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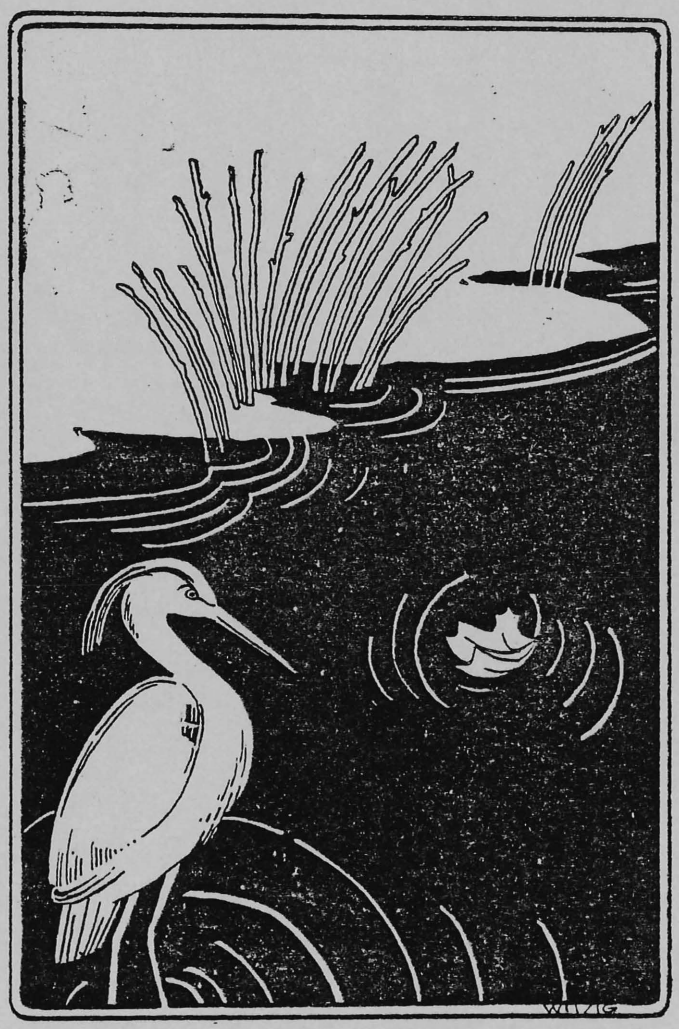
ST. LOUIS RIVER ESTUARY EXPEDITION



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ST. LOUIS RIVER ESTUARY

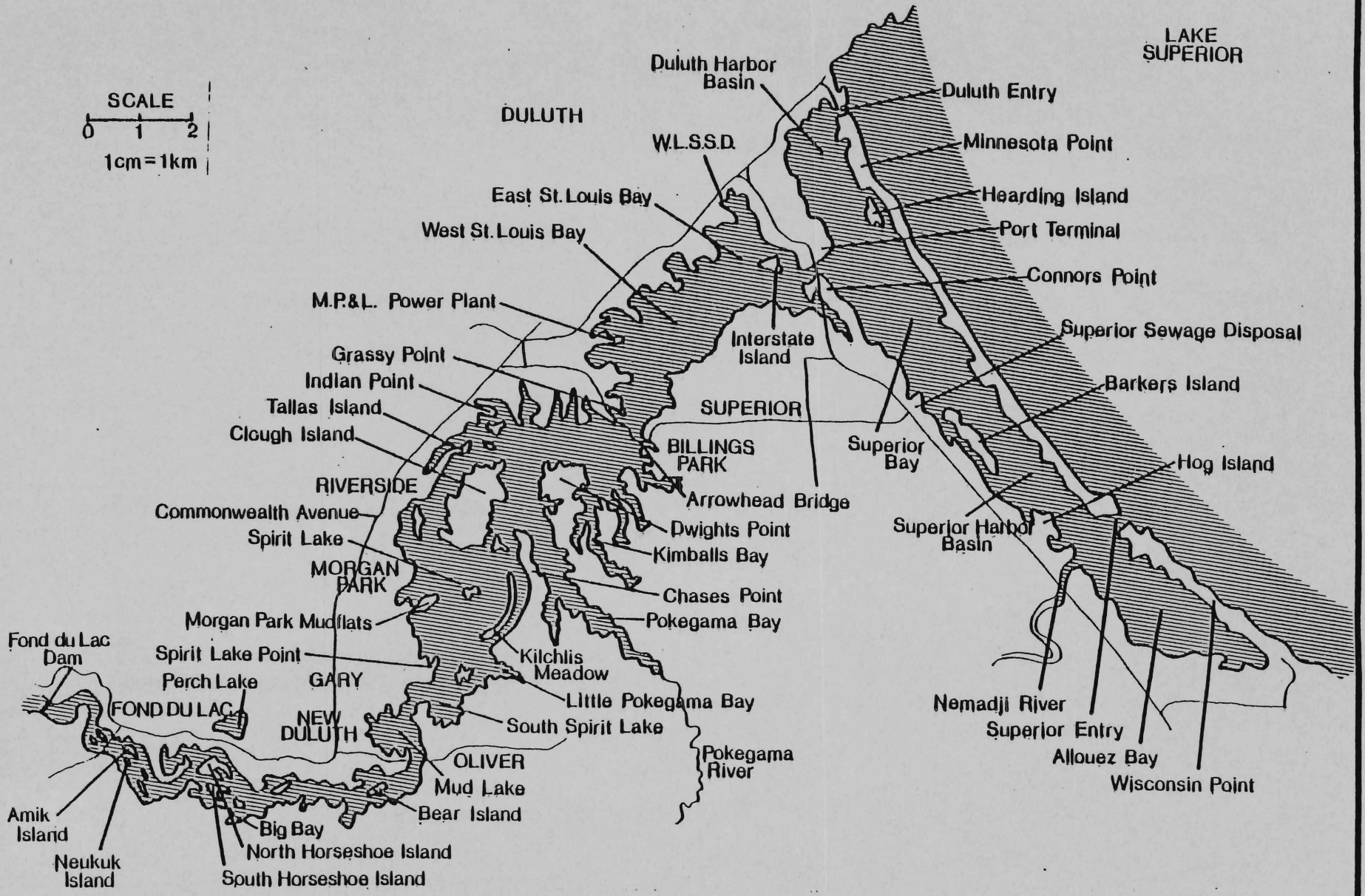

Figure 1. Geographic locations in the St. Louis River estuary.
from: "Distribution and Relationships of Habitats and Birds in the St. Louis River Estuary"

THE BIRTH OF AN ESTUARY

For about 11,000 years, the St. Louis River has been flowing 160 miles from its source, Seven Beaver Lake, in the Superior National Forest, to Lake Superior. The area where the lower reaches of the river meet the lake is called an estuary, a drowned river valley.

The St. Louis River has two major tributaries, the Whiteface and the Cloquet Rivers. At Cloquet, the St. Louis undergoes an extreme change in character. Nearly half of the drop in elevation from headwaters to Lake Superior occurs in the 10 river miles between Cloquet and Fond du Lac. Deep gorges of Precambrian bedrock form the river bed in much of this area. These thinly bedded layers of slate, siltstone and graywacke thousands of feet thick, folded steeply by great earth forces, can be seen in the river bed as it flows through Jay Cooke State Park. These Middle Precambrian rocks are the oldest (about 1.8 billion years) exposed in the Duluth-Superior area. In this stretch flow is very fast, characterized by numerous rapids, but much of the lower part has been dammed for hydroelectric power.

Below Fond du Lac, the river widens gradually as it flows its last 20 miles to Lake Superior. Water flows slowly and meanders along an established channel, which has an average depth of 25 feet. In the back waters of the bays, the current is very slight, and water depth is six feet or less. Bottom sediments consist of a few feet of mostly organic-rich soft clay, silt and peat, overlying glacial deposits.

In its last few miles of flow, the river becomes an estuary.

Near the end of the Ice Age (about 12,000 years ago), no lake existed in the Lake Superior Basin. It was filled with the Superior lobe of the continental ice sheet. As melting progressed, it uncovered the southwest end

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of the basin first and a large ice-dammed lake, 500 feet higher than the present lake, formed here (Glacial Lake Duluth). The St. Louis River began to dump its sediment load of sand, silt, and clay into this lake and built up thick lakebed deposits. Then as the ice continued to melt back to the northeast it exposed lower and lower outlets, dropping the lake level and allowing the river to extend its channel northeastward and erode down through the old lake bed. Because the earth's surface at the outlet had been depressed by the weight of the glacier, the level fell to several hundred feet below its present position, but soon the land to the north gradually rebounded.

Just like a bowl of water tipping slightly, the northern region of Lake Superior has flooded the southern region, that is, the harbor and the St. Louis River mouth. Today, Lake Superior's southern region, including the harbor, is being submerged at a rate of a few inches per century. This complex history has produced the estuary.

The baymouth bars (first, Rice's and Connor's Points, and later, Minnesota and Wisconsin Points) were formed as the lake's level stabilized. With the protection of these extensive sand bars the estuary has become an almost ideal natural harbor.

FLORA AND FAUNA OF THE ST. LOUIS RIVER ESTUARY

The estuary, which lies 602-605 feet above sea level, contains more than 11,500 acres of water. It is shallow with large areas of submerged and emergent vegetation, a characteristic of many estuaries. It has always been a very important and productive water mass, with critical habitat for waterfowl and shorebirds (migrant and resident) and fish (both resident and Lake Superior species).

BIRDS

At least 276 species of birds have been identified and recorded in the Duluth-Superior harbor and St. Louis River estuary. Birds have a tendency to congregate in this area for several reasons. Since many birds are reluctant to cross large bodies of water, the lake has a leading line effect, bringing many migrating birds into this area. Often groups of several thousand birds are sighted. Also, the natural movements of water and air tend to bring birds into the vicinity because it is an aid to their migrations. Once here, the wide variety of aquatic and terrestrial environments offer excellent habitats for many species.

Two good birdwatching points in the estuary are Grassy Point and the Mud Lake-Spirit Lake area. Both shorebirds and waterfowl can be found at Grassy Point. Ring-billed gulls and a few common terns nest nearby. The marsh habitat here is the most diverse in the harbor, and is the northeastern-most locality in the state for nesting Virginia rails and least bitterns; green herons, and yellow-headed blackbirds are two other species that also reach the edge of their range in Duluth.

The Mud Lake-Spirit Lake areas are open water pools bordered by marsh. The marshes, which dominate the terrain, serve as home for mallard and blue-winged teal. Thousands of ducks of 20 or more species can be seen resting and feeding in the river during the spring and fall migrations. Whistling

swans, one of the more spectacular visitors, can be seen in early- to mid-April on its journey to arctic breeding grounds. As many as 250 of these magnificant birds have been seen at one time. Bald eagles are found at this time also.

WILDLIFE

Other animals which are common to the Duluth-Superior area and may be found in the estuary are various species of frogs, painted and snapping turtle, Eastern garter snake, and the red-backed and blue-spotted salamanders.

Mammals which are sensitive to human pressure or are highly territorial such as the bobcat and lynx, are not likely to be found on the Minnesota side of the estuary. The Wisconsin side offers much less developed areas and is probably well suited to this type of wildlife. Mammals to be found are snowshoe hare, muskrat, Norway rat, weasel, white-tailed deer, otter, beaver and mink.

FISH

The St. Louis River upstream from the Arrowhead Bridge area contains over 5,200 acres of water of which approximately 4,200 acres are less than five to six feet deep. It is the only area which contains extensive dense weedbeds and large reedy areas. It contains the most important northern pike habitat in the estuary, including spawning, nursery and adult forage areas.

The majority of the spawning habitat for all three of the major species of fish of the area occurs here. Northern pike and yellow perch utilize limited spawning habitat in other portions of the estuary, but all walleye spawn in the upper reaches of this area. It is the area most affected by pollution from paper mills.

Before the arrival of the white man, Indians took advantage of the estuarine fishery for lake sturgeon, walleye and northern pike. An Ojibway village at Fond du Lac relied heavily on this fishery for its sustanance.

The Indians exploited the spring spawning run of walleye and northern pike, which they could harvest with spears. In the lower St. Louis River they harvested these species with gill nets during the ice-free months. When the white man entered the area, he too took advantage of this fishery. During the mid 1800s, the spring spawning run of walleye provided one of the most consistently and successfully exploited fisheries in western Lake Superior.

Today, walleye, northern pike and yellow perch offer excellent fishing in the estuary. The balance of habitat which now exists is practically ideal for these species. The most critical area in need of protection and preservation is the St. Louis River from approximately Fond du Lac upstream to the first dam. This area supports what is apparently the major spawning run of walleye in southwest Lake Superior. Both water quality and habitat preservation are major concerns in this area. With the recent improvement in water quality resulting from the regional sewage treatment plant, lamprey predation is seen as a potentially serious threat to the walleye.

FLORA

Spirit Lake Point offers a beautiful view of the river and is one of the few sites within Duluth or Superior which boasts a maple-basswood forest. The forest type is generally considered the climax forest in this area, but it is uncommon, since most of it has been disturbed.

When the glacier retreated, around 11,000 years ago, vegetation was probably sparse in this area, dominated by mosses and lichens, wildflowers and shrubs. By 8,000 years ago the region had warmed enough to permit re-establishment of a boreal type forest of spruce, balsam, fir, and tamarack. During the next 3,000 years, warming continued, culminating in a climate somewhat warmer and drier than today. Spruce and jack pine were dominant and white pine was becoming established. Deciduous forests were present in southern portions of the St. Louis River watershed. Four thousand years ago,

the climate became cooler and wetter again. Peat bogs developed as shallow, glacially formed lakes filled in with sediment. Because of this cooling trend, cedar became more common, and white pine forests became dominant in northern Minnesota. Deciduous woodlands were largely displaced farther south during this period. These vegetational types dominated northeast Minnesota until modern times, when natural succession was interrupted by the activities of man.

Many showy plants are associated with this habitat, and in the appropriate season, blossoms of large-flowered and nodding trillium, Dutchman's breeches, yellow lady's slipper and jack-in-the-pulpit can be seen.

Much of the shoreline is lined with marsh plants and/or emergent aquatic vegetation such as arrowhead, burreed, and cattails. The river and harbor also abound in submerged aquatic vegetation such as pondweed, tapegrass, and filamentous algae.

MARSHES OF THE ESTUARY

Marshes have too long been regarded as waste land. These areas are not only home for a distinct variety of plants and animals, they also may be important in water purification and maintenance of water tables. Two of the most important aspects of marshland in the St. Louis River estuary are its estensive acreage and the rarity of its presence in rocky northeastern Minnesota.

A marsh habitat is only produced following thousands of years of sedimentation and deposition of organic material. To replace a marsh would take thousands of years. By comparison, it would take only 50 to 100 years to replace an aspen-birch woodland.

There are three basic types of marshland in the estuary: non-persistent emergent aquatic, persistent emergent aquatic (primarily cattail-sedge), and woody marsh vegetation.

The non-persistent emergent aquatic type (including burreed, arrowhead, water lilies, sedges and rushes), is probably most important to the black tern as a nesting habitat. This type of marsh is also important to all five swallow species which feed on insects, and to a wide variety of water birds which use this habitat for feeding and cover. These include mallards, wood ducks, blue-winged teal, wideon, and the pied-billed grebe.

Cattail-sedge marshes are also abundant throughout the entire estuary. This habitat provides cover, nesting and feeding areas for a wide variety of wildlife, especially muskrat. Among the important breeding birds in this community are the long-billed marsh wren, sora, American bittern, Virginia rail, yellow-headed blackbird, and possibly the least bittern.

The woody marshes also house a variety of breeding species of birds; the most abundant are the alder flycatcher, yellow warbler and the swamp sparrow. The river otter can be found here too.

Industrial and residential areas dominate the Minnesota portion of the area, while forest type vegetation characterizes the uplands in Wisconsin, especially to the west of Superior. Marsh vegetation, especially the non-persistent emergent type, dominates the lower areas adjacent to open water areas. Extensive marsh communities are found in the southern Spirit Lake and Mud Lake areas, and at Allouez Bay.

Other smaller but important marsh communities are found at the mouth of the Nemadji River, between Hog Island and the mainland, at Grassy Point, at the west Belknap Avenue area, at Indian Point and Tallas Island, at the end of Dwights Point, along the Pokegama River, at the Morgan Park mudflats, Spirit Lake Point, Kilchlis Meadow, near the Oliver Bridge, at the end of Commonwealth Avenue, at the west edge of Sargent Creek and the eastern end of Fond du Lac, and within the bow of North and South Horseshoe Island.

ST. LOUIS RIVER'S CULTURAL HERITAGE

Life along the St. Louis River had been dominated by the American Indian until recent history.

Three thousand years ago, "Woodland Cultures" inhabited northern Minnesota. They planted wild rice and established permanent villages. Population increased and encouraged the development of a culture which made pottery and constructed burial mounds.

By the time the French explorers reached the St. Louis River area in the early 1660s, it was inhabited by the Dakota (Sioux). However, the Dakota were slowly being displaced by the Ojibwa who were driving them toward the plains.

Legends say that the Ojibwa migrated here from a "great salt water sea," moving northwest first to Lake Michigan and then to Lake Superior. The largest group settled on what is now Madeline Island, Wi. It is from this village that Sieur du Lhut and a group of Ojibwa in 1679 traveled to Fond du Lac to meet with the Dakota in an attempt to expand the fur trade.

Sieur du Lhut was successful, and the Ojibwa became middlemen between French traders and the Dakota.

During 1740, the Hudson Bay Co. established a fur trading post at Fond du Lac. In 1793, the Northwest Co. constructed Fort St. Louis at the mouth of the River, near present-day Superior.

The post became a major center for fur trade. Following the War of 1812, the British-owned Northwest Co. departed, and John Astor's American Fur Co. moved its fur trade operations to Fond du Lac. By 1820, almost 400 Ojibwa camped near the post.

Styles changed and fur-bearing animals became scarce, however. By the 1840s the post had declined, as had living conditions for many of the Ojibwa.

Dependence on the fur trade for almost half a century had seriously disrupted their original culture and economy. Contributing to the Ojibwa's demise in the area was the report of copper in northern Michigan which started a mining boom that reached this area at about the same time. By 1854, pressure from prospectors, lumbermen, and land speculators culminated in the treaty of La Pointe. It called for the removal of the Ojibwa from much of northeastern Minnesota to a reservation west of Cloquet.

With vigorous lumber and prospecting activities the area again began to flourish. In 1856, the Townsite of Fond du Lac was platted. Superior had been founded a little earlier, with a population of 500; by 1857, this number tripled to over 1500.

Several small sawmills were soon in operation cutting timber from the shores and banks of the St. Louis River. But the Panic of 1857 and later the Civil War halted, and even reversed, area growth for almost a decade.

In the 1880s, stands of white pine in northern Michigan and Wisconsin were nearly exhausted. Looking for a new supply, lumbermen turned to northern Minnesota. With the opening of U.S. timber reserves to private entry, Duluth and Superior entered another boom period. For the next 30 years, St. Louis Bay was ringed with sawmills producing hundreds of millions of board feet of lumber every year. Logs of white and red pine floated down the river to Rices' Point, where thirteen mills operated full time. Brownstone and slate quarries provided construction material for some of Duluth's non-wood houses. People worked hard and many prospered. Four breweries operated at one time, as did four cigar companies.

In 1885, James J. Hill's Great Northern Railroad bought a large tract of land in west Superior to be used as a rail terminal to connect the transcontinental railway with lake shipping. These years saw the growth of

Duluth-Superior into one of the world's major grain terminals which, combined with lumber, made it the fifth largest seaport in America by 1890.

Duluth's population climbed to 50,000. The city flourished with 34 schools, 41 churches and 100 saloons.

In 1895 Fond du Lac was annexed to the City of Duluth. It was during this time, toward the end of the century and for the first part of the next, that Fond du Lac's prosperity reached its pinnacle. It became a popular resort area. Excursion steamers made regular trips from Duluth and Superior to Fond du Lac, and the railroad provided commuter service.

Those were the halcyon days when large numbers of people would make the trip up the St. Louis River on steamers with names like Columbia, Newsboy, Rotarian, and Montauk, spend the day at Fond du Lac, and picnic in the park or dine in the hotel. A popular resort hotel operated on Nekuk Island, across from Fond du Lac, from 1890 until 1915. The best known excursion steamer was the Montauk of the Clow and Nicholson line. It operated from 1925 to 1940.

TRADITIONAL WILD RICING ON THE ST. LOUIS RIVER

Fall is one of the most religious times of the year for the Ojibwa Indian. And wild rice is used in religious and ceremonial ways much as bread is used in the Christian tradition.

In early September up until thiry years ago, Ojibwa families, numbering anywhere from 10 to 25, convened on the banks of the St. Louis River near Oliver Bridge for the annual wild rice harvest.

As soon as they arrive, the women set up camp for their four to six week stay and begin to prepare for the feast that will be held that first night.

The men take the long canoes with flat bottoms and flat backs and slip them into the water. Each canoe is manned by two harvesters. One harvester, kneeling, reaches for the tall plants with his right hand and bends them over the boat. With his left hand, he gently thrashes the rice. He uses a lightweight flail--a piece of cedar, pointed at one end. It measures 30 inches long and about one inch in diameter. The other harvester, standing in the back of the canoe, propels the boat forward by pushing against the roots of the rice at the river bottom with a forked Tamarack branch. It is unthinkable to whiplash the rice, so the men move gently. Throughout the day the harvesters, singing chants of thanks to the Great Spirit, can be seen in their canoes slowly moving through the grasses, bending and thrashing the rice.

At sunset, when the first crop is brought in, all members of the families gather for the feast. The children, who have already gathered the wood for the fires, stand around to watch the preparation of the rice. First, it is parched in a large tub over the fire. There is a distinct aroma many of these children will remember long after the tradition has been modernized--something like the smell of barbecuing food. Then, the rice is put into a

barrel to be "kicked out" or "danced out" by men wearing soft-soled moccasins. This separates the hull from the grain.

Small portions of the rice are then taken out of the barrel for fanning. The fanning, done by women using birch bark baskets, removes the lightweight hulls which fly away, and leaves only the valued grain.

Sometimes the rice is then put into a kettle with meat for wild rice stew, or even saved until morning and popped like corn and used as a breakfast cereal with maple sugar and milk.

But during this first and holy supper of the season, the rice is served with duck or deer and maybe fish, and with fried bread and corn. Everyone joins in to celebrate the harvest and gives thanks to the Great Spirit for providing food for the winter.

Later, the marshland rings with the sound of dancing and ceremonial songs accompanied by the beat of drums and staccato of crickets.

WESTERN WATERFRONT TRAIL

The Western Waterfront Trail is a proposed 9 mile long multi-use recreational area adjacent to the St. Louis River. There is a need in Duluth for recreational development of shoreline along the St. Louis River and Lake Superior. In the past, general public access to these two great water bodies has been limited by railroad and industrial development. Only recently with the closing of several industries along the shore and the abandonment or relocation of some rail lines has the City had an opportunity to pursue public recreational waterfront development and link the waterfront to adjacent residential neighborhoods.

The location of the Western Waterfront Trail is proposed to generally follow the shoreline edge of the St. Louis River from Indian Point up river to Fond du Lac. General points of interest encountered along the way are:

A. Camping at Indian Point

B. Views to Tallas Island and Clough (Whiteside)

C. Riverside Marina (Old Drill's Marina)

D. Blackmer Park and Morgan Park Company (United States Steel) Town

E. The Morgan Park Mud Flats

F. The Point, which is a narrow manmade spit of land jutting out almost one half mile into the River

G. Spirit Lake Point and adjacent extensive marsh community habitat

H. Views to the old United States Steel Plant with its extensive buildings and massive cranes

I. The Mud Lake Crossing with views to huge cliffs of slag and to the Oliver Bridge crossing to Wisconsin

J. The Boy Scout Landing boat launch site at the foot of Commonwealth Avenue

K. Historic Fond du Lac and Chambers Grove Park

THE FUTURE--A COASTAL COVENANT

Special care must be given to all our coastal resources if their variety and usefulness are to survive this century and live on into the next. By the end of this decade, three-quarters of the nation's population will live in or near the coastal areas. Protection and management of these areas requires cooperation and sustained effort by all members of our society--by public and private organizations as well as by individuals. As a guide to informed action, the Year of the Coast/Coastal Alliance presents this covenant:

WHEREAS,

our nation's coastline-more than 100,000 miles of beaches, mountains, estuaries, islands, bays and wetlands is an invaluable and finite resource; and

WHEREAS,

in recent years we have damaged this fragile coastline, sometimes irreparably, by pollution, poorly-planned development, dredging, filling and other disturbances; and

WHEREAS,

in all parts of the nation access to desirable coastal areas is becoming increasingly difficult;

We, pledge to work to:

Discourage private and public investment in flood and erosion-prone coastal areas

Improve the quality of coastal salt and fresh water

Protect vital fish and wildlife habitat in coastal wetlands and estuarine areas

Avoid disturbance of dunes, offshore sandbars and other natural barriers

Encourage public and private revitalization of deteriorated waterfronts in urban areas away from fragile and sensitive natural coastal areas

Increase, wherever possible, public access to the coast in ways consistent with protection of ecological values.

In addition to living our own lives consistent with these principles, we will urge our elected and appointed officials at all levels of government to adopt and enforce policies based on these objectives.