

Environmental Assessment Worksheet (EAW)

Hartley Park Phase 1 Implementation of Master Plan

Prepared for
City of Duluth

August 2015



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Environmental Assessment Worksheet

July 2013 Version

This Environmental Assessment Worksheet (EAW) form and EAW Guidelines are available at the Environmental Quality Board's website at:

<http://www.eqb.state.mn.us/EnvRevGuidanceDocuments.htm>. The EAW form provides information about a project that may have the potential for significant environmental effects. The EAW Guidelines provide additional detail and resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item, or can be addresses collectively under EAW Item 19.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. Project Title

Hartley Park Phase 1 Improvements, Duluth, Minnesota

2. Proposer

City of Duluth, Minnesota

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3. RGU

City of Duluth, Minnesota

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4. Reason for EAW Preparation

EIS scoping Mandatory EAW Citizen petition **RGU discretion** Proposer volunteered

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s): The City of Duluth has opted to prepare a discretionary EAW in response to a citizen's request. The proposed improvements do not require a Mandatory EAW per Minn. Rules 4410.4300.

5. Project Location

County: St. Louis County

City/Township: City of Duluth. The Park is in T50N R14W sections 2, 3, 10, and 11 as displayed in Table 5-1 and shown on Figure 1. Figure 2 shows the diverse topography within the Park using a Digital Elevation Model (DEM) on an aerial map.

Table 5-1 40 Acre Parcels Crossed by Proposed Improvements

Township	Range	Section	40 Acre Parcels
50	14	2	S1/2SW, NESW
50	14	3	NWSW, E1/2 SW, SWSE
50	14	10	N1/2NE, SWNE
50	14	11	NWNE, NW1/4, NWSW

6. Description

- a. Provide a brief project summary to be published in the *EQB Monitor*, (approximately 50 words).

Implementation of the 2014 Hartley Park Master Plan Phase 1 improvement projects include: forest management of red pine and aspen stands, invasive vegetation management, new trail construction to repair and realign existing trails, and parking improvements at three park entrance locations and the main Hartley Nature Center entrance. The proposed project would be initiated when all permits and approvals are received.

- b. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes, 2) modifications to existing equipment or industrial processes, 3) significant demolition, removal or remodeling of existing structures, and 4) timing and duration of construction activities.

Site History

Hartley Park's history dates back to the late 1800's, when Guilford Hartley purchased the land along Woodland Avenue for his Allandale Farm between 1890 and 1911. In 1913, Hartley Road and Hartley Pond were constructed. Mr. Hartley passed away in 1922 and in 1931 the fields were abandoned. During the 1940's, the fields were used for Victory Gardens and for pasturing of cattle. School and youth groups planted pines in several locations during this decade. In 1941, the Hartley land was cleared of buildings and became a City of Duluth park.

During the 1960's, an asphalt Soap Box Derby track was constructed onsite and used until interest declined. In the 1970's, the first ski trails were constructed within the Park. In 1987, Hartley Nature Center, Inc. (HNC) formed and began educational programs serving area schools in cooperation with the City. In 1997, HNC received a donation of 22 acres adjacent to the Park (See Figure 2). In 2003, the new Hartley Nature Center Building officially opened at the end of Hartley Road, marking a new area of stewardship and sustainability for the Park.

In 2010, the City of Duluth worked with the community to create a Parks and Recreation Master Plan for the entire City. This plan established a blueprint to achieve an economically sustainable park and recreation system. The Guiding Principles and the action plans of this Master Plan set a course to: reduce operating and capital costs, enhance efficiency, improve parks, strengthen partnerships, connect the city with trails, increase access to nature, increase and stabilize funding, create equitable access to healthy recreation, and enhance stewardship. Objectives in the Parks Master Plan emphasize management and improvement of access to existing natural resource-oriented parks for outdoor recreation (hiking, biking, cross country skiing, horseback riding, birding, rock climbing, boating, snowmobiling, etc.). In 2013 and 2014 the City hosted six meetings and three open houses to facilitate a dialogue with the public and collect feedback on the Hartley Park Master Plan (HPMP). In addition to these gatherings, the public had the opportunity to comment online. In 2014, the HPMP was approved by the City Council. The proposed project improvements are part of the approved Hartley Park Master Plan.

Project Description

This EAW summarizes and evaluates the proposed project listed in the approved HPMP that were funded as part of the implementation of the HPMP Phase 1. The Phase 1 proposed improvements include two main components within Hartley Park, which are shown in the attached Figures and outlined and described in further detail below:

- i. Silvicultural Resource Improvements
 - Implement selective thinning (forest management) of the red pine stands
 - Harvest portion of pine stands infected with bark beetles
 - Create openings in aspen stands
 - Manage invasive vegetation (buckthorn and other invasive species) in the Park
- ii. Improvements to Park Access

-
- Trail Improvements / Maintenance to existing areas
 - Realign and re-grade existing natural surface multi-use trail (Nature Center to Hartley Pond) to provide Americans with Disabilities Act (ADA) compliant access
 - Restore Old Hartley Road Trail to also provide ADA compliant access
 - Relocation and realignment of multi-use trail segments primarily to correct unsustainable alignments
 - New Trail Construction
 - Add auxiliary trail with pier off Old Hartley Road Trail into wet meadow for wetland education of student visitors and also provide ADA compliant access
 - Gazebo Point Overlook Trail Construction to correct unsustainable alignment
 - Connect the Duluth Traverse Trail to Hartley Park
 - Expand and improve interpretive opportunities
 - Expand and revise ski trail segments to correct unsustainable alignments
 - Parking Improvements – create approximately 46 new parking spaces to reduce conflicts with residential on-street parking, city maintenance and emergency vehicles.
 - Hartley Road parking area (3 parking spaces)
 - North Road parking area (2 parking spaces)
 - Fairmont Street parking area (1 parking spaces)
 - Hartley Nature Center Parking (40 parking spaces)

Silvicultural Resource Improvements

Approximately ten years ago, Hartley Nature Center thinned the red pine stand in the enclosure behind the Hartley Nature Center in Hartley Park (Park). Ten years later, the pines remaining after the thinning are noticeably larger and more vigorous than those pines left untouched, located on the same hillside with the same sun and weather exposure, north of Hartley Pond. All of these pines were planted at the same time during the 1940's. In addition, previous thinning of the pines allowed for planting of native species after buckthorn was removed.

The proposed Silvicultural Improvements Plan for the Forest Management areas (shown in Figure 3), was prepared for the City by Janet Bernu, in accordance with standard practices of the Society of American Foresters' (SAF) and the proposed work is consistent with Minnesota Department of Natural Resources (DNR) silvicultural practices. Janet Bernu is a SAF Certified Forester. This Silvicultural Improvements Plan was reviewed and approved by the City Forester. Information on SAF standard practices is available at: <https://safnet.org/index.cfm>. Information on Minnesota DNR Silvicultural standard practices can be found at: http://www.dnr.state.mn.us/forestry/ecs_silv/silvics.html.

In conifer stands, periodic stand thinnings are recommended in order to enhance forest health, tree growth potential, and wildlife habitat. Without periodic thinnings these conifer stands will become more crowded, resulting in increased competition and subsequent slower growth rates.

The proposed work will remove approximately one quarter to one third of the four 10-acre red pine stands in each thinning. The work will consider overall spacing, form, and health of the surrounding trees when selecting trees to remove or leave. In stands which have never been thinned, a row or two of trees will need to be removed to provide access for the harvesting equipment and avoid damage to the remaining trees.

Periodic thinnings enhance forest health by creating better tree spacing; reducing competition for sunlight, water, and soil nutrients within the stand. Less competition results in enhanced tree growth and encourages plant layering underneath the stand canopy. Most pine plantations tend to be monocultures and provide wildlife habitat for a very limited number of species. The proposed thinning will open the forest canopy some and provide additional plant layering that is important to enhance wildlife habitat by increasing plant diversity and providing food and nesting cover in essential diverse forest layers. Periodically thinning red/Norway pine stands will reduce tree stress; stressed red pine trees can lead to bark beetle infestations which can decimate red pine stands.

One of the pine stands has a small infestation of pine bark beetles. These standing trees need to be removed so that the infestation does not spread to the healthy trees in the Park. Care will be taken during the thinning operations to address and remove this potential threat.

In the Park aspen stands, the proposed action will include 10 small, scattered, strategically placed 1/2 acre selection harvests (totaling 5 acres) to enhance woodland and wildlife habitat diversity. Figure 3 shows the approximate plan locations of these openings, which will be spread evenly throughout the aspen forest. Actual locations will be adjusted when the trees are marked for cutting and will vary slightly to avoid conflicts with trails and trail uses. These small openings will decrease aspen reproduction and encourage the growth of other more shade tolerant tree species and also increase diversity of tree and shrub age classes. This will provide a variety of food and cover for numerous wildlife species and improve the overall health of the stand and the forest.

The harvested wood is proposed to be sold in the market. Waste wood (infested wood and slash) will be chipped to be used for fuel. The proposed forest improvement plan proposes to remove the following species for pulp, bolts or logs:

- Red Pine 595 cords
- Jack Pine 140 cords
- Spruce 100 cords
- Aspen/Birch 165 cords

Truck access to remove thinned vegetation will occur from the existing Old Hartley Road via the Nature Center Entrance to avoid disturbance to the neighborhood streets. The timber will be cut and hauled to specified landing areas using equipment with low pressure tires or tracks to minimize soil disturbance via Old Hartley Road, the Tunnel Trail and the old Soap Box Derby

Road. Following removal of the wood, these temporary access routes will be closed and restored back to native vegetation or trail surface. Typical seed mixes are found at http://www.bwsr.state.mn.us/native_vegetation/. Stumps will be cut to a height of 3 inches or less. All forest management activities will occur in accordance with permit requirements and Minnesota DNR best management practices (BMPs) for erosion and stabilization will be implemented to protect the Park and its environment. The project will comply with setback requirements for trout streams.

Buckthorn and Invasive Species Management

Woodland diversity is essential for a healthy forest. A diversified forest, with a variety of tree and shrub species and sizes, will enhance wildlife habitat and encourage numerous wildlife species year round. This forest diversity provides a variety of habitats for wildlife and for Park visitors to experience. Near the pines, buckthorn is the dominant understory plant, competing for resources with the pines. Buckthorn is found throughout the Park but is a significant threat on approximately 88 acres of the Park. Figure 4 shows the prevalence of buckthorn within the Park.

The City of Duluth has an active program using volunteers and contractors to control buckthorn and other invasive vegetation in the Park. Management measures include: complete cutting of stems and selective treatments with an application of Glyphosate or Garlon herbicides. Trained staff and contractors apply minimal amounts of herbicide to target only the buckthorn through cut surface or basal bark treatments to effectively control the vegetation from resprouting. These methods help prevent injury to non-target vegetation. Buckthorn has persistent leaves that remain into October after other species lose their leaves. This makes it easy to identify and treat thereby limiting herbicide application only to target species. Other invasive vegetation species that will be managed in the Park include Japanese knotweed, reed-canary grass, common tansy and purple loosestrife. Specific plans to address these species are not yet developed.

Trails

There are approximately 14.3 miles of trails currently in use within Hartley Park, adjacent to other City land or on land adjacent to the Park owned by the Hartley Nature Center Corporation. These 14.3 miles are comprised of 2.4 miles of existing hiking, 8.5 miles of multi-use trails, and 3.4 miles of Nordic ski trails.

Approximately 6.3 miles of new trails will be added for this proposed project. This will include 0.3 miles of new hiking, 5.4 miles of new multi-use trails, and 0.6 miles of Nordic ski trails. Part of the multi-use trail changes will provide a revised ADA compliant access trail from the Nature Center to Hartley Pond, aggregate surfacing repairs and boardwalk replacements to the Old Hartley Road trail, and a new educational boardwalk (200 feet) that traverses into the wet meadow.

Some of the new added miles will replace trails that were not constructed in accordance with International Mountain Bicycle Association (IMBA) standards, such as construction straight down

slopes, or in wetlands and other unsustainable areas. Therefore, the proposed project will remove approximately 3.7 miles of trails that are considered unsustainable. The trails to be closed include approximately 0.4 miles of hiking trails, 2.5 miles of multi-use trails, and 0.8 miles of ski trails. These trails will be closed and each area will be restored to the surrounding natural habitat. After closing the trails in the unsustainable areas, there will be a net increase of 2.6 miles of trails as shown in Table 6-1 below.

Table 6-1 Miles of Existing and Proposed Hartley Park/Hartley Nature Center Trails

Trail Type	Existing Miles	To Be Removed Miles	To Be Added Miles	Total Miles	Net Change Miles
Hiking	2.4	0.4	0.3	2.3	-0.1
Multi-use	8.5	2.5	5.4	11.4	2.9
Nordic ski	3.4	0.8	0.6	3.2	-0.2
Total	14.3	3.7	6.3	16.9	2.6

Hiking and Nordic Ski Trails

Hiking and Nordic ski trails will be constructed in accordance with Minnesota DNR Trails and Waterways *"Trail Planning, Design and Development Guidelines"*. Examples of DNR Typical Trail Designs are attached in Appendix B of this document. Minnesota DNR Trails and Waterways guidelines are designed to provide sustainable trail construction to avoid and minimize impacts to the environment while also minimizing maintenance. Examples of DNR Sustainable Trailbuilding Guidelines to be implemented in the design and construction of the proposed project include:

- Avoid Sensitive Ecological Areas and Critical Habitat – Trails will be placed to avoid habitat for endangered or threatened species; wetlands and/or streams will be crossed on boardwalks or existing bridges to minimize impacts to these resources. New trails will avoid steep slopes and hydric soils that are easily rutted.
- Develop Trails in Areas Already Influenced by Human Activity – Trail alignments will connect people with the Park’s resources while connecting people with nature. New trails will correct existing locations where trail alignments were not constructed in accordance with International Mountain Bicycle Association (IMBA) standards such as construction straight down slopes, or in wetlands and other unsustainable areas.
- Provide Buffers to Avoid Sensitive Ecological and Hydrological Systems - Buffers and BMPs will be used to protect streams and wetlands from erosion and sediment loss. In addition, standard silvicultural practices will use buffers and other BMPs during forest management activities.
- Use Natural Infiltration and Best Practices for Stormwater Management – All construction activity will include natural infiltration where feasible. There are portions of the Park that

contain rock outcrops or boulder areas at the surface where natural infiltration may not be possible. In these areas, runoff will be redirected toward natural infiltration areas.

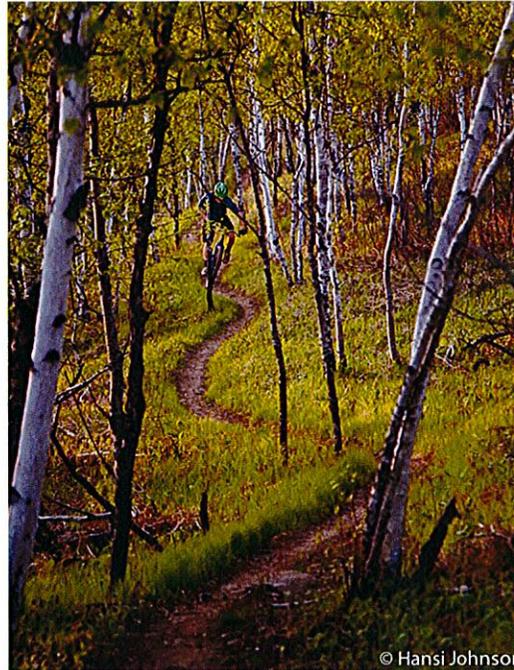
- Provide Ongoing Stewardship of the Trail and Adjoining Natural Systems – Stewardship starts with a sustainable design followed by routine trail monitoring and maintenance. Part of the reason why new trail segments are being proposed, is that the City is trying to correct some trails that have been poorly located in the past. Ongoing monitoring and maintenance will protect adjoining natural systems.
- Ensure that Trails Remain Sustainable – Trails are considered sustainable if:
 - the trail tread is stable and compacted
 - displacement of the soils from the trail tread is minimal
 - the tread drains well with minimal to no signs of ongoing erosion
 - the tread does not restrict site hydrology
 - impacts to surrounding ecological systems are limited to the trail tread and adjacent clearance zone.
- Formally Decommission and Restore Closed or Unsustainable Trail Corridors – Unsustainable trail corridors will be closed and formally decommissioned and restored to the adjacent natural plant community.

Multi-use Trails

Multi-use trails will be constructed to accommodate both hiking and bicycle users in accordance with IMBA standards. Examples of typical trail designs using IMBA standards are attached in Appendix B of this document. IMBA's guidelines are designed to provide sustainable trail construction to avoid and minimize impacts to the environment while minimizing the need for maintenance. Examples of IMBA Sustainable Trailbuilding Guidelines to be implemented in the design and construction of the proposed project include:

- Avoid the Fall Line – Fall-line trails usually follow the shortest route down a hill – the same path that water flows. The problem with fall-line trails is that they focus water down their length. The speeding water strips the trail of soil; exposing roots, creating gullies and scarring the environment.
- Avoid Flat Areas – Trails that are not located on a slope have the potential for the trail to become a collection basin for water leading to chronically muddy conditions. The trail tread must always be slightly higher than the ground on at least one side of it so that water can drain properly.
- Slope the trail tread - Outslope encourages water to sheet across and off the trail, instead of funneling down the center. Insloping the trail's tread to sump areas also keeps water from funneling down the center of the trail.
- Follow the Half Rule - The trail grade should not exceed half the grade of the hillside or sideslope that the trail traverses to prevent it from becoming a fall line trail.
- Maintain an average trail grade of 10% or less for the majority of the trails – An average grade of 10% or less is most sustainable to prevent erosion.

- Establish and don't exceed the Maximum Sustainable Trail Grades except for very short distance and other special sustainable conditions (typically 15-25%).
- Implement Rolling Contour Trails with Grade Reversals – Grade reversals force water to exit the trail at the low point before it can gain more volume and momentum and erosive power.



Typical Final Stabilized and Sustainable Trail Surface

Parking

There will be a net increase of nearly 50 new parking spaces which will be improved at each of the four road entrances to the Park as shown in Table 6-2, Figure 2 and the proposed plans in Appendix C.

Table 6-2 Existing and Proposed Parking Spaces for Park Access Points

Access Point	Existing Parking Spaces	Proposed Parking Spaces
Hartley Road Main Entrance	60	100
Fairmont Street (East) Entrance	7	8
Hartley Road (South) Entrance	8	11
North Road (West) Entrance	6	8
Total	81	127

The existing parking is limited at the Hartley Nature Center and the other three Park entrances. The three outlying entrances are placed at dead-end roads that often provide conflicts with

surrounding neighborhood on-street parking. Currently when Park visitors use spaces at these three parking areas, the congestion at the end of these dead end roads makes it difficult to turn around. This congestion also makes it difficult for snow plows, garbage trucks and emergency vehicles to turn around. All proposed parking areas will be reconfigured to provide additional and better designated parking, while providing access for emergency, garbage and snow maintenance vehicles. All on-street parking will be alternate side parking consistent with the City's on-street parking program.

- Approximately 40 new parking spaces will be added to the existing 60 spaces (for a total of 100 spaces) at the main entrance parking area at the Nature Center off of Woodland Avenue at the northeastern boundary of the Park. This addition will include a new curb and gutter paved parking lot with drainage to infiltration areas. The parking areas will include installation of lights and native seed to restore disturbed areas. The proposed parking improvements will result in approximately 7,600 square feet of impact to a shallow marsh wetland as shown in Appendix C.
- At the second entrance from Woodland Avenue via Fairmount Street at the eastern boundary of the Park, it is estimated that there are approximately 7 on-street spaces. The proposed parking will include 8 paved parking spaces (an increase in one additional parking space) with curb and gutter, street lighting, a revised drainage alignment with rock check dams, and a new designated turn-around area for trucks and emergency vehicles.
- At the third entrance, accessed from Woodhaven Lane to Hartley Road at the southeastern boundary of the park, the proposed parking will increase from an existing 8 spaces to 11 newly defined and paved spaces with curb and gutter, lighting, a designated turn-around area and a stormwater pond.
- At the fourth entrance accessed on the west entrance of the Park from Howard Gnesen Road then easterly to the end of North Road, there will be a total of 8 new paved spaces added (an increase of two additional parking spaces) with curb and gutter, street lighting, a designated turn-around area and a stormwater pond or infiltration area. This proposed improvement will result in 1,100 square feet of impact to a scrub-shrub wetland as shown in Appendix C.

All four parking improvement areas will be blended into the native surrounding native vegetation. Standard erosion and sediment control BMPs will be used to protect water quality and the surrounding wetlands and streams.

c. Project magnitude:

Trail widths will be initially constructed to a maximum of approximately four feet for hiking and multi-use trails, and ten feet for Nordic cross country ski trails. Table 6-3 summarizes the total area and/or length of each of the proposed project components.

Table 6-3 Magnitude of Proposed Project Components

Project Component	Approximate Length or Area of thinning ¹	Percent of the Park Area
Implement thinning in four, ten acre red pine stands	10 – 12 acres	1.5-2%
Create ten, ½ acre openings in aspen stands	5 acres	0.8%
Manage invasive vegetation (buckthorn etc.)	88 acres	13.8%
Construct Hiking/Multi-Use Trails – Net increase	1.6 miles / 0.8 acres	0.1%
Reconfigure ADA compliant trail	0.3 miles / 0.2 acres	>0.1%
Revise ski trail segments – Net decrease	-0.1 miles / 0.1 acres	>0.1%
Revision of multi-use trail segments – Net increase	1.9 miles / 0.9 acres	>0.2%
Create Hartley Road Parking Area	>0.1 acres	>0.1%
Create North Road Parking Area	>0.1 acres	>0.1%
Create Fairmont Street Parking Area	>0.1 acres	>0.1%
Revise Hartley Nature Center Parking	approximately 0.9 acres	>0.2%

¹ Each pine stand is approximately 10 acres in size. Thinning will only occur on 1/4 to 1/3 of each stand of pine.

- d. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The Guiding Principles and the action plans of the 2014 approved HPMP sets a course to reduce operating and capital costs, enhance efficiency, improve parks, strengthen partnerships, connect the city with trails, increase access to nature, increase and stabilize funding, create equitable access to healthy recreation, and enhance stewardship. Hartley Park and Hartley Nature Center serve more than 25,000 visitors a year, which includes more than 17,000 students through field trips and special events according to the Hartley Nature Center web site (<http://www.hartleynature.org>).

Phase 1 Implementation of the Master Plan includes many proposed improvements; however, due to limited funding, not everything outlined in Phase 1 of the Master Plan will be included in this implementation. The scope of this EAW and the purpose of the proposed project improvements include:

-
1. Performing forest management activities (thinning) in red pine stands to preserve and enhance the overall forest health and diversity of the Park forest, creating openings in aspen stands to increase vegetation diversity and benefit wildlife habitat;
 2. Removing invasive vegetation species such as buckthorn, which overtakes the native vegetation and destroys wildlife habitat;
 3. Improving access through new, sustainable trails to help people connect with nature, providing ADA access and trails for education about the environment while correcting and closing eroded trails that were constructed on poor alignments and/or on wet or highly erodible soils; and
 4. Providing access by constructing additional parking which will reduce parking conflicts with the adjacent neighborhoods and city utility and emergency vehicles.

These proposed actions will provide enhanced recreational opportunities for Duluth citizens and visitors to the Park from around the region, while protecting the overall health of the Park's native vegetation and increasing wildlife habitat diversity in accordance with the Park's approved 2014 Master Plan.

- e. Are future stages of this development including development on any other property planned or likely to happen? **Yes** **No**. If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

There are parcels of land outside of the Park that are owned by the City or the Hartley Nature Center Corporation (HNC). Trail work is planned on these parcels as part of the proposed project in addition to the trail work planned inside the Park boundary. Figure 2 displays the proposed new trails that extend outside of the Park boundary: 1) the northeast area from Hartley Park Road (main entrance) towards Allendale Avenue, and 2) the southern property area from Hartley Road trail towards West Arrowhead Road. The proposed trail improvements on HNC property will also correct eroded trails with new sustainable trail segments. This environmental review includes the trails located both within the Park boundary and also those located on the parcels outside of the Park.

The completion of a feasibility study for the restoration of Tischer Creek and preservation of Hartley Pond outlined in Phase 1 is not within the scope of this environmental review. Funding for the feasibility study is not available at this time and no schedule has been set for the future phases.

- f. Is this project a subsequent stage of an earlier project? **Yes** **No**. If yes, briefly describe the past development, timeline and any past environmental review.

The HPMP was approved on July 21, 2014. The proposed project proposes to implement portions of the Phase 1 recommendations in accordance with funding from a Minnesota Parks Legacy grant, City funds and any income derived from the forest improvement harvest.

7. Cover Types

Estimate the acreage of the site with each of the following cover types before and after development:

The assessment of forest cover and other land cover types was estimated using GIS. The Esri ArcMap geometry calculator was used to calculate acreage through North American Datum 1983, Universal Trans Mercator 15N Projection, and the results are summarized in Table 7-1 and shown in Figure 5.

Table 7-1 Cover Types for Proposed Project Components (Acres)

Cover Types	Before	After
Wetlands	92.9	92.8
Deep water/streams	18.0	18.0
Wooded Forest	430.0	423.0
Developed	33.0	33.0
Brush/grassland	58.0	63.0
Cropland	0.0	0.0
Lawn/landscaping	0.2	0.2
Impervious surface	0.8	1.3
Stormwater Pond	0.0	0.0
Other (Trails)	7.1	8.7
Total	640.0	640.0

According to St. Louis County parcel information, HNC owns approximately 22 acres adjacent to the Park on the southwest and northeast sides of the Park as shown in Figure 2. In total, Hartley Park and Hartley Nature Center property comprise approximately 640 acres.

Approximately 7.1 total acres (1.1% of the total project area) will be disturbed for construction of the proposed project – primarily for:

- Aspen stand improvements (approximately 5 acres from forest to shrub/grass);
- Trail construction (approximately 1.6 acres wooded forest to trails); and
- New parking (approximately 0.4 acres of forest and 0.1 acre of wetlands to impervious surface).

Additionally, approximately 10 to 12 acres of red pine will be thinned for stand improvements; however, this area will remain forested after project implementation. The approximate 1.6 acres (0.3% of the total forest area) of permanent forest cover type conversion primarily represents the clearing of understory vegetation to establish a trail corridor suitable to the corresponding recreational use. The tree canopy will remain intact and over time the actual trail width will narrow to allow the regeneration of some of the understory that was temporarily disturbed for trail construction.

8. Permits and Approvals Required

List all known local, state and federal permits, approvals, certifications and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

<u>Unit of Government</u>	<u>Type of Application</u>	<u>Status</u>
City of Duluth	Shoreland Permit,	To be submitted
	Wetland Conservation Act,	To be submitted
	Erosion Control Permit,	To be submitted
	Fill Permit	To be submitted
City of Duluth Public Works Dept.	Stormwater General Construction Permit	To be submitted
MN State Historical Preservation Office (SHPO)	Notification	Completed
Minnesota Pollution Control Agency	Stormwater General Construction Permit	To be submitted
Minnesota DNR	Public Waters Permit	Submit if needed
U.S. Army Corps of Engineers (USACE)	Section 404 Permit	Submit if needed
St. Louis County Public Works Department	Right of Way Permit	To be submitted

9. Land Use

a. Describe:

- i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

Forest cover types and land uses are identified on Figure 5. The existing land use is primarily parkland. Rural residential land uses are found west of the Park while traditional neighborhoods are found on the north, east and south sides of the Park. HNC owns approximately 22 acres on the west side of the Park near Catherine Street and east side of the Park near Woodland that is open space.

- ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

The proposed improvements will be constructed in accordance with the following City of Duluth Comprehensive Land Use and other Master Plans, as well as Zoning Ordinances and Regulations:

- 2006 Duluth Comprehensive Land Use Plan
- 2010 Duluth Parks and Recreation Master Plan

- 2011 Trails and Bikeways Master Plan
- 2014 Hartley Park Master Plan
- 2015 Cross Country Ski Trail Master Plan
- City Zoning Regulations as spelled out in the UDC which guides land use and development in the City of Duluth
(<http://www.duluthmn.gov/media/355221/May-29-2015-UDC.pdf>)

The project will be constructed in accordance with Phase 1 of the approved Hartley Park 2014 Master Plan. Hartley Park was designated by the Duluth City Council in the 2010 Parks and Recreation Master Plan as a Regional Park.

The 2006 City of Duluth Comprehensive Plan Future Land Use Map lists Hartley Park as "Preservation" with "Sensitive Lands Overlay". The classification as "Preservation" recognizes the natural resources and scenic value of the Park. It also suggests that low intensity use, such as trails and other recreational land use, are appropriate as well as provide access to, and protection of, viewsheds. The "Sensitive Lands Overlay" classification further recognizes the natural resource value of the Park and suggests conservation design and natural resource performance standards. The proposed trail improvements, forestry management, and parking improvements align with the Comprehensive Plan "Preservation" and "Sensitive Lands Overlay" future land use.

- iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The Zoning Regulations, as spelled out in the Unified Development Chapter (UDC), guides land use and development in the City of Duluth. Shoreland areas are shown in Figure 6 and floodplains areas are shown in Figure 7. Tischer Creek and the West Branch of Tischer Creek are designated trout streams and DNR protected waters that flow through Hartley Park. No detailed flood study has been conducted for the creek flowing through the Park. Hartley Pond is a protected water (DNR #965P). The UDC provides for a 300-foot shoreland overlay on either side of the stream ordinary high water mark. Trail construction is considered a permitted use within shoreland areas. All proposed work in a shoreland overlay zone will require a City shoreland permit.

The area within Hartley Park is zoned Rural Residential, RR-1. The RR-1 district is established to accommodate large-lot, single-family detached residential uses, typically surrounded by significant open space, on lots of at least 5 acres each. The district encourages distinctive neighborhoods with a semi-rural character. Complimentary uses such as limited agriculture, small-scale institutional uses, parks, minor utilities and certain temporary uses are allowed as shown in the UDC Table 50-19.8. Surrounding neighborhoods are zoned Residential-Traditional, R-1.

- b. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

Hartley Park meets the City zoning regulations as set forth by the UDC. The UDC's definition of a park, playground or forest reserve as defined in the UDC 50-41.16:

"A facility or area for recreational, cultural, or aesthetic use owned or operated by a public or quasi-public agency and available to the general public. This definition may include but is not limited to: parks, public lawns, active and passive recreation areas, playgrounds, water courses and wooded areas. Facilities may also include fountains, swimming pools, pavilions and similar public facilities within their boundaries."

According to the City Planning Department,

- Trails are not specifically listed in the definition of parks, playgrounds or forest preserves; they are considered a passive recreation use and therefore allowed in RR-1 zones.
- Forest Management activities are exempt from tree replacement requirements (UDC Sec. 50-25.9B) of the UDC when approved by the City Forester.
- Parking lots are also considered a permitted use in RR-1 when associated with a park.

The final design will incorporate existing bridges to cross streams and minimize shoreland and floodplain impacts. All forest management activities will be completed in accordance with accepted forest management standards and using BMPs to control potential erosion and sediment loss during trail construction. Forest management activities will use existing roads in the Park where possible; some temporary access roads may be needed in certain areas. After the timber is removed, the temporary access roads will be restored with native vegetation.

The proposed project is compatible with the 2010 Duluth Parks and Recreation Master Plan, which highlights numerous Action Steps. These Action Steps are then split into various strategies:

- Parks Strategies, including preserving and protecting priority natural areas;
- Trails and Connectivity Strategies, including creating an interconnected multi-use trail system, and developing plans for the Duluth Traverse trail (a planned multi-use natural surface trail system that will span the City of Duluth to connect several hubs of multi-use trails, including Hartley Park);
- Funding Strategies, including initiating and strengthening funding by designating signature parks and trails that serve a regional role as "regional parks and regional trails";
- Stewardship Strategies, including proactively managing natural resource areas, prioritizing invasive species management actions, stabilizing steep slopes and correcting storm water runoff issues to prevent erosion, improving existing trails with erosion or surface quality issues, and constructing new soft surface trails to meet IMBA standards.

The proposed project is compatible with the 2011 Trails and Bikeways Master Plan, which recommends Hartley Nature Center as a trail center location as well as a signature trail park. Additionally, this plan discusses Hartley Park as part of the Duluth Traverse Trail.

The proposed project implements most of Phase 1 of the 2014 Hartley Park Master Plan. Specifically, the proposed project addresses several improvement opportunities that are identified in the Master Plan, including re-routing and building new trails to replace unsustainable trail sections, completing restoration of closed trail sections, improving multi-use access to the Park, selective thinning of red pine and aspen, management of invasives (especially buckthorn), installing elevated boardwalk across wet meadow to allow free flow of water and wildlife, parking lot improvements, and providing natural resource education opportunities.

The proposed project is also compatible with the 2015 Cross Country Ski Trail Master Plan, which outlines several leading issues and recommended improvements, including ski trail re-alignments/re-routes/re-configurations and improving trailheads with added parking at the neighborhood access points.

- c. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above.

The proposed project is compatible with approved plans and zoning for the area.

10. Geology, Soils and Topography/Land Forms

- a. Geology – Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.

Hartley Park is a mixture of forested hills, shrubs and wetlands located largely on the Duluth Complex a large metamorphic and igneous rock formation. Large boulders and rock outcrops can be seen throughout the park. There are no susceptible geologic features, such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions in this area. The depth of ground water and bedrock varies throughout the Park due to the nature and depth of glacial till. In some areas, ground water may be present near the surface, and in other areas it may be 30 feet deep or more underground. Seeps and wet soils will be identified prior to finalizing the location of the proposed Phase 1 trail segments and will be avoided where possible or will be crossed with boardwalks. Wetlands impacted by the proposed parking construction will be mitigated as required by the City's wetland rules, state and federal rules as a part of the permit process.

- b. Soils and Topography – Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions

relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

Table 10-1 summarizes the texture, drainage, slope and hydric status of each of the NRCS soil series potentially affected by the proposed project that are shown in Figure 8. Generally, new trails will be located on upland locations where possible. To protect hydric soils and reduce erosion potential, bridges or boardwalks will be used to cross wetlands in new areas. No grading of trails is expected to occur in wetlands or areas mapped as hydric soil (Figure 9). Parking improvements for the Main Park entrance and at North Road entrance will impact wetlands. The impacts are shown in the plans in Appendix C.

Steeper slopes are present near the center of the Park, which creates conditions requiring special attention to minimize erosion. Steep slopes and highly erodible soils will be avoided, routed around, or built at a gentle enough grade that erosion would not be an appreciable concern. All construction areas will use BMPs to control erosion and reduce sediment loss off site or trail segment rerouting may be considered as a solution, should a chronic erosion problem arise. The purpose of the trail design and construction is to minimize any erosion issues and minimize the maintenance requirements of the trail. The closed trail segments will be removed from the trail system and restored back to natural habitat.

Acreage to be graded and excavated and volume of soil to be moved for the proposed trail improvements are preliminary estimates based on assumptions of maximum trail width and the average grade based on the project component type: hiking trail (4 feet wide, 3% grade), multi-use trails (4 feet wide, 30% grade), and ski trails (10 feet wide, 6%). The preliminary estimate of acreage for the proposed trail improvements are approximately 1.8 acres (net increase) and less than a total of 1.2 acres for the four parking lot expansions, which includes the area of the existing parking area surfaces. The preliminary volume estimation for the trail proposed improvements is 5,500 cubic yards.

In order to minimize soil disturbance, existing roads will be used to the greatest extent possible to conduct the proposed forestry management work. Truck access to remove thinned vegetation will occur from existing Old Hartley Road via the Nature Center Entrance to avoid disturbance to the residents along neighborhood streets. The timber will be cut and hauled to specified landing areas using equipment with low pressure tires or tracks to minimize soil disturbance via Old Hartley Road, the Tunnel Trail and the old Soap Box Derby Road. Following removal of the wood, these temporary access routes will be closed and restored back to native vegetation or trail surface. Typical seed mixes are found at http://www.bwsr.state.mn.us/native_vegetation/. Final

plans for access are not available at this time to estimate the area or volume of soil disturbance. Final plans and specifications will be available for the permitting process.

Table 10-1 Soils in Proposed Improvement Areas

Soil Series	Texture	Drainage	Slope	Hydric Status
E11E—Miskoaki-Rock outcrop complex	Silt loam / gravelly sandy loam	Well Drained	18-45%	Non-Hydric
F111B—Augustana-Hegberg complex	Silt loam / sandy loam / gravelly sandy loam	Somewhat Poorly Drained	3-8%	Partially Hydric
F33A—Cathro muck	Muck / Mucky silt loam	Very Poorly Drained	0-1%	Hydric
F120D—Grayling-Cromwell complex	Loamy sand	Excessively Drained	8-18%	Non-Hydric
F134A—Giese Muck	Silt loam / gravelly sandy loam	Very Poorly Drained	0-1%	Hydric
F135A—Hermantown-Canosia-Giese complex	Silt loam / gravelly sandy loam	Somewhat Poorly Drained	0-3%	Partially Hydric
F137B—Normanna-Canosia-Hermantown complex	Loam / Gravelly sandy loam	Moderately Well Drained	3-8%	Non-Hydric
F138D—Ahmeek-Normanna-Canosia complex	Silt loam / gravelly sandy loam	Well Drained	8-18%	Non-Hydric
F139F—Ahmeek	Silt loam / gravelly sandy loam	Well Drained	18-45%	Non-Hydric
F147D—Ahmeek-Canosia-Rock outcrop complex	Gravelly sandy loam	Well Drained	0-25%	Non-Hydric
F148F—Ahmeek-Rock outcrop	Silt loam / gravelly sandy loam	Well Drained	18-50%	Non-Hydric
F160F—Rock outcrop-Mesaba-Barto complex	Gravelly sandy loam / bedrock	Well Drained	18-60%	Non-Hydric

11. Water Resources

- a. Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.
 - i. Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

Tischer Creek and the West Branch of Tischer Creek are public waters and DNR designated trout streams that flow through Hartley Park (see Figure 2). There are no

Minnesota Pollution Control Agency (MPCA) Impaired Waters within 1 mile of the proposed project. Hartley Pond was created in 1913 by placing a dam across Tischer Creek. Hartley Pond is also listed as DNR public water (#965P) and is located in the north half of the Park in the southwest corner of Section 2 (Figure 1). Hartley Pond annually receives visits from migratory waterfowl feeding and or nesting on the pond.

- ii. Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

There are no known listed springs in the Park. The depth of ground water and bedrock varies throughout the Park due to the nature and depth of glacial till. In some areas, ground water may be present near the surface, and in other areas it may be deep underground. Seeps and wet soils will be identified prior to finalizing the proposed Phase 1 trail segments and will be avoided where possible or will be crossed with boardwalks.

The proposed project is not within a Minnesota Department of Health (MDH) wellhead protection area. There are no monitoring wells located within the proposed project site. The MDH County Well Index indicates that there are several domestic and abandoned wells located outside of the proposed project.

- b. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

- i. Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.
 - a. If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

The proposed project is not expected to generate any significant amount of additional wastewater. The facility has an existing sewer line connected to Western Lakes Sanitary Sewer District (WLSSD). Any resulting wastewater is not expected to cause a significant increase to the daily WLSSD operations. The proposed improvements are not anticipated to require expansion of the wastewater infrastructure. The Hartley Nature Center would be the largest generator of waste water. As the number of visitors is expected to increase over time, wastewater generation would increase proportionately.

- b. If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.

Not applicable.

- c. If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.

Not applicable.

Stormwater - Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

A Stormwater Pollution Prevention Plan (SWPPP) will be developed for all improvements at Hartley Park and will be followed during its construction as required by the MPCA's Construction Stormwater General Permit and the City of Duluth's Construction Stormwater Permit. Parking improvements will be designed to infiltrate stormwater where feasible. Vegetation management (thinning aspen and red pine stands and buckthorn removal) will incorporate silvicultural BMPs to protect the Park's water quality.

Due to the presence of trout streams (Tischer Creek and the West Branch of Tischer Creek), all disturbed areas that drain to, and are within 1 mile of the special and/or impaired waters, will be stabilized immediately and within 7 days of final shaping of the proposed project elements. The City of Duluth will oversee the construction of all proposed improvements and will implement compliance with all permits including the construction stormwater permit.

For hiking and multi-use trail improvements, the natural trail surface will consist of a porous surface, allowing some water to infiltrate. The treadway will be compacted during construction and initial use to form a sustainable trail surface to support trail traffic, which will not infiltrate water as readily as the downslope. In most cases, the trail treadway will have a slight outslope to shed water off the trail and grade reversals will be built into the trail periodically to shed any water that runs down the tread way off into a vegetated buffer before it generates enough volume and velocity to erode the trail. There should be

no significant increase in surface water runoff due to the trails because runoff from the trail will be filtered by adjacent undisturbed vegetation between the trail and water bodies. This will result in on-site infiltration and filtration before the water reaches any nearby water bodies. Ski trails are expected to have minimal impact on stormwater because the woody vegetation will be cut at ground level with minimal soil disturbance.

Water shed by the trail systems will follow the same drainages as before the trails existed. The majority of the water will run off the downslope edge of the trail to an existing vegetated buffer. In some cases the water may follow the trail down grade for a very short distance but then will be directed off the downslope edge of the trail at the next grade reversal. There will be no significant displacement of surface water runoff and no impact on the quality of receiving waters. No significant adverse effect is expected on downstream water quality.

- ii. Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

Water may be used for vegetation establishment and for dust control during construction activities; no DNR permit will be required as volumes are expected to be well below the 10,000 gallons per day trigger. Temporary dewatering may be required during excavations especially close to wetland areas. Should water needs meet the threshold of a permit, a MNDNR water appropriation permit will be acquired from the agency if construction uses water from public waters. However, water would likely be appropriated from City hydrants. This appropriation will not require expansion of any infrastructure and is unlikely to cause any environmental effects.

- iii. Surface Waters
 - a. Wetlands - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts will occur in the same minor or major watershed, and identify those probable locations.

Proposed project designs will avoid and minimize wetland impacts to the extent practicable through the orientation and layout of the proposed trails and parking lot expansions. However, there will be small unavoidable wetland impacts in the creation of additional parking spaces at the North Road Entrance, and potentially for the creation of parking spaces at the Hartley Nature Center. Wetland impacts are not anticipated for other parking improvements at either the Hartley Road South Entrance or the Fairmont Street Entrance. Any wetland impacts will require permits from the USACE and from the City of Duluth, who enforces the WCA on behalf of the Board of Water and Soil Resources. These two agencies will require compensatory wetland mitigation for unavoidable wetland impacts. This will be addressed during permitting.

Hiking and biking trails in wetlands will be crossed by elevated boardwalks approximately 2 feet to 4 feet wide to span the wetland on piers. No permits are required for elevated boardwalks on piers. No excavation or fill is proposed to construct these structures over streams or wetlands. Cleared brush will be lopped and scattered in upland locations. The proposed crossings will not involve the hydrologic alteration of streams or wetlands, nor will it adversely affect the wetland functions and values.

The proposed vegetation management improvements will occur in upland areas and will not adversely affect surface waters or wetlands.

The proposed parking improvements will impact approximately 8,700 square feet or 0.20 acres of shallow marsh/scrub shrub wetlands (7,600 square feet at the Hartley Road main entrance and 1,100 square feet at the North Road west entrance). Mitigation needs will be determined during final design. See proposed plans in Appendix C.

- b. Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

Tischer Creek runs along the northern side of the Park and the West Branch of Tischer Creek runs along the southern side of the Park. No alterations to Hartley Pond, the structural dam on Tischer Creek, or the West Branch of Tischer Creek are planned as part of this proposed project.

The proposed project does not require any new stream crossings. The proposed project will have trails crossing Tischer Creek and the West Branch of Tischer Creek using existing bridges to minimize wetland and stream impacts. There is no plan at this time to replace the culverted crossing of Tischer Creek just west of the HNC parking lot. No alterations are planned at this time for Hartley Pond and the structural dam on Tischer Creek.

As shown in Figure 3, trail sections with unsustainable alignments, such as the existing trail to Gazebo Point, will be closed, restored to the surrounding natural plant community, and re-routed with new sustainable trail sections to address known erosion and/or water quality concerns. Bridges and boardwalks will also be replaced and/or expanded along the Old Hartley Road and also the trail from HNC to the north side of the dam at Hartley Pond. The proposed boardwalk designs will avoid and minimize wetland impacts to the extent practicable during their construction and use. Additionally, the trail surface of both the Old Hartley Road and the trail from HNC to Hartley Pond will also be reshaped and resurfaced to prevent water from running down the trails to address erosion issues into the adjacent wetlands and streams. Area wetlands are identified in Figure 10 and also shown on the plan sheets in Appendix C.

Two of the four proposed parking expansions will require fill in wetland areas. The proposed project will incorporate BMPs to further minimize impacts to water quality in the form of erosion and sedimentation. None of the proposed improvements will affect or change the number or type of watercraft on any water body, including current and projected watercraft usage.

12. Contamination/Hazardous Materials/Waste

- a. Pre-project site conditions - Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.

The proposed improvements to Hartley Park will be constructed on undeveloped park land or forest where the primary use has been for recreational purposes and green space since the Park

was created in 1941. No known environmental hazards due to past site uses such as (dumps, landfills, storage tanks, or hazardous liquids have been identified. No significant environmental hazards are anticipated with the proposed project.

- b. Project related generation/storage of solid wastes - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

All solid waste generated during construction and maintenance will be carried out and will be properly disposed by the trail construction crews, road construction crews or forestry work crews.

- c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

No aboveground or below ground tank installations are proposed for this proposed project. Any chemicals or other potentially hazardous materials, such as Glyphosate or Garlon herbicides, required to perform the proposed work will be applied in the small effective quantity by trained professionals and will be secured and properly stored on site.

The only potential for groundwater contamination from the proposed project would be accidental spills of fuel used for motorized tools during construction and maintenance or from the forestry equipment used to perform the silvicultural work in the red pine stands. Only very small capacity fuel containers (<10 gallons) would be carried to construction and maintenance sites. Refueling will be performed at least 100 feet from streams or wetland areas to minimize the impact of any fuel spill during refueling. Equipment operators will be required to perform daily checks on all equipment that holds fluids to verify that fluids aren't being lost to leaks. All spills will be immediately cleaned up and any resulting waste will be properly disposed. A spill prevention plan will be required for all contractors' equipment working within the Park as part of the Construction Stormwater Pollution Prevention Plan and associated permits.

- d. Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

The proposed construction is not anticipated to generate any hazardous waste.

13. Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features)

- a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

The native plant communities of Hartley Park cover 640 acres within a Land Type Association called the Tettegouche Till Plain and they are among the best remnants of natural vegetation in Duluth. Of the forests within city limits, only the Magney-Snively and Park Point forests are of higher quality. The predominant natural vegetation is northern hardwood forest of sugar maple and red oak, as well as red and Norway pine. The Park is one of the largest remnants of northern hardwoods in Duluth. Figure 5 presents the broad categories of vegetation cover types for Hartley Park. Within the Park there are five general vegetation cover types – deciduous forest, coniferous forest, upland brushland, upland grassland, and wetlands (based upon the specific plant community types identified by Perry in 2004). Wetlands are shown in more detail in Figure 10.

According to HNC records, the DNR annually stocks brook trout into Tischer Creek. Brown trout have been stocked into Hartley Pond in the past. In addition to these two trout species, other species found in the pond include largemouth bass, yellow perch sunfish and black bullhead. The lands within and surrounding the Park are primarily wooded forestland and provide habitat for a variety of wildlife composed of mammals, amphibians, reptiles and birds. Appendix D lists species of fish and wildlife observed in the Park. Common mammals found in the area are black bear, deer, beaver, river otter, martin, chipmunks, and squirrels. Frequently observed reptiles and amphibians include turtles, frogs and snakes. Over 170 different species of birds have been counted in the Park. Some of the most common observed species include: American redstart, red-eyed vireo, ovenbirds, chickadees and cedar waxwings.

- b. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-585) and/or correspondence number (ERDB _____) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

A field survey was conducted in September 2014 by Daniel Jones, Barr Engineering Company, in conjunction with a wetland delineation for proposed Phase 1 improvements in Hartley Park. The results of the field survey determined that no threatened or endangered species would be affected by the proposed improvements.

- c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

All proposed construction activity will temporarily disturb the surrounding Park wildlife habitat and plant communities. The purpose of the proposed improvements includes: performing forest management activities (thinning) in pine stands to maintain the overall forest health of the Park, creating forest openings in aspen stands to increase the habitat and plant diversity to benefit wildlife, controlling and removing invasive vegetation species such as buckthorn that overtakes the native vegetation, improving access through new trails to help visitors connect with nature, correcting trails on poor alignments, and providing improved and or added parking.

Existing studies of the environmental impacts of biking (see list below) have indicated that, similar to other forms of recreational activity such as hiking or trail running, there is the potential for measurable impacts to vegetation, soil, water resources, and wildlife; however, the environmental effects are minimal with sustainable trail design and well-managed trails. In fact, the largest factors influencing environmental impacts are trail design and management, rather than the type or amount of trail use.

Additionally, it has been found that biking impacts are not very different from hiking. And in fact, some studies have found that the environmental impacts from biking are typically the same, or even less than, those caused by hiking, with both causing significantly less degradation than horse or motorized users.

These studies have also shown that restricting trail users to designated, purpose built trails greatly reduces and/or avoids environmental impacts. This also applies to wildlife impacts, which have been found to be significantly reduced when trail users stay on trails. This is due to the well-documented ability for wildlife to become accustomed to recreational uses that take place in consistent locations.

Examples of past studies evaluating the environmental impacts of recreational activities on wildlife:

- Marion, J. L. (2006). Assessing and Understanding Trail Degradation: Results from Big South Fork National River and Recreational Area. USDI, National Park Service.
- Gander, H. and P. Ingold (1997). Reactions of Male Alpine Chamois *Rupicapra r. rupicapra* to Hikers, Joggers and Mountainbikers. *Biological Conservation* 79: 3.
- Papouchis, C. M., F. J. Singer, et al. (2001). Responses of desert bighorn sheep to increased human recreation. *Journal of Wildlife Management* 65 3: 573-582.
- Taylor, A. R. and R. L. Knight (2003). Wildlife Responses to Recreation and Associated Visitor Perceptions. *Ecological Applications* 13 4: 12.

- Van der Zande, A. N., J. C. Berkhuizen, H. C. van Latesteijn, W. J. ter Keurs, and A. J. Poppelaars (1984). Impact of outdoor recreation on the density of a number of breeding bird species in woods adjacent to urban residential areas. *Biological Conservation* 30: 1-39.
- Webber, P. (Ed.) (2007). *Managing Mountain Biking: IMBA's Guide to Providing Great Riding*.

The proposed project contracts and permits will require standard BMPs to control the spread of invasive vegetation during construction. These BMPs will continue to be used in the management and eradication of the invasive species.

- d. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

Areas of known endangered and threatened species, with statutory protection, will be avoided as none were found within the park. Trail alignments will avoid seeps and highly erodible and unstable soils that could potentially affect fish, wildlife, and rare or native plant communities. None of the trail work proposed in this project will impact or reduce the forest canopy of the park. Construction and forest management contract specifications for the multi-use trail will include BMPs and language for limiting the spread of invasive vegetation species by construction equipment and personnel to protect fish, wildlife, plant communities, and sensitive ecological resources. In addition, the forest management contract will include language for trout stream setbacks to protect the trout streams. In order to further avoid impacts to sensitive natural features, a pre-construction meeting will be held with construction contractors to emphasize the need to avoid sensitive resources.

14. Historic Properties

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.

A Phase 1A cultural resources survey was conducted in September and October 2014 for the proposed improvements to Hartley Park. One known historic site was identified within the park boundary, the Hartley Root Cellar site, as part of the Hartley Allendale Farm; however, this site is outside the proposed project impact area and will not receive impacts from the proposed project. The State Historic Preservation Office (SHPO) has reviewed the results of the survey and has determined that there are no properties listed in the National Register of Historic Places or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project." See Appendix A for a copy of the letter received from the SHPO on December 19, 2014.

15. Visual

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

Scenic views and vistas are available in parts of Hartley Park, including Rock Knob and Gazebo Point. The proposed project components are not anticipated to have any adverse visual effects or impairments to the existing scenic views or vistas. Some of the trails are proposed to make scenic views and vistas more accessible to Park users. Measures will be taken to minimize visual effects of the parking lot lighting by using features such as down-cast lighting.

16. Air

- a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

Not Applicable – No stationary sources of air emissions are part of this proposed project.

- b. Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

Based on traffic history experience, the City of Duluth and St. Louis County Public Works Departments normally expect the traffic on their respective roads to increase by a factor of 1.2 over 20 years. Therefore, Park visitors can be expected to increase proportionately. Woodland Avenue, is a St. Louis County four-lane highway, and is the main access route to the Park and its Visitor Center. The 2011 Average Annual Daily Traffic (AADT) on Woodland Avenue was 10,300 vehicles per day (vpd) or adjusted to 2015 AADT of 10,712 vpd or an annual increase of 103 vpd. Roads are generally not upgraded to four-lane until the traffic reaches 10,000 vpd. Woodland Avenue has the most available traffic capacity of all roads that access the Park and clearly is not congested in this location. Local traffic counts are not available for the other three access points which are all on dead-end city streets.

The proposed improvements are not expected to significantly increase the number of users and thereby cause an increase in traffic and traffic congestion, which would otherwise artificially increase air emissions. A very small increase in vehicle-related air emissions may be expected as a

result of increased visitation by trail users of the Park. Therefore, the proposed improvements are not expected to cause any significant decrease in air quality.

- c. Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.

In addition to hand tools, some of the trail construction will be performed using small diesel or gasoline powered mechanized equipment such as mini-excavators, mini-skid steers, powered wheelbarrows, chainsaws and brush-cutters. These tools will emit some exhaust fumes when being operated. The proposed trail construction will cause minimal odors and dust during daylight hours. Forestry equipment may additionally create dust and odors during the proposed silvicultural activities. The impacts are expected to be temporary during construction and thinning operations.

During construction, wind-blown dust will be controlled with watering. Due to the nature of the trail construction practices and maintenance, these impacts will be temporary and of limited intensity. Maintenance of the trail will be primarily performed with zero emission hand tools.

The additional parking improvements will require the use of traditional road construction equipment such as trucks, graders, excavators, etc. These operations will be temporary. Dust will be controlled with water or dust chemicals if necessary.

17. Noise

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.

Where small diesel or gasoline powered mechanized equipment (e.g. mini-excavators, mini-skid steers, powered wheelbarrows, chainsaws and brush-cutters) are used for of the trail construction, these tools will generate noise when being operated. The proposed trail construction will cause minimal noise during daylight hours. The proposed parking improvements will also generate noise from road construction equipment such as trucks, excavators, and dozers. Forestry equipment such as skidders, feller-bunchers, trucks and chainsaws will be used to perform the proposed silvicultural work.

Since there are homes adjacent to the Park entrances, efforts will be made to limit construction to daytime hours. The construction is not expected to generate significant noise levels or violate daytime and nighttime noise standards.

18. Transportation

Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

Many Park users will commute from their homes to and from the Park by bicycle, skis, or on foot as they do presently. Visitors of Hartley Park traveling by cars or trucks utilize the existing parking and trail head facilities. Phase 1 improvements propose to create an additional total of 46 parking spaces as shown in Table 18-1 below. Four ADA compliant parking spaces will be placed at the Park’s main entrance; with one ADA compliant parking space each on Hartley Road South and on Fairmont Street entrances.

Table 18-1 Existing and Proposed Parking Spaces for Park Access Points

Access Point	Existing Parking Spaces	Proposed Parking Spaces
Hartley Road Main Entrance	60	100
Fairmont Street (East) Entrance	7	8
Hartley Road (South) Entrance	8	11
North Road (West) Entrance	6	8
Total	81	127

The proposed parking improvements would slightly increase but better define the neighboring on-street parking use. At the main entrance to Hartley Nature Center, current parking is provided by one, often overfull, parking lot and on-street parking at neighborhood access areas. The parking areas are not defined well on street or at the Nature Center. The proposed revised parking area would designate spaces within the parking lot and optimize management of the parking space. Additional features will include a stormwater infiltration area. The expansion of Hartley Nature Center parking lot proposes 40 additional spaces to maximize space. Construction of the parking spaces will likely temporarily disrupt visitor access and may temporarily divert parking to nearby neighboring streets.

The recommendations for Hartley Road/North Road and Fairmont Street include widening existing public right-of way enabling more space for safe on-street parking and adding a turnaround space.

- a. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project’s impact on the regional transportation system. *If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW.* Use the format and procedures described in

the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (*available at: <http://www.dot.state.mn.us/accessmanagement/resources.html>*) or a similar local guidance.

This part of the City of Duluth (Hartley Park) does not experience traffic congestion. Woodland Avenue, an undivided four lane road, has the largest volume of traffic near Hartley Park. The 2015 AADT on Woodland Avenue is estimated at 10,712 vpd. Woodland Avenue peak hour traffic would normally be anticipated to be 10% of that volume or approximately 1071 vpd. There is no available traffic count data for the other three access roads which are all dead-end City streets. North Road (west entrance) has the most homes (14) would likely have an AADT of 50 vehicles per day (vpd) or less. Hartley Road (south entrance) has 2 homes along the dead end street and Fairmont Street (south east entrance) has 7 homes along this entrance. Both of these entrance points are expected to generate less than 50 vpd each.

The City does not have an estimate of the users or traffic count data at each of Hartley's four entrance points. It is assumed that most people visiting the Park would likely spend a minimum of 1 hour to enjoy the park's amenities. Based on the proposed parking improvements and estimated traffic data, it is unlikely that the peak hour traffic generated by the proposed improvements would increase and exceed 250 vehicles per hour or 2,500 daily trips per day for any of the four access points.

Visitors may travel to the Hartley Nature Center by transit via Woodland Avenue. The Duluth Transit Authority provides racks on city buses to accommodate bicyclists.

- b. Identify measures that will be taken to minimize or mitigate project related transportation effects.

19. Cumulative Potential Effects

(Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

- a. Describe the geographic scales and timeframes of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.

The proposed project components will connect to other existing recreational trails such as the Superior Hiking Trail, Nordic ski trails, and mountain biking trails (including the Duluth Traverse). Given the narrow corridors and footprint, collectively these trails are not expected to present significant cumulative adverse effects to the environment. The improved accessibility of trails will also allow for greater access by Park visitors, including school and youth groups, to connect with nature and view wildlife. The forest management improvements promote overall forest health in the Park and help to eliminate invasive vegetation, which will help improve wildlife habitat and increase wildlife diversity. The closure and restoration of trails to natural vegetation will also improve and restore wildlife habitat and improve overall water quality, by repairing eroded areas. The proposed project will also retain large portions of the Park that remain trail-free and provide wildlife habitat.

- b. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

At this time, there are no known funded future projects that may interact with the environmental effects of the proposed project within Hartley Park. The approved Hartley Park Master Plan identifies additional projects that may be implemented in the future; however, there is currently no known timeframe or design work for implementing any additional projects that have not been outlined in this environmental review.

- c. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.

Continued forestry management in the Park will result in beneficial effects on the environment within the Park resulting in a healthy diverse forest with native species and benefitting a diverse wildlife population for the public to view. The closure and restoration of unsustainable trail alignments will restore wildlife habitat and along with the addition of purpose built and designed, sustainable trails, will minimize environmental impacts. The use of standard BMPs will also minimize environmental impacts and ensure sustainably managed trails for the public to access Hartley Park's unique natural resources.

20. Other Potential Environmental Effects

If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.

No other additional environmental impacts were identified.

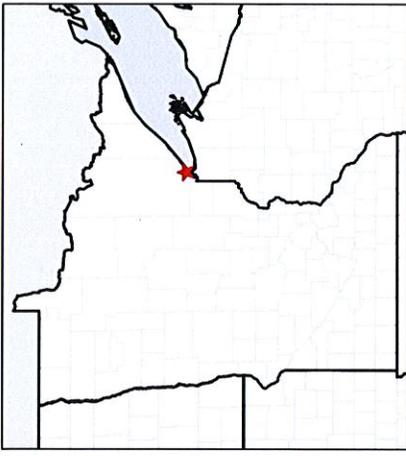
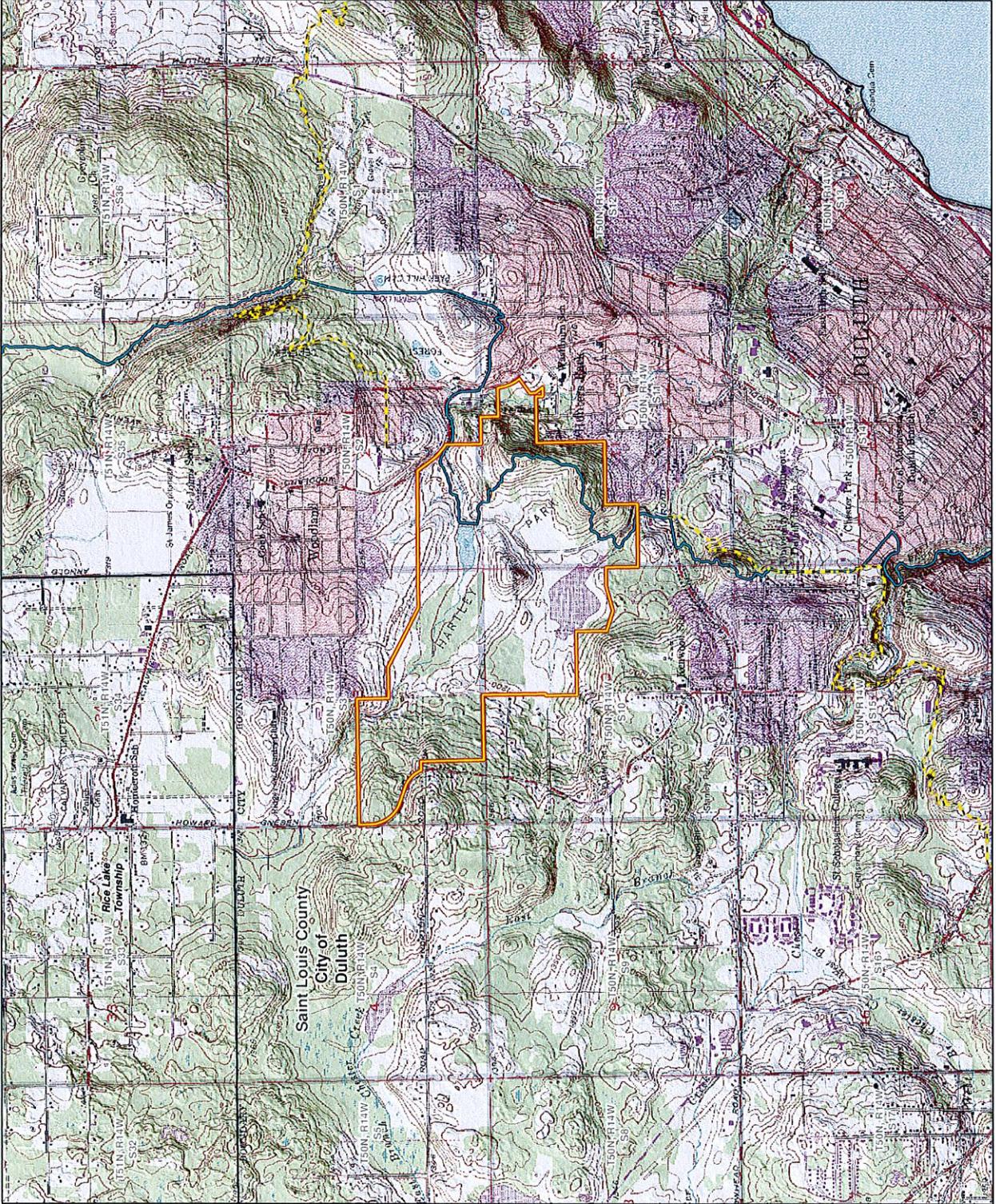
RGU CERTIFICATION. (The Environmental Quality Board will only accept **SIGNED** Environmental Assessment Worksheets for public notice in the EQB Monitor.)

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature  Date 8/21/2015

Title Planning Director



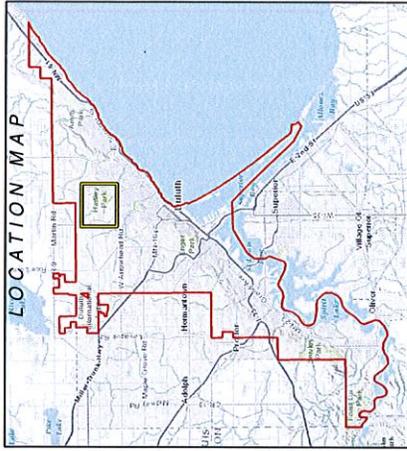
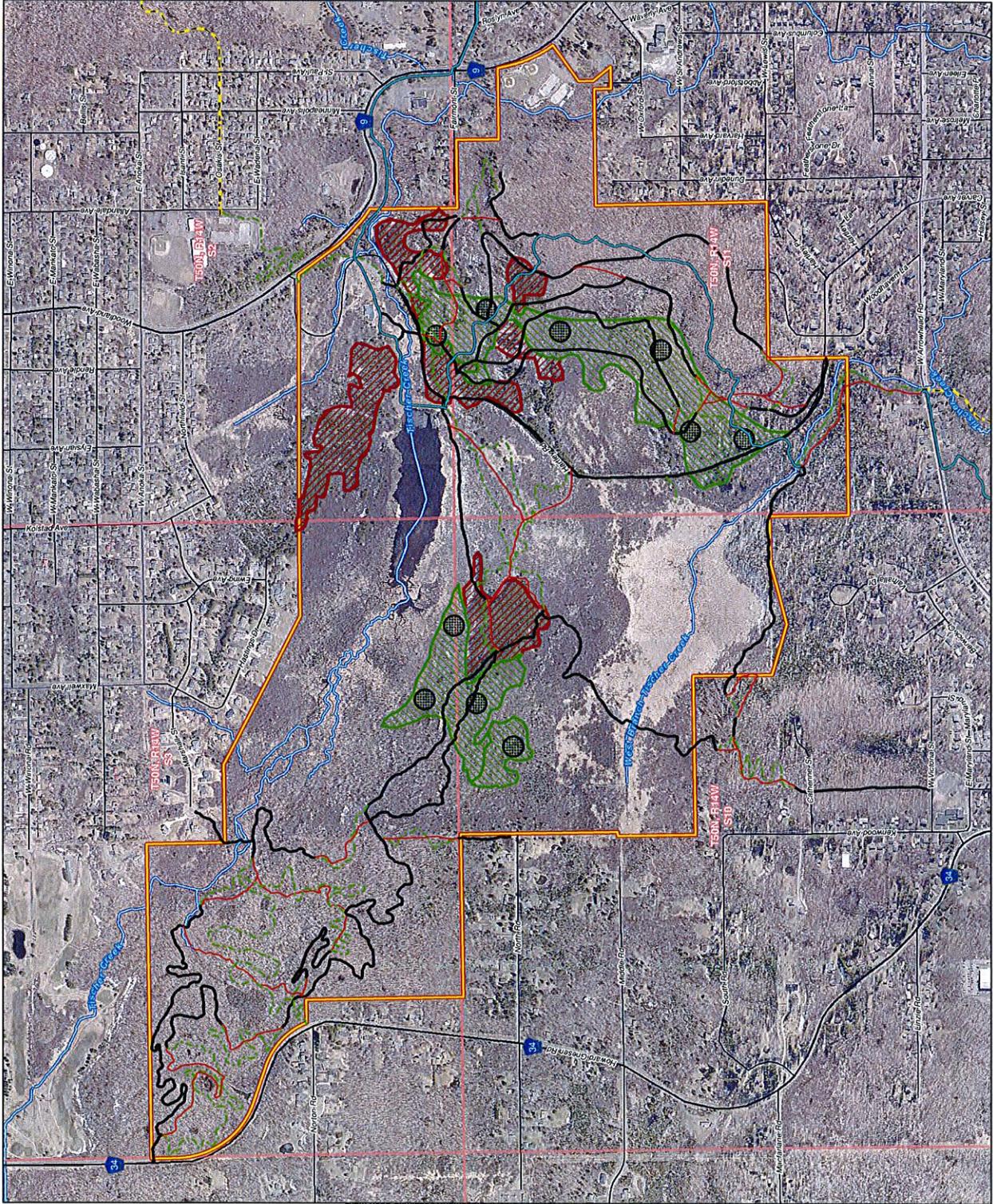
- ★ Site Location
- ▭ Hartley Park Boundary
- Superior Hiking Trail
- - - Duluth Traverse Trail (Proposed not yet Approved)



1 Inch = 2,000 Feet

Figure 1
SITE LOCATION
 Hartley Park EAW
 City of Duluth, Minnesota





- Hartley Park Boundary**
- Hartley Park Boundary
- Sections**
- Existing
 - Proposed
 - Remove
- Aspen Stand Management Areas (1/2 Acre)**
- Aspen Areas
 - Red Pine Areas
- Aspen Areas**
- Red Pine Areas
- Trails**
- Superior Hiking Trail
 - Duluth Traverse Trail (Proposed not yet Approved)
- Rivers and Streams**
- Surface Waters
 - Underground (Culvert)

Forested Areas obtained from City of Duluth

N

0 800 1,600

Feet

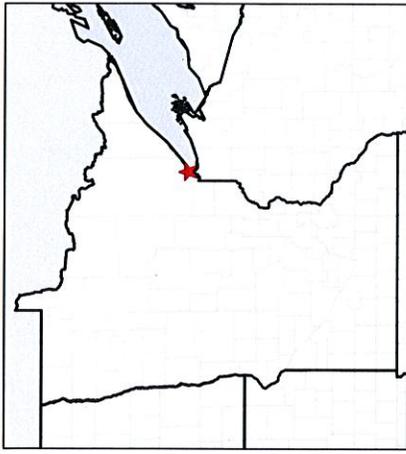
1 Inch = 800 Feet

St. Louis County Imagery Circa May, 2013

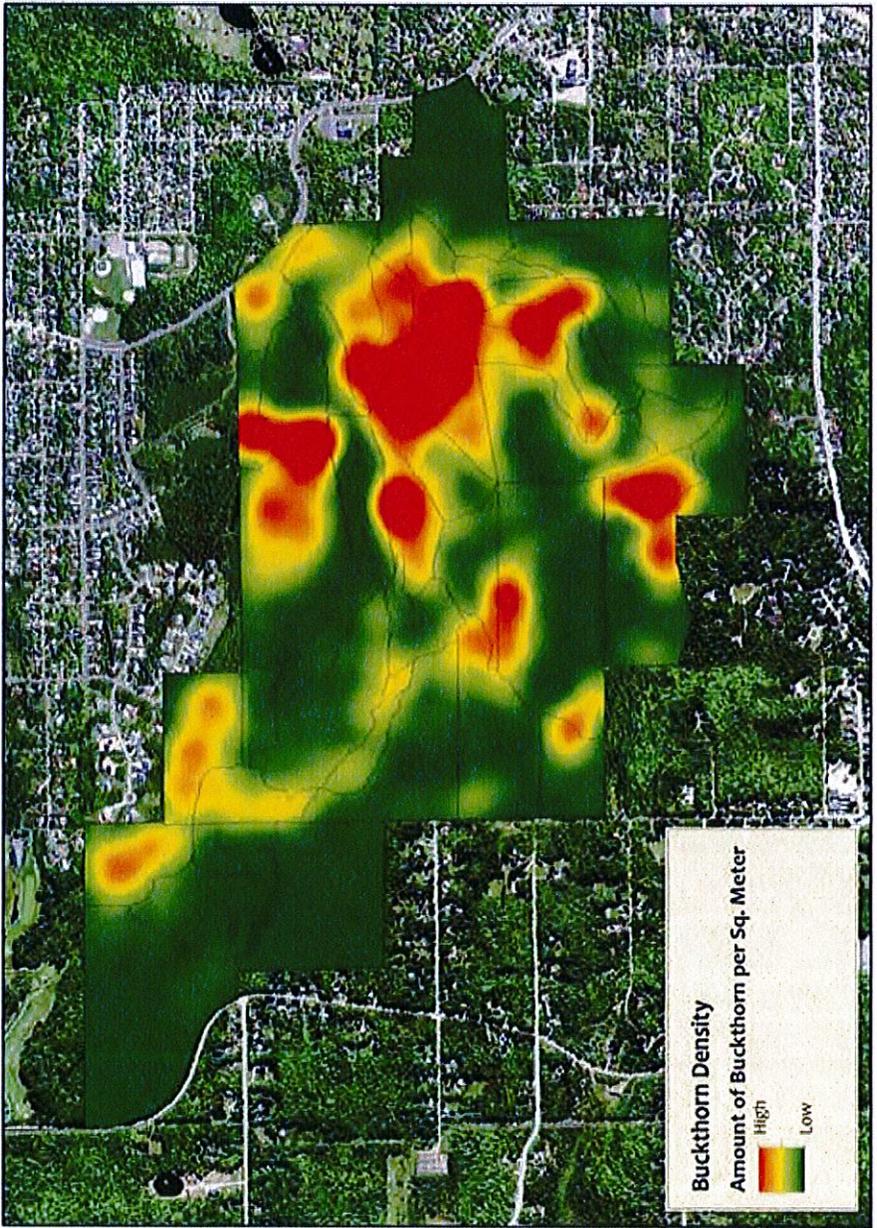
Figure 3

FOREST MANAGEMENT AREAS
Hartley Park EAW
 City of Duluth, Minnesota





Heat Map of Buckthorn Density in Hartley Park



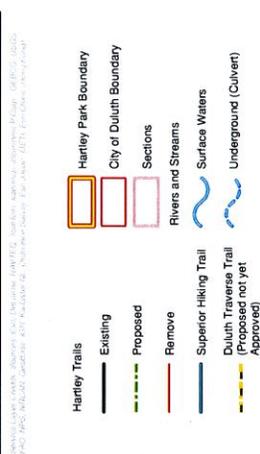
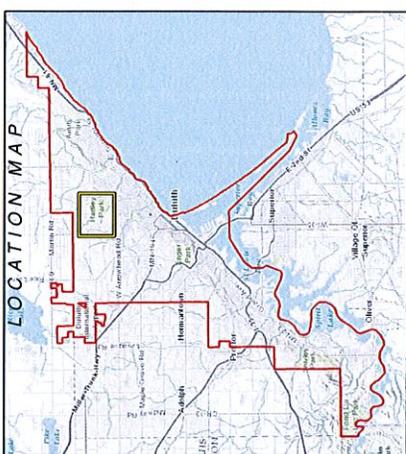
0 0.125 0.25 0.5 0.75 1 Mile

Source: Ethan Perry, Dave Schimpf, COGS, UMD GAC, NHD, MN DNR
Author: Stephanie Gibson

Figure 4

BUCKTHORN HEAT MAP
Hartley Park EAW
City of Duluth, Minnesota





1997 NRRI Forest Cover Types provided by City of Duluth GIS.
Area extent revised by Barr Engineering.

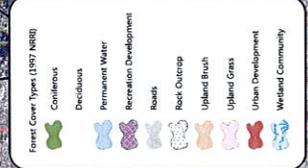
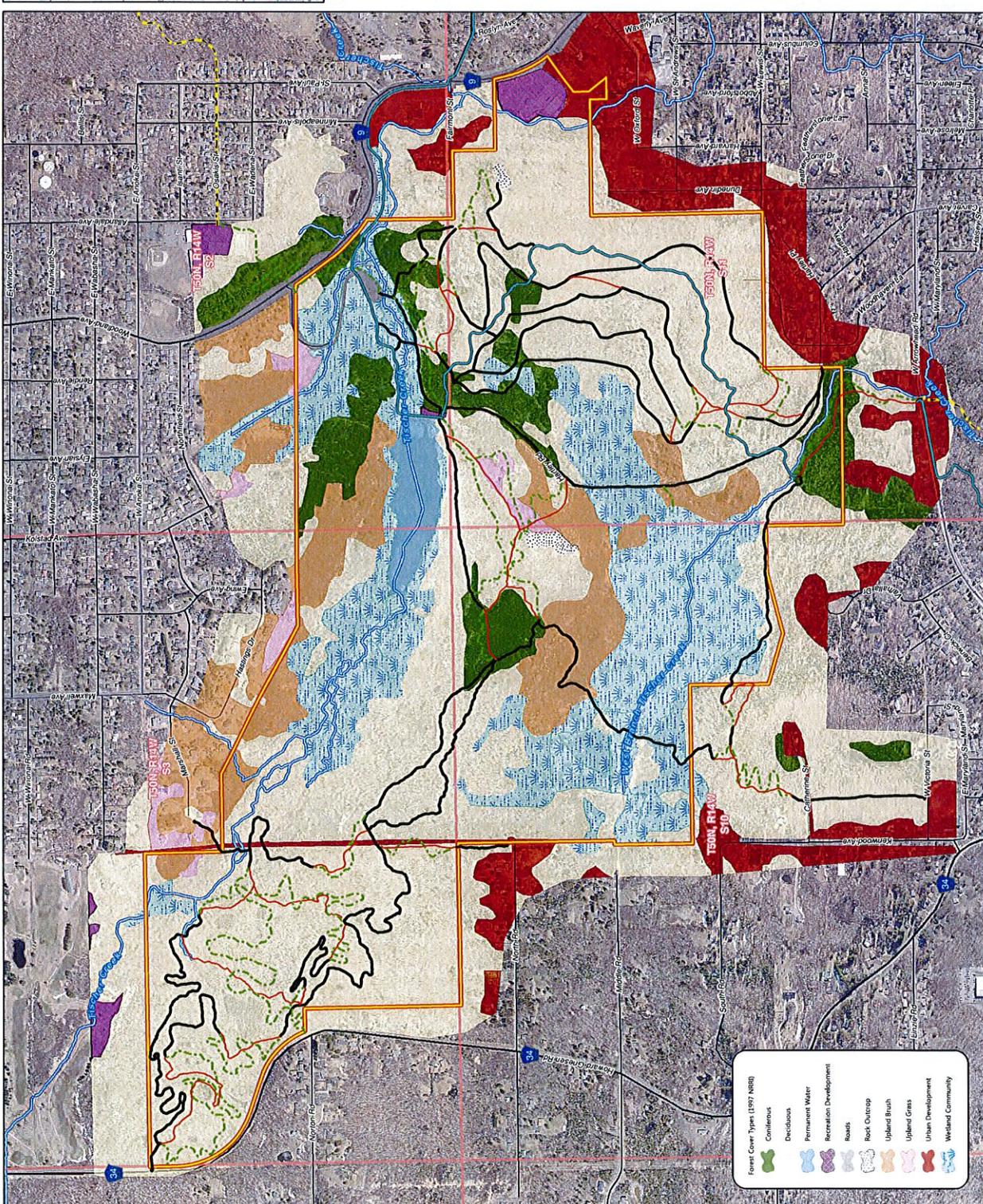


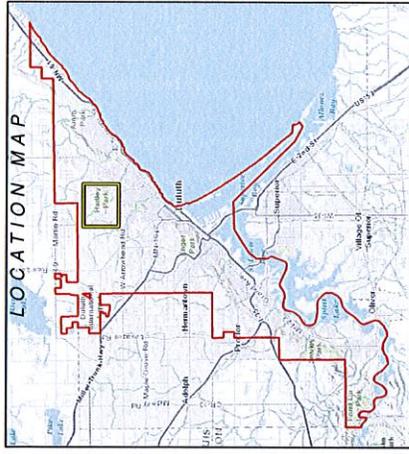
1 Inch = 800 Feet

St. Louis County Imagery Circa May, 2013

Figure 5

FOREST COVER TYPES
Hartley Park EAW
City of Duluth, Minnesota





- Hartley Trails**
- Existing (Solid black line)
- Proposed (Dashed green line)
- Remove (Red line)
- Superior Hiking Trail (Blue line)
- Duluth Traverse Trail (Proposed not yet Approved) (Yellow dashed line)
- Hartley Park Boundary** (Orange outline)
- City of Duluth Boundary** (Black outline)
- Sections** (Red hatched areas)
- Shoreland (NRO) (Blue hatched areas)
- Rivers and Streams (Blue lines)
- Surface Waters (Blue wavy lines)
- Underground (Culvert) (Blue dashed lines)

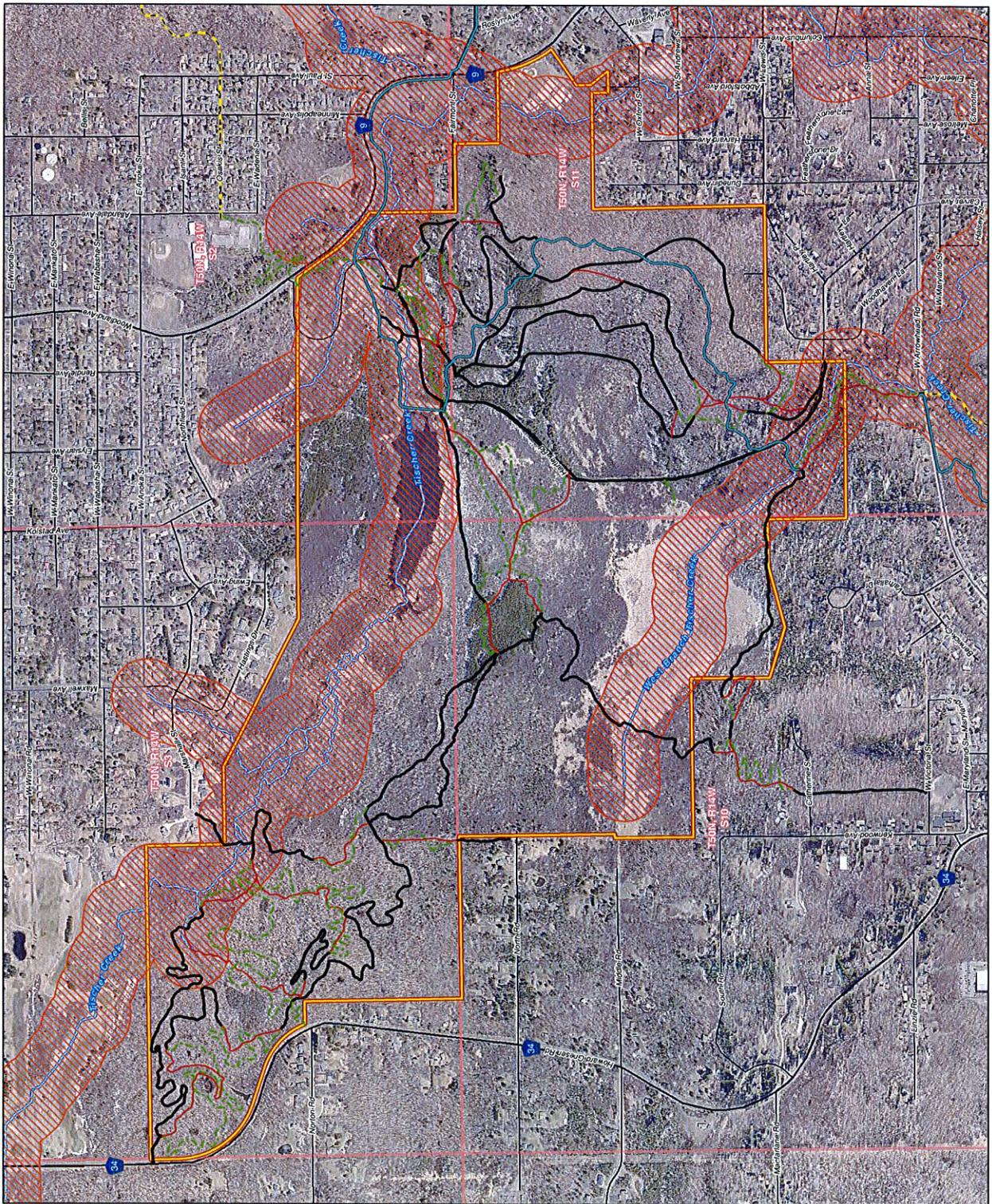


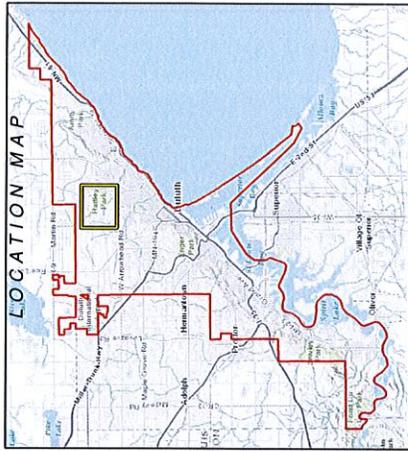
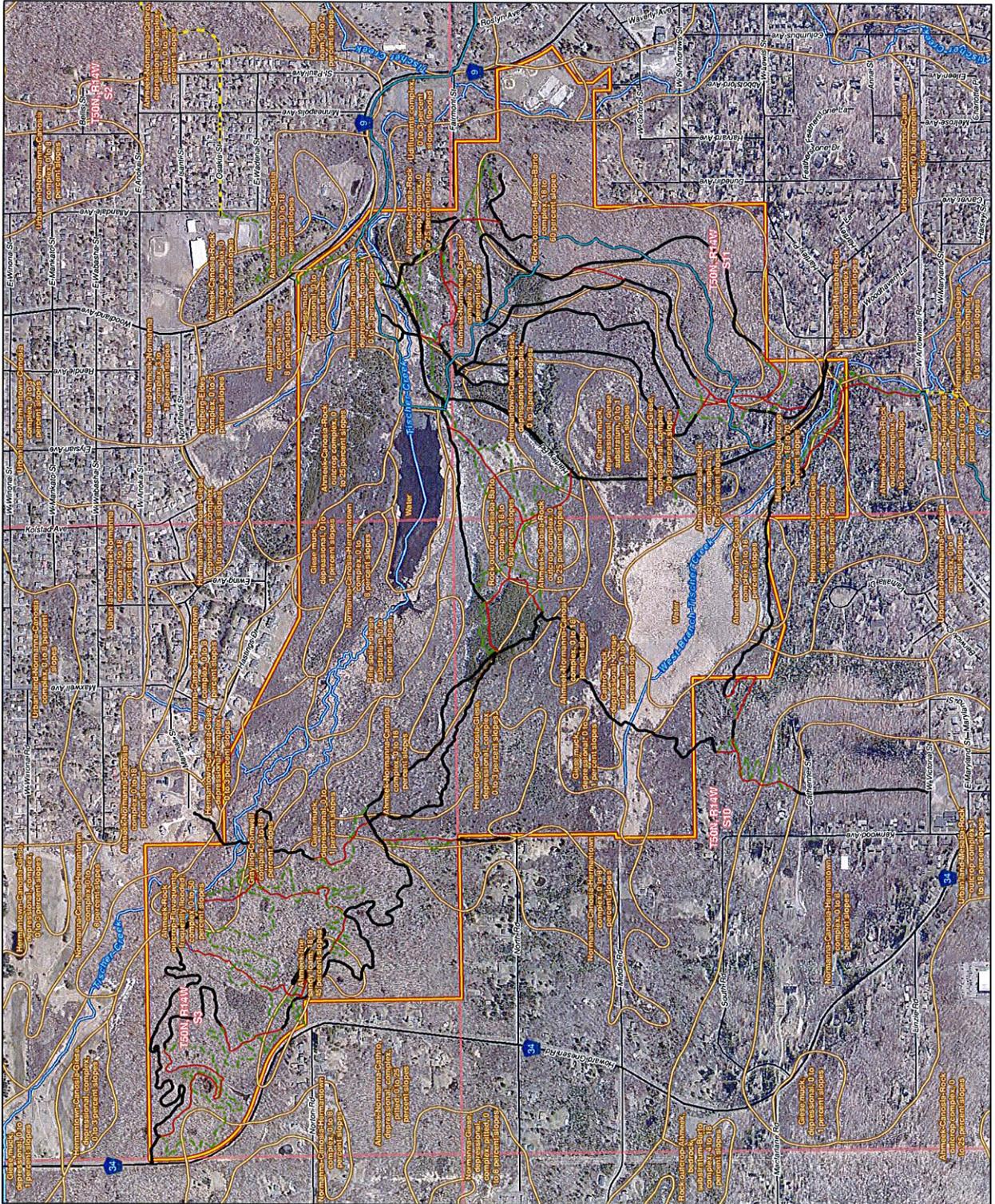
1 Inch = 800 Feet

St. Louis County Imagery Circa May, 2013

Figure 6

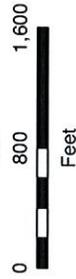
SHORELAND AREAS
 Hartley Park EAW
 City of Duluth, Minnesota





- Existing
- - - Proposed
- - - Remove
- Superior Hiking Trail
- Duluth Traverse Trail (not yet Approved)
- Rivers and Streams
- Surface Waters
- Underground (Culvert)
- Hartley Park Boundary
- City of Duluth Boundary
- Sections
- USDA NRCS Soils

Soils data obtained and processed from NRCS (SSURGO), July 2015.



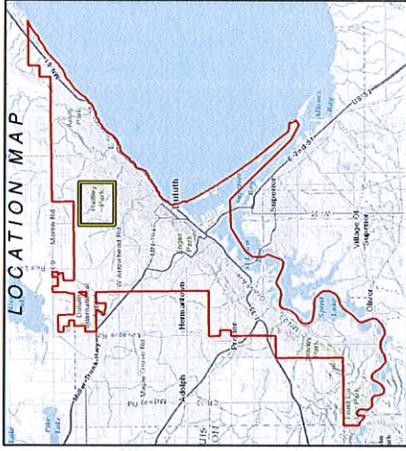
1 Inch = 800 Feet

St. Louis County Imagery Circa May, 2013

Figure 8

NRCS SOILS
Hartley Park EAW
 City of Duluth, Minnesota





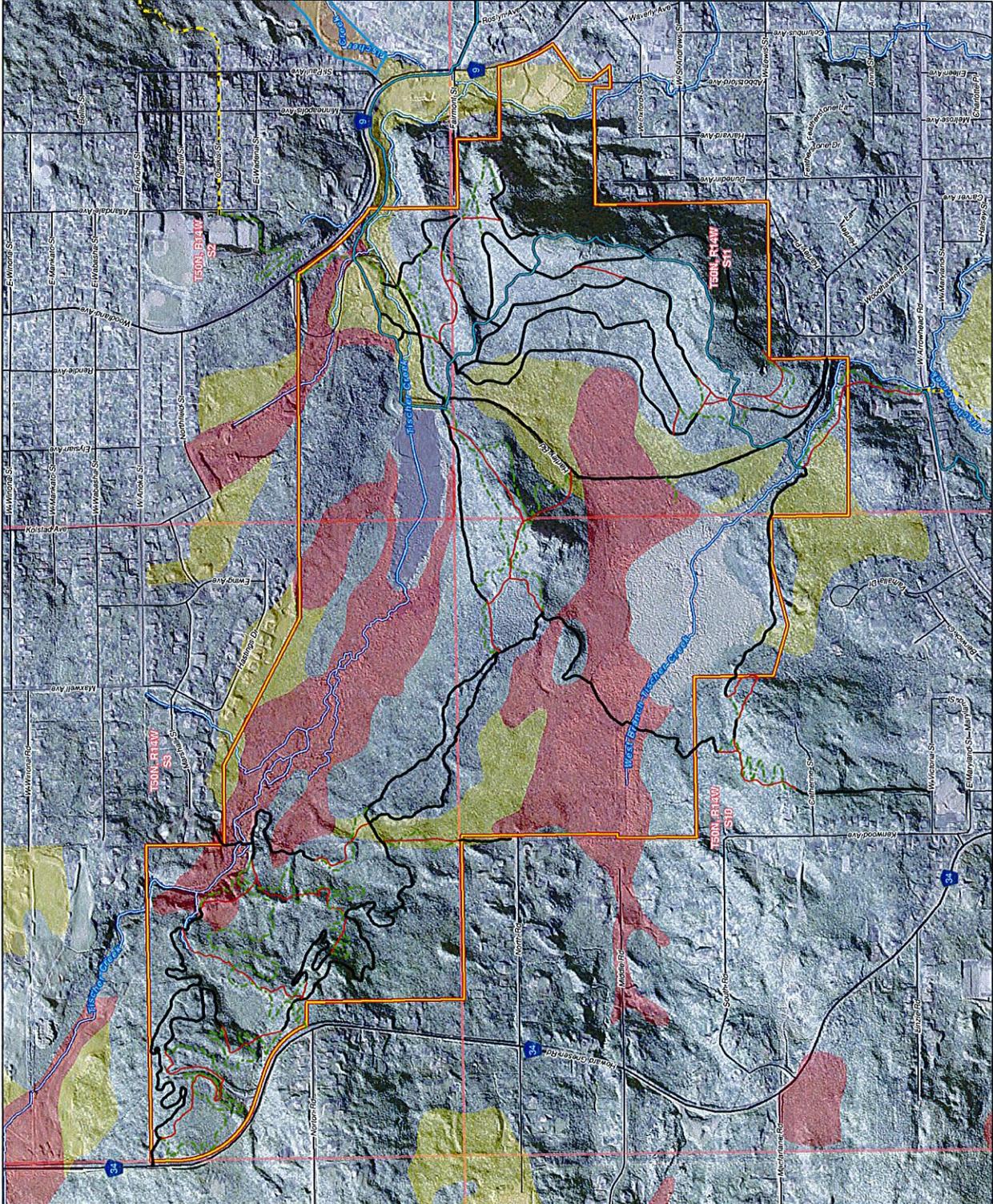
- Hartley Trails**
- Existing
 - Proposed
 - Remove
 - Superior Hiking Trail
 - Duluth Traverse Trail (Proposed not yet Approved)
- Hartley Park Boundary**
- City of Duluth Boundary
 - Sections
 - Rivers and Streams
 - Surface Waters
 - Underground (Culvert)
 - Hydric Soils
- Hydric Soils**
- Hydric (100%)
 - Predominantly hydric (66 to 99%)
 - Partially hydric (33 to 65%)
- Soils data obtained from NRCS (SSURGO) July, 2015.
Hydric Soils processed/created using NRCS Soils Data Viewer.

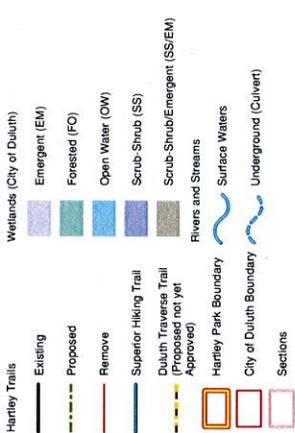
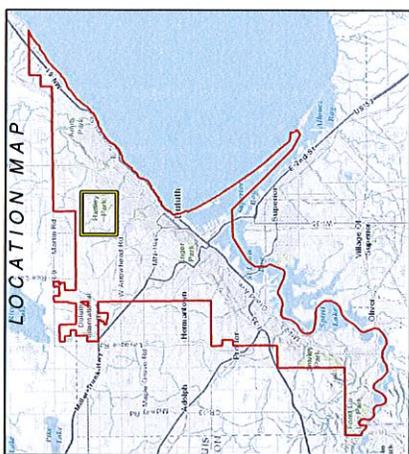


1 Inch = 800 Feet
2013 FSA Via MngGeo WMS

Figure 9

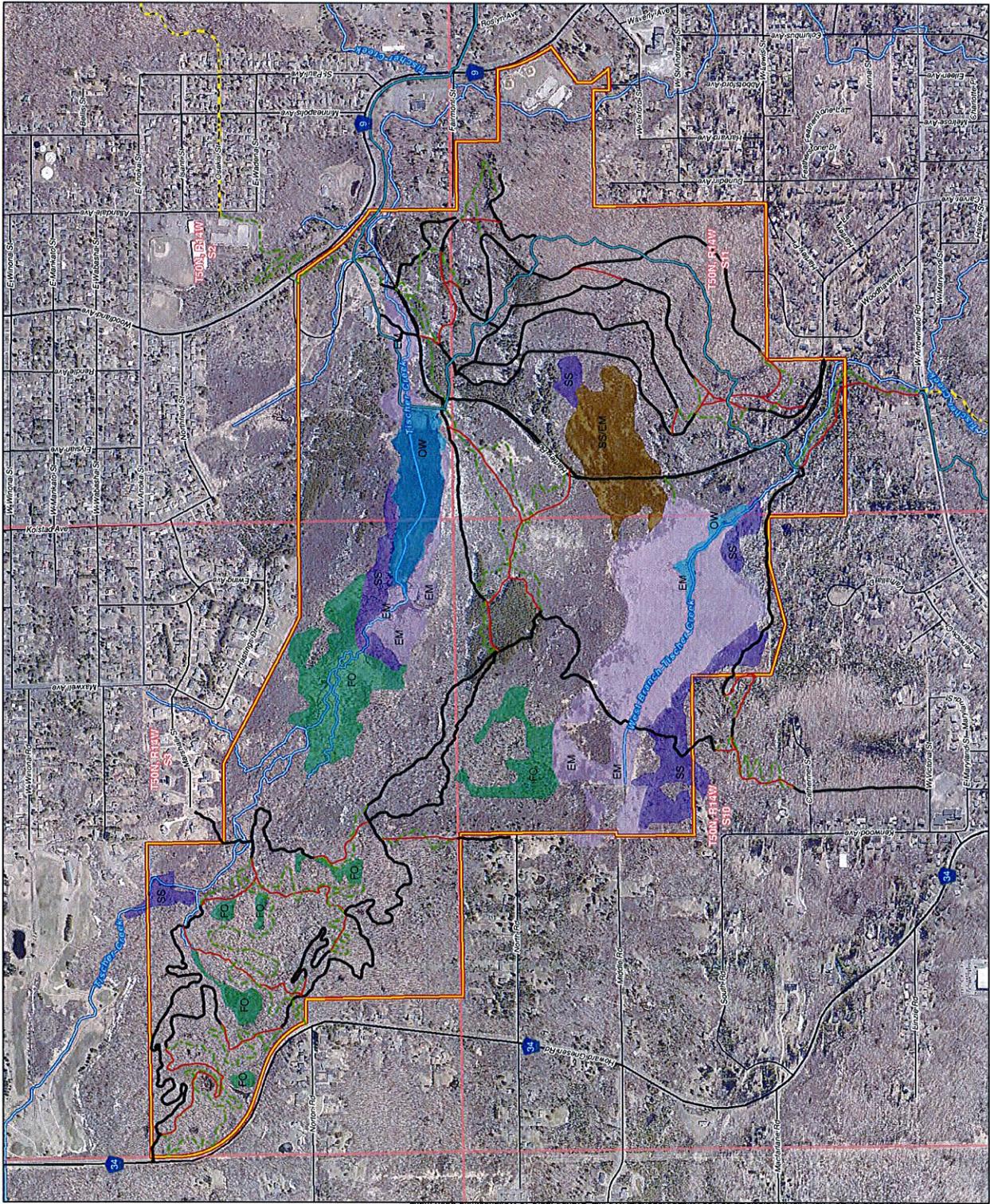
HYDRIC SOILS
Hartley Park EAW
City of Duluth, Minnesota





1 Inch = 800 Feet
 St. Louis County Imagery Circa May, 2013

WETLANDS (City of Duluth)
 Hartley Park EAW
 City of Duluth, Minnesota



Appendices

Appendix A

SHPO Review Letter of Proposed Improvements to Hartley Park

STATE HISTORIC PRESERVATION OFFICE

December 19, 2014

Ms. Kathleen Bergen
Manager, Parks and Recreation
City of Duluth
City Hall – Ground Floor
411 W. First Street
Duluth, MN 55802

RE: DNR Legacy Grant: Improvements to Hartley Park
Duluth, St. Louis County
T50 R14 S2, 3, 10, 11
DNR Number: PL 14-002
SHPO Number: 2015-0733

Dear Ms. Bergen:

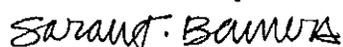
Thank you for the opportunity to comment on the above project. It has been reviewed pursuant to the responsibilities given to the Minnesota Historical Society by the Minnesota Historic Sites Act and the Minnesota Field Archaeology Act.

We have reviewed the cultural resources survey report that was prepared for this project. Based on the results of the survey, we conclude that there are no properties listed in the National or State Registers of Historic Places, and no known or suspected archaeological properties in the area that will be affected by this project.

Please note that this comment letter does not address the requirements of Section 106 of the National Historic Preservation Act of 1966 and 36CFR800, Procedures of the Advisory Council on Historic Preservation for the protection of historic properties. If this project is considered for federal assistance, or requires a federal permit or license, it should be submitted to our office by the responsible federal agency.

Please contact our Compliance Section at (651) 259-3455 if you have any questions on our review of this project.

Sincerely,



Sarah J. Beimers, Manager
Government Programs and Compliance

Cc: Audrey Mularie, DNR Division of Parks and Trails

Appendix B
Typical Trail Designs

7

Winter-Use Trails



Winter trail activities have a long history in Minnesota. The extensive winter trail systems across the state allow outdoor enthusiasts ample opportunity to pursue their interests.

In traditional/classic style cross-country skiing the skier uses a kick and gliding motion to move forward within a set track – which in most park settings is machine set, as shown in this photo. In wilderness settings, the track is most often set by the lead skier “breaking” trail.



Skate skiers use a skating motion to move forward following a groomed trail surface without a track. Skating trails are almost always machine groomed, as shown in this photo (to the right of the set traditional track).

OVERVIEW

Winter-use trails serve a wide array of users. Although there are some common features, each trail has unique design and grooming requirements that greatly affect the user's experience.

WINTER TRAIL CLASSIFICATIONS

As defined in Section 4 – Trail Classifications and General Characteristics, a number of classifications fall under winter use trails, including:

- Cross-County Ski Trail
- Snowshoeing Trail
- Winter Hiking Trail
- Dogsledding Trail
- Skijoring Trail
- Snowmobile Trail

The following considers each of these in greater detail.

CROSS-COUNTRY SKI TRAIL

The following provides general design and grooming guidelines for cross-country ski trails. As with other types of trails, the guidelines are not intended to be a substitute for site-specific design that responds to local conditions, development requirements, and safety concerns.

CROSS-COUNTRY SKIING STYLES

Groomed cross-country ski trails typically accommodate two distinct skiing styles: Traditional/classic and skating style. Each of these styles has specific trail width and grooming requirements, as the following photos illustrate.

TRAIL TREAD WIDTHS AND CONFIGURATIONS

The physical space required for the two styles of skiers provides the base-line for determining the optional width for cross-country trails. The configuration of trails also affects the width of the trail, as the following graphic illustrates.

TYPICAL TRAIL WIDTHS FOR CROSS-COUNTRY SKI TRAILS

Trail widths vary considerably to accommodate the two styles of skiing. The following defines the basic trail widths and directional configurations for each type of cross-country ski trail commonly found in Minnesota. (These correspond with the cross-country ski trail configurations defined in Section 4 – Trail Classifications and General Characteristics.)



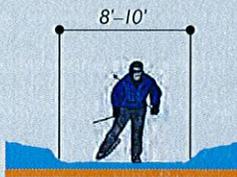
Generally used in a casual park setting or trails in less frequently used county, regional, and state parks. Grooming is limited and trails are often tracked by local users. One direction is used where use levels are higher, otherwise direction of use is often informal and two way.

Traditional (Classic) Style - One Track Set/One or Two Direction



The most common type of groomed trail in many state parks and less frequently used regional or county parks. Routinely groomed, especially after a snowfall of a couple inches or more. One direction is used on busy and/or more challenging trails. Otherwise, two-way trail is most common.

Traditional (Classic) Style - Two Track Set/One or Two Directions



Occasionally used in county, regional, or state parks where use pressures are high and/or where separation of skiing styles is preferred. Also occasionally used as a connector trail from one loop to the next.

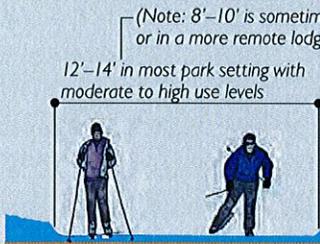
Skate Style - Single Width/One Direction



Occasionally used in county, regional, or state parks where use pressures are high and/or where separation of skiing styles is preferred.

Not as common as combination trails due to increased kilometers of trails needed to accommodate separated uses, and the additional time needed to groom the trails.

Skate Style - Double Width/One or Two Directions



(Note: 8'-10' is sometimes used with low use levels or in a more remote lodge-to-lodge setting)

12'-14' in most park setting with moderate to high use levels

The most common trail configuration in county, regional, and state parks where both styles of skiing are accommodated. Suitable for moderate to high use levels.

One directional use helps avoid confusion and conflict and keeps overall tread width a bit narrower.

Combination Traditional and Skate Style - One Direction

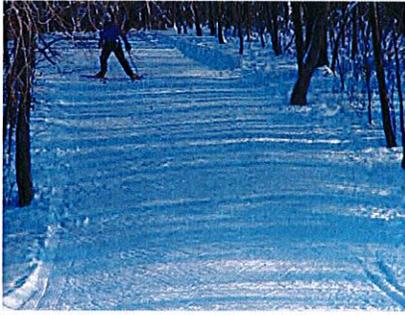


This trail width is generally used in transition areas, near a trailhead, and where use levels are very high and more maneuvering space is needed for skiers.

Also used as a linear connector between loops where two-direction use must be accommodated.

Combination Traditional and Skate Style - One or Two Directions

The trail widths as shown in the graphic are general and are often modified to accommodate site-specific conditions. For example, trail widths are often increased on steep hills to allow skiers to herringbone up or snowplow down, or to provide adequate space at the bottom of a slope for run-outs. Long uphill may also require extra width to allow moving skiers to pass resting ones. Trailhead areas and trail intersections and transition zones where skiers often congregate often warrant wider trails to avoid congestion. At busier trails, consider providing a wider trail for the first 1/4 to 1/2 kilometer from the trailhead to allow skiers to spread out and let faster skiers get past slower ones. The following photos illustrate a variety of situations where widening the trail has merit.



This short but steep hill climb has been widened by grooming equipment (and use) to allow faster skiers to pass slower ones without crossing skis. Notice how the track on the right ceases to exist since traditional style skiers tend to use a herringbone stride to get up the hill. Too narrow of a trail up a hill this steep can be very annoying to skiers. This segment is about 16 feet wide.



This longer hill "grind" forces many skiers to take a break part way up. Without some extra width, a hill like this can become congested quickly as resting, traditional, and skate skiers all jockey for position to avoid losing momentum. In these cases, the groomed part of the trail should be wide enough for a skate skier to pass another skier doing a herringbone maneuver. This segment is about 16 feet wide.



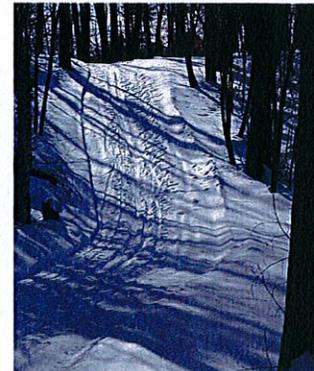
This uphill section does not require much trail widening since it is gentle and short enough for either style of skier to maintain form and make it up with relative ease. This segment retains the recommended 12- to 14-foot width.



Although not excessively steep, this downhill run warrants a slightly wider run-out area on the right side since it transitions quickly into a sharp curve with trees on the outside of it. Note the loss of the track as skiers break their speed using a snowplow maneuver. It only takes one snowplower to wipe out the track, forcing all that follow to also snowplow, thereby compounding the problem.



Trails are commonly widened at intersections since it is common for skiers to stop and decide on which direction to go and/or catch their breath. These areas should be wide enough to allow through-skiers to continue on unimpeded.



On this steeper uphill section, this two-track traditional trail only widens a foot or two to accommodate herringbone or snowplowing skiers. With light levels of use, there is no reason to make the trail wider on a hill.

Make sure clearance of brush takes snow load into consideration!

Brushy material that might hang into the trail once it gets loaded with snow should also be removed when the trail is being prepared for the ski season.

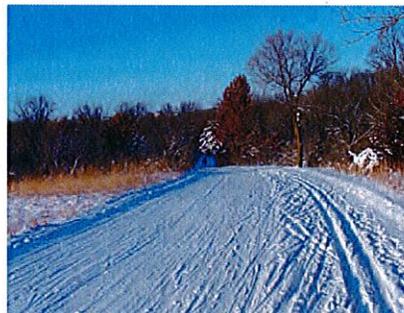
TRAIL CLEARANCE ZONES

The clearance zone is defined as the physical space above and on either side of the trail that is free from obstructions. A 10-foot vertical clear area is recommended for all ski trails. This clear zone is especially important and may have to be enlarged when larger grooming equipment is used. The vertical clearance zone should also take into consideration the depth of the snow since the grooming equipment will sit on top of it.

The horizontal clearance zone should extend a minimum of 24 inches on either side of the groomed area to provide enough extra space for a skier's pole or ski to occasionally flail out and not catch on brush and tree limbs. It also provides more space for the grooming equipment to maneuver. The horizontal clearance zone should also increase around corners at the base of a hill where skiers are most likely to fall or go off the trail and catch a ski on brush or run into a tree. The extent to which this should occur is a matter of site-specific evaluation. The following photos illustrate common clearance zones adjacent to ski trails.



This is a common example of a comfortable clearance zone adjacent to a groomed and tracked trail. The clearance zone is especially important where trees and brush are present on downhill runs.



In grassy areas, the clearance zone is less obvious and less important since this type of vegetation is less likely to catch a pole or ski and skiers are less likely to be injured if they ski off the trail.



This two-track traditional trail through the woods is nicely groomed and has appropriate clearance zones for a pleasant experience.

TRAIL GRADES, CURVES, AND SIGHT DISTANCES

Cross-country ski trails should provide a variety of terrain consistent with the desired difficulty level. As a general rule, one-third of a given trail should be uphill, one-third should be downhill, and one-third should be undulating or rolling grade. The height and steepness of uphill and downhill should be consistent with the trail difficulty rating as described in Section 4 – Trail Classifications and General Characteristics and the guidelines in the following table.

CROSS-COUNTRY TRAIL GRADE GUIDELINES

The table provides general guidelines for trail grades relative to trail difficulty ratings associated with general use cross-country ski trails.

Aspect	Easy	Intermediate	Expert/Advanced
Avg. trail grade	4%–10%	6%–12%	> 12% (most challenging loops)
Max. hill grade	10%–12%	12%–18%	>18, with 40% max. for short distance
Avg. total climb per km	10–15 m/30–50 ft	15–25 m/50–80 ft	25–35 m/80–115 ft
Max. hill height	10–30 m/30–100 ft	30–50 m/100–165 ft	50–80 m/165–260 ft

Combining easier and more difficult trails!

Note that a trail cutoff can be used to bypass challenging hill climbs or descents. This allows an otherwise expert trail to be used as part of an easier or intermediate trail loop.

The maximum hill height and grade are important considerations in trail design in that most skiers are not experts and can become frustrated (and less likely to return) if the trails are consistently too difficult. As defined in Section 4, easy to intermediate trails should make up the core system of trails, with expert level trails being “stacked” onto these trails. For beginning skiers, an average gradient of 4 percent is preferred across a pleasant, undulating terrain. Climbs should be less than 10 meters in height at a maximum grade of 9 percent.

Even on more difficult trails, steeper and longer climbs should be broken up with short, level sections for brief resting areas. This is especially the case on easy trails, where anything above 10 percent can be too challenging to negotiate for recreational skiers. As common practice, steep uphill should be kept to a minimum on all but advanced trails since relatively few skiers have the skills and stamina to really enjoy them.

DOWNHILLS

The design of downhill runs is especially important with cross-country ski trails. In general, the longer and steeper the run, the straighter and longer the run-out area needs to be at the bottom of the hill. As a general guideline, the run-out should be at least as long as the slope in order to dissipate speed and allow a skier to regain any loss of control before a sharp curve or another downhill section. If space is limited, a rise in grade at the bottom of the slope can be used to offset the loss of run-out distance. Also, the clearance zone along and at the bottom of a downhill run should be ample enough to allow a skier to fall and slide off-trail several feet without running into a tree or heavy brush. Long downhill should also be avoided on most trails since the average skier is not comfortable with excessive speed.

On two-direction trails, the trail should be wide enough to completely separate uphill and downhill skiers when trail grades exceed 8 to 10 percent. This can be accomplished by widening the trail or by providing separate trails for uphill and downhill skiers.

CURVES

Since most skiers are not experts and are likely to lose control from time to time, sharp curves at the bottom of a hill should simply be avoided. “Sharp” is defined as any curve radius that is tight enough where the average skier can be thrown off-balance. As a general guideline, a radius of 100 feet or more is preferred, with 50 feet being the minimum on non-hill sections of the trail. For tracked trails, average skiers should be able to stay in the groomed track as they proceed down the slope. Average skiers should not have to rely upon a snowplowing technique to proceed down a slope on a recreational-level ski trail.

If a curve is needed through a downhill section, it should be as long and gentle as possible to avoid throwing the skier off balance. Widening the trail and adding additional clearance on the outside of the curve should also be considered to provide enough space for out-of-control skiers to regain their stride, or to fall and slide a few feet outside the groomed trail. A widened trail also provides more space for advanced skiers to pass slower ones through these sections with greater ease. In situations where a curve at the end of a downhill cannot be avoided, a warning sign at the top of the slope should be provided, typically about 100 feet before the beginning of the slope.



This long downhill is made easier by having open sightlines and enough undulations to slow skiers and help them avoid excessive speeds and loss of control.



The gentle curve of this trail controls sightlines and piques skiers' interest about what is around the corner. Juxtaposition of longer sightlines with intimate spacing using curves is appealing to skiers.

Although curves through downhills should be carefully considered, taking all of the challenge out of a ski trail by making it too straight, uninteresting, and less challenging should also be avoided. For high-level trails, curves through a downhill can be part of the desired experience as long as reasonable precautions are taken with run-out area and clear zones. An alternative approach is to provide a bypass around a more difficult section that allows skiers to choose the level of challenge best suited to their skill level. A well-placed bypass could be a de facto run-out that allows even more advanced skiers to “bail out” if they misjudge the curve. Signage is recommended in these instances to alert skiers to the options.

Where curves are provided through or at the base of a downhill, a modest superelevation may have merit to keep skiers in the set track. Since this often allows skiers to go faster, providing an adequate run-out and clearance area on the outside of the curve remains an important safety consideration. A maximum superelevation of 4 or 5 percent is recommended.

SIGHT DISTANCES

Although not as critical as some types of trails, reasonable sight distances should still be provided along a ski trail. As a general guideline, a sight distance of 100 feet is optimal, especially through sharp curves or downhill sections. The recommended minimum is 50 feet to ensure that skiers can see and react to approaching trail conditions.

The following photos illustrate a variety of trail grades, curve situations, and sightlines encountered on cross-country ski trails.



This gentle curve through a long but not too steep downhill is fun and skiers can stay in control. The long run-out at the bottom provides a nice, slightly uphill transition into another downhill segment.



The approach to this short but steep hill section is long and straight, allowing a skier to build momentum for the climb.



Skiers can readily see the trail ahead as they descend along this modest downhill. The curvilinear character of this trail through the woods adds to its appeal.



Managing sightlines can add excitement to a ski trail experience. In this photo, skiers get a hint of what is to come, yet the full scene is not exposed until they reach the corner and the view of a riverway is framed by the rock outcrops.

TREAD PREPARATION

The tread refers to the underlying trail beneath the compacted and groomed snow. Proper off-season evaluation of trail alignments and tread surface preparation and maintenance is critical to setting the stage for quality cross-country ski trails. The following considers the most important aspects of preparing the tread for winter use.

TRAIL ALIGNMENT

Section 4 – Trail Classifications and General Characteristics, considered cross-country trail alignment in terms of laying out a system of trails with varying levels of difficulty. In the context of the tread surface, alignment refers to locating trails where snow will remain the longest and be most stable. One of the biggest factors in this regard is sun intensity, especially later in the season when the sun begins to build strength and more quickly melts the snow surface in exposed areas.



Hardwood forests help shield the trail from sun, which helps extend the season. The only downside is that maintaining a grass ground cover can be more challenging in the summer for the same reason – especially if the trail is also used for summer hiking. Limiting summer access or using an alternative surface, such as woodchips, are possible solutions.



Excessive pine needles dropping on the trail can be very annoying to skiers. Where this is a persistent problem, the trail corridor may have to be selectively opened up or the trail rerouted to a less problematic corridor.

Hardwood forests are usually well suited for ski trails because the sun is less intense and the air temperature is slightly colder than open areas. Using changes in topography to reduce the extent of direct sun on the trail can also be an effective strategy. This is especially the case along the base of north-facing slopes where the sun is usually less intense relative to wide-open flat areas. Avoid locating ski trails along the base of south facing slopes whenever possible since the sun tends to be the most intense in these areas, especially in open settings.

Running a trail through a coniferous forest also poses some problems with pine needles and cones dropping on to the trail and sticking to the skis, thereby slowing down the skier. Where this situation cannot be avoided, the clearance zone may have to be widened to prevent excessive needle accumulation on the trail.

In open, shortgrass prairie areas, wind can strip snow from or deposit drifting snow on the trail, both of which make for poorer skiing conditions and require more frequent grooming. Before a trail is permanently established, potential alignments in wind-swept areas should be field tested over one or two seasons to determine seasonal wind effects and snow displacement patterns. Even relatively minor shifts in the location of a ski trail can make a dramatic difference in the impact wind will have on it.

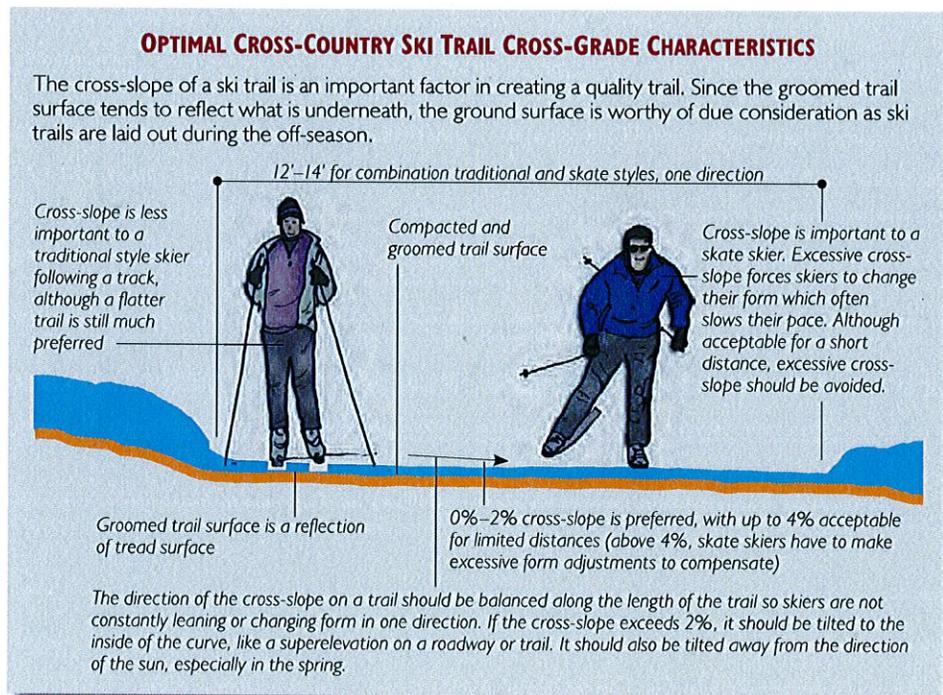
In tallgrass prairies, wind and sun are less of a concern since the grasses are high enough to shade the trail and reduce sun exposure. As with shortgrass prairies, field testing the alignment of a trail over one or two seasons can be beneficial to determining the most advantageous location to hold snow.

TREAD CHARACTERISTICS

The trail tread is another major consideration in the development of quality ski trails. The cross-section, trail surface, summer uses, and erosion are all reflected in the groomed surface of the trail and factor into overall trail quality.

Trail Cross Grades

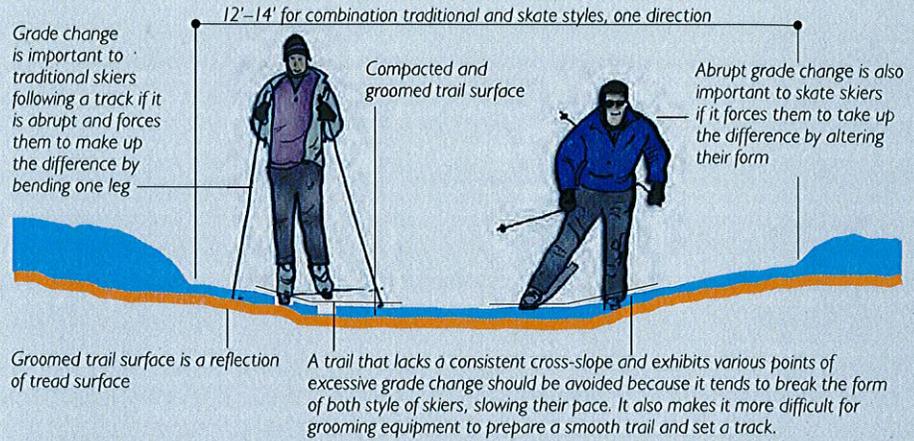
The optimal ski trail cross-section is of a consistent, even grade with a 0 to 2 percent cross-slope, as illustrated in the following graphic.



As illustrated, an evenly sloped grade across the trail is important to both styles of skiers in order to maintain an optimal skiing form. Abrupt grade changes or general unevenness across a trail should be also avoided to make trails easier to groom and more enjoyable to ski on. The following two graphics illustrate these conditions.

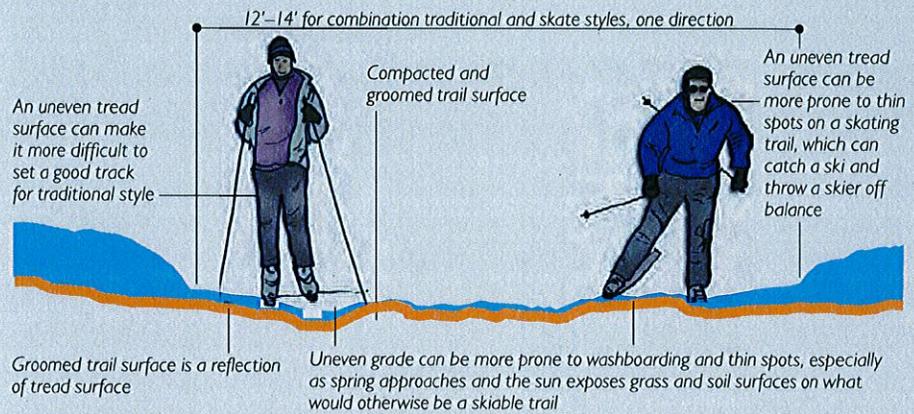
ABRUPT TREAD CROSS GRADES

Abrupt trail cross grades negatively affect the form of both styles of skiers, depending on the degree to which it occurs and the skill of the skier. While more advanced skiers can more easily compensate for grade changes in their form, novice and recreational skiers can find it frustrating.



EXCESSIVE TRAIL UNEVENNESS

Excessive trail unevenness negatively affects the form of both styles of skiers. It also requires more snow to establish a base. Although good grooming technique can smooth out some of the rough spots on the tread surface, excessively uneven areas should be avoided because they can be more prone to washboarding and thin spots.



The following photos illustrate some of the previously described cross-section conditions.



The nice even trail tread with a slight cross-slope is well suited for a two-track set through the woods, making for easy grooming and fun skiing.

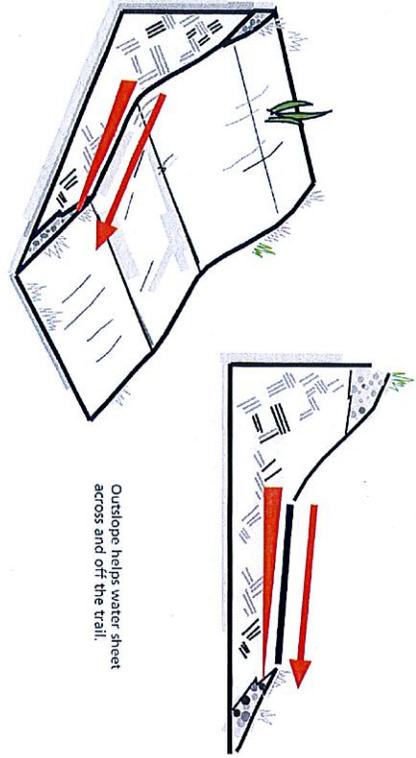


The cross-slope on this trail (arrow) is greater than desired but is not a major issue because it is only for a short distance. If this went on for a distance, skiers would find it annoying.

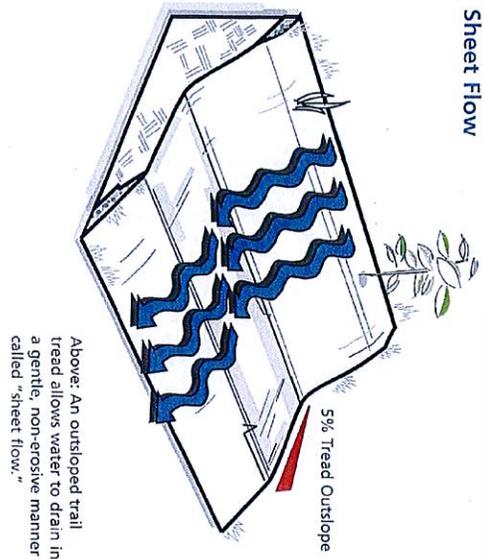


Even these simple ruts unintentionally caused by maintenance vehicles can cause an uneven surface that may be reflected in the ski trail, annoying both groomers and skiers.

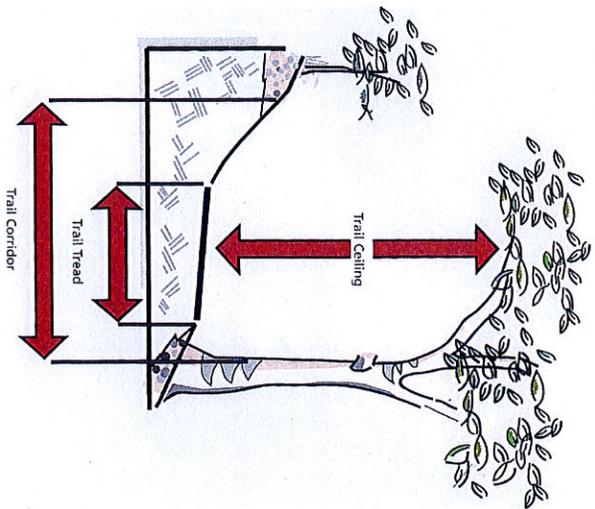
Outslope



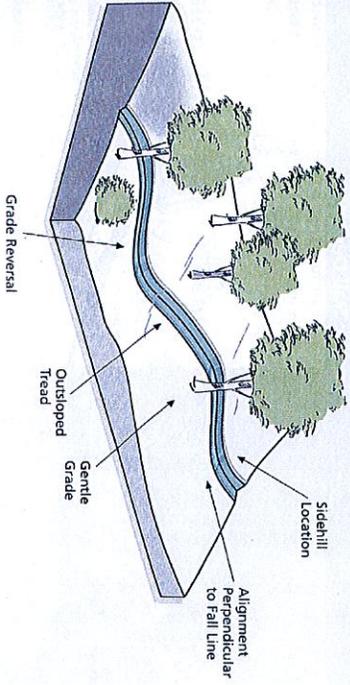
Sheet Flow



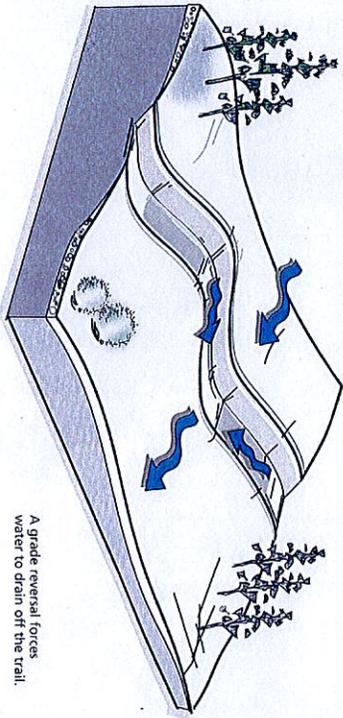
Trail Corridor



Rolling Contour Trail



Grade Reversal



A grade reversal forces water to drain off the trail.

All images provided courtesy of International Mountain Bike Association (IMBA)

Figure B2

International Mountain Biking Association (IMBA)
Trail Standards

Duluth, Minnesota



Appendix C

Parking and Boardwalk Designs



**ARCHITECTURAL
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- ARCHITECTURE
- ENGINEERING
- LANDSCAPE ARCHITECTURE
- INTERIOR DESIGN

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**DULUTH
TRAVERSE
TRAIL**

**Example for
Hartley Park**

DULUTH, MINNESOTA

PROJECT NO.: 12-039

DATE: JANUARY-2013

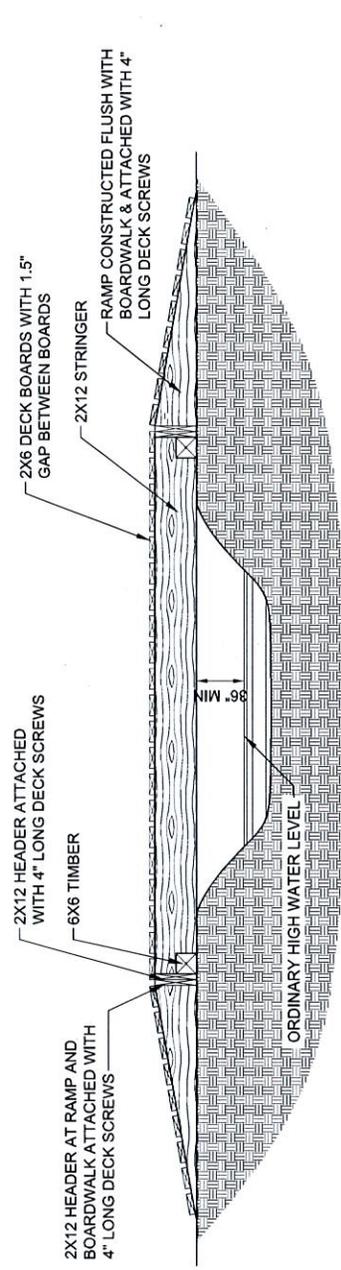
DRAWN BY: TTP

REVISIONS:

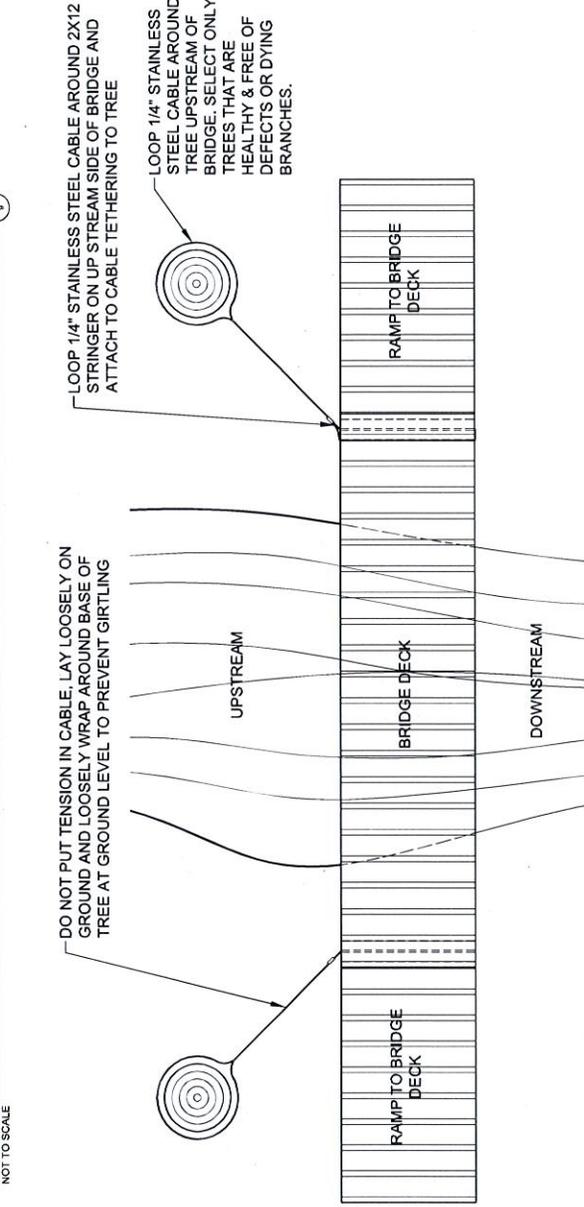


**TRAIL
DETAILS**

Figure 1



TYPICAL ELEVATION DETAIL FOR BRIDGE (CREEK CROSSINGS)
NOT TO SCALE



TYPICAL PLAN DETAIL FOR BRIDGE (CREEK CROSSINGS)
NOT TO SCALE

- MATERIAL NOTES:**
- LUMBER SHALL BE ROUGH SAWN RED PINE #2 OR BETTER, SIZED TO THE FULL DIMENSIONS SHOWN ON THE PLANS UNLESS NOTED OTHERWISE. ALL LUMBER SHALL BE TREATED ACCORDING TO THE OPTIONS INDICATED BELOW.
 - TREATMENTS OTHER THAN THOSE LISTED MUST BE APPROVED BY THE ENGINEER PRIOR TO BIDDING.
 - LUMBER SHALL BE TREATED IN ACCORDANCE WITH AWPA STANDARD C2/C3.
 - PRESERVATIVES FOR MEMBERS NOT IN GROUND CONTACT SHALL BE AOC (0.4 LBS/CF RET.)
 - PRESERVATIVES FOR 6x6s OR OTHER MEMBERS IN GROUND CONTACT SHALL BE AOC (0.60 LBS/CF RET.)
 - FIELD TREATMENT: ALL FIELD CUTS AND DRILLED HOLES SHALL BE SATURATED WITH 2 COATS OF COPPER NAPHTHENE (2% SOLUTION). ALLOW TREATMENT TO ABSORB INTO WOOD PRIOR TO APPLYING SECOND COAT AS PER TREATMENT MANUFACTURER'S RECOMMENDATIONS.
 - WHENEVER POSSIBLE APPLY THIS TREATMENT AWAY FROM WATER. USE EXTRA CARE IN THIS TREATMENT PROCESS NEAR OR OVER WATER. REFER TO MANUFACTURER'S RECOMMENDATIONS.
 - HARDWARE
 - POT DIP GALVANIZED (TRIPLE DIPPED): ALL HARDWARE SHALL MEET ASTM A307, HOT DIP GALVANIZE ALL HARDWARE IN ACCORDANCE WITH ASTM A153.
 - ATTACH DECKING TO STRINGERS WITH 4" X #10 SCREWS.
 - TWO PER DECK BOARD TO EACH STRINGER CONNECTION.
 - ATTACH STRINGERS TO PIERS WITH 3/8" DIA. LAG SCREWS WITH FLAT WASHER ON HEAD END. TWO LAG SCREWS PER STRINGER TO PIER CONNECTION.
 - ATTACH 6x6s TOGETHER WITH 10" LONG RING-SHANK SPIKES. STAGGER SPIKES - MINIMUM OF 4 SPIKES FOR EACH 6x6 TO 6x6 CONNECTION.
 - ATTACH HEADERS TO STRINGERS WITH 4" LONG X #10 SCREWS. THREE PER HEADER TO STRINGER CONNECTION.
 - ATTACH HEADER AND STRINGER TO 6x6 BLOCKING WITH 4" LONG X #10 SCREWS. TWO PER HEADER TO LEVELING GRADE BEAM OR STRINGER TO LEVELING GRADE BEAM CONNECTION.
 - LEVELING GRADE BEAMS SHALL BE SHIMMED LEVEL WITH 2 X 6 ROUGH SAWN RED PINE #2 OR BETTER SIZED TO THE FULL DIMENSIONS SHOWN ON PLAN.
 - PRESERVE LUMBER IN ACCORDANCE TO ABOVE AWPA PRESERVATION TREATMENT.
- GENERAL NOTES:**
- SEE SPECIFICATIONS SECTION 3 FOR PROJECT DETAILS
 - SEE SPECIFICATIONS SECTION 4 FOR FINISHED TRAIL CONSTRUCTION DETAILS.
 - SEE SPECIFICATIONS SECTION 5 FOR UNIT DEFINITIONS AND TREAD CONSTRUCTION DETAIL DRAWINGS.
 - ALL DISTURBED AREAS NOT PART OF ACTIVE TREAD TO BE SEEDED AND MULCHED WITHIN 7 DAYS OF NOT BEING WORKED. SEE (SWPPP) STORM WATER POLLUTION PREVENTION PLAN FOR DETAILS.
 - CUT BRUSH AND SLASH MUST BE DISPOSED IN AN UPLAND LOCATION AND MUST BE KEPT OUT OF STREAMS, GULLIES, SWALES, WETLANDS, AND LOW AREAS. SEE SPECIFICATIONS FOR DETAILS.
 - NO EXCAVATION OR FILL PERMITTED IN WETLANDS CONSULT WITH OWNERS REPRESENTATIVE PRIOR TO DOING ANY WORK WITHIN SUSPECTED WETLAND AREAS.

**Preliminary Example for Hartley Park
Subject to final design**

Appendix D

Hartley Nature Center Fish and Wildlife Species



HARTLEY NATURE CENTER

Natural History. Stewardship. Sustainability.



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Frogs, Toads, and Salamanders



Over the last ten years, we have been conducting regular listening surveys at the great number of vernal and ephemeral pools throughout the park. Our listening surveys (monitoring), based on the Thousand Friends of Frogs listening survey protocols from Hamline University, are conducted in the spring and summer.

Many Frogs, Toads, and Salamanders make Hartley Park their home. Popular locations for spotting amphibians in the park include Fairmont Pond and along the shore of Hartley Pond. To learn more about amphibians in Hartley Park, click on the links below. You can also purchase books on amphibians at the Hartley Nature Center store.

FROGS & TOADS

Common in Hartley Park:		Less common in Hartley Park:	
Wood Frog	Spring Peeper	Green Frog	American Toad
Western Chorus Frog	Gray Treefrog	Northern Leopard Frog	Mink Frog

[Hartley Frog and Toad locations map](#)

[2010 Frog Survey results](#)

SALAMANDERS

Eastern Red-backed Salamander	Blue-spotted Salamander
---	---

[Hartley Salamander locations map](#)



This page is in memory of Eric Bloomquist, who left us some months after he graduated from Duluth East High School in 2007. Eric loved frogs and held frog parties for his frog-loving friends. His jokes kept his classmates and friends in the "Cookie Club" in room 131 and everyone who knew him in good spirits.

HARTLEY NATURE CENTER

3001 Woodland Ave
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218-724-6735

info@hartleynature.org

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Monday-Friday: 9-5
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[Home](#) > [Hartley Ecology](#) > [Birds](#) > Most Common Birds

Some of Hartley's Most Common Birds

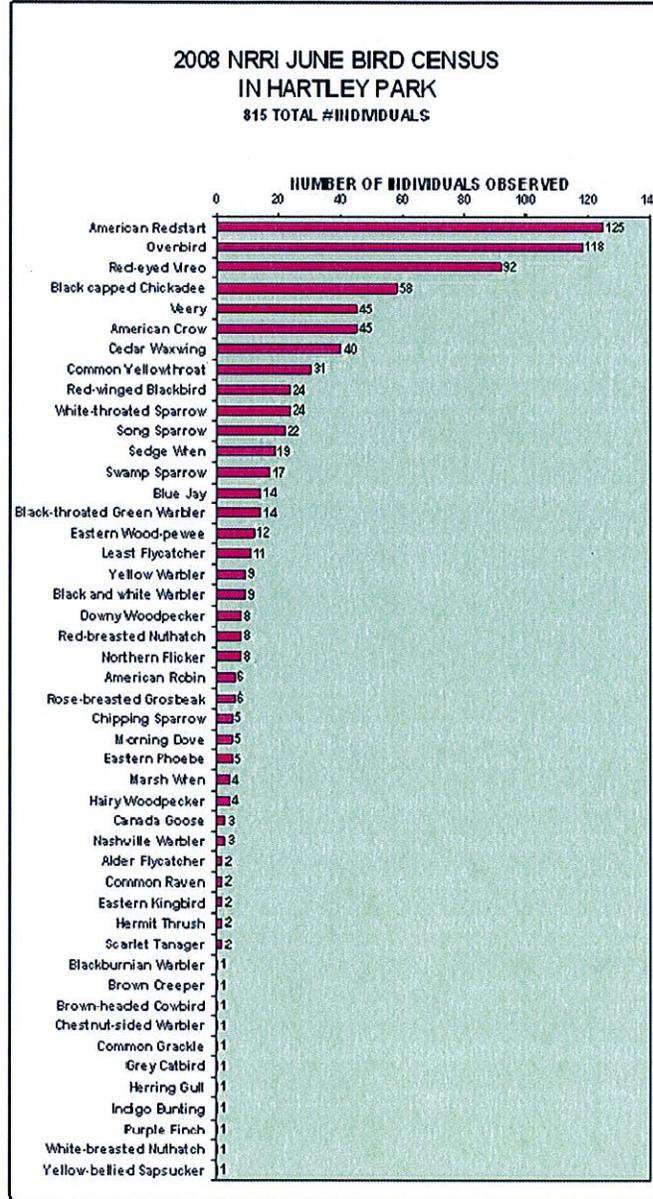


CHART 1: NRRI Breeding Bird Survey 2008
[Click here for data from 2007](#)



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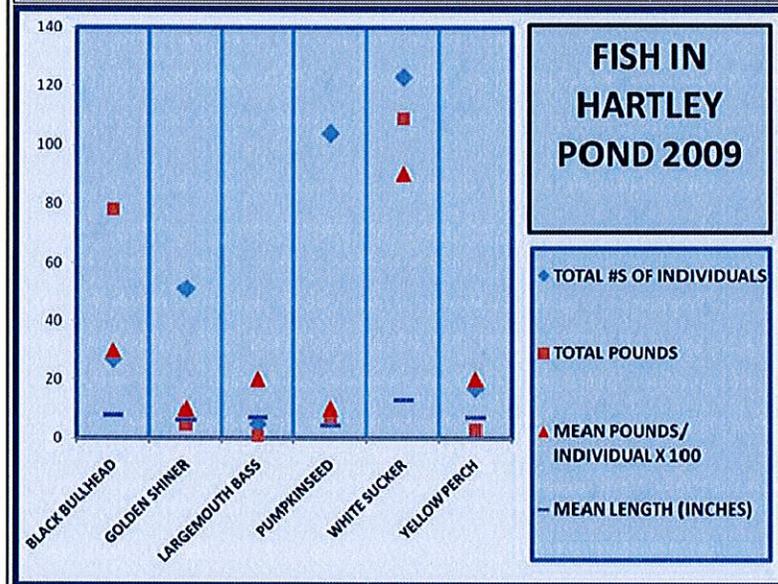
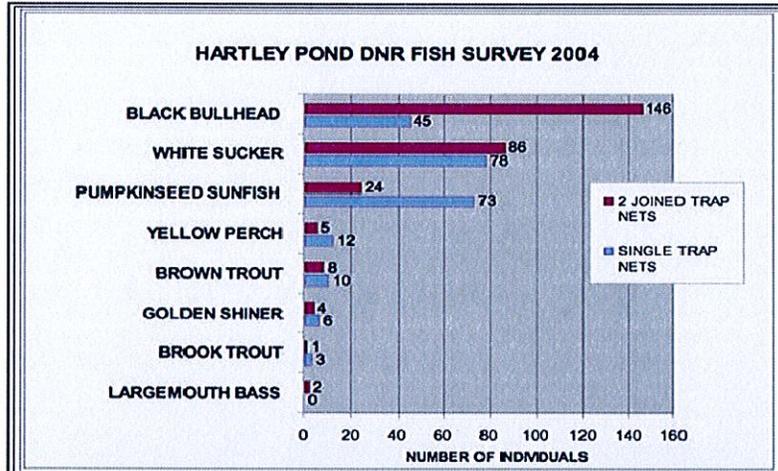
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Fish



Links to more information on the fish found in Hartley Pond

[Black Bullhead](#)

[White Sucker](#)

[Golden Shiner](#)

[Largemouth Bass](#)

[Yellow Perch](#)

[Brook Trout](#) are stocked every year into Tischer Creek by the MN DNR

[Brown Trout](#) apparently were one of the earliest fish species recorded to live in Hartley Pond. Also they have been stocked into Hartley Pond in recent years.

[Pumpkinseed Sunfish](#)

Also consider visiting the [MN DNR website](#)



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Mammals



Mammals in Hartley Park range from our occasionally seen bear and fox and frequently seen deer, to much rarer species, including ermine, fisher, otter, pine marten, and coyote. Small mammals, such as mice, shrews, squirrels, and chipmunks abound. Ecologically, mammals serve as excellent indicators of food-chain dynamics, especially in urban environments, where sightings are much more rare and encounters often occur only by the side of the road or beneath the tires. For these reasons, diligent data management and utilization of GIS mapping technologies are all the more important for their study, as long-term tracking may help guide our maintenance and policies within the park.

LARGE MAMMALS

- [Red Fox](#)
- [Northern River Otter](#)
- [American Marten](#)
- [White-tailed Deer](#)
- [Black Bear](#)

SMALL MAMMALS

- [Red Squirrel](#)
- [Meadow Vole](#)
- [Northern Short-tailed Shrew](#)
- [Eastern Chipmunk](#)
- [Eastern Gray Squirrel](#)

HARTLEY PARK MAPS

- [Otter Sightings](#)
- [Pine Marten Sightings](#)
- [Red Fox Sightings](#)

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Snakes and Turtles



At Hartley we do not have the same sort of data for the reptiles of the area as we do for our amphibians and birds. Snakes and turtles cannot be monitored by sounds, so any data relies on people seeing them. We do keep record of reported sightings, but it may be a while before data is available for viewing.

SPECIES FOUND IN HARTLEY PARK	
Snakes	Turtles
Common Garter Snake Red-bellied Snake	Painted Turtle Snapping Turtle Blanding's Turtle (uncommon)

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Appendix E

Forest Management Equipment and Systems

Conventional Logging System

The Conventional logging system is designed mostly to cut high volumes of low quality wood like pulpwood and chips. It usually deploys more equipment in the harvest area than a Cut to Length System. A harvester or feller buncher cuts the trees and “bunches” them in groups that a log skidder can pick up and pull tree length to the landing area or “pre skid” to a main skid trail. At the landing or main skid trail a delimeter takes off the limbs. At the landing a slasher cuts the delimbed trees into 8 foot lengths to be loaded on to trucks. A chipper chips some of tops and limbs or sometimes if markets dictate, the whole tree is chipped and blown into chip vans. The harvester can cut and bunch trees quickly in this system and most of the time two skidders are deployed to keep up with pulling the wood out to the landings. This system is most efficient during clear cutting but with good experienced operators they can also do a thinning.



Cut To Length (CTL) Logging System

Uses only two machines in the harvest area: A processor, which cuts the tree, takes off the limbs, and cuts it into lengths right at the stump. The second piece of equipment is a forwarder, which picks up the cut lengths and carries them to the landing area. Some CTL systems have only one machine. It is a combination forwarder that can change heads on the boom from a processing head to a grapple loading head.

The CTL system in theory has less impact on the forest and uses a smaller landing area. The tops and limbs are left out in the forest where the trees were cut. Chipping the tops and branches is not an option. If working in a sensitive area (like Hartley Park), a CTL system is generally quieter than a conventional system.

