Nomination of
Hartley Park
to the
Duluth Natural Areas Program

July 2018

Nominated by:

City of Duluth in cooperation with Hartley Nature Center

PREFACE

The Duluth Natural Areas Program (DNAP) was created as a city program to protect and preserve Duluth's natural heritage by using mechanisms to identify valued environmental properties owned by the city and/or other owners interested in participating by establishing a means to protect such properties from development or exploitation. The qualifications for lands to be incorporated into the DNAP and the various avenues to protect these special places are specified in the ordinance (Duluth City Code, Chapter 2, Article XXIX, Sect 2-152) and its complimentary guidelines.

Hartley is a prime candidate for the DNAP. Duluth's declared purpose for Hartley Nature Center is to *"foster and enhance educational and recreational activities aimed at promoting the preservation of, learning about, and understanding of the natural environment of the Duluth area."* Most of Hartley's city owned lands as well as some additional lands owned by the state and Hartley Nature Center meet the requirements of the DNAP because the lands are viable examples of significant native plant communities, natural water features and geologic landforms representative of the area and the land owners have expressed an interest in permanently protecting them.

This report provides the following information established in the guidelines for nominating Hartley lands to the DNAP:

- Nomination in Brief – background of the DNAP and the categories met for the nomination
- Nomination Area and Land Ownership – map of the land parcels incorporating the nomination area along with an ownership table
- Significant DNAP Scientific Criteria – assessment of the three environmental criteria (plants, water, geology) for which the lands are being nominated.

I. NOMINATION IN BRIEF

Hartley Nature Center has worked in partnership with the City of Duluth to complete this application for Hartley Park to be included in the Duluth Natural Area Program (DNAP) and requests submission to the Planning Commission and City Council for review under Duluth City Code, Chapter 2, Article XXIX, Sect 2-152. Hartley Park has areas of high natural quality and unique environmental value that should be preserved and managed for future generations. Furthermore, on-going restoration is enhancing Hartley as Duluth's premier nature-based park.

A natural-area program within an urban environment creates opportunities and challenges different than in remote settings. While most natural areas require management and restoration of ecological features, management and restoration in urban areas must deal with past and present human pressure. The land-use history at Hartley Park offers a range of opportunities to protect high-quality natural features as well as opportunities to restore degraded plant communities to healthier ecological condition. Furthermore, Hartley Park's urban setting offers an opportunity to demonstrate Duluth's commitment to permanent protection of an important and well-known park already perceived by residents as a natural area. Finally, the combination of history, location, and mission offers the ability to demonstrate and educate the public about ecological restoration and land management focused on natural features.

The Master Plan for Hartley Park approved by the City of Duluth on July 21, 2014 says that "*The Park is … a laboratory, classroom, and regional showcase for ecological restoration … learning about, creating and advocating for visionary restoration of Hartley's diverse landscapes and similar landscapes in northern Minnesota."* It says that "***The Park provides a unique, immersive nature experience****."* and that "*Preservation and restoration of natural resources is unusually important to the use of Hartley Park. Ecological restoration is not only essential to the extensive environmental education programming occurring in the Park, but it is integral to place-appropriate recreational use."* and *"to the unique purpose of Hartley as Duluth's premier nature-based park."*

The Hartley Park nomination includes approximately 620 acres in Duluth's east side. All of the lands nominated are parcels owned by the City of Duluth, State of Minnesota, and Hartley Nature Corporation: The area is one of the best and largest remaining examples of viable natural areas representative of the Duluth areas under the Significant Native Plant Communities, Natural Water Features, and Geological Landforms as described in the DNAP Guidelines under Article IV, Sections A, C, and E as follows:

Section A. Significant Native Plant Communities—Hartley Park is a viable and functional ecosystem within the City limits, including fourteen distinct, high quality occurrences of plant communities native to Duluth and a designation by MN DNR a site of Biodiversity Significance.

Section C. Natural Water Feature Area—Hartley Park includes the headwaters of both branches of Tischer Creek, a designated trout stream (MN Dept. of Natural Resources Class 2A cold water sport or commercial fish and associated aquatic life, and their habitats; i.e. the most sensitive surface waters) as well as numerous vernal pools, and unique wetlands.

Section E. Geological Landforms Area—Hartley Park contains outcrops from the Midcontinent Rift 1.1 billion years ago, as well as evidence from the Tettegouche Till Plain.

II. NOMINATION AREA AND LAND OWNERSHIP

The City of Duluth, in partnership with Hartley Nature Center, is nominating Hartley Park for inclusion in the Duluth Natural Areas Programs (DNAP). The "Declaration of Policy" of the City's lease agreement with Hartley Nature Center approved by the Duluth City Council on July 22, 2002 states that "*The City hereby declares its intention that the primary use of Hartley Park shall be that of a nature center and, as such, that Hartley Park be used as a facility to foster and enhance educational and recreational activities aimed at promoting the preservation of, learning about, and understanding of the natural environment of the Duluth area. In order to serve this purpose, the City hereby declares its intention to maintain ownership and control of Hartley Park as it presently exists, to develop, in cooperation with Lessee, a plan to manage Hartley Park with the intent of protecting its natural qualities….*". Management to restore and protect natural qualities throughout the park is central to the Hartley Park Master Plan approved by the City of Duluth in 2014. Park management will prevent fragmentation, foster ecological restoration and provide ecological resiliency to the diverse complex of plant communities.

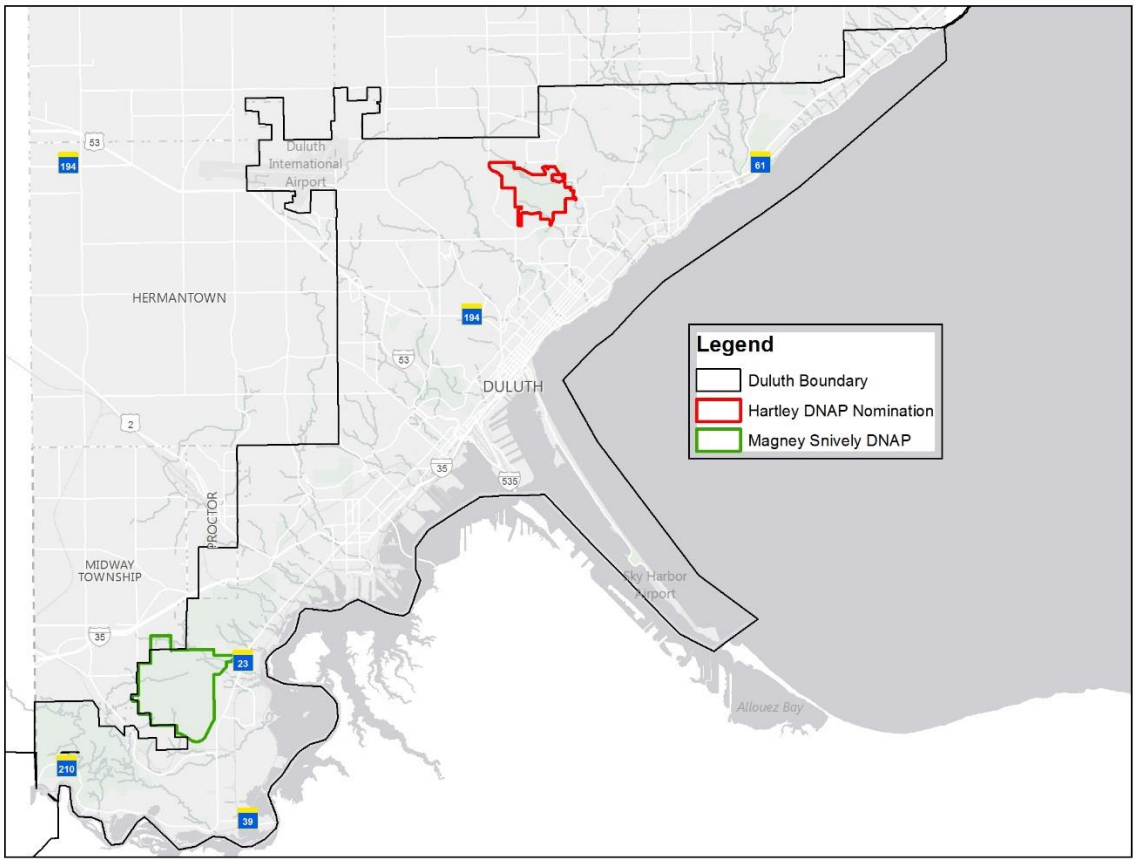

Figure 1: Hartley Park in proximity to the rest of the City of Duluth

The Hartley Park DNAP nomination includes approximately 620.41 acres in northeast Duluth. Figure 1 shows the proximity of Hartley Park in relation to the City of Duluth and the only currently existing DNAP area, Magney Snively, and figure 2 shows the proposed DNAP boundary for Hartley Park.

Figure 2 shows the proposed Hartley Park DNAP area in relation to the land ownership. Appendix A provides the parcel ownership table.

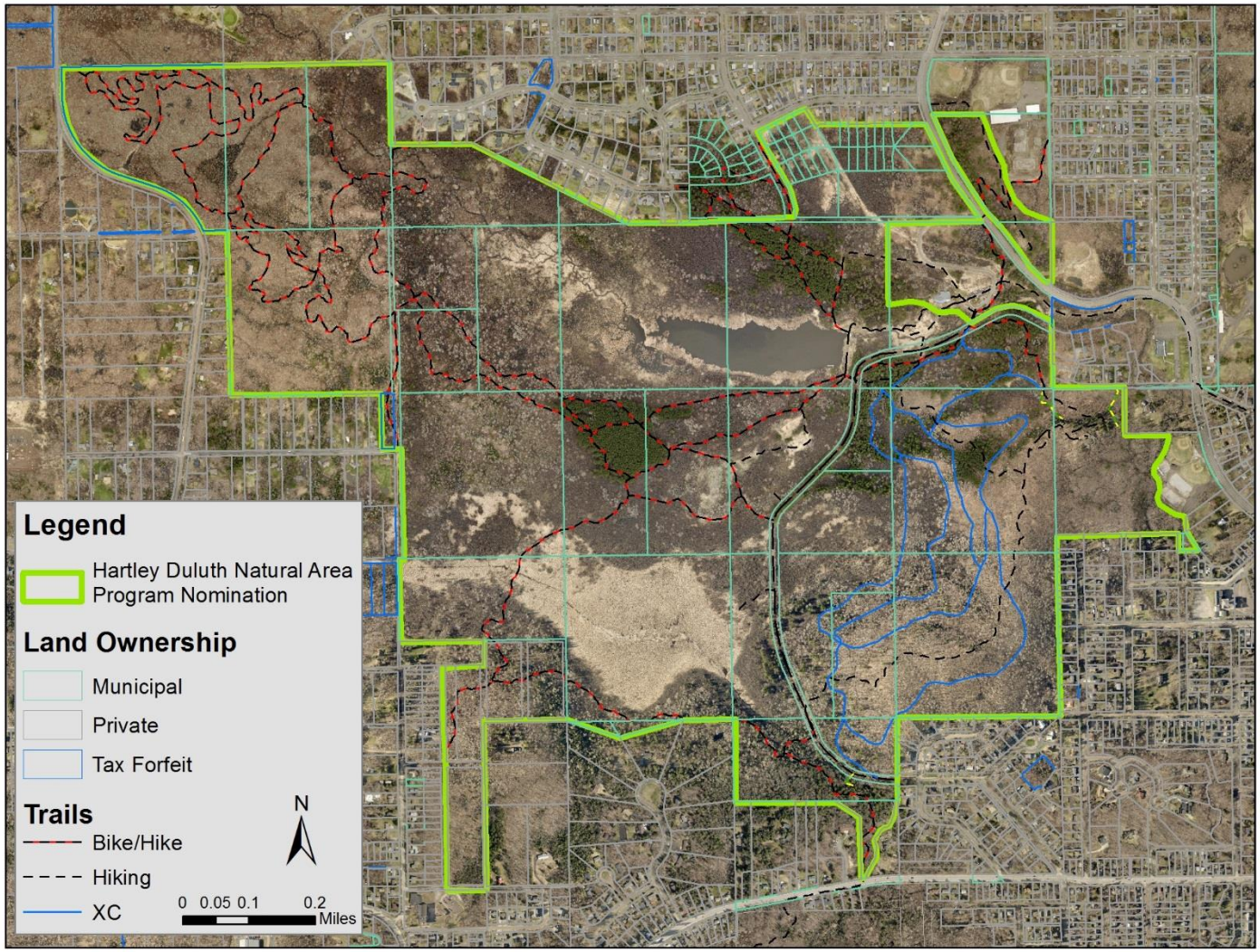

Figure 2: Hartley Park DNAP boundary

Hartley Park's wooded hills, fields, designated trout streams, pond, wetlands, and vernal pools provide ecological systems in a variety of habitats that include a rich diversity of flora and fauna. The park is identified with nature and is a community focus point for nature appreciation, education, preservation, and restoration.

The DNAP nominated area consists of approximately 573.51 acres owned by the City, 18.76 acres owned by Hartley Nature Corporation, and 28.14 acres owned by the State of Minnesota for a total of 620.41 acres (Figure 2).

III. SIGNIFICANT DNAP SCIENTIFIC CRITERIA

Hartley Park is one of the largest areas of natural communities in Duluth. The management plan will be used to prevent fragmentation, guide restoration efforts, and give ecological resiliency to the diverse complex of plant communities

Below is some background on the significant science criteria supporting this nomination.

Significant Native Plant Communities--14 high quality occurrences totaling 488 acres of different undisturbed and viable native plant communities to the Duluth area are present within Hartley Park (Figure 3). Appendix B provides the breakdown of native plant communities in acreage.

The Sugar Maple-Basswood-(Bluebead Lily) MHn56 forest type is relatively rare in the Tettegouche Till Plain, and its presence increases Hartley's ecological significance. The predominant natural vegetation of the Tettegouche Till Plain is northern hardwood forest of sugar maple and red oak (MHn56), like the 171.4 acres found at Hartley. In Duluth, most of this forest has been removed or converted to aspen forest. This is one of the largest remaining remnants of northern hardwoods in Duluth (the Magney Snively Forest is the largest remnant).

Adding to Hartley's significance is the large wet meadow (WMn82b) and willow swamp (WMn1a) complex. This is the largest wet meadow in Duluth within the Tettegouche Till Plain. Outside the Tettegouche Till Plain, only a few wet meadows along the St. Louis River are larger.

Hartley Park is also home to a group of eastern white pine trees that have the highest natural resistance to white pine blister rust of any trees ever found in Minnesota. Cuttings collected by science staff from the University of Minnesota Cloquet Forestry Center and the United State Forest Service from several trees in this stand have been grafted for research to enhance propagation of blister rust resistance into Minnesota forests. The protection of this unique stand through a DNAP designation is a high priority, as this small population provides the opportunity to re-establish this ecologically important species.

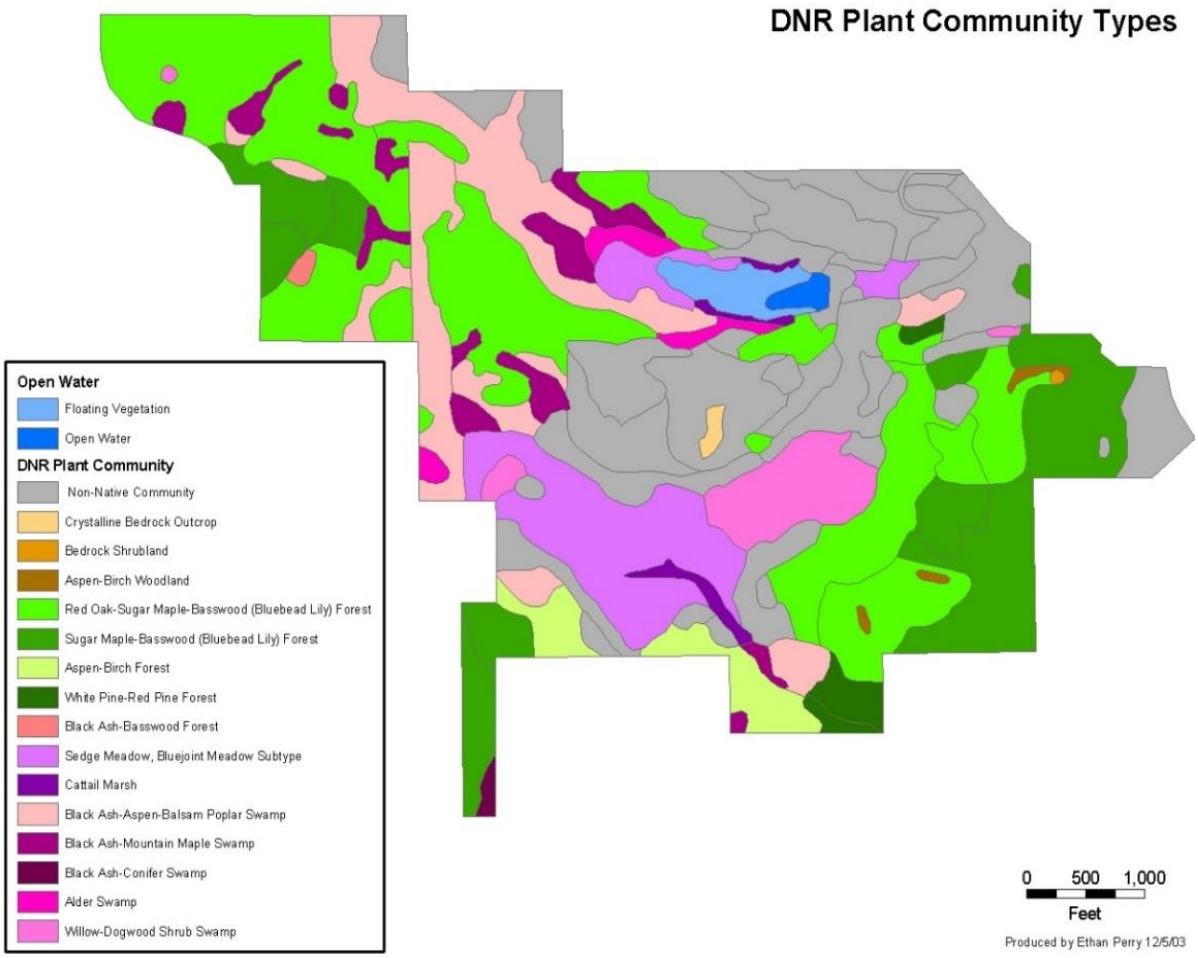

Figure 3 – MDNR Plant Community Types

The diversity of community types (two types of northern hardwood forest, three types of lowland forest, pine forest, wet meadow, willow swamp, etc.) is in and of itself significant. Further, 117 acres of BC-ranked plant communities (Figure 4) is considered significant for Duluth where all places have been impacted to some degree by humans and most places have been heavily impacted. These remnants stand among the best of natural vegetation in Duluth. Only the Magney-Snively and Park Point forests are assessed thus far as higher quality and the size of the wet meadow at Hartley further increases the significance. Using guidelines refined since the 2004 native plant community mapping and condition ranking, many of the previously unranked communities would now likely receive a D or CD ranking and some of the communities ranked D and CD would likely be ranked moderately higher. In addition, recent restoration projects focused on addressing non-native species and the lack of diversity in planted conifer stands to enhance the condition of lower ranked communities and is not represented in this mapping effort, nor are pending efforts to create new pollinator meadows.

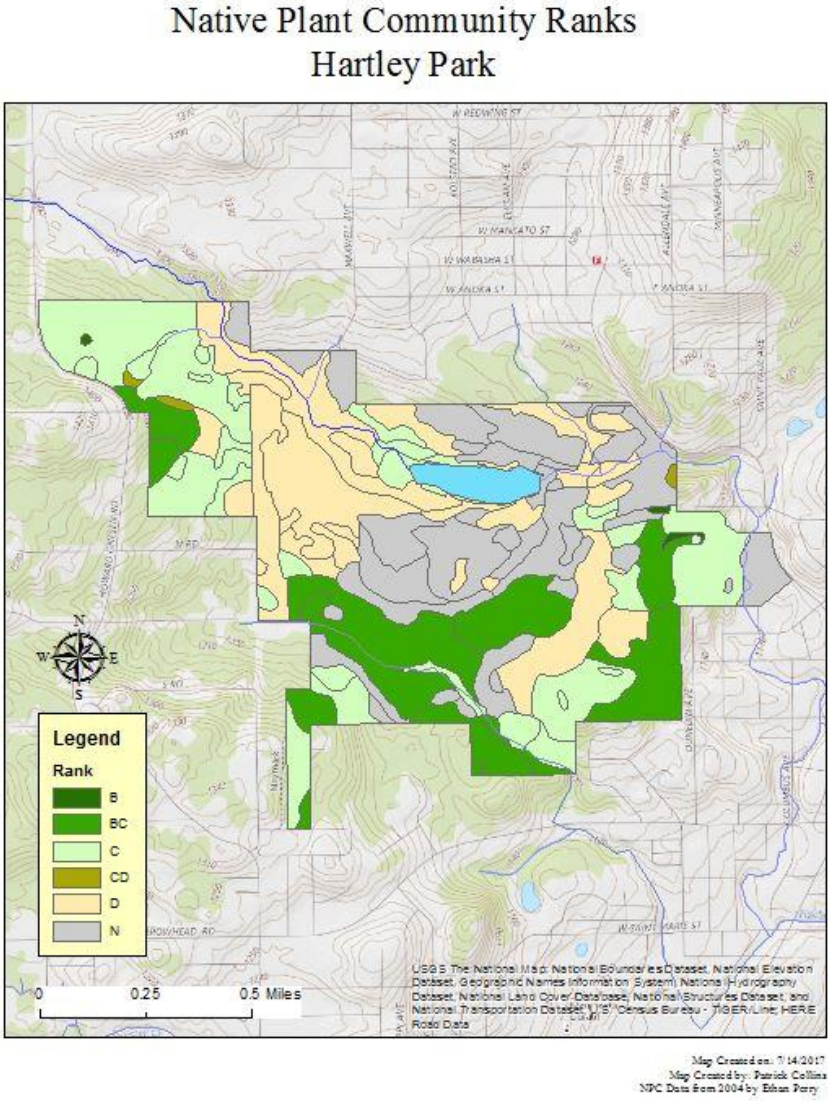

Figure 4 – Plant Diversity – Quality Rank

Most of the park will serve as a managed buffer for natural processes of native plant communities, and ongoing restoration will continue to improve the condition of those communities. In addition, the northwest of Hartley Park, across Howard Gnesen Road, there are natural areas linked with only a few intervening roads to the natural communities surrounding Wild Rice Lake. Connectivity to these natural areas may explain why animals such as otters and black bears frequent the habitat at Hartley Park.

Natural Water Feature Area—Hartley Park forms the wet meadow/shrub swamp headwaters of two branches of the designated cold-water trout stream, Tischer Creek. Coldwater streams are very sensitive to human caused disturbance, and therefore, are given the highest level of protection by the state. The Tischer Creek watershed (Figure 5) is one of Duluth's 16 named trout stream watersheds that are grouped together as a potential management unit for the purpose of implementing the state's new watershed restoration and protection strategy (WRAPS). Protection of the park's streams and other aquatic resources is most easily and inexpensively accomplished by:

1. Protecting wetlands which provide water storage that reduces storm flows, streambank erosion, and downstream flooding (Figure 6);
2. Protecting and revegetating the stream and pond riparian zone; and,
3. Educating and informing the park's user groups.

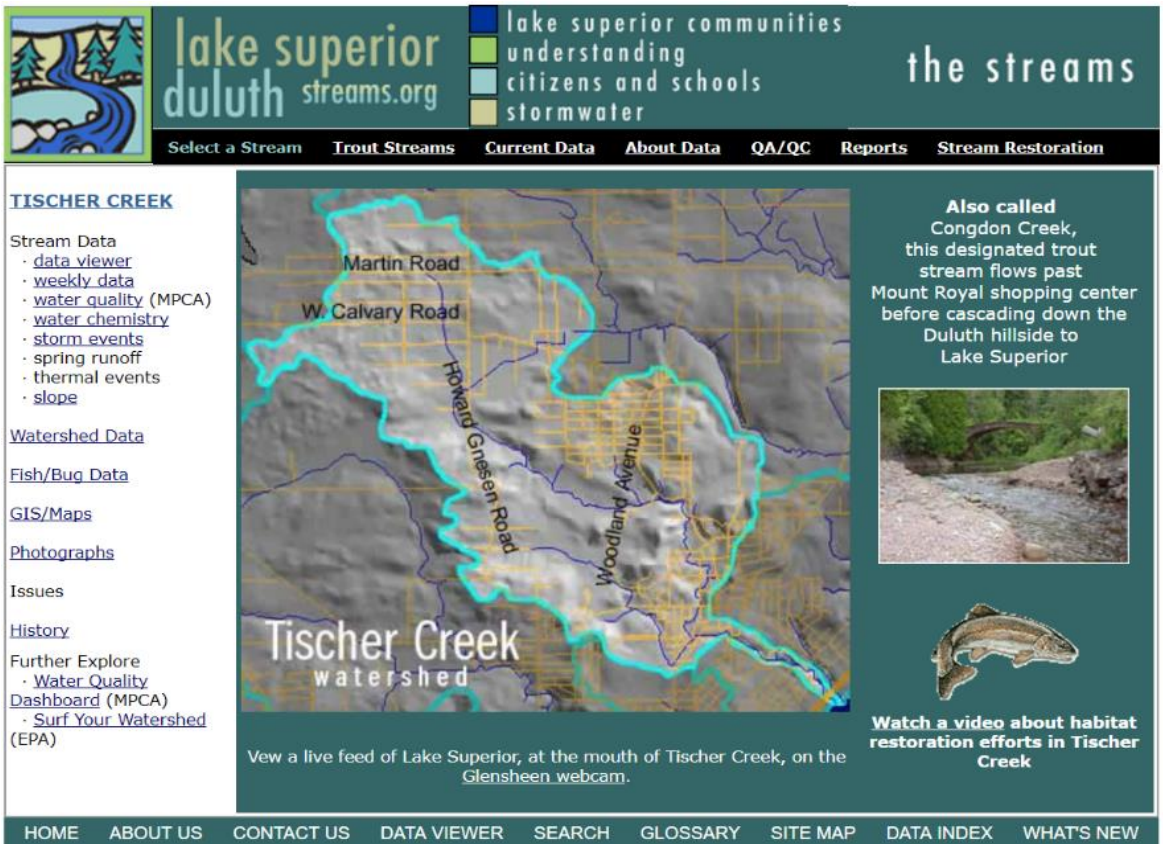

Figure 5 – Tischer Creek Watershed – Lake Superior Streams

Further, protecting the Tischer Creek ecosystem also serves to help protect the nearshore waters of Lake Superior, since it discharges into the lake at the Glensheen Mansion property. Headwater wetlands, such as those present in Hartley Park, are a critical component of protecting cold-water streams and the important habitat they provide. Protection of these natural wetland areas provides base flow to the streams during dry conditions, maintains the input of cool water to prevent overheating, and reduces peak flow events that cause flooding and downstream erosion. Additionally, because Lake Superior is extremely phosphorus deficient in regard to algal growth, protection of Hartley Park's natural features, also known as "green infrastructure" is important to minimize the loading of excess phosphorus to the lake.

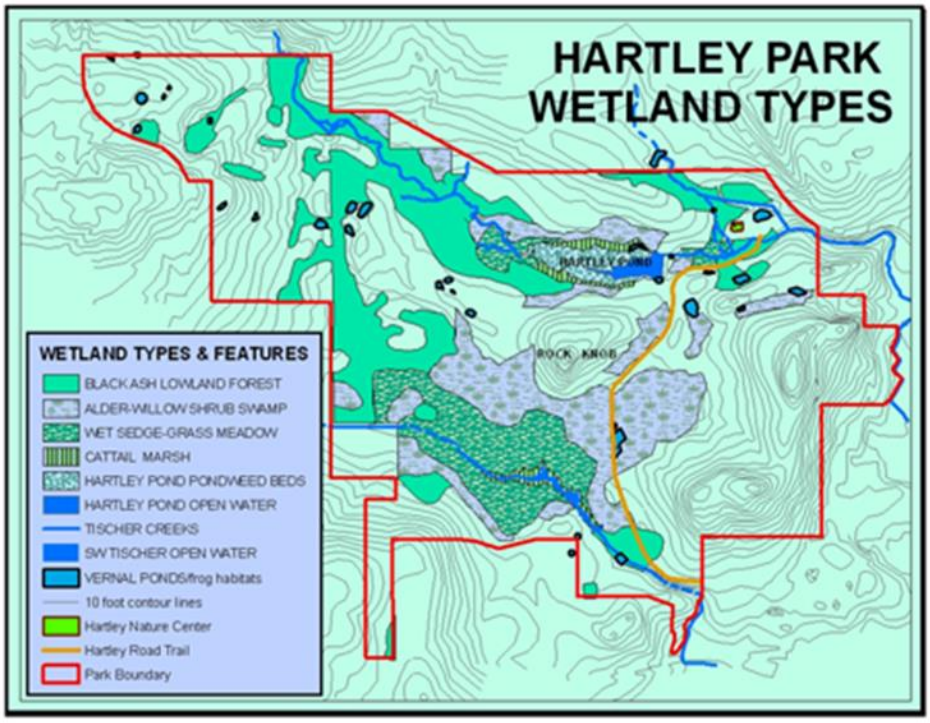

Figure 6: Wetland types within Hartley Park contribute to the health of Tischer Creek and retain water.

Vernal pools are small seasonally flooded wetlands that provide vital habitat for many native amphibians (e.g, blue-spotted salamanders, spring peepers, chorus frogs, gray treefrogs, wood frogs) and aquatic insects that require fish-free wetlands to survive. Plants and animals supported by vernal pools are the primary food base for terrestrial wildlife in northern forests (i.e., reptiles, small mammals, etc.). Research estimates 37,000 vernal pools may exist in the 740,000 acres of Minnesota's Lake Superior coastal zone (5 pools per 100 acres); however, many are unmapped due to their small size and ephemeral nature. Scientists at NRRI-UMD completed a project funded by Minnesota's Lake Superior Coastal Program (administered by MNDNR): "*Evaluating vital, small forested wetlands.*" The goal was to map potential vernal pool locations in the MN coastal zone, field verify vernal pool locations, and conduct public workshops to raise awareness about the value of vernal pools and recruit citizen scientists/volunteers to locate and monitor vernal pools throughout the MN Lake Superior coastal zone. The work included vernal pool surveys in National Forest, State Parks, and other public properties. In Hartley Park, the results show multiple vernal pools (Figure 7) that provide breeding habitat for a suite of northern amphibian species including the following observed in 2014: wood frog, northern leopard frog, spring peeper, western chorus frog, gray treefrog, mink frog, and blue-spotted salamander. All of these species require wetlands, such as vernal pools, for breeding, but also need upland terrestrial habitat for foraging, migration, and/or overwintering. Hartley Park is unique because it includes the breeding habitat for these amphibian species and the upland terrestrial habitat within an intact forested area, providing a safer environment for movement between habitats and migration (e.g., no roads to cross).

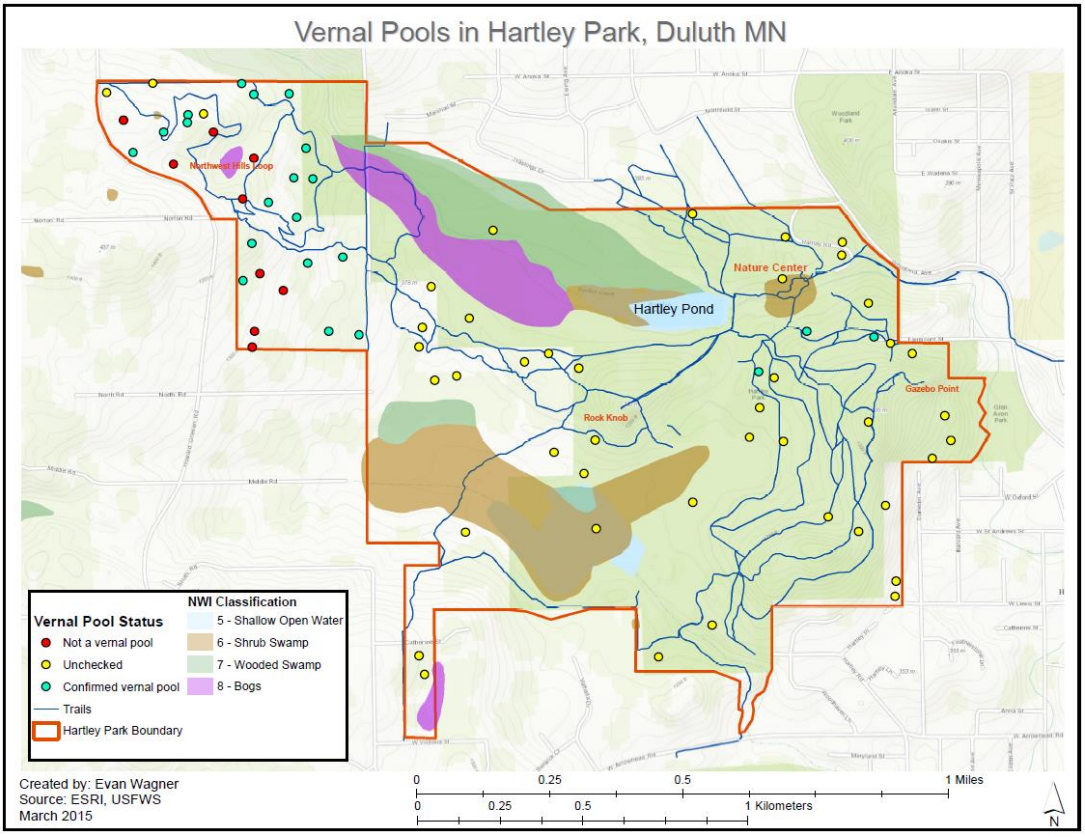

Figure 7 – Potential (yellow) and Verified (green) vernal pools in Hartley Park

<u>Geologic Landforms Area</u>—Tettegouche Till Plain - The Tettegouche Till Plain, a band of rolling topography at the crest of the slope overlooking Lake Superior and the St. Louis River, forms the backbone of Duluth. Hartley Park contains the substantially undisturbed geological landform of the Tettegouche Till Plain, illustrating the northwest to southeast flutes formed by the glacier (Figure 8).

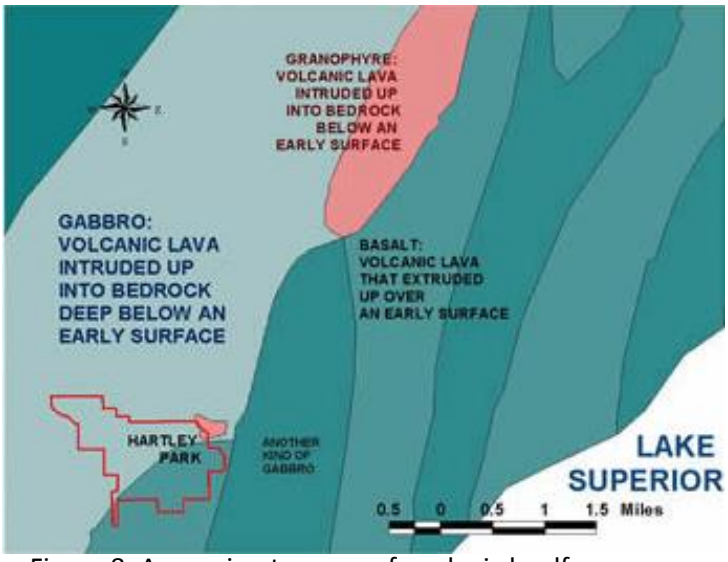

Figure 8: Approximate areas of geologic landforms

The evidence of geologic history within Hartley Park exemplifies the Midcontinent Rift, including volcanism, intrusion, and crystallization of plutonic rocks such as the Duluth Gabbro Complex, and deposition of sediments, about 1.1 billion years ago. This was followed by the Tettegouche Till Plain glaciation period that sculpted the landscape of Hartley.

APPENDIX A: - Table of Parcels/Owners

Parcel #	Owner	Acres
010-2710-00330	53.5% of City of Duluth Parcel (36.19 acres)	19.37
010-3470-00250	State of Minnesota C278 L35	1.02
010-2710-00350	City of Duluth	38.83
010-2710-00525	City of Duluth	20.08
010-2710-00526	City of Duluth	20.07
010-2710-00540	State of Minnesota C278 L35 (note: preliminary title review shows the City of Duluth as owner – June 2018)	27.12
010-2710-00560	City of Duluth	39.14
010-2710-00572	City of Duluth	1.84
010-2710-00585	City of Duluth	17.30
010-2710-00595	City of Duluth	20.12
010-2710-00590	City of Duluth	9.6
010-2710-00596	City of Duluth	10.07
010-2710-00600	City of Duluth	40.25
010-2710-02820	City of Duluth	20.06
010-2710-02825	City of Duluth	20.07
010-2710-02830	City of Duluth	39.11
010-2710-02840	City of Duluth	20.04
010-2710-02860	City of Duluth	40.13
010-2710-03170	City of Duluth	39.09
010-2710-03180	City of Duluth	24.68
010-2710-03185	City of Duluth	12.30
010-2710-03190	City of Duluth	25.88
010-2710-03195	City of Duluth	11.52
010-2710-03200	City of Duluth	39.22
010-2710-03210	City of Duluth	18.40
010-1560-00740	HNC	3.95
010-1560-00500	HNC	3.92
010-3900-00010	HNC	3.44
010-1560-00330	HNC	1.46
010-1560-01360	HNC	5.99
010-2710-03245	City of Duluth	2.61
010-2116-00190	City of Duluth	0.24
010-2116-00200	City of Duluth	0.24

010-2116-00210	City of Duluth	0.25
010-2116-00220	City of Duluth	0.26
010-2116-00230	City of Duluth	0.41
010-2116-00240	City of Duluth	0.53
010-2116-00250	City of Duluth	0.27
010-2116-00260	City of Duluth	0.28
010-2116-00270	City of Duluth	0.29
010-2116-00280	City of Duluth	0.32
010-2116-00290	City of Duluth	0.33
010-2116-00300	City of Duluth	0.30
010-2116-00310	City of Duluth	0.32
010-2116-00320	City of Duluth	0.34
010-2116-00330	City of Duluth	0.35
010-2116-00340	City of Duluth	0.48
010-2116-00350	City of Duluth	2.71
010-2116-00480	City of Duluth	0.90
010-2116-00490	City of Duluth	0.37
010-2116-00500	City of Duluth	0.30
010-2116-00510	City of Duluth	0.29
010-2116-00520	City of Duluth	0.29
010-2116-00530	City of Duluth	0.29
010-2116-00540	City of Duluth	0.29
010-2116-00550	City of Duluth	0.29
010-2116-00560	City of Duluth	0.59
010-2116-00570	City of Duluth	0.50
010-2116-00580	City of Duluth	0.31
010-2116-00590	City of Duluth	0.31
010-2116-00600	City of Duluth	0.31
010-2116-00610	City of Duluth	0.31
010-2116-00620	City of Duluth	0.32
010-2116-00630	City of Duluth	0.41
010-2116-00640	City of Duluth	1.30
010-2116-00650	City of Duluth	8.43
	Total Acres:	**620.41**

APPENDIX B: - DNAP Plant Communities Found in Hartley Park

DNR Code	Plant Community Type	Acreage in Hartley Park
WMn1a	northern sedge meadow	52
CPn79a	northern alder swamp	53
WMn82b	willow-dogwood shrub swamp	23.9
MHn62b	wet-mesic black ash/sugar maple forest	1.1
WFn31c	very wet black ash swamp	1.3
WFn71c	wet black ash swamp	23.2
CTn1b	northern dry circumneutral cliff	0.3
LSn5a	lake superior dry bedrock shore	1.9
ROn1a	northern rock outcrop	1.3
FDn3b	dry-mesic red pine-white pine woodland	7.6
FDn4c	mesic aspen-birch-fir forest	16.3
MHn5b	northern rich maple-basswood forest	254.3
MHn61a	mesic white spruce-pine/paper birch forest	70
	Total Acres:	506.2