

The Lower St. Louis River Habitat Plan

A summary for citizens



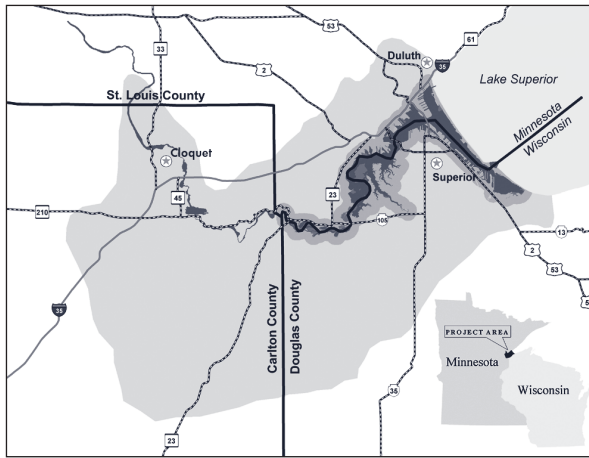
The Blatnic Bridge, also known as the “High Bridge,” spans the St. Louis River between Connors Point in Wisconsin and Rice’s Point in Minnesota.

Vision for the Lower St. Louis River
is a thriving human community
connected to the aquatic and
terrestrial ecosystems of the river.

Welcome to the Lower St. Louis River

Flowing from its headwaters near the Mesabi Iron Range to its mouth at the Duluth-Superior Harbor, the St. Louis River is the major U.S. tributary to Lake Superior, which is the largest and deepest of the Great Lakes and contains 10% of the world's fresh surface water.

The Lower St. Louis River, covering a distance of approximately 21 river miles from Fond du Lac to its outlet at Lake Superior, is a freshwater estuary, created



Map showing project area of the Lower St. Louis River Habitat Plan.

when the level of Lake Superior rose following the retreat of the glaciers. The rising waters gradually drowned the mouth of the St. Louis River along with its lower tributaries. In this area the river channel marks the boundary between Minnesota and Wisconsin and separates the Twin Ports of Duluth, Minnesota, and Superior, Wisconsin. Protected from the waves of Lake Superior by a

baymouth sand bar (known locally as Minnesota Point and Wisconsin Point), portions of the estuary also serve as the Duluth-Superior Harbor, largest harbor on all the Great Lakes.

After more than 150 years of commercial and industrial activity on and along the shore of the Lower St. Louis River, ecological conditions vary greatly. The upper portion of the estuary still retains relatively undisturbed high quality ecological areas, while sections of the lower portion of the estuary and harbor have been dredged and modified since the mid-1800s to accommodate shipping traffic, commerce, and industrial needs.

Despite this activity, the estuary as a whole, including modified as well as undisturbed areas, provides habitat for a rich variety of fish, birds, aquatic invertebrates, and other wildlife.

An Ecosystem of Global Significance

The Lower St. Louis River's diverse ecosystems are significant both regionally and globally. The unique combination of habitats found within the Lower St. Louis River (estuarine wetlands and open water areas, the baymouth bar complex of Wisconsin and Minnesota Points, and the surrounding upland forests) is very unusual, not only within Lake Superior, but also within the Great Lakes region and even the world. This concentration of such diverse habitats, along with its location on the western end of Lake Superior, makes the estuary an important breeding area for many species as well as a critical stopover for numerous migratory species.

PAT COLLINS



ESTUARINE WETLANDS: Great Lakes wetland systems are unique, and the St. Louis River wetlands are the largest such system on the Lake Superior shore, representing a significant source of plant and animal diversity and productivity for the entire Lake Superior ecosystem.

ERIC EPSTEIN



ESTUARINE OPEN WATER HABITATS: The estuary and its tributaries have a wide variety of aquatic habitats that support a large and diverse assemblage of native fish and mussel species.

LYNELLE HANSON



BAYMOUTH BAR COMPLEX: Minnesota Point and Wisconsin Point form an unusual and complex baymouth bar system; similar systems are known from only two other locations in the Great Lakes. Not surprisingly, the plant communities supported by these baymouth bars exist only in the Great Lakes region.

UPLAND FOREST COMMUNITIES:

The forests surrounding the estuary are part of the transition zone between boreal forest, northern hardwoods forest, and Great Lakes pine forest. The Great Lakes white and red pine forests are found nowhere else in the world, and this particular convergence of forest types, with its unique Great Lakes element, is significant.



DAVID NICHOLS



NANCY NELSON

SMALL TRIBUTARY SYSTEMS:

The small tributary systems include the many streams that flow into the Lower St. Louis River, providing habitat for a wide variety of the native fish found in the estuary.

The vision for the Lower St. Louis River is a thriving human community connected to the aquatic and terrestrial ecosystems of the river. The river ecosystems are diverse, productive, and healthy, with natural processes (such as hydrologic regimes, biological productivity, and nutrient cycling) operating within the natural range of variation. The diversity of plants and animals and the composition of natural communities present at the time of European settlement are reflected in the sustainable ecosystems of today.

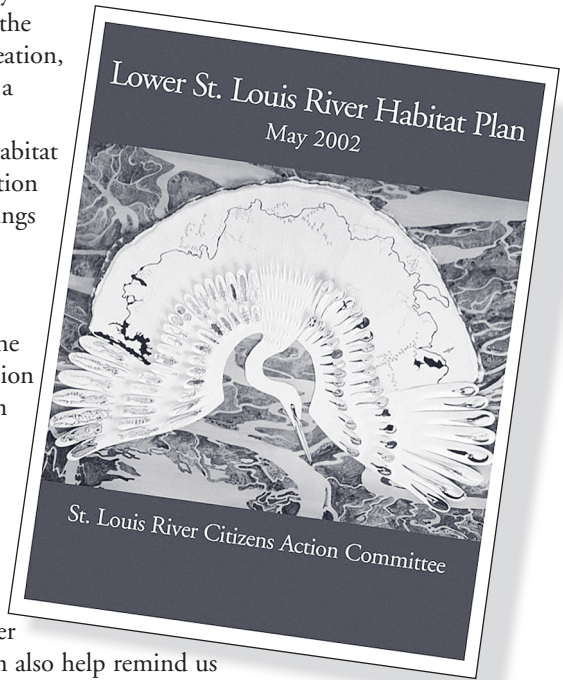
What is the Habitat Plan?

The Habitat Plan for the Lower St. Louis River is intended to serve as a dynamic, coordinated, and comprehensive guide for all those who care, decision-makers, and resource managers in both Minnesota and Wisconsin as they work toward maintaining a healthy river ecosystem that is connected to a thriving human community. Reaching this goal will involve the management, enhancement, creation, restoration, and reclamation of a mixture of habitats.

It is not the intent of this Habitat Plan to recommend the restoration of the estuary and its surroundings to a presettlement condition. Rather, by setting conservation goals that will achieve a mix of ecological and social benefits, the Habitat Plan presents a new vision of the St. Louis River ecosystem toward which communities, organizations, and individuals can work in cooperation and partnership.

By highlighting the interconnections between the human community and the river ecosystem, the Habitat Plan can also help remind us that even small, seemingly isolated human actions can become cumulative impacts that result in unexpected and unintended problems for the ecosystem.

Because the Twin Ports human community is an integral part of the river ecosystem, the 260,000 acre Habitat Plan project area includes the city of Superior and much of Duluth along with numerous ecologically significant areas that remain within the urban landscape surrounding the estuary.



Guiding Principles

“Habitat” is a broad term meaning the environment where an organism lives. This environment may be described by physical or biological characteristics, or a combination of both. For example, the “Large Riverine Reach” is a habitat within the river that is defined by its physical characteristics—it has high water velocity, a riffle-pool-run structure, and does not often experience the effects of the changing water levels of Lake Superior. The “spruce-fir forest” habitat is defined primarily by its biological characteristics—spruce and fir are the dominant tree species found in the habitat. An “emergent marsh” suggests something about both its physical and biological characteristics—it is dominated by plant species such as cattails, bulrushes, and other emergent vegetation, and it is located in a shallow water setting. An “ecosystem” includes many habitats, so it refers to the interactions among many different living things and their physical environments. The loss or impairment of one habitat can cause impacts to an entire ecosystem.

The Habitat Plan for the Lower St. Louis River is guided by the following principles:

- Promote stewardship of the resource by local residents, users of the resource, and those concerned with it.
- Recognize that what is to be managed is not the environment but the actions of humans operating within the environment.
- Protect, enhance, and restore ecological functions and maximize biodiversity without seeking to restore the estuary to its presettlement condition.
- Conduct the planning process within the context of similar planning efforts for the St. Louis River watershed (including the Nemadji River watershed), the Lake Superior Basin, and the Great Lakes.

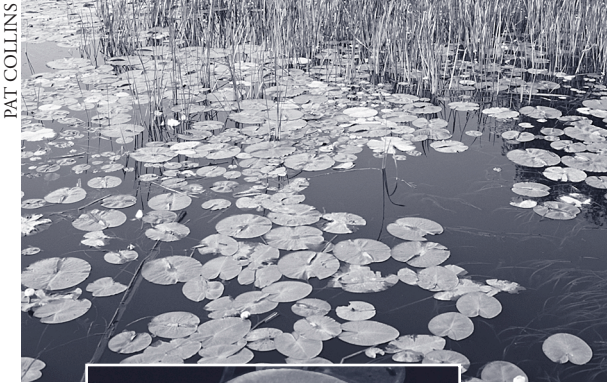


PAT COLLINS

What Are Conservation Targets?

Conservation targets are the habitats, plant communities, and specific animal and plant species that are the focus for management activities.

The conservation targets identified for the Lower St. Louis River can be broadly grouped into five general categories: estuarine wetlands, estuarine open water habitats, baymouth bar communities, upland forest communities, and small tributary systems. These conservation targets include some habitats where human activities have resulted in highly modified plant communities as well as some habitats that are considered to be relatively “natural” or unaltered by human activities.



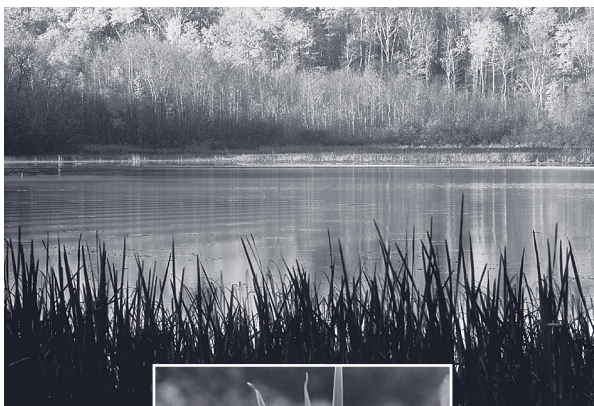
PAT COLLINS



LYNELLE HANSON

The **estuarine wetlands** of the St. Louis River form one of the largest complexes of estuarine wetlands found in the Lake Superior Basin; only the Bad River-Kakagon Sloughs of Wisconsin are comparable. Although there are many different types of wetland, sheltered bays have been identified as the most significant wetland type in the estuary. Located along the Minnesota and Wisconsin shorelines between Nekuk Island and Stryker Bay, many of the sheltered bays support the highest diversity of plant and animal species of any habitat type in the estuary. Sheltered bays provide spawning areas for many species of fish and support a high diversity and abundance of invertebrates. The extensive emergent wetlands in the sheltered bays are very important for waterfowl and wading birds. Wild rice, an aquatic plant of significant ecological and native cultural importance, grows in some sheltered bays. **North Bay**, located on the Minnesota shoreline east of Fond du Lac, is one of the finest remaining sheltered bays on the river.

A wide variety of **estuarine open water habitat** exists in the Lower St. Louis River between the Fond du Lac dam and Lake Superior. Some areas are vegetated, others are not. Some areas have fast-moving or deep water; other areas have slow-moving shallow water. Industrial and commercial activities have heavily impacted some areas, while others are relatively unaltered. Upstream areas provide prime spawning habitat for walleye, lake sturgeon, and other fish. Undredged river channels are rich in fish species, home to high numbers of native mussels, and may be an important wintering habitat for fish. Dredged channels are used by some fish as wintering habitat and serve as an important feeding area for fish-eating birds.



MARK STENSAAS



LYNELLE HANSON

The **baymouth bars** of Minnesota Point and Wisconsin Point are home to a variety of plant community types and also provide important habitat for many species of shore birds. The older, more stable dunes sustain forests of old growth white and red pine as well as a shrubby juniper-lichen community.



AMY TRANGER

Embedded within the forest and shrubland communities are a variety of wetland types, including sedge marshes and alder thickets. Active dunes closer to the lakeshore are dominated by beachgrass. The varied plant communities of Minnesota and Wisconsin Points are found only in the Great Lakes region, and they form one of only two examples of such plant communities around Lake Superior. In addition, no other freshwater estuary/baymouth bar systems are found anywhere in the interior of North America.



The **upland forests** surrounding the estuary include a unique mixture of boreal forest, northern hardwoods forest, and Great Lakes pine forest. They provide habitat for a wide variety of nesting and migrating birds as well as numerous mammals and amphibians.

Forest vegetation also helps to slow down stormwater runoff and helps hold soil in place. Because the sediment, nutrients, and pollutants carried by stormwater runoff from upland areas affect the water quality of the estuary, the presence of upland forests directly influences conservation targets within the estuary.



The **tributary systems** include smaller streams that flow into the Lower St. Louis River. These streams, which travel through lacustrine red clay deposits on the Wisconsin side of the river and over crystalline bedrock on the Minnesota side of the river, provide habitat for many of the native fish and birds found in the estuary.

Challenges to the Conservation Targets

Over 230 native bird species have been documented in the Lower

St. Louis River and surrounding areas. The estuary is both an important breeding area and a critical migratory stopover location. Several factors make the Lower St. Louis River an important stopover site for migrating birds, including the abundance of food and shelter in the estuary (many migrating birds avoid flying over large bodies of water).

In the spring, birds migrating north from across the central United States encounter the south shore of Lake Superior and travel westward until they reach the estuary. In the fall, birds migrating south are channeled along the western edge of Lake Superior through the estuary. During migration, waterfowl, raptors, gulls, terns, shorebirds, and waders are concentrated in a relatively small area. Some years, observers have reported seeing tens of thousands of birds.

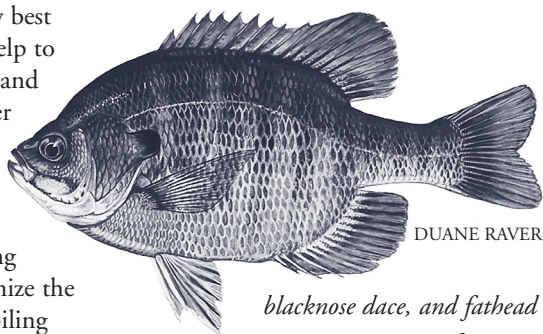
Many natural and human processes and events can have a direct impact on the health of the conservation targets.

- **Water quality** deteriorates when contaminants such as grease, oil, road salt, pesticides, fertilizers, animal droppings, and excess sediment are carried into the river by stormwater runoff. These pollutants can cause short-term die-offs as well as longer-term health problems for fish, birds, and other animals.
- **Excess sediment**, carried into the river by tributaries, accumulates in sheltered bays and other estuarine habitats and slowly fills the wetlands and destroys the vegetation that provides necessary food and shelter for many fish, insects, and birds.
- **Habitat loss** occurs when land is converted to other uses, such as filling wetlands for roads, parking lots, and buildings.
- **Competition from undesirable exotic species**, such as the zebra mussel or purple loosestrife, threatens the survival of native species and plant communities.
- **Exposure to contaminants** left behind by previous industrial and commercial practices in areas like Stryker Bay continues to impair the health of many animals that live in the Lower St. Louis River.

Activities that create these challenges can be modified to reduce the impact on the conservation targets.

- **Residential, commercial, and industrial development** within the St. Louis River watershed and the Duluth-Superior harbor can be carefully planned and designed to minimize the loss of upland and wetland habitat, control erosion and sedimentation, protect water quality, and slow down the introduction and spread of undesirable invasive species.
- **Forestry activities** can follow best management practices that help to minimize the amount of soil and nutrients carried into the river by water runoff.
- **Commercial shipping activities** within the harbor should fully utilize the existing navigation channels to minimize the need for dredging and stockpiling dredged materials.
- **Contaminated sediments** that remain in the estuary from a variety of historic industrial and commercial sources can be removed so fish, birds, and people are no longer exposed to these toxins.

Approximately 45 native fish species have been documented in the Lower St. Louis River. Fish-eating species such as yellow perch, white bass, muskie, walleye, and northern pike inhabit the estuary, along with prey species such as emerald shiner, spottail shiner,



blacknose dace, and fathead minnow. A range of habitats within a self-sustaining ecosystem is necessary to maintain this rich diversity.

Conservation Targets of the Lower St. Louis River

Conservation targets are the habitats, plant communities, and specific species that guide conservation efforts. The following conservation targets were identified for the Lower St. Louis River.

Estuarine Aquatic

Habitat Targets

- Large riverine reach
- Upper estuarine (undredged) river channel
- Lower estuarine (dredged) river channel
- Upper estuary flats
- Sheltered bays
- Clay-influenced river mouths
- Industrially-influenced bays
- Lower estuary (industrial harbor) flats
- Industrial slips
- Clay-influenced bay
- Clay-influenced tributaries
- Bedrock-influenced tributaries

Estuarine Plant

Community Targets

- Great Lakes coastal wetland complex

Baymouth Bar

Community Targets

- Beaches
- Beachgrass dunes
- Dune shrublands
- Interdunal wetlands
- Dune pine forests

Upland Forest

Community Targets

- White pine-red pine forest
- Northern conifer-hardwoods forest/
Northern hardwoods forest
- Spruce-fir boreal forest

Other Inland Plant

Community Targets

- Eroding clay bluffs
- Clay seeps
- Conifer swamps
- Hardwood swamps
- Shrub swamps
- Inland marshes
- Wet meadows
- Fens
- Cliffs and rock outcrops

Species Targets

- Native fish assemblage
- Lake sturgeon
- Native mussel assemblage
- Migratory and breeding bird aggregations
- Piping plover
- Common tern
- Wild rice



DUANE RAVER

What Can We Do?

As stakeholders, there are a number of things we can do to help protect, maintain, enhance, and restore the ecosystems of the Lower St. Louis River.

Protect water quality by minimizing stormwater runoff, preventing erosion, and eliminating pollutants. Most storm sewers carry rainwater, along with its load of sediment and pollutants, directly into the St. Louis River or Lake Superior. To help protect water quality, you can:

- **Cover bare ground** as quickly as possible with vegetation and mulch so the soil is not carried away by stormwater runoff.
- **Establish deep-rooted native plants on hillsides** to help prevent soil from washing away.
- **Develop and implement remedial alternatives for areas of contaminated sediment** and restore the affected resources according to the appropriate conservation goal for the area.
- **Maintain buffers of native vegetation** (not mowed grass) along streams and rivers to reduce runoff and hold soil in place.
- **Don't dump debris or garbage** into ravines or creeks. The material may kill fish or block the stream and cause flooding.
- **Encourage the protection of remaining high quality habitat areas** through effective long-term land protection programs and guidelines (see map on pages 16-17).
- **Support efforts to control the spread of undesirable invasive species** and to eliminate existing populations of undesirable invasive species (for example, zebra mussels) in the Lower St. Louis River. If you are a boater, angler, water-skier, scuba-diver, sailor, or canoeist, follow recommended procedures to help prevent the transport of these species.

What Can We Do?

- **Encourage the restoration of modified sites** that still provide important ecological functions. Restoration can be appropriate in a wide variety of sites that vary from slightly to highly disturbed.
- **Encourage the modification of local regulations related to zoning, shoreland development, stormwater management, and erosion control.** These regulations can be modified to ensure appropriate land uses that protect ecosystems by preventing the increase in stream flow rates, runoff volumes, erosion, and sedimentation that often result from inappropriate land use patterns.
- **Support improved management of recreational trails and increased regulation of recreational motorized vehicles** with the goal of controlling erosion and minimizing impacts on public and private land and water resources.
- **Keep leaves, yard clippings, trash, and soapy water out of street gutters, storm drains, and ditches.** Don't sweep or rake yard debris into the street; instead, collect it and compost it or use it to fill low spots.
- **Minimize impervious surface** (rooftops, driveways, roads) on your property.
- **Capture rainwater** in a rain barrel or rain garden to help minimize stormwater runoff and increase the amount of water that soaks into the ground.



LYNELLE HANSON

Sweep up sand from sidewalks and driveways to keep it from getting into storm drains, where it could end up in our river and streams.



LYNELLE HANSON

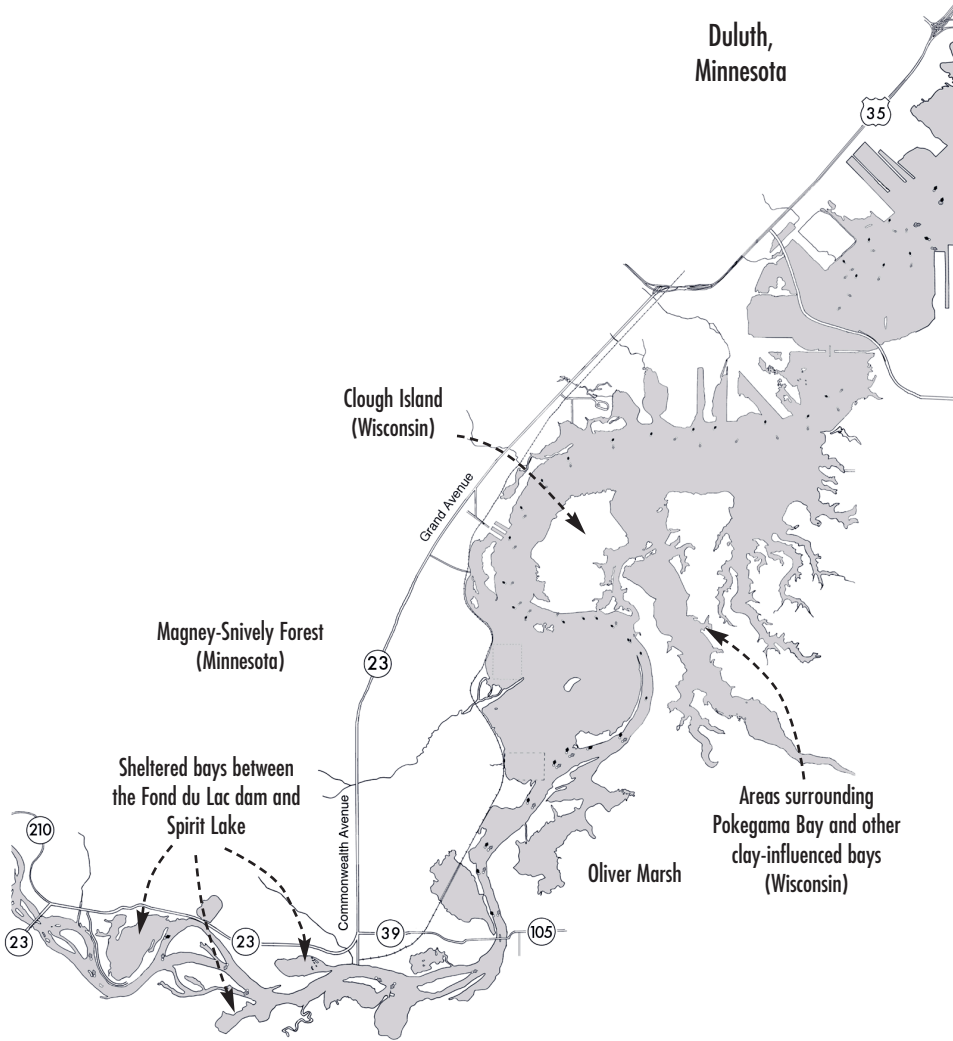
Set up a rain barrel to capture water and slow the flow from your yard. Fast moving water from your yard carries soil and other pollutants into the river.



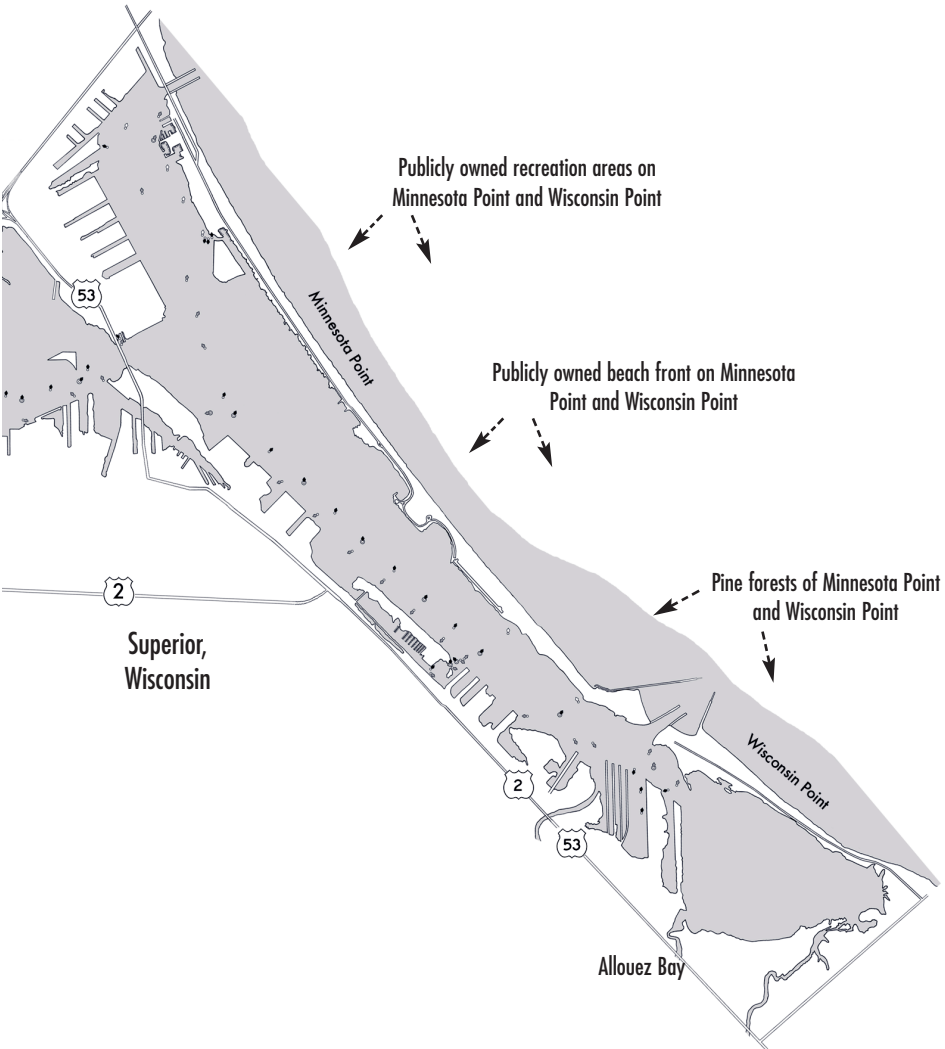
DIANE SODEN-GROVE

Install pervious surface driveways that allow polluted water to soak into the soil to filter it before it reaches streams and the lake. This also reduces the volume of runoff during storms.

Highest Quality Habitat Areas in the Lower St. Louis River Estuary



St. Louis River and Red River Streambank Stabilization Area (Wisconsin)



Note: The St. Louis River Citizens Action Committee guided the preparation of this Habitat Plan and will continue to work with all stakeholders to protect the conservation targets of the Lower St. Louis River.

Historical Development of the Lower St. Louis River

Prior to the 1850s, the Lower St. Louis River was home to a small population of Lake Superior Chippewa and served as an important center for the European fur trade. Once the LaPointe Treaty with the Chippewa was signed in 1854, the area began to change rapidly as thousands of European immigrants arrived.

When first charted by William Hearing in 1861, the Lower St. Louis River was relatively shallow and was



COURTESY OF MN SEA GRANT

bordered by a variety of wetlands and forest communities.

According to Hearing's 1861 chart of the estuary, the area upstream of Rice's Point/ Connors Point was less than 15 feet deep. Marsh vegetation and floating islands of peat covered so much of the estuary that the river channel was often difficult to follow because of the

extensive vegetation. The forests of the surrounding uplands were dominated by coniferous and mixed deciduous/coniferous stands. A variety of fish, waterfowl, mammals, and other wildlife used the area for breeding and migration.

Development of the river shoreline and reconfiguration of the Duluth-Superior Harbor began in earnest in 1872 when a ship canal for Duluth was cut through the baymouth bar that had separated the river and Lake Superior. The next quarter of a century saw both the Duluth and the Superior entries entirely reconstructed, and the basins and channels in both Superior Bay and St. Louis Bay dredged into the basic

contours they possess today. Dredging had significant effects on both the shoreline and the riverbed.

According to the U.S. Army Corps of Engineers,

between the late 1800s and 2002, over 69,500,000 cubic yards of clay and mud mixed with sand were dredged from the river and used as fill to create docks, to replenish eroded areas on

Minnesota and Wisconsin Points, and to form new islands. It has

been estimated that

since Harding's time, approximately 3,000 acres of shallow wetland habitat have been lost as a result of intentional filling and approximately 4,000 acres of the estuary have been dredged or deepened for navigation.

Despite these significant changes, the Lower St. Louis River still provides vital habitat for fish, nesting colonial water birds and waterfowl, migratory shorebirds and songbirds, and many other animals. The estuary supports a large, diverse warm-water fish community of approximately 45 native species. Recent studies (based on air photos from 1997 and 1999) indicate that approximately 2,000 acres of vegetated wetlands remain in the estuary.

COURTESY OF MN HISTORICAL SOCIETY





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