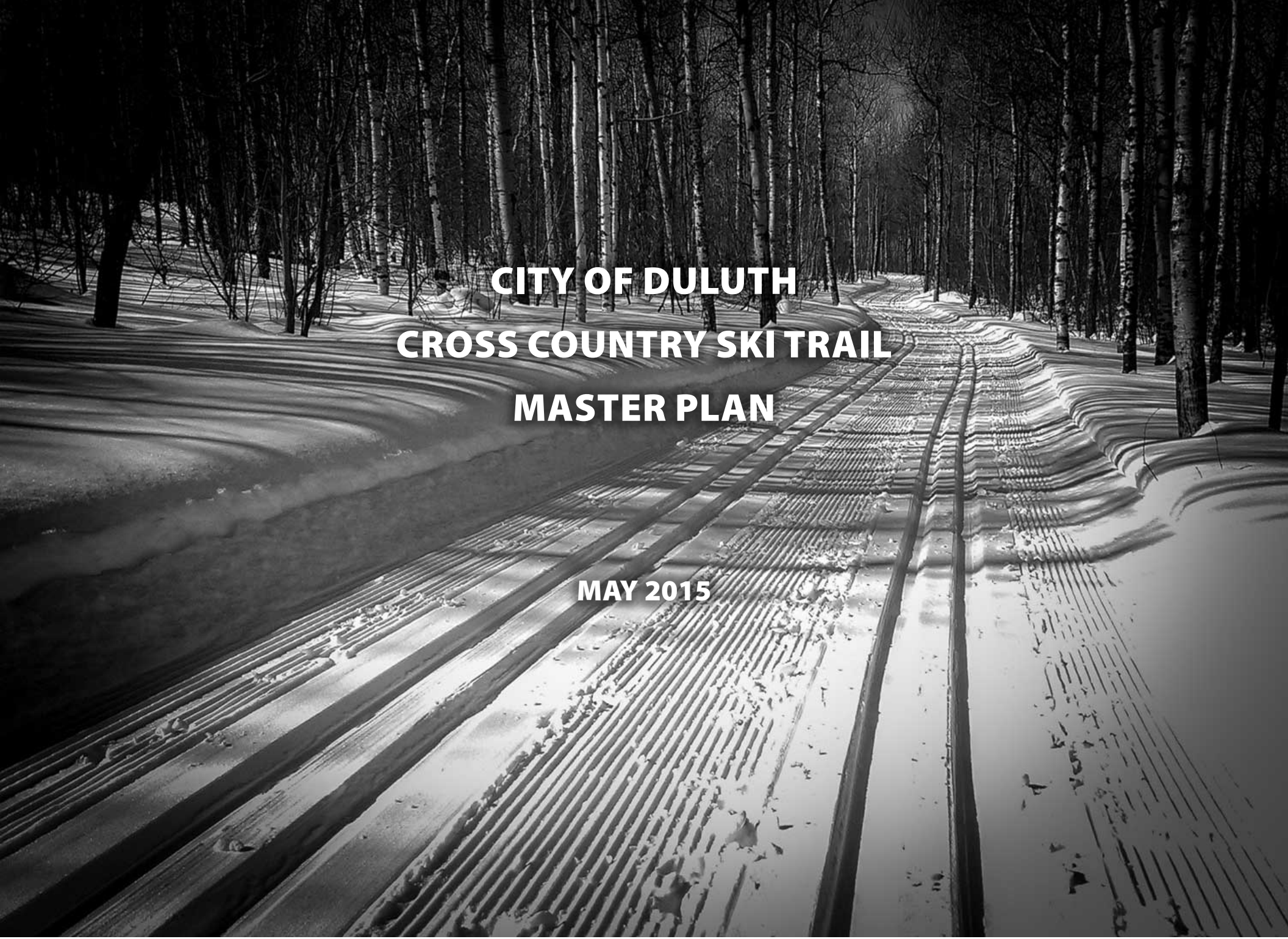


# CITY OF DULUTH
# CROSS COUNTRY SKI TRAIL
# MASTER PLAN

**MAY 2015**

Submitted by: Gary Larson • Gary Larson Sports LLC • Duluth • Minnesota

# Table of Contents


| | |
|---|---|
| Overview | 3 |
| Summary | 4 |
| City of Duluth Ski Trails | 5 |
| Chester Park | 6 |
| Chester Park Map | 7 |
| Hartley Park | 8 |
| Hartley Park Map | 9 |
| Lester-Amity | 10 |
| Lester-Amity Map | 11 |
| Magney-Snively | 12 |
| Magney-Snively Map | 13 |
| Piedmont Park | 14 |
| Piedmont Park Map | 15 |
| Spirit Mountain | 16-18 |
| Spirit Mountain Map | 19 |
| Grand Avenue Nordic Center | 20-21 |
| Ski/Multi-Use Opportunities | 22 |
| Grooming | 23 |
| Ski Trail Width Recommendations | 24 |
| Grooming Equipment | 25 |
| Snowmaking | 26-27 |
| Signage and Wayfinding | 28-29 |
| Public Input | 30-32 |


DULUTH PARKS

*Fun Places, Great Spaces!*

# Overview

## City of Duluth

The City of Duluth is located at the western tip of Lake Superior, stretching nearly 38 kilometers along the elevated shore rising up to 255 meters above the lake. Winters historically have plentiful snowfall for cross country skiing.

Duluth has a strong winter sports heritage including: cross country skiing, ski jumping, snowmobiling, hockey and alpine skiing. Winter mountain biking has seen tremendous growth in the last several years.

## Skiing in Duluth

The City of Duluth maintains and grooms a total of 55 kilometers of cross country ski trails at 6 locations throughout the City. All but one of the trails is included in the Minnesota DNR grants-in-aid system which provides some revenue for grooming and maintenance.

One of the trails has 4.4 kilometers of lighted skiing. No trail is yet equipped with snowmaking. There is also one major private ski area in Duluth, Snowflake Nordic Ski Center. The center has 15 kilometers of trail, a chalet and lighted skiing. At UMD's Bagley Nature Area there are 2.7 kilometers groomed for classical skiing. Trails are also groomed at Duluth Marshall School for their school ski team.

College of Saint Scholastica is the only college in Duluth with an NCAA varsity ski team. Duluth East High School, Duluth Denfeld High School and Duluth Marshall School have competitive ski programs as part of the Minnesota State High School League.

## 2012 Flood

On June 20, 2012, there was a 500 year rain event that caused extensive damage to City of Duluth infrastructure. Parks were particularly hard hit, being located along the banks of streams. The ski trails lost several bridges and suffered major erosion in a number of places.

## John Aalberg Visit

Between July 21-25, 2012, John Aalberg, world renowned ski trail consultant and Olympic organizer, toured the trails in Duluth and reported on the possibilities for improving the trail system and needed mitigation relating to the damage sustained to the trails in the flood. This became the framework for this more in depth Master Plan.

## Master Plan Goals

The City created a Request For Proposal with the following stated goal for the Master Plan: "To provide a road map for cross country ski trail improvements and procedures within the Duluth ski trail system which will enhance the skiing experience and enable Duluth to become a regional and national cross country ski destination."

The findings for the Duluth Cross Country Ski Trail Master Plan would come from public meetings and focus group input. This input would be added to and help strengthen existing plans which include, the report presented by John Aalberg to the City after his visit in 2012, Duluth Parks and Recreation Master Plan, Spirit Mountain Master Plan and would dovetail with Duluth mini-master plans at Chester Park and Hartley Park.

## Professional Services Contractor Hired

In May 2013, Gary Larson was hired to provide professional services to prepare the City of Duluth Cross Country Ski Trail Master Plan. Gary has been immersed in the sport of cross country skiing for the last 40 years. His ski history includes: UMD Cross Country Ski Team, coach; US Cross Country Ski Team, coach; Giants Ridge, Biwabik, Minnesota, Nordic Director; 2002 Salt Lake Winter Olympics and Paralympics, Cross Country & Nordic Combined, Chief of Course; 2014 Paralympic Winter Games, Sochi, Russia, Jury member; International FIS Technical Delegate; Worldloppet Technical Delegate, Sapporo Japan, and Gatineau, Quebec.

## Duluth Cross Country Ski Club

Our thanks to the members of the Duluth Cross Country Ski Club (DXC) for all of their valuable help in bringing together the information in this report. Particularly the Trail Stewards and John Ipsen who put in countless hours to help improve the cross country skiing in Duluth. Thank you!

# Summary

Skiers in Duluth are passionate about their ski time. Most have a "favorite" trail that they return to frequently while others follow the groomer from trail to trail for variety. Most do have ideas on how the skiing in Duluth could become better and what is missing.

### Improvements

More frequent grooming
Grooming wider for skating
Keep walkers off trails
Groom earlier and later, in season
Grooming updates on-line
Better signage and wayfinding

### Additions

Snowmaking option
Additional skiing opportunities
Easier skiing options
Warming building
More lighting
Event center

By taking on these improvements and additions, Duluth will not only provide an enhanced cross country ski experience to "home towners" but can become a major national cross country ski destination at the same time. The City's charisma as a "trails" town is already attracting attention, primarily in the summer season but could do the same in the winter with enhancements on the trails, added opportunities, insurance against climate change and a long range focus on providing a consistently high quality experience for cross country skiers.

In order to be able to groom with minimal snow and save wear and tear on equipment, an ongoing annual summer trail maintenance project needs to be established. This project would be focused on bringing the surface of each trail up to a standard for width, drainage and surface irregularities. Work would be coordinated through the City with added volunteer workers. Some work could be done by hand with other work requiring excavator, small cat and some fill material. All trails could be reworked, where needed, in a 5-7 year plan. Twice a summer mowing and edge clearing, when needed, will prepare the trail for full width grooming and early snow skiing.

Once the snow arrives, packing successive snow falls to the full trail width will provide a solid base for the winter and harden the outside classical pole track. Once skiing begins, grooming needs to take place on a more frequent basis. Many ski areas groom trails every day but more realistically grooming should be done when it is needed. Trails such as: Lester-Amity with lights and higher use, Chester where walkers disturb the grooming and Spirit Mountain where wind causes drifting and fills in tracks may need additional grooming. With the possibility of wider trails, additional cross country trail kilometers and groomed trails for walkers, this would put even a heavier load on the existing grooming staff and equipment.

More grooming frequency is not as simple as driving faster, grooming needs to be done at a certain speed. More grooming hours could be accomplished in several ways: current City staff could put in more hours , additional seasonal staff could be hired to keep equipment running longer (second shift), additional equipment could be purchased and seasonal staff hired, the City could contract for additional grooming, and volunteers could provide additional grooming support with club or private equipment.

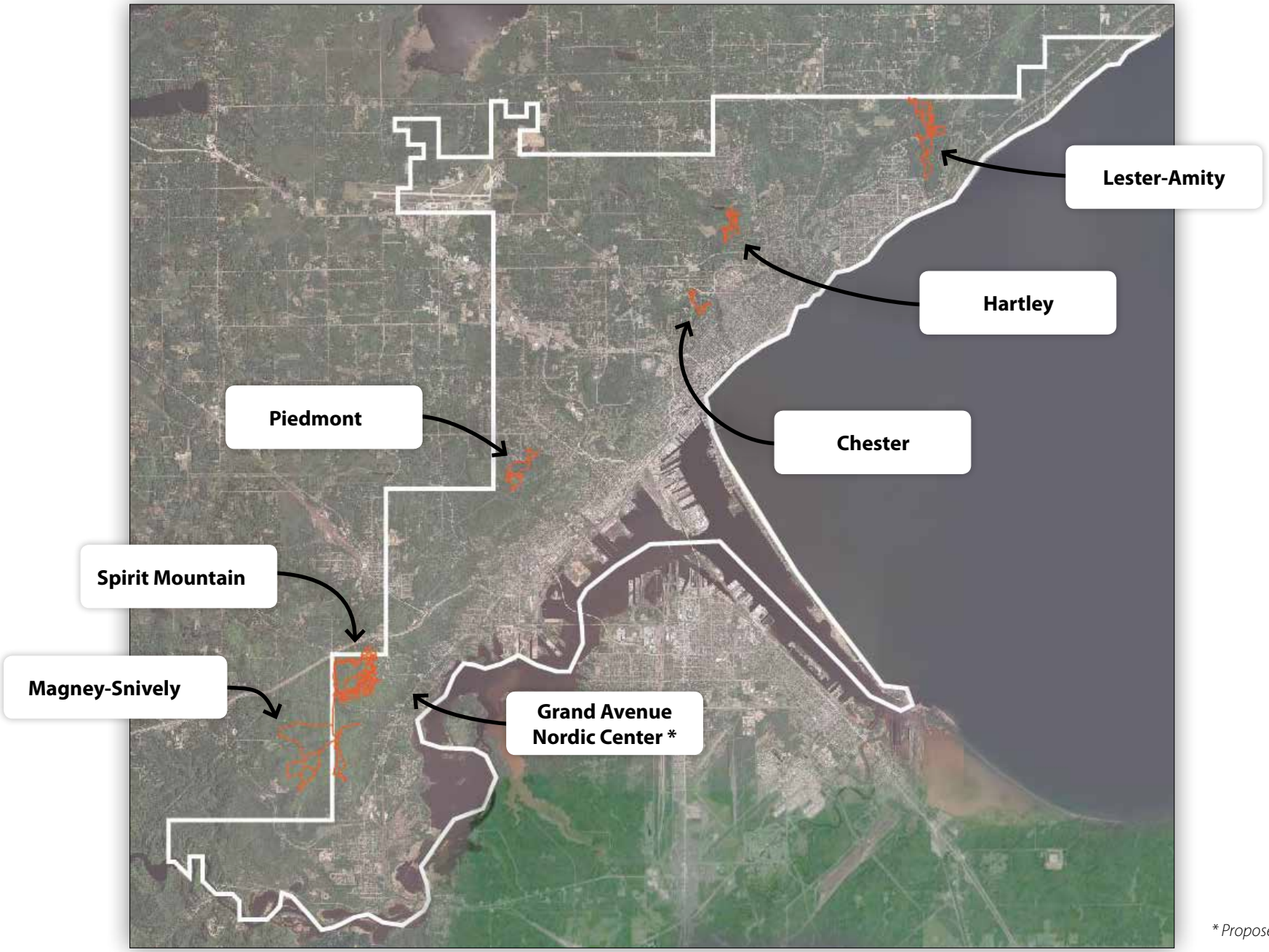
Ideally, one snow cat would be located at Spirit Mountain and would be used to keep Spirit Mountain and Magney groomed on a daily basis. A second snow cat would cover Chester alpine and nordic and trailer to Lester-Amity. A smaller trailered machine, such as the bearcat or a John Deere Gator, would handle grooming at Piedmont and Hartley. This way all trails could be groomed the same day after a snowfall.

To tie it all together, an effective wayfinding plan should be implemented across the City to help skiers find the trailheads. Once there, consistent signage at each park would show them the way around and shortest route back to the trailhead.

The best location for an event center capable of hosting national and regional level events would be at Spirit Mountain. The variety of terrain and trails are already there. Infrastructure and knowledge for snowmaking already exist close by and would fit into the existing Spirit Mountain Master Plan.

Duluth has the potential to become a winter ski destination. Let's make it happen!

# City of Duluth Ski Trails




** Proposed*

# Chester Park

## Overview

The Chester Park trail is located in the heart of Duluth and situated in the picturesque bowl of Chester Creek. The trail shares this small area with an alpine hill, soccer field and in the winter, a speed skating oval. This is perhaps the park with the highest recreational density. The trail has some of the most difficult ski terrain in the Duluth park system and has the potential to become a limited competition site for college and high school skiers. The current trail length is 2.9 km with an average width between 3-4 meters and is groomed for skating. A classic track is set in the beginner loop only. The Great Minnesota Ski Pass is required.

## Flood Damage

On June 20, 2012, the City of Duluth suffered a destructive flood which did severe damage to many parks. The ski trail at Chester was dealt a severe blow when the flood damaged two critical bridges crossing Chester Creek. There were also several places on the trail where runoff caused severe erosion. After the flood, the trails were not skiable. The last bridge was replaced in late 2013 and the trail was groomed again beginning in January 2014.

## Chester Mini-Master Plan

Concurrent with the Ski Trail Master Plan, the Chester Park Mini-Master Plan was underway. The recommendations in this report were developed in coordination with and are contained within the Chester Mini-Master Plan. The Chester Mini-Master Plan can be viewed at this location: http://www.duluthmn.gov/media/278784/Chester-Mini-Master-Plan-11-24-2014.pdf

## Leading Issues

1.) The number one complaint of skiers is conflict with walkers on the trail and with walkers the number one complaint is a lack of trail length for walking in the winter. Unregulated mixed use on the trail affects safety, grooming quality and user enjoyment.
2.) The width of the trail is extremely narrow in a number of locations.
3.) Trail too short and too difficult for many skiers.

## Recommended Improvements

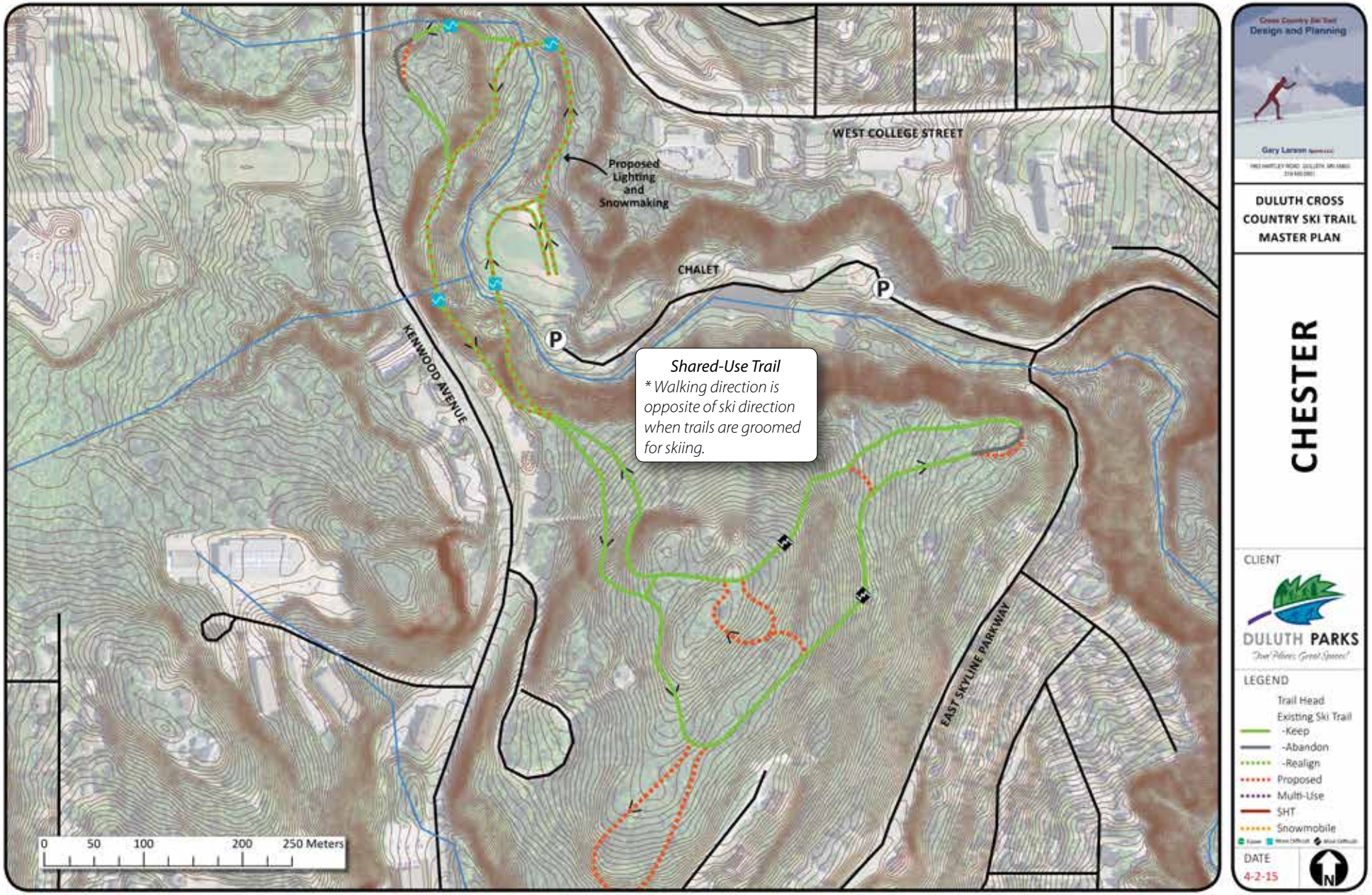
1.) Shared-use of the trail by both skiers and walkers will be initiated on a trial basis until June 1, 2017. At that time an evaluation will be made and a permanent policy will be put forward as outlined in the Mini-Master Plan.
2.) Widen trail to a consistent 4 meters where possible by brushing, shrub and rock removal and moderate earth work along some edges.

3.) Add trail sections and cut-offs, detailed in Mini-Master Plan, to allow the trail to be used by a wider range of skier abilities.

## Comments

The difficulty of the current trail limits the appeal to many skiers, but at the same time, is a draw to the higher skilled skier. By redesigning, widening, signing and adjusting the grooming plan, it will allow safe shared-use of the trail and will make the trail attractive to a wider skill level of skier. This plan includes a 1.5 km portion of trail for snowmaking and lights. Consistent with the Chester Mini-Master Plan, the City will seek to identify a different area for locating snowmaking and lights. Should this effort fail, snowmaking and lights will again be considered at Chester. Consistent and frequent grooming would greatly improve the enjoyment of users and the frequency of use. Adding a trailhead and parking off Kenwood Avenue, as shown in the Mini-Master Plan, would improve the accessibility to the trail and also increase visits.

# Chester Park Map



# Hartley Park

## Overview

Hartley Park encompasses 640 acres of woodlands, creeks and pond, and is located between the Woodland and Hunter Park neighborhoods.
The Hartley Nature Center hosts environmental programs year-round in their nature center building in the north east corner of the park. Ski rentals are also available at the nature center. The ski trails are located in the east side of the park. There are three trail access points: Hartley Nature Center, Fairmont Street and Hartley Road. The current ski trail length is 5.7 km with an average width of 3-3.5 meters, and is groomed with a double track for classical skiing only. The Great Minnesota Ski Pass is required.

## Hartley Mini-Master Plan

Concurrent with the Ski Trail Master Plan, the Hartley Park Mini-Master Plan was being prepared. The recommendations in this report were developed in coordination with and are contained within the Hartley Park Mini-Master Plan. The Hartley Mini-Master Plan can be found at this site: http://www.duluthmn.gov/media/239907/Hartley-Master-Plan-07-21-2014.pdf

## Leading Issues

1.) Downhill corner on south end of outer loop too difficult for most skiers and crosses private property.
2.) Uphill on north end of outer loop too steep.
3.) Walkers and dog walkers use ski trail.
4.) Confusing trail layout.
5.) Lack of beginner terrain.
6.) No options for skate skiing.
7.) Trail surface rocky and narrow.

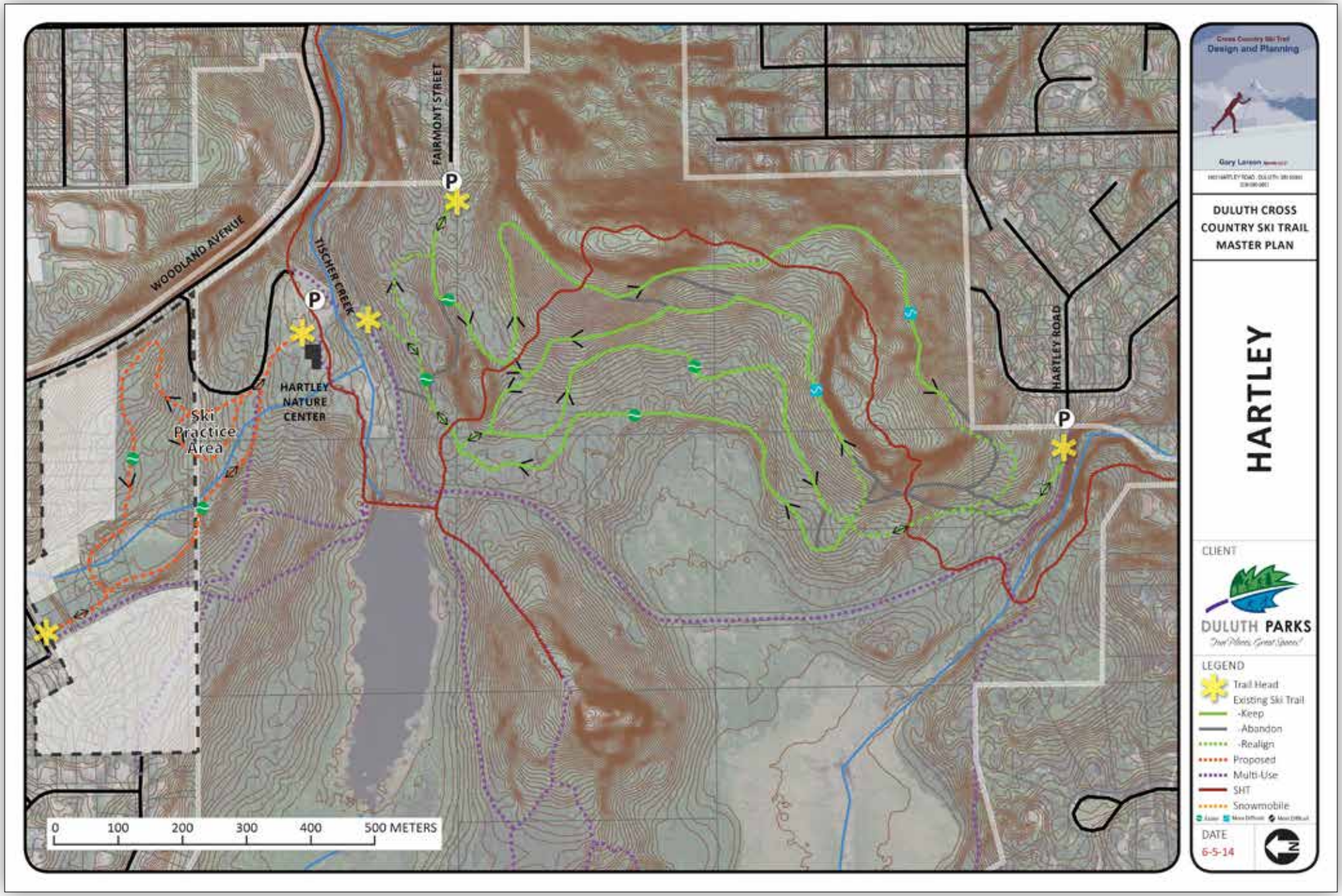
## Recommended Improvements

1.) Re-align downhill to avoid private property and make corner easier to ski.
2.) Re-route trail, from nature center parking lot to Fairmont trailhead, avoiding steep uphill.
3.) Provide groomed walking trail on Old Hartley Road in winter and inform with better signage.
4.) Reverse inner loop ski direction, re-configure trail junctions on south end and better signage.
5.) Proposal in Mini-Master Plan to add 1.6 km of new beginner trail just north of Nature Center.
6.) New beginner trail would be wide enough for skate skiing.
7.) Widen trail to a consistent 3.5 meters, where possible, by brushing, rock removal and moderate earth work along some edges. Remove rocks in trail to prevent groomer damage and enable grooming with less snow.

## Comments

The trails at Hartley Park pass through some of the most picturesque woodlands in the City and provide an intimate ski experience where you can ski side by side and carry on a conversation. With the proposed new beginner trails and ski practice area, the nature center will be able to better include skiing within their programing along with utilizing the rental ski inventory they have. Updating and improving the trailheads with added parking at the neighborhood access points at Fairmont Street and Hartley Road will enhance the experience for those driving to ski and enhance the overall appeal of the park entrances. Consistent signage will assist skiers around the trails. By improving the trail surface, grooming can be started with less snow and will extend the length of the ski season.

# Hartley Park Map



# Lester-Amity

## Overview

The 11.4 km Lester-Amity ski trail climbs 107 meters from the confluence of Lester and Amity creeks to Oak Street through moderate terrain and second growth woodland. This is the most popular ski trail in the City due to the easier skiing and the 5.4 km of lighted trail. The trail width varies between 4 and 6 meters. All trails are groomed for skating with a single classical track on one side or two depending on the width. The Great Minnesota Ski Pass is required.

## Flood Damage

On June 20, 2012, the City of Duluth suffered a destructive flood which did severe damage to many parks. Erosion that closed Seven Bridges Road required that the road be moved which impacted a short section of lighted ski trail, which in turn required relocation. A steep bank at a popular overlook of the Lester River became unstable due to the flood and required a short section of lighted trail to be relocated. Both projects were finished at the end of 2014.

## Leading Issues

1.) Trail relocation due to flood damage.
2.) Trailhead at bottom confusing.
3.) Walkers and dog walkers use ski trail.
4.) Poor access/parking at Oak Street.
5.) Trail width and surface problems.
6.) Culverts too small or short.
7.) Lack of warming building.
8.) Upper trails not lighted.
9.) Corner at "A" too sharp for smooth skiing.

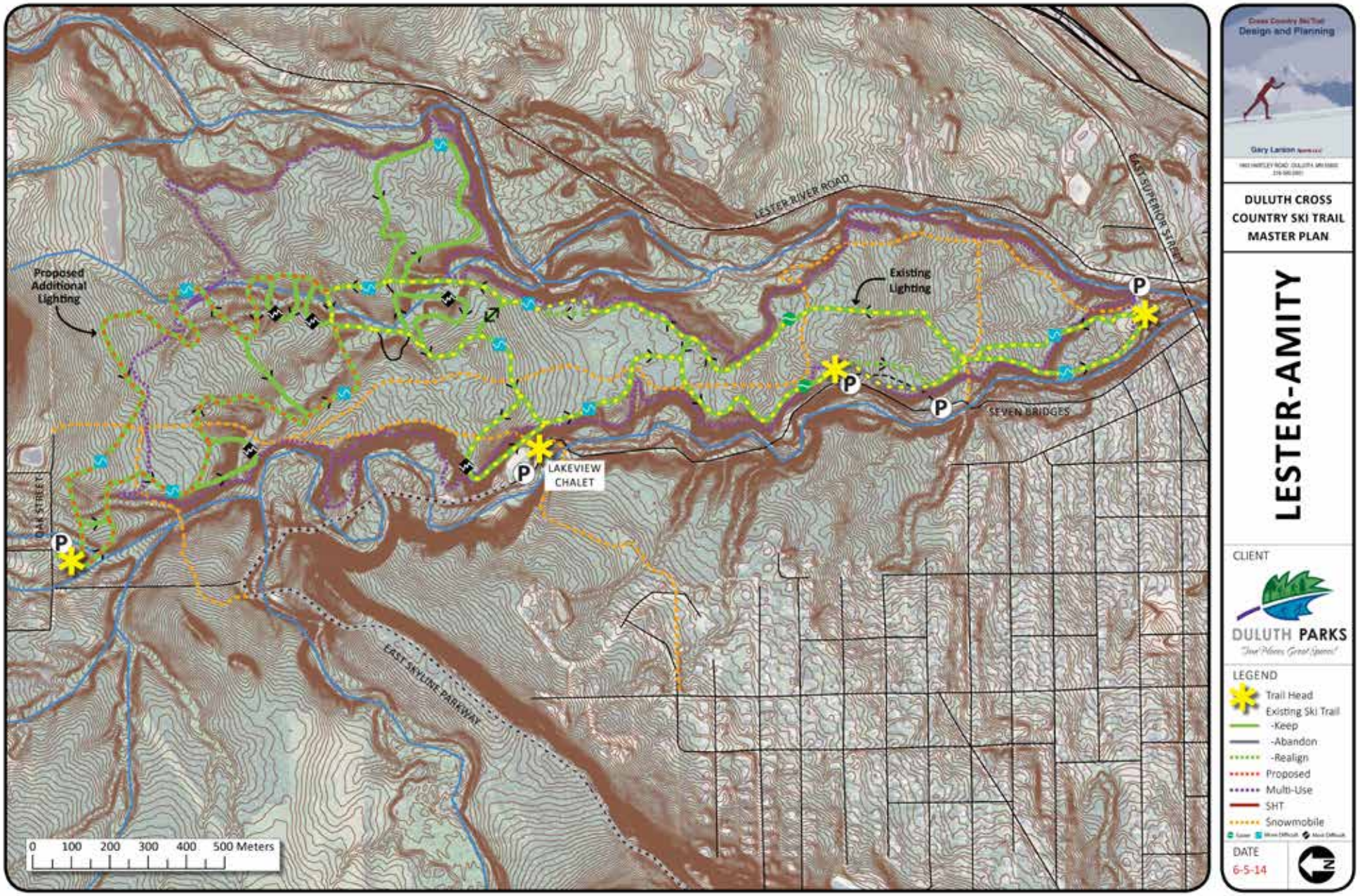
## Recommended Improvements

1.) Relocate trails and lights affected by flood.
2.) Better signage and better differentiation between snowmobile and ski trails.
3.) Better informational signage.
4.) Provide parking and trailhead off Oak Street.
5.) Widen trail to a consistent 5-6 meters where possible by brushing, rock removal and moderate earth work along some edges. Better drainage to prevent rutting in summer.
6.) Replace undersized culverts with larger diameter and longer. Replace culverts that are too short with longer or extended length. Riprap the ends to prevent future washouts.
7.) Open the closed Lakeview Chalet for warming, instruction and as potential event site. A community group is working on that currently.
8.) Extend lighted trail to the upper end of the trail system adding 3.1 km. Upgrade existing lights with high efficiency fixtures.
9.) Move light pole and cut smother corner.

## Comments

Lester-Amity gets the most use of any trail in the Duluth system. Due to the high use at Lester-Amity the frequency of grooming should be increased. Every other day would be good and after each snow or wind event. There is a marked difference in snow cover from the lower end near Superior Street to the upper end due to the elevation difference and effect of Lake Superior, which is the major reason to consider creating parking and a trailhead at Oak Street and extending the lighted trail. Additional parking options on Seven Bridges Road and the opening of the Lakeview Chalet, now referred to as the Lester-Amity Chalet, under a 10 year agreement with the City, adds a missing component to the ski experience. Brushing the sides of the trail and grooming wide are requests many skiers have suggested. This would enable the entire lighted trail to be groomed with a skate lane and classical tracks on both sides. New mountain bike trails have been built with numerous crossings and signage needs to be located to inform bikers not to take the ski trail. The same would apply to the numerous snowmobile trail crossings.

# Lester-Amity Map



# Magney-Snively

## Overview

The Magney-Snively trail is located within the 1800 acre Magney-Snively Natural Area. The 12.9 km trail system passes thorough old growth forest and beautiful rugged terrain. It is the most remote feeling trail in the Duluth system and recommended for intermediate to advanced skiers. Two scenic overlooks can be accessed from the trail, Elys Peak and Bardon's Peak. The trail is groomed for skating with a single classical track. Trail width is 3 to 4 meters. The trail has a connector to the Spirit Mountain trail system. The Great Minnesota Ski Pass is required.

## Leading Issues

1.) Very steep two-way connector to Spirit Mountain trail.
2.) Trail from trailhead on Skyline Parkway is prone to erosion.
3.) Trail width and surface.
4.) Inadequate signage and wayfinding.

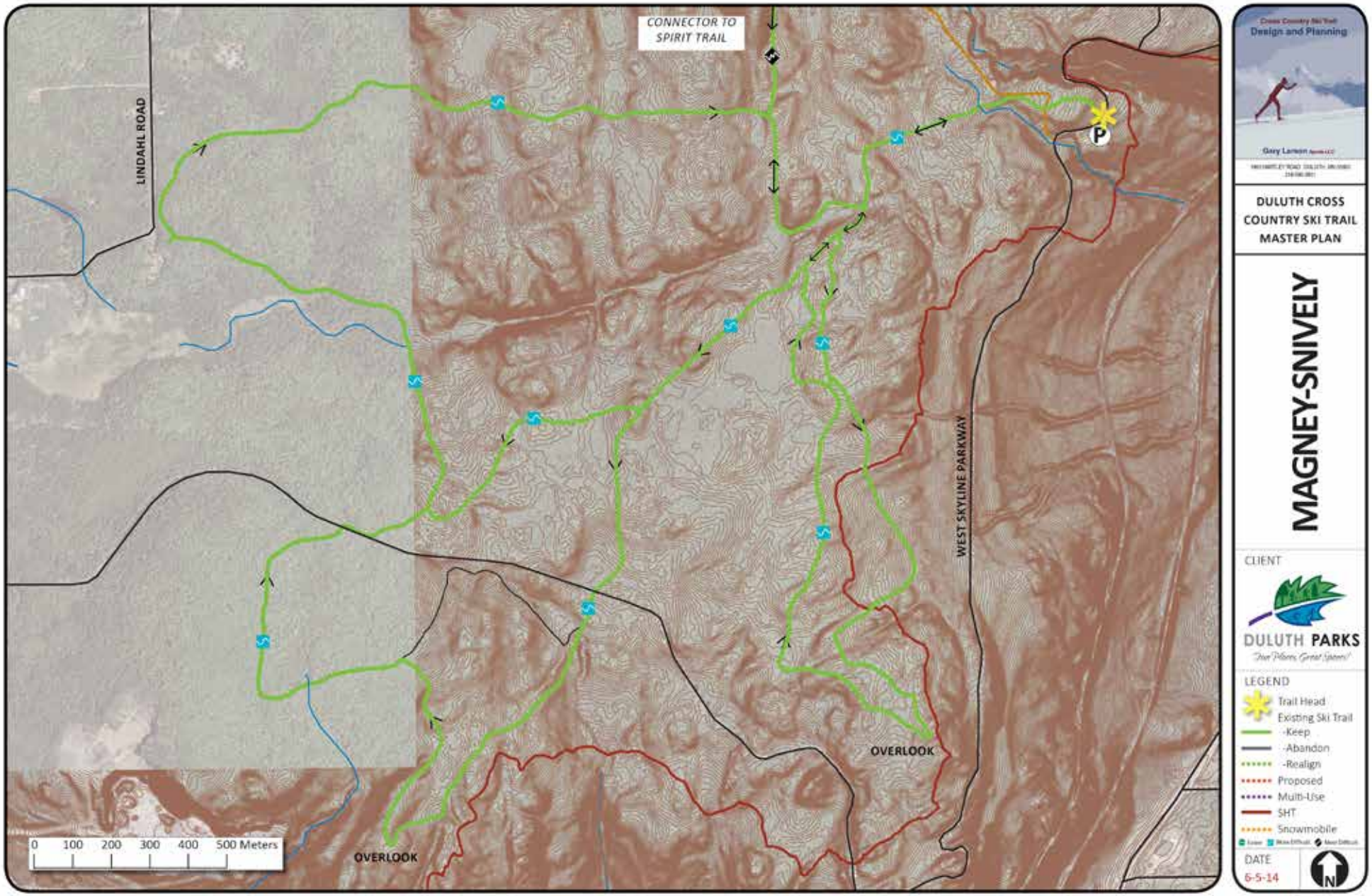
## Recommended Improvements

1.) Add one-way uphill trail to Spirit Mountain. Use existing trail as one-way down.
2.) Re-build Trailhead trail to solve erosion problems, widen for safer two-way traffic.
3.) Widen trail to a consistent 4 meters where possible by brushing, rock removal and moderate earth work along some edges. Widen to 6 meters where trails are two-way. Better drainage to prevent rutting in summer.
4.) Improve signage and map locations. Add shortest route back to trailhead indicators.

## Comments

The Magney-Snively trail is likely the least used of the trails in the Duluth system. That is the appeal for skiers who frequent the trail. Together with Spirit Mountain, the system has 30 km of unrepeated trail. This is a real plus for skiers looking for a longer tour. With the overlooks and old growth woodland, this trail system makes for a spectacular experience. Of primary concern is the two-way connector trail with Spirit Mountain.

# Magney-Snively Map



# Piedmont Park

## Overview

The Piedmont ski trail snakes 5.2 km through rolling second growth forest. Trails are suitable for novice to intermediate skiers although one outer loop with steep hills is best left to the advanced skier. The most unique feature of the trail is the hand-made signs throughout. The trail width varies between 3 and 5 meters. The trail and loop closest to the trailhead is two-way and groomed for skating with classical tracks on both sides. The outer loops are groomed with a double track for classical only. A scenic overlook of the Saint Louis River Valley and the harbor is a hidden gem. The Great Minnesota Ski Pass is required.

## Leading Issues

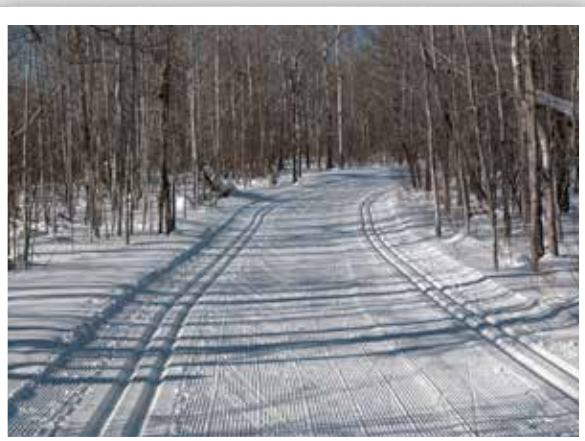
1.) Trail width and surface.
2.) Some bridge and culverts too narrow.
3.) More skiing kilometers would be nice.
4.) Hard to locate trailhead by car.

## Recommended Improvements

1.) Widen trail where possible by brushing, rock removal and moderate earth work along some edges. Better drainage to prevent rutting in summer.
2.) Two bridges should be widened to allow full width grooming and skiing. Put in longer culvert in two-way section.
3.) Possibility to add single track classical skiing in Duluth park for first time. Could locate within inner trail and if possible to the west.
4.) Improve signs on road directing to trailhead from Piedmont Avenue.

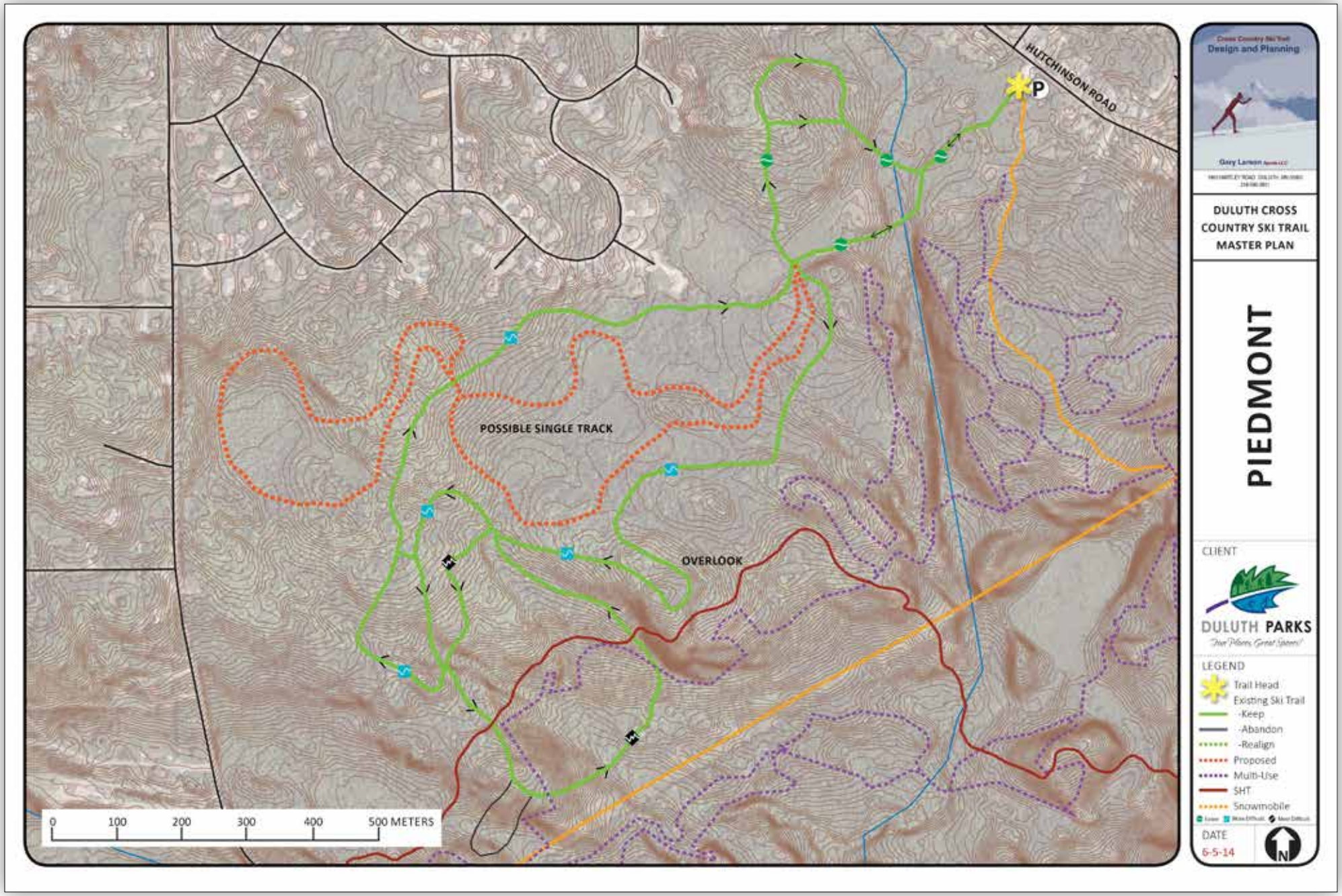
## Comments

Piedmont seems to be the place that could be groomed earliest due to the smoother trail surface and elevation of 400 meters, second highest in the City trail system. In addition, grooming could continue at Piedmont as long as possible in the spring after grooming on the other trails has ended Grooming could continue with the snowmobile and Ginzugroomer. As the snow conditions deteriorate, cut back the loops groomed until it is no longer possible. How late can we ski? Let's find out! Late grooming is not always possible due to snow conditions but the last couple of years skiers were disappointed when grooming stopped even with abundant snow. Spring skiing can be great but does require daily grooming to keep it safe and skiable. Perhaps it could be made into a good PR event and attract some skiers from the Twin Cities? This is a great neighborhood trail made special by the eclectic collection of hand-made signs and puts the Piedmont Trail into a special niche. A very nice personal touch and fun to ski.



*Single track trail at Korkki Nordic, similar to what could be easily added at Piedmont.*

# Piedmont Park Map



# Spirit Mountain

## Overview

The Spirit Mountain Recreation Area is operated by a separate public authority as a component unit of the City of Duluth providing alpine and Cross Country Skiing along with amenities such as a campground, tubing park, mountain bike trails, zip line and alpine coaster. The mission of Spirit Mountain Recreation Area is:

***"To develop a wide range of quality, year-round recreational activities which encourage regional economic growth while conserving our environment. "***

Through 2012, Spirit Mountain operated the Nordic Center, with it's 25 kms of trail. Since the Spirit Mountain trail was not constructed using state funds through the Grants-In-Aid program, the Great Minnesota Ski Pass is not required and, a user trail fee was collected. In 2010, the revenue was $15,835 from Nordic tickets and rentals with expenses of $8,794. The equipment they used and the grooming quality did not keep up with improving standards in the sport. Complaints increased so Spirit Mountain looked into other ways of managing the Nordic ski operation. In 2012, the Duluth Cross Country Ski Club (DXC) entered into a 4 year agreement with Spirit Mountain and the City of Duluth, to operate and manage the Spirit Mountain Nordic Center. The City agreed to provide grooming. Once DXC took over, they reconfigured the system, eliminating redundant trail sections and came up with the current 17 km layout. They also added the Nordic Spirit Ski Race and Tour. The club has worked on widening the trails and working on the trail surface to make it smoother allowing grooming with less snow. DXC also provided some grooming with Spirit Mountain equipment.

Since 2012, no trail pass has been collected at Spirit Mountain. Donations to DXC are accepted.

The Spirit Mountain trail has the highest elevation of any of the Duluth trails at 405 meters, which provides a higher snow accumulation than lower elevations. The beautiful terrain is well suited to Cross Country Skiing with rolling hills interspersed with challenging climbs and descents, all meandering through a mature hardwood forest with views of the surrounding Saint Louis River Valley. All trails are groomed for skating with one classical track. There is limited parking and a small Nordic building at the only trailhead. Spirit Mountain is unique in Duluth with the only ski trail that has the length, variety and quality of terrain that could host a national level cross country ski event.

## Spirit Mountain Master Plan*

In 2008, the Spirit Mountain Recreation Authority prepared the Spirit Mountain Master Plan. http://spiritmt.com/wp-lib/wp-content/uploads/2014/09/MasterPlanOutline.pdf. Within the plan, improvements to infrastructure for the Nordic program were addressed with the following recommendations.

**Enhanced Snowmaking System** (page 6*)

- Increase snowmaking capacity from 2,700 gpm to 6,000 gpm and additional snow sticks to augment snow guns will increase coverage and reduce operating cost. System is to be capable of supporting Snocross event, expanded ski runs, and future tubing/Nordic areas.

# Spirit Mountain

**Improved Camping, Parking, and Nordic Areas** (page 7*)

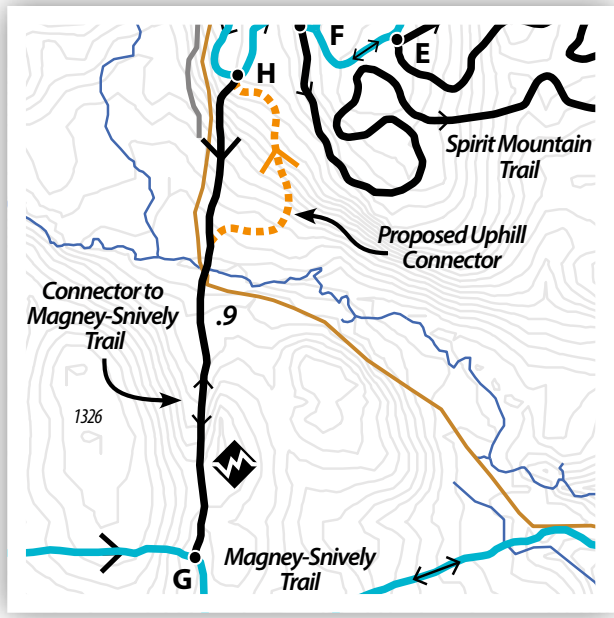
- Upgrade existing campground service building so as to serve campground, Nordic ski area, and villa rentals.
- Establish short, lighted trail loop, possibly with snowmaking capacity, for Nordic trail system.

## Leading Issues

1.) Connector to Magney-Snively trail is dangerous for two-way skiing.
2.) Nordic building is too small.
3.) Not enough parking.
4.) Trail width and surface.
5.) Bridges too narrow and additional needed.
6.) No place to host large events/instruction.
7.) Not able to ski after dark.
8.) No skiing in poor snow year.
9.) Signage and wayfinding needs improving.
10.) Grooming not frequent enough.
11.) No revenue generated.
12.) No cross country ski options at bottom of ski hill along Grand Avenue.

## Recommended Improvements

1.) Add one-way uphill trail from Magney-Snively trail to Spirit Mountain. Use existing connector for one-way downhill.
2.) Replace and enlarge current Nordic building as recommended in Spirit Mountain Master Plan.
3.) Re-configure and add parking at trailhead. For overflow parking old tennis courts at villas could be utilized.
4.) Widen trail to a consistent 5-6 meters where possible by brushing, rock removal and moderate earth work along some edges.




Lengthen culverts if needed. Better drainage to prevent rutting in summer.
5.) Widen existing bridges and add bridges over several draws.
6.) Create "stadium" area for event start/finish and area for instruction.
7.) Provide lighted skiing, as recommended in Spirit Mountain Master Plan, using energy efficient lighting.
8.) Add snowmaking, as recommended in Spirit Mountain Master Plan. Connecting to Spirit Mountain snowmaking system would be most practical and should be explored.
9.) Improve maps and directional signage. Trailhead signage should be consistent with each City trail. Add "shortest route back to trailhead" signs. Trailhead wayfinding from approach roads.
10.) Increase frequency of grooming. Ideally a grooming machine should be located at Spirit Mountain to groom the Spirit Mountain and Magney-Snively trails exclusively.
11.) Collect trail use fee for Spirit Mountain. Additional fees for skiing at Magney-Snively can not be collected since it is part of the Grants-in-Aid system even though there is a connector between the two.
12.) Provide plan for adding a trail at the bottom of the ski hill along Grand Avenue. Lights and snowmaking should be added for extended use.

## Comments

Spirit Mountain is certainly the crown jewel of the Duluth ski trail system. Not only does it have the most kilometers of any park at 17, but more importantly the most varied skiing terrain. When you add in the Magney-Snively trail of an additional 13 km it becomes a full day's worth of skiing from one trailhead! The only place in Duluth!

*Comments - cont'd*

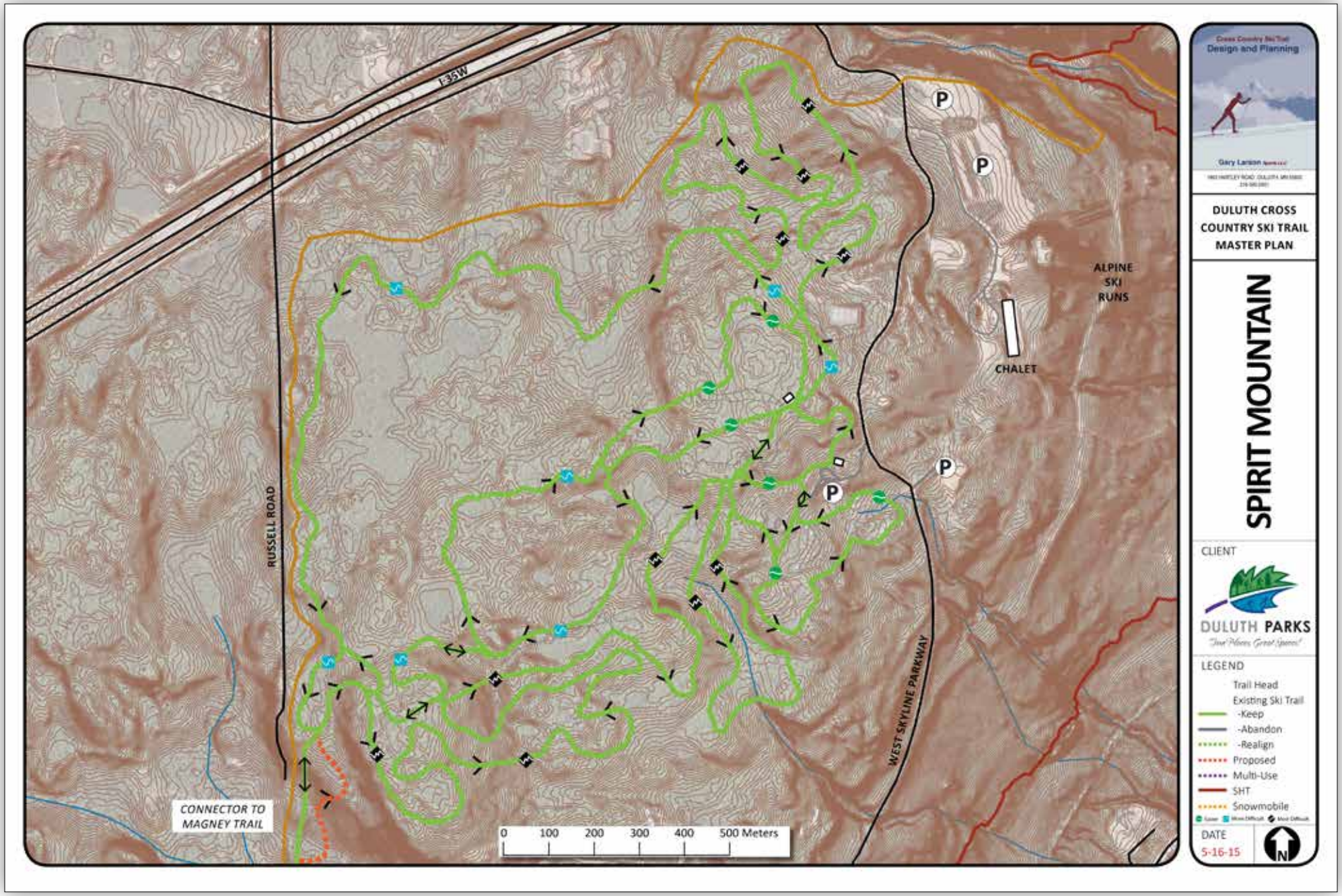
Since 2012, when DXC took over management and operation of the Nordic center, they have made great improvements to the skiing at Spirit Mountain. Here are several examples: they have simplified the trail system by reducing redundant trails, opened and staffed the Nordic building on weekends, worked with scouts and other groups to improve the trail surface, improved alignment and width of trail, updated maps and signage, added a local ski event to the calendar, invested in grooming equipment, and provided occasional grooming. Club members were also involved in many other ways to improve and promote skiing at Spirit Mountain and across the Duluth trail system.
As the quality of the grooming and ski experience improves, as the word gets out about the incredible trails and terrain, so do the expectations. This is where Spirit Mountain could improve. It will require an increase in the frequency of grooming. A facility with 30 km of trail (adding Spirit Mountain and Magney-Snively) should have a dedicated grooming machine and driver(s) to groom almost daily to keep the trails in reliable shape when they are open.

*The Spirit Mountain Nordic Center is the best location in Duluth for a regional and national event center venue which would also provide instructional area for youth and educational programs.*

## Event Center

Spirit Mountain has the greatest potential to put Duluth in the minds of cross country skiers across the country. When John Aalberg toured Duluth in 2012, he commented on how incredible the ski system was in Duluth but how he had never known about the quality of the skiing here. As a member of the US Olympic team, he competed at Giants Ridge, Mora and at Telemark. He traveled through Duluth but never knew that this caliber of skiing existed here. To put Duluth on the skier's map, we need to have the ability to host events at a regional and national level. We have the knowledgeable ski community. We have a winter that is ideal for cross country skiing.
We have the length of trail and terrain that is required. What we need is a venue! A place to start and finish an event of this caliber. The Minnesota State High School League has expressed interest in rotating the Boys and Girls State Nordic meet between a metro site and one in the north and asked if Duluth had a place to host it. We had to decline. Giants Ridge has hosted this event for many years as well as the Alpine State Meet.
Another event would be the Junior National Cross Country Championship. This is a week long event which would bring approximately 300 athletes and 200 parents and coaches from around the country to Duluth for a full week's worth of competition and entertainment. By having skiers experience our wonderful City once, they will return. Events are the rally point for the ski community. Put on a successful event and the skiers become our ambassadors. In keeping with our goal of being the "Trails City," promoting cross country ski events is the way we accomplish that for winter skier focus.

# Spirit Mountain Map



# Grand Avenue Nordic Center

## Overview

As part of the initiative for the St. Louis River Corridor revitalization and through the 1/2 and 1/2 Tourism Tax earmarked for outdoor recreation along Grand Avenue, the Grand Avenue Nordic Center (GANC) concept was created. In a collaboration between the City of Duluth, Spirit Mountain Recreation Area and the Duluth Cross Country Ski Club (DXC), plans took shape for this 3.3km cross country ski trail with snowmaking and lights.

Due to climate change and the resultant decline in reliable natural snow, an era has been ushered in where snowmaking for nordic centers across the country has become a necessity.

The area along Grand Avenue is ideally suited for a Nordic Center and the timing could not be better. Spirit Mountain is undertaking a project which will increase their water capacity for snowmaking and begin drawing water from the St. Louis River rather than using City water. This increased capacity will easily accommodate the water needs for this 3.3km trail. In addition, Duluth cross country skiers are in need of a trailhead building to be used for warming, meeting and adding an additional social component to the experience. The Spirit Mountain Grand Avenue Chalet provides this missing amenity. There also is ample parking and easy access off Grand Avenue along with DTA bus service. The West Duluth/Grand Avenue area currently has no cross country skiing option and this center would fill that need.

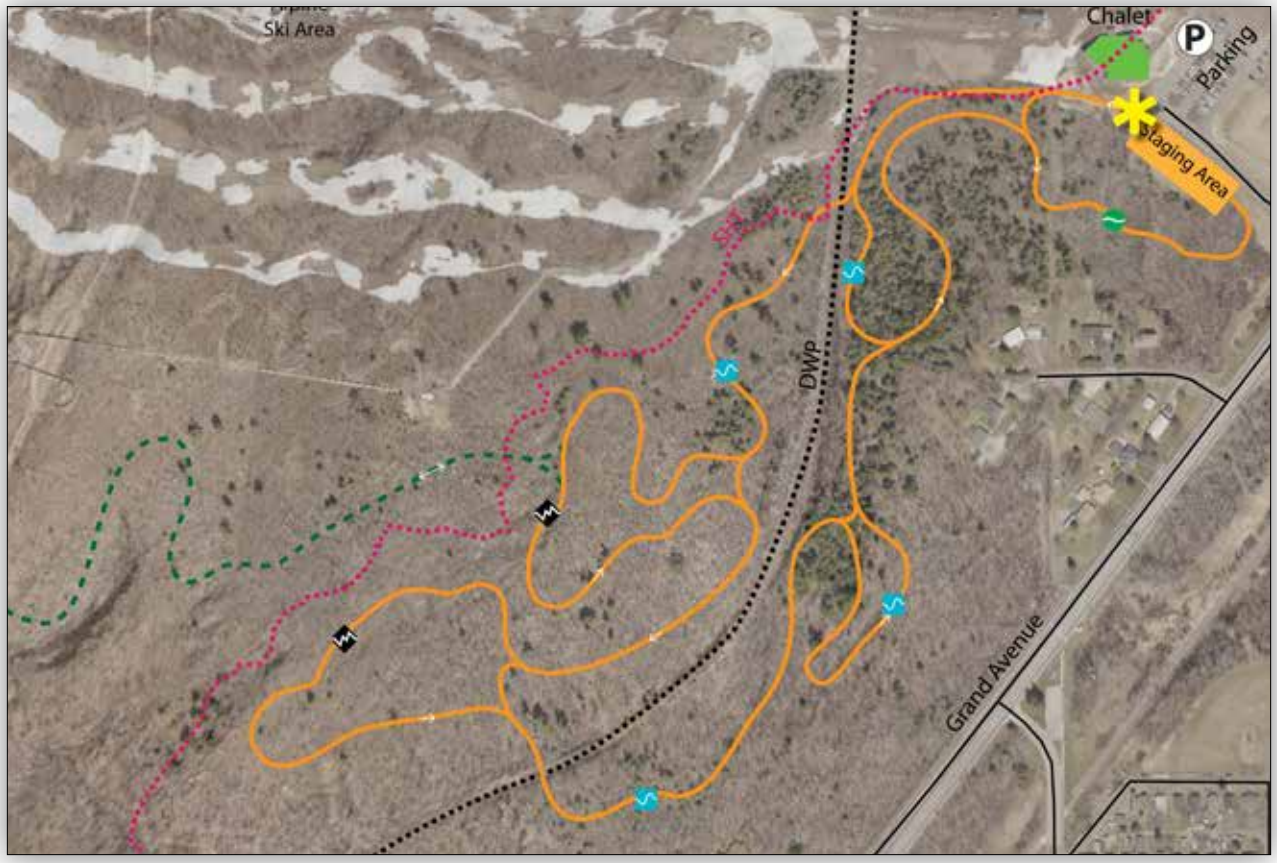
The plan is set out in a two Phase strategy.

## Phase I

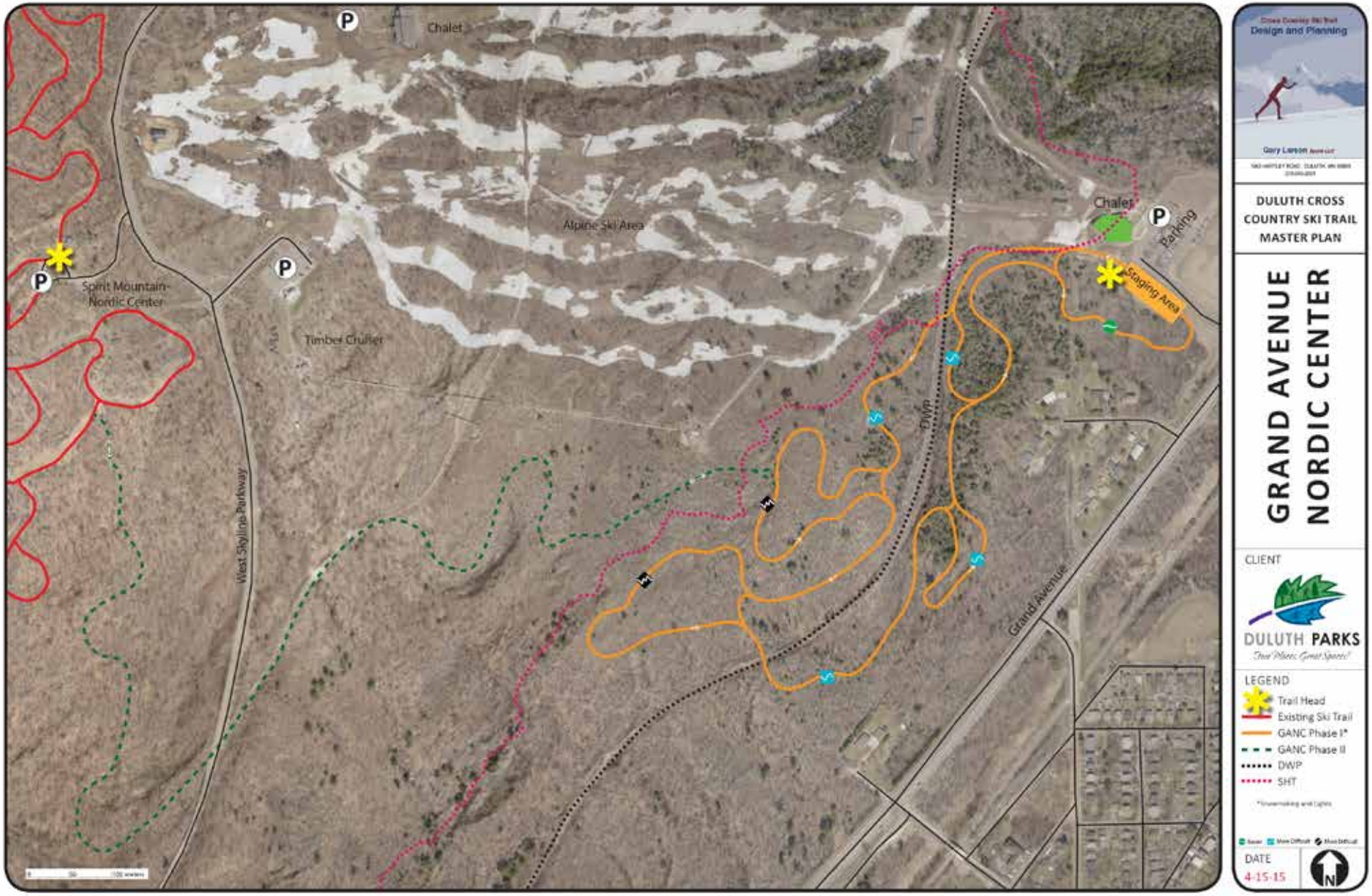
- Staging area for lessons and events
- 3.3 km of initial cross country ski trail above and below the DWP grade
- Snowmaking system to cover the entire 3.3 km trail and staging area
- Energy efficient lighting on entire trail and in staging area
- Integration of Alpine and Nordic grooming

## Phase II

- Add two-way bottom-to-top trail, connecting GANC to the Nordic Center on the top using natural snow.
- Increase GANC trail system from 3.3km to a possible 5km (additional trail would be natural snow) for better destination appeal and to provide a venue for high school, junior, and regional event capability.



# Grand Avenue Nordic Center



## East Skyline Parkway & Seven Bridges Road

The most scenic road in Duluth is undoubtedly Skyline Parkway. It traverses the entire City and commands spectacular views overlooking the lake and City from each bend and twist. The portion of Eastern Skyline Parkway from the "Monument Overlook" to Maxwell Road and down Seven Bridges Road to the third bridge from the top does

not get plowed in the winter. A portion of this 6.7 meter wide route is currently groomed on one side for snowmobile use but the remainder of the road surface receives no grooming. It is, however, very popular with people skiing, walking, exercising dogs, skijoring and winter biking. The users pack a narrow path for their use or walk on the groomed snowmobile trail creating a potential conflict. By grooming the other half of the roadway, flat for

*Summer road groomed for skiing in Gatineau Park, Gatineau, Quebec. Similar to what could be done on East Skyline Parkway.*

walking, biking, skate skiing and a track on the far side for classical skiing, would provide a spectacular 3.7 km multi-use trail that is unmatched for beauty anywhere else. Coordination with the snowmobile club would be critical in restricting speed on that portion of trail to 20 mph for safety reasons. Parking is currently provided and plowed at both ends of the route.

## Western Waterfront Trail

The Western Waterfront Trail is an untapped opportunity, within the western Duluth community to provide cross country skiing along the banks of the St. Louis River. The trail was groomed in the past by the Willard Munger Inn, for guests at the Inn. This homemade grooming equipment was not sturdy enough for continued grooming so it was stopped. 4 km of the 3 meter wide trail could be groomed for mixed use winter walking and winter biking with a classical track for skiing on one side. There are two designated and plowed parking lots serving the trail.

## Ready to Go

We have an outdoor culture here in Duluth. It is great to see Duluthians out in the winter; walking and exercising their dogs, biking and snowshoeing, demonstrating their desire to get out and enjoy the beautiful winter snowscapes. These additional opportunities for outdoor winter recreation are already being used but in very poor condition due to the lack of grooming. By providing an attractive option for these other activities it reduces the temptation to use the groomed ski trails and reduces conflicts of use. Separate trails in the winter would also keep the ski trails from getting harmed. These would be mixed use activity trails that would be open to most user groups. There should be ways to recoup some of the cost for this extra grooming. Perhaps a "Friends of Duluth Trails" pass for walkers and bikers that would provide access to these groomed multi-use trails?

## Grooming

The quality of the grooming in Duluth has never been better! The staff has done a great job getting to know the personality of each trail and learning how to get the most out of the snow! It's a time consuming process to load equipment, transport, unload, groom, load and do it all again for the six locations across the City. It takes a long day to groom Lester-Amity, Hartley, Chester cross country and alpine and Piedmont. Another day to finish up with Spirit Mountain and Magney-Snively.

As said, the quality of the grooming is excellent, it is the frequency of grooming and the time of grooming at each trail that could improve the skier experience. With trails that see heavy use such as Lester-Amity, when a weather event such as new snow, high wind or thaw/freeze happens, the grooming should be done daily or when needed.

Ideally, the snow pack should be groomed with sufficient time for setting-up before skier use and while the temperature is still falling for best solidifying of disturbed snow. The best time for this is in the evening, at night or early in the morning. In the case of fresh snow, the first grooming should be done as soon as possible, regardless of time of day, with follow-up grooming at night.

Duluth skiers will continue to put the most demand on the trails during the week and tend to ski more at Lester-Amity in the evening under the lights. On weekends there is an increase in skiers from outside the area who are visiting and skiing the trails. They are investing time and money for an anticipated quality of experience compared to other places they have skied. Duluth can meet and exceed these expectations, moving closer to the goal of becoming a "Cross Country Ski Trail" destination.

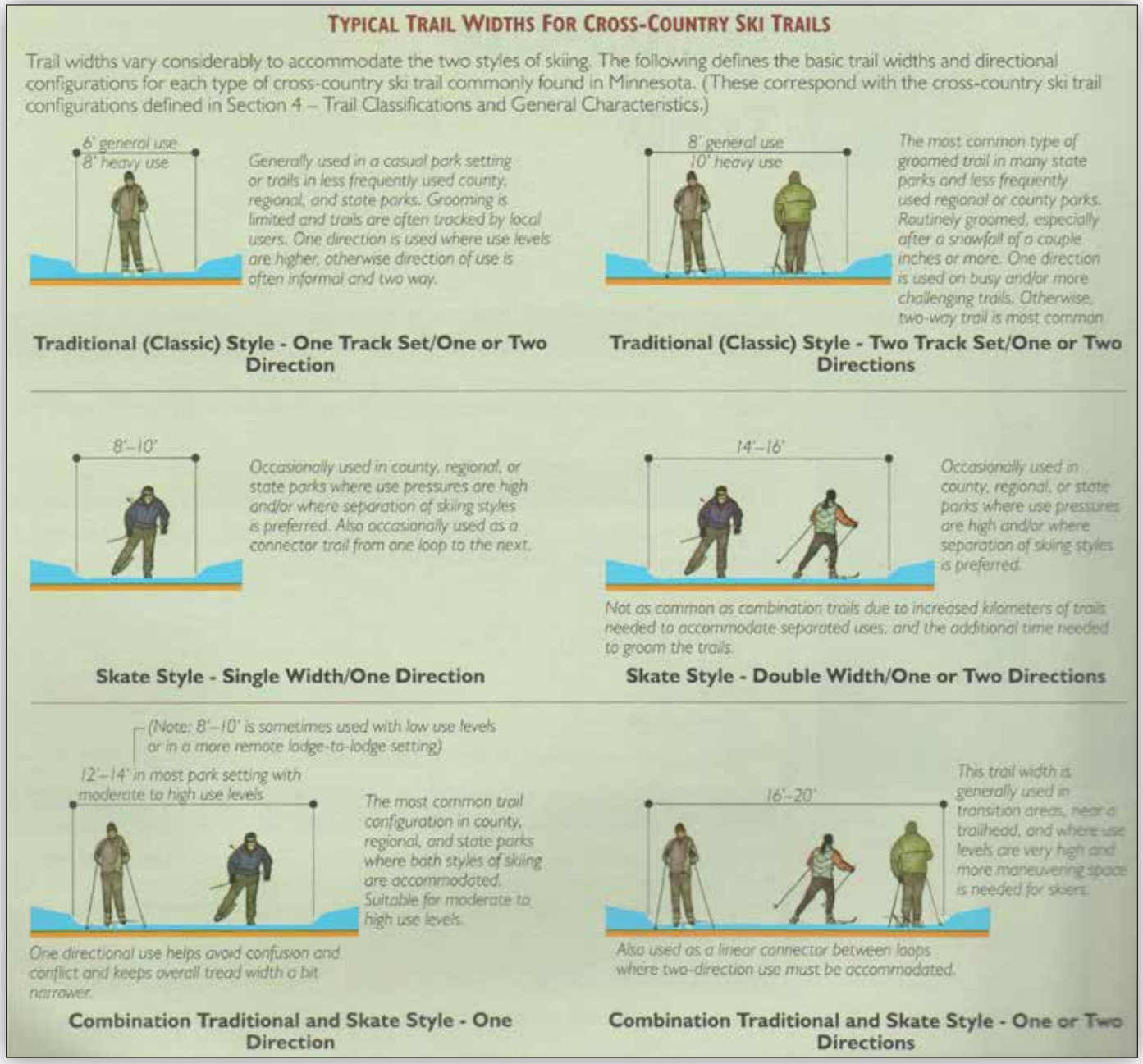
In cases where the track is still in good shape but the skate lane is in need of dressing up, the re-groom could be done by the snowmobile and Ginzugroomer more efficiently than with the tiller. Once tracks are set with a tiller, in most cases, they need to be re-set with the tiller for best results.

Feedback to the groomers on trail conditions is essential for making good decisions as to when trails need to be re-done. The ideal situation is for the groomers to ski the trails themselves. This is not always possible to do, so getting reliable feedback from the trail is critical, needs to come from skiers and needs to be timely. DXC has trail stewards associated with each trail and could be asked to provide that feedback.

### Trail Condition Reporting

Skiers are keenly interested to know when and what trail has been groomed and where they can get this information. After skiing, some skiers post on www.SkinnySki.com. This is a convenient way to share that information with others, although the best option would be for the groomer to post immediately after grooming. An automatic option is available through SkiTrails Trail Reporting: SystemSkiTrails.com. Once set up, GPS data is automatically uploaded to a website hosting maps of each of the trails. This will show, in real time, when grooming has been finished at each park or designated section of trail. This can be linked to any web page and provides automatic grooming updates showing date and time when the trail was last groomed. A dedicated GPS can be installed on the groomer or an App can run from a smart phone.

# Ski Trail Width Recommendations




Graphic reprinted from the MN DNR *Trail Planning, Design and Development Guidelines manual.*

# Grooming Equipment

## PistenBulley 100

The City has recently purchased a state-of-the-art PistenBulley 100 (PB100) to replace the aging Bombardier BR180 that has been the City workhorse groomer for many years. The PB100 is the industry standard for cross country ski trail grooming throughout the world. The new groomer will be a much needed upgraded asset and provide many years of improved grooming quality while grooming the 55 kilometers of Duluth cross country ski trails. The rear mounted hydrostatic tiller provides increased power for grooming difficult snow conditions and the new configuration of hydraulically movable track setter will speed up track setter adjustment. The advanced all-way front blade will also enhance the job of pushing snow on the alpine ski hill at Chester Park. The acquisition of the PB100 by the City sends a strong message to the skiing public that Duluth is serious about providing the very best ski experience on City trails. The PB100 is housed in West Duluth and transported by trailer.

## Arctic Cat Bearcat GS

The Arctic Cat Bearcat has been an important addition to the grooming fleet and pulls an 84" YTS Ginzugroomer with a single track setter. This combination has the added benefit of being able to groom with minimal snow. There is also a 6' corrugated roller used to pack fresh snow. The Bearcat is also housed in West Duluth and transported by trailer.

## John Deer Gator

An additional grooming option added to the City fleet is a John Deer Gator with winter tracks and a heated enclosed cab. The Gator, when paired with a Ginzugroomer will give the City added possibilities for keeping all of the City trails in tip-top shape throughout the winter and, with the rubber tracks, particularly in low snow situations..

## Winter Insurance

Ample snow for grooming cross country ski trails is not a certainty, even in Duluth. A good example is the winter of 2014-2015 when we had very few days of skiing. At one time, alpine ski areas relied on only natural snow for their slopes. Bad snow years could wipe out a whole season of skiing. Enter the arrival of snowmaking, "insurance" for winter.

Cross country skiing has recently seen the addition of snowmaking to many locations across the country. The systems are becoming more refined for specific cross country ski trail implementation.

## Snowmaking Methods

There are primarily two methods commonly employed to get machine made snow onto cross country ski trails:

**1.) Make the snow somewhere else and move it onto the trails.**

The first option would be the least expensive in regard to up front costs but would incur higher annual operating expenses in the form of loading and transport. Generally large piles of snow are made in an open area, close to water and power, allowed to cure, then loaded into trucks or trailers, driven out onto the trail and dumped. A snow cat would spread and groom the snow. Problems develop when natural snow, falling on steep hills, creates slippery conditions too slick for trucks to climb. The shorter the distance between the pile and the trail, the less the cost of transportation. One advantage of this method is that the snow can be laid down just where it is needed and at sufficient depth, usually 2-3 feet and width of the trail. Work must start at the furthest end of the trail and work outward. The roads at the campground at Spirit Mountain could be covered effectively with this method if snow were to be made at the top of Spirit Mountain and trucked across the road.

*Snow hauled by truck onto the trail at Canmore Nordic Center in Canmore, Alberta Canada. The snow is blown into a pit by snowgun during the previous winter and covered with several feet of sawdust. In the fall, a snowcat pushes the sawdust off of the top, snow is then loaded into trucks and hauled onto the trail. They cover 3km with this method.*

**2.) Make the snow in place on the trail.**

This second method requires significant infrastructure on the front end of the project to deliver an adequate water supply with proper pressure along the trail for distribution through strategically located hydrants. There are two types of snow guns that can be attached to the hydrants for snow making.

*Snowmaking pipes running through the woods at Middlebury's Rickert Nordic Center. One pipe carries water and the other compressed air. Hoses connect hydrants to snow guns for making snow in place on the ski trail. The snowmaking system is used to cover 5km of their 50 km trail system with snow.*

# Snowmaking

**A.) Air/Water guns rely on compressed air to propel the water through the gun to make snow.**

This method needs a second line delivering a source of compressed air. Guns are generally mounted on the ends of long poles fixed or portable.

*Top picture shows the holding pond, pump house and one of the snow guns at Middlebury's Rickert Nordic Center. The bottom picture shows system section intersections with connection valves. Short hoses are used to connect sections. One advantage of the air/water method is using the air to blow out water lines.*

**B.) Airless (or fan) guns use a large fan to blow the water into the air to make snow.**

*Airless fan guns making snow early in the season.*

In addition to adequate water, fan guns require the correct power supplied for running the on-board compressor and fan. The power lines are buried below ground with an above ground pedestal located next to the water hydrant so the power cord can be run along with the hose to the gun. Fan guns used for cross country are generally portable but could be fixed in larger open areas. Smaller capacity guns are more suited for a wooded 6 meter wide trail. Keeping as much snow on the trail as possible is most efficient. Another concern when snow making on a narrow trail is the wet snow loading up on adjacent trees and branches, freezing and pulling them down.

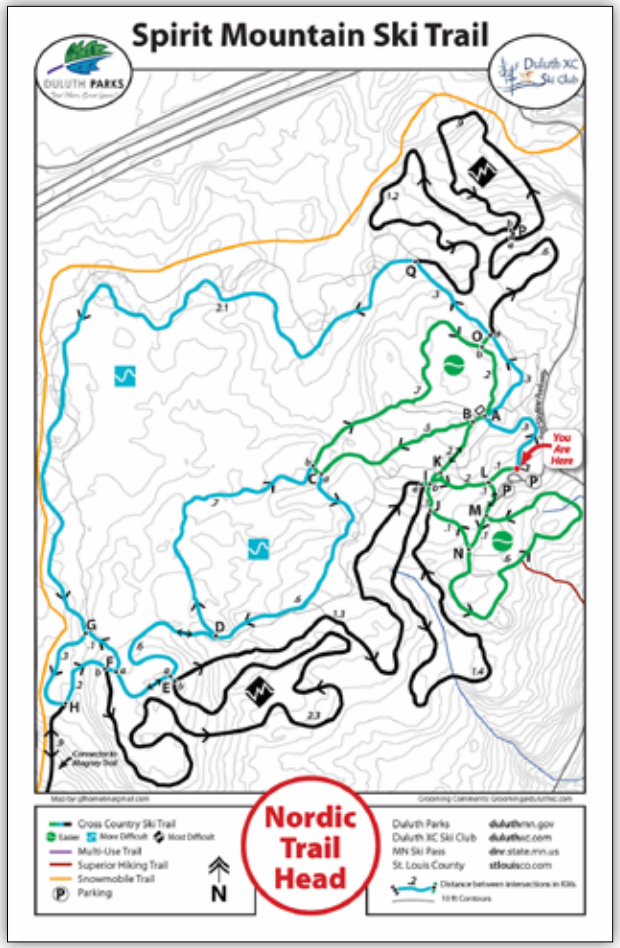
2.5km to 5km would be an effective trail length for snowmaking and of moderate terrain. Lighting would add to the value.

*A water hydrant and electric pedestal stand along the new 5km snowmaking loop at Hyland Park in the Twin Cities. Below, excavation for buried snowmaking power.*

# Signage and Wayfinding

## Trail Maps

Over the last couple of years new trail maps have been developed, printed and installed on the trails. This has been possible with vast input, hours of planning, feedback and installation from DXC member John Ipsen. Several iterations have been tested with the current version installed last winter receiving positive feedback from the ski public.




## Trailhead Signage

There needs to be a consistent look and information available at each trailhead so that park users are aware of what uses are accepted on the trail for that season. The trailhead is also the "front door" of the trail and an appealing first impression is important. Each park is a little different as to what activities take place there and how to inform users of acceptable usage of the trail. As an example, the Chester Park trailhead need not post "no snowmobiles" nor "no horses" since there are no trails nearby nor any known activity in the area. The same would be true for Hartley Park. A Trailhead Kiosk of consistent special design should be considered. Activities prohibited at all times of the year on the ski trails are bikes and horses.

Over the years, many different signs have been installed on the trails, many now in disrepair. It should be a goal to develop a signage design and strategy plan, take down the old and worn out signs and replace with the new look for a clear and consistent message throughout the City trails.

# Signage and Wayfinding

## Trail Difficulty Rating

The City has been using the three designated symbols and nomenclature for rating trail difficulty: Easier or beginner, green; More Difficult or intermediate, Blue; and Most Difficult or expert, black. This system is quite subjective but widely used across the country. These ratings are for average snow conditions. If there is a lack of snow or icy conditions the difficulty rating would not indicate the quality of the skiing nor the safety.

## On Trail Signage

Signage once you enter the trail is generally found at intersections. Maps indicating "You Are Here," one-way or two-way travel, difficulty of the trail section(s) and any warning signs; "Do Not Enter," "Steep Hill,""Merging Trails," "Trail Crossing Ahead," etc., need to be strategically placed. Signs to reinforce accepted ski trail uses need to be placed where intersections with other user trails occur, such as: Superior Hiking Trail, mountain bike trails, snowmobile trails and other multi-use trails.

## Wayfinding to Trailhead

Navigating through Duluth to a trailhead is not always easy by car. The parking lots are not obvious and someone from out of town would have a hard time. There needs to be a consistent plan throughout the City from main thoroughfares to the trailhead parking area. There are a few brown signs on streets indicating where the trail can be found but finding the trailhead is still not obvious. This very nice sign for Piedmont Trail *(picture below)* is on Hutchinson Road on both approaches to the trailhead parking lot. Additional signs directing traffic, from Piedmont Avenue and Morris Thomas Road, would be additionally helpful.

## Google Map

In this day and age, it seems that, the time of folded paper maps is over. We are in the electronic age now and more people use their phones or pads to locate and navigate places. If the Duluth city ski trails were visible on Google Map, this would be a big benefit for those navigating by electronics. The Superior Hiking Trail and most other park trails are shown. The only thing missing are the ski trails. The City has the ski trail data and should send it to Google and request adding to their map as a public service.

*A sign at one of the neighborhood cross country ski trailheads at Gatineau Park, Gatineau, Quebec. Notice the $100 minimum penalty for walking dogs on trail.*

*A sign at Lester Park needing to be replaced.*

# Public Input

## Public Meetings

The following meetings were held to gather skier input on the ski trail system.

June 5, 2014
Public, Duluth Heights Community Center

May 5, 2014
DXC Board Meeting, Sara's Table

November 18, 2013
Area Ski Coaches, Clyde Iron

June 4, 2013
Public, Hartley Nature Center

May 13, 2013
Focus Group, Chester Park Chalet

## Comments

Following is a compilation of skier comments gathered at these meetings.

### CHESTER PARK

"Add Nordic rental program at Chester (chalet) and Nordic ski lessons"
"Rental/loaner skis available for people to try"
"Expand trails to provide for green and blue levels too"
"A chalet means beginner friendly"
"These trails need major work to come up to standards for dual technique"
"Modify trail at summit to show off view over harbor"
"Keep skate trail-great for Birki training"
"Classic only"
"Develop a race trail and build a new chalet so teams could ski here daily"
"Speed skating oval alternate location?"

**Snowmaking**

"Put snowmaking on this trail"
"Snowmaking /lights up to C cutoff"
"Snowmaking is handy (ie water)"

**Multi-use**

"Separate attractive dog-walking trail"
"Great trail. Keep downhill skiers and walkers off "
"Separate trail for walkers needed"

### HARTLEY PARK

"Go around steep hill on Outer Loop"
"Get rid of steep hill"
"Modify/simplify intersections on south end"
"Invasive species"
"Add a beginner trail"
"Beginner trail for Hartley (near pond)"

**Single Track**

"West side of Hartley Road single track"
"Have meandering single track in new area"

**Classical Skiing**

"Would leave current trail system as classic only"
"Keep classic only" (2)
"I love this trail and that it's classic only-very family friendly"
"Terrain is best for classic only (existing trails)"

**Skate Skiing**

"Skate"
"Beginner classic and skate"
"We need to consider developing a skate trail or widening existing trail to allow for skate/classic"

**Multi-use**

"Walkers a problem during transition seasons"
"Restore Hartley Road"
"Groom Hartley Road for walkers"
"Improve options for separate dog/walking trail"

### LESTER-AMITY

"Golf course enhancements for skiing"
"Walkers problem during transition"
"Back country (single track)"
"Restroom facilities"
"Warming house at Lester would be great"
"Open the chalet Yes!"
"Expand lighting"
"Extend lights onto all K's of trail"

**Snowshoe Trail**

"Snowshoe trails please"
"Add snowshoe trails (apart from COGGS)"

**Snowmobile Trail**

"Reroute snowmobile trails away from ski trails. Too much vandalism on groomed trails, or create some kind of obstruction to prevent snowmobiles from

going down ski trails"
"Reduce snowmobile access as some trails hardly used"
"Look at switching ski and snowmobile trails to reduce crossing"

**Seven Bridges Road/Skyline**

"Expand trail system to Hawk Ridge. Track trail on Seven Bridges Road"
"Groom Seven Bridges Road and Skyline Parkway"
"Connect to Hawk Ridge trails"
"Do a loop behind Hawk Ridge, add parking on Hawk Ridge with trail access"

**Parking**

"Better lighting in parking lot"
"Security camera at parking"
"Parking for access at upper end."
"Add trailhead with parking lot at north end of trail."

## MAGNEY-SNIVELY

"Consider describing Spirit and Magney as one linked trail system"
"Back country?"
"More brush work along classic track side of trail
"Need trail work! (flood damage)"
"Drainage work to do in spots"
"Nopeming training center. Biathlon, 40 acres of public land with good terrain"
"Go through to Nopeming"

**Connector**

"Keep/improve connector"
"Wind around (instead of straight shot)"
"Figure out connection to Spirit"
"Improve connection between Magney and Spirit."
"New separate descent trail-from G area?"

## PIEDMONT

"Add restrooms"
"Better signage to get to trailhead"
"Nice terrain-could expand system"
"Back hills can be treacherous (but fun), can they be modified?"
"That back stretch is soooo steep-modification possible"
"Keep trails classic only (combo trails not the same)"
"Keep classic only"
"Add skate trails"
"Skate trails please"

**Homemade Signs**

"Love the personalized signs"
"Don't lose the neighborhood feel-it's part of this trail's charm"
"Those homemade signs are a Piedmont tradition (love em or hate em) Must they be cast aside in favor of standardized signage?"

## SPIRIT MOUNTAIN

"Event center here"
"Put snowmaking on this trail"
"Get more true skate skis for rental/learn to ski program"
"Spirit Mountain needs to REALLY work with DXC"
"Facility needs maintenance, could be bigger if programs held"
"Have building open more"
"New larger building to promote ski community feeling."
"Develop larger building at Spirit Mountain. Open up field above campground as discussed at spring meeting"
"Lighted loop!"
"Trained volunteers for grooming. Set up schedule so trails are ready when skiers are"
"Can we wrap around the downhill, to Grand Ave, between parking, railroad and McDonalds"
"Make "C" cut off much clearer so beginners don't end up on blue"
"Still drainage work to do"
"Rework access to main trail head. Intimidating for beginning skiers"

**Parking**

"More parking"
"Parking insufficient when in full use such as youth ski. Currently shuttles are used"
"Tennis court parking"

## GROOMING

"Hire (additional) temporary groomers"
"More equipment"
"Groom wider, more frequently, and provide accurate and timely updates"
"Grooming needs to be: Timely; re-groomed frequently; have skilled operators that continue

to improve their skills and knowledge; done with proper equipment"
"Do late season grooming until snow is gone, this year as example"
"Consider: After a snowfall allow selected trained snowmobilers to pack the snow during a defined window of time prior to City grooming"
"Get ski community to support more grooming with extra $"
"Groom Lester first, has lights, most usable trail"
"On combo trails, classic tracks are far to the sides, brush in way, hard to plant pole, soft pole plant"
"Groomer training course here like at ABR"

## ONLINE UPDATES

"Communication about grooming important"
"Daily grooming status reports, possibly join and use www.SkinnySki.com where most skiers get their info""Prompt grooming updates""Real time grooming updates""Daily web updates of status"
"Single on-line site with grooming updates"

## SIGNAGE

"Use "nodes" on all trails (A, B, C)"
"Indicate # of km for each loop"
"Maps-less factual, more beautiful and helpful"
"Develop mobile App map/grooming/events"

**Multi-use**

"More signage to keep snowmobiles off"
"Post clear – No Dogs – No Horses – signage"
"Keep walkers off trails (more signs)"
"Courtesy hints for walkers on trails, ie walk here"
"Bigger signs to keep off walkers and runners (Specify when trails are groomed)"
"No dogs on ski trails everywhere"
"Yes (to the no dogs message)"

## EVENT CENTER

"Great idea, good for tourism. Seems Spirit Mountain only logical place"
"Building for groomer to be on site similar to Wolverine, doubles as wax area for events"
"1 level chalet, bathroom, changing area large enough for school teams"
"Tent is a portable chalet"
"Need capital funds request to build stadium area-connect to existing chalet?"
"Spirit Mountain may be a great site for an event center-but it also might be best to start at ground zero At a new undeveloped site"
"We need an event center! with snowmaking and a chalet! This should be part of the Master Plan!"
"Great idea! Have the State/National tourney here"
"Yes, do the development to host major races"
"Develop a site to hold big races like Jr. Nationals, state meet, etc."
"Could be a great draw for many different events: cross country ski, dog sleg, skijoring, mountain biking, trail run, concerts, etc., at all levels of expertise"
"Like the idea to be home to High School skiers"
"Let's build a building like Mora's"
"Having a "Heart" of ski community that a building would provide: it's a great thing"
"Bus parking with easy in and out"
"Have to have lots of parking and easy access"

## OTHER

"Promote cross country skiing through Visit Duluth, City website, etc."
"Go through each trail system with a fine toothed comb to rectify trail widths and contours. Repair erosion in a sustainable fashion"
"Let's do some key-informant interviews with others who aren't here (ex: college students, tourists)"
"Need warming buildings at some of the trails"
"More lit trails""Lights? Other trail(s)?"
"Have outhouses/restrooms at trail systems"
"Enforcement of MN Ski Pass"
"Where can skijoring happen? Which trail(s)""Having one or two options to would be nice"

Submitted:

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