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MISSISSIPPI RIVER ISLAND
SCIENTIFIC AND NATURAL AREA

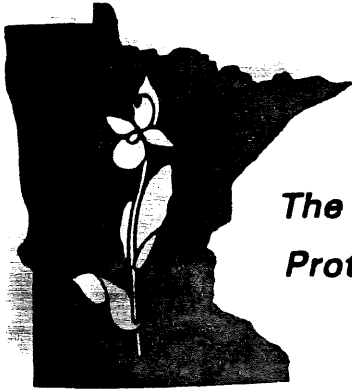
RESOURCE INVENTORY

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***The Scientific and Natural Areas Program . . .
Protecting and Managing
the Best of Minnesota's
Natural World***

**MISSISSIPPI RIVER ISLAND
SCIENTIFIC AND NATURAL AREA**

RESOURCE INVENTORY

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**Division of Fish and Wildlife
Minnesota Department of Natural Resources**

The 1979 Resource Inventory
for
Mississippi Scenic and Recreational River Islands
Scientific and Natural Area

Sherburn County, Minnesota
Section 2,3,4,
Township 32 North, Range 26, 27 West
Wright County, Minnesota
Section 7, 19, 18,
Township 121 North, Range 23,24 West
Big Lake and Elk River Quadrangles

Prepared by
The Scientific and Natural Areas Section
Division of Parks and Recreation
Minnesota Department of Natural Resources

December 1979 Draft

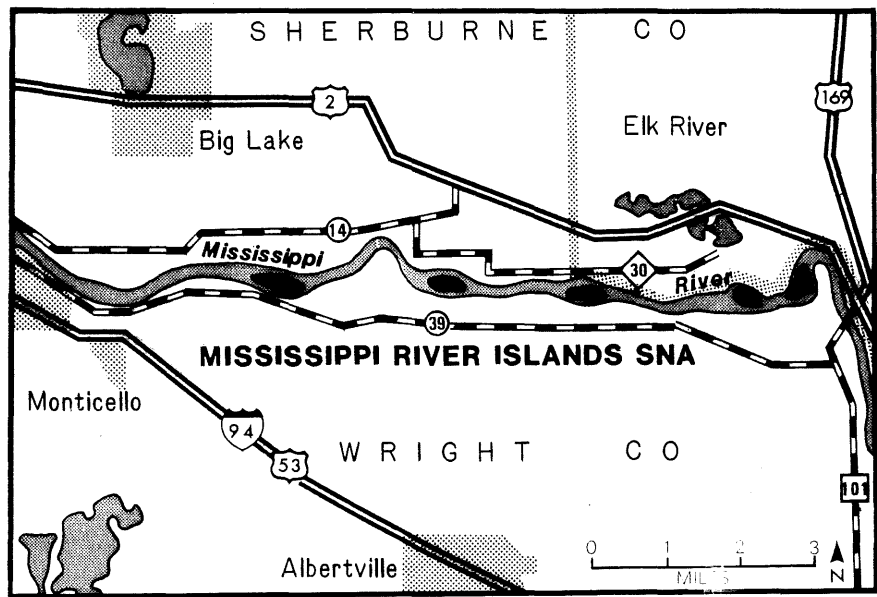


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INTRODUCTION

Scope and Organization

This report documents the information collected during a 1979 inventory of the Mississippi River Islands natural area. The inventory recorded information on climate, geology, soils, hydrology, plant communities, flora, birds, mammals, amphibians, reptiles, and land use history. Data supplied by this document will be used by the Minnesota Natural Heritage Program and other evaluators to assess the site as a potential Scientific and Natural Area (SNA). The document can also be used by scientists, educators, and others interested in the area. Should the site be designated an SNA, management plans can be written using this document as a reference.

This report is divided into five sections including: introduction, abiotic, vegetational, and zoological components, and land use history of the site. Methodologies and results are presented for each section.

The inventory of Mississippi River Islands was part of a larger 1979 effort in which eighteen natural areas in east central, northwest, and southeast Minnesota were surveyed. Inventory team members were: John Borowske, SNA Planning Coordinator; Cherry Keller, Karen Lustig, Deb Schowalter, and Jeff Weigel, Researcher/Writers; Kathy Bolin, Community Specialist; and Nancy Berlin, Tony Busche, Barbara Eikum, Peter Farrell, Joanne Herman, Laura Hill, Susan Ottoson, Deanna Schmidt, Marianne Severson, Angela Tornes, and James Ziegler, Researchers. Gerald Jensen, Coordinator, Scientific and Natural Areas Program, and Mark Heitlinger, Coordinator of Preserve Management, The Nature Conservancy, Minnesota Chapter served

as inventory advisors. Michael Rees, Project Editor, The Nature Conservancy, provided editorial assistance. Other individuals who assisted in the preparation of the inventory are mentioned in the appropriate sections. Their help is gratefully acknowledged.

Description of Study Area

The Mississippi River Islands natural area is a chain of five island complexes totaling 142 acres in southern Sherburne and northern Wright counties. The area's climate is mid-continental, relatively cool and moist, with warm summers and cold winters. The islands are formed primarily from water-deposited Mississippi outwash and alluvium. Elevations up to about 30 feet above river level are found in some locations, although most areas are much lower. Mississippi waters constantly affect the islands through flooding, erosion, and sedimentation processes. Poorly developed, highly variable soils formed under aquatic vegetation and water tolerant trees. The area's present vegetation is primarily river-bottom forest with occasional clearings and peripheral sandbars.

The flora and fauna of the Mississippi River Islands are characteristic of natural floodplain island communities. Species observed on the tract include: 183 vascular plants, 48 birds, 11 mammals, 2 amphibians, and 3 reptiles. Although human impact has been minimal, the islands have been used for a variety of purposes, including grazing, cultivation, and recreation.

Preliminary Assessment of Significance

This section lists features identified by the Minnesota Natural Heritage Program (MNHP) as potential elements¹, and identifies other aspects of the preserve believed by the authors to be important components of Minnesota's natural diversity, or which otherwise might qualify the site for SNA designation. Criteria for SNA evaluation are enumerated in "Minnesota Department of Natural Resources Policy Plan for Scientific and Natural Areas", dated July 6, 1979.

The Mississippi River Islands support a river bottom vegetation type essentially representative of the original vegetation for this area, as described by Marschner (1930). The natural area contains virtually all species listed in Marschner's description of "river-bottom forest", including American and Slippery Elm (Ulmus americana and U. rubra), Black and Green Ash (Fraxinus nigra and F. pennsylvanica), Cottonwood (Populus deltoides), Box Elder (Acer negundo), Silver Maple (A. saccharinum), Bur Oak (Quercus macrocarpa), Basswood (Tilia americana), Hackberry (Celtis occidentalis), and various willows (Salix alba, S. interior, and S. rigida). The relatively open structure of such forests is maintained by periodic flooding (Curtis, 1959). The Bladdernut shrub (Staphylea trifolia), found on Bladdernut or Lily Pond Island, is near the northern extent of its range (University of Minnesota herbarium records).

¹ An element is a natural feature of particular interest because it is exemplary, unique, threatened, or endangered on a national or statewide basis.

ABIOTIC FACTORS

The abiotic resources of an area provide a framework necessary to the existence of all life. The role of physical factors, involving processes of climate, geology, soils, and water is important in ecology. Biotic characters such as range, distribution, and diversity of plant and animal life are ultimately determined by potential limiting factors of the physical environment. These factors must be considered in any analysis of the biota of a natural area.

The natural diversity of an area must be assessed in terms of abiotic as well as biotic elements. Unique physical characteristics, such as influential hydrologic conditions or landforms illustrating geologic processes contribute to overall diversity. The preservation value of a particular area may rest wholly on its abiotic features. The following sections describing climate, geology, soils, and hydrology are an effort to describe the abiotic setting of the Mississippi River Islands Natural Area.

CLIMATE

Methods

Climatological data were gathered by researching reports from the National Oceanic and Atmospheric Administration (NOAA), Minnesota Agricultural Experiment Station, and Soil Conservation Service (SCS). Most numerical data were obtained from the NOAA station at Cambridge, approximately 28 miles northeast of Mississippi River Islands.

Regional Climate

The climate of east central Minnesota is typical of areas in the central part of the North American continent. Sharp seasonal contrasts in temperature and precipitation result from lack of moderating factors, such as location near a large body of water. During summer months, southerly winds carry warm, moist air masses northward from the Gulf of Mexico, making summer the season of greatest precipitation. During winter, cold air masses invade from the north, making the winter months cold and dry.

Discussion

The mean temperature for June, July, and August in the Mississippi River Islands area is 68° F; the December, January, and February mean is 13° F. On the average, there are 14 days above 90° F. in the summer and about 45 days below 0° F. in the winter. The average duration of the freeze-free season is 140 days. The length of the total crop season, which includes the growing period for both cool and warm season species, averages 210 days (Baker and Strub, 1963b).

About 80%, or more than 21 inches, of the area's annual precipitation (water equivalent) falls during the period of April through September. June is the wettest month, with numerous thunderstorms accounting for an average of 4.8 total inches of rain. There are about 36 thunderstorms per year. Rainfall intensities of 2.3 inches per day every year, 4.1 inches per day every ten years, and 5.2 inches per day every 50 years are expected to occur. The precipitation during the winter months usually falls as snow, with an average seasonal total of 42 inches. About 100 days a year have a ground snow cover of one inch or more. Precipitation of 0.01 inch or more can be expected about 110 days a year. Total annual precipitation about equals total annual evaporation in the area. Prevailing winds blow from the west and northwest during the winter, and from the south and southeast during the summer.

Damaging storms such as severe blizzards, tornadoes, and ice storms occur infrequently in the area. The occurrence of ice storms averages less than once per year. However, heavy rains, winds, and hail associated with thunderstorm squall lines occur each year. Table 1 is a summary of selected climatic data for the Cambridge area.

Sources of Information

Baker, D.G. and J.H. Strub, Jr. 1963b. Climate of Minnesota: Part I. Probability of Occurrence in Spring and Fall of Selected Low Temperatures. Minnesota Agricultural Experiment Station Tech. Bulletin 243.

_____. 1963b. Climate of Minnesota: Part II. The Agricultural and Minimum Temperature Free Seasons. Minnesota Agricultural Experiment Station Tech. Bulletin 245.

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U.S. Department of Commerce, National Oceanic and Atmospheric Administration. 1977. Climate of Minnesota. Climatology of the U.S. #60. Asheville, N.C.

_____. 1973. Monthly Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1941-70. Climatology of the U.S. #81. Asheville, N.C.

Table 1. Selected Weather Data for Cambridge.

TEMPERATURE	°F	°C
Mean annual temperature	42.0	5.6
Highest temperature recorded (14 July 1936)	109	42.8
Lowest temperature recorded (1 January 1935)	-42	-41.1
Mean temperature warmest month		
Month: July		
Mean daily maximum	81.1	27.3
Mean daily minimum	59.0	15.0
Mean temperature coldest month		
Month: January	8.5	-13.1
Mean daily maximum	18.4	-7.6
Mean daily minimum	-1.4	-18.6
Average date last freeze (Spring) ^a	c. 7 May	
Average date first freeze (Fall) ^b	c. 1 Oct.	
Average days freeze freeze season ^c	140	
Average days total crop season ^d	210	
PRECIPITATION	in.	cm.
Mean annual precipitation	28.47	72.3
Mean precipitation wettest Month		
Month: June	4.77	12.1
Mean precipitation driest month		
Month: January	0.69	1.7
Mean annual snowfall	42.4	107.7
Mean snowfall heaviest month		
Month: December	9.3	23.6

^aBased on Figure 3. Baker, D. G., and J. H. Strub, Jr. 1963a. Climate of Minnesota: Part I. Probability of Occurrence in Spring and Fall of Selected Low Temperatures. Minnesota Agr. Exp. Sta. Tech. Bull. 243.

^bBased on Figure 4. Baker and Strub, 1963a.

^cBased on Figure 16. Baker, D. G., and J. H. Strub, Jr. 1963b. Climate of Minnesota: Part II. The Agricultural and Minimum-Temperature-Free Seasons. Minnesota Agr. Exp. Tech. Bull. 245.

^dBased on Figure 14. Baker, D.G., and J. H. Strub, Jr. 1963b. Climate of Minnesota: Part II. The Agricultural and Minimum-Temperature-Free Season Minnesota Agr. Exp. Sta. Tech. Bull. 245.

GEOLOGY

Methods

Geologic information was primarily obtained through a literature search. Field observations using topographic maps and aerial photos aided in interpretation.

Historical Geology

Glaciation during the past two million years (the Pleistocene Epoch) has dominated development of the landscape of Minnesota. The most recent ice advances of the Wisconsin Stage of glaciation are responsible for the majority of the state's landforms. Two separate ice lobes, the Superior lobe, and the Grantsburg sublobe of the Des Moines lobe, covered the Mississippi River Islands area at different times during the Wisconsin Stage. Glacial events had a profound affect on the flow regime of the Mississippi River. Erosion, sedimentation, and other fluvial processes combined to produce the present configuration of the Mississippi and adjacent land, including the Mississippi River Islands natural area.

About 20,000 B.P. (years before present; Wright, 1972) the Superior lobe advanced southwestward out of a lowland now occupied by Lake Superior; it extended about as far south as the Twin Cities area. This lobe left characteristic deposits of sandy, reddish, noncalcareous glacial drift. A large drift deposit called the St. Croix end moraine was formed at the Superior lobe ice front. This northwest to southeast trending landform is approximately 10 miles southwest of the natural area; it is roughly parallel to the Mississippi River.

Following recession of the Superior lobe, a tongue of ice called the Grantsburg sublobe of the Des Moines lobe pushed northeastward over the St. Croix moraine. This sublobe eventually advanced across east central Minnesota to a terminus near Grantsburg, Wisconsin about 16,000 B.P. (Wright, 1972). The Grantsburg sublobe diverted Glacial Mississippi River drainage northeastward around the ice front and into the St. Croix River valley area. The natural area at this time was under the Grantsburg sublobe ice. A large proglacial lake, Glacial Lake Grantsburg, was formed north and east of the site from ponded meltwaters and tributary streams. Wastage of stagnant Grantsburg ice opened south flowing channels which drained the lake; however, meltwaters and Mississippi waters continued to flow on and around the remaining ice. These waters deposited a series of coalescing sandy outwash fans over east central Minnesota until the Grantsburg sublobe disintegrated completely. This large glaciofluvial deposit, which lies east and northeast of the natural area, is called the Anoka Sandplain.

As the Grantsburg ice melted, the course of the Mississippi slowly migrated southwestward back to its original course. During this time the sediment-laden river was broad, shallow, and braided, and did not flow in a distinct valley. Eventually the Grantsburg ice melted completely so the river was no longer diverted. The main Mississippi stream then broke through the St. Croix moraine near Minneapolis causing the river to straighten and establish a more channeled course. A 2 to 5 mile wide valley, called the Mississippi Valley Train (Cooper, 1938), was cut into the Anoka Sandplain at this time. The establishment of a distinct channel

increased water velocity, so all but the coarsest sediments were washed away. Thus, the valley train is marked as a strip along both sides of the river consisting of deposits that are somewhat coarser than those in the adjacent Anoka Sandplain (Wright, 1972). The Mississippi River Islands natural area is located within the Mississippi Valley Train.

As glacial retreat continued, the sources of meltwater and sediment feeding into the Mississippi were cut off. The late-glacial river began to cut down into the valley train, ultimately forming the more narrow, steep-sided valley which bounds the present floodplain. Since then, the trend has been reversed to a period of gradual valley filling which continues today.

Islands form in rivers under a variety of conditions. As a river such as the Mississippi meanders back and forth across its floodplain, it forms many different channels which may isolate sections of land as islands. Sandbars may accumulate enough sediment and vegetation to eventually form islands. Tributary streams entering the river empty their sediment load into the Mississippi; these deposits may create islands. Whatever their origin, the islands comprising the natural area are part of a dynamic river system. They are continually affected by fluvial processes of erosion and sedimentation which may alter their shape either gradually or catastrophically.

Topography and Bedrock

The Mississippi River Island's five major islands are not topographically prominent features. Of the five, Bladdernut Island, with a maximum relief of between 20 and 30 feet over normal river levels, is most prominent. The Elk River island group, with relief of less than 10 feet, is lowest. The lowest peripheral areas of the islands are

probably affected annually by high water levels. Higher elevations are probably relatively undisturbed, except during infrequent periods of heavy flooding.

East central Minnesota is underlain by various Paleozoic sedimentary rocks deposited from marine seas that covered southeastern Minnesota during Cambrian and Early and Middle Ordovician times (approximately 570 to 450 million B.P.; Bray, 1977). These rocks, predominantly sandstones and shales about 700 feet thick, were laid down during a series of transgressions and regressions in a shallow branch of the Cambrian and Ordovician seas called the Hollendale Embayment (Sims and Morey, 1972). They are overlain by deposits of glacial drift varying from 100 to 200 feet thick in the vicinity of the natural area (USGS, 1975). Precambrian basalts, rhyolites, sandstones and shales underlie the sedimentary rocks in this part of the state.

Sources of Information

- Bray, Edmund C. 1977. Billions of Years in Minnesota. Science Museum of Minnesota, St. Paul.
- Cooper, William S. 1938. Ancient Dunes in the Upper Mississippi Valley as Possible Climatic Indicators, in Bull. Am. Meteorological Soc., Vol. 19, May, 1938.
- Dott, R.H. and Batten, R.L. 1976. Evolution of the Earth. McGraw-Hill, Inc.
- Morey, G.B. 1976. Geologic Map of Minnesota, 1:3,168,000. Minnesota Geological Survey. University of Minnesota, Minneapolis.
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- U.S. Department of Agriculture, Soil Conservation Service (SCS) and Minnesota Agricultural Experiment Station. 1977. Soil Surveys of Sherburne and Wright Counties, Minnesota. U.S. Government Printing Office, Washington, D.C.

U.S. Department of the Interior, Geological Survey (USGS). 1961.
Big Lake and Elk River Quadrangles. MN: 7.5 Minute Series (Topo-
graphic). 1:24,000. Denver, Colorado.

_____. 1975. Water Resources of the Mississippi and Sauk Rivers Watershed,
Central Minnesota. Hydrologic Investigations Atlas HA-534.
Washington, D.C.

SOILS

Methods

Soil information was obtained from literature sources and from the Sherburne and Wright County soil Survey manuals published by the Soil Conservation Service (SCS). Soil series descriptions are based on interpretations found in these manuals.¹

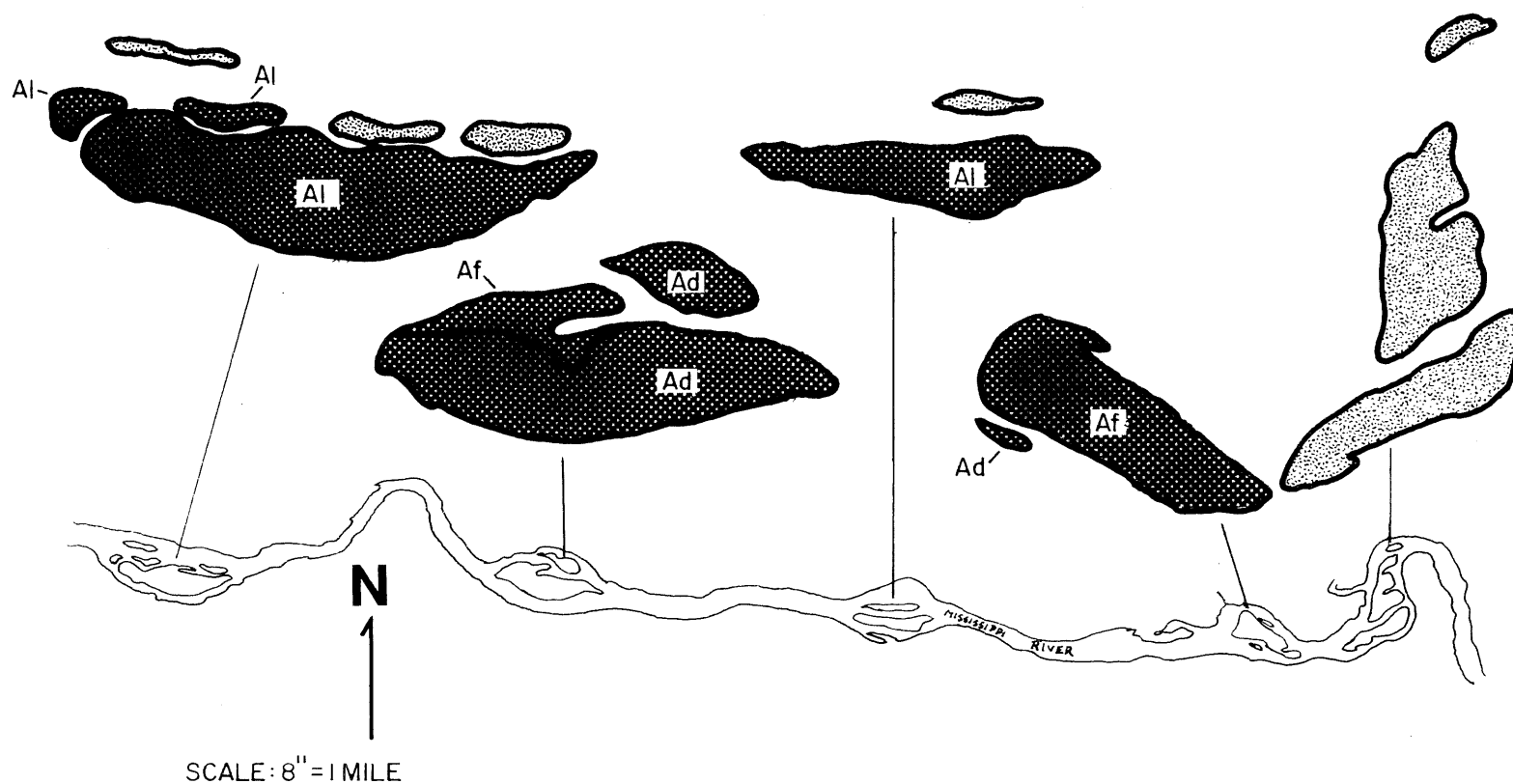
Soils of the Mississippi River Islands Natural Area

Soils of the Mississippi River Islands natural area are formed primarily of alluvial deposits of varying thickness, texture, and consistency. Little soil horizon development is exhibited in most areas due to periodic flooding which reworks old alluvial material and deposits new sediments. One soil series and two land types are present on the islands.

Soils of the Comfrey series (cumulic haplaquolls) are mollisols, characterized by nearly black, friable surface horizons rich in organic matter. Comfrey soils are mapped on the Prickly, Bladdernut and Elk River Islands. They are poorly drained, seasonally wet soils with horizons in which materials have been altered or removed, but no clay or calcium carbonate has accumulated. Relatively thick surface layers are a result of accumulation of alluvial material. Subsurface horizons are poorly developed in these mildly alkaline soils.

Two land types, alluvial land and alluvial land-frequently flooded cover the remainder of the Mississippi River Islands. They consist of

1. Ray Diedrich, Soil Specialist, SCS, St. Paul, provided valuable help for this section.





<u>DRAINAGE</u> <u>SYMBOL</u>	<u>DRAINAGE</u> <u>CLASS</u>	<u>KEY</u>	<u>SOIL</u> <u>SERIES</u>	<u>MAP</u> <u>SYMBOL</u>
	Poorly Drained		Comfry	Cp
	Very Poorly Drained		Alluvial land	Al
				Ad
				Af

Figure 1. Soil and drainage classes for the Mississippi Scenic and Recreational River Islands.

alluvial material deposited by floodwaters, and are highly variable in physical character. Interbedding of different textured sediments is common. Occasionally a thin surface layer of peat is present. Flooding is common, occurring annually land-frequently flooded but less often on the slightly higher alluvial land.

Key to Table 2

TEXTURE: Relative proportions of various soil separates (silt, sand, clay) in a soil.

Topsoil: "surface soil" in uncultivated soils, a depth of 3 or 4 to 8 or 10 inches; in agriculture, refers to the layer of soil moved in cultivation.

Subsoil: soil below the top soil, from 8 or 10 to 60 inches.

DRAINAGE CLASS: Soil drainage refers to natural frequency and duration of saturation which exists during soil development. Soil drainage classes are those used in making detailed soil maps (Arneman and Rust, 1975; USDA-SCS and Minnesota Agr. Exp. Sta., 1977).

ED - Excessively Drained - water is removed very rapidly. Soils are without mottles.

SED - Somewhat Excessively Drained - water is removed rapidly and soils are without mottles.

WD - Well Drained - water is removed from soil readily but not rapidly. Soils are nearly free of mottling.

MWD - Moderately Well Drained - water table usually below 5 feet. Soils are wet for small but significant part of time. Mottling in lower B horizon.

SPD - Somewhat Poorly Drained - water table at depths of 36 to 60 inches. Soil is wet for significant periods, commonly with mottles below 6 to 16 inches.

PD - Poorly Drained - water table seasonally near surface for prolonged intervals. Water table from 18 to 36 inches. Soils wet for long periods, generally with mottles.

VPD - Very Poorly Drained - water table remains at or near surface (above 18 inches) greater part of time. Soils wet nearly all the time, with or without mottl

COMPONENT IN STATE: Extent of acreage in state.¹

M - Major: 100,000 acres or more

I - Intermediate: 10,000 to 100,000 acres

m - Minor: 10,000 acres or less

LOCATION IN STATE:¹

SC - South central Minnesota

SW - Southwestern Minnesota

¹ Determined by Ray Diedrich, Soil Specialist, SCS, St. Paul.

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Sources of Information

Arneman, H.R. and R.H. Rust. 1975. Field Manual for Field Course Soil Survey. University of Minnesota. Department of Soil Science, St. Paul, Minnesota.

Buol, S.W., F.O. Hole, R. J. McCracken. 1973. Soil Genesis and Classification. Iowa State University, Ames.

U.S. Department of Agriculture, Soil Survey Staff. 1960. Soil Classification, A Comprehensive System - 7th Approximation U.S. Government Printing Office, Washington, D.C.

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_____. 1977. Soil Survey of Morrison County, Minnesota. Preliminary data, unpublished.

HYDROLOGY

Methods

Hydrologic conditions of the site were investigated using soil and topographic maps, aerial photographs, and literature sources. Field observations were also used in determining relief and drainage patterns.

Hydrology of Mississippi River Islands Natural Area

Hydrologic conditions of the Mississippi River Islands natural area are affected primarily by fluvial processes of the surrounding Mississippi River. Recently deposited alluvium covers the islands, which have little or no soil development due to the constant modification of the substrate by river waters. Only the highest elevations are relatively undisturbed by the river. Of the five island groups, one supports a body of water. Lily Pond is a small, possibly permanent feature near the eastern tip of Bladdernut Island. In 1979, Lily Pond held water throughout the summer.

The natural area is not prominently elevated above river level. Thus, substantial portions are subjected to annual flooding, mostly during spring. The floods affect the islands by eroding and/or depositing alluvium, thereby altering the land, either gradually or catastrophically. The lowest peripheral zones of the islands are constantly affected in this manner, not just during floods. Vegetation patterns on the natural area are affected by fluctuating river levels. Frequently flooded zones lack understory growth because floodwaters prevent it from becoming established. Higher, infrequently flooded sites support a thick understory (Curtis, 1959). The water table is typically close to, or above, the surface in alluvial bottomlands such as these.

Sources of Information

U.S. Department of Agriculture, Soil Conservation Service (SCS). 1975.
Hydrology Guide for Minnesota. St. Paul

U.S. Department of the Interior. Geological Survey (USGS). 1961.
Big Lake and Elk River Quadrangles. MN: 7.5 Minute Series (Topographic).
1:24,000. Denver, Colorado.

_____. 1975. Water Resources of the Mississippi and Sauk Rivers Watershed,
Central Minnesota. Hydrologic Investigations Atlas HA-534. Reston,
Virginia,

VEGETATIONAL COMPONENTS

Plants and plant communities are a major part of the ecosystems present on a natural area. Vegetation reflects the combined influences of all physical factors, and provides the primary energy source for all other living organisms. A description of the flora provides information on the natural area's diversity, as well as an understanding of the origin and recent history of the vegetation. An inventory of vegetational components was conducted to: 1) document the area's species diversity and communities, 2) obtain baseline data so changes can be discerned, and 3) identify rare, sensitive, or representative species and communities.

VEGETATIVE COMMUNITIES

Methods

Vegetative communities were mapped and described according to their cover type. Vegetation maps were produced by delineating major communities visible on aerial photographs. Recent color infrared and/or black and white photographs were used. Communities were described by walking through the area and recording the dominant (i.e., most abundant) species present based on visual estimation. It should be noted that all variations in vegetation were not distinguished on the map. Rather, major types are separated and variations within each type are discussed in the text.

Releves were conducted on selected communities to supplement field inspection and provide further information on species composition. Visual estimates were made of the abundance (% cover) of each species found in a prescribed plot. Plot locations were chosen to represent homogenous stands of vegetation within a community type. Releves were conducted in mid-July and late August according to the methods described by Heitlinger (1979). All releve data is given in Appendix 1.

Photo points were established to give a visual description of vegetation, and to allow documentation of any future changes. All photo point slides are on file at Scientific and Natural Areas Section, St. Paul and The Nature Conservancy, Minneapolis Field Office.

Overview of Regional Plant Communities

The Mississippi River Islands natural area is located on the western edge of the Mississippi River Sand Plains landscape region (Figure 2). Prior to European settlement, plant communities were composed of riverbottom forest surrounded by oak openings and prairie

Minnesota's Landscape Regions

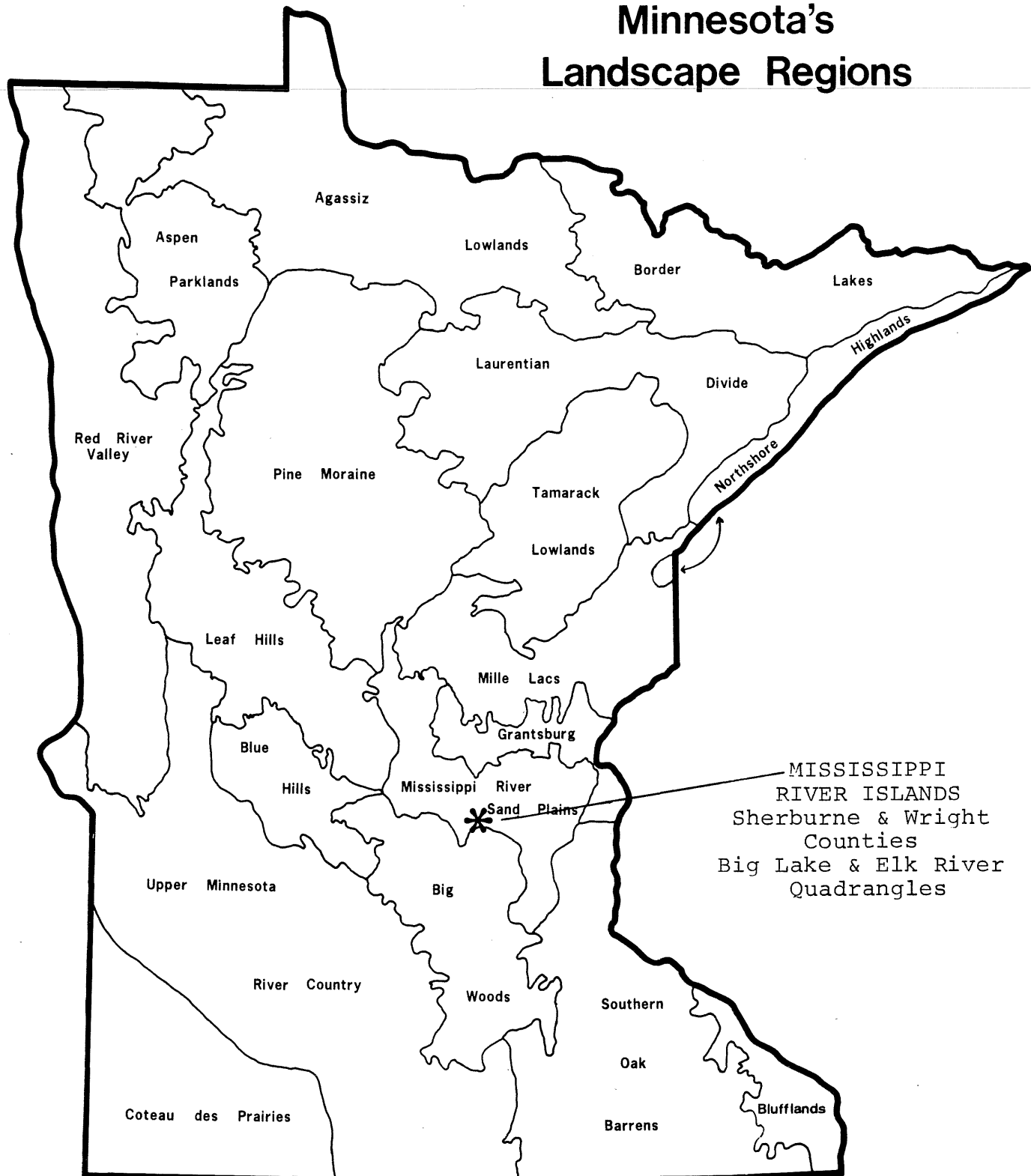


Figure 2. Mississippi River Islands in relation to Minnesota's landscape regions. Adapted from T. Kratz and G.L. Jensen, an ecological geographic division of Minnesota (Unpublished, 1977).

on the mainland (Marschner, 1930; Figure 3). Examples of the original riverbottom vegetation can still be found on the islands today.

Results

The vegetative communities of the Mississippi River Islands are mapped in Figure 4. The area is predominantly wooded floodplain with scattered clearings and sand bars. Variations in elevation, with corresponding differences in flooding and soil moisture, have produced a lower wet floodplain and a higher, wet mesic wooded floodplain community. Periodic flooding and previous land use practices have also affected the vegetation. A description of each community is given below.

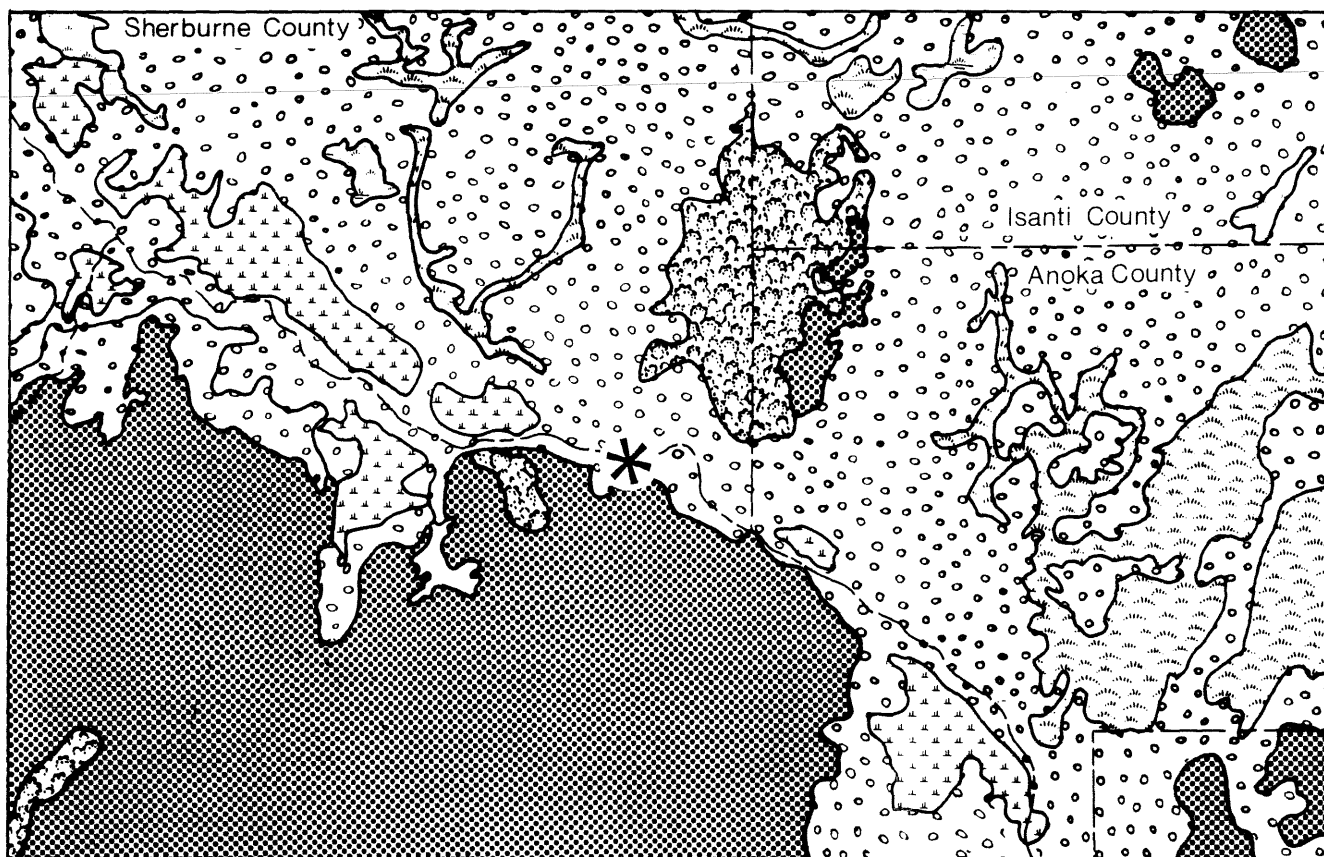
WOODED FLOODPLAIN/WET: 96 acres, 67% of preserve.

This area is dominated by a canopy of Silver Maple (Acer saccharinum), American Elm (Ulmus americana), and Green Ash (Fraxinus pennsylvanica). Wood Nettle (Laportea canadensis) and Ostrich Fern (Matteuccia struthiopteris) dominate the ground layer.

Areas slightly higher than the river level and islands mostly or completely flooded have a wooded floodplain/wet vegetation. This community has wide spaced trees, but few or no shrubs in the understory layer. Vines, such as River-Bank Grape (Vitis riparia) and Moonseed (Menispermum canadense) are also common. Source of information: field inspection and releves MI - 2, 3, 5, and 6.

WOODED FLOODPLAIN/WET-MESIC: 25 acres, 18% of preserve.

Common overstory species include Black Ash (Fraxinus nigra), American Elm (Ulmus americana), Basswood (Tilia americana), Prickly Ash (Zanthoxylum americanum), Chokecherry (Prunus virginiana), and Bladdernut (Staphylea trifolia). Virginia Waterleaf (Hydrophyllum virginianum) and Long-Beaked Sedge (Carex sprengei) are dominant forbs.



Scale : 1:500,000

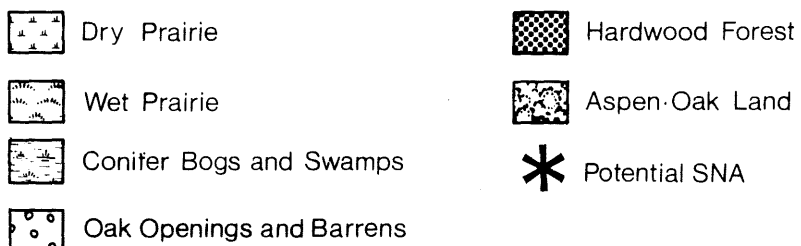


Figure 3. The original vegetation of east-central Minnesota, including the Mississippi Scenic and Recreational River Islands. Adapted from F.J. Marschner, The Original Vegetation of Minnesota, 1:500,000.

This community has a definite shrub layer and a large number of species in the ground layer. Ironwood (Ostrya virginiana) and Paper Birch (Betula papyrifera) also occur on the wooded slopes of Bladdernut Island. This island is the only location of Bladdernut in the natural area. Source of information: field inspection and relevés MI - 1, 4.

SAND BAR/SHORELINE: 14 acres, 10% of preserve.

This community varies in size depending on the flood stage level of the river. Sandbar Willow (Salix interior) is dominant on the lowest islets. Cottonwood (Populus deltoides) and White Willow (Salix alba) trees are common in slightly higher areas. Source of information: field inspection.

CLEARINGS: 7 acres, 5% of preserve.

Clearings range from open areas dominated by Kentucky Bluegrass (Poa pratensis) to shrub thickets dominated by Smooth Sumac (Rhus glabra), Black Raspberry (Rubus occidentalis), and River-Bank Grape (Vitis riparia). Source of information: field inspection.

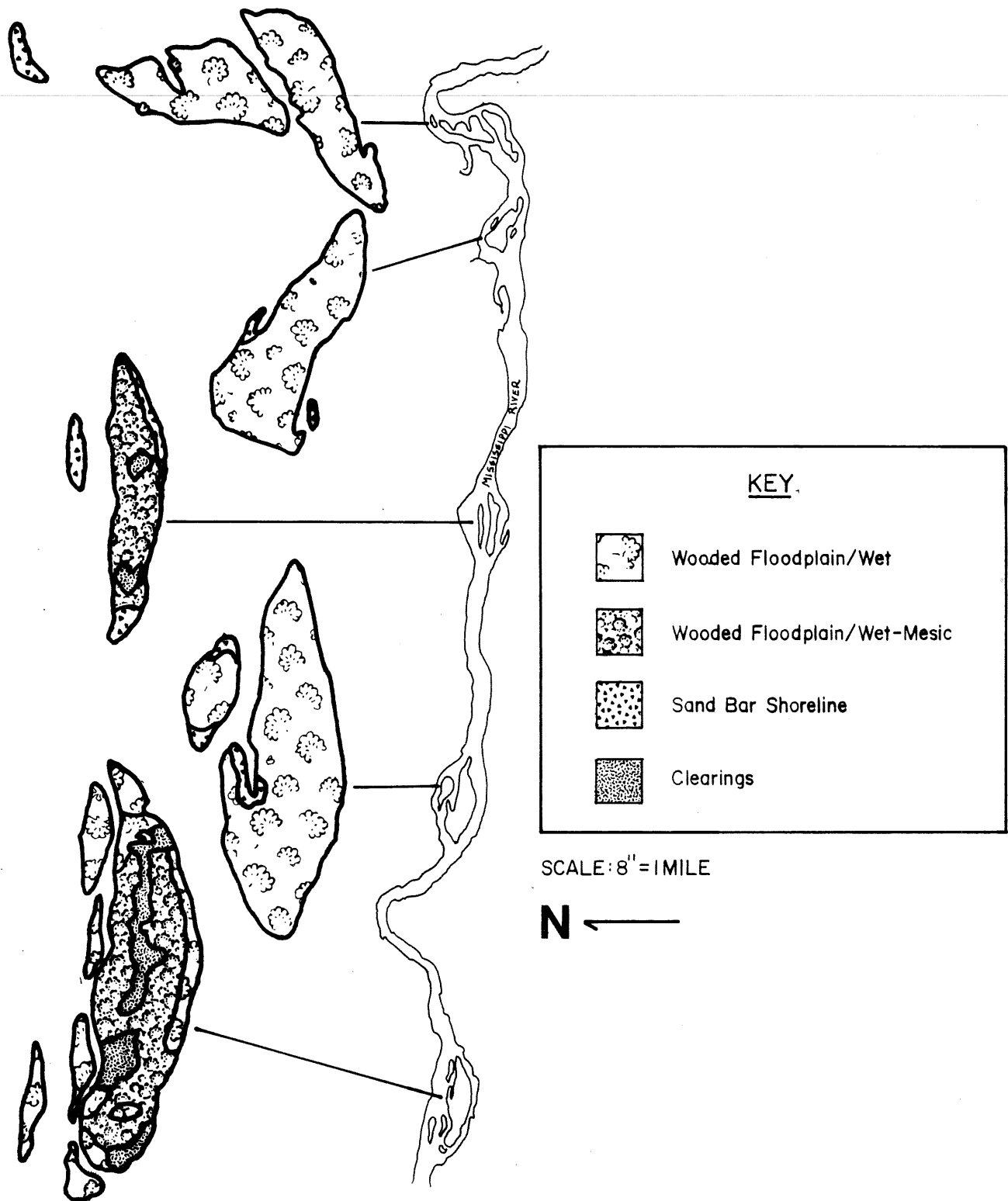


Figure 4. Vegetation communities identified on the Mississippi Scenic and Recreational River Islands.

Sources of Information

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FLORA

Methods

The Mississippi Islands natural area was visited on a weekly basis, when weather conditions permitted, from 14 May to 5 September 1979.

Flowering or fruiting plants were collected and pressed. Habitat, associated species, and collection date was recorded for all specimens. Locations of specimens were indicated on an aerial photograph of the area, or grid field map.¹ Specimens were deposited at the University of Minnesota Herbarium, Botany Department, St. Paul.

A phenological record of the flowering plants was also kept. The recording began on the first visit to the area and ended on the last visit.

Plants were identified using several references (cited at the end of this section). John W. Moore, retired Associate Scientist, University of Minnesota, identified 22 specimens. Gerald Wheeler, graduate student, Botany Department, University of Minnesota, identified all species of the genus Carex. Dr. Gerald Ownbey, Curator of the Herbarium, University of Minnesota, verified the remaining specimens. Any specimens identified in the field but not collected, are indicated as such in the list.

Plants were designated alien if described as "introduced" in north-eastern United States by both Fernald (1950) and Gleason and Cronquist (1963). Plants were designated possibly alien if described as "introduced" by one of these authorities and native by the other.

¹ On file, Scientific and Natural Areas Section, St. Paul.

Results

Table 3 is an annotated list of the plants identified on the tract.¹ A total of 183 vascular plant species,² representing 70 families, were recorded on the unit in 1979. Eight of these species are alien. The families with the largest number of species were: Asteraceae with 23 species (12.57% of total), Poaceae with 10 species (5.46% of total), and Lamiaceae with 10 species (5.46% of total).

Figure 5 illustrates the number of species in flower on each visit to the preserve. A total of 136 species were included. The peak in blooming occurred in August.

1 Nomenclature is according to Gleason and Cronquist (1963).

2 This total does not include additional plant species identified in releve plots.

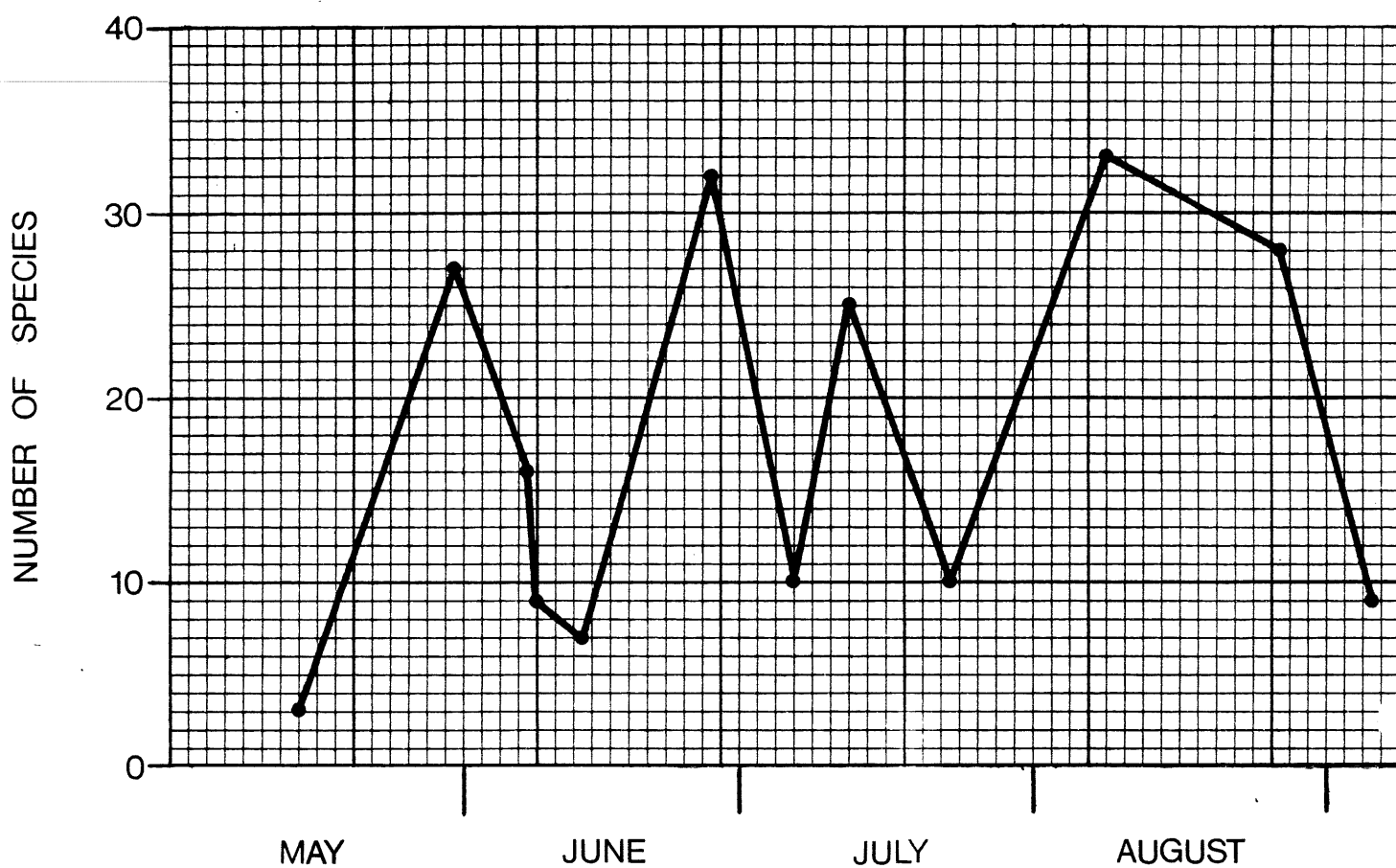


Figure 5. The 1979 blooming phenology on the Mississippi Scenic and Recreational River Islands. Graph illustrates the number of plant species blooming on each trip to the preserve.

Table 3. Annotated list of Plants for Mississippi Islands Natural Area.

Format: Scientific name. Common name. Collection number of voucher specimen. Community in Mississippi Islands. Designated "alien" or "possible alien" if not native to Minnesota. Special significance of collection, if known. A (+) indicates a species was noted but not collected. Asterisk (*) if specimen was identified by John Moore. Species of the genus Carex were identified by Gerald Wheller, all other specimens were verified by Dr. Gerald Ownbey.

PTERIDOPHYTA - Spore-Bearing Plants

POLYPODIACEAE - Polypody Family

Cystopteris fragilis (L.) Bernh. - Fragile Fern. #736. Wooded Slope.

Matteuccia struthiopteris (L.) Todaro. - Ostrich Fern. #858. Shoreline.

SPERMATOPHYTA - Seed Plants

GYMNOSPERMAE - Gymnosperms

CUPRESSACEAE - Cypress Family

Juniperus virginiana L. - Red Cedar. #1054. Edge of Clearing.

ANGIOSPERMAE - Angiosperms

MONOCOTYLEDONAE - Monocots

ALISMATACEAE - Water Plantain Family

Alisma plantago - aquatica L. - Water-Plantain. #1033. Edge of Lily Pond.

CYPERACEAE - Sedge Family

Carex alopecoidea Tuckerm. - Sedge. #426. Floodplain.

Carex laeviconica Dew. - Polished-Fruited Sedge. #340. Shoreline.

Carex laxiflora Lam. var. blanda (Dewey) Boott. (C. blanda Dewey in Fernald, 1950) - Woodland Sedge. #341. Clearing.

Carex retrorsa Schwein. - Retrorsed Sedge. #1034. Edge of Pond.

Carex rosea Schkuhr. - Stellate Sedge. #427. Floodplain.

Carex sparganoides Muhl. var. cephaloidea (Dewey) Carey. - (C. cephaloidea in Fernald, 1950). #425. Wooded Floodplain.

Carex sprengelii Dewey. - Long-Beaked Sedge. #337. Clearing.

Carex stricta var. elongata (Bock) Gl. - (C. emoryi Dew. in Fernald, 1950). Emory's Sedge. #429. Shoreline.

LILIACEAE - Lily Family

Allium stellatum Ker. - Wild Onion. #431. Near Shore.

Erythronium albidum Nutt. - White Trout Lily. #324. Near Shoreline. *

Polygonatum biflorum Walt. Ell. - True Solomon's Seal. +

Smilax ecirrhata (Engelm.) Wats. - Upright Carrion Flower. #332. Wooded Floodplain.

Smilax hispida Muhl. - Green Brier. #1041. Wooded Slope.
Smilacina racemose (L.) Desf. - False Solomon's Seal. #321. Clearing.
Smilacina stellata (L.) Desf. Star Flowered Solomon's Seal. #477.
Wooded Floodplain.
Trillium cernuum L. - Nodding Wake-Robin. #328. Wooded Floodplain.
Uvularia grandiflora Sm. - Large Flowered Bellwort. #247. Wooded
Floodplain.

NAJADACEAE - Pondweed Family

Potamogeton crispus L. - Crisp Pondweed. #861. Shoreline.
Potamogeton nodosus Poir. - Long-Leaved Pondweed. #855. Channel.
Potamogeton pectinastis L. - Sago Pondweed. #854. Near Shore.

ORCHIDACEAE - Orchid Family

Corallorhiza trifida Chat. - Early Coral Root. #414. Wooded Slope.

POACEAE - Grass Family

Argrostis perennans (Walt.) Tuckerm. - Upland Bent Grass. #1030. Prickly
Ash Thicket. *
Bromus ciliatus L. - Fringed Brome Grass. #1030. Edge of Pond. *
Bromus purgans L. - Hairy Woodchess. #548. Sandy Bank. *
Calamagrostis canadensis (Michx.) Beauv. - Blue-Joint Grass. #552.
Shoreline. *
Elymus canadensis L. - Nodding Wild Rye. #553. Edge of Wooded Floodplain. *
Muhlenbergia mexicana (L.) Trin. - Mexican Satin Grass. #810. Clearing. *
Phalaris arundinacea L. - Reed Canary Grass. #546. Shoreline. Possible
Alien. *
Poa pratensis L. (P. pratensis L. var. angustifolia (L.) Sm.) - Lawn
Blue Grass. #338. Clearing. Alien. *
Setaria glauca (L.) Beauv. (S. lutescens (Weigel) F.T. Hubb, nomilleg)
Foxtail Grass. #811. Clearing. *
Spartina pectinata Link. - Cord Grass. #830. Shoreline.

DICOTYLEDONEAE - Dicots

ACERACEAE - Maple Family

Acer negundo L. - Box Elder. #334. Wooded Floodplain.
Acer saccharinum Marsh. - Silver Maple. #307. Edge of Wooded Floodplain.

AMARANTHACEAE - Amaranth Family

Amaranthus tuberculatus (Moq.) Sauer. - (A. altissima Riddell. in Fernald,
1950). Water-Hemp. #1055. Sandy Bank. *

ANACHARDIACEAE - Cashew Family

Rhus glabra L. - Smooth Sumac. #708. Clearing.
Rhus radicans L. - Poison Ivy. +

APIACEAE - Parsley Family

Angelica atropurpurea L. - Angelica. #738. Clearing.
Cryptotaenia canadensis (L.) DC. - Honewort. #533. Wooded Floodplain.
Osmorhiza claytoni (Michx.) Clarke. - Sweet Cicely. #424. Wooded Floodplain.
Zizia aurea (L.) Koch. - Golden Alexander. #433. Wooded Floodplain.

APOCYNACEAE - Dogbane Family

Apocynum cannabinum L. - Indian Hemp. #857. Shoreline.

ARACEACE - Arum Family

Arisaema triphyllum (L.) Schott. - Jack in the Pulpit. #308. Wooded Floodplain.

ARALIACEAE - Gingseng Family

Aralia nudicaulis L. - Wild Sarsaparilla. #329. Wild Sarsaparilla. #329. Wooded Slope.

ARISTOLOCHIACEAE - Birthwort Family

Asarum canadense L. - Wild Ginger. #248. Wooded Floodplain.

ASCLEPIADACEAE - Milkweed Family

Asclepias incarnata L. - Swamp Milkweed. #736A. Shoreline.

Asclepias syrica L. - Common Milkweed. #713. Clearing.

ASTERACEAE - Composite Family

Artemisia absinthium L. - Absinth Wormwood. #826. Sandy Bank.

Artemisia frigida Willd. - Fringed Sage. #1049. Shoreline.

Artemisia serrata Nutt. - Serrate Wormwood. #1056. Sandy Bank.

Aster ciliolatus-Lindl. Lindley's Aster. #1053. Wooded Floodplain. *

Aster ericoides L. - Heath's Aster. #1093. Sandy Bank.

Aster ontarionis Weig. - Ontario Aster. #1057. Wooded Floodplain.

Aster simplex Willd. - Panicked Aster. #1092. Sandy Bank.

Bidens cernua L. - Nodding Bur Marigold. #1088. Sand Bar.

Cirsium discolor (Muhl.) Spreng. - Field Thistle. #808. Grassy Area.

Erigeron annuus (L.) Pers. - Daisy Fleabane. +

Erigeron philadelphicus L. - Common Fleabane. #560. Shoreline.

Eupatorium perfoliatum L. - Boneset. #818. Shoreline.

Eupatorium rugosum Houtt. - White Snakeroot. #805. Shoreline.

Helenium autumnale L. - Sneezeweed. #1042. Shoreline.

Helianthus hirsutus Raf. - Stiff-Haired Sunflower. #1097. Clearing. *

Helianthus tuberosus L. - Jerusalem Artichoke. #1045. Shoreline.

Rudbeckia laciniata L. - Goldenglow. #802. Shoreline.

Silphium perfoliatum L. - Cup Plant. #1052. Wooded Floodplain.

Solidago gigantea Ait. - Late Goldenrod. #801. Shoreline.

Solidago graminifolia (L.) Salisb. - Lance-Leaved Goldenrod. #816. Shoreline.

Tragopogon dubius Scop. - Goat's Beard. #444. Clearing. Alien.

Vernonia fasciculata Michx. - Ironweed. #1027. Edge of Lily Pond.

Xanthium italicum Moretti. (in Fernald, 1950) - Common Clotbur. #1036A. Wooded Floodplain.

BALSAMINACEAE - Touch-Me-Not Family

Impatiens biflora Walt. (I. capensis Meeb. in Fernald, 1950) - Spotted Touch-Me-Not. #1041A. Shoreline.

Impatiens pallida Nutt. - Touch-Me-Not. #1046. Wooded Floodplain.

BERBERIDACEAE - Barberry Family

Caulophyllum thalictroides (L.) Michx. - Blue Cohosh. #343. Wooded Floodplain.

BETULACEAE - Birch Family

Betula papyrifera Marsh. - Paper Birch. #710. Wooded Slope.

Ostrya virginiana (Mill.) K. Koch. - Ironwood. #316. Wooded Slope.

BORAGINACEAE - Borage Family

Hackelia virginiana (L.) Johnst. - Stickseed. #807. Grassy Area.

BRASSICACEAE - Mustard Family

Arabis shortii (Fern.) Gl. (A. perstellata Braun. var. shortii Fern. in Fernald, 1950) - Rock-Cress. #327. Wooded Floodplain.

Erysimum cheiranthoides L. - Wormseed Mustard. #714. Clearing.

Hesperis matronalis L. - Dame's Rocket. #441. Shoreline.

Sisymbrium altissimum L. - Tumbling Mustard. #549. *

CAMPANULACEAE - Harebell Family

Campanula americana L. - Tall Bellflower. #812. Grassy Area.

CAPRIFOLIACEAE - Honeysuckle Family

Lonicera dioica L. - Wild Honeysuckle. #440. Clearing.

Lonicera tatarica L. - Tartarian Honeysuckle. #333. Edge of Clearing.

Sambucus canadensis L. - Common Elder. #740. Shoreline.

Sambucus pubens Michx. - Red-Berried Elder. #326. Floodplain.

Symphoricarpos occidentalis Hook. - Wolfberry. #712. Clearing.

Viburnum lentago L. - Nannyberry. #437. Edge of Clearing.

Viburnum opulus L. (V. trilobum Marsh. in Fernald, 1950) - High Bush Cranberry. #1095. Shoreline.

CARYOPHYLLACEAE - Pink Family

Arenaria lateriflora L. - Sandwort. #320. Wooded Floodplain.

Lychnis alba Mill. - White Campion. #716. Grassy Area. Alien.

CELASTRACEAE - Staff-Tree Family

Euonymus atropurpureus Jacq. - Burning Bush. #554A. Clearing.

CERATOPHYLLACEAE - Hornwort Family

Ceratophyllum demersum L. - Coontail. #1037A. Channel between Islands.

CHENOPODIACEAE - Goosefoot Family

Chenopodium album L. - Lamb's Quarters. #822. Sandy Bank.

CONVOLVULACEAE - Convolvulus Family

Cuscuta umbrosa Hook. - Dodder. #1037. Wooded Floodplain

CORNACEAE - Dogwood Family

Cornus stolonifera Michx. - Red Osier Dogwood. #657. Shoreline.

CUCURBITACEAE - Gourd Family

Echinocystis lobata (Michx.) T.&G. - Wild Cucumber. #828. Shoreline.

EUPHORBIACEAE - Spurge Family

Acalypha rhomboidea Raf. - Three-Seeded Mercury. #735. Clearing.

FABACEAE - Bean Family

Amorpha fruticosa L. - False Indigo. #551. Shoreline.

FAGACEAE - Beech Family

Quercus macrocarpa Michx. - Bur-Oak. #335. Clearing.

FUMARIACEAE - Fumitory Family

Dicentra cucullaria (L.) Bernh. - Dutchman's Breeches. #245. Wooded Floodplain.

GERANIACEAE - Geranium Family

Geranium maculatum L. - Wild Geranium. #317. Wooded Floodplain.

HYDROPHYLLACEAE - Waterleaf Family

Hydrophyllum virginianum L. - Virginia Waterleaf. #315. Shoreline.

HYPERICACEAE - St. John's-Wort Family

Hypericum pyramidatum Ait. - Greater St. John's-Wort. #768. Shoreline.

JUGLANDACEAE - Walnut Family

Juglans cinerea L. - Butternut. #309. Clearing.

LAMIACEAE - Mint Family

Agastache foeniculum (Pursh.) Kuntze. - Giant Hyssop. #1051. Shoreline.

Glechoma hederacea L. - Ground-Ivy. #312A. Wooded Floodplain.

Leonurus cardiaca L. - Motherwort. #659. Wooded Floodplain.

Lycopus americanus Muhl. - Water Horehound. #809. Grassy Area.

Mentha arvensis L. - Wild Mint. +

Monarda fistulosa L. - Wild Bergamot. #812. Grassy Area.

Nepeta cataria L. - Catnip. #717. Grassy Area. Alien.

Physostegia virginiana (L.) Benth. - False Dragon-Head. #859. Clearing.

Scutellaria lateriflora L. - Mad-Dog Skullcap. #829. Sandy Bank.

Stachys palustris L. - Woundwort. #814. Clearing.

Teucrium canadense L. - American Germander. #800. Shoreline.

LYTHRACEAE - Loosestrife Family

Lythrum salicaria L. - Purple Loosestrife. #1086. Sand Bar.

MENISPERMACEAE - Moonseed Family

Menispermum canadense L. - Moonseed. #559. Wooded Floodplain.

MORACEAE - Mulberry Family

Humulus lupulus L. - Hops. #540. Prickly Ash Thicket.

NYCTAGINACEAE - Four-O'clock Family

Oxybaphus nyctagineus (Michx.) Sweet. (Mirabilis nyctaginea (Michx.)

MacM. in Fernald, 1950). - Heart-Leaved Umbrellawort. #541. Clearing.

OLEACEAE - Olive Family

Fraxinus nigra Marsh. - Black Ash. #535. Wooded Floodplain.

Fraxinus pennsylvanica Marsh. - #345. Green Ash. Shoreline.

ONAGRACEAE - Evening-Primrose Family

Circaea quadrisulcata (Maxim.) Franch. & Sav. - Enchanter's Nightshade.

#734. Clearing.

Oenothera parviflora L. - Northern Evening-Primrose. #804. Near Shoreline. *

OXALIDACEAE - Wood-Sorrel Family

Oxalis stricta L. (O. europaea Jordan. in Fernald, 1950). Common Wood-Sorrel. #534. Shoreline. *

PAPAVERACEAE - Poppy Family

Chelidonium majus L. - Celandine. #542. Grassy Clearing. Alien.

Sanguinaria canadensis L. - Bloodroot. #246. Wooded Floodplain.

PHRYMACEAE - Lopseed Family

Phryma leptostachya L. - Lopseed. #660. Clearing.

PLANTAGINACEAE - Plantain Family

Plantago Major L. - Common Plantain. #820. Shoreline.

POLEMONIACEAE - Phlox Family

Phlox divaricata L. - Wild Blue Phlox. #312b. Wooded Floodplain.

POLYGONACEAE - Smartweed Family

Polygonum coccineum Muhl. Swamp Smartweed. #1029. Edge of Lily Pond.

Polygonum lapathifolium L. - Dock-Leaved Smartweed. #819. Sandy Bank. *

PRIMULACEAE - Primrose Family

Lysimachia ciliata L. - Fringed Loosestrife. #806. Near Shore.

RANUNCULACEAE - Crowfoot Family

Actaea rubra (Ait.) Willd. - Red Baneberry. #555. Clearing.

Actaea rubra (Ait.) Willd. (A. rubra (Ait.) Willd. forma neglecta (Gillman) Robins. in Fernald, 1950) - Red Baneberry. #723. Clearing.

Anemone canadensis L. - Canada Anemone. #556. Clearing.

Clematis virginiana L. - Virgin's Bower. #803. Near Shore.

Isopyrum bitermum (Raf.) T.&G. - False Rue Anemone. #241. Wooded Floodplain.

Ranunculus abortivus L. - Small Flowered Crowfoot. #318. Wooded Floodplain.

Thalictrum dasycarpum Fisch. & Ave-Lall. - Tall Meadow Rue. #661. Clearing.

Thalictrum dioicum L. - Early Meadow Rue. #443. Floodplain. *

Thalictrum venulosum Trel. - Meadow Rue. #419. Shoreline.

RHAMNACEAE - Buckthorn Family

Rhamnus catharticus L. - Buckthorn. #439. Clearing.

ROSACEAE - Rose Family

Geum aleppicum Jacq. - Yellow Avens. #715. Clearing.

Geum canadense Jacq. - White Avens. #538. Prickly Ash Thicket.
Potentilla norvegica L. var. hirsuta (Michx.) T.&G. #718. Rough
Cinquefoil. *

Prunus virginiana L. - Choke-Cherry. #322. Clearings.
Rosa blanda Ait. - Smooth Rose. #550. Shoreline.
Rubus occidentalis L. - Black Raspberry. #436. Shoreline.

RUBIACEAE - Madder Family

Galium aparine L. - Cleaver's Bedstraw. #306. Wooded Floodplain.
Galium obtusum Bigel. #737. Shoreline.
Galium triflorum Michx. - Sweet-Scented Bedstraw. #1026. Wooded
Floodplain.

RUTACEAE - Rue Family

Zanthoxylum americanum Mill. - Prickly Ash. #311. Clearings.

SALICACEAE - Willow Family

Populus deltoides Marsh. - Cottonwood. #1035. Edge of Lily Pond.
Salix alba L. - White Willow. #313. Shoreline.
Salix interior Rowlee. - Sandbar Willow. #330. Shoreline.
Salix rigida Muhl. - Heart-Leaved Willow. #1028. Edge of Lily Pond.

SAXIFRAGACEAE - Saxifrage Family

Ribes americanum Mill. - Wild Black Currant. #305. Wooded Floodplain.
Ribes cynosbati L. - Dogberry. #438. Edge of Clearing.
Ribes missouriense Nutt. - Missouri Gooseberry. #310. Clearing.

SCROPHULARIACEAE - Figwort Family

Gerardia tenuifolia Vahl. - Slender-Leaved Gerardia. #1091. Sandy Bank.
Linaria vulgaris Hill. - Butter-And-Eggs. #821. Sandy Bank. Alien.
Mimulus ringens L. - Monkey Flower. #1048. Near Shore.
Scrophularia lanceolata Pursh. - Figwort. #539. Clearing.
Verbasum thapsus L. - Great Mullein. #720. Clearing. Alien.

SOLANACEAE - Family

Physalis heterophylla Ness. - Clammy Ground Cherry. #735A. Grassy Area.
Solanum americanum Mill. (in Fernald, 1950). - American Black Nightshade.
#831. Shoreline.

STAPHYLEACEAE - Bladdernut Family

Staphylea trifolia L. - Bladdernut. #331. Wooded Slope.

TILIACEAE - Linden Family

Tilia americana L. - Basswood. #536. Wooded Floodplain.

ULMACEAE - Elm Family

Celtis occidentalis L. - Hackberry. #1090. Wooded Floodplain.
Ulmus americana L. - American Elm. #323. Wooded Slope.
Ulmus rubra Muhl. - Slippery Elm. #537. Wooded Floodplain.

URTICACEAE - Nettle Family

Boehmeria cylindrica (L.) Sw. - False Nettle. #1036. Floodplain
near Pond. *

Laportea canadensis (L.) Wedd. - Wood Nettle. #739. Wooded Floodplain.

VERBENACEAE - Vervain Family

Verbena hastata L. - Blue Vervain. #817. Shoreline.

Verbena urticifolia L. - Nettle-Leaved Vervain. #815. Clearing.

VIOLACEAE - Violet Family

Viola eriocarpa Schw. - Smooth Yellow Violet. #325. Wooded Floodplain.

Viola pubescens Ait. - Downy Yellow Violet. #423. Floodplain. *

Viola sororia Willd. - Woolly Blue Violet. #423. Wooded Floodplain.

VITACEAE - Grape Family

Parthenocissus vitacea (Knerr) Hitchc. (P. inserta (Kerner) Fritsch.
misapplied) - Virginia Creeper. #721. Clearing.

Vitis riparia Michx. - River-Bank Grape. #543. Shoreline.

The following additional plant species were identified in releve plots.
Voucher specimens were not collected.

ASTERACEAE

Taraxacum officinale

LILIACEAE

Smilax herbacea

POACEAE

Bromus inermis

ROSACEAE

Rubus strigosus

URTICACEAE

Urtica dioica

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ZOOLOGICAL COMPONENTS

Animals are an important part of virtually all of Minnesota's natural areas. Their diversity is determined by both abiotic and vegetational components of the environment. Reciprocally, the zoological components may have a limited effect on the vegetational and abiotic resources of an area; seed dispersal, soil aeration, and water levels, for example, are often influenced by animals. In addition, certain animal species, by their presence or absence, are considered ecological indicators that provide information on changes occurring in the area. An inventory of birds, mammals, amphibians, and reptiles was conducted to: 1) document the area's species diversity, 2) obtain baseline data so changes can be discerned, and 3) identify rare, sensitive, or representative species and communities.

BIRDS

Methods

The 1979 bird inventory used a variation of the IPA (Indices Ponctuels d'Abondance) or Point Count Method (Robbins, 1978) to inventory breeding birds. This method infers a breeding territory based on repetition of a singing male in the same area during the breeding season (May-June). Eleven circular stations¹ (50 m radius) were established to include each of the major habitat types. A researcher visited the tract once a week, remaining 10 minutes at each station. The time of day and order in which the stations were visited was varied. All birds seen or heard from each station were recorded. A minimum of three noncontemporaneous occurrences of a particular species on a given station was used as a guideline for inferred breeding of that species. Additional species observed outside of the established stations were also recorded.

Species identification was based on visual observations, songs, and/or nest characteristics. Locating nests was done on an incidental basis throughout the field season.

Results

The results of the 1979 bird inventory are presented in the form of an annotated list, Table 4.² Forty-eight species of birds, representing 26 families, were observed on or above the Mississippi River

1 Maps showing the location of these stations are on file, Scientific and Natural Areas Section, St. Paul.

2 Additional information, in the form of field data sheets and secondary sources, is on file, Scientific and Natural Areas Section, St. Paul.

Islands. Six species were found nesting on the area with 15 others recorded as inferred breeders.

Sources of Information

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Additional Sources of Information

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Sounds of Nature Series. Vol. IV Warblers, Vol. VI Finches, Federation of Ontario Naturalists.

Key to Table 4

FAMILY/SCIENTIFIC NAME: Names are in phylogenetic order, according to Green and Janssen, 1975.

DATE: Date of first observation.

HABITAT: All habitats where a given species was observed are listed.

Flmi - Floodplain mixed

FlBE - Floodplain - basswood, elm

FlASM - Floodplain - ash, silver maple

FlHPA - Floodplain - Hackberry, prickly ash

RESIDENCY: Represents a basic breakdown based on breeding populations in Minnesota (Green and Janssen, 1975).

M - Migrant

P - Permanent Resident

S - Summer Resident

WV - Winter Visitant

BREEDING STATUS:

- - Positive Nesting - nest with eggs, adult sitting on nest constantly, or eggshells near nest; young in nest; downy young or young still unable to fly seen away from nest (Green and Janssen, 1975).
- - Inferred Nesting - adults seen building nest, in distraction display, carrying fecal sac, or carrying food; fledglings seen in area (Green and Janssen, 1975).
- ⊕ - Inferred Breeding - based on the Point Count Method (Robbins, 1978), a minimum of two noncontemporaneous occurrences of a species at a given observation station.

FAMILY/SCIENTIFIC NAME	COMMON NAME	DATE	HABITAT	RESI-DENCY	BREEDING STATUS	REMARKS
ARDEIDAE						
<u>Ardea herodias</u>	Great Blue Heron	31 May	Flmi	S		
<u>Casmerodius albus</u>	Great Egret	31 May	Flmi	S		
ANATIDAE						
<u>Anas platyrhynchos</u>	Mallard	18 June	FlBE FlASM	S		
<u>Aix sponsa</u>	Wood Duck	31 May	Flmi	S	●	
FALCONIDAE						
<u>Falco sparverius</u>	American Kestrel	31 May	Flmi	S		
TETRAONIDAE						
<u>Bonasa umbellus</u>	Ruffed Grouse	31 May	FlBE Flmi	P		
SCOLOPACIDAE						
<u>Philohela minor</u>	American Woodcock	18 June		S	●	Female Woodcock and 10 chicks 6/18/79.
COLUMLVIDAE						
<u>Zenaidura macroura</u>	Mourning Dove	31 May	FlHPA FlASM Flmi	S	●	Old mourning dove nest 7/6/79
CUCULIDAE						
<u>Coccyzus erythrophthalmus</u>	Black-Billed Cuckoo	31 May	FlASM Flmi	S		
STRIGIDAE						
<u>Bubo virginianus</u>	Great Horned Owl	31 May	FlASM Flmi	P		
APODIDAE						
<u>Chaetura pelagica</u>	Chimney Swift	31 May	Flmi	S		
TROCHILIDAE						
<u>Archilochus colubrus</u>	Ruby-Throated Hummingbird	31 May	FlBE Flmi	S		
ALCEDINIDAE						
<u>Megaceryle alcyon</u>	Belted Kingfisher	13 June	FlASM	S		

TABLE 4. ANNOTATED LIST OF BIRDS OBSERVED AT MISSISSIPPI RIVER ISLANDS

FAMILY/SCIENTIFIC NAME	COMMON NAME	DATE	HABITAT	RESI- DENCY	BREEDING STATUS	REMARKS
PICIDAE						
<u>Colaptes auratus</u>	Common Flicker	31 May	FlHPA FlASM Flmi	S		
<u>Dryocopus pileatus</u>	Pleated Woodpecker	2 July	FlASM	P		
<u>Centurus carolinus</u>	Red-Bellied Woodpecker	13 June	Flmi FlASM	P		
<u>Melanerpes erythrocephalus</u>	Red-Headed Woodpecker	18 June	FlASM	S		
<u>Dendrocopus villosus</u>	Hairy Woodpecker	13 June	FlHPA FlASM	P	●	Nest found 6/13/79
<u>Dendrocopus pubescens</u>	Downy Woodpecker	31 May	FlHPA FlBE Flmi	P	0	Hole in tree 6/7/79
TYRANNIDAE						
<u>Myiarchus crinitus</u>	Great Crested Flycatcher	7 June	FlASM Flmi	S	⊕	
<u>Empidonas minimus</u>	Least Flycatcher	31 May	FlBe Flmi	S		
<u>Contopus virens</u>	Wood Pewee	31 May	FlASM FlBE Flmi	S		
HIRUNDINIDAE						
<u>Iridoprocne bicolor</u>	Tree Swallow	6 July	Flmi	S		
<u>Hirundo rustica</u>	Barn Swallow	31 May	Flmi	S		
CORVIDAE						
<u>Corvus cristata</u>	Blue Jay	31 May	FlASM FlBE Flmi	P		
<u>Corvus brachyrhynchos</u>	Common Crow	31 May	FlASM FlBE Flmi	S		
PARIDAE						
<u>Parus atricapillus</u>	Black-Capped Chickadee	31 May	FlHPA FlBE Flmi FlASM	P	⊕	
SITTIDAE						
<u>Sitta carolinensis</u>	White-Breasted Nuthatch	7 June	FlHPA FlBE Flmi FlASM	P	⊕	
TROGLODYTIDAE						
<u>Troglodytes aedon</u>	House Wren	13 June	FlASM FlBE Flmi FlHPA	S	●	1 nest found 6/13/79

TABLE 4. ANNOTATED LIST OF BIRDS OBSERVED AT MISSISSIPPI RIVER ISLANDS

FAMILY/SCIENTIFIC NAME	COMMON NAME	DATE	HABITAT	RESI- DENCY	BREEDING STATUS	REMARKS
MIMIDAE						
<u>Dumetella carolinensis</u>	Gray Catbird	31 May	FlHPA FlBE Flmi FLASM	S	0	
<u>Toxostoma rufum</u>	Brown Thrasher	31 May	Flmi	S		
<u>Turdus migratorius</u>	American Robin	31 May	FlHPA FlBE Flmi FLASM	S	+	
<u>Hylocichla mustelina</u>	Wood Chuck	6 July	FlBE	S		
<u>Catharus fuscescens</u>	Veery	31 May	FlBE	S	+	
BOMBYCILLIDAE						
<u>Bombycilla cedrorum</u>	Cedar Waxwings	31 May	Flmi	S		
VIREONIDAE						
<u>Vireo olivaceus</u>	Red-Eyed Vireo	31 May	FLASM FlBE Flmi	S		
<u>Vireo gilvus</u>	Warbling Vireo	31 May	FlBE Flmi	S		
PARULIDAE						
<u>Dendroica petechia</u>	Yellow Warbler	31 May	FlBE FLASM Flmi	S	+	
<u>Geothlypis trichus</u>	Common Yellowthroat	31 May	FlBE Flmi FLASM	S		
<u>Setophaga noticilla</u>	American Redstart	31 May	FlHPA FlBE Flmi FLASM	S	+	
ICTERIDAE						
<u>Agelaius phoeniceus</u>	Red-Winged Blackbird	31 May	FLASM FlHPA FlBE Flmi	S	+	
<u>Icterus galbula</u>	Northern Oriole	31 May	FLASM Flmi	S	+	Observed two young 5/31/79
<u>Quiscalus quiscula</u>	Common Grackle	31 May	FLASM FlHPA Flmi	S	●	Nest found 5/31/79
<u>Molothrus ater</u>	Brown-Headed Cowbird	31 May	SNA	S	+	
FRIGILLIDAE						
<u>Cardinalis cardinalis</u>	Cardinal	31 May	FlHPA FlBE Flmi	P	+	
<u>Pheucticus ludovicianus</u>	Rose-Breasted Grosbeak	31 May	FLASM FlHPA Flmi FlBE	S	0	Making nest 6/8/79
<u>Passerina cyanea</u>	Indigo Bunting	31 May	FlBE FLASM Flmi	S		
<u>Melospiza melodia</u>	Song Sparrow	31 May	FlHPA FLASM Flmi FLBE	S	+	

MAMMALS

Methods

Mammals were identified by sight, track, sound, and collections. Collection tools used were drift fences, live and snap traps. The 1979 mammal inventory was conducted late in the summer; incidental observations were made throughout the summer.

The mammal inventory was conducted over a three day period during which traps were set and scent stations were made. A trapline was set in each of the major habitat types. Each line consisted of 16 Museum Special snap traps, two Shermans, one Havahart and one wooden live trap set approximately 8 m. apart. Traps were baited with a peanut butter and oatmeal mixture. Victor Pocket Gopher traps were set in gopher mounds. The drift fences used during the amphibian and reptile inventory were reopened. Scent stations, 1 m. diameter, were established on mounds of soil excavated by pocket gophers. Artificial scent was placed in the center of these stations.

Traps and scent stations were checked once daily over a three day trapping period. The specimens were collected for measurements and identification, live duplicates were released. A male and female of each species collected were deposited in the Bell Museum of Natural History, University of Minnesota, Department of Ecology and Behavioral Biology, as voucher specimens.

Results

The results of the 1979 mammal inventory are presented in the form of an annotated list, Table 5. Eleven species, representing seven families were observed or captured on the Mississippi River Islands.¹

¹ Additional information, in the form of field data sheets and secondary sources, is on file, Scientific and Natural Areas Section, St. Paul.

Table 5. Mammals Identified on Mississippi River Islands Natural Area.

Family Name/ Scientific Name	Common Name	Habitat
SORICIDAE <u>Sorex cinereus</u>	Masked Shrew	Prickly Ash, Floodplain
SCIURIDAE <u>Tamias striatus</u>	Eastern Chipmunk	
<u>Scirurs niger</u>	Red Squirrel	
CRICETIDAE <u>Peromyscus leucopus</u>	White-footed Mouse	Disturbed Floodplain
<u>Clethrionomys gapperi</u>	Gapper's Red-backed Vole	Disturbed Floodplain
<u>Microtus pennsylvanicus</u>	Meadow Vole	Disturbed Floodplain
MURIDAE <u>Mus musculus</u>	House Mouse	Disturbed Floodplain
ZAPODIDAE <u>Zapus hudsonius</u>	Meadow Jumping Mouse	Disturbed Floodplain
PROCYONIDAE <u>Procyon lotor</u>	Raccoon	
MUSTELIDAE <u>Mephitis mephitis</u>	Striped Skunk	
CERVIDAE <u>Odocoileus virginianus</u>	White-tailed Deer	

Sources of Information

Banfield, A.W.F. 1974. The Mammals of Canada. University of Toronto Press, Toronto.

Burt, William H., Richard Grossenheider. 1964. A Field Guide to the Mammals. Houghton Mifflin Company, Boston.

Gunderson, Harvey L. and James R. Beer. 1953. The Mammals of Minnesota. University of Minnesota Press, Minneapolis.

AMPHIBIANS AND REPTILES

Methods

Amphibians and reptiles were identified by vocalizations, sight and collection of specimens.¹ Collection tools used were drift fences, fyke nets, and hand collection. Incidental observations were made throughout the summer.

Collection of amphibians was accomplished by hand capture. In the spring frogs, toads, and salamanders congregate for breeding, often in the same areas. Frogs and toads can be identified, using their breeding vocalizations, located and hand captured. Salamanders were collected by searching the breeding area. Collecting was done at night with head lamps and waders.

Reptiles were collected by hand with the exception of turtles which were collected by fyke nets. The fyke nets were anchored in the water and tied to shore. These nets are composed of a net trap with 50 foot net leads which funnel the animals into the trap. Turtles were also sighted when surfacing to breathe and collected by wading after them.

Voucher specimens were placed in the Bell Museum of Natural History, University of Minnesota, Department of Ecology and Behavioral Biology.

Results

The results of the 1979 amphibian and reptile inventory are presented in the form of an annotated list, Table 6. The following amphibians and reptiles were identified on the Mississippi River Islands.

¹ Field work in the spring and early summer was conducted by Scientific and Natural Areas volunteers Bruce Brecke and Mike Pappus.

Table 6. Amphibians and Reptiles Identified on the Mississippi River
Islands Natural Area.

AMPHIBIA

HYLIDAE

Pseudacris triseriata triseriata (heard in chorus)

BUFONIDAE

Bufo americanus (heard in chorus)

REPTILIA

EMYDIDAE

Graptemys geographica (Map Turtle)

Chrysemys picta belli (Western Painted Turtle)

TRIOHYCHIDAE

Trionyx spinifer spinifer (Eastern Spiny Softshell)

Sources of Information

Breckenridge, W.J. 1944. Reptiles and Amphibians of Minnesota.
The University of Minnesota Press, Minneapolis.

Conant, Roger. 1958. A Field Guide to Reptiles and Amphibians.
Houghton Mifflin Company, Boston.

LAND USE HISTORY

Virtually all "natural areas" have been affected to some degree by the activities of people. Farming, grazing, logging, drainage of wetlands, and the suppression of fire are some of the ways people have affected the land. Knowledge of historical land use practices helps explain the present condition of the land and its resources. Surrounding land use practices also affect the viability of all natural areas.

Methods

The land use information presented here is based on historical records, aerial photographs, inspections of the site, and interviews with individuals who are knowledgeable about the islands.

Recent Land Use History

The Mississippi River has been a source of sustenance and a transportation corridor for centuries. Before Europeans arrived in the area Indians occupied the banks across from the river islands. Halfway between Dimmick and Davis (Prickly) Islands there is a shallow point where the Indians used to cross the river. Several Indian artifacts have been found on the south side (Wright County) of this crossing, and Indians are said to have been buried there. Further down river at the junction of the Elk River, a battle occurred between the Chippewa (or Ojibway) and Dakota Sioux Indians.

The first Europeans settled in the area in the early 1800's. At first fur trade was the major occupation. One trading post was established near the mouth of the Elk River. As fur trading declined in the mid-19th century the logging industry moved into the area. Large amounts of white

Figure 6. Past and present land use practices in the vicinity of the Mississippi Scenic and Recreational River Islands.

pine and hardwoods were logged from the surrounding woods and floated downstream to sawmills. One sawmill was located at the mouth of the Elk River and another about half a mile upstream. A flour mill was also built at the river junction. By the beginning of the twentieth century, agriculture had replaced the logging industry as the dominant source of income for the area around the Mississippi River Islands.

Today much of the land on both sides of the river is still used for agricultural purposes. However, many houses and subdivisions are being developed near the river. The river itself is used for recreation, including fishing and boating, irrigation, and transportation. It also has been used to dispose of industrial and commercial wastes.

The river islands have been affected by the activities of people, but the impacts have been tempered due to the small size of the islands and the barrier formed by the river. Northern States Power Company (NSP) purchased all of the islands around 1915 as potential spots for hydro-electric dams.¹ This idea was abandoned because the water's force was not sufficient to justify their construction. However, NSP retained its possession of the islands until 1975 when the company donated the islands to The Nature Conservancy.²

The river islands experienced differing degrees of disturbance prior to and during NSP's ownership. Bladdernut Island (also called Lily Pond and Snow Island) was grazed from the early 1900's to sometime

1 NSP acquired the land from the Mississippi Electric Company, which in turn acquired the land from the U.S. Bureau of Land Management around 1903.

2 The following year (1976) The Nature Conservancy transferred the island to the Minnesota Department of Natural Resources.

between 1940 and 1960. The cattle probably crossed the river from the south side (Wright County).

Dimmick Island was never grazed or logged. NSP, however, rented the land for one year in 1926 for the purpose of putting up a large wooden fishing house. The structure has subsequently collapsed, but remnants are still present. NSP also at one time had a 34.5 or 69 KV transmission line crossing over Dimmick Island. One or two poles were probably on the island to support the weight of the wires. Scars of the powerline are still visible in aerial photographs of the area.

Several activities occurred on the Davis or Prickly Island. Up until 1915 logs would commonly jam up behind the island while being floated downstream to the mills. Then around 1920 syrup was made from Box Elder trees on the island. Finally, the island was annually grazed in late summer by about forty head of cattle from 1920 to 1969.

Behind and immediately upstream of Nettle Island floating logs were trapped and sorted according to markings. A booming operation was set up to process the logs in the late 1800's, and continued through 1920. The boom spanned the river from the island to a sawmill located on the Sherburne County side (the bricks of which are still visible). Also, from 1900 to 1949 Nettle Island was rented to an adjacent landowner for the purpose of grazing forty to fifty head of milking Short-horn cattle.

The Elk River Island Complex was the scene of many battles between the Chippewa and Sioux Indians; each tribe took refuge on the islands when necessary. These islands are extremely low, and therefore no grazing has occurred on them. However, during the dry years around 1930 the river was so low that the furthest downstream island was used for a few years as a vegetable garden.

Over the years many of the Mississippi River islands have been used by furtrappers, seeking mink and muskrat, and by recreationists - children swam out or waded across to the islands and people took their picnic lunches there. A well-used campsite was discovered on Bladdernut Island during the course of the 1979 inventory. The site included a wood-pile and fire pit. A path lead to the river on the north side of the island where a fish spearing pole and hatchet were found.

APPENDIX I.

The following is a summary of the species identified in each releve plot during 1979.¹ Relve plots were surveyed twice during the season; the dates and people conducting each survey are given in the heading. If the abundance of a species was recorded differently in the two surveys, the summary includes the greatest abundance noted. Species are grouped into grasses and forbes, or, woody and herb categories. Species are then listed by abundance within each category. A list of the symbols used in recording releve data are given below. Data is recorded in the following format:

Species name	<u>height class</u> cover-abundance/sociability
--------------	--

SYMBOLS USED FOR RELEVÉ DESCRIPTIONS

Height Class (Stratification)

8	35 m
7	20 - 35 m
6	10 - 20 m
5	5 - 10 m
4	2 - 5 m
3	1 - 2 m
2	.5 - 2 m
1	0 - .5 m

Coverage for Height Classes

75%	continuous
50 - 75%	interrupted
25 - 50%	parklike, patchy
5 - 25%	sparse
5%	sporadic to very scarce

Cover-abundance, for species

r	single occurrence
+	occasional, cover 1%
1	plentiful, cover 1-5%
2	very numerous, cover 5-25%
3	any number of individuals, cover 25-50%
4	any number of individuals, cover 50-75%
5	any number of individuals, cover 75-100%

Sociability (dispersion)

1	growing singly
2	grouped, few individuals
3	large group, many individuals
4	small colonies, extensive patches, broken mat
5	extensive mat

Certainty of Identification

(no notation)	positive
?	some doubt

¹ The scientific names in the releve data are from field notes and do not necessarily follow the nomenclature of Gleason and Cronquist (1963).

DATE: June 8, Aug 28, 1979

SURVEYOR: Lustig

PLOT #1: Mississippi Islands - Bladdernut

LOCATION:

COVER TYPE: Black ash-american elm-box elder wooded slope
approx 330 feet NW of Lily Pond

SOIL SERIES:

PLOT SIZE: 20x20 meters

Height Classes

Coverage for Height Class -

8	7	6	5	4	3	2	1
	75%	5%	5%	75%		25%	75%

[illegible]

SURVEYOR: Lustig

LOCATION: Bladderhut

COVER TYPE: Wooded floodplain -

SOIL SERIES:

North
of small pond (Uly Pond)

PLOT SIZE: 20 x 20 meters

Coverage for Height Class -

	8	7	6	5	4	3	2	1
Species		50-75%	25%	5%			25%	75%

(5-25% with death of elms)

	2/1	+1	1/1	r/1	+1	+1	August +1; P+d for height class 7
Tilia americana	2/1				+1	+1	
Ulmus americana	2/1	+1				+1	
Acer negundo	+2					+1	
Fraxinus pennsylvanica		+1			+1	+1	
Fraxinus nigra			1/1				
Rhamnus catharticus			r/1			+1	
Prunus virginiana					+1		
Ribes missouriense					+1		
Rudbeckia laciniata					+1	+1	
Smilax ecirrhata					2/1	+1	
Xanthoxylum americanum					2/1	+1	
Menispermum canadense						3/1	
Matteuccia struthiopteris						5/2	(cited 5/2, 2/2)
Panthenocissus inserta						2/1	
Laportea canadensis						3/1	
Hydrophyllum virginianum						2/1	+1 August
Carex cf. springlei						2/2	3
Rhus radicans						1/1	
Thalictrum dioicum						1/1	
Asarum canadense						+1	
Celtis occidentalis						+1	
Arisaema triphyllum						+1	
Clematis virginiana						+1	
Verbena urticifolia						+1	
Aster ontariensis						+1	
Euonymus atropurpurea						+1	
Galium aparine						+1	
Galium triflorum						+1	
Glechoma hederacea						+1	
Impatiens capensis						+1	
Isopyrum ternatum						+1	
Lysimachia ciliata						+1	
Ribes americanum						+1	
Smilacina stellata						+1	
Smilax herbacea						+1	
Stachys palustris						+1	
C... ..						+1	

SURVEYOR: Lustig

Miss. Islands [continued]

LOCATION:

COVER TYPE:

SOIL SERIES:

PLOT SIZE:

Height Classes

8 7 6 5 4 3 2 1

Coverage for Height Class -

Species

Remarks

Taraxacum officinale

 $\frac{1}{2} +$

Trillium cernuum

 $+/1$

Viola pubescens

 $\frac{1}{2}$

Vitis riparia

 $+/1$

Elymus canadensis

 $\frac{1}{4}$

Teucrium canadense

 $\frac{+}{-}$

Oxalis stricta

2/1

Rubus strigosus

4

Sanquinaria canadensis

r/v

Viola sp.

2/1	2
-----	---

Geum sp.

r/1	2
-----	---

DATE: 7 June, 28 August 1979

SURVEYOR: Lustig

PLOT #: 3 Mississippi Islands

LOCATION: Amimick Island:

COVER TYPE: wooded floodplain. (approx 50 feet west of clearing)

SOIL SERIES:

SOIL SERIES:

PLOT SIZE: 20 x 20 meters

[illegible]

DATE: June 7, 1979

SURVEYOR: Lustig

PLOT # 4 Mississippi Islands

LOCATION: Prickly Island

COVER TYPE: wooded floodplain

SOIL SERIES:

PLOT SIZE:

Note: plot not permanently marked

Height Classes

Coverage for Height Class -

8	7	6	5	4	3	2	1
	25-50%	45%	5%			5-25%	75%

Species									Remarks
Tilia americana	2/2						+ / 1		
Celtis occidentalis	1/1						+ / 1		
Acer negundo		+ / 2					+ / 1		
Fraxinus pennsylvanica			+ / 1	+ / 1			+ / 1		
Xanthoxylum americanum				1/1		1/1			
Ulmus americana				+ / 1		+ / 1	+ / 1		
Fraxinus nigra						+ / 1	+ / 1		
Carex cf rosea							3/2	?	
Hydrophyllum virginianum							3/1		
Isopyrum biternatum							2/1		
Arisaema triphyllum							1/1		
Carex cephaloidea							1/2		
Eupatorium rugosum							1/1		
Laportea canadensis							1/1		
Ribes missouriense							1/1		
Sambucus cf pubescens							1/1	?	
Asarum canadense							+ / 1		
Aster ciliolatus							+ / 1		
Circaea quadrisulcata							+ / 1		
Echinocystis lobata							+ / 1		
Euonymus atropurpurea							+ / 1		
Galium aparine							+ / 1		
Glechoma hederacea							+ / 1		
Leonur cardiaca							+ / 1		
Osmorhiza claytoni							+ / 1		
Menispermum canadense							+ / 1		
Oxalis stricta							+ / 1		
Parthenocissus inserta							+ / 1		
Ranunculus abortivus							+ / 1		
Rhamnus catharticus							+ / 1		
Ribes americanum							+ / 1		
Rubus cf strigosus							+ / 1	?	
Rudbeckia laciniata							+ / 1		
Scrophularia lanceolata							+ / 1		
Smilacina stellata							+ / 1		
Smilax herbacea							+ / 1		
Salidago sp.							+ / 1	?	

DATE: _____ SURVEYOR: _____

PLOT #: 4 Miss. Islands continued

LOCATION: _____

COVER TYPE: _____

SOIL SERIES: _____

PLOT SIZE: _____

Height Classes

8 7 6 5 4 3 2 1

Coverage for Height Class -

--	--	--	--	--	--	--	--

Species

Remarks

Symphoricarpos occidentalis

+/1

Stachys palustris

+/1

Taraxacum officinale

+/1

Thalictrum dioicum

+/1

Urtica dioica

+/1

Vitis riparia

+/1

Viola pubescens

+/1

Viola sp.

+/1

?

Erysimum cheiranthoides

+/1

Geum sp

r/l

?

Nepeta cataria

r/l

DATE: Sept. 5, 1979

SURVEYOR: Lustig

PLOT #: 5 Mississippi Island

LOCATION: Nettle Island

COVER TYPE: Silver maple, green ash - box elder wooded
SOIL SERIES: floodplain

PLOT SIZE: 20 x 20 meters

Height Classes

Coverage for Height Class -

8	7	6	5	4	3	2	1
		25-50%	5%	45%		75%	25-50%

Species									Remarks
Acer saccharinum		2/1							
Acer negundo		2/1				+1/1	+1/1		Log down
Fraxinus pennsy/vanica			2/1						
Celtis occidentalis				1/1			(+1/1)		log down in plot
Laportea canadensis						5/1			
Rudbeckia laciniata						1/1			
Sambucus canadensis						+1/1			
Cryptotaenia canadensis							1/1		
Viola sp.							+1/1		?
Prunus virginiana							+1/1		
Ribes missouriense							+1/1		
Campanula americana							+1/1		
Impatiens sp.							+1/1		?
Galium triflorum							+1/1		
Glechoma hederacea							+1/1		
Parthenocissus inserta							+1/1		
Smilax lutea							+1/1		
Hydrophyllum virginianum							1/1		
Arisaema triphyllum							+1/1		
Smilacina racemosa							+1/1		
Ulmus americana							+1/1		
Cicuta umbrosa							+1/1		on Laporte
Rhamnus catharticus							+1/1		
Vitis rotundifolia							1/1		dd

DATE: June 13, 1979

SURVEYOR: Lustig

PLOT #: 6 Mississippi Islands

LOCATION: Nettle Island

COVER TYPE: Silver maple-green ash wooded floodplain

SOIL SERIES:

PLOT SIZE: 20x20 meters

note: no permanent marker
close to plot #5

Height Classes

Coverage for Height Class -

8	7	6	5	4	3	2	1
	25- 50%	5- 25%		15%		15%	75%

Species							Remarks
Acer saccharinum	3/2						
Fraxinus pennsylvanica	2/1					+1/1	
Acer negundo		+1/1				+1/1	
Ulmus americana		+1/1				+1/1	
Celtis occidentalis				+1/1		+1/1	
Laportea canadensis						4/1	
Glechoma hederacea						3/1	
Ribes americanum						1/1	
Urtica dioica						1/1	
Arisaema triphyllum						+1/1	
Carex sp.						+1/2	?
Cryptotaenia canadensis						+1/1	
Eubynamus atropurpurea						+1/1	
Galium aparine						+1/1	
Impatiens sp.						+1/1	?
Ranunculus abortivus						+1/1	
Rudbeckia laciniata						+1/1	
Solidago sp.						+1/1	?
Thalictrum dioicum						+1/1	
Bromus inermis						+1/1	?
Sambucus canadensis						r/1	?
Stachys palustris						r/1	
Vitis riparia						r/1	
Xanthoxylum americanum						r/1	

53530
MADE IN U.S.A.