

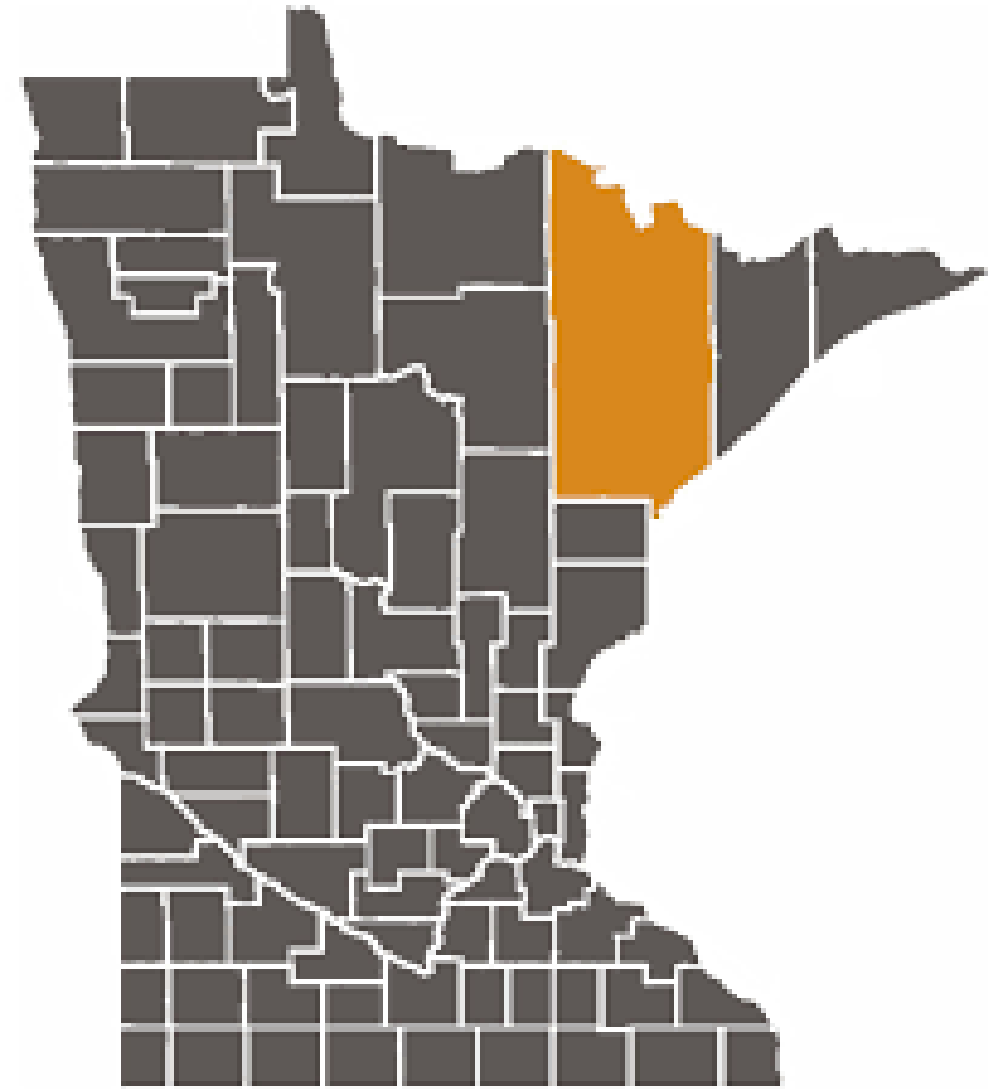


Managing Water Locally Duluth, MN

Indiana Water Summit

August 13, 2020





St. Louis County:

- one of 87 MN counties
- includes 27 cities, 72 townships, 75 unorganized townships, and parts of 2 Indian Reservations
- 7,000+ sq. mi. in area

2019 US Census Est. Pop

State of Minnesota: 5,639,632

St. Louis County: 199,070

City of Duluth: 85,618



Background Information

- 6,900,000 people visited in 2019 (est.)
- 3 Institutions of Higher Learning: University of Minnesota Duluth (Fall 2019 enrollment =10,800); St. Scholastica, (3,900); and Lake Superior College (4,900)
- 2 Major Medical Institutions: Essentia Health w/6,500 Employees and St. Luke's Hospital w/2,000 Employees)
- Recreation Features Include a Fresh Water Aquarium, Public Zoo, Two Public Golf Courses, Public Ski Hill, 129 Parks, 11,000 acres of Green Space and 6,834 Acres of City Parkland, 10 miles of horseback trail, 30 miles paved and 16 miles gravel accessible trail, 38 miles of cross-country ski trail, 85 miles of bike-optimized singletrack Trail, and Over 150 miles of Natural Surface Hiking Trail

Background Information

- Duluth Seaway Port Authority, annual average of nearly 800 vessel visits, some 35 million short tons on average (iron ore, coal, grain, limestone, cement, other)
- Duluth International Airport (300,000 visitors, 2019; 80 +18 Aircraft Based)
- Duluth Sky Harbor Airport and Seaplane Base
- Two Major Freight Lines (CN and BNSF), Two Historic/Scenic Rail Lines

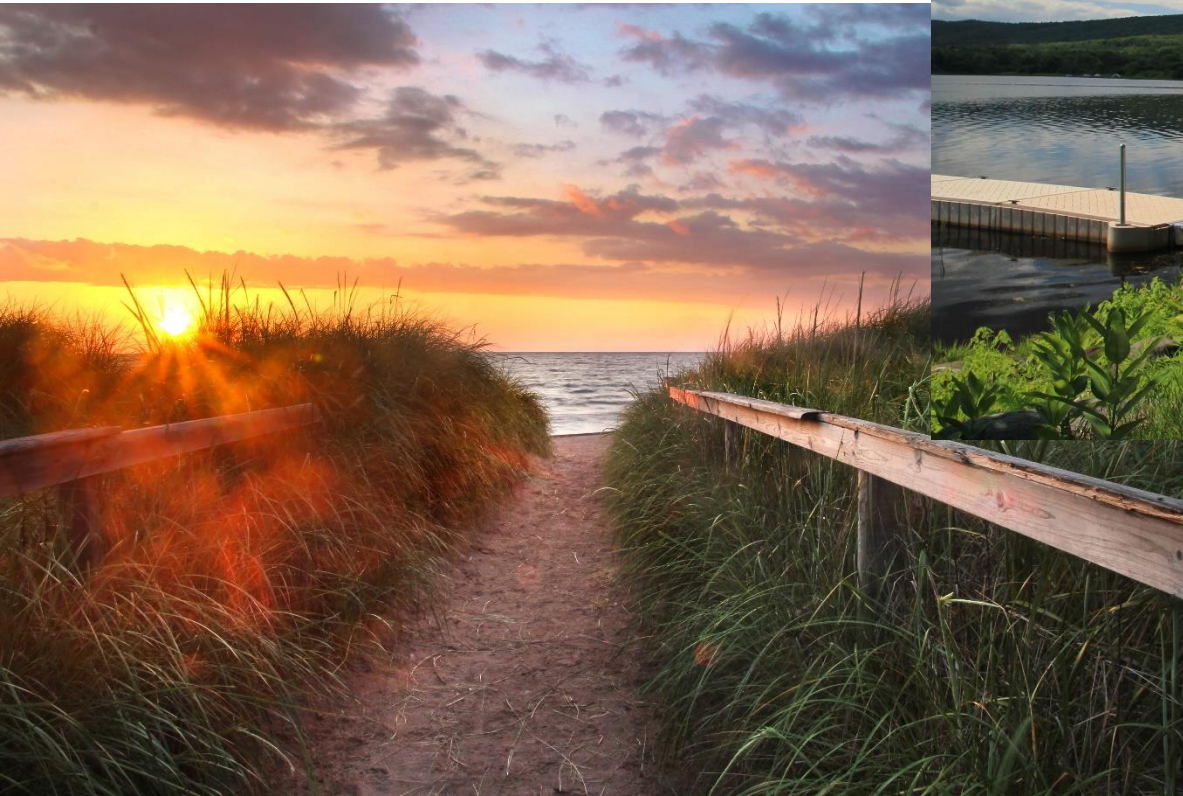
Transportation Has Been An Important Factor in Duluth's Past, Present, And Future



Transportation Has Been An Important Factor in Duluth's Past, Present, And Future



Open Space and Water Have Been An Important Factor in Duluth's Past, Present And Future



Past Industrial Activity, While Beneficial for Employment, Has Left a Legacy of Pollution in Areas



Source: ZenithCity.Com. As World War II began Barnes-Duluth and several other dormant shipyards sprang back to life in the Twin Ports. The facilities employed over ten thousand men and women, averaging ten ships a month while producing a fleet of 230 vessels.

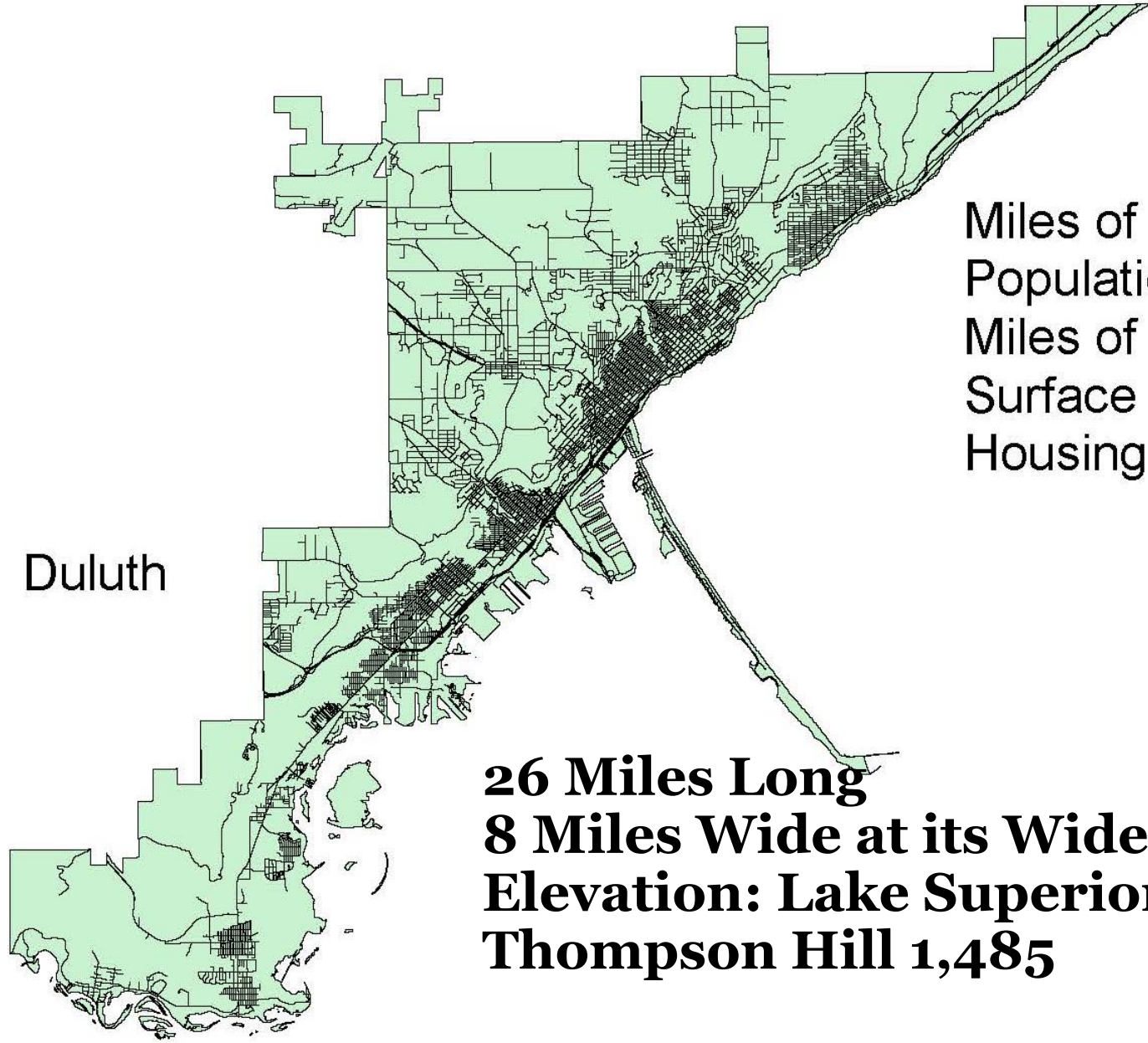


Source, MNDNR: Two sawmills that operated during the late 1800s and early 1900s left their mark at Grassy Point. During milling, sawdust and the unusable parts of logs and boards were dumped in the bay, leaving thick layers of wood waste underwater. Although not contaminated, the waste eliminated important aquatic plant and animal habitat.

Past Industrial Activity, While Beneficial for Employment, Has Left a Legacy of Pollution in Areas



Source ZenithCity.Com: Built along Commonwealth Avenue adjacent to the Minnesota Steel Company complex in 1915, the Universal Portland Cement plant converted granulated slag — a byproduct of steel manufacturing — into cement. The operation employed between 350 and 400 workers who could produce up to 4,000 barrels of cement daily. The cement factory's first client was its owner, United States Steel. The nearby "company town" of Morgan Park was created for U.S. Steel employees and named for the company's founder, J. P. Morgan. Like the steel plant itself, nearly every building and home in Morgan Park was made of concrete block, so in 1915 when the steel plant began producing steel — and slag — Portland took over from other cement providers. In 1976 the Minnesota Pollution Control Agency pressured the steel company to arrest air pollution caused by cement dust; the plant was demolished in 1978.

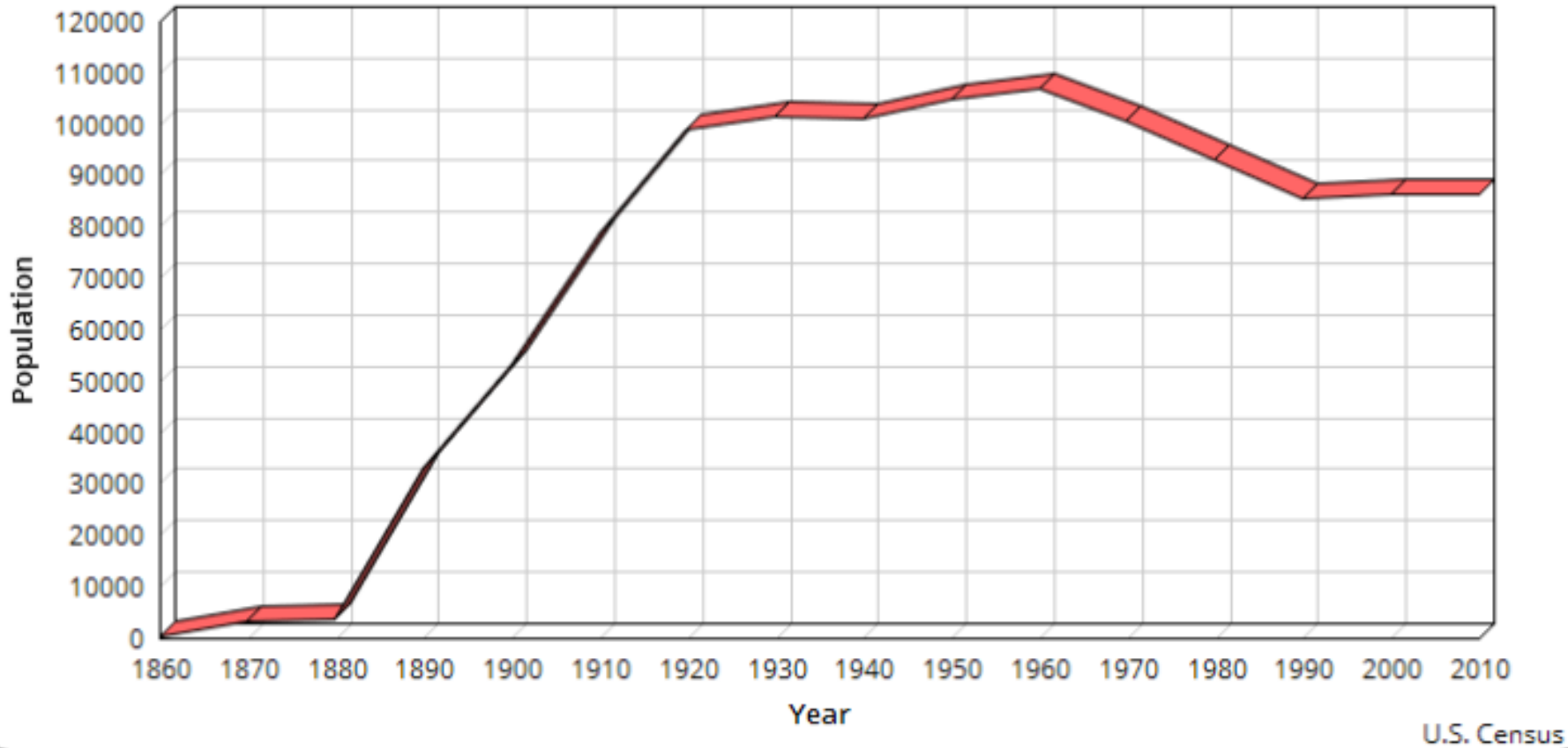


Duluth

Miles of road: 711
Population: 86,128
Miles of road per 1000: 8
Surface area: 72.3 mi²
Housing density: 524 h/mi²

26 Miles Long
8 Miles Wide at its Widest Point
Elevation: Lake Superior 602,
Thompson Hill 1,485

Duluth Population: 1860 to 2010



1860	–	80
1870	–	3,131
1880	–	3,483
1890	–	33,115
1900	–	52,969
1910	–	78,466
1920	–	98,917
1930	–	101,463
1940	–	101,065
1950	–	104,511
1960	–	106,884
1970	–	100,578
1980	–	92,811
1990	–	85,493
2000	–	86,319

Duluth's Population Has Declined, But Public Infrastructure Remains (Streets, Water, Sanitary Sewer, Storm Sewer, Etc) With Less Resources for Ongoing Operating and Maintenance Costs

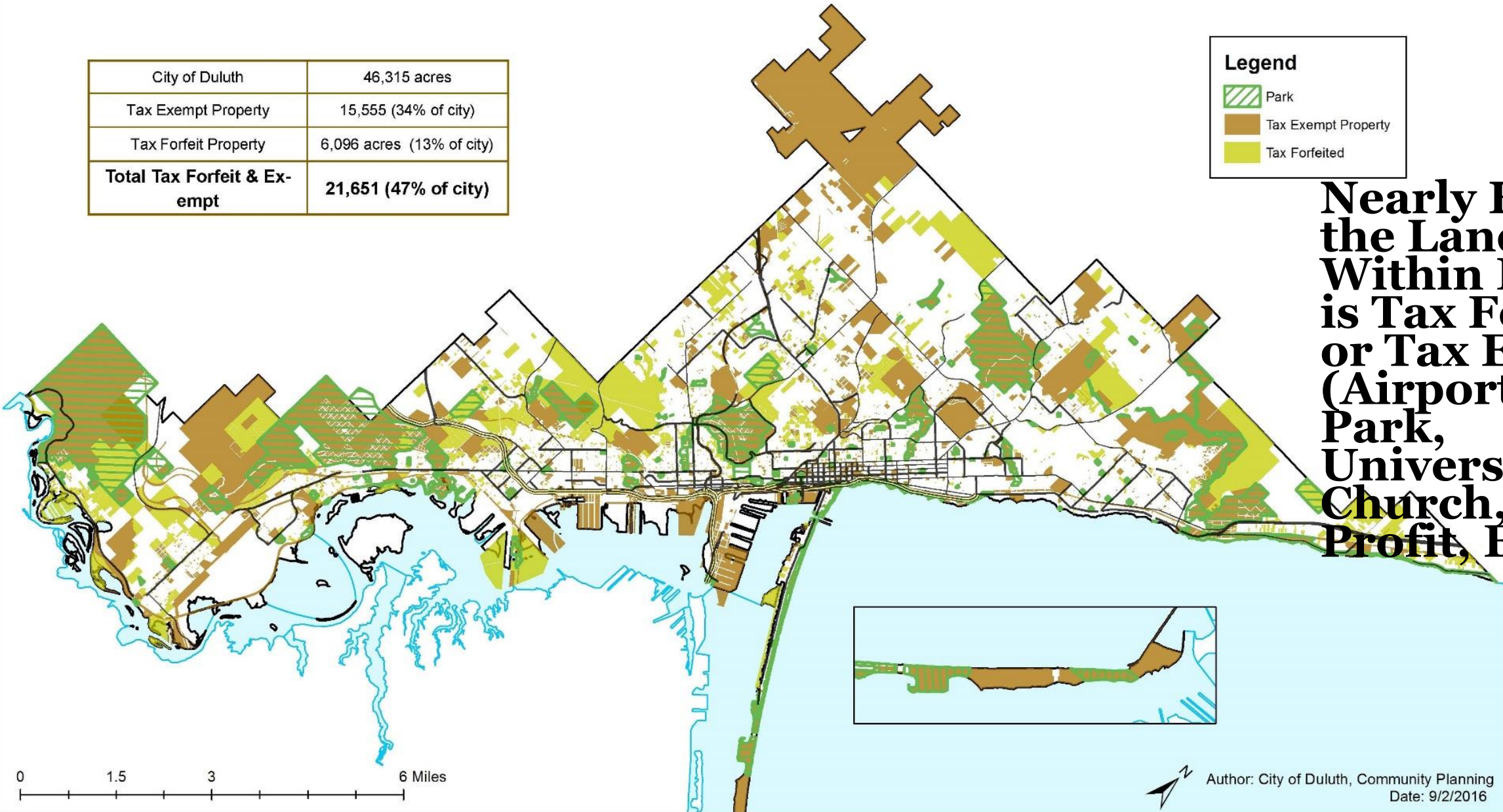


City of Duluth	46,315 acres
Tax Exempt Property	15,555 (34% of city)
Tax Forfeit Property	6,096 acres (13% of city)
Total Tax Forfeit & Ex-empt	21,651 (47% of city)

Legend

-  Park
-  Tax Exempt Property
-  Tax Forfeited

Nearly Half of the Land Within Duluth is Tax Forfeit, or Tax Exempt (Airport, City Park, University, Church, Non-Profit, Etc)



Challenges Related to Topography

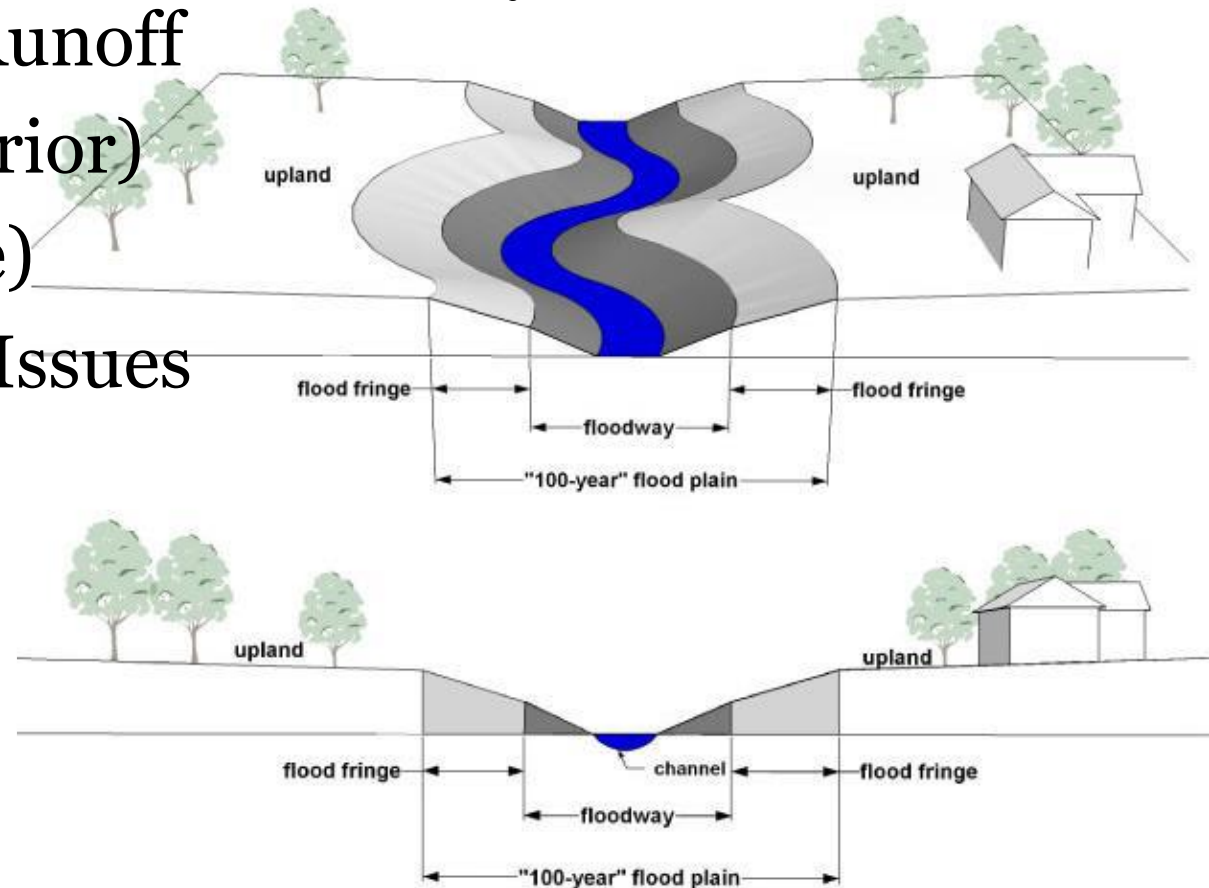
-Wetlands

-Exposed Bedrock, Mostly Type D Soils, Cohesive Clay Soils with Low Permeability/Low Infiltration/High Runoff

-Wind and Water Erosion (Lake Superior)

-Streams, Floodplains (Flood Damage)

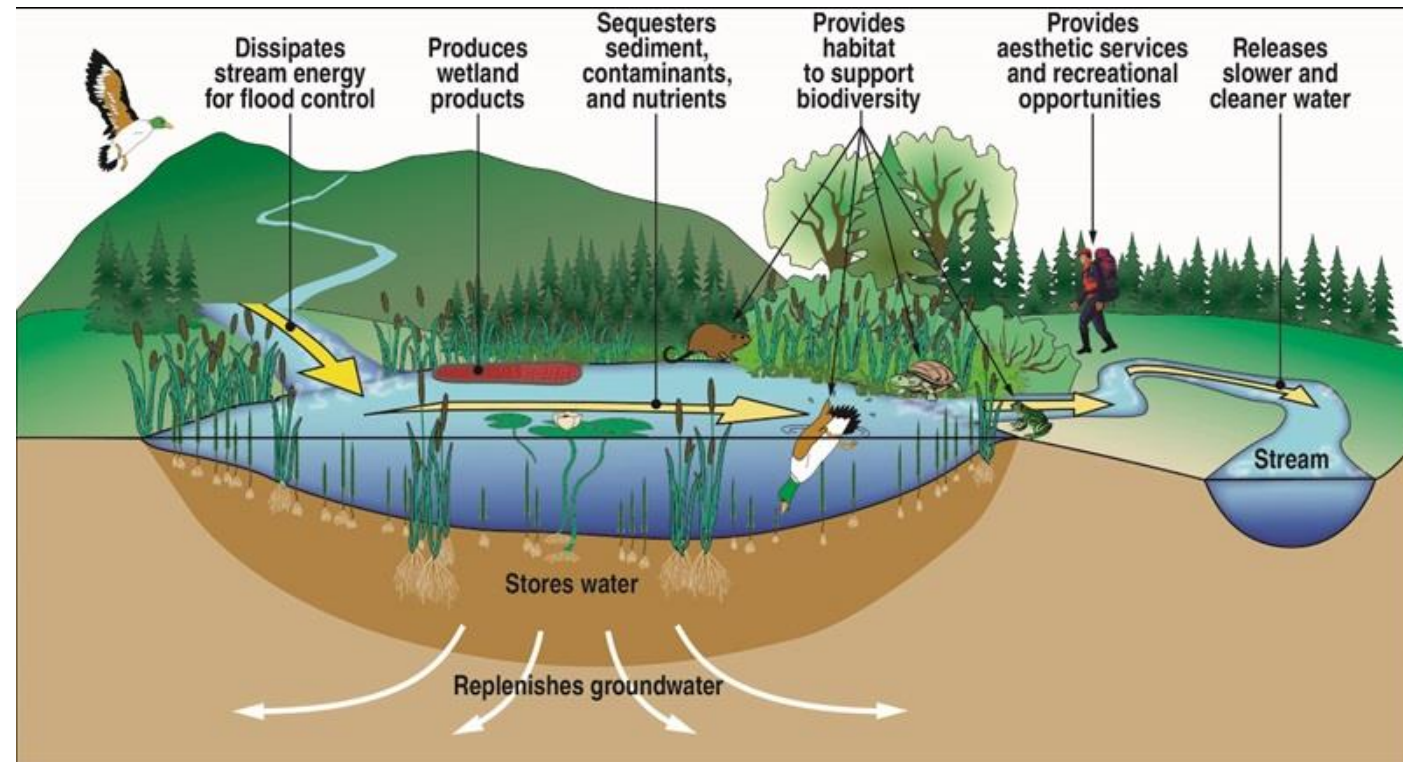
-Storm Water Inflow and Infiltration Issues



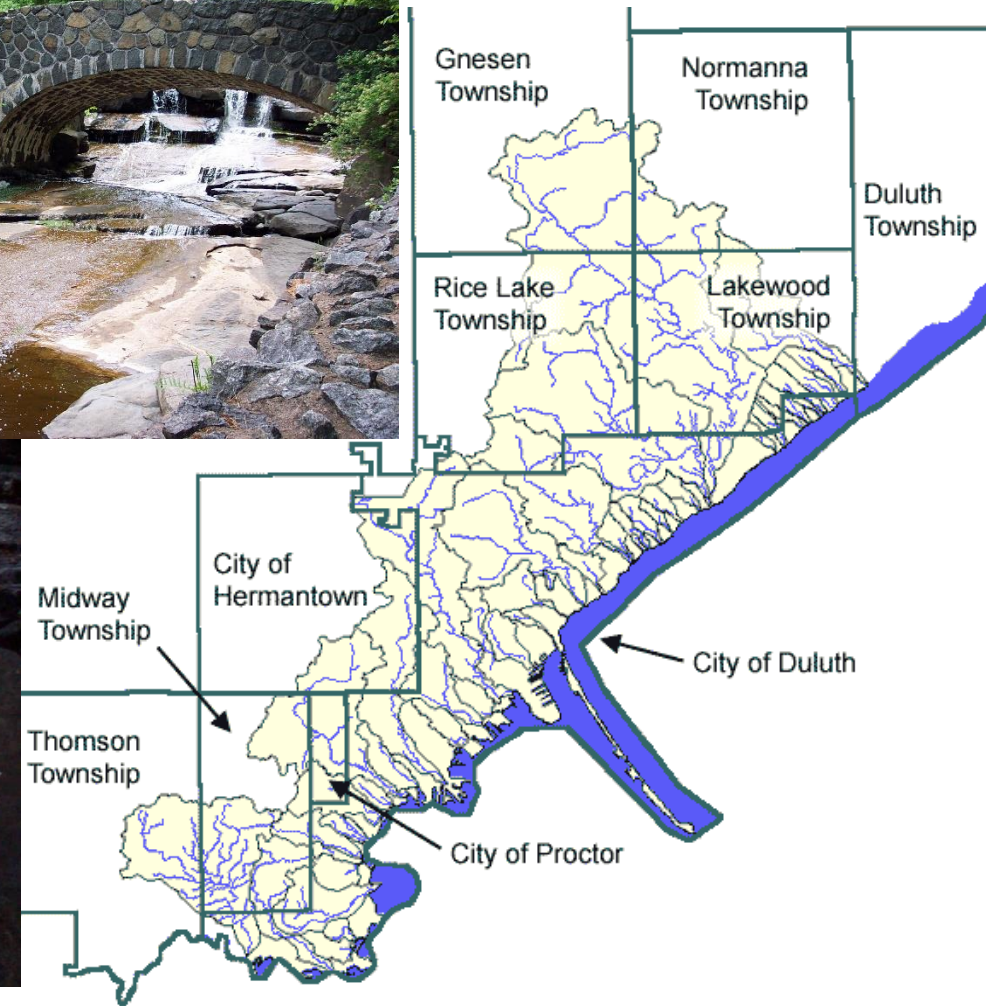
Wetlands provide Public Benefit, But Can Be Seen As A Private Cost. Management Should Be: Avoid, Minimize, and Mitigate, NOT: Find Them, Fill Them, Forget Them

Wetland Sequencing

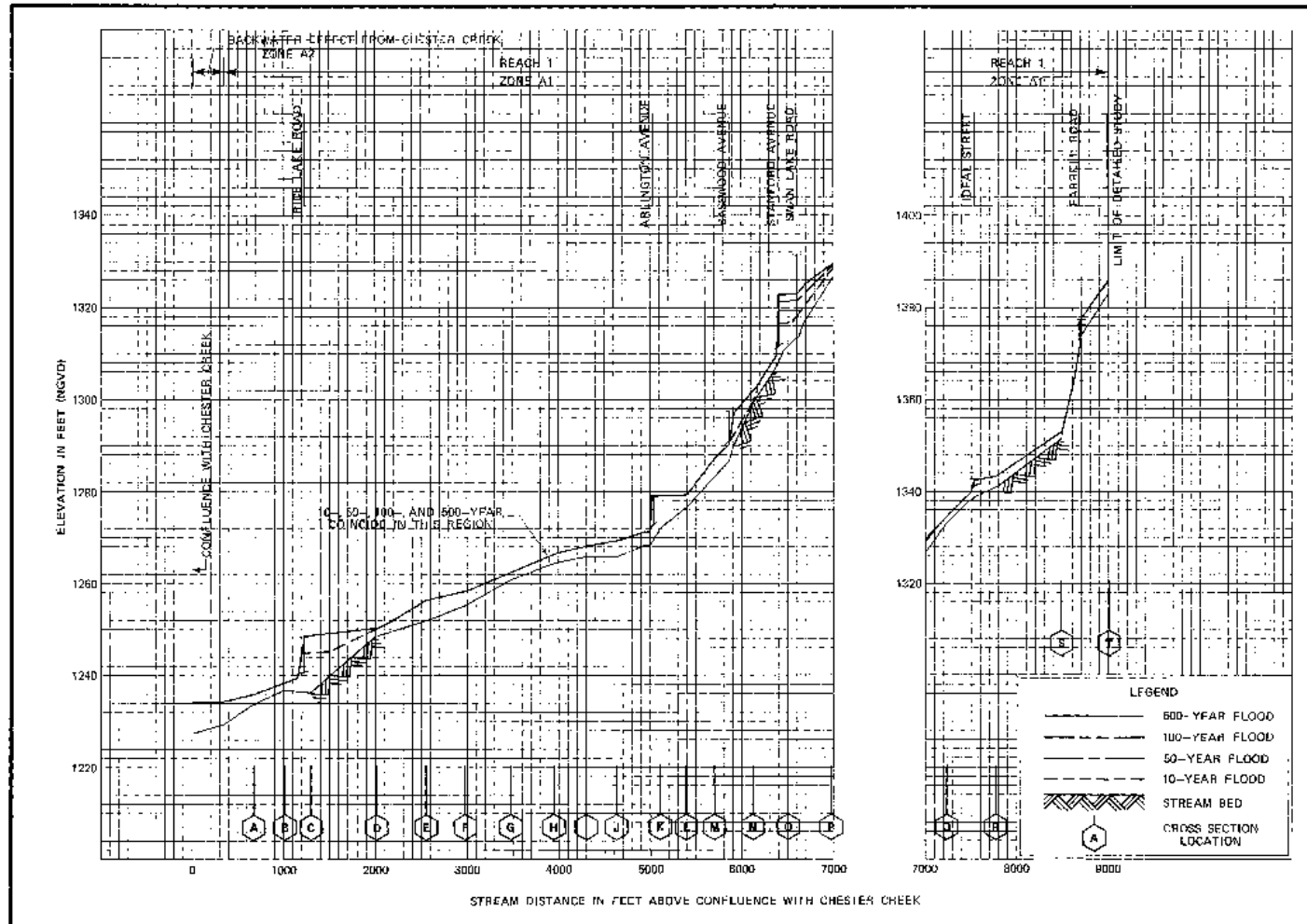
1. Avoid direct or indirect impacts that may destroy or diminish the wetland.
2. Minimize wetland impacts by limiting the degree or magnitude of the wetland activity.
3. Rectify wetland impacts by repairing, rehabilitating, or restoring the affected wetland.
4. Reduce or eliminate impacts over time by operating the project in a manner that preserves/maintains the wetland.
5. Replace unavoidable wetland impacts by restoring wetlands or creating wetlands of equal or greater public value.



City Features 42 Named Streams, 16 Are Designated Coldwater Streams



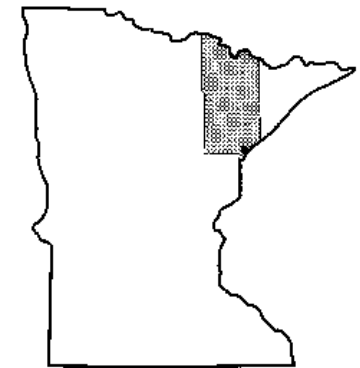
Many FEMA Designated Floodplains Within Duluth



FLOOD INSURANCE STUDY



CITY OF DULUTH,
MINNESOTA
ST LOUIS COUNTY



AUGUST 1979

FEDERAL EMERGENCY MANAGEMENT AGENCY
FEDERAL INSURANCE ADMINISTRATION

COMMUNITY NUMBER 270421

Many Flood Related Events

-Flooding and Wind Damage from Lake Superior, Three Major Events in the Last Three Years, October 2017, April 2018, October 2018 Storms. Peak Wind Gust Recorded at 74 mph (Blatnik Bridge), 604.75 Duluth Water Level Observation Station (All Time Recorded High).

-Two 100/250 Year Flood Events, One in 1972, and the Most Serious Being June 19-20, 2012.





3rd Ave. E. Between Superior and 1st Streets



6th Ave. E. and 6th Street



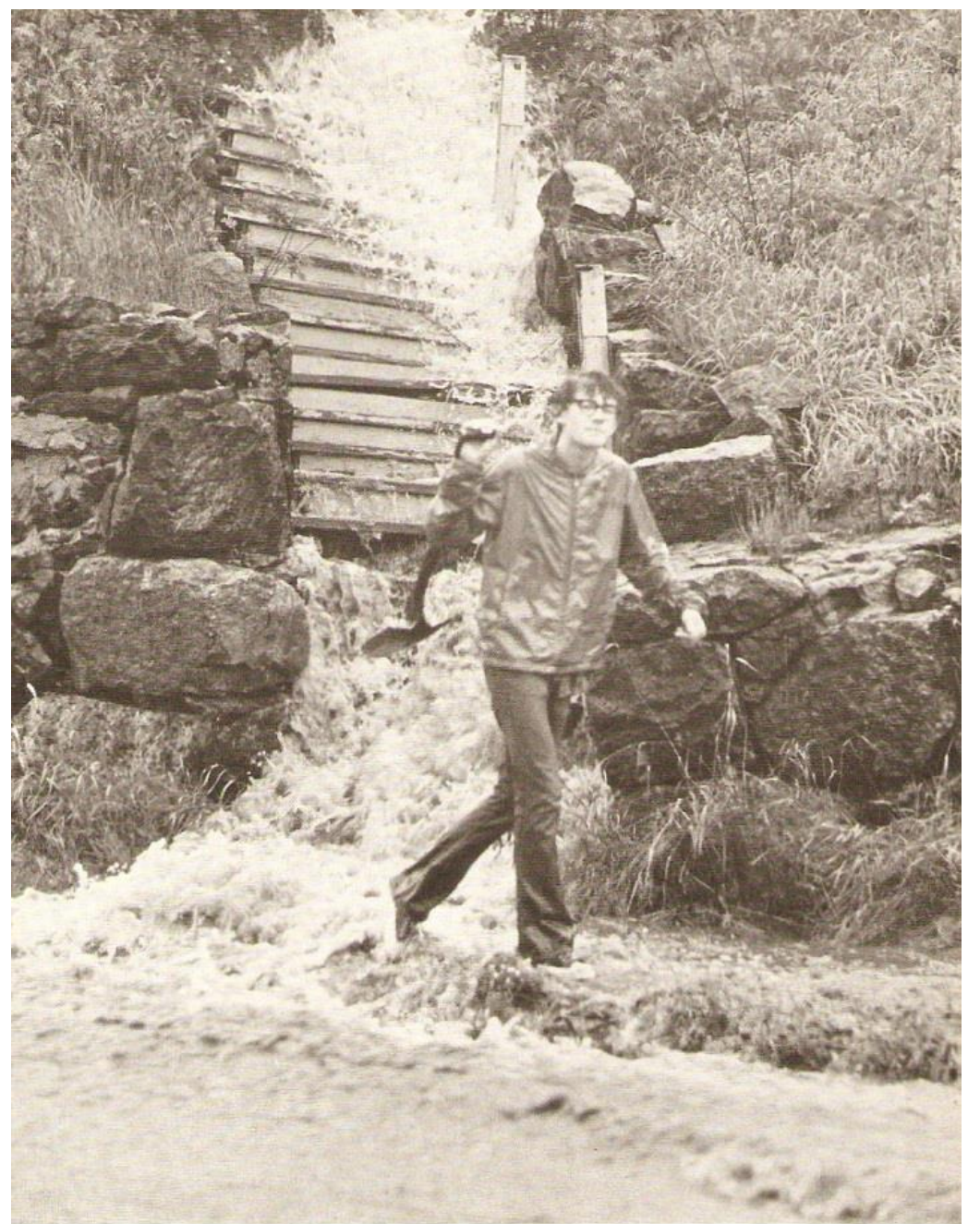
Debris strewn in a backyard on 7th St.



A rushing torrent spills rubble on the street



A torrent at Waverly and Elizabeth Streets



A river splashes down the stairs



June 19-20, 2012. The Duluth office of The National Weather Service: Three day rainfall amounts of 8 to 10 inches were common across the Minnesota Arrowhead and northwestern Wisconsin from June 17th through June 19th. The heavy rain took its toll on the road infrastructure and caused rivers and streams to flood.



A. Standards Related Land Use

- Shoreland Setbacks
- Increased Focus on Stormwater Management
- Zoning Standards to Gently Promote Sustainability
- Reduction in Off-Street Parking Space Requirements, Maximum Cap of Off-Street Parking, and Exemptions from Parking Requirements in Some areas in Downtown (To Reduce Impervious Surface)

B. Programs To Preserve - Restore -Manage

- Duluth Natural Areas Program
- Outdoor Heritage Fund (TF Land Swap)
- St. Louis River Area of Concern (MN and WI DNR, EPA, USACE, MN Land Trust)



Stormwater Management

- When stormwater flows across the surface of the ground it picks up soil and pollutants and carries them to the nearest stream, river, or lake. **Stormwater is not treated at the treatment plant. Asphalt parking lots and streets, concrete sidewalks, rooftops, and compacted gravel areas are examples of impervious surfaces.**
- The City is supportive of efforts to provide green Infrastructure, but to date no new City project has utilized green infrastructure.



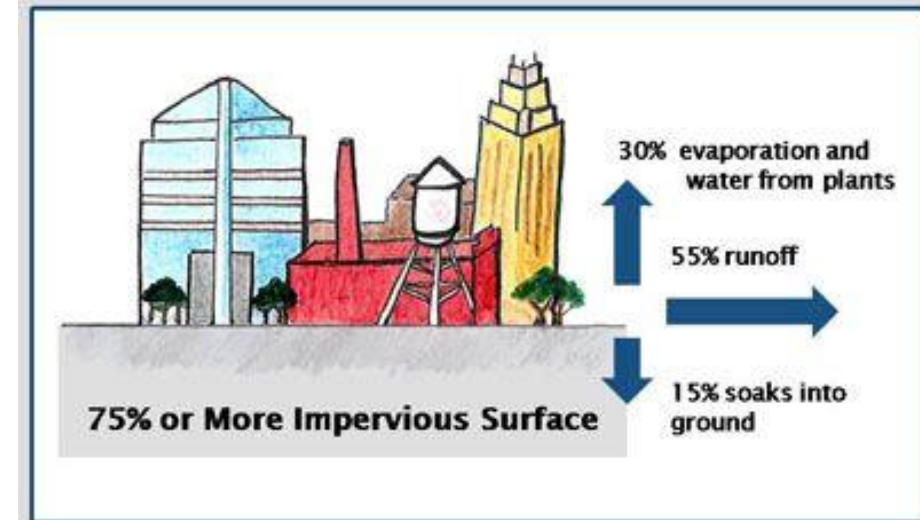
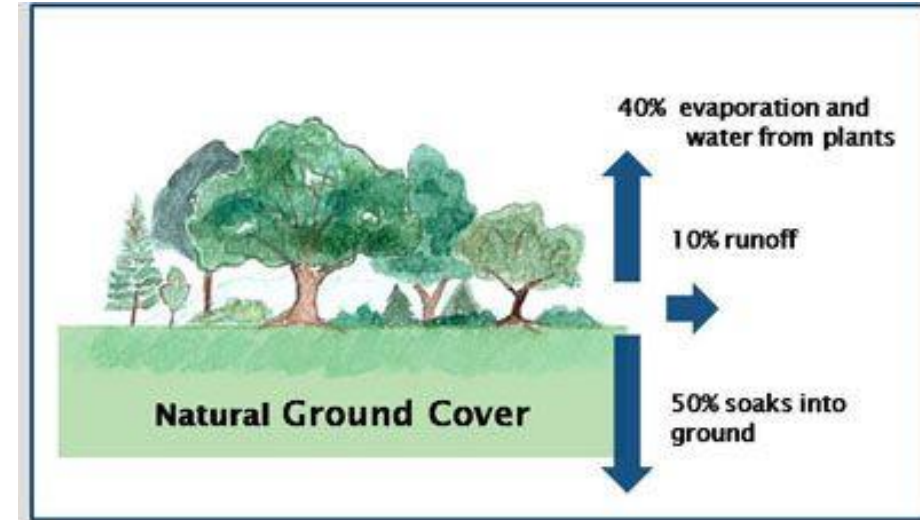
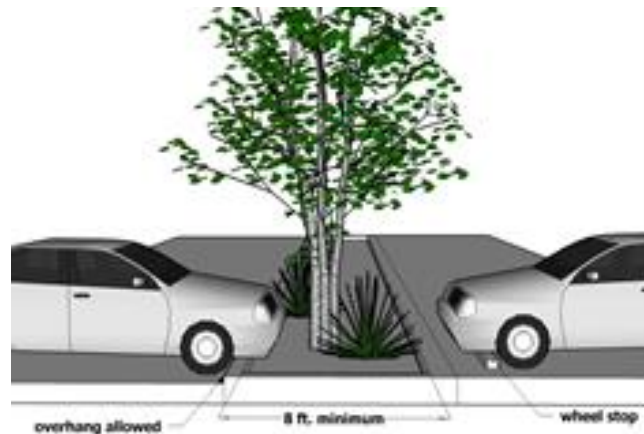
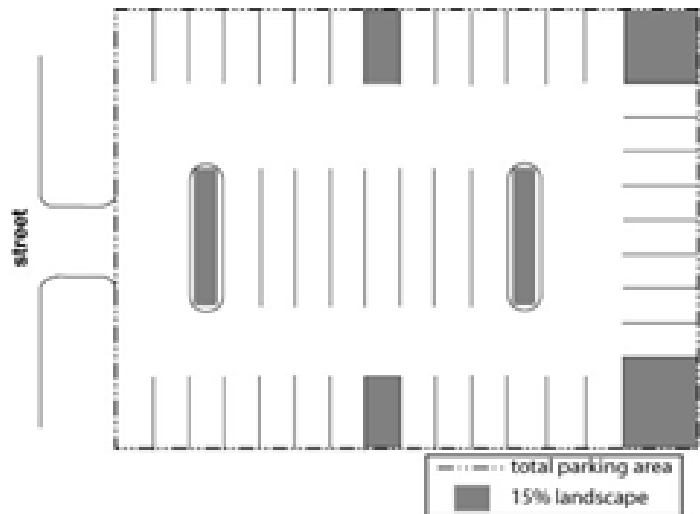
Stormwater Management, Fees

- RESIDENTIAL: Stormwater fees are calculated based on the number of Equivalent Residential Units (ERUs) on a property. 1,708 square feet is the average impervious surface area in Duluth for a single family home. All residential buildings are billed 1 ERU per living unit.
- COMMERCIAL/INDUSTRIAL: Commercial/Industrial properties are billed based on the total square footage of impervious surface on the property (typically buildings and parking lots). The total impervious square footage of a commercial property is then converted to ERUs.
- CREDIT: Credits for installing engineered Best Management Practices (BMPs) are available for non-residential properties. **Most properties that install stormwater BMPs receive a reduction of 37.16%** for the area of the property that flows to the BMP. In order to receive credit, the BMP must:
 - Be designed (and signed) by a licensed, professional engineer.
 - Be sized to capture at least the first 0.5” of runoff.
 - Have annual, documented inspections by the property owner, licensed professional engineer, or other qualified individual.
 - Be maintained as needed based on the annual inspections.



Reduction in the Size of New Impervious Surfaces to Reduce Future Runoff/Flooding Issues

- Zoning Rules Encourage Reduced, But Appropriate, Amounts Of Off-Street Parking For New Developments.
- The City Would Rather New Development Focus More Resources on New Structures and Less Resources on Large Parking Surfaces That Are Not Fully Utilized.



Duluth Natural Areas Program

The Duluth Natural Areas Program is designated by city ordinance (Chapter 2, Article XXIX) to **designate certain lands with environmental value as permanently protected natural places**. Designating these lands ensures everyone in Duluth will always have access to these special places where they can appreciate nature and enjoy the outdoors. Duluth preserves its natural heritage for the public good by:

- Ensuring the city can better manage **Duluth's forests, streams, and wetlands**
- Supporting diversification of our region's **economy**
- Promoting the well-being and happiness of our citizens and **visitors**
- Maximizing resiliency for a changing climate through the services these lands provide (e.g., **controlling stormwater runoff**, supporting diverse plant communities)

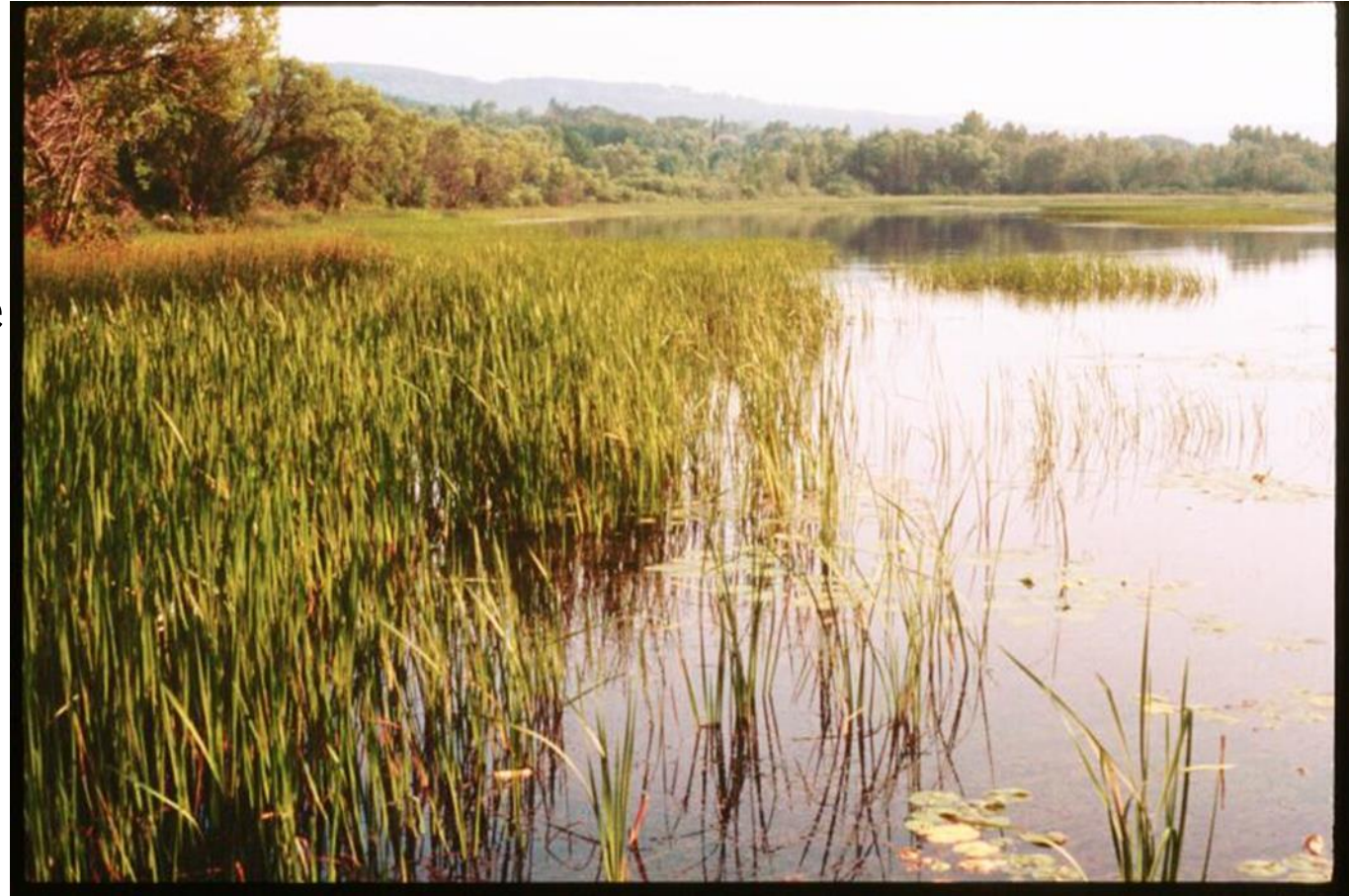




Duluth Natural Areas Program, 02-036-0

In order to qualify for designation under the program, the resources sought to be protected **must be in a substantially undisturbed natural state and must represent a unique resource characteristic of the Duluth area.** The land most likely for designation is city-owned land within the city itself which contain resources in this category, though privately-owned land which a private owner wishes to have included in the program will also be eligible.

Areas that have connectivity, or a critical mass, are most appropriate.

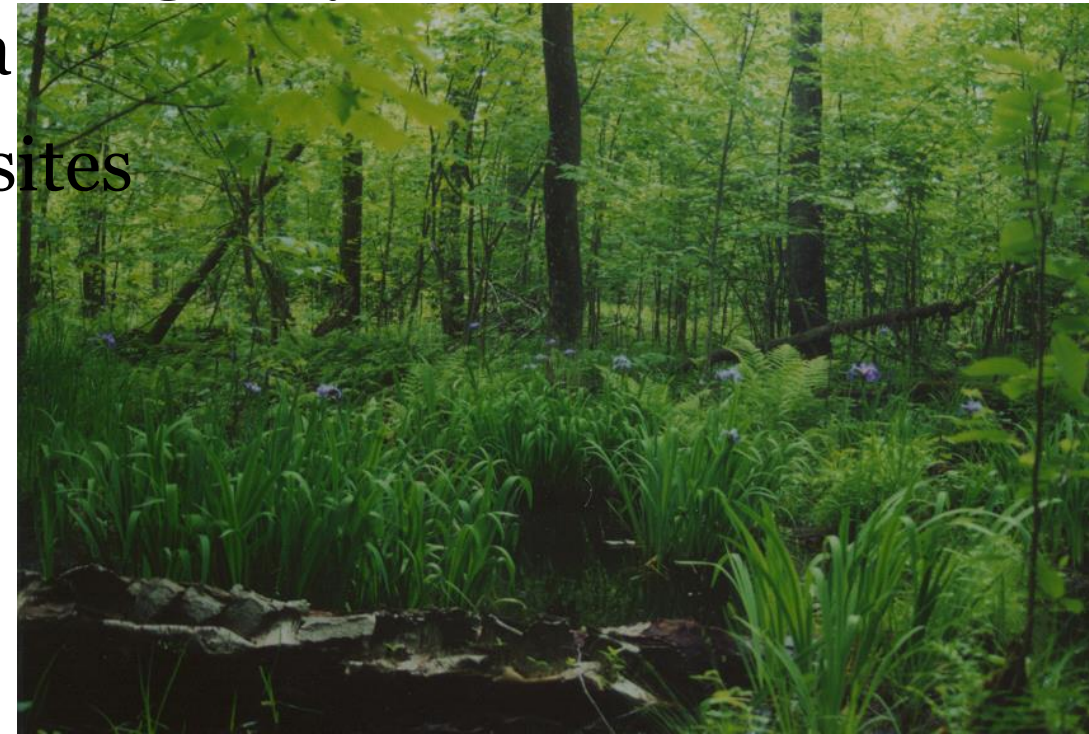


Duluth Natural Areas Program, Selection Criteria

Objective Criteria ...based on widely accepted standards:

- U.S. National Vegetation Classification System
- MN DNR Natural Heritage and Nongame Research Program
- State list of Threatened, Endangered and Special Concern Species
- “Important Bird Areas Program” criteria managed by the American Bird Conservancy and Bird Studies Canada
- Defined “viability” criteria for nominated sites

Significant Native Plant Community: A relatively undisturbed, viable family of plants native to the Duluth area. These groups of plants form recognizable units, such as a maple forest, a marsh, a sand dune. Nationally standardized definitions.



Duluth Natural Areas Program, Program Benefits

- Conserve discrete, significant places
- Enhance public and private property
- Use objective and accepted criteria for decision-making
- Tool to help evaluate the quality of natural areas
- Provide a legacy for future generations
- Help put development in the right places



Duluth Natural Areas Program, 02-036-0

The ordinance contemplates a two-stage process for designation. In the **first phase**, property which was proposed for inclusion would be reviewed **first by the environmental advisory council (now the Natural Resources Commission)** for the purpose of evaluating its environmental qualifications, then by the **planning commission** to review how designation would fit into the overall land use planning objectives of the city. The recommendations are approved by the City Council.

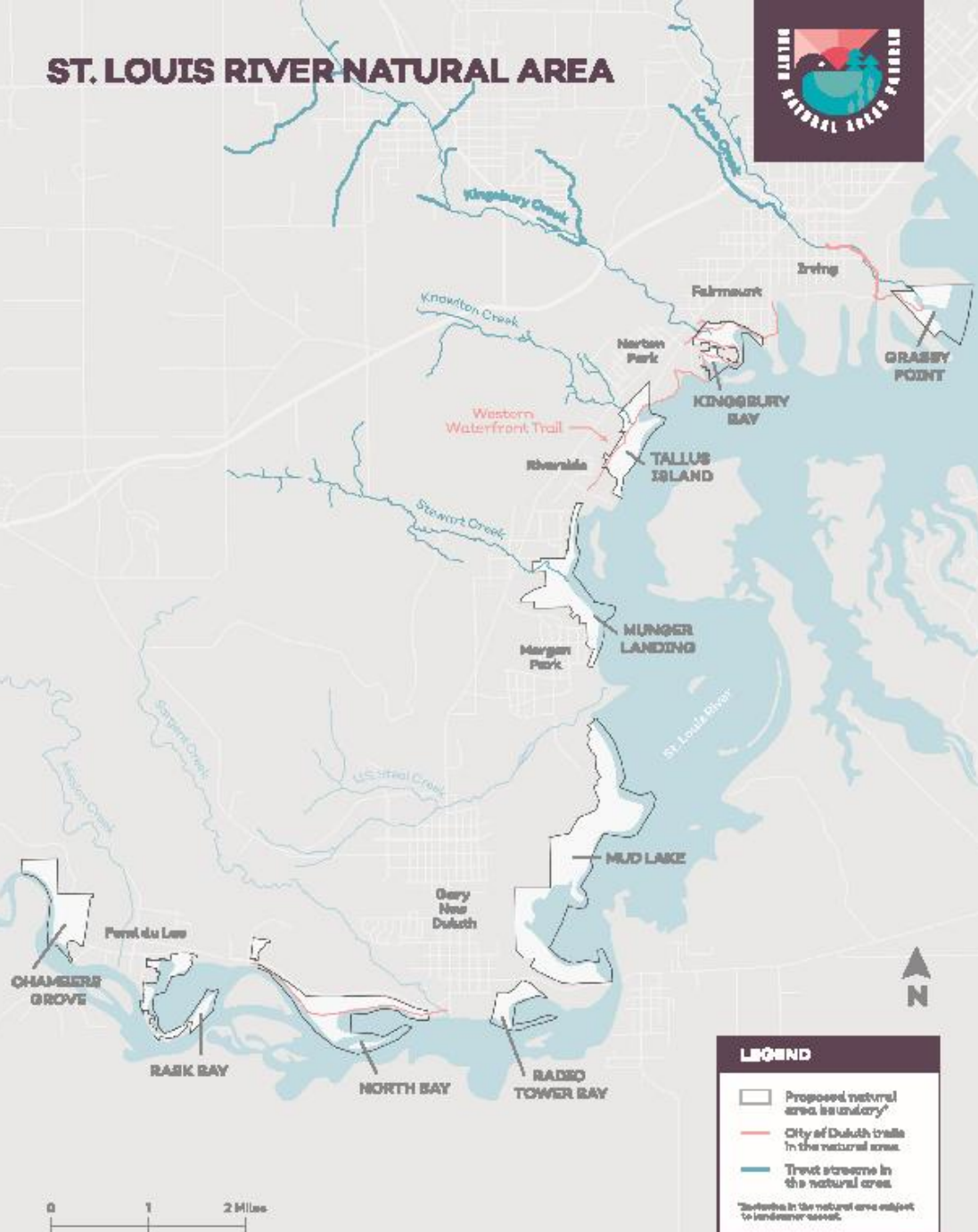
The **second phase** involves the development of a management plan for the subject property and the determination of the most appropriate protections to be imposed on it. The protections could range from **simple designation along with approval of a management plan, to conservation easement, to public ownership**. In addition, **zoning** of these areas could be established to encourage **very low density and low impact**, encouraging preservation.



Three Current Natural Areas Identified by DNAP

- The **Hartley** Natural Area consists of over 600 acres in northeast Duluth. Its wooded hills, fields, designated trout streams, and wetlands provide a variety of habitats that have a rich diversity of flora and fauna. The natural area is a community focus point for nature appreciation, education, preservation, and restoration.
- The **St. Louis River** Natural Area is comprised of nine places along the shoreline of the St. Louis River from Chambers Grove Park in the Fond du Lac neighborhood on the west, to Grassy Point in the Irving neighborhood on the east. The approximately 1,200 acres are home to a mix of 17 distinct native plant communities and over 150 species of birds. The natural area protects the waters of the St. Louis River estuary and provides river access for Duluth's residents and visitors.
- The **Magney-Snively** Natural Area is comprised of almost 1,800 acres in west Duluth. The natural area is a highly functional, viable ecosystem consisting of a diverse mosaic of wetlands, uplands, and rock outcrop communities. These characteristics, as well as its large size, make Magney-Snively of the highest ecological significance and quality to be found within an urban area.

ST. LOUIS RIVER NATURAL AREA



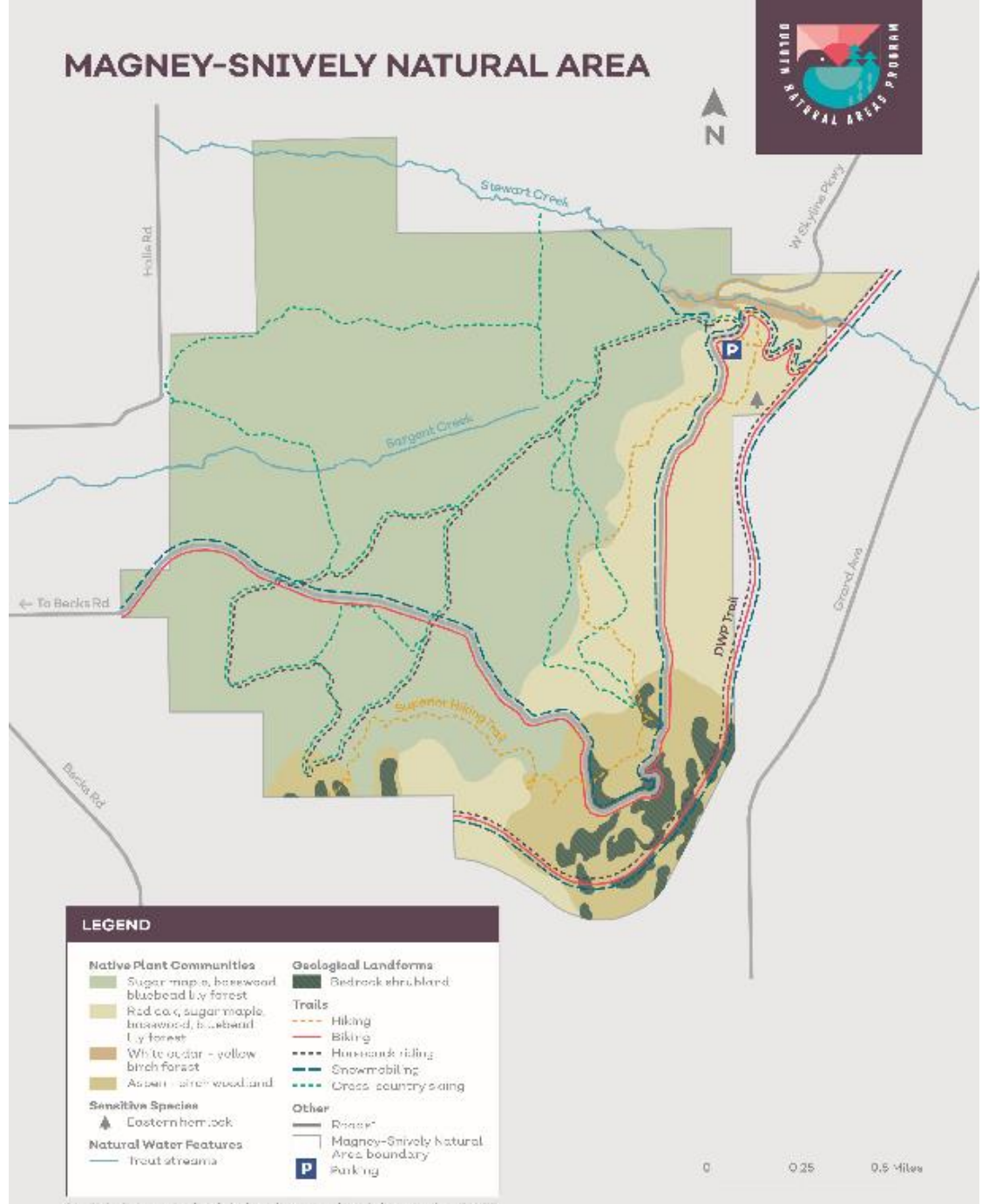
LEGEND

- Proposed natural area boundary*
- City of Duluth trails in the natural area.
- Trout streams in the natural area.

*Sections in the natural area subject to landowner consent.

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MAGNEY-SNIVELY NATURAL AREA



LEGEND

<p>Native Plant Communities</p> <ul style="list-style-type: none"> Sugar maple, basswood, bluebead lily forest Red oak, sugar maple, basswood, bluebead lily forest White oak - yellow birch forest Aspen - birch woodland <p>Sensitive Species</p> <ul style="list-style-type: none"> Eastern horned lark <p>Natural Water Features</p> <ul style="list-style-type: none"> Trout streams 	<p>Geological Landforms</p> <ul style="list-style-type: none"> Bedrock shrubland <p>Trails</p> <ul style="list-style-type: none"> Hiking Biking Horseback riding Snowmobiling Cross-country skiing <p>Other</p> <ul style="list-style-type: none"> Road Magney-Snively Natural Area boundary Parking
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*All color and symbols were used for field mapping by the Duluth Natural Areas Program. © 2014 DAP. Note: All natural areas within Duluth.

Management Plans

Management plans identify likely threats that may compromise the integrity of the plant communities, special plant populations, and geologic features of each management area. **Each plan is accompanied by short, general, suggested strategies for addressing the threat.** Common topics are invasive/exotic species, insect and disease outbreak, and dumping/littering.



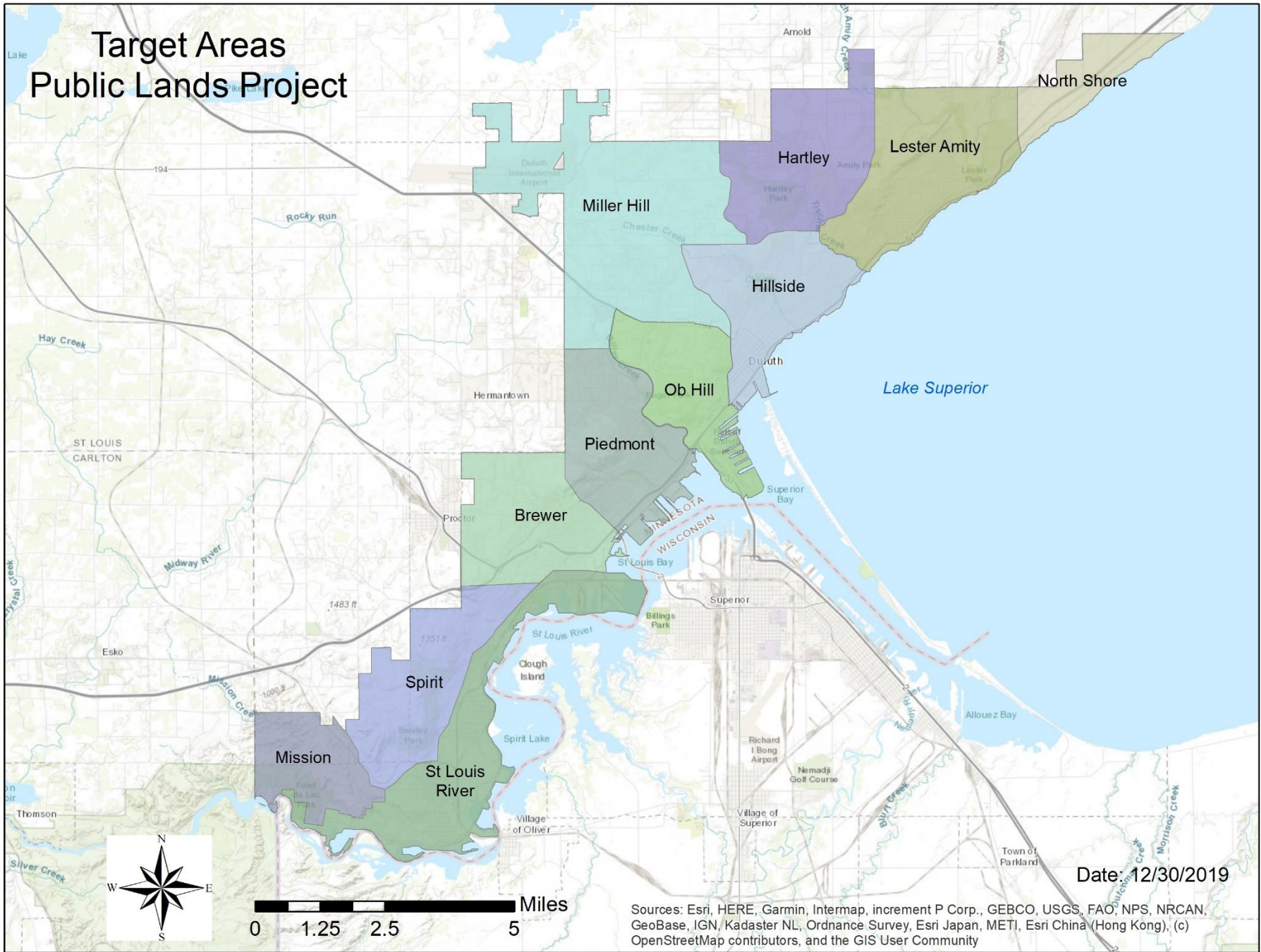
Land Acquisition/Open Space Preservation

-While the City of Duluth has 1.5% Sales/Use Tax, of Which Some is Intended to Support Parks/Open Space/Tourism, In the Current Budget No Additional Funds Are Established for Acquisition of DNAP Land.

-The City is working with St. Louis County and the State of Minnesota to leverage \$4,200,000 in equivalent grant funding (Potlatch) from the **Minnesota Outdoor Heritage Fund** to acquire tax forfeit land with the city limits. Much of this land will likely be with the Duluth Natural Areas Program management areas.



Target Areas Public Lands Project



Land Acquisition/Open Space Preservation

In addition, the City continues to work with programs, such as **GLRI** (Great Lakes Restoration Initiative) and the **St. Louis River Restoration Initiative** to help restore contaminated areas along the waterfront.

The **GLRI** has the aim of cleaning up the most polluted areas of the Great Lakes. More than 4,000 projects have focused on improving water quality, restoring habitats and combating invasive species.

The Minnesota Department of Natural Resources (DNR) is leading habitat restoration projects in the **St. Louis Estuary** intended to address harm to fish and wildlife populations, and restore fish and wildlife habitat.

The City is lucky to have many partners, such as the US Forest Service, EPA, DNR, USACE, Mn Land Trust, supporting its efforts to preserve open space and restore water quality and habitats.

Thank you for your time!

