 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 Natural Heritage Inventory Section of the Bureau of Endangered Resources (Wisconsin DNR) 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 Atkins-Hiles Swamp for protection.

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 with the CNNF in 2008 to co-designate all current and future RNAs and Special Management Areas (SMAs) as State Natural Areas.

Atkins-Hiles Swamp 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 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 Atkins-Hiles Swamp for establishment.

(2) CULTURAL/HERITAGE

USDA Forest Service cultural resource information indicates there are no known cultural sites recorded in Atkins-Hiles Swamp RNA (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 Atkins-Hiles 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

Atkins-Hiles Swamp RNA is bounded by Chequamegon-Nicolet National Forest land to the east and State of Wisconsin land to the west (*Atkins Lake and Hiles Swamp State Natural Area*). With the possible exception of the upland islands within Hiles Swamp, all upland stands have experienced past timber harvesting. The present distribution of small isolated large-diameter hemlock stands is likely a fragmentation of past vegetation management.

Old logging roads and log-skidding trails occur throughout upland areas and are rapidly reestablishing as forest. Within Hiles Swamp the overgrown railroad bed north of the Eagle River has affected the ground water flow. The higher elevation north side of the bed has significantly higher water than the south side. Weathering of this unused railroad bed may continue to change water levels in the future.

(4) OCCURRENCE OF EXOTIC SPECIES

There are few non-native invasive plants in and around Atkins-Hiles Swamp. The CNNF has developed an invasive plant strategy (USDA Forest Service 2009) that utilizes adaptive pest management to discover, prioritize, and control non-native invasive plants wherever they occur. There are two small populations of bull thistle (*Cirsium vulgare*) and European marsh thistle (*Cirsium palustre*) on the road on the north boundary that have been treated. There are other non-native plants such as sweet clover (*Melilotus officinalis*) and common tansy (*Tanacetum vulgare*) along the railroad right-of-way (Figure 4). These are lower priority for control on the Forest as of 2012.

e. OTHER INFORMATION

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

The RNA includes Nicolet Breeding Bird Survey (Nicolet BBS 2004) site #103. The Survey has collected data in Atkins-Hiles Swamp since 1987 which has been used in numerous publications. The RNA photo record is 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, reports, and journal articles that resulted from study within this RNA are listed in Appendix 2 – *Bibliography*.

(3) POTENTIAL RESEARCH TOPICS

Topics for study include muskeg wetland ecosystems, wet-mesic forest, and rare animals. Surveys of taxa not yet recorded include amphibians, reptiles, invertebrates, bats, and other mammals.

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

The sensitive animals and unique plants need to be protected from illegal off-road vehicle use. The road leading in from industrial forest land to the west in section 18 will be monitored to determine if further barriers are needed to prevent illegal motorized use. Protection and maintenance of Atkins-Hiles Swamp RNA is the responsibility of the Lakewood-Laona Ranger District, CNNF.

The abandoned railroad grade on the northern border impedes water movement to some degree (Figure 6). A hydrologic analysis to restore the surface water flow may be warranted.

There is potential for incompatible management on portions of lands adjacent to the RNA boundary. The entire three mile western RNA boundary also represents the Chequamegon-Nicolet forest proclamation boundary. Much of that boundary is corporate timber land, one half mile is privately owned, and one-fourth mile is State-owned land as of 2012. About one mile of the eastern boundary is private land in forty acre (16 ha) parcels.

A portion of the National Forest lands surrounding Atkins-Hiles Swamp RNA are designated for *Early Successional Aspen-Hardwood* (MA 1C) in the 2004 CNNF Forest Plan (USDA Forest Service 2004a pg 3-5). The site is bordered to the north by a protected area designated in the 2004 CNNF Forest Plan as *Old Growth and Natural Features Complex* (MA 8G) and by the *Argonne Experimental Forest* (MA 8A). The southern boundary is in another protected designation: the Atkins-Hiles Swamp CNNF *Special Management Area* (MA 8F). Approximately one-half mile of the boundary to the east is another portion of the Atkins-Hiles MA 8G. These management designations (8A, 8f, 8G) can be changed in future Forest plans.

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

The Atkins-Hiles Swamp RNA is does not include any lands designated by congress in any special management category such as Special Management Area.

g. PHOTOGRAPHS

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



Figure 5. “Dead-man’s fingers” fungal fruiting bodies emerging from the forest floor within a hemlock/hardwood stand [Ian Shackleford 1997]



Figure 6. Impounded waters above the old railroad right-of-way on the north side of Atkins-Hiles Swamp RNA [Shackleford 1997]

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.

BIBLIOGRAPHIC REFERENCES:

American Ornithological Union. 1983. Check-list of North American birds, 6th edition.

BCPL: Board of Commissioners of Public Lands. 2004. Wisconsin Public Land Survey Records: Original Field Notes. <http://bcpl.state.wi.us/asx/> Accessed October 12, 2004.

Cleland, D.T.; Freeouf, J.A.; Keys, J.E., Jr.; Nowacki, G.J.; Carpenter, C; McNab, W.H. 2007. Ecological Subregions: Sections and Subsections of the Conterminous United States [1:3,500,000] [CD-ROM]. Sloan, A.M., cartog. Gen. Tech. Report WO-76. Washington, DC: U.S. Department of Agriculture, Forest Service. Available online; http://fsgeodata.fs.fed.us/other_resources/ecosubregions.html

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

Epstein, E. 1986. Evaluation Report: Atkins Lake. Unpublished inventory report on file in Park Falls Chequamegon-Nicolet Office.

Hoffman, R. 1999. Site Evaluation on Atkins Lake, unpublished.

Kotar, J., J. Kovach, T. Burger. 2002. A Guide to Forest Communities and Habitats of Northern Wisconsin (2nd edition). Madison: University of Wisconsin, Department of Forest Ecology and Management. <http://dnr.wi.gov/org/land/er/communities/habitats.asp>

Midwestern Regional Climate Center. 2003. Historical Climate Data. Climate of the Midwest. http://mcc.sws.uiuc.edu/html/MWclimate_data_summaries.htm#. Accessed November 18, 2003.

NGDC. National Geographic Data Committee. 2012. National Vegetation Classification Standard (NVCS). Available online: <http://usnvc.org/explore-classification/> Accessed 2012.

Nicolet BBS. 2004. Nicolet National Forest Breeding Bird Survey. Bird Records on file in Park Falls Headquarters. <http://www.uwgb.edu/birds/nnf/index.htm>

Parker, Linda. 1999. Landscape analysis and design on the Chequamegon-Nicolet national forest. Unpublished Forest Service draft report on file in Park Falls office.

Shackleford Ian. 1997. Chequamegon-Nicolet National Forest Research Natural Area Evaluation Report: Atkins-Hiles Swamp. Unpublished reports on file in Park Falls Headquarters.

Tribal-USDA MOU. 2012 Memorandum of Understanding Regarding Tribal - USDA Forest Service Relations on National Forest Lands Within the Territories Ceded in Treaties of 1836, 1837, and 1842. Amended March 2012. Available online: http://www.fs.fed.us/spf/tribalrelations/documents/agreements/mou_amd2012wAppendixes.pdf and MOU Appendix A 1998 (amended from time to time): Off-reservation Gathering code, Tribal Wildernesses, Tribal Research Natural Areas, and Tribal Vehicle Permit Areas on National Forests.: http://www.baymills.org/resources/glifwic_wilderness_permits.pdf

Tyrrell, Lucy E., Faber-Langendoen, Don, and Snow, Kristin. 2000. Establishing a region-wide network of representative research natural areas (RNAs): an assessment for the eastern region's RNA framework. Unpublished Forest Service draft report on file in Park Falls office.

USDA Forest Service. 2003a. Chequamegon-Nicolet National Forest Soils (ELTP) Inventory Reports. On file in Park Falls Headquarters.

USDA Forest Service. 2003b. Chequamegon-Nicolet National Forest Heritage Site Points Shapefiles cd and database.

USDA Forest Service. 2004a. Chequamegon-Nicolet National Forests Land and Resource Management Plan. <http://www.fs.usda.gov/main/cnnf/landmanagement/planning>

USDA Forest Service. 2004b. Final Environmental Impact Statement to accompany the 2004 Land and Resource Management Plan. Available online at:
<http://www.fs.usda.gov/main/cnnf/landmanagement/planning>

USDA Forest Service. 2004c. Record of Decision, 2004 Land and Resource Management Plan. <http://www.fs.usda.gov/main/cnnf/landmanagement/planning> (select ROD at this website)

USDA Forest Service. 2012. Motor Vehicle Use Map (MVUM) Decision Notice and Finding of No Significant Impact. Available online: <http://www.fs.usda.gov/detail/cnnf>

USDA NRCS. 2003. Official Soil Series Descriptions. <http://ortho.ftw.nrcs.usda.gov/osd/osd.html> Accessed 2003.

USDA, NRCS. 2012. The PLANTS Database (<http://plants.usda.gov>, 25 November 2012). National Plant Data Team, Greensboro, NC 27401-4901 USA.

Watermolen, D.J.; M.D. Murrell. 2001. Checklists of Wisconsin Vertebrates (out of print). Wisconsin Department of Natural Resources. Now available online:
<http://dnr.wi.gov/files/PDF/pubs/ss/ss0954.pdf>

WGNHS: Wisconsin Geological and Natural History Survey. 2011. Wisconsin's Glacial Landscapes. An online publication updated December, 12, 2011. Accessed 1/13/2012:
http://wisconsingeologicalsurvey.org/ice_age.htm

WI DNR. 2010. Wisconsin Department of Natural Resources, NR-40 Invasive Species Rule, Sept. 29, 2010. Available from the DNR website at: <http://dnr.wi.gov> Link to NR-40 list:
<http://dnr.wi.gov/topic/Invasives/documents/NR40ListsSep292010.pdf>

WI DNR. 2011. State Natural Areas Program. Available online:
<http://dnr.wi.gov/topic/Lands/naturalareas/>

WI DNR. 2012. Natural Heritage Inventory, Wisconsin Department of Natural Resources Bureau of Endangered Resources. Online: <http://dnr.wi.gov/topic/nhi/>

WIDNR. 2013a. Wisconsin Watersheds and Basins Website. <http://dnr.wi.gov/topic/watersheds/> Accessed on January 13, 2013.

PUBLICATIONS FROM STUDIES ON RNA:

Howe, R.W. and L.J. Roberts. 2005. Sixteen Years of Habitat-based Bird Monitoring in the Nicolet National Forest. Pages 963-973 in Ralph, C.J. and T.D. Rich, editors. 2005. Bird Conservation Implementation and Integration in the Americas: Proceedings of the Third International Partners in Flight Conference. 2002 March 20-24; Asilomar, California, Volume 2. Gen. Tech. Rep. PSW-GTR-191. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 643 p.

Nieme, Gerald J., R.W. Howe, G.R. Sturtevent, L.R. Parker, A.R. Grinde, N.P. Danz, M. Nelson, E.J. Zlonis, N.G. Walton, E.E. Giese, S.M. Lietz. In Review. Analysis of long term forest bird monitoring in National Forests of the Western Great Lakes Region. General Technical Report NRS-GTR-##. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station.

APPENDIX 3 FOREST MANAGEMENT AREA DIRECTION

The management prescription for the Atkins-Hiles Swamp 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

USDA Forest Service, Chequamegon-Nicolet National Forest

Linda R. Parker, Forest Ecologist, Supervisor's Office
Steve Janke, Plant Ecologist, Lakewood Office
Deborah Veen, GIS Specialist, Supervisor's Office
Greg Knight, Forest Soil Scientist, Supervisor's Office,
Kim Potaracke, Assistant Forest Archeologist, Supervisor's Office
Randy Erickson, Land Surveyor, Supervisor's Office
David Campbell, Engineer - roads, Supervisor's Office
Mark Theisen, Forest Silviculturist, Supervisor's Office

Other Agencies, Groups, and Individuals Consulted:

Craig Anderson, NHI Program Botanist, WI Department of Natural Resources, Madison WI
Eric Epstein, NHI Program Community Ecologist, WI Department of Natural Resources, Madison
Randy Hoffman, Conservation Biologist, WI Department of Natural Resources, Madison WI
Thomas Meyer, Conservation Biologist, WI Department of Natural Resources, Madison WI
Eunice Padley, Forest Ecologist, WI Department of Natural Resources, Madison WI
Bill Smith, NHI Program Zoologist, WI Department of Natural Resources, Madison WI
Sue M. Lietz, Forester, USFS Northern Research Station, Rhinelander WI

Eastern Region RNA Review Committee 2012:

Sue Lietz, Forester, Northern Research Station
Linda R. Parker, Ecologist, Chequamegon-Nicolet National Forest
Greg Nowacki, Regional Ecologist, Forest Service Eastern Region
Diane Burbank, Green Mountain/Finger Lakes NF
Christel Kern, Research Forester, Northern Research Station
Jennifer Pontius, Research Assistant Professor, University of Vermont Rubenstein School of
Environment and Natural Resources and Research Ecologist, USDA Forest Service
Northern Research Station