Bulkley Valley Cross Country Ski Club
Management Plan
2020 – 2022

Bulkley Valley Nordic Centre
www.bvnordic.ca

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Section 1 About Us

1.1 Organization and Purpose

The Bulkley Valley Cross Country Ski Club ("BVCCSC" or "the Club") is a not-for-profit society registered under the British Columbia's *Societies Act*[1] .

The society's constitution states that the purposes are to promote community participation in the healthy outdoors lifestyle of cross-country skiing in the Bulkley Valley that includes:

1. encouraging recreational cross-country skiing;
2. developing and maintaining the Nordic and biathlon facilities at the Bulkley Valley Nordic Centre;
3. offering and promoting cross-country skiing skill development programs for children, youths and adults;
4. offering and promoting athlete development programs for cross-country ski racing and biathlon; and
5. organizing and hosting cross-country ski and biathlon race events.

The Vision of the Club is to be a vibrant, welcoming community of members and visitors participating in and supporting cross-country skiing and biathlon in the Bulkley Valley.

1.2 Priorities

Club priorities during the term of this management plan are to:

- Nurture our volunteers
- Continue to foster skill development through existing programs
- Maintain or increase the Club's membership
- Maintain or improve our assets: trails, buildings, equipment and finances
- Implement strategies to adapt to a changing climate, and
- Ensure safety is considered in all operations.

1.3 Governance

The Club's board of directors provides oversight and direction for the Club's programs. Policies and procedures are available on the Club's website bvnordic.ca.

[1] BVCCSC is not designated as "member-funded society", meaning that the Club can accept public and outside funds to help support operations.

Club operations are divided into programs as described in the following table. Each program has a responsible director, delegated decision-making and a program budget within the overall club budget.

PROGRAM	DECISION-MAKERS	FINANCIAL MANAGEMENT
Nordic Centre Develop, maintain & operate ski trails, lights, machines, buildings.	Nordic Centre Director with input from trails coordinator, buildings manager, groomers and advice from the Board	Program budget with income primarily from user fees (day tickets and season passes). Capital projects supported by grants and donations.
Membership Member registration Communications Administration	Registration: Registrar & Membership dir. Communications: Communications director Administration: President & Secretary	Program budget with income from membership fees, grants, sponsorships and budget surpluses from events, projects & programs.
Events Competitions Clinics Fun events, Socials Master's Drop-in	Events Director plus Race Committee or Event coordinator	Program budget with event-specific incomes and expenses. Events budget balances total income and expenses across all events.
Nordic Skills Development Athlete Development Biathlon Rabbits Ski S'Kool	NSDP Committee: NSDP director, head coach & reps from each skills program Coach Mgt Committee supervises paid coach	Program and sub-program budgets with income from program fees, grants, sponsorships and fundraising. NSDP budget balances total income & expenses across all skills programs.

1.4 Plan Area

The Bulkley Valley Nordic Centre is located west of Smithers on the Hudson Bay Mountain Road. The ski trails were located at this site because of its proximity to the town of Smithers, varied terrain that is well suited to skiing, and its elevation. The Nordic Centre provides significantly more reliable and deeper snow than sites in the valley.

BVCCSC has a Partnership Agreement with the Province of British Columbia to maintain ski trails in the area. The agreement is administered by Recreation Sites and Trails BC (RSTBC). RSTBC has established the area as a recreation site.

BVCCSC holds Licence of Occupation 6408004 for 7.15 ha of Crown land where the lodge, staging area, parking lot, biathlon range, and associated buildings are located. Licence of Occupation 6408005 covers the lit trail system.

The Nordic Centre is within the Wetzin'kwa Community Forest. The Club and Wetzin'kwa Community Forest Corporation have a memorandum of understanding which acknowledges each party's interests and sets out guiding principles for operations.

The Nordic Centre is within the traditional territory of the Cas Yex/Grizzly House within the Gitdumden (Wolf/Bear) Clan of the Wet'suwet'en Nation. BVCCSC relies on RSTBC for formal consultation related to Nordic Centre operations. BVCCSC has expressed interest in working with the Cas Yex house to ensure access to the trail system, to engage early regarding any new trail proposals, and to explore ways to incorporate Wet'suwet'en trail names and interpretive signs.

1.5 Trail Network

A map of the existing trails is attached to this plan. The trail network has evolved over time to reflect user demand (e.g. dog trails) and to provide as much variety as possible. The trails have been modified and expanded in many separate projects over the past twenty years, often taking advantage of logging in the community forest.

Three new trails were completed in the summer of 2018, representing the completion of the previous strategic trail plan. With the new trails, the network contains a total of 52 km of trails of which 5 km is lit and 10 km is dog-friendly.

All trails have been built to allow a skate track plus classic tracks on both sides. Trails meet or exceed standards provided by RSTBC. Some trails were built to meet "Homologation" requirements set by the International Federation du Ski, so that they could be used to host major competitions.

Section 2 Goals and Strategies

2.1 Provide Great Cross-Country Skiing

- **Maintain and increase the community's participation in cross-country skiing**
  Strategies:
  - Continue to communicate to the community to encourage use of our facilities, our programs and events
  - Accept that existing facilities and programs are generally the right offerings and apply any incremental efforts toward improved quality, availability and efficiency of these services.

2.2 Ensure We Can Sustain It

- **Improve sustainability of volunteer efforts**
  Strategies:
  - Decrease maintenance requirements or make volunteer maintenance work easier through targeted improvements in trails, facilities and equipment.
  - Expand programs or commitments only when an adequate volunteer base is available and confirmed.
  - Support and retain volunteers and staff by providing job descriptions that ensure each job is clearly understood, has realistic expectations and supports a satisfying experience.
  - Increase the volunteer base by positive and welcoming communications of volunteer opportunities.

- **Ensure long term financial sustainability of the Club's operations**
  Strategies:
  - Maintain or increase the membership base.
  - Ensure programs are supportable by projected revenue.
  - Maintain or reduce operating costs through optimization of equipment and assets.

- **Sustain infrastructure and equipment**
  Strategies:
  - Plan and budget for proactive maintenance and repairs to equipment and infrastructure.
  - Establish and periodically update a long-term financial plan for major repairs and improvements to infrastructure and major equipment.

These three sustainability goals are interdependent, so all proposed actions need to be designed concurrently with all three goals in mind. After these sustainability goals are being realized, then new programs, facilities or trails may be considered.

2.3 Keep it Safe

- **Follow Public Health Requirements**
  Strategies:
  - Section 3.5.1 specifies health requirements and club initiatives that the Club is following to protect public health at the Nordic Centre.

- **Provide first aid supplies, emergency communications and signage**
  Strategies:
  - Section 3.5 *Safety Measures at the Nordic Centre* specifies actions to ensure that supplies, communications and signage support safe operation and use of the Nordic Centre.

- **Ensure safe practices in skills training programs, events and work bees**
  Strategies:
  - Coaches and race officials will continue to be trained to ensure safe activities
  - The Club will periodically offer safety-related training to paid and volunteer members.
  - Hazardous activities like chain saw work will be restricted to those with appropriate qualifications.
  - The board will maintain and periodically review and update safety-related policies.

- **Ensure safe operation of the club's machines**
  Strategies:
  - Require operators to have sufficient training and/or experience to be able to safely operate the tracksetting, plowing and brushing machines. (See section *3.5.8 Machine Operator Training* for implementation details)

2.4 Take Care of the Environment

- **Construct and maintain trails to maintain natural drainage patterns and avoid sedimentation of water sources**
  Strategies:
  - All stream crossings are built to the same environmental standards as forest roads. Fish bearing streams are known from mapping made available by

Wetzin'kwa Community Forest and open log culverts are used for crossing these.
    - Annual inspection of trails is undertaken to ensure culverts are properly functioning.
    - All trails are grass-seeded the year following construction to reduce potential for surface erosion.

- **Reduce potential for a fuel spill from tracksetting**
  Strategy:
    - A fuel tank was installed in 2018 with a proper fuel spill catch membrane underneath it. The Club maintains a supply of absorbent cloths on hand to catch minor spills if they occur.

2.5 Plan for a Changing Climate

Climate change in this area is expected to result in warmer winters and increased winter precipitation. Projections indicate significant variation from year to year including the possibility of more rain events in the fall, later onset of winter, and periodic fall droughts.

- **Adapt trails to allow skiing on a shallower snowpack**
  Strategies:
    - Improve the trail base to allow skiing on a shallow snowpack. This includes grading of trails, improving drainage and frequent mowing of early-season trails.
    - With Wetzin'kwa Community Forest, explore opportunities to expand trail system upward on the mountain as part of any planned logging in the area.

- **Adapt grooming equipment and grooming protocols**
  Strategies:
    - Upgrade grooming equipment to increase capability to trackset in low snow conditions.
    - Implement early season operating procedures, such as early track packing and low-snow tracksetting using roller and Ginzu groomer.

- **Over time, reduce then eliminate the carbon footprint of our operations**
  Strategies:
    - In the near term, reduce fuel consumption by adopting a "minimum tool" principle that prioritizes smaller, more fuel-efficient grooming equipment in snow conditions where a good quality skiing experience can still be achieved.
    - Any additional equipment should increase our minimum tool capacity.

- Plan for eventual replacement of current PistenBully and snowmobiles with electric-powered machines.
- Until feasible electric alternatives become available, retain existing equipment to reduce the “embodied carbon” that comes from manufacturing replacement equipment.

Section 3 Nordic Centre Operations

3.1 Trails

Following the recent trail expansions, the Club now has over 52 km of maintained cross-country ski trails. Maintenance of this network is a high priority to ensure safety and environmental protection and to optimize the trails for skiing.

3.1.1 Annual Inspections

All trails are inspected annually for three things:

- To determine if mowing is required.
- To inspect any culverts for seasonal maintenance, including potential cleaning; and
- To identify hazard trees for removal

3.1.2 Mowing and Brushing

The Club has a Bobcat 92 hp tracked skid-steer loader equipped with a 7-foot rotary mower. The skid steer has relatively low hours and should provide service for 10 to 20 years. With the acquisition of the tracked skid-steer in 2019, the club is now able to access most of the trails. A small amount of area still requires hand brushing each year.

A group of 3 to 4 volunteers mow the trails, which usually takes 40 to 60 hours of mowing each year. A designated set of Early Season Trails (Appendix 7.1.2) are mowed annually and other trails are mowed every two years, or as needed. As the trails are mowed, windfall is removed to make start-up of the ski season easier. Each year, some effort is targeted at reducing the brush beside the trails to reduce brush leaning onto the trails when it snows.

Portions of the trails are still quite rough and make mowing challenging. Planned improvements will remove rocks and stumps and grade the trails to reduce wear and tear on the mower as well as improve the base for skiing.

3.1.3 Trail Improvements

BVCCSC has just completed a major three-year “Trails for Tomorrow” project. The project improved the surface so designated trails can be skied with less snow (target skiing with less than 20cm) and improved access for mowing. With the completion of that project, many of the trails are in good shape. However, driven by our climate change strategies, additional improvements are still needed on remaining trails.

All trail works are undertaken under the authority of the Partnership Agreement with Recreation Sites and Trails BC and any work-specific authorizations. Logging is coordinated with Wetzin’Kwa Community Forest to ensure timber is removed and utilized.

Grading and drainage are the key to early season skiing so we have proposed the following improvements for the existing trail network (cost estimates listed in Appendix 7.1.3):

a) **Grading and drainage:** minor grading and drainage is required on trails to improve early season skiing and to facilitate mowing. These improvements, when complete, will substantially complete upgrades on the existing trail system. Funding will be sought as available and trails can be completed over multiple years.
b) **Bridges**: Replace log culverts with permanent bridges. There are two log culverts on Pine creek that were installed in 2015 and will need to be replaced before 2025. A new culvert on the Wetzinkwa extension will also need replacement. All should be replaced with permanent bridges that have a deck that is suitable for crossing with a skid-steer and PistenBully, and that facilitate early season skiing. An inexpensive option is treated timber bridges due to the relatively short spans. A site design plan is required before final design is confirmed. Estimated budget is $15,000. This is a lower priority but can be done when funding is available.
c) **Gates**: The Club has 7 gates and four cables which prevent vehicle access to the trails and facilities to avoid damage to the trails and to reduce risk of vandalism or theft at the lodge and associated buildings. Wetzin'kwa Community Forest has a key to the gates to allow periodic use for forest management purposes. The local trapper is also provided a key if needed. Two new cables are planned for installation in 2020 to prevent rutting on Upper Logging Trail.

Potential Capital Projects: In 2020 the club will look for funds for a significant portion of the remaining trail upgrades. Other projects will be prioritized for future years.

3.1.4 Trail Optimization

In recent years, a series of minor changes have optimized the trail system to make tracksetting more efficient and to make trails easier for skiers to find and follow. These changes, combined with the creation of a new "Wetzin'Kwa extension" and "Down the Mountain" have substantially reduced the amount of trail where a tracksetter has to traverse the same trail twice; the overall impact is increased efficiency of tracksetting.

3.1.5 Maps and Signs

As a safety measure (see section 3.1.5) and to make skiing our extensive trail network more enjoyable, we supply free maps in paper, downloadable georeferenced pdf and through Trailforks.com. New signage welcomes and informs skiers at the turn-off and a new information kiosk in the lower parking lot.

We also installed signage at each trail junction:

- junction letter
- trail names with difficulty ratings,
- "you are here" maps, and
- a directional P sign indicating the easiest route back to the parking lot.

Renewal of our maps and signs has been generously supported by Recreation Sites and Trails, BC Rural Dividend Fund, club volunteers and Nordic Centre operational funds. Ongoing sign maintenance will be covered by the operational budget.

The Club has invited Cas Yex clan of the Wet'suwet'en to provide some names for trails to increase people's knowledge of the Wet'suwet'en presence. Other interpretative options that will be considered if time and funds are available are:

- Find opportunities for more Wet'suwet'en information to be presented to skiers, and
- Install an interpretative sign at the old homestead on Wetzin'kwa extension. This is located along the old Duthie Mine road and is an interesting part of the settler history of the region.

3.2 Lodge and Buildings

3.2.1 Lodge Maintenance

Regular maintenance occurs under the direction of a buildings manager. One or two annual work bees use volunteers to stock firewood, clean the lodge and do special projects. In addition, a roster of athletes and parents from the Athlete Development Program contribute to routine maintenance during the season (i.e. cleaning bathrooms, taking out garbage, shovelling the decks, etc.).

3.2.2 Lodge and Building Improvements

Major upgrades to the lodge in recent years include a new cistern, furnace, chimney, and roofing. New flooring and ceiling were installed in 2017, completing the original vision for the lodge. In 2018, a second woodshed was constructed which allows the Club to store 1.5 years of firewood, ensuring that firewood is always dry and burns efficiently.

In addition to the lodge, the Club has a Caretaker Cabin, a Wax Hut, a Biathlon Cabin, and a Timing Hut. During the term of this plan, no major projects are required for these buildings. The Nordic Centre's operational budget covers minor repairs and upgrades. For unforeseen major repairs, the Club has an Infrastructure Reserve Fund. This contingency fund currently has $40,000 which is available for unforeseen major repairs of buildings or equipment.

3.2.3 Machine Shed

The current machine shed was built in approximately 1995. In 2018, a grant from Wetzin'kwa Community Forest allowed ceiling beams to be reinforced with LVL beams to address a concern with the structural integrity. Although the ceiling is reinforced, the roof still leaks and there are some foundation issues on one end. The Club is making plans to upgrade the shed but even with the upgrades, the shed is not well suited to protect and maintain our primary tracksetter which is currently the PistenBully. The shed is too small to allow efficient servicing of the tracksetter, does not have a concrete floor and cannot be insulated and heated.

A new building for our primary tracksetter is a high priority for the club and will be the subject of grant applications in 2020. The new tracksetter "garage" will be built adjacent to the east wall of the existing machine shed. The building will be 32 feet by 40 feet; large enough for the PistenBully plus workbench and storage for tools, supplies and parts. It will have a concrete floor with catchments for meltwater and any spills. The building will be insulated and will have a heater to facilitate repairs and maintenance.

The existing shed will continue to be useful for storage of smaller machines, tools and signs. Upgrading the shed is a lower priority than building the new shed but if and when additional funding is available, the Club plans to:

- Stabilize several foundation posts at the west end of the shed.
- Upgrade the lean-to for the skid-steer with new post foundations and extended roof
- Roof and concrete base for the fuel tank
- Rebuild the doors on the main bay
- Siding to match other buildings
- New trusses and roofing for the whole shed
-

Potential Capital Projects: The Club will use some of its infrastructure reserve fund and seek grants to build a new, single bay Tracksetter garage. Estimated cost $100,000.

If funding is available that does not affect funding for the new garage, the existing machine shed will be upgraded to continue storing auxiliary equipment and fuel. Upgrades can be done in phases. Total cost: $40,000. Cost without new trusses and roofing: $20,000

3.3 Tracksetting

3.3.1 Primary Tracksetter

The primary machine for tracksetting is a 2004 PistenBully Edge with a tiller/groomer attached. It was purchased used in 2012. At the end of the 2018 it had 8350 hours. As of spring 2020 the PistenBully has 9077 hours.

Appendix 7.2.1 examines the question of replacing, retaining and/or supplementing the PistenBully. In 2018, based on that analysis, the Board of Directors decided that the Club would not consider buying a second PistenBully. In 2019, the Board adopted a management plan with a Proactive Maintenance strategy to keep the PistenBully Edge running indefinitely, or until there is a suitable electric replacement. The initial shift to proactive maintenance involved significant investments to replace worn parts in 2019: approximately $20,000 for hydraulic pumps, and $15,000 to replace the track belts. In 2020, the left final drive had to be replaced and a spare final drive was purchased at a total cost of $17,000. For the next several years, only regular maintenance is expected. Despite the proactive investments, the PistenBully is still a high-cost machine and is expected to occasionally have unavoidable down time.

3.3.2 Auxiliary Tracksetters

In addition to the PistenBully, the Club has small tracksetting equipment:

- a Skidoo Skandic snowmobile that pulls a Ginzugroomer (purchased in 2012) or an 8-foot roller.
- two Skidoo Alpine “Twin Track” snowmobiles that pulls a single classic track setter or 8-foot roller.

The Skandic snowmobile and Ginzu have been used as our auxiliary tracksetter for when the PistenBully is being repaired or as the preferred machine in early season low-snow conditions. Increasingly the auxiliary tracksetter has been used in conditions when it can set a good quality track for lower operating costs. This “minimum tool” strategy reduces wear and tear on the PistenBully as well as reducing greenhouse gas emissions.

As the club increases use of the auxiliary tracksetter, reliability issues have become apparent with the current Skandic. Research from other clubs indicates these machines are at the limits of their design capacity pulling a heavy tracksetter, and in these kinds of heavy use they will break down and require service. Having a reliable back up machine (or fleet) of machines is essential to deliver quality trails, based on the lessons from 2020. Appendix 7.2.2 presents an analysis of machine options to improve our auxiliary tracksetting fleet. The analysis identifies four

reasonably viable options, **any one of which will meet the primary objective of improving the reliability of our tracksetting fleet**. The following table ranks capabilities and costs.

Machine Options	Capability	Funding Considerations
2nd Skandic (existing Ginzu) $18,000	**Same** capability as current Skandic	Funding is likely. (fundraising and grant)
Tracked ATV (existing Ginzu) $22,000	**Better** pulling. Similar grooming results as Skandic	Funding is likely. (fundraising and grant)
UTV + new groomer $35,000	**Better** pulling. Enclosed cab. ~Better grooming	Small improvement in capability not worth extra cost if funding is limited
Sherpa 1.2 + F250 groomer $73,000.	**Best** pulling, reliability and grooming.	High cost will likely affect ability to fund PB garage. 10+ year solution not needed if switching to electric in 5-8 years.

If funding was not a limitation, buying the Sherpa could improve capabilities enough to reduce reliance on the PistenBully. Funding is expected to be limited so pursuing one of the low-cost options is the best way to improve the reliability of our tracksetting fleet. The small cost increment for a tracked ATV would add a different machine to the fleet and would allow the grooming operator to select the machine best suited for that day's conditions.

Potential Capital Project: Pursue the purchase of a tracked all terrain vehicle capable of pulling a Ginzu groomer. Estimated total cost $22,000

3.3.3 Tracksetting Policy

The Club's tracksetting policy sets out when and how tracks are to be set and the desired trail standards. To date, the policy was only partly documented and as a result, it has not been clear to members what standard they can expect and how that standard will vary with snow conditions.

Recently, the Club made changes to which trail segments are being groomed so that tracksetting will be optimized (e.g. reducing out and back sections). Tracksetters have also established tracksetting routes and priorities to ensure efficiency and to target heaviest use areas after snowfalls. The Club continues to experiment with how and when to effectively use the smaller Ginzu groomer. The goal of these actions is to maximize the amount of trail set within the existing budget. End-of-season analysis will guide adjustments to the tracksetting policy and future budgeting.

In the next year, the tracksetting policy and standards will be documented to support tracksetter decisions and to communicate to members what they can expect and clarify how snow conditions and budgets might limit how and when trails are groomed.

3.4 Snow Plowing

The Nordic Centre has two parking lots and approximately 500 metres of road to maintain. In the past, these were plowed under contract, but contractors were not able to do the work as quickly as needed and it was expensive. The skid-steer loader with a hydraulically controlled plow was used in 2019/20 and proved to be very effective. Five operators were trained and a combination of volunteers and paid staff ran the machine. Having a dedicated plowing machine has reduced use of the PistenBully and allowed the tracksetters to focus their efforts on trails.

Minor adjustments are needed to improve plowing effectiveness including installation of studs on the rubber tracks for icy conditions.

3.5 Safety Measures at the Nordic Centre

3.5.1 Public Health

The Nordic Centre's operation will follow the rules and intent of public health requirements:

a) COVID-19

- In March 2020, following the guidance of provincial health officials and direction and advice from Recreation Sites and Trails BC, the Wetzin'kwa Loppet was cancelled and the Nordic Centre's lodge and indoor washrooms were closed for the remainder of the ski season.
- Over the summer of 2020 and for the 2020-2021 ski season, the Club will follow direction from provincial health officials and Recreation Sites and Trails BC, regarding any activities at the Nordic Centre.
- With advice from Recreation Sites and Trails BC, the Club will establish guidelines for activities such as summer works, response to lodge rental requests and how to plan for the 2020-2021 ski season.

b) Food and Sanitation

- Food facility operating permit (annual)
- BVCCSC Food Safety Plan (In Food Safety binder in lodge kitchen and filed in lodge office filing cabinet)
- BVCCSC Sanitation Plan (In Food Safety binder in lodge kitchen and filed in lodge office filing cabinet)
- Key kitchen volunteers have Food Safe training
- Inspections by provincial Environmental Health Officer

c) Water

- Operating permit (annual)
- Water quality testing as per operating permit and recommended testing of residual chlorine. (Caretaker tests monthly during ski season)
- BV Nordic Centre's Emergency Response Plan for Drinking Water System (In Food Safety binder in lodge kitchen and filed in lodge office filing cabinet)
- Inspections by provincial Environmental Health Officer

3.5.2 First Aid Supplies

There is a dedicated First Aid room in the lodge with a bed and First Aid equipment. For all major races, a safety officer is on duty. There is a rescue snowmobile and helmets available to search for lost skiers or if necessary, to rescue a skier. A sled to tow behind the rescue sled is available in the first aid room.

3.5.3 Emergency Action Plan

An Emergency Action Plan and Emergency Contact Numbers are posted near the telephone on the first floor of the lodge.

3.5.4 Safety Equipment on Trails

Several major junctions have a sealed bucket that contains a blanket and basic survival supplies. Locations are marked on the trail maps. The buckets are placed on the trails early in the season and removed at the end of the season.

3.5.5 Maps and Signs

To assist with navigating our extensive trail network and to reduce the risk of lost skiers, we supply free maps in paper, online and georeferenced pdf formats. We also install signage at each trail junction:

- junction letter
- trail names with difficulty ratings,
- "you are here" trail maps, and
- a directional P sign indicating the easiest route back to the parking lot.

3.5.6 Work Bees and Trail Work

Volunteer participation at work bees will be documented and will indicate any relevant training or safety-related certification. Volunteers will be assigned tasks appropriate to their training and abilities.

Chain saw work for the Club (e.g. firewood or clearing windfall) will only be done if the person is qualified to use the saw safely (trained and/or equivalent experience) and uses personal

protective equipment. Tree falling should only be done by qualified fallers. Chainsaw safety training will be offered periodically.

3.5.7 Machine Operators' Radio

Operators of the tracksetter or brushing tractor often work alone. They are responsible to assign a check in person (usually their spouse or partner) before leaving. They carry a radio that can telephone out from all areas on the trails for use in an emergency or if there is a breakdown.

3.5.8 Machine Operator Training

Operators of the Club's tracksetting or brushing machines will be required to have sufficient training and/or experience to operate safely and proficiently.

- The Head Groomer will determine who can operate the tracksetting machines and what training and experience they need.
- The Trail Coordinator will determine who can operate the brushing machine(s) and what training and experience they need.
- The Club will pay for training services if needed to ensure safe and proficient operation of tracksetting and brushing machines.

Section 4 Nordic Skills Development Program

4.1 Programs

The Nordic Skills Development Program provides skills training from qualified coaches for:

- Rabbits
- Extended Rabbits
- Track Attack
- Junior Development
- Biathlon
- Masters
- Schools

4.1.1 Athlete Development Program

The Athlete Development Program includes three tiers that are designed to follow the Long-Term Athlete Development Model. In 2018/19 these programs include approximately 130 athletes. The programs are described at:

Rabbits: http://www.bvnordic.ca/skills-development/rabbits/

Track Attack: http://www.bvnordic.ca/skills-development/track-attack/

Junior Development: http://www.bvnordic.ca/skills-development/athlete-development-program/

4.1.2 Biathlon

The Club has a biathlon program for youth (ages 8 and up) as well as masters. The biathlon range has 16 targets and a dedicated biathlon warming cabin. In 2018/19 there were seven athletes in Biathlon. The program is described at:
http://www.bvnordic.ca/skills-development/biathlon/

4.1.3 Masters

For adults, BVCCSC offers drop-in sessions for all skill levels. Participants and coaches meet at the lodge after the sessions for hot apple cider and tasty appetizers.

Private lessons for adults can be arranged with local CANSI instructors.

4.1.4 Schools

The Ski S'Kool program includes students from 6 different schools in the region and in a typical year will see over 1800 skier days. The program is described at
http://www.bvnordic.ca/skills-development/ski-skool/

4.2 Organizational Structure

Governance of the Nordic Skills Development Program is briefly described in section 1.3 of this management plan. Further information about the programs is available on the bvnordic.ca website on the Ski Programs pages.

4.3 Safety

Safety is a key part of the training for coaches and race officials.

All coaches and parents of children in the Athlete Development Program receive an annual safety orientation at the beginning of each year.

Section 5 Events and Communications

5.1 Competitions

BVCCSC regularly hosts local and regional cross-country ski races and biathlon competitions; up to 5 in a year. The Nordic Centre is capable of hosting provincial and national-level races (1999 Junior Nationals, 2006 Canada Games Trials, 2007 Western Canadian Championships).

No provincial or national competitions are being pursued at this time. During the term of this plan, the Club will typically host 2 to 3 local and regional competitions at the BV Nordic Centre.

5.2 Social Events

The Nordic Centre plays a significant role in the recreational and social life of Smithers, Telkwa and the surrounding Bulkley Valley. BVCCSC strives to provide a variety of events through the long ski season, catering to skiers of all ages and abilities. Events are well-organized, safe, friendly and inclusive. Planned events are posted on the bvnordic.ca website.

5.3 Communications

The club uses several methods of communicating about our club, facilities and activities. In addition to sending information out, wee provide opportunities for feedback from members and other users.

5.3.1 Website

BVCCSC maintains a website at www.bvnordic.ca. The site describes Club programs, trails and facilities, as well as various policies. An automated weather station provides updates on current weather at the Nordic center. Trail updates are posted on the website as soon as possible when tracksetters are finished for the day.

5.3.2 Newsletters and Email

The Club provides periodic newsletters by email to members to keep them apprised of news in the Club. Usually newsletters are twice or three times per season.

5.3.3 Social Media

BVCCSC uses social media (primarily Facebook) to update members on events and stories.

5.3.4 Marketing Strategy

The current communication tools have been adopted primarily to improve communications to current club users. With the quality of the trails and facilities, there are opportunities to also

market the Nordic centre as a destination for out of town skiers. Recently, Tourism Smithers added the Nordic Centre to their Ski and Stay Smithers website http://skiandstay.ca/. There may also be opportunities to expand the use of the facility by local people who are looking for healthy outdoor opportunities but are not familiar with cross-country skiing.

The club has discussed developing a marketing strategy that seeks to expand the reach of our communications both locally and as a skiing destination. There are likely funding sources available to do marketing work. The Club's first step will be to find a project lead who has a vision and a passion to drive this initiative. Within the next two years, the Club will then work with the project lead to expand its communications.

Section 6 Capital Project Priorities

6.1 Capital Plan for Priority Projects

6.1.1 Trails

In addition to the Club's trail maintenance budget ($5,000 for Fiscal Year 2021), the Club requested up to $38,725 of funding from Recreation Sites and Trails BC to address priority 1 and 2 improvements listed in Appendix 7.1.3.

6.1.2 Auxiliary Tracksetter

As described in section 3.3.2, it is a priority for the Club to improve the reliability of our auxiliary tracksetting. We will pursue fundraising and grants to purchase a tracked all terrain vehicle capable of pulling a Ginzu groomer. Estimated total cost $22,000

6.1.3 New Machine Garage

Section 3.2.3 describes the need for a new machine shed. Plans are being developed for a "garage" to built adjacent to the east wall of the existing machine shed. The building will be 32 feet by 40 feet with a concrete floor. It will be insulated and able to be heated to facilitate repairs and maintenance.

The Club has up to $40,000 of reserve funds which will be used to leverage other grants to pay the estimated cost of $100,000.

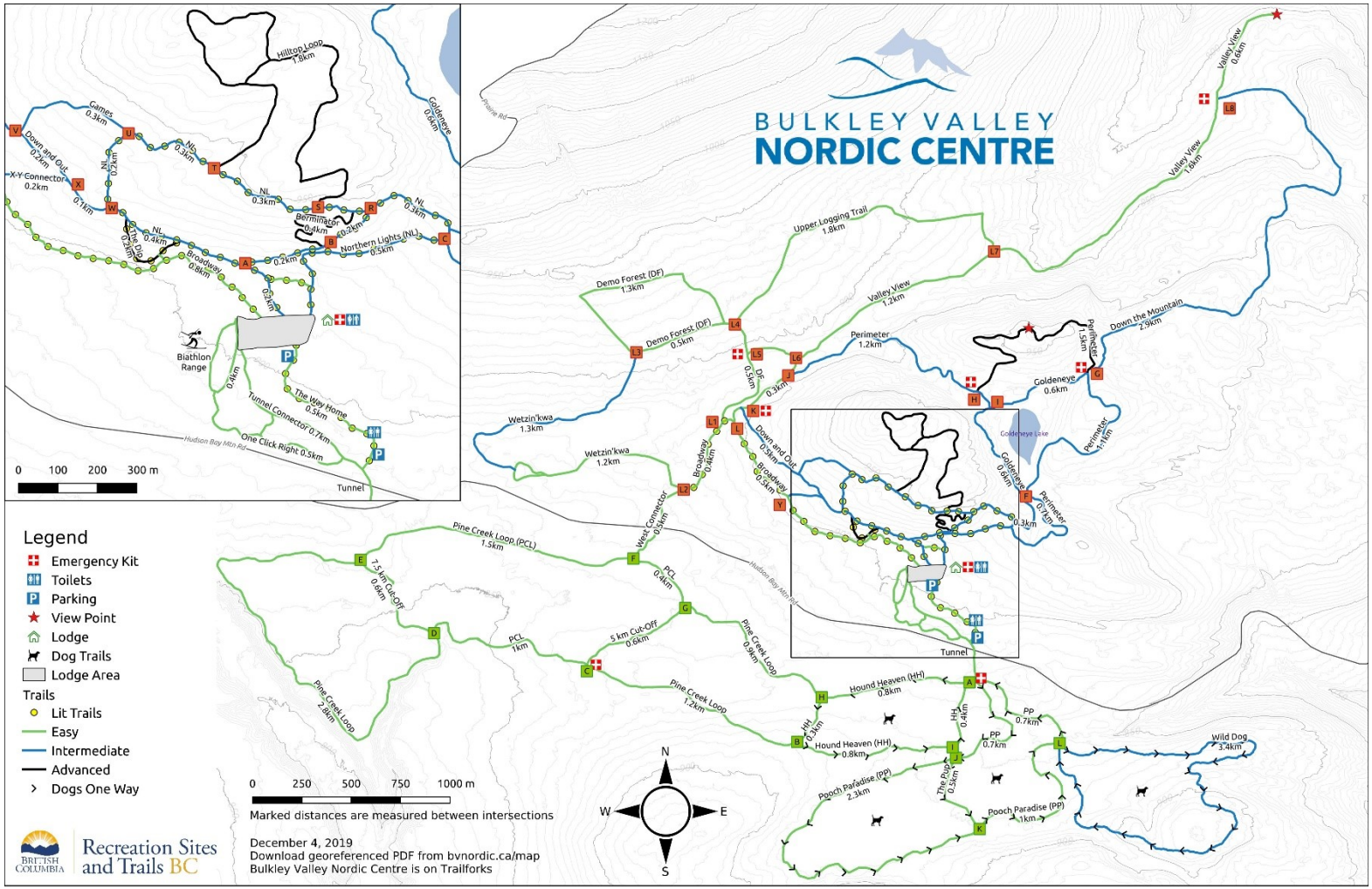
6.1.4 Upgrade Existing Machine and Fuel Sheds

As described in section 3.2.3, the old machine shed needs some upgrades to continue storing auxiliary equipment and fuel. Upgrades can be done in phases and only if funding does not affect funding for the new garage. Total cost: $40,000. Cost without new trusses and roofing: $20,000.

Section 7 Appendices

7.1 Trails

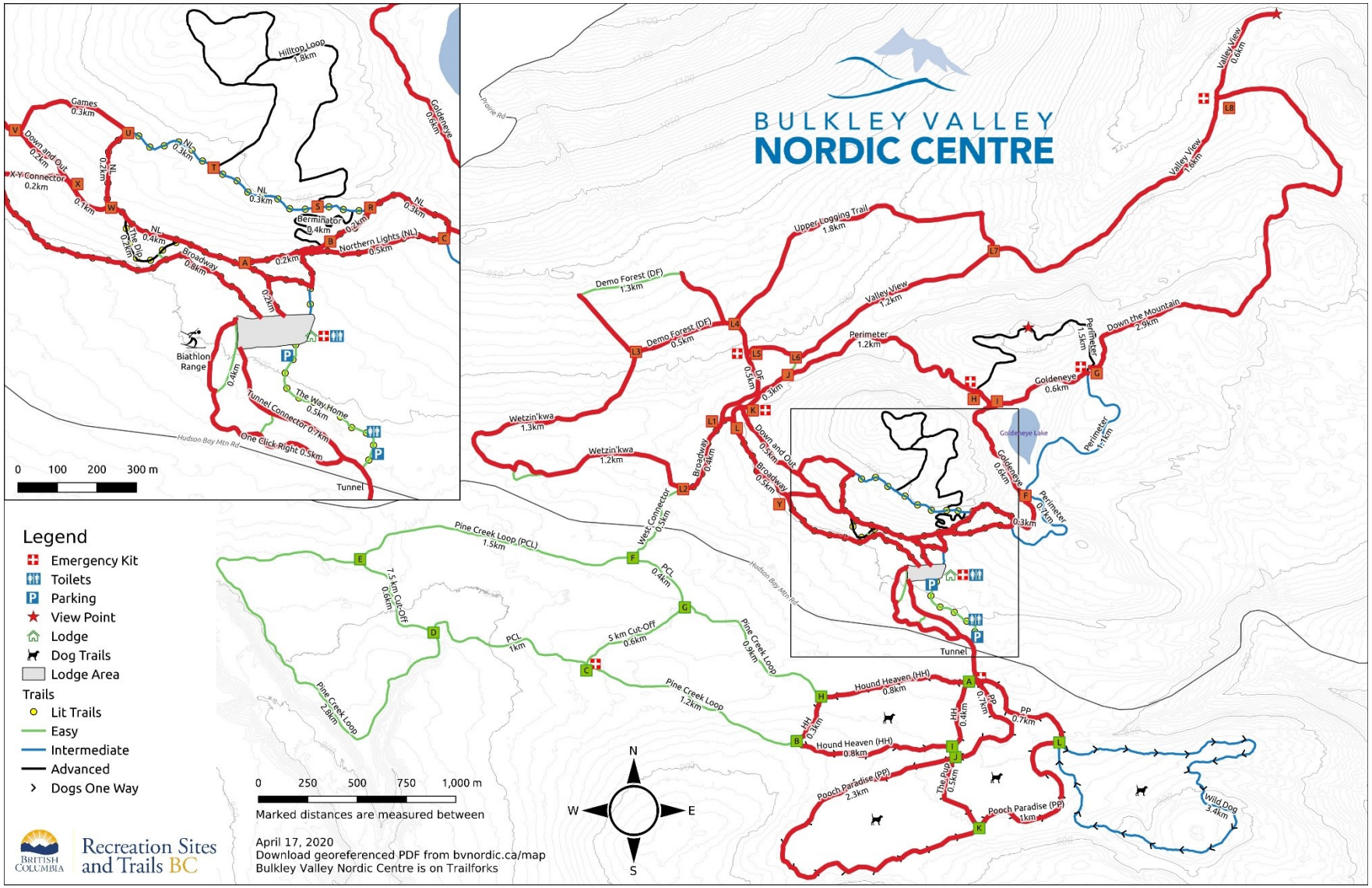
7.1.1 Existing Trails



High resolution, georeferenced PDF version can be downloaded from http://www.bvnordic.ca/map Trails are also on www.trailforks.com

7.1.2 Early Season Trails

Red trails are designated early season trails, as of April 2020.



7.1.3 Trail Improvement Cost Estimates

BV Nordic Centre Trail Works 2020

	Trail Name	Action	Equipment	days large hoe	days small hoe	Total $$	Comments
Priority 1	Wild Dog	Subgrade development	large hoe	2		2,400	strip loonshit and build subgrade over about 300 m near bottom of west hill. Install two culverts
	Wild Dog	Grading	small hoe		1.5	1,350	Widen narrow parts of trail for mowing.
	Pooch Paradise; A to J	Grading	small hoe		2	1,800	minor additional grading and fill holes; goal ski on low snowpack. Buried logs or small culvert for low drainage "culvert" at junction J (low spot between pooch and hound)
	Pooch Paradise; J to K	Grading and culverts	Large hoe	4		4,800	4 culverts. Corduroy over mudhole. Spot fill. Goal ski on low snowpack
	Pooch Paradise K to L	Grading and culverts	small hoe		2	1,800	four culverts to install. Long ditch to culvert at junction with wild dog. Extend ditch on existing culvert. Culvert at junction with the pup. Minor grading throughout. Goal ski on low snow.
	The Pup	grading	small hoe		1	900	minor grading to widen last years work and improve bed for mowing. 450 mm culvert at junction k
	Pine Creek A to I	culvert and grading			0.5	450	install one culvert. Extend ditch from existing culvert. Grade north of culverts. Possible log for seepage.
	Pine Creek I to B	Grading	small hoe		1.5	1,350	remove stumps, widen in narrow spots. Minor grading. Fill one wet area. Two culverts. Goal very smooth surface for early season
	Pine Creek G to H	Install Culverts	Large hoe	0.5		600	install two culverts just east of G. Fill over wet spots at culverts.
	Pine creek 5 km	Culverts and grading		1		1,200	two culverts. Minor ditching. Minor Grading. Fill over wet spots

Hound Heaven	minor grading on Hound Heaven/2.5	small hoe		1	900	to improve early season skiing on Hound Heaven (old 2.5). Culvert and ditching at north end of 2.5. widen trail. Remove trees/stumps
Upper Logging road	Install Culverts	small hoe		1	900	two culverts on Bobs Boogie. Extend ditch to bridge on east side. Minor grading. Minor ditching at Fuhrs. Reduce dip where bobs joins Dem loop
wetzinkwa	Grading and culverts		2.5		3,000	tidy up south side of log culvert to address beaver pond overflow. Install four culverts; 3 300 mm. Extend ditches in several places.
Perimeter G to H	Grading			1	900	remove rocks. Widen trail in spots. Fix ruts.
Goldeneye	Grading, ditching, culvert			1.5	1,350	one culvert past I. Widen narrow spots above lake.
Tunnel Connector	Ditch and grading			1	900	extend ditches to existing culverts. Grade wider and smoother for early season.
Biathlon	install two culverts			0.5	450	one 300 mm x 9m one 300 mm x 12 m. Dry up two wet areas on biathlon loop. First culvert at parking lot entrance. Second culvert leaving staging area.
One Click Right	install 2 culvets. Grading			1	900	
Broadway	fix wet spot			0.5	450	narrow spots between Y and L. Make Broadway 10 m wide to junction L
Down and Out	Culvert and ditches			0.5	450	one culvert at xy junction. Ditching to culverts.
Northern Lights	culverts near staging area			1.5	1,350	one culvert where 1.5 junction joins. Ditch at entrance to sprint bumps. Ditch above corner leaving staging area. Possible culvert at trail that joins 1.5. Culvert between B and C (bottom of hill)
1.5	Ditching, grading			1	900	extend ditch from where berminator enters. may need culvert but better to avoid.
Access Road	Widen just above HBM on north		0.5		600	extend culvert at parking lot entrance
Grass Seed	grass seed				1,000	8 bags @$125 per bag
Gates/cables	Steel Posts				600	ten posts 8 feet long
	Cables and signs				700	6 new signs @ $100 each. 4 new cables @ $25 each

				10.5	19	**32,000**	
	Mob and Demob					2,400	
	Project Management	3 hours per day 20 days				1,800	
Total Priority 1						**36,200**	
Priority 2							
	Hilltop loop	grading	small hoe		1	900	hammer out rock outcrops on hilltop and northern lights. If time also on Perimeter and Goldeneye.
	Northern Lights	Grading	small hoe		1	900	remove rocks; fix off cant trail. Minor ditching west side below Games trail junction. Grading; goal early season skiing. D
	Demo Forest Trail	Grading	small hoe		1	900	grading, widen, stump removal. Goal; improve maintenance address overflow. Install 2 culverts. Leave major bridge to next year.
	Misc all	rock cutting			1	1,200	rocks. Northern lights, goldeneye, perimeter.
	Lodge area	spot gravelling				625	1 double load; clean up muddy spots in front of lodge and parking lot
	Pine Creek B to C	Ditching, culverts, grading	Large Hoe	1		1,200	Two swayles. Ditch and fill wet spot. Widen down hill west of B.
	Pine Creek C to D	Culvert, wet spots, grading	Large Hoe	1		1,200	Swayle and ditches east of junction D. Minor widening in other places.
	Project Management					600	20 hours
Total Priority 2						**7,525**	
Total Priority 1 and 2						**38,725**	

7.2 Equipment Assessments

7.2.1 Primary Tracksetter Assessment

[2019 assessment updated April 2020]

The primary machine for tracksetting is a 2004 PistenBully Edge with a groomer attached. It was purchased used in 2012 and as of April 2020 has 9077 hours. The Club also has snowmobiles with grooming and tracksetting attachments but given the size of the trail system and the periodic deep snowfalls, the PistenBully remains essential to tracksetting at Nordic Centre.

In February 2018, an analysis of tracksetter costs and replacement options noted that we use the PistenBully for about 400 to 600 hours a year. At the time, the machine had 8350 hours and was expected to have a working life of around 18,000 hours; potentially another 15 years of service. The analysis of options led to the following board decision in April 2018: "given the information and analysis that we have at this time, the Club is not in a position to consider buying a second PistenBully because we have insufficient funds."

In late January 2019, the Nordic Centre director and senior tracksetting staff had an informal discussion with Jason Shumaker of Jace Heavy Duty Repair. Jason is the professional snow cat mechanic who does the major repairs on our PistenBully. The following assessment is based on information and advice from that discussion.

What primary tracksetter is best for us?

- A brand-new machine like a PB400 would be expensive ($400,000 with attachments), uses more fuel and requires more expensive/more frequent maintenance by specially trained, non-local, mechanics.
- A second hand PB400 would still have costly operating costs but also have the risk of a shortened engine life because it would likely come from a ski hill and there would be a high likelihood of over-revving on convex slopes.
- A PB300 is a good machine but is longer than our Edge and is not suited to tight turns.
- A smaller machine would not be able to handle our periodic large snowfalls.

Conclusion: The PB Edge that we have is well-suited to our trails and snow conditions, is less complex than the newer machines and we have gained experience that allows us to do a lot of our own maintenance. The Edge can be maintained to last indefinitely (like Beaver bush planes and many helicopters).

What major repairs should we expect in the next few years? (as of Jan 2019)

- The Final Drives were replaced recently (2017?) and should be good for awhile.

- The left-hand Track Pump was replaced with a rebuilt pump recently and should be good for 4000 hrs.
- The track pumps receive similar wear and since the left-hand pump already failed, we should expect to have problems soon with the right-hand Track Pump ($6500). The Tiller Pump ($6000) and Auxiliary Pump ($2500) are also at their expected end-of-life. (Costs are rough est of rebuilt pumps.) If a Track Pump fails while out on a trail, the tracksetter is stuck there until repaired and repair costs will likely increase by a third.
- The splitter box is in good shape and we now have some minor parts that allow simple repairs if needed.
- The track belts will probably start causing problems (initially breaking track bars) within 2-3 years. When we replace the belts, we should consider getting a better belt (12mm OEM for about $15,000).
- The engine should be good for awhile (PB engines typically last 6,000 to 18,000 hours), especially if we do a valve set every 2-3 years.

Conclusion: Overall, our Edge is in good shape but until the three hydraulic pumps are rebuilt, there is a high risk of breakdown. After the pumps and belt are replaced, we should be good for the next 4000 hours (8-10 years), although surprises are always possible.

What are our options? (assuming we stay with the PB Edge)

1. **Repair When Broken.** In the next 1-2 years, expect $20,000+ repairs with a high risk of significant downtime mid-season. In the next 2-4 years expect another $20,000 repairs and downtime.
2. **Proactive Maintenance.** Plan to replace parts before expected end-of-life. Initially, the maintenance plan should include:
   - March 2019: Replace with rebuilt pumps the RH Track pump, Tiller pump and Auxiliary pump. Possible drive hoses and valve set. ~$17,000+
   - 2021: Belt replacement ~15,000 and valve set
   - 2024 valve set and any parts with significant wear.

   Proactive maintenance should result in less downtime than option 1 but some downtime is still likely.

3. **Proactive Maintenance and Second Machine.** In addition to being proactive with repairing/replacing major parts before failure, we could buy a second, used Edge.
   - It should be possible to buy a second-hand Edge PB for $40,000 to $65,000. The market is decent now but eventually they will be harder to find.
   - The second machine would not need to be in as good a shape as our current Edge and would not necessarily have to receive the same level of proactive maintenance.

- The second machine would need to be used at least occasionally, but its primary roles could be limited: e.g. a backup machine to Edge 1, snow clearing, and a ready source of parts.

Conclusion: Given the above information, the preferred approach is to plan on keeping the PistenBully Edge and adopt a Proactive Maintenance strategy. Depending on other priorities and if funding can be secured, consider purchasing a used PB Edge as a backup and source of parts.

Updated Status (April 2020)

With the adoption of the 2019-2021 Management Plan, the Club adopted a proactive maintenance strategy with the objective of keeping the PistenBully Edge working indefinitely (at least 10 years). Significant investments have been made in 2019 and 2020:

- Right hand track pump, Tiller pump and Auxiliary pump replaced with rebuilt pumps (~$20,000 in 2018-2019)
- Track belts replaced with high quality PistenBully brand belts ($15,000 fall 2019)
- In 2020, the left final drive failed and was replaced with a rebuilt drive. A spare rebuilt final drive (fits left or right side) was purchased to have on hand and reduce down time. Combined cost of drives $17,000.
- Ongoing maintenance and replacement of valves and seals as needed.

The Club also pursued other strategies from the 2019-2021 management plan to reduce wear and tear on the PistenBully and extend its life:

- Purchased a Skid Steer and attachments for use in snow plowing and mowing. ($21,000 club money and the rest from grants)
- Increased use of snowmobile-pulled Ginzugroomer when conditions were suitable.

7.2.2 Auxiliary Tracksetter Options

Objective: Purchase a new auxiliary grooming machine that can reliably:

- Set tracks in the early season
    - capable of towing roller and track setter (Ginzugroomer or similar)
- Can act as back up tracksetter. Will set skating and classic tracks when the PistenBully is down for maintenance and repairs.
- May be used for cleaning up tracks mid-season allowing quality tracksetting with the least expensive tool.

Key machine attributes

- Reliable; a machine that is not prone to breakdown or maintenance issues
- Pulling power; must be designed to pull heavy loads.
    - Minimum requirement is ability to pull current Ginzugroomer with 15cm of snow
    - Optional consideration would be the ability to pull wider groomer (such as 108" Ginzu) to make early season trail maintenance more efficient (i.e. 2-pass setting instead of three).
- Easy to maintain; access to parts and knowledge of the machine for repairs

Considering Climate Change

The impacts of climate change have already affected our grooming strategies and the club has adapted to some degree already. Further warming and changes in precipitation will continue. In addition, there will be an increasing need to reduce and ultimately eliminate the use of fossil fuels in order to reduce greenhouse gas emissions. From the perspective of tracksetting, the implications are:

- Over time, position the club to reduce and eliminate the carbon footprint of our operations
    - Have a set of grooming equipment that uses the least amount of fuel (and releases the least amount of carbon) to get the job done; and
    - Keep equipment as long as possible, to reduce the "embodied carbon" that comes from manufacturing equipment.
- Be prepared for more varied tracksetting, likely with snow arriving later in the year, periodic dry early seasons, more warm/wet snow conditions, and other weather extremes. Use of early season grooming equipment will likely be more frequent and "early season" will be a larger part of our season.

Tracked ATV

These are quite popular in areas with low snow (eastern US and mid-west). Many places report replacing snowmobiles with tracked ATV's (or UTV's) in the past ten years. The larger models

have greater pulling power and lower gearing than snowmobiles. Caledonia recently bought a tracked quad and a wider Ginzu (108”). Their rationale was that they wanted the benefit of the wide Ginzu as they use this set up a lot. They looked at the Alpina Sherpa but decided it was too pricey and the ATV was necessary to pull the wider Ginzu (compared to a Skandic).

Caledonia reports good results with the tracked ATV over two seasons; no significant repair issues and it can effectively pull loads including their 108” Ginzu. They had an overheating issue due to operator learning curve. Their experience is that their Skandic had more issues than the ATV; they are hoping that the Skandic performance issues are resolved and their next machine may be another Skandic, as they feel each machine has its niche. Sovereign Lake Nordic runs several tracked ATVs.

There are many different models and sizes of ATV to choose from. A minimum 700 cc machine is needed; if a wider Ginzu (108”) is used the minimum size is 850cc. Example: A Canam Outlander DPS with 850cc engine has 82hp, power steering (which is essential when running tracks), winch, and other accessories fitted to a utility purpose.

- Cost; ATV with factory tracks: $22,000
- Advantages: lots of power so they will pull and climb.
- Easy to get serviced locally.
- Can pull bigger groomer if we ever go that direction.
- Some clubs put a small blade on it to increase its ability to “work” the snow.
- Can be used for summer trail work if needed.
- The tracks have mixed reports. Some have had reliability issues. The local dealer says they are a maintenance item but that with regular care of the bearings they can be reliable and last a long time.

Tracked UTV

Similar to a tracked ATV, a “side by side” can be fitted with snow tracks. There are many different brands and models. Telemark has had a Kubota 1100 diesel for about five years with poor results. The heated cab configuration is a major bonus. The side by side is very useful on wheels for summer trail works. However, the model they chose was underpowered and has had major and expensive maintenance issues. The advice from the general manager is that the side by side concept is good, but a model with more power and designed specifically for tracks is warranted.

If the tracks are too wide (compared to the implement), the track setter may leave exposed track marks going around corners. Turning radius may be an issue on some machines, especially the longer ones may not be able to turn around as quickly as a quad or snowmobile.

There is an electric version available, but it has max 2 hour run time, so was not examined further.

These will definitely outpull a Skandic and could easily handle a wider groomer.

Discussion with the local dealer recommended a Polaris Ranger 1000 with power steering. 62 hp machine rated towing capacity up to 2500 pounds.

- Cost with tracks; Approximately $35,000
- Advantages: lots of power so they will pull and climb.
- Easy to get serviced locally.
- Can pull bigger groomer if we ever go that direction.
- Some clubs put a small blade on it to increase its ability to "work" the snow.
- Can be used for summer trail work if needed.
- The heated cab is a definite advantage over an ATV.
- The width may be an issue with leaving marks with our current Ginzu groomer but would not be an issue with a 108" Ginzu (an additional $12,000)

Utility Snowmobile

There are a few "utility" snowmobiles similar to the Skandic. The Skandic is the only one with a super wide track (24") so is the reference used here, and is the most commonly used snowmobile for these purposes as its focussed on the utility market. These are all essentially heavier duty versions of recreational machines. A true heavy-duty load puller has not been manufactured in North America since Skidoo stopped making the Twin track. The Alpine had twin 20" tracks and a "double bogy" suspension.

Most clubs and users report continued maintenance issues with these machines; they are inherently complex and even in recreational settings have relatively limited lifespans; some reports say 15,000 km is the expected lifespan. Pulling heavy loads like a groomer stresses cooling systems and other elements; expect maintenance when using a Skandic for this purpose. Many clubs have more than one snowmobile to account for the expected downtime due to repairs (similar to a PistenBully). Newer four stroke snowmobiles should have longer engine life but also have complex cooling and electronic issues.

- Cost: about $18,500
- Advantages: easy to service locally
- Two speed transmission so it can pull heavy loads at relatively slow speeds.
- Pulling power is partly dictated by traction; the Skandic track is long and 24" wide which is better than other models which have 20" wide tracks.

- Some clubs report good luck with these machines. Others have issues. Generally, they have electronic everything and so expect some maintenance problems.

Alpina Sherpa

The Alpina is the only true heavy-duty snowmobile sold in Canada. There is a different one made for the European market but its not sold in Canada (https://www.brplynx.com/en/lynx/69-ranger/69-ranger-alpine.html) which looks like a beefier Skandic. Alpinas are designed from the bottom up for pulling and are extensively used in Europe for commercial purposes. They have two twenty-inch-wide tracks, and all other elements are built to tow. The suspension design prevents the "bobbing" that you get with a traditional snow machine when pulling. There is a 1.6l version and recently released 1.2l version.

While similar to the old Twin tracks in some elements (suspension) they are very different in others. They have two skis, have longer tracks, and the centre of gravity is much further forward so they tow with the weight centred. The turning radius is impressive.

https://proalpineventures.ca/wp-content/uploads/Alpina_Sherpa_1.6_US_16.pdf

- Cost: about $55k for a basic machine. With the F250 groomer package, the total cost is approximately $73,000.
- There is a dealer based in Prince George. These have been in North America for over a decade, so they have a network. Current users report that most parts can be obtained from North America in a few days. Other parts can be obtained from Europe in about a week.
- They can pull. And are reported to be very reliable. Clubs that use them have high levels of satisfaction and would buy another.
- They can be serviced locally by a good mechanic.
- The F250 groomer includes a small "vibrator" in front of the classic track that is essentially a tiller for just the classic track. This would make it better at resetting an old classic track than the current Ginzu.
- The wide track would climb steep hills in deeper snow better than current set up.

Farm Tractor and Meuler Groomer

Many clubs back east are using farm tractors with tracks and a groomer from Europe that is specifically designed to run off a tractor 3-point hitch and PTO. This set up is much less expensive than a PistenBully for similar horsepower and width of groomer. Tractors sourced in the local area would be easy to maintain. Track systems would require maintenance. We do not know of any of these used in BC.

For a video of tractor setting tracks: https://www.youtube.com/watch?v=gaNcQxLA-Qs

The dealer in North America is Mountain Grooming.
https://mountaingrooming.com/2014/05/mueller-snow-tillers/

Smaller tractors (75 hp) would be a good size for an auxiliary machine and would pull a groomer of about 2.2m. Because a dedicated new groomer would be needed, and there is limited experience with them out west, these were not fully explored. However, we should continue to watch their evolution; a small niche tractor, possibly electric, may be a good option in the future.

Taiga Motors Nomad Electric

The first commercial electric snowmobiles are to be in production in 2020. Prices are reported to be around $20k. Their utility version is called a "Nomad" and has about 120 hp, will pull around 1100 pounds. Its range is about 134 km, based on 60 km/h. It could be recharged in 2 hours with a level II charger (costs from 1 to 5k to install) or 20 minutes for a level III charger (costs tens of thousands to install). The limiting factor is probably range; hard to say how long it could tow heavy loads without running out of juice. Also, the current model has a track that is only 15" wide. The manufacturer said they are investigating a more utility-oriented version designed for pulling in the future.

https://taigamotors.ca/snowmobiles/#1559274358056-802e4123-2712

- Advantage; low carbon, clean quiet
- Probably low maintenance as most of the issues with snowmobiles (overheating, transmissions etc) are gone.
- No track record of reliability
- Stay tuned. In five years, this kind of machine could be a game changer.

Summary

There are four reasonably viable options that are currently used in our region. A Skandic is well known, reasonably priced and will get the job done. If we have two Skandics, and we have one or more Twin Tracks that are fully functional, our fleet could cover off all likely scenarios.

The tracked ATV will likely be more capable with better towing power in deeper snow. It would require annual maintenance of tracks but reported reliability overall is similar to a Skandic because they are better suited to pulling. Having a different machine would move the club towards a "quiver"; each machine has some advantages in different conditions and the operator can choose the machine best suited for that day.

The tracked UTV offers the advantage of a heated cab compared to an ATV, but costs considerably more. It does not appear to be worth the additional cost compared to a tracked ATV and requires a wider groomer to be most effective.

The Alpina Sherpa is more capable than a Skandic or ATV and could produce a good track in a wider range of conditions. It would likely last a decade or longer and should be very reliable. However, it is considerably more expensive, and parts availability may be an issue for some parts that are not stocked in North America. At three times the cost, it is not clear if the advantages justify the additional cost.

7.3 Possible Future Projects

The following projects have been under consideration for some time but currently are not deemed to be priority projects for the Club and consequently, the club is not actively pursuing them. The status of these projects can be revisited if a project leader and potential funding is identified.

7.3.1 Biathlon Target Roof

A roof installed over the biathlon targets would significantly reduce volunteer effort required for shovelling snow and reduces problems with frozen targets sticking. The biathlon group has started some fundraising and pursue funding sources if there are adequate volunteers to take it on. Total cost would be between $35,000 and $45,000.

7.3.2 Ticket booth

In the past, the Club had a ticket booth in the lower parking lot. On weekends and holidays, volunteers on ticket booth duty would interact with everyone entering the lower parking lot. The ticket booth facilitated volunteers to act as an ambassador to the club and facilitated easier ticket checking and increased ticket sales. Unfortunately, the wood ticket booth was destroyed by vandals in two consecutive years, so the decision was made to move the ticket booth to the office of the main lodge. A preliminary assessment noted that a modified seacan could be purchased and outfitted for $8,000 to $10,000. It would be largely fire-proof and could be moved behind the gate during off season.

7.3.3 LED lights

The Club maintains 5 km of lit trails which are on throughout the season till 9:30 pm each day. The estimated cost of lighting the trails is $900 per year (or $2.80/hour). An analysis of current electrical use, conversion cost and potential savings from LED did not find a strong financial case for LED conversion. (see April 29, 2019 Board minutes) No action is proposed at this time.

7.3.4 Day-Use Trail Cabin

A day-use trail cabin approximately 16 feet x 16 feet has been proposed for a location at the end of Valleyview trail, where it would serve as a destination for longer ski outings. The views from this location are spectacular. An outhouse would also be needed. Estimated cost, using volunteer labour, would be $25,000. Approval application, design and fundraising will only be pursued only after other priority projects are completed.

7.4 History of BVCCSC

Cross-country skiing in the Bulkley Valley has roots back to the 1920s. As more people moved into the Bulkley Valley, cross-country skiing grew in popularity and by 1970 three cross-country ski groups had evolved: Tyhee Mountain Club – Telkwa, Silver King International (SKI) Club – Driftwood, and Smithers Ski Group – Smithers. In addition to these, there was a fourth group known as: Every Man and His Dog Ski Club, which, as the name suggests, encouraged dogs to accompany club members on their ski trips. By the late 1970's these clubs had amalgamated to form the Bulkley Valley Cross Country Ski Club.

Shortly thereafter, Gary and Liz Murdoch started a "Jack Rabbit" ski program out of Telkwa Elementary School. Cross country ski trails were established around Tyhee Lake and it wasn't long before young skiers from Telkwa were becoming very successful in cross country ski races throughout British Columbia. A few years later Esther Bahen, an Olympic cross country skier, and Gary Murdoch established a racing program for youths based out of Telkwa Elementary School. The program utilized technical knowledge of cross country ski equipment and training to develop the young racers in the Telkwa area. It was not long before the fledgling racers were seeking more challenging terrain to ski and train on.

The Club decided that the Smithers Community Forest provided a perfect opportunity to develop a more challenging array of trails with more dependable snow conditions, and in the early 1980s club members developed ski trails along Pine Creek.

On February 16,1984, the Club incorporated as a not for profit society.[2] In the early 1990s, the Club commenced the more complex Chris Dahlie trail network. The biathlon range was built in time for the BC Winter Games in 1994. A new day lodge was constructed during 1993-1994, assisted by a significant donation from relatives of the Buchfink family who were tragically killed in 1994 in a helicopter crash. In 1996, electrical power was generously extended to the BV Nordic Centre by BC Hydro and its employees at a nominal cost to the society for materials. In 1997, lighting was installed on the 2.5 km loop and parking lot and then in 2005 extended to the Perimeter Trail for a total of 5 km of lit track. In 2004, a caretaker cabin was constructed. The Gary Murdoch waxing hut and toilets for the lodge were built in 2008. In 2012, a new Biathlon cabin was built.

The cross-country ski trail network expanded over time to 52 km of skate and classic trails of which 5 km is lit and 10 km is dog-friendly.

[2] In 2017, the Club transitioned to BC's new Societies Act and elected to not be designated as "member-funded society". This allows the Club to continue supplementing member fees with public and outside funds to support our operations.