

POINTE AUX CHENES

CANDIDATE RESEARCH NATURAL AREA

HIAWATHA NATIONAL FOREST

ESCANABA, MI 49829

4508487 - MORAN

~~4508488~~ POINTE AUX CHENES

SUBMITTED BY:

MICHIGAN NATURAL FEATURES INVENTORY

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A. Background

1. Historic setting

The description of the Pointe aux Chenes marsh area by the General Land Office surveyors agrees with present day conditions on the marsh. The center of the marsh, probably a shallow embayment when Great Lakes water levels were a few feet higher, was described as several pools or swales. Separating the pools were beach ridges, which supported white pine, red pine, hemlock, cedar, and other conifers. To the northeast of the marsh were small dunes, dominated by red pine and jack pine. Between these dunes and the open pools of the marsh were large marshy areas dominated by grasses and sedges or small cedar, balsam fir, and tamarack.

The pine on the beach ridges within the marsh were cut, probably in the 1880s or 1890s, as were the pine on the steep sand dunes to the northeast. The cedar and other conifers within the marsh were also cut, with the exception of the stunted cedar growing in the wettest part of the marsh. Cutting of the swamp conifers probably continued into the early 20th century.

2. Description of physical characteristics

The marsh occupies a shallow embayment surrounded by dunes and beach ridges on all sides, except to the southeast, where a steep moraine ridge is located. Within the embayment are dozens of low, parallel beach ridges, marking the gradually receding water levels of Lake Michigan. These beach ridges formed when the embayment was part of Lake Michigan, when the shoreline was subject to beach ridge formation caused by seasonal and long-term fluctuations of water level and by storms. Between the beach ridges are swales, many of which contain shallow ponds less than 3-4 ft deep. The wet swales of the marsh within a mile or two of the Lake Michigan shoreline are broad and interconnected, forming a broad shallow embayment which is separated

from Lake Michigan by low beach ridges. The marsh is connected to Lake Michigan by a breach in the beach ridges, through which the Pointe aux Chenes River flows.

To the northeast there is an area of low sand spits and small parabolic dunes, separated by swales, which contain a diversity of wetlands. Backing these small dunes to the northeast is a range of steep parabolic dunes.

B. Justification and Features

1. Geographic significance

The site contains examples of most of the plant communities and surface features typical of eastern Upper Michigan marshes and coastal areas. The Pointe aux Chenes marsh is the 2nd largest and one of the least disturbed Great Lakes Marshes in Michigan, and is unusual because it has undergone almost no commercial development or major manipulation for wildlife management. The marsh supports a large number of state or federally endangered, threatened, or special concern nongame species, including Charadrius melodus (piping plover), Pandion haliaetus (osprey), Haliaeetus leucocephalus (bald eagle), Sterno hirundo (common tern), and Gavia immer (common loon). Grus canadensis (sandhill cranes) also nest at the east end of the marsh complex. Several rare, threatened, and endemic plants, including Cirsium pitcheri (Pitcher's thistle), Tanacetum huronense (Lake Huron tansy), Iris lacustris (dwarf lake iris), Solidago houghtonii (Houghton's goldenrod), Cypripedium arietinum (ram's head lady slipper), Lycopodium selago (fir clubmoss), and Stellaria longipes (starwort) are found along the beach dunes and swales between the marsh and Lake Michigan.

2. Importance to RNA program objectives

The Pointe aux Chenes marsh is the 2nd largest and one of the least

disturbed Great Lakes Marshes in the Upper Peninsula. The marsh provides a diversity of habitats for both plants and animals, including numerous rare, threatened, endangered, or endemic species. Within or adjacent to the marsh, good examples of most of the plant communities characteristic of the Great Lakes shoreline environment can be found. Its large size, undisturbed condition, and number of special plants (9) and animals (5) probably make it the best Great Lakes Marsh in Michigan.

The marsh and adjacent Great Lakes shoreline, with its open dunes and swales, have been recognized as significant by both zoologists and botanists. Several surveys have been conducted since, and probably before 1980 (Appel 1981, Chapman 1983, Brodowitz and Penskar 1985, Dunewitz and Chapman 1985, Taylor 1985, Ewert 1986, Albert 1986, 1987, and Penskar and Henson 1987).

Figure 1 shows the boundaries of the proposed Pointe aux Chenes RNA. The boundaries recommended by the Hiawatha National Forest are shown outlined with a thick line. On the basis of MNFI's field surveys, additional areas have been recommended in Sections 21, 28, 27, and 33. The addition of the area in Section 33 allows Patterned Fen, a regionally rare plant community to be included in the RNA, while the additions in Sections 21, 27, and 28 allow inclusion of Dry Northern Forest of jack and red pine on the steep parabolic dunes and on the low sand spits and dunes. The parabolic dunes are locally present within the eastern Upper Peninsula, but no other proposed RNA includes areas of these dunes dominated by pines. The only other areas with similar parabolic dunes in the Hiawatha National Forest (and the entire Upper Peninsula) are the dunes south of Brevoort Lake, which support Mesic Northern Forest (dominated by hemlock, sugar maple, red oak, yellow birch, and white pine), and the dunes of the proposed Oak Ridge North RNA, which support Mesic Northern Forest (red oak on slopes with south or west aspect and beech and

sugar maple on slopes with east or north aspect). Figure 2 shows the survey routes and photo points from the 1986 and 1987 field seasons.

3. Impact of alternative designation

In the Land and Resource Management Plan (Hiawatha National Forest 1986), a large area is designated Management Area 8.1, emphasizing the protection of an area with significant biological features (Figure 3). Minimal level management (custodial management) as Management Area 9.1 would probably protect the significant biological resource of the marshland, but would not provide the formal recognition endowed by RNA designation.

The jack pine and red pine forest on steep dunes in Sections 21, 27, and 28 and the Patterned Peatland in parts of Section 33 are presently under the 6.4 Management Area designation, which classifies the tract as wildlife habitat and motorized recreational use with even and uneven-aged management. The mature red and jack pines on the dunes are eligible for harvest under present 6.4 designation. The steep dunes are vulnerable to severe degradation by ORVs under the present designation, which allows motorized recreational use. Portions of the North Country Trail within this proposed extension of the RNA boundaries are already being degraded by ORV use. The North Country Trail cuts through portions of this jack pine/red pine forest in Sections 21 and 28.

MNFI would suggest protecting within the RNA at least a portion of the steep dunes, which adds a significant example of Dry Northern Forest (S.A.F. 15: red pine) to the forest cover types represented within the Forest's RNAs. The dunes are also a geologically significant feature. We propose two potential boundaries to include the Dry Northern Forest, recognizing the possible hesitance to include a large area of a valuable economic tree species. Changing the designation of a portion of the dunes to 6.1, emphasizing wildlife and non-motorized recreational use, could at least reduce the degradation of

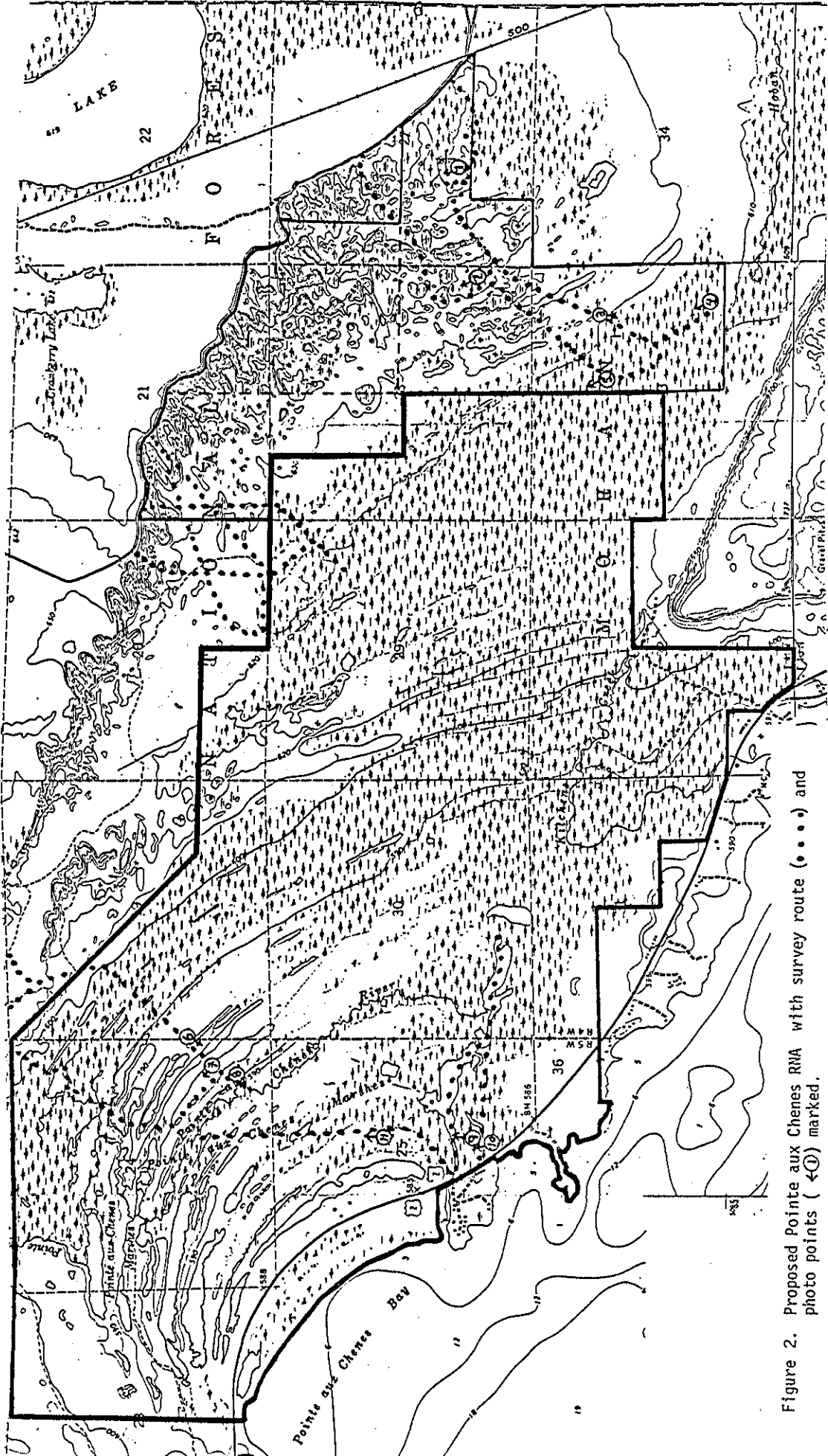


Figure 2. Proposed Pointe aux Chenes RNA with survey route (●●●●) and photo points (⊙) marked.

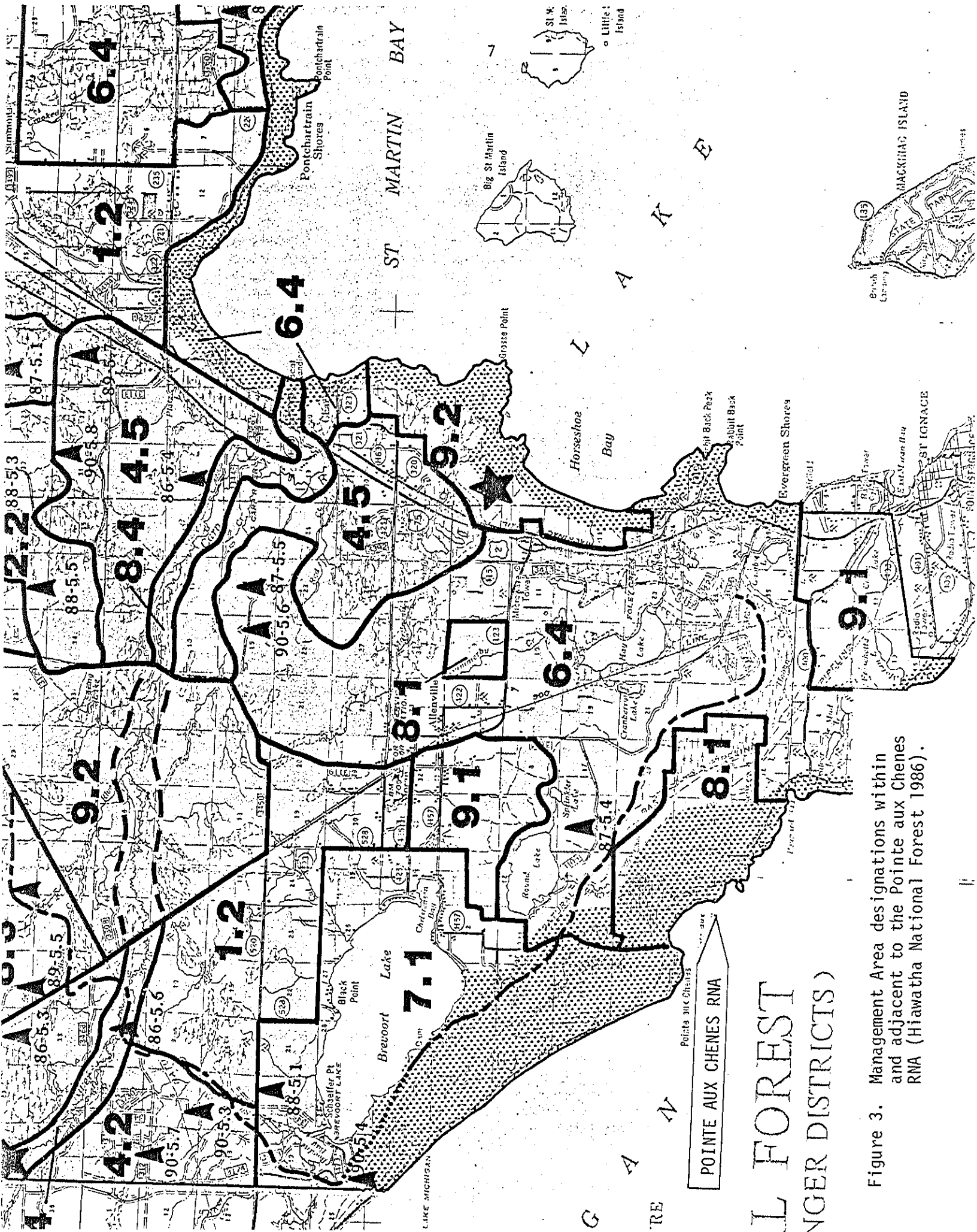


Figure 3. Management Area designations within and adjacent to the Pointe aux Chenes RNA (Hiawatha National Forest 1986).

the dunes by ORVs.

4. Historical activity/interest in site

As mentioned above, the marsh is presently under designation of Management Area 8.1 by the Hiawatha National Forest. The North Country Trail crosses the proposed addition to the RNA in Sections 21,27, and 28.

The Michigan Natural Features Inventory reported the marsh as a highly significant natural area worthy of preservation in the Natural Areas Inventory recently conducted for Moran Township (MNFI 1986).

U.S. Highway 2 crosses the marsh near the Lake Michigan shoreline. Attempts have been made to limit destruction of special plants located along the highway right-of-way by conducting special-plant surveys, followed by fencing and signing of the right-of-way. A roadside park provided access for the public to a portion of the Pointe aux Chenes marsh complex, but this appears to have been recently closed.

Several cottages and inholdings are located along the Lake Michigan shoreline near the mouth of the Pointe aux Chenes River. The Nature Conservancy is actively purchasing these inholdings and transferring them to the Hiawatha National Forest for protection and management.

C. Significant elements (natural features)

1. Natural communities

- a. Open Dune. Federal: G3 State: S3 Grade: A
- b. Interdunal Wetlands. Federal: G3? State: S2 Grade: A
- c. Sand/Gravel Beach . Federal: G4? State: S3 Grade: A
- d. Great Lakes Marsh (Emergent and Submergent Marsh)
Federal: GU State: S3 Grade: A
- e. Northern Wet Meadow. Federal: G4 State: S4? Grade: A and B

- f. Patterned Fen. Federal: GU State: S3 Grade: B to C
- g. Northern Fen. Federal: G3? State: S3? Grade: B
- h. Wooded Dune and Swale. Federal: G4 State: S3 Grade: A and B
Forest Cover Type 37 (northern white-cedar)
- i. Dry Mesic Northern Forest (on beach ridges within marsh and on
parabolic dunes). Federal: G4 State: S4? Grade: B
Forest Cover Type 21 (white pine) and 22 (white pine-hemlock)
- j. Dry Northern Forest (on parabolic dunes). Federal: G4?
State: S3? Grade: B
Forest Cover Type 1 (jack pine) and 15 (red pine).

2. Special plants

- a. Aster nemoralis (bog aster) State Special Concern
- b. Cirsium pitcheri (Pitcher's thistle) State Threatened and
Federally Proposed Threatened
- c. Cypripedium arietinum (ram's head lady-slipper) State Threatened
- d. Iris lacustris (dwarf lake iris) State Threatened and Federally
Proposed Threatened
- e. Lycopodium selago (fir clubmoss) State Special Concern
- f. Pinguicula vulgaris (butterwort) State Special Concern
- g. Solidago houghtonii (Houghton's goldenrod) State Threatened and
Federally Proposed Threatened.
- h. Stellaria longipes (starwort) State Special Concern
- i. Tanacetum huronense (Lake Huron tansy) State Threatened

3. Special animals

- a. Charadrius melodus (piping plover) Federally and State
Endangered
- b. Gavia immer (common loon) State Threatened

- c. Haliaeetus leucocephalus (bald eagle) Federally and State Threatened
- d. Pandion haliaetus (osprey) State Threatened
- e. Sterna hirundo (common tern) State Threatened

4. Geologic features

Nothing in data base. The parabolic dunes to the north of the marsh are one of three in the eastern Upper Peninsula.

5. Aquatic features

Not inventoried.

6. Other special features

Sandhill cranes nest at the eastern end of the wetland. Although recognized as an important area for migratory waterfowl, no figures could be found concerning which species utilize the area or the productivity of the marsh for waterfowl.

D. Area of natural communities

The major plant communities are shown of Figure 4. Detailed mapping of the plant communities listed in section C1 is not practical on the scale of the enclosed map. The repetitious pattern of dry beach ridges of varying height and wet swales of varying height create a diverse mosaic of plant communities which are difficult to map precisely. This is complicated by the continual fluctuation of Great Lakes water levels, which causes the boundaries between the wetland and upland plant communities to likewise fluctuate. For example, the water level fluctuation between 1986 and 1988 caused many areas which were flooded in 1986 and early 1987 to be dry in 1988. Cedars growing near the edge of the Shrub Swamp or Wet Meadow margin were killed by the high water of 1986. Low water conditions have caused herbaceous and shrub vegetation to replace the

dead cedar. This type of change is characteristic of almost every plant community present within the Pointe aux Chenes marsh complex.

E. Climatic conditions

The proposed RNA is located within the St. Ignace Subdistrict of the Mackinac District, a subdistrict characterized by a strong lacustrine influence from Lake Michigan and nearby Lakes Superior and Huron (Albert, Denton, and Barnes 1986). As a result of the lacustrine influence, the growing season is lengthened, precipitation is relatively uniform throughout the growing season, and there is some additional lake-effect snowfall.

F. Flora

1. Plant communities

a. Interdunal Wetlands, Open Dune, and Sand/Gravel Beach along Lake Michigan shore.

Between Lake Michigan and the large marsh is a narrow band of beach ridges and swales. This community, is concentrated in Sections 23 and 25 (Figure 4). This is a dynamic zone, where both the foredune (the beach ridge closest to the lake) and first interdunal swale are greatly effected by short and long term variation in lake levels.

The Open Dune and Interdunal Wetlands contain several special plants. Huron Tansy, Pitcher's thistle, and starwort grow on the Open Dune ridges, while fir clubmoss and Houghton's goldenrod are found in the moist Interdunal Wetlands. The piping plover also nests on the sand and gravel beach near the shoreline. Populations of Houghton's goldenrod in the low interdunal areas are recovering from inundation during the high lake levels in 1986. Typical Great Lakes water level fluctuations are probably of little consequence

for the species. Piping plover nesting habitat has been similarly reduced by high water levels, but the high water levels may have a much greater impact on the plover. The species list, Appendix I-a, is a composite list derived from several surveys of the shoreline communities.

b. Great Lakes Marsh (Emergent and Submergent Marsh)

The majority of the Emergent and Submergent Marsh at Pointe aux Chenes is located in a large bay separated from Lake Michigan by the foredune. The Pointe aux Chenes River flows through this shallow embayment and eventually erodes through the foredune to enter Lake Michigan. The embayment, which consists of several interdunal swales separated by beach ridges, is concentrated in Sections 19, 23-25, and 30 (Figure 4). The waters of the shallow embayment are influenced by the water level of Lake Michigan. When water levels are high, the interdunal swales become larger and deeper and some of the beach ridges become surrounded by water, thus becoming islands. When water levels drop, the beach ridges again become connected to the upland and the interdunal swales become smaller and some become dry. The vegetation of the Emergent and Submergent Marshes reflects these water level fluctuations. During the 1986 field survey, when water levels were high, Emergent Marsh species, such as Eleocharis smallii and Cladium mariscoides were completely submerged, a condition that can possibly be tolerated for only a short period of time. Similarly, areas which had previously been exposed, allowing Potentilla fruticosa (shrubby cinquefoil) and Sarracenia purpurea (pitcher plant) to establish and grow, were several inches under water. Due to such extreme water level fluctuations, the Emergent and Submergent Marsh plant communities are relatively low in species diversity, limited to species tolerant of such fluctuations. The species found in field survey of the Emergent and Submergent Marshes are listed in Appendix I-b.

c. Northern Wet Meadow and Wooded Dune and Swale Complex

Near the margins of the marsh, large areas are dominated by grasses and shrubs. In Sections 19 and 24, along the upper reaches of the Pointe aux Chenes River, broad expanses are grass dominated. Common plants include Calamogrostis canadensis and sedges such as Carex lacustris, C. aquatilis, and C. stricta. The area along the river is included within map unit 2 (Figure 4), where Emergent and Submergent Marsh and cedar-dominated swales and low ridges are the predominant vegetation. Beaver dams along the river cause flooding of the low ridges and swales, resulting in the creation of broad grassy meadows.

The flora in some of the swales also contains shrubs, such as Potentilla fruticosa, Alnus rugosa, and Myrica gale and many herbaceous species along with grasses and sedges. A species list is included (Appendix I-c).

d. Patterned Fen

The Patterned Fen is a peatland characterized by alternating wet depressions called flarks and drier ridges called strings. The alternating flarks and strings form patterns which can be seen on aerial photographs. Patterned Fens can cover areas of several square miles, but this example is small, covering approximately 1/4 of a section. It is the only known Patterned Fen in this part of the Hiawatha National Forest, but there are other larger examples further to the north and west in Chippewa, Luce, and Schoolcraft Counties.

The vegetation of the wet flarks consists of only a few species tolerant of the saturated conditions, while the strings support a more diverse flora, including stunted cedar, tamarack, and black spruce.

The Patterned Fen (map unit 4 on Figure 4) is located in Section 33 in one of the deeper portions of the embayment. I was unable to reach

mineral soil with a 7 ft probe. In contrast, most of the peat depths in the remainder of the Pte. aux Chenes embayment were less than 3 ft. A partial species list is included from the Patterned Fen (Appendix I-d).

e. Northern Fen

Northern Fen is a community of plants which includes many calcophiles, that is, species which grow best or require calcareous conditions. Some characteristic species include Potentilla fruticosa, Eleocharis elliptica, Eleocharis rostellata, Gentiana procera, and Parnassia glauca. The Northern Fen community is limited to the margins between the sandy upland beach ridges or sand dunes and the broad embayment. At the edge of the Fen, organic soils may be only a few millimeters thick, and at their thickest, they are seldom greater than a meter thick. Calcareous groundwater flow from the uplands appears to be important for maintaining a flora which includes calcophiles. A common special-concern plant in the fens is Aster nemoralis, which is concentrated in the northern-most swale next to the uplands.

The large area shown as Map Unit 1 in Figure 4 consists of broad expanses of graminoids, herbs, and shrubs, with scattered small cedar, tamarack, and black spruce trees. Portions of this area contain the calcophiles mentioned above and are best classified as Northern Fen. Other parts of the area are dominated by grasses, primarily Calamagrostis canadensis, and sedges, primarily Carex aquatilis and C. stricta, and are classified as Northern Wet Meadow. It is almost impossible to distinguish these from one another on aerial photographs. On the ground the two communities often merge into each other. For this reason both are lumped within Map Unit 1. A species list is included for the Northern Fen (see Appendix I-e).

f. Rich Conifer Swamp

Rich Conifer Swamp is dominated by cedar, but typically includes

tamarack, balsam fir, paper birch, balsam poplar, speckled alder, and shrub willows. Because of water level fluctuation in the swales and on the low beach ridges at the margins of the embayment, where the Rich Conifer Swamp is concentrated, productivity is poor and the cedar is typically stunted. Cedar-dominated swamp is scattered throughout the marsh, but is concentrated in the area mapped as unit 2 in Figure 4. The species composition of the groundcover and shrub layer is similar to that of the Northern Fen. A species list is included in Appendix I-f.

g. Dry Northern Forest (on beach ridges and on parabolic dunes).

The Dry Northern Forest, dominated by jack pine and red pine, is best represented on the steep parabolic dunes to the north of the marsh. Locally the steep north-aspect slopes of the dunes support more mesic forests dominated by hemlock. On Figure 4, the area mapped as unit 3 consists of steep parabolic dune, while the areas mapped as 3a and 3b contain low parabolic dunes, beach ridges, and sand spits also dominated by jack and red pine, but also containing many small wetlands (mostly Bogs and Poor Conifer Swamps). These Bogs and Poor Conifer Swamps were not listed as Significant Elements because of their small size. Regardless of the size and low species diversity of these wetlands, they are typical of the depressions among the parabolic dunes. On the steep dunes the groundcover and shrub floras are limited, but typical for the droughty conditions (see Appendix I-g).

Many of the larger, droughtier beach ridges within the marsh are also dominated by jack and red pines. The groundcover and shrub floras of these larger beach ridges are depauperate and very similar to those found on the parabolic dunes.

h. Dry-Mesic Northern Forest

The smaller, moister beach ridges within the marsh support Dry-

Mesic Northern Forests of hemlock and white pine. Both hemlock and white pine may have established on the beach ridges following fire. Cedar, balsam fir, and white spruce are often located at the moist edges of the beach ridges.

The groundcover and shrub floras of the hemlock and white pine stands is very similar to that of the Dry Northern Forests, probably because of the influence of ground fires.

2. Natural quality and conditions

The quality of all of the plant communities is high, with the exception of some of the Dry Northern Forests and Dry-Mesic Northern Forests on beach ridges within the marsh complex. Heavy logging followed by burning on some of the beach ridges has reduced the groundcover to lichens and has resulted in overstory dominance by only aspen or paper birch, whereas the original overstory consisted of pines. Although the conifer and hardwood-conifer swamps were cut, regeneration was typically good. Regeneration of the Dry Northern Forests on the parabolic dunes was generally good, but heavy logging followed by fire has altered the flora of some areas.

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. Field survey was conducted in 1987 to determine both abiotic conditions, such as mineral soil and organic soil characteristics, and also to determine forest stand composition and structure, and herbaceous plant community composition. Photos of the site are attached to the end of the report and noted on Figure 2, along with survey routes.

G. Fauna

No faunal survey was executed as part of the survey, but Appendix II lists species noted in other surveys undertaken by MNFI, and the Nature Conservancy, and the DNR Wildlife Division.

H. Wildlife and plant values

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

For most of the plants and plant communities listed, maintenance of natural ecological processes and hydrologic conditions is sufficient.

2. Population trends

No specific data is available for most of the special plants and animals within the marsh complex. Most of the special plants of marshes and Great Lakes shorelines are adapted to either fluctuating water levels or blowing sand substrates. Although their populations may fluctuate, they are generally stable over the long term, unless their habitat is permanently destroyed by diking, dredging, seeding of exotics, etc.

The populations of piping plover are under threat because of both habitat destruction and higher levels of predation caused by development of Great Lakes shorelines. High water levels may temporarily eliminate some nesting sites, but return of low water levels will possibly result in recolonization of beaches with appropriate nesting sites.

I. Management needs

U.S. Highway 2 crosses the marsh near the Lake Michigan shoreline. Alterations of this highway have in the past included design measures to limit degradation of the marsh and destruction of special plant and animal habitat. It is important that this care continues in further maintenance and

construction projects.

Several cottages and inholdings are located along the beach near the mouth of the Pointe aux Chenes River. The Nature Conservancy has purchased some of these inholdings and continues to pursue further purchases.

J. Administrative records

The Michigan Natural Features Inventory will maintain Element Occurrence Records for the special plants and animals listed, as well as the natural communities listed. This site contains a large number of high quality elements.

K. References

1. Literature cited

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L. Appendices

Site name: Pointe aux Chenes

Surveyor: M. Ponsik, D. Haasol, D. A. GERT

Date: 7-13-1987/9-6-1987

	<i>Glyceria canadensis</i>		<i>L. trisetula</i>		<i>M. mexicana</i>		<i>P. obtusata</i>		<i>P. secunda</i>
	<i>G. striata</i>		<i>Lepidium densiflorum</i>		<i>M. richardsonii</i>		<i>P. psycodes</i>		<i>P. uniflora</i>
	<i>Syntherisma drupetensis</i>		<i>Liatris spicata</i>		<i>Nyctanthes</i>		<i>Poa aioides</i>		<i>Quercus bicolor</i>
	<i>Valeriana autumnale</i>		<i>Lilium philadelphicum</i>		<i>Myrica gale</i>		<i>P. compressa</i>		<i>Q. macrocarpa</i>
	<i>Valerianthus giganteus</i>		<i>Lindera benzoin</i>		<i>Myriophyllum farwellii</i>		<i>P. paludigena</i>		<i>Q. palustris</i>
	<i>H. grosseserratus</i>		<i>Lindera angustiloba</i>		<i>H. heterophyllum</i>		<i>P. palustris</i>		<i>Quercus</i>
	<i>H. tuberosus</i>		<i>Linnaea borealis</i>		<i>M. spicata</i>		<i>P. pratensis</i>		<i>Ranunculus abortivus</i>
	<i>Heracleum lanatum</i>		<i>Liparis loeselii</i>		<i>M. tenellum</i>		<i>Poa</i>		<i>R. acris</i>
	<i>Heuchera richardsonii</i>		<i>Liriodendron tulipifera</i>		<i>M. verticillata</i>		<i>Pogonia ophioglossoides</i>		<i>R. asbigens</i>
	<i>Hieracium odorata</i>		<i>Lobelia cordata</i>		<i>Myriophyllum</i>		<i>Polemonium reptans</i>		<i>R. aquatilis</i>
	<i>Hieracium boreale</i>		<i>Lobelia cardinalis</i>		<i>Hajus flexilis</i>		<i>Polygala cruciata</i>		<i>R. flabellaris</i>
	<i>H. canadense</i>		<i>L. dortmanna</i>		<i>Nasturtium officinale</i>		<i>P. sanguinea</i>		<i>R. hispidus</i>
	<i>H. ellipticum</i>		<i>L. kalmii</i>		<i>Nelumbo lutea</i>		<i>Polygonum amphibium</i>		<i>R. pensylvanicus</i>
	<i>H. kalmiana</i>		<i>L. siphilitica</i>		<i>Nesopenthus mucronata</i>		<i>P. hydrophiloides</i>		<i>R. sepiaratus</i>
	<i>H. nuttiana</i>		<i>L. spicata</i>		<i>Nyctanthes odorata</i>		<i>Polygonum</i>		<i>R. septentrionalis</i>
	<i>H. punctata</i>		<i>Loebelia</i>		<i>Nyssa sylvatica</i>		<i>Pontederia cordata</i>		<i>Ranunculus</i>
	<i>Hypericum</i>		<i>Lonicera caerulescens villosa</i>		<i>Oenothera perennis</i>		<i>Populus balsamifera</i>		<i>Ranunculus alniifolia</i>
	<i>Hypoxis hirsuta</i>		<i>L. oblongifolia</i>		<i>Oenothera</i>		<i>P. deltoides</i>		<i>R. frangula</i>
	<i>Ilex verticillata</i>		<i>Ludwigia alternifolia</i>		<i>Onoclea sensibilis</i>		<i>P. heterophylla</i>		<i>Rhynchospora alba</i>
	<i>Isotriaens capensis</i>		<i>L. palustris</i>		<i>Osanda cinnamomea</i>		<i>Portulaca oleracea</i>		<i>R. capitata</i>
	<i>I. pallida</i>		<i>Luzula acuminata</i>		<i>O. claytoniana</i>		<i>Potamogeton zosterifolius</i>		<i>R. capitellata</i>
	<i>Iris versicolor</i>		<i>Lycopodium annotinum</i>		<i>O. regalis</i>		<i>P. aphidrus</i>		<i>R. fusca</i>
	<i>I. virginica</i>		<i>L. clavata</i>		<i>Oxyopsis rigidior</i>		<i>P. filiflorus</i>		<i>Rhynchospora</i>
	<i>Isoetes verticillata</i>		<i>L. inundata</i>		<i>Panicum capillare</i>		<i>P. foliosus</i>		<i>Ribes asericum</i>
	<i>Juncus alpinus</i>		<i>L. lucidula</i>		<i>P. clandestinum</i>		<i>P. friesii</i>		<i>R. glandulosus</i>
	<i>J. balticus</i>		<i>L. obscurus</i>		<i>P. virgatum</i>		<i>P. graebnens</i>		<i>R. hirtellus</i>
	<i>J. biflorus</i>		<i>Lycopodium</i>		<i>Panicum</i>		<i>P. illinoensis</i>		<i>R. lacustre</i>
	<i>J. brachycephalus</i>		<i>Lycopodium asericum</i>		<i>Parnassia glauca</i>		<i>P. natans</i>		<i>R. triste</i>
	<i>J. canadensis</i>		<i>L. uniflorus</i>		<i>Pedicularis lanceolata</i>		<i>P. nodosus</i>		<i>Ribes</i>
	<i>J. effusus</i>		<i>Lysisachia ciliata</i>		<i>Pellandra virginica</i>		<i>P. declinatus</i>		<i>Rorippa islandica</i>
	<i>J. greenii</i>		<i>E. L. monularia</i>		<i>Pentstemon digitalis</i>		<i>P. draeconius</i>		<i>Rosa acicularis</i>
	<i>J. allitarsis</i>		<i>L. quadriflora</i>		<i>Penthorum sedoides</i>		<i>P. richardsonii</i>		<i>R. palustris</i>
	<i>J. nodosus</i>		<i>L. tarastriis</i>		<i>Petasites frigidus</i>		<i>P. robinii</i>		<i>R. setigera</i>
	<i>J. pelocarpus</i>		<i>Lysisachia</i>		<i>Phalaris arundinacea</i>		<i>P. strictifolius</i>		<i>Rosa <u>palustris</u></i>
	<i>J. tenuis</i>		<i>Lytchua alata</i>		<i>Phragmites australis</i>		<i>P. zosterifolius</i>		<i>Rubus acutis</i>
	<i>J. torreyi</i>		<i>E. L. salicaria</i>		<i>Physocarpus opulifolius</i>		<i>Potamogeton</i>		<i>R. alleghaniensis</i>
	<i>Juncus</i>		<i>Mattuceia struthiopteris</i>		<i>Picea glauca</i>		<i>Potentilla anserina</i>		<i>R. hispids</i>
	<i>Justicia americana</i>		<i>Mentha arvensis</i>		<i>P. mariana</i>		<i>P. fruticosa</i>		<i>R. pubescens</i>
	<i>Kalmia angustifolia</i>		<i>Mentha trifoliata</i>		<i>Pilea pumila</i>		<i>P. norvegica</i>		<i>Rudbeckia laciniata</i>
	<i>K. latifolia</i>		<i>Mertensia virginica</i>		<i>Pinguicula vulgaris</i>		<i>P. palustris</i>		<i>R. sullivanti</i>
	<i>Laportea canadensis</i>		<i>Mniolus alatus</i>		<i>Plantanthera blechnifolius</i>		<i>Prenanthes racemosa</i>		<i>Rumex altissimus</i>
	<i>Larix laricina</i>		<i>M. ricinus</i>		<i>P. ciliaris</i>		<i>P. x clavellata</i>		<i>R. orbiculatus</i>
	<i>Lathyrus palustris</i>		<i>Mitella repens</i>		<i>P. dilatata</i>		<i>P. x clavellata</i>		<i>R. verticillatus</i>
	<i>Legum. canadensis</i>		<i>Mitella nuda</i>		<i>P. flava</i>		<i>P. virginiana</i>		<i>Rosa</i>
	<i>Legum. sylvatica</i>		<i>Morinda fistulosa</i>		<i>P. hyperborea</i>		<i>P. virginiana</i>		<i>Sagittaria cuneata</i>
	<i>L. virginica</i>		<i>Morus rubra</i>		<i>P. lacera</i>		<i>P. acerifolia</i>		<i>S. graminea</i>
	<i>Lesna minor</i>		<i>M. glomerata</i>		<i>P. leucophaea</i>		<i>P. rotundifolia</i>		<i>S. latifolia</i>
									<i>Sagittaria</i>

Appendix II. Fauna of the Proposed Pointe aux Chenes Marsh noted during field surveys.

BIRDS

Bald eagle
Blackburnian warbler
Black duck
Cedar waxwing
Chipping sparrow
Common tern
Dunlin
Osprey
Pine warbler
Piping plover
Redstart
Red-winged blackbird
Ring-billed gull
Sanderling
Sandhill crane
Savannah sparrow
Spotted sandy killdeer
Yellow-bellied flycatcher
Yellow warbler

MAMMALS

Beaver
Muskrat
White-tailed deer
Black bear (sign)

USDA-FOREST SERVICE

PHOTOGRAPHIC RECORD

PHOTOGRAPHER

Dennis A. Albert

HEADQUARTERS UNIT

MNFI

LOCATION

Lansing, MI

DATE SUBMITTED

31 May 1988

31 May

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			9-6-1987	Pte. aux Chenes Bay proposed RNA Mackinac Co T41N R04W NE4 of SW4 of Sec. 27	Bog located in shallow depression between red and jack pine dominated sand spits and and small parabolic dunes.
2			9-6-1987	T41N R04W SE4 of SE4 of Sec. 28	Red pine on low sand spit adjacent to Bog
3			9-6-1987	T41N R04W SE4 of NE4 of Sec. 33	Bog located between two low beach ridges. Some calcophiles located near the edge of the depression.
4			9-6-1987	T41N R04W NE4 of SE4 of Sec. 33	Northern Fen with stunted cedar growing on 3-4 ft deep muck.
5			9-6-1987	T41N R04W SW4 of NE4 of Sec. 33	Patterned Fen, sedge dominated. Note the long wet swale, surrounded by sedges and other herbs, typical of Pa tterned Fens.
6			9-6-1987	T41N R04W NW4 of SW4 of Sec. 19	Hemlock and White Pine dominated stand located near Pte. aux Chenes River on a small ridge.
7			9-6-1987	T41N R05W NE4 of SE4 of Sec. 24	Pond in swale between two beach ridges. Most of the swale is dominated by sedges.
8			9-6-1987	T41N R05W SE4 of SE4 of Sec. 24	<u>Calamagrostis canadensis</u> (blue joint) along the edge of Pte. aux Chenes River.
9			10- -1987	T41N R05W Sec. 25	Emergent Marsh growing in sandy swale.
10			7-15-1987	T41N R05W SW4 of SE4 of Sec. 25	<u>Utricularia cornuta</u> (bladderwort) growing near the site of slide number 9 on a dry year.
11			9- -1986	T41N R05W Sec. 25	Flooded pool, Emergent Marsh, and Dry Northern Forest (on low sand beach ridge).