MAF: HIAWATHA N.F. RNA

LITTLE WAISKA BASIN

CANDIDATE RESEARCH NATURAL AREA

HIAWATHA NATIONAL FOREST

ESCANABA, MI 49829

SUBMITTED BY:

MICHIGAN NATURAL FEATURES INVENTORY

DENNIS ALBERT

ECOLOGIST

PRELIMINARY REPORT: 31 MAY 1988

FINAL REPORT: 30 SEPT. 1988

D A Albert

Dennis A. Albert

30 SEPT. 1988

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A. Background

1. Historic setting

General Land Office Surveyors under the direction of Harvey Mellen surveyed T46N R3W and T47N R3W in 1849. The area of the proposed Research Natural Area was described as level land containing large swampy areas and dissected by several streams. The drier areas supported forests of sugar maple, hemlock, yellow birch, red maple, spruce, white pine, and fir. The wetter areas supported spruce, tamarack, and cedar swamp. One to two miles to the north and west of the proposed RNA, the surveyors noted pine plains, locally almost devoid of timber.

The entire area was logged, probably between 1880-1900, when much of the eastern Upper Peninsula was harvested for timber. Logging on the upland areas eliminated white pine and hemlock, and neither species has shown good regeneration over most of the proposed RNA. Instead, trembling aspen, paper birch, and red maple increased in dominance after the fires which followed logging. Wetter areas, which supported swamp species, were also cut, and many also burnt following logging. The dominants-spruce, tamarack, cedar, and hemlock-regenerated following fire. As a result, the swamp forests are presently more characteristic of the original "pre-logging" forest than are the drier-site forests.

Cutting also occurred in some of the steep ravines in sections 1 and 36. These forests were originally dominated by northern hardwoods, including sugar maple, red maple, and yellow birch, and some hemlock, cedar, and white pine. Regeneration was good for all of these species in the ravines. Some of the deepest ravines appear to have never been cut, and support mature and overmature timber. Slumping and windthrow are common in these ravines, naturally limiting the age of many trees.

2. Description of physical characteristics

The soils of the proposed RNA represent a narrow band of lacustrine clay, 2-3 miles wide, bounded on the east by a high wave-cut escarpment. These clay soils are 40-50 ft thick, and are exposed in the sides of the ravines of the Little Waiska River and its tributaries. A glacial lake bed with clay and loam soils is located immediately to the east, at the base of the high wave-cut escarpment. To the west of the proposed RNA, the soils are generally sandy outwash deposits.

Most of the clay plain is level, with minor depressions which are occupied by swamp. Post-glacial erosion has formed deep ravines, which extend back from the wave-cut escarpment 1-2 miles in the proposed RNA. A thin layer of fine sand covers the clay soils, and appears to increase in thickness to the west. The surface soils in Sections 35 and 2 are sand, whereas those in the eastern half of Section 1 are clay or clay loam. In the eastern portions of Sections 35 and 2, underlying clay soils may be close to the surface, as moderately-well drained and poorly drained soils are common.

B. Justification and Features

1. Geographic significance

The proposed RNA is one of the few large, forested areas on moderately-well drained clay soils in the eastern Upper Peninsula. Clay soils are common to the east on the clay lake plain, but almost all of these lands, except the most poorly drained areas, have been converted to pasture. Similar lands exist along Lake Superior, in the western part of the Upper Peninsula, but the cutting history has been much more severe there, and it is doubtful any forested tracts representative of original forested conditions remain.

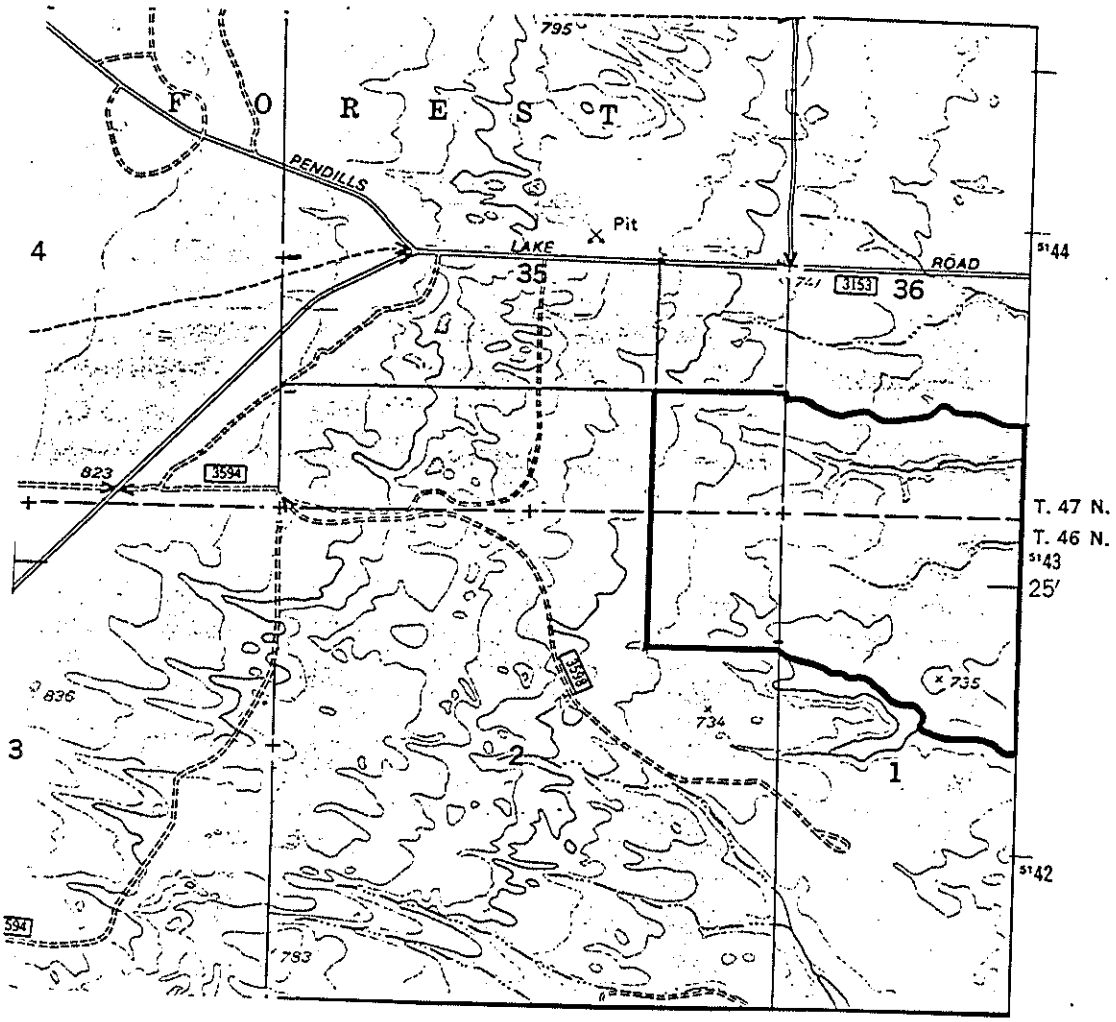
2. Importance to RNA program objectives

The high quality of the Hardwood-Conifer Swamps and the Mesic Northern Forest in the ravines warrants their protection within an RNA. Good examples of the Hardwood-Conifer Swamp forest type on clay lake deposits are very uncommon. The remaining red-maple dominated forest on the moderately well drained clay lake plain will serve primarily as buffer for the higher quality forests in the swamp and ravine.

The original boundaries of the candidate RNA, as proposed by the Hiawatha National Forest (Figure 1), did not include large portions of the Hardwood-Conifer Swamp, but instead included primarily those portions of the clay plain most heavily impacted by the 1880-1900 logging. The modified boundaries, drawn on the basis of public comment (Figure 2), included all of the area recommended by the Hiawatha N. F., plus other areas to the south and west with even more severe and recent disturbance. Based on my 1987 field survey, the parcel in Section 25 is almost entirely disturbed, including a large area of recent clearcut. These areas alone do not merit protection under the RNA program.

Based on MNFI's 1987 field survey and further aerial photo interpretation, I am recommending the boundaries of the proposed RNA be modified to those shown in Figure 3. This modification allows for the inclusion of large areas of the plant communities (Figure 4) least modified by past logging, those being the shallow basins (swamps) dominated by cedar, hemlock, white spruce, white pine, yellow birch, and red maple, the steep ravines dominated by northern hardwoods, and some of the drier areas between the steep ravines, which are still dominated by mature and overmature white pine and hemlock. Included in this revised RNA are areas, such as along the western edge, which have regenerated to red maple, trembling aspen, and paper

Map No. 8



Little Waiska Basin

Hiawatha National Forest
Candidate Research Natural Area

Gross Acres:
261

T46N, R3W
T47N, R3W

NFS Acres
261

Figure 1. Original proposed Little Waiska Basin RNA boundaries as proposed by the Hiawatha National Forest.

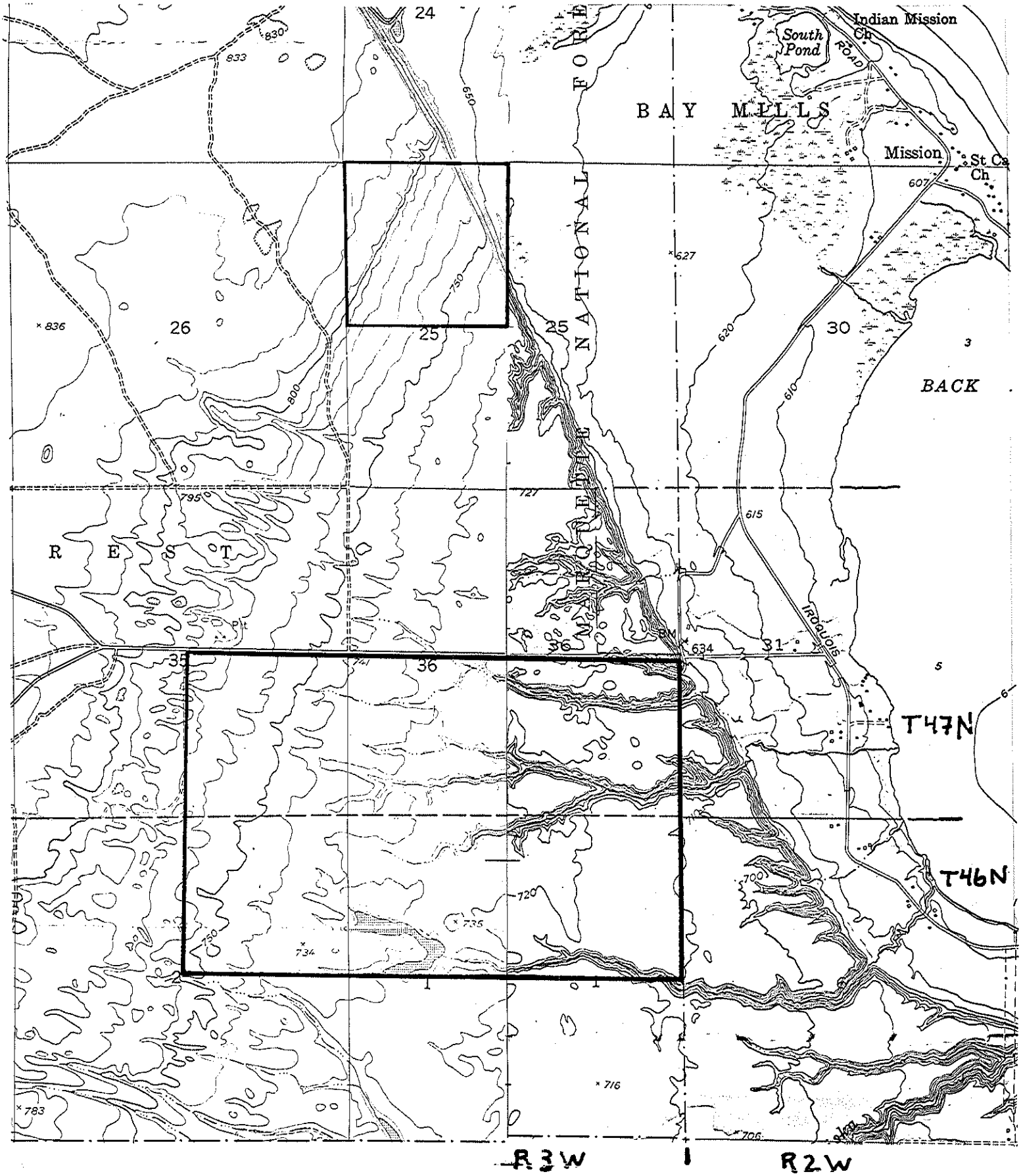


Figure 2. Boundaries of the Little Waiska Basin proposed RNA as revised on the basis of public recommendations.

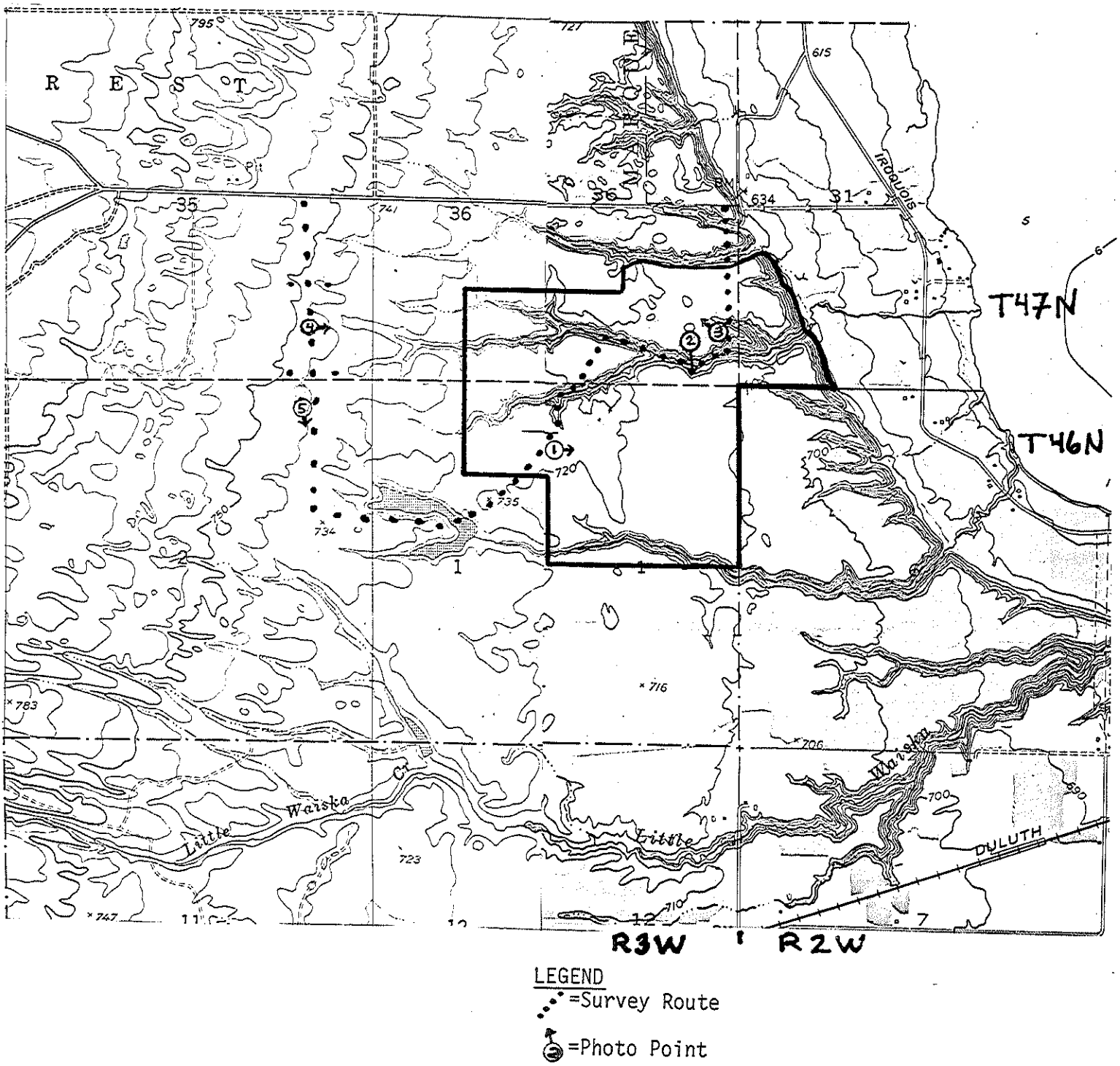
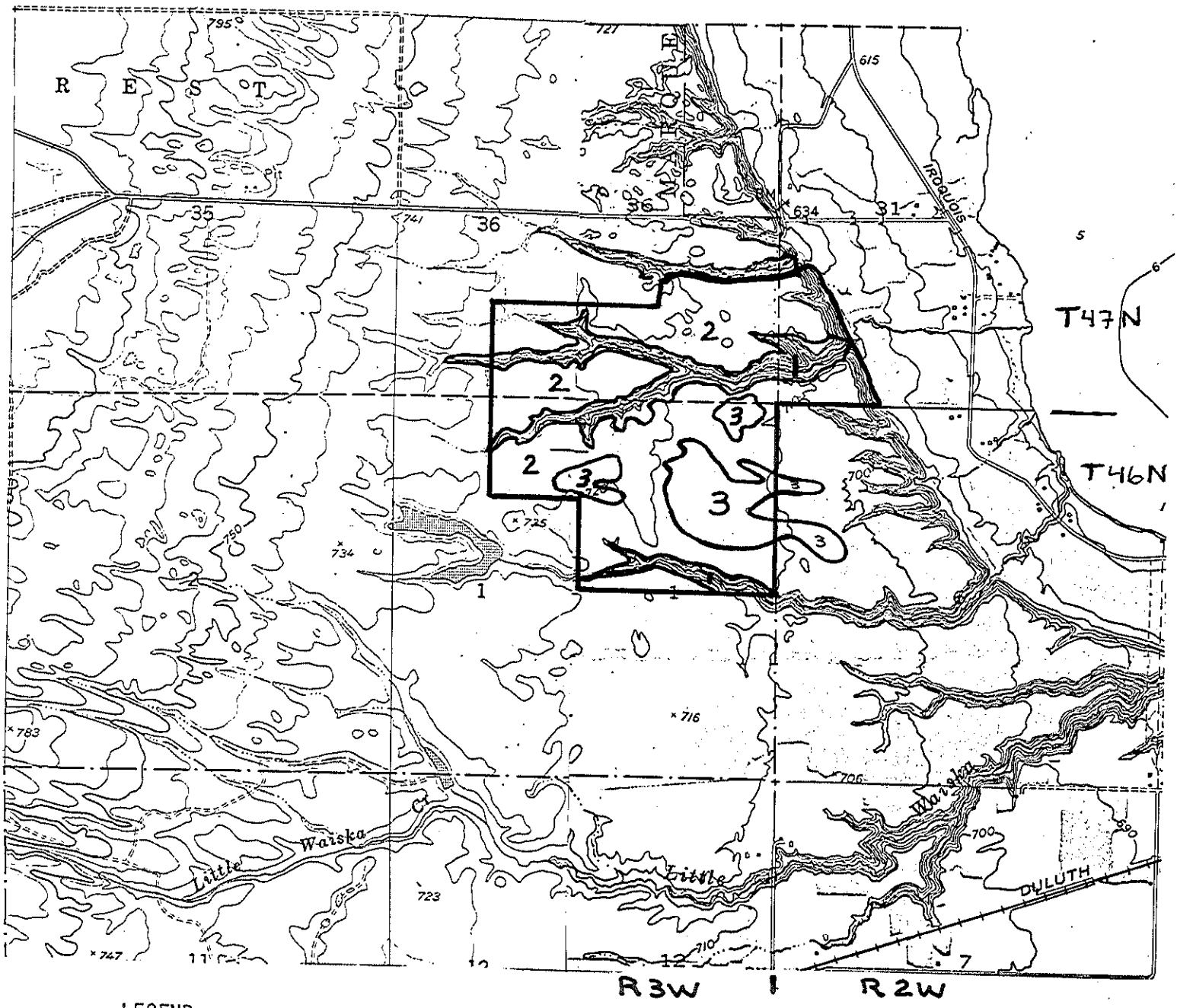


Figure 3. Boundaries of the Little Waiska Basin proposed RNA based on MNFI field surveys and further aerial photo interpretation.



LEGEND
1=Mesic Northern Forest along steep ravines (sugar maple, yellow birch, red maple).
2=Mesic Northern Forest on flat clay plain (red maple, trembling aspen, paper birch; white pine and hemlock stumps, but no regeneration)
3=Hardwood-Conifer Swamp

Figure 4. Plant Communities of the proposed Little Waiska Basin.

birch after the cutting of hemlock and white pine. However, the area of this disturbed forest type has been greatly reduced by revising the boundaries.

As proposed in this report, MNFI's boundaries would provide protection for significant Mesic Northern Forest (S.A.F. 25) within the ravine, small areas of Mesic Northern Forest dominated by hemlock and white pine (S.A.F. 22) along the ridgetops between the ravines, and Hardwood-Conifer Swamp (S.A.F. 37 and 39) in shallow depressions in the clay lakeplain.

3. Impact of alternative designation

Present Management Area designations include 8.1 and 4.2 (Hiawatha National Forest 1986), as shown in Figure 5. The area presently designated as Management Area 8.1 includes high quality Mesic Northern Forest within and immediately adjacent to the ravine, and highly disturbed forest dominated by red maple on most of the flat clay plain. My revisions of the proposed RNA boundaries attempted to minimize the amount of red maple forest within the RNA boundaries.

Portions of the area designated Management Area 4.2 are high quality Hardwood-Conifer Swamp, which has regenerated well since it was cut in the late 19th or early 20th century. Management Area 4.2 emphasizes conifer sawlog production, which would obviously destroy the Natural Area value of the Hardwood-Conifer Swamp. The present 4.2 designation would probably result in the eventual cutting of everything but the steep ravines. We attempted to include a large block of quality Hardwood-Conifer Swamp within the revised RNA boundary proposal.

Although a 9.1 designation could suffice to protect the ecological value of this site, its significance as a high-quality remnant of a now rare natural landscape type merits the greater recognition and protection afforded by RNA designation.

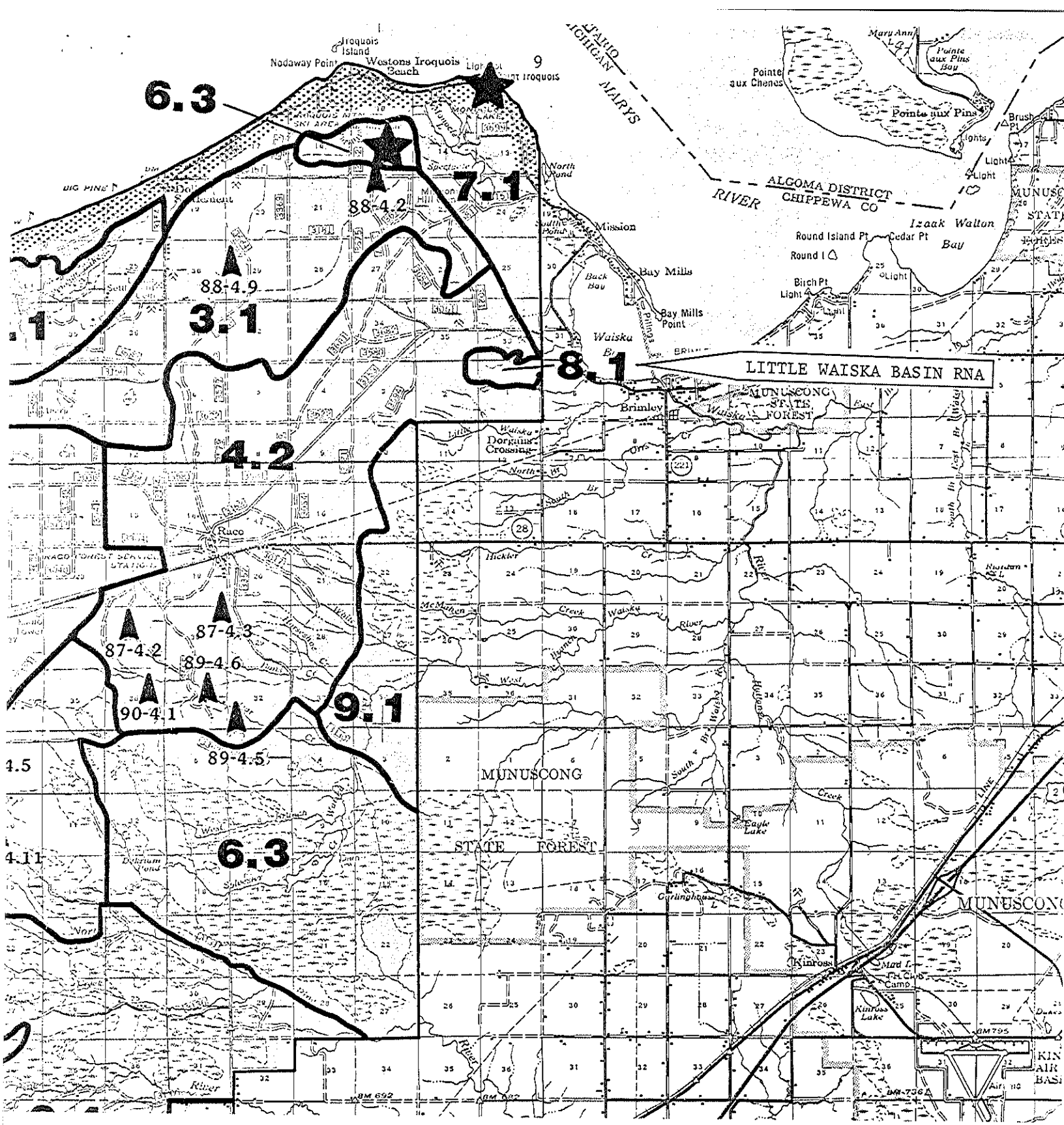


Figure 5. Management Area designations in and adjacent to the Little Waiska Basin RNA (Hiawatha National Forest 1986).

4. Historical activity/interest in site

Although no known historical activity is documented, several foresters have expressed an academic interest in the red-maple dominated forests of the proposed RNA. The overstory composition of the red-maple forest is not typical of the original forest composition, but is instead an artifact of 19th century logging practices. The original forest contained a high percentage of white pine and other conifers which did not regenerate following logging and post-logging fires. The swamp and ravine forests in MNFI's revised proposal are more typical of the original forest composition on the clay plain.

C. Significant elements (natural features)

1. Natural communities (See description under F. Flora, page 9)

a. Mesic Northern Forest. Federal: G4 State: S4 Grade: B
Forest Cover Type 22 (white pine-hemlock) and
25 (sugar maple-beech-yellow birch)

b. Hardwood-Conifer Swamp. Federal: G4 State: S4? Grade: B
Forest Cover Type 37 (northern white-cedar) and 39 (black ash-American elm-red maple)

2. Special plants

No rare or endangered species were noted, but an interesting western disjunct of restricted regional distribution, Adenocaulon bicolor (trail-plant), was common on the open, slumping lower slopes of the steep ravines.

3. Special animals

None surveyed.

4. Geologic features

The proposed RNA lies on a small area of glacial lake bed with clay soils, located above a larger clay lake bed. Lacustrine clay deposits are

common at the eastern end of the Upper Peninsula of Michigan. The RNA has no special geological significance.

5. Aquatic features

None surveyed.

6. Other special features

None noted.

D. Area of natural communities

The natural communities are shown on Figure 4. The most significant communities are the Hardwood-Conifer Swamp, totalling approximately 40 acres, and the northern hardwoods forest on the steep ravines, totalling approximately 100-120 acres. The remainder consists primarily of disturbed Mesic Northern Hardwoods, with the majority of the original white pine and hemlock removed. Within 50-100 years, natural disturbance, primarily windthrow, may allow natural regeneration of these conifers. At present these disturbed forests function primarily as buffer to the swamp and steep ravines.

At the drier upper edges of the ravines there are small areas dominated by hemlock and white pine, such as the area photographed in southeastern Section 36 (Figure 4, photo point 3). These are small areas not denoted on the plant community map (Figure 4).

E. Climatic conditions

The proposed RNA is located in north-central Chippewa Co., in the Rudyard Subdistrict of the Mackinac District of Eastern Upper Michigan, an area with a strong lacustrine influence from the nearby Great Lakes (Albert, Denton, and Barnes 1986). As a result of the lacustrine influence, winter low temperatures are higher than in the western Upper Peninsula, but lake-effect snows are responsible for increased snowfall.

F. Flora

1. Plant communities

a. Mesic Northern Forest

The soils of the forest are generally only moderately well drained. As a result, several swamp species, including cedar, balsam fir, white spruce, trembling aspen, and red maple, are common, in addition to species associated with more well drained conditions, such as sugar maple, yellow birch, and basswood. Cutting has removed white pine and hemlock, which were originally common, from many areas.

Within the steep ravines, mature and overmature sugar maple, red maple, and yellow birch are common dominants. White pine, hemlock, and cedar are also present on the steep slopes. Ferns and herbs typically associated with streams or wetlands, such as Matteuccia struthiopteris (ostrich fern) and Caltha palustris (marsh marigold), are common on the saturated clay banks of the ravine. The western disjunct, Adenocaulon bicolor (trail-plant), is also locally common on these open clay slopes.

On the dry plateau between the ravines, mature and overmature hemlock and white pine form small stands. The groundcover beneath these conifers indicates the dry, acidic conditions of the organic layer. Typical species are Coptis groenlandica (goldthread) and Clintonia borealis (blue-bead lily).

b. Hardwood-Conifer Swamp

The swamp occupies shallow depressions in the flat clay plain. The overstory is diverse, including cedar, hemlock, balsam fir, white spruce, white pine, trembling aspen, red maple, and black ash. Regeneration of both hardwood and conifer species has been good. Many of the larger conifers are in the same size range as the larger cut stumps, indicating that the swamp forests

are reaching maturity.

2. Natural quality and conditions

The natural quality of the Hardwood-Conifer Swamps and the Mesic Northern Hardwoods in the ravines is high. However, the overstory composition of the Mesic Northern Forests on the flat clay plain has changed greatly due to cutting, and these stands will require a long period of time to return to their original condition. They can only be treated as buffer to the ravines and swamps at this time.

3. Methods

Aerial photos were consulted before doing field reconnaissance and were used to delineate boundaries of the plant communities. Aerial photos from 1939, 1978, and 1986 were compared to determine past disturbance history and the original General Land Office survey notes were studied to understand the original vegetation. Field survey was conducted during the summer of 1987 to determine both abiotic conditions, such as mineral soil and organic soil characteristics, and also to determine forest stand composition and structure and ground cover composition. Photographs of the site are attached at the end of the report and photo points are shown on Figure 4. A species list was produced for the plant communities (Appendix Ia-b).

G. Fauna

No survey of the fauna was conducted.

H. Wildlife and plant values

1. Habitat/management requirements (special plants and animals)

There were no special plants noted during the survey and therefore no management recommendations are being made. No special management is

recommended for the forests of the proposed RNA.

2. Population trends

Not applicable.

I. Management needs

In general, present management, excluding further logging, is adequate for the survival of the high quality plant communities present.

J. Administrative records

The Michigan Natural Features Inventory will maintain element occurrence information on the Hardwood-Conifer Swamp and on the Mesic Northern Forest along the steep ravines in its data base. The majority of the Mesic Northern Forest located on the flat clay plain has been too greatly altered to qualify for entry in our data base.

K. References

1. Literature cited

Albert, D. A., S. R. Denton, and B. V. Barnes. 1986. Regional Landscape Ecosystems of Michigan. School of Natural Resources, University of Michigan.

Hiawatha National Forest. 1986. Land and Resource Management Plan. United States Department of Agriculture, Forest Service, Eastern Region.

Michigan Natural Features Inventory. 1986. Draft description of Michigan natural community types. (Unpublished manuscript, revised 6 March 1986).

Society of American Foresters. 1940. Forest Cover Types of the Eastern United States. Washington, D. C.

2. Additional references

Albert, D. A. 1987. Field survey notes.

L. Appendices

Appendix Ia.

Mesic Northern Forest Site Name: Little Waiska Basin Surveyor: Dennis A. Albert

D=dominant, codominant U=uncommon LD=locally dominant Date: 9-4-1987
A=abundant R=rare LC=locally common
C=common I=characteristic E=exotic

LD	Abies balsamea		Equisetum sylvaticum	LC	Thelypteris phegopteris		MOSSES
D	Acer rubrum		Erythronium americanum		Tilia americana	LC	Sphagnum girgensohnii
D	A. saccharum		Fagus grandifolia	C	Trientalis borealis	LC	Polytrichum juniperinum
C	A. spicatum		Fraxinus americana	LC	Trillium cernuum	LC	Sphagnum squarrosum
	A. pensylvanicum		F. nigra		T. grandiflorum	LC	Mnium sp.
C	Actaea alba		Galium lanceolatum	LD	Tsuga canadensis		
LC	A. rubra		G. triflorum		Ulmus americana		
	Adiantum pedatum		Geranium robertianum		U. rubra		
	Anemone quinquefolia	LC	Gymnocarpium dryopteris		Uvularia grandiflora		
U	Aralia nudicaulis		Hepatica americana		U. sessilifolia		
LC	A. racemosa		Hystrix patula		Viola canadensis		
	Arisaema triphyllum		Laportia canadensis		V. cucullata		
	Aronia nudicaulis		Lonicera canadensis		V. incognita		
LC	Aster macrophyllus	U	L. oblongifolia	LC	V. pubescens		
	Aster	LC	Lycopodium annotinum	C	V. selkirkii		
LC	Athyrium filix-femina	C	L. lucidulum				
	A. thelypteroides	C	L. obscurum	C	Amelanchier arb.		
LD	Betula alleghaniensis	C	Maianthemum canadense	LC	Pteridium aquilinum		
	B. papyrifera	LC	Medeola virginiana	LC	Lycopodium clavatum		
	Botrychium lanceolatum		Milium effusum	LC	Coptis groenlandica		
	B. virginianum	C	Mitchella repens	LC	Cornus canadensis		
LC	Carex aretata		Mitella diphylla	LC	Schizachne purpurascens		
	C. brunnescens		M. nuda	U	Ranunculus sceleratus		
	C. communis	C	Onoclea sensibilis	LC	Sanicula marilandica		
	C. deweyana		Oryzopsis asperifolia	LC	Brachyelytrum erectum		
C	C. intumescens		Osmorhiza claytoni	LC	Populus balsamifera		
	C. leptonervia	C	Osmunda claytoniana	LL	Salix sp. (shrub)		
	C. nigro-marginata		Ostrya virginiana	LC	Adenocaulon bicolor		
	C. pendunculata	LC	Oxalis montana	U	CORNUS ALTERNIFOLIA		
	C. plantaginea	LD	Picea glauca				
	C.	LD	Pinus strobus				
	C.		Polygonatum pubescens				
	Carya cordiformis		Populus grandidentata				
	Caulophyllum thalictroides		P. tremuloides				
	Cinna latifolia		Prunus serotina				
	Circaea alpina		Quercus alba				
	C. quadrisulcata		Q. borealis				
	Claytonia caroliniana		Ranunculus recurvatus				
	C. virginica		Ribes cynosbati				
C	Clintonia borealis		R. triste				
	Corylus cornuta		Sambucus pubens				
	Dentaria diphylla		Scutellaria lateriflora				
	Dicentra canadensis	C	Smilacina racemosa				
	Dirca palustris		Sorbus americana				
C	Dryopteris intermedia	C	Streptopus roseus				
	D. spinulosa	C	Taxus canadensis				
	Epifagus virginiana	LD	Thuja occidentalis				

Appendix Ib.
Hardwood-Conifer Swamp

Site Name: Little Waiska Basin   Surveyor: Dennis A. Albert

Date: 9-4-1987

D=dominant, codominant U=uncommon L=local
A=abundant I=infrequent E=exotic
C=common R=rare In=indicator *=special plant

LD	Abies balsamea
D	Acer rubrum
LD	A. saccharum
C	A. spicatum
LC	Adiantum pedatum
	Agrostis perennans
LC	Alnus rugosa
	Andromeda glaucophylla
	Anemone quinquefolia
C	Aralia nudicaulis
	Arceuthobium pusillum
	Arisaema triphyllum
LC	Aster macrophyllus
LC	Athyrium felix-femina
LC	Actaea rubra
LD	Betula allegheniensis
LD	B. papyrifera
	Botrychium virginianum
C	Caltha palustris
	Carex arctata
	C. brunnescens
	C. canescens
	C. comosa
LC	C. crinita
	C. disperma
	C. interior
LC	C. intumescens
	C. leptalea
	C. leptonervia
C	C. oligosperma
	C. pauciflora
	C. pedunculata
	C. projecta
LC	C. trisperma
	Cardamine pensylvanica
	Chamaedaphne calyculata
	Chrysosplenium americanum
	Cinna latifolia
C	Circaea alpina
C	Clintonia borealis
C	Coptis groenlandica
	Corallorhiza trifida
C	Cornus canadensis
	C. stolonifera

	Corylus cornuta
LC	Cypripedium acaule
	C. reginae
C	Diervilla lonicera
	Dryopteris cristata
	D. intermedia
	Epilobium adenocaulon
	Equisetum fluviatile
	E. scirpoides
LC	E. sylvaticum
	Eriophorum spissum
	E. tenellum
	E. virginicum
	Fraxinus nigra
	Gaultheria hispidula
	G. procumbens
	Geum rivale
	Glyceria canadensis
	Goodyera repens
LC	Gymnocarpium dryopteris
LC	Glyceria striata
	Habenaria clavellata
	H. hyperborea
	H. media (hybrid)
	H. obtusata
	Ilex verticillata
C	Impatiens biflora
	Iris versicolor
	Kalmia polifolia

	Laportea canadensis
	Larix laricina
	Ledum groenlandicum
	Linnaea borealis
	Listera convallarioides
	Lonicera canadensis
	L. villosa
C	Lycopodium annotinum
C	L. lucidulum
LC	Lycopus uniflorus
	Maianthemum canadense
	Mileum effusum
	Mitella nuda
	Mnium
LC	MATTEUCHIA STREUTT
	Nemopanthus mucronatus
	Onoclea sensibilis
	Osmunda cinnamomea
	O. regalis
C	Oxalis montana
	Parthenocissus vitacea
LD	Picea glauca
	P. mariana
	Pinus banksiana
LD	P. strobus
	Potentilla palustris
LC	Polygonum biflorum
LC	Petasites palmatum
	Rhamnus alnifolius
	Ribes americanum
	R. glandulosum
	R. hirtellum
	R. lacustre
	R. triste
	Rubus idaeus
C	R. pubescens
	Rumex verticillatus
LC	Ranunculus septentrionalis

	Salix pedicillaris
	Sarracenia purpurea
C	Scutellaria galericulata
	S. lateriflora
	Sium suave
	Smilacina trifolia
	Solanum nigrum
C	Sphagnum squarrosum
	Stellaria calycantha
	Streptopus amplexifolius
	S. roseus
LC	Sorbus americana
C	Taxus canadensis
	Thelypteris phegopteris
	Thuja occidentalis
	Trientalis borealis
U	Tiarella cordifolia
	Ulmus americana
	Vaccinium angustifolium
	V. myrtilloides
C	V. ~~oxycoccos~~ ovalifolia
	Viola blanda
	V. cucullata
	V. pallens
C	V. selkirkii
LC	Carex gynocrates
LC	Viburnum lentago

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

PHOTOGRAPHER: Dennis A. Albert

HEADQUARTERS UNIT: MNFI

LOCATION: Lansing, MI

DATE SUBMITTED: 31 May 1988

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

TEMP. NO. (1)	PERMANENT NO. (To be filled in by the WO) (2)	SELECTED FOR W.O. PHOTO LIBRARY (3)	DATE OF EXPOSURE (4)	LOCATION (State and National Forest or County) (5)	DESCRIPTION OF VIEW (6)
1			9-4-1987	Little Waiska Basin RNA Chippewa Co. T46N R3W NE4 of NW4 of Sec. 1	Hardwood-Conifer Swamp dominated by cedar, hemlock, balsam fir, white spruce, yellow birch, red maple, and scattered white pine. Located in small depression and surrounded by mesic to wet-mesic northern forest. Soil is clay or clay loam.
2			9-4-1987	T47N R03W SE4 of SE4 of Sec. 36	Slumping clay bank along steep ravine. Fallen tree is 24 inch diameter hemlock.
3			9-4-k987	T47N R03W SE4 of SE4 of Sec. 36	A small stand of hemlock and white pine located on a dry plateau between two steep ravines.
4			9-4-1987	T47N R03W SE4 of SE4 of Sec. 35	Logging road (old) in mesic northern forest. The trees are 6-9 inch red maple, paper birch, and trembling aspen with understory balsam fir common.
5			9-4-1987	T46N R03W NE4 of NE4 of Sec. 2	A small stand of mature hemlock and cedar in a small moist depression. Hemlock and white pine regeneration is poor over large areas in this portion of the tract.