

OGONTZ BAY
CANDIDATE RESEARCH NATURAL AREA
HIAWATHA NATIONAL FOREST
ESCANABA, MI 49829

SUBMITTED BY:

MICHIGAN NATURAL FEATURES INVENTORY

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A handwritten signature in cursive script, reading "D A Albert", is written over a horizontal line.

Dennis A. Albert

30 SEPT. 1988

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A. Background

1. Historic setting

General Land Office Surveyors provided relatively cursory descriptions of the landscape and vegetation during several traverses that took them through representative portions of the proposed RNA area. Little reference was made to physiography other than noting the low ridges that were encountered in addition to rolling and level land. The ridges were described as having sandy soil and being "3rd rate", wooded with hemlock, paper birch, poplar, balsam fir, red maple, and scattered large white pine. Level and rolling areas (excluding swamp) were forested with similar timber and considered 3rd and 2nd rate. Swampy portions were described as being dominated by tamarack, spruce (presumably black spruce), and white cedar. The swamp dominants also occurred on the low sandy ridges and other areas of upland terrain. The Ogontz River, which forms the western border of the site, was transected several times during the early survey, and between sections 4 and 9 surveyors noted a "lively current" of water about one foot in depth, a sandy bottom, and five-foot high banks.

Examination of several sets of aerial photos, in addition to field surveys, indicates that logging activities have taken place throughout the entire site. Numerous skid rows are still visible on the 1978 color infrared aerial photos (MDNR). The largest timber, which was probably cut between 1890-1910, based on the cutting history of the region, occurred on the ridges where white pine was prevalent. White pine is now absent from most of the ridges, where the largest trees remaining are hemlock, these presumably being an undesirable species passed over during the logging of other timber. White pine regeneration was poor. Cedar was also heavily cut as indicated by the frequent stumps in regenerated cedar swamp and the large cleared areas on 1939 and 1954

aerial photos. Of several cedar trees that were cored, the youngest was about 50 years old (9.7 cm dbh) and the oldest about 110 years (23.5 cm dbh).

2. Description of physical characteristics

The tract is located within the Mackinac District, Escanaba Subdistrict of Region III in the eastern Upper Peninsula (Albert et al. 1986), characterized as a subdistrict of limestone bedrock and sand lake plain. This subdistrict comprises a relatively narrow strip of land on the north shore of Lake Michigan. The sand lake plain is characterized by wet depressions and dry beach ridges. Exposed limestone along the banks and on the bed of the Ogontz River indicate that bedrock is probably close to the surface. Bedrock is overlain by sandy circumneutral soils such as those of the Tawas series.

The proposed RNA site is a discrete, distinctive unit of the local landscape, representing an old, shallow lake embayment which is slowly being exposed as dry land through a progressive lowering of lake levels. The raising of the landscape through isostatic rebound (the rebound of land surfaces following the recession of glacial ice masses) may have played a role in this terrestrialization. The site is primarily a swamp complex characterized by a series of numerous low sandy beach ridges. The east-west oriented ridges, formed in a parallel series, represent the successive swales and beach ridges produced by subsequent drops in lake levels. Patterning of the beach ridges is fairly consistent and strong except in some eastern portions of the tract, where they become more faint and indistinct, with extensive areas of level lowland terrain forested with dense cedar swamp.

The dynamic conditions of the current shoreline are indicative of the active processes that were involved in the development of this site. Low foredunes (beach ridges) are formed along the active, gently-sloping shoreline. Behind the foredunes are linear, trough-like interdunal wetlands or ponds

paralleling the shore. Over thousands of years of lake level recession, dozens of beach ridges and dunes have been left landward of the present lake levels. All of the beach ridges are forested; those near the present lake level are near the water table and support swamp forest, whereas those more distant from the lake are drier and often support Dry Northern Forest of jack and red pine. The swales near the present shoreline are ponded and contain aquatic plants, whereas those farther from the lake are drier and support wetland sedges, grasses, and shrubs. Over thousands of years, these swales fill in with organic material and begin to support swamp forests.

Based on our field sampling, the organic material in the swales is typically 2-4 ft deep, but shallow swales may contain less than a ft of muck and deep swales as much as 6 ft. Seepages are common in portions of the cedar swamp, indicating that, at least locally, there is groundwater flow.

B. Justification and Features

1. Geographic significance

The Ogontz Bay proposed RNA is a typical example of a terrestriallized lake embayment with a strongly developed pattern or series of low beach ridges and interdunal swales or swamps. The proposed RNA is not an uncommon landscape feature, but locally and perhaps even regionally it is one of the better examples, and the best identified to date on USFS property in the central Upper Peninsula.

Most human alterations of the site are due to timber harvesting. Extensive logging activities have taken place throughout the tract. White pine has not regenerated well, even though it was formerly an important overstory component. However, cedar has regenerated well in the areas where it was clearcut, and in some areas the trees are now close to the diameter of those

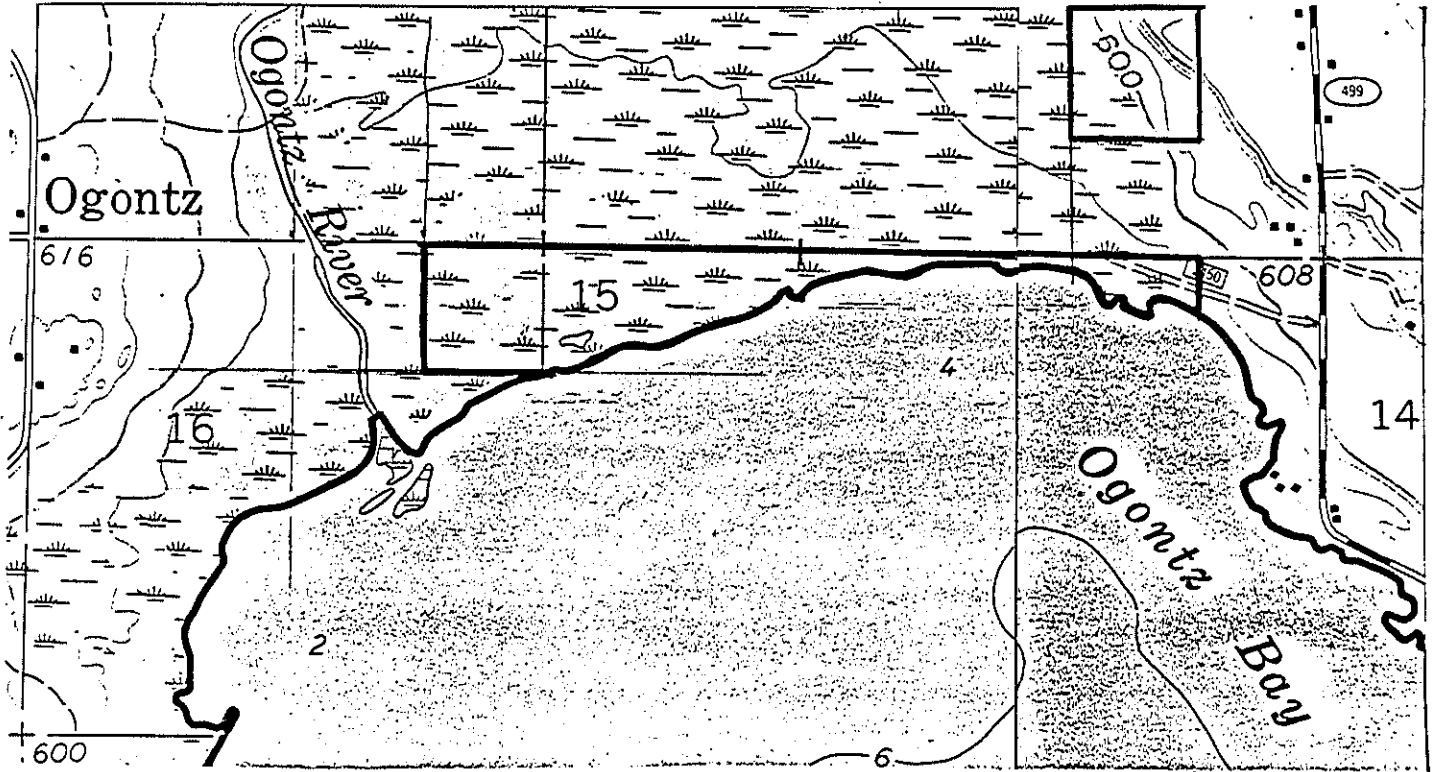
formerly harvested. Some large hemlock and a few scattered large white pine (with some regeneration) occur in the western portion of the tract, particularly the areas close to the river. The most undisturbed portion of the tract is the shoreline, which is free of structures and shows little impact from human activities, exhibiting the natural dynamics typical of a Great Lakes shore.

2. Importance to RNA program objectives

The proposed RNA site is a good example of a terrestrialized Great Lakes embayment. Since most sites have undergone similar management histories (i.e. extensive logging) it is unlikely that similar landscape features will be found with less disturbed ecosystems. Other similar sites in the Hiawatha National Forest-Wedens Bay and Nahma-were field surveyed and determined to be more heavily disturbed. The Great Lakes shoreline of the Ogontz Bay Proposed RNA, however, is relatively undisturbed and shows little human use and impact. Unlike other shorelines of the region, no evidence of recreational vehicle use was noted. The Ogontz River and Lake Michigan provide natural boundaries for the site, enhancing the defensibility of the tract.

As will be mentioned in following sections, the cedar swamp in the eastern portion of the tract supports a population of the extremely rare Lapland buttercup (Ranunculus lapponicus L.) a boreal species discovered during 1987 field surveys. The colony forms a large population of approximately 1000 stems or more and possibly represents the southernmost known occurrence throughout its worldwide range. As a species known from only one other locality in Michigan (where a small population exists) the preservation of this important component of genetic diversity is especially desirable.

Figure 1 shows the original boundaries of the proposed RNA as drawn by the Hiawatha National Forest. Figure 2 shows modified boundaries as suggested



Ogontz

Hiawatha National Forest

Candidate Research Natural Area

T40N, R20W

Gross Acres:

160

N.F.S. Acres:

160

Figure 1. Original proposed Ogontz Bay RNA boundaries as submitted by the Hiawatha National Forest.

STUDY AREA MAP

Ogontz Bay

Hiawatha National Forest
Michigan

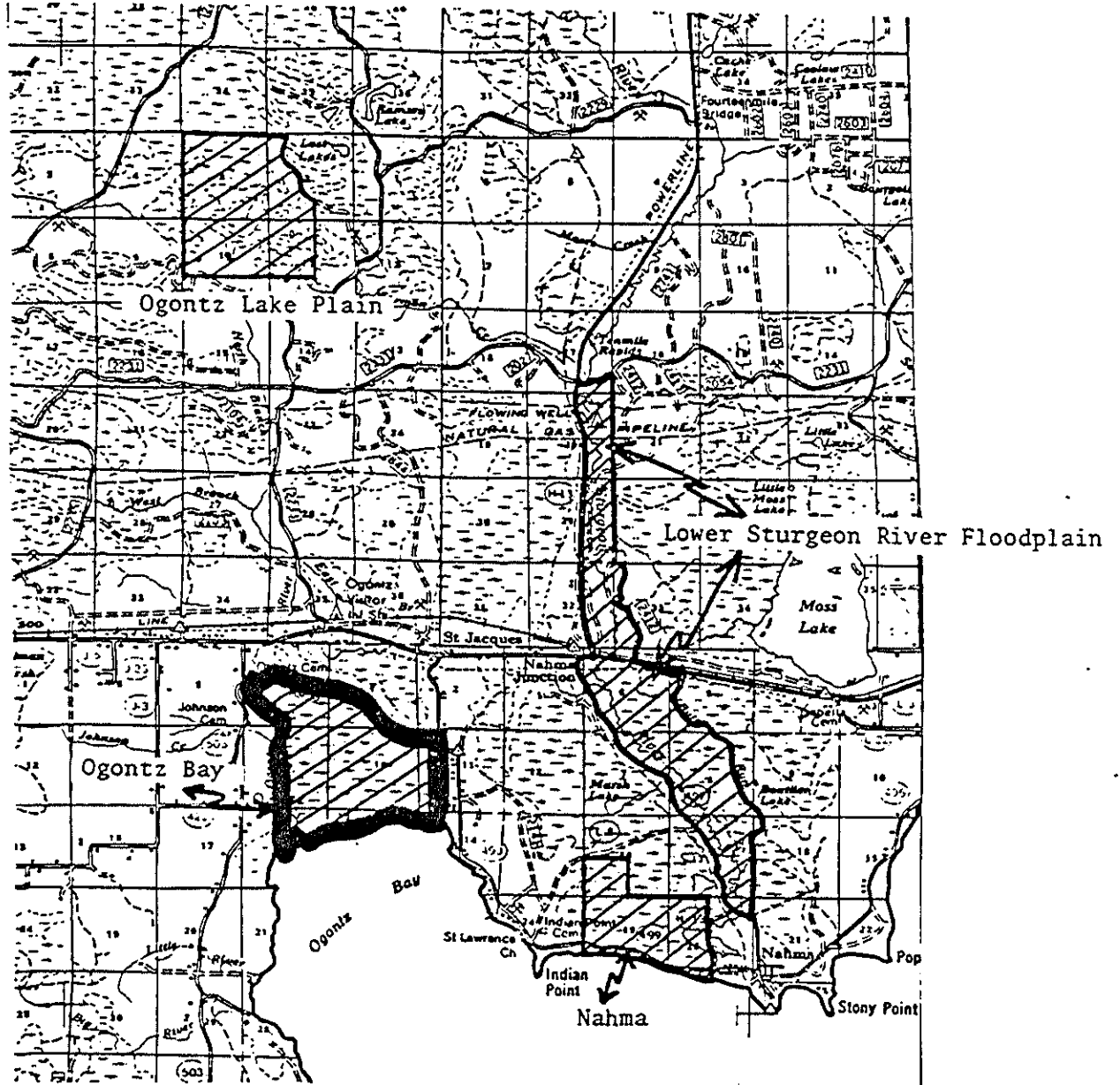


Figure 2. Revised Ogontz Bay proposed RNA boundaries based on public comment.

during public discussion of the proposed RNA boundaries. Figure 3 shows the proposed final boundaries for the RNA based on field work and aerial photo interpretation by Michigan Natural Features Inventory during 1987; by including the southern half of Sections 9 and 10, the Lapland buttercup, the less disturbed Rich Conifer Swamp, and the coastal Open Dune, Interdunal Swale, and Great Lakes Marsh communities are protected.

3. Impact of alternative designation

The designation in the Land and Resource Management Plan (Hiawatha National Forest 1986) is management area 6.4, emphasizing habitat for game and nongame wildlife, SPM recreation, and access to hunting and fishing areas, with a mix of timber management. Under this designation, strip cutting for wildlife habitat improvement is a common practice. This would probably have little or no long-term adverse impact, unless such strip cuts take place in the rare plant site. Renewed logging would probably have minimal long-term impact floristically unless the activities caused disruptions of the normal hydrological regime important in maintaining (and regenerating) the swamp forests and the colonies of Lapland buttercup. There would also be obvious impact if cutting occurred directly in the rare plant colonies.

Short-term impacts of these activities would be to reduce the area's value as an example of a relatively natural terrestrially lake embayment. MNFI's recommendation would be RNA designation to the southern half of Sections 9 and 10; custodial management under 9.1 designation is recommended for the remaining portion of the area as shown in Figure 2 (Shown as a broken line in Figure 3). Management area 6.4 designation could also be adequate if care were taken to do any cutting in the winter, with minimal road development, to reduce alteration of the hydrology.

4. Historical activity/interest in area

No known previous interest in this area was encountered by the authors.

C. Significant elements (natural features)

1. Natural communities (See description under Section F. Flora (page 12)).

- a. Rich Conifer Swamp. Federal: G4 State: S4 Grade: B and C
Forest Cover Type 37 (northern white-cedar)
- b. Interdunal Wetland. Federal: G3? State: S2 Grade: A/B
- c. Open Dune. Federal: G3 State: S3 Grade: A/B
- d. Great Lakes Marsh. Federal: GU State: S3 Grade: A/B
- e. Dry-mesic Northern Forest: Federal: G4 State: S4? Grade: D
Forest Cover Type 22 (hemlock-white pine)

2. Special plants

- a. Ranunculus lapponicus L. (Lapland Buttercup) Status: State Threatened. Previously known only from a single locality in Chippewa County (supporting approximately 40 stems). Approximately 1000 stems, very locally distributed in cedar swamp (Figure 4, which also shows survey route and photo points) in the NW4 of the SE4 of Section 10, T40N, R20W, were encountered during the 1987 RNA field survey, representing a significant discovery. Many plants were fertile and found to be setting fruit, indicating this to be a healthy, vigorous population. Lapland buttercup is primarily a boreal species (and also circumboreal) occurring disjunctively to Upper Michigan. Its occurrence in Ogontz Bay places it well south of its known range, and it is of particular interest that it occurs in a relatively warm climatic district of the Upper Peninsula. This species was found in dense second-growth cedar swamp, thriving in a deep carpet of Sphagnum moss, particularly on the margins of wet depressions and cool springy seeps. It is not known whether it survived

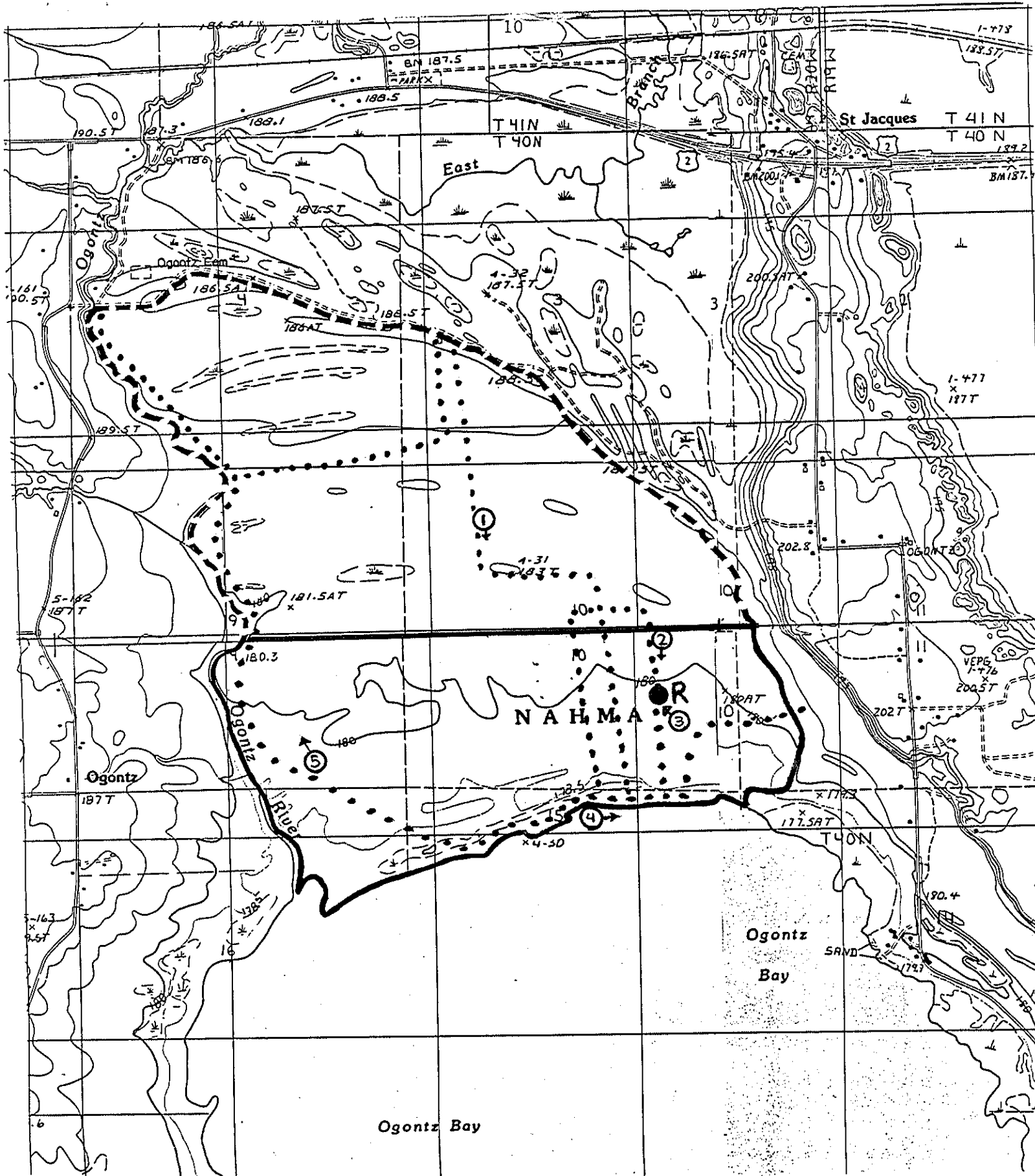


Figure 4. Location of *Ranunculus Lapponicus* (●R), Survey Routes (●●●), and Photo Points (②→) within the Ogontz Bay proposed RNA.

earlier logging or colonized the site since this area was logged.

3. Special animals

None noted. Not surveyed.

4. Geologic features

As previously mentioned, the proposed RNA site represents a typical terrestriated Lake Michigan embayment with a series of parallel beach ridges and interdunal wetlands.

5. Aquatic features

The shoreline displays the dynamics of Great Lakes marsh ecosystems, showing the advancement during years of lower lake levels and the retreat and degradation of marsh vegetation during years of higher lake levels. Interdunal wetlands adjacent to the shore, bordering the foredunes, are frequently deep and stable enough to support the growth of aquatic macrophytes. Aquatic features were not specifically or intensively inventoried for this report.

6. Other special features

None noted.

D. Area of natural communities

Figure 5 delineates the boundaries of plant communities identified during field surveys, also noting some of the related physical features of the site.

E. Climatic conditions

Ogontz Bay occurs within the Mackinac District, a region considerably milder than that of more upland districts of Upper Michigan due to the moderating influence of Lake Michigan (Albert et al. 1986). The growing season of the Mackinac District is comparable to that achieved at the tip of the Lower Peninsula, and is the longest growing season of any district delineated in the

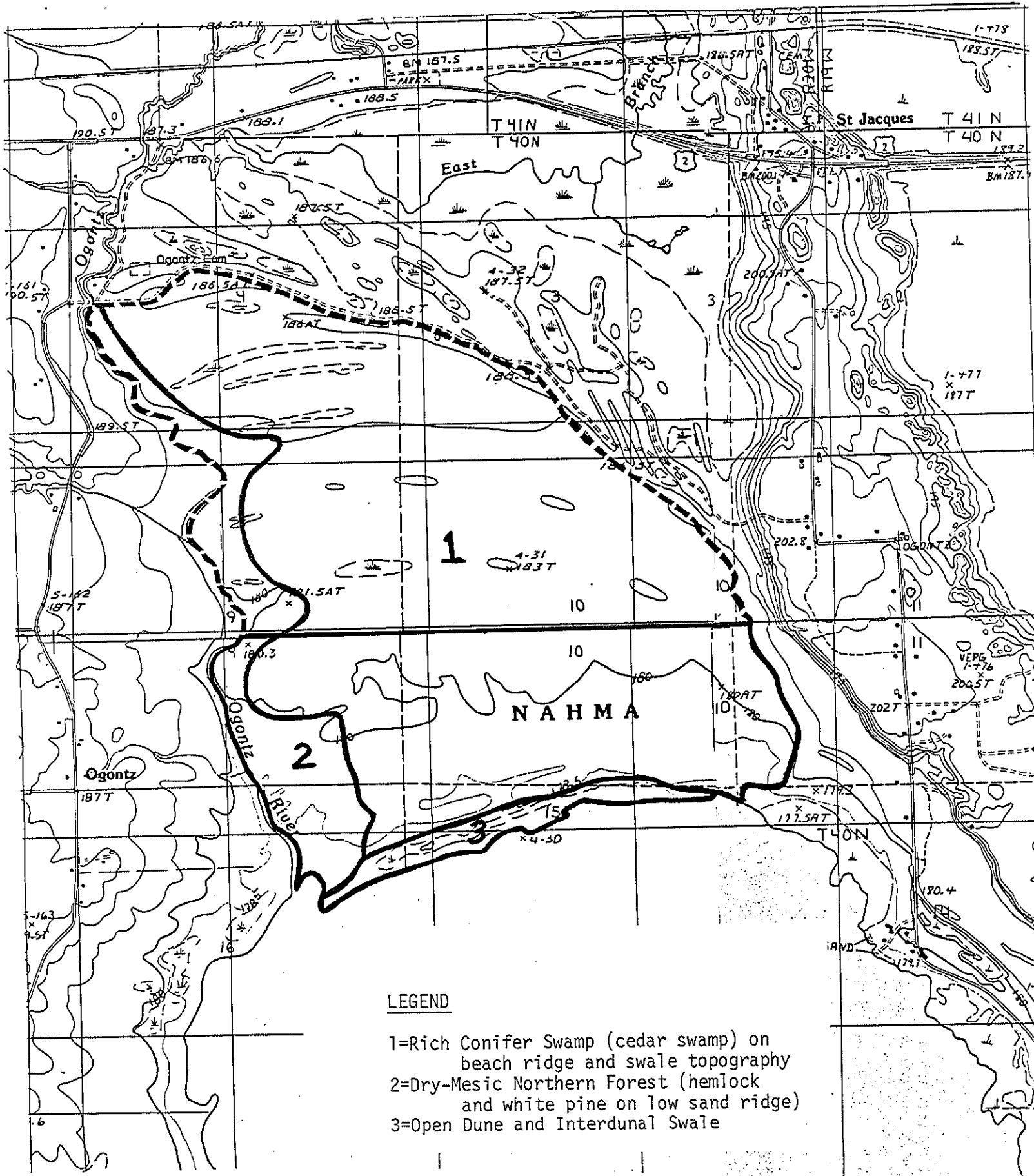


Figure 5. Plant Communities within the Ogontz Bay proposed RNA.

Upper Peninsula (Albert et al. 1986).

F. Flora

1. Plant communities

a. Rich Conifer Swamp

Much of the site supports extensive tracts of rich conifer swamp dominated by dense northern white-cedar. Black spruce, balsam fir, paper birch, and larch also occur locally in the canopy. Alder is a common understory plant, occurring more densely where there are gaps in the canopy. The ground flora is diverse and includes a rich moss component. Typical ground-cover species include Coptis groenlandica (goldthread), Rubus pubescens (dwarf raspberry), Mitella nuda (bishop's cap), Glyceria striata (manna grass), Smilacina trifolia (false solomon's seal), Viola renifolia (kidney-leaf violet), and several sedge, grass, and orchid species. The moss flora is similarly diverse, particularly in areas of dense cedar, with well developed carpets of Sphagnum mosses, including such species as S. recurvum, S. centrale, S. girghensonii, S. magellanicum, S. warnstorffii, and S. wulffianum. Numerous other moss species are present. Stumps from previous cutting activities are present throughout. Natural disturbance commonly includes windthrows, creating frequent snags. Small wet or springy depressions and hummocks are a typical microphysiographic feature. Cores extracted from several cedar trees (with the ages cited previously) show a slow rate of growth.

Although not mapped, there are also pockets of what can be classified as Poor Conifer Swamp, a natural community swamp type dominated primarily by larch and with small amounts of black spruce in the overstory.

b. Interdunal Wetland

A variety of interdunal wetlands occur between the low dune ridges. These vary from the open, pond-like areas bordering the foredunes to the increasingly swale-like and swamp-forested wetlands to the north. The interdunal wetlands along the shoreline are formed in relatively deep depressions with standing water of sufficient depth and duration to support a number of aquatic macrophytes. Pondweeds (Potamogeton natans, P. illinoensis, P. zosteriformis, and P. amplifolius), Nuphar variegata (yellow water-lily), Myriophyllum heterophyllum (water-milfoil), Najas flexilis (naiad), and Eleocharis acicularis (spike-rush) are among the aquatic plant species occurring in these long linear ponds. Northward, the wetlands are more densely vegetated, sometimes developing a floating sedge mat of Carex lasiocarpa (as in one noteworthy site in the southwestern part of the tract). Swale-like interdunal areas have less standing water and may be vegetated with sedges, high grasses (such as Calamagrostis canadensis; blue-joint grass), and an increasing number of shrubs such as Cornus stolonifera (red-osier dogwood), Ledum groenlandicum (Labrador tea), Chamaedaphne calyculata (leatherleaf), and Alnus rugosa (tag alder).

c. Open Dune

The open dunes occur along the lake shore, consisting primarily of low foredunes built from wind and wave action. Most of the foredunes are no more than approximately 1 meter above lake level and many are considerably less in height. Characteristic plant species of the open, calcareous, sand-dune areas include Salix candida (hoary willow), S. exigua (sandbar willow), Potentilla anserina (cinquefoil), Solidago graminifolia (grass-leaved goldenrod), Equisetum laevigatum (horsetail), and Asclepias syriaca (milkweed). Plant diversity is high along the dune-interdunal wetland ecotone, particularly

in the shallow portions of the wetlands where a number of sedges and other herbs can become established.

d. Great Lakes Marsh

Small areas of Great Lakes marsh occur along the shoreline strand, consisting of what were once more extensive mats of bulrush beds (Scirpus spp). During periods of low Lake Michigan levels these strongly rhizomatous plants advanced into the shallow water areas and established large beds. The return to higher water levels flooded the beds, causing erosion of the rhizomes of the bulrush colonies. Vestiges of the rhizome mats, which persist on the strand, give some evidence of the former extent of marsh vegetation.

e. Dry-mesic Northern Forest.

Larger dune ridges and other upland areas within the proposed RNA site are vegetated largely with Northern Dry-Mesic Forest, a mixed forest type dominated by hemlock, white pine, and to some extent red pine, with red maple, sugar maple, red oak, and yellow birch. Balsam fir and cedar also occur, often in the sub-canopy. White pine, which was heavily logged, is present but has not regenerated well enough to indicate its former importance as a canopy dominant. The largest conifers present are the occasional to frequent hemlocks which are 1-3 ft in diameter. In the southwestern portion of the site, a number of fairly large hemlocks were observed on a beach ridge that had many signs of past cutting activities.

2. Natural quality and conditions

The natural quality of the Interdunal Wetland, Open Dune, and Great Lakes Marsh communities are high, with little signs of human disturbance. Present high water levels in Lake Michigan have caused natural alteration of the plant communities, but this is a typical process within coastal Great Lakes

wetlands. The Rich Conifer Swamp varies in quality and degree of human disturbance, but probably represents one of the best examples of this community within a terrestrialized lake embayment. The Dry-Mesic Northern Forest, located on some of the drier beach ridges, is of much lower quality, with little white or red pine regeneration.

3. Methods

Prior to 1987 field reconnaissance, 1978 MDNR color infrared aerial photographs (1:24,000 scale) were interpreted to delineate landscape features and major community boundaries. Black and white 1939 aerial photos of a smaller scale were also studied and compared to 1978 photos to elucidate the disturbance history. Additional photography consulted included more recent USFS color infrared photos (1:10,000 scale) and USFS 1954 black and white photos. Many of these photos were carried during field reconnaissance for ground truthing. A Soil Survey was consulted to determine major soil types present. Field surveys consisted of transects through representative portions of the site, including a complete north to south transect from the northern boundary to the lakeshore. Peat and muck depths were recorded with a probe and plant species were recorded during all transects. Many unknown plant species were collected for keying and identification. Photographs taken throughout the tract and along the lakeshore are provided in Appendix Ic. Species identified during field reconnaissance studies are presented in Appendix Ia-b.

G. Fauna

No faunal surveys were conducted. Deer sign, however, was abundant and black bear likely occur in the area also. Seasonal camping sites, tree stands, and blinds indicate the use of the site by hunters.

H. Wildlife and plant values

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

Little is known of the specific ecological requirements of Ranunculus lapponicus, the only special (state listed) plant species found during field surveys. No detailed management guidelines are known or have been developed. However, it is highly likely that this population would be severely impacted by any significant alterations of the local hydrological regime that maintains its habitat. The unimpeded flow of cool ground-water through springy seeps and depressions appears to be a significant habitat feature, as indicated by the deep carpets of Sphagnum that serve as the substrate for this rhizomatous species. It is likely that any opening of the dense cedar canopy would also have adverse impacts on this population.

2. Population trends

The population of Ranunculus lapponicus appeared to be vigorous, healthy, and actively reproducing, as evidenced by the numerous flowering and fruiting stems. However, since there is only cursory baseline information, no trend has been recorded or can be estimated.

I. Management needs

Management needs are discussed under Section H.1 above. The main requirement for the RNA is that the hydrology of the swale and swamp areas is not altered.

J. Administrative records

The Michigan Natural Features Inventory will maintain information on the Rich Conifer Swamp, Interdunal Wetlands, Open Dunes, and Ranunculus lapponicus. The degraded Dry-Mesic Northern Forest will not be included 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. 32 pp.

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 1b
 Dune and Shore, including
 Interduna Wetland, Site Name: OGONTZ BAY Surveyor: MRP, DCH, DMH Date: July - August 1984

Abies balsamea	C	Carex lasiocarpa		Festuca saximontana		Matianthemum canadense		Ptelea trifoliata		Solidago
Achillea millefolium		Carex sterilis		Fragaria virginiana		Melantherum lineare		Pyrola asarifolia		Sorbus
Agropyron: gryposepala		Carex viridula		FRAXINUS <i>Ranunculus</i>		Mentha arvensis		Pyrola		Sparganthum ciliat.
Agropyron: trachycaulum	C	Carex MASTIGIS		Gentiana procera	LD	Ranunculus trifoliata		Pyrola	C	Sparganthum ELIPSEUM
Agrostis gigantea	C	Carex STRICKTH		Gentiana		Monarda punctata		Quercus borealis		Sphagnum
Agrostis hyemalis	C	Carex GEBBI		Geum alepticum		Moss (non-splagnum)		Quercus velutina		Sphenophis
Alnus crispus		Carex		Geum rivale		Muhlenbergia glomerat.		Rhus radicans	C	Spiraea alba
Alnus rugosa		Castilleja coccinea		Glyceria striata		Muhlenbergia mexicana		Rhynchospora alba		Spiranthes cernua
Amaranthus: breviflorus		Castilleja septentrionalis		Habenaria: clavellata	C	Myrica gale		Rhynchospora capillac.		Spiranthes lacera
Amaranthus: margaritacea		Celastrus: scandens		Habenaria: dilatata		MUPHAR <i>WATERBURY</i>		Rosa acicularis		Stachys palustris
Ammannia canadensis		Chamaedaphne calyculata		Habenaria: hyperborea		Oenothera biennis		Rosa blanda		Stachys huronense
Anemone multifida		Cicuta bulbifera		Habenaria: lacera		Orbanche: fasciculata		Rosa palustris		Thalictrum: dasycarpum
Andropogon gerardii		Cirsium plicatum	LC	Habenaria: psycodes		Orbanche: uniflora		Rosa SP.	LC	Thelypteris palustris
Andropogon scoparius		Cladium mariscoides		Halenia deflexa		Oryzopsis: asperifolia		Rubus pubescens		Thuja occidentalis
Arabis hoibellii		Clintonia borealis	LC	Helianthus: scaberrimus		Osmunda: claytoniana		Rubus		Tofieldia glutinosa
Arabis lyrata		Comandra: livida		Hieracium		Osmunda: regalis		Rudbeckia hirta		Triadenum: virginicum
Arnica nudicaulis		Coreopsis: umbellata		Hieracium: odorata		Panicum: tipplicatum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Arctostaphylos: uva-ur.		Coreopsis: lanceolata		Hieracium: odorata		Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Arenaria stricta		Corispermum hyssopifol.		Hudonchloa: tomentosa		Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Artemisia: canadata		Cornus rademosa		Hypoxis: californiana		Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Asclepias: syriaca	LC	Cornus: stolonifera		Impatiens: biflora	C	Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Asclepias: tuberosa		Cornus: virginica	C	Iris: laevis		Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Asclepias: viridiflora		Cypripedium		Iris: virginicus	LD	Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Aster: laevis		Dianthus: ispicata		Juncus: balticus		Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Aster: macrophyllus		Deschampsia caespitosa		Juncus: brevicaudatus		Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Aster: pilosus		Deschampsia: flexuosa		Juncus: nodosus	C	Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Aster: ptarmicoides		Diervilla: lonicera		Juncus: SP.		Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Aster: tradescanti		Diervilla: lonicera		Juncus: SP.		Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Aster: AMULEUS		Dracopis: linearis		Juncus: SP.		Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
Aster: AMULEUS		Dracopis: rotundifolia		Juncus: SP.		Panicum		Sagittaria: LEPTOPHYLLA		Trientalis: borealis
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Aster: AMULEUS		Dracopis: rotundifolia		Juncus: SP.		Panicum		Sagittaria:		

APPENDIX Ic. PHOTO RECORD

USDA-FOREST SERVICE

PHOTOGRAPHER

Dennis A. Albert

PHOTOGRAPHIC RECORD

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.	PERMANENT NO. (To be filled in by the WO)	SELECTED FOR W.O. PHOTO LIBRARY	DATE OF EXPOSURE	LOCATION (State and National Forest or County)	DESCRIPTION OF VIEW
(1)	(2)	(3)	(4)	(5)	(6)
1			8-19-1987	Ogontz Bay RNA-Delta Co. T40N R20W NW4 of Sec. 10	Rich Conifer Swamp (cedar) on beach ridge and swale topography.
2			8-19-1987	T40N R20W SE4 of Sec. 10	Windthrow in wet swale.
3			8-19-1987	T40N R20W SE4 of Sec. 10	<u>Ranunculus lapponicus</u> growing on mosses beneath dense cedar and tamarack.
4			8-19-1987	T40N R20W SE4 of Sec. 10	Great Lakes Marsh, Emergent Marsh vegetation and Wet Meadow vegetation being eroded by high water.
5			8-19-1987	T40N R20W SE4 of Sec. 9	Mature hemlock on a low sand ridge. White pine, once common on the ridge, is now only scattered.