DEVELOPMENT OF CROSS COUNTRY SKI TRAILS ON THE CASTLEGAR GOLF COURSE

Prepared by: Stephen Waterreus
September 18, 1984

Prepared for: Gord Gibson
Co-Ordinator
Wildland Recreation

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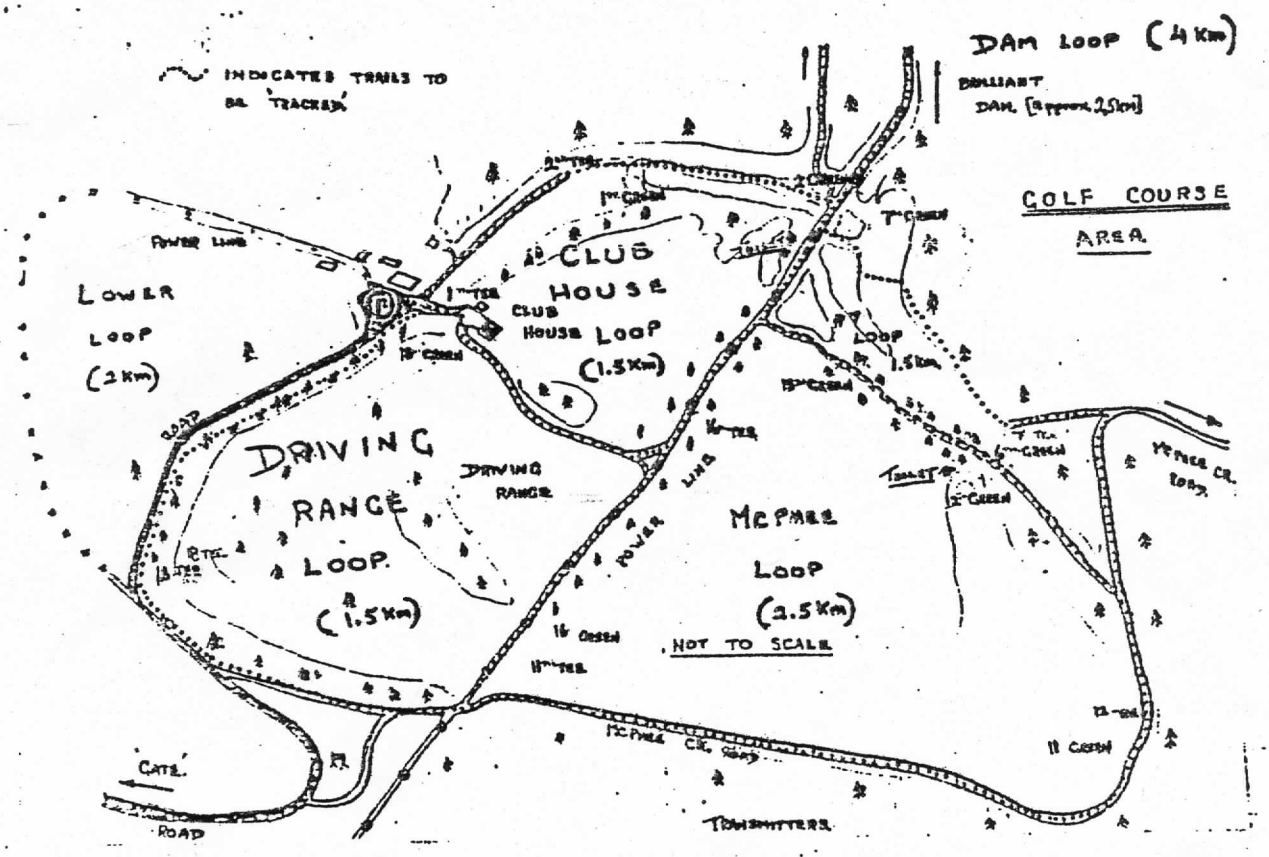
Figure 2 - 1

CASTLEGAR GOLF COURSE SKI TRAIL SYSTEM



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6.5 km.

INTRODUCTION

The following report is related to the proposal for a ski trail system on the Castlegar Golf Course.

The report discusses the key factors related to ski trails and their development. The areas covered include a description of the various types of ski trails (touring, racing and back-country), ski trail designs, trail construction and trail signage. One of the more important points covered includes the ability of an area to hold a ski trail system with relation to topography, vegetation, climate and scenic views.

The report will also briefly discuss the potential of the Castlegar Golf Course to hold a ski trail system. A map of proposed ski trails, in the area, is also included with this report.

1.0 DESCRIPTION OF THE KOOTENAYS

1.1 TOPOGRAPHY

The Kootenays has a very rugged topography. Three major mountain ranges run through the Kootenays: the Monashees, the Selkirk Mountains, and the Purcells. Steep landscapes are indicative of the past glacial activity throughout the Kootenays.

1.2 VEGETATION

Vegetation within the Kootenays consists of many dense stands of trees such as Cedar, Hemlock and Douglas Fir. Trees found in the valley bottoms are typically west site trees such as Cedar, Hemlock and Spruce. Higher up on the slopes, in drier areas, the stands generally consist of Douglas Fir, Lodgepole Pine and Ponderosa Pine.

1.3 CLIMATE

During the winter months the higher elevations of the Kootenays receive a great deal

of snow. The snowfalls average between 5 and 10 ft. per year. Lower valleys receive considerably less snow due to the warmer temperatures found at these lower elevations. Temperatures within the Kootenays rarely drop below -20°C. Because of the colder temperatures found at higher elevations, snow may stay as much as 3 months longer up in the mountains than it does down in the valleys.

2.0 DESCRIPTION OF THE CASTLEGAR AREA

2.1 PHYSIOGRAPHY

2.11 TOPOGRAPHY

The topography throughout the Castlegar area is very representative of the entire Kootenays. It has both steep sided mountains and large valleys. Castlegar is located within a large valley and is completely surrounded by mountains. The two major summits accessible by highway are the Salmo

Creston summit and the Blue Berry Paulson summit. The summits are opposite each other with Castlegar lying in between the two.

2.12 VEGETATION

The major trees which can be found throughout the Castlegar area are Douglas Fir, Spruce (Engallmann), Western Red Cedar, Western Hemlock, Lodgepole Pine, Ponderosa Pine and Western Larch.

2.13 CLIMATE

The following climatic conditions have been recorded in the Castlegar area over a period of 30 years.

Mean annual temperature (^{o}C)	8.2
Mean summer temperature (^{o}C)	13.3
Mean winter temperature (^{o}C)	2.3
Mean summer precipitation (mm)	243

(climate cont..)

Mean winter precipitation	(mm)	436
Mean annual precipitation	(mm)	290

The average depth of snow which actually falls in the Castlegar area is about 203 cm.

2.2 SKI TRAILS

2.21 TOURING TRAILS

The majority of cross-country ski trails within the Castlegar area are touring trails. The trails which receive the most use, from Castlegar residents, are the trails located at Nancy Greene and at Mud Lake. Both trail systems are situated along the Blueberry Paulson highway approximately 30 km. west of Castlegar.

The Nancy Greene trail system is very flat with few hills of any great slope or length. The ski trail follows the

perimeter of Nancy Greene Lake. The trail is also used in the summer for hiking. The total length of the trail is no more than 5 km.

The Mud Lake trail system is more elaborate with more available trails and also with greater variability in trail difficulties. The trails are narrow, windy and very bumpy. In most areas the trails are only wide enough to allow a single trail to be set. There is a total of about 30 km. of trails in the Mud Lake area. Two shelters, which can be used for overnight use, are also present in the area.

2.22 BACK COUNTRY TRAILS

The major area for back country ski trails is on the Salmo Creston Summit, 35 km. East of Castlegar. Back country

skiing is done in areas in which there are no set trails. This type of skiing can therefore be done virtually anywhere. The Salmo Creston summit is especially suited for this type of skiing due to the great amount of snow fall and also because of the openness of the area.

2.23 RACING TRAILS

The Castlegar area, as well as the entire Kootenays, has very few trails suitable for racing. There are actually no trails within the Kootenays that meet C.S.A. (Canadian Ski Association) racing standards. The trail used most for racing in the Castlegar area is out past the town of Rossland, in the Red Mountain Ski Area. The trail is located about 35 km. away from Castlegar. Although the trail is

quite short, about 10 km. in total, the trail surface is quite smooth. Over much of the course the trail is wide enough to set two tracks. Therefore, however, stretches in which the trail narrows, becomes windy and it is impossible to set two sets of tracks. The steepness and lengths of the slopes throughout the course are too gradual and too short respectively. Although the trail is used for racing it technically only meets the standards of a touring trail.

3.0 DESCRIPTION OF GOLF COURSE

3.1 LOCATION AND BOUNDARIES

The Golf Course is located about 3 miles out of Castlegar along highway 3A., towards Nelson. The Golf Course access road turns off to the right of the highway and runs about 1 mile up to the course. The area is situated on a plateau about

300 m. above the Castlegar airport. The course is a privately owned parcel of land which has a total perimeter of about 5 km.

3.2 ADJACENT LAND USE

Adjacent land use is of importance as there are plans for extending the trails outside of the Golf Course boundaries. The land to the North of the golf course is owned by the Ootichenia Water Board. Conflicts may arise as to the effects of a ski trail on the existing watershed. This should however, not be too detrimental as the trails in this area will be following existing roads and trails.

The land to the East, West and South of the golf course is crown land and is under the jurisdiction of the Ministry of Forests.

3.3 TOPOGRAPHY

The topography of the actual golf course consists of rolling hills with very few steep slopes. There are many long hills, but all of these have very gradual and gentle slopes. The course has a westerly aspect. The surrounding topography is quite different from that of the golf course. The immediate surrounding areas are quite steep and mountainous. The entire East side of the course is backed by a mountain with many talus slopes. The area south of the course is completely flat grass land which has been used for both cattle and for orchards. The areas to the North and West of the course are forested areas with moderate to steep slopes. The North and West sides of the course offer the best opportunities for expansion of the ski trails.

3.4 VEGETATION

The stands of trees on the golf course consist of open stands of Douglas Fir and Ponderosa Pine. Many of the lower branches have been cleared from these trees. There are very few understory species present on the golf course. The outer perimeter of the course is surrounded largely by Birch and Trembling Aspen. Moving further out from the course the stands become dispersed and consist of Douglas Fir, Cedar, Hemlock, Lodge pole and Ponderosa Pines.

3.5 SOILS

The soils in the area vary from sandy loams to silty clay loams. The clay is evident in the cutbanks alongside the access road. The soil is fairly compact and the drainage can be classified as moderately well to well drained. Depth to bedrock is greater than 100 feet.

There is almost 0% stoniness and rockiness on the surface of the golf course area.

3.6 CLIMATE

The climatic conditions are literally the same as those given for the Castlegar area. This is because the airport is directly below the Golf Course and the airport is where the weather conditions have been recorded. The only possible difference is in the amount of snowfall. The golf course is about 300 m. higher than the airport and although the same amount of snow is received in each area the snow has a tendency to stay for a longer period of time on the golf course.

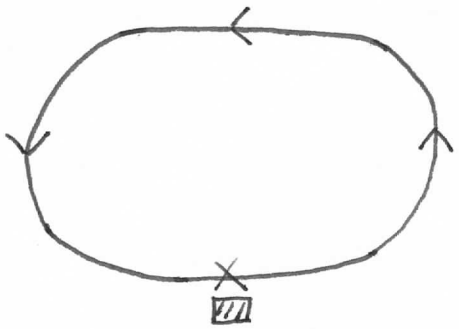
4.0 SKI TRAILS

4.1 TRAIL TYPES

4.11 TRAIL LAYOUT PATTERNS

There are many forms of trail shapes and designs. Just exactly how a trail is laid out is dependant both on topography and the difficulty the trail or trails are designed for. There are 6 general "Trail Layout Patterns":

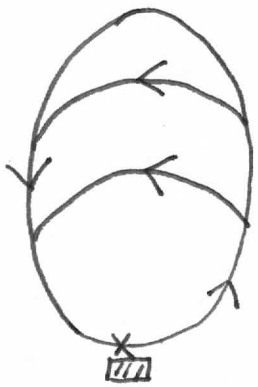
1) The Basic Loop



This design is used for shorter trails. An example of this type of trail is the trail which follows the perimeter of Nancy Greene Lake. Skiers may

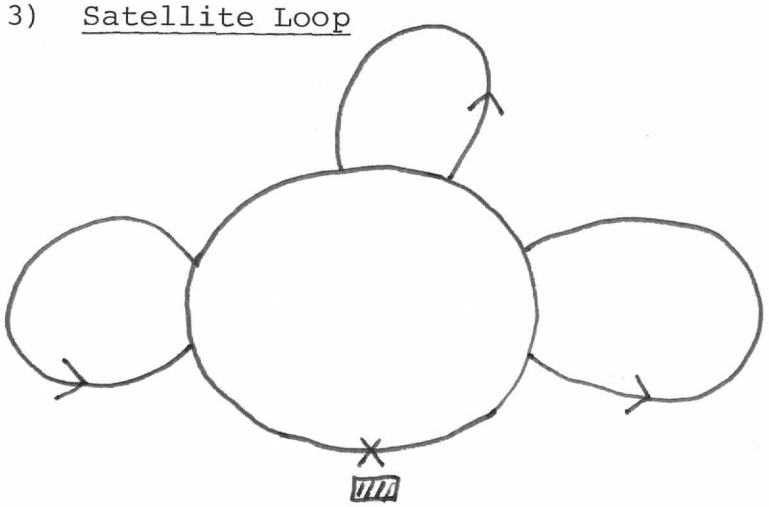
quickly lose interest in this type of trail from skiing it over and over.

2) Stacked Loops



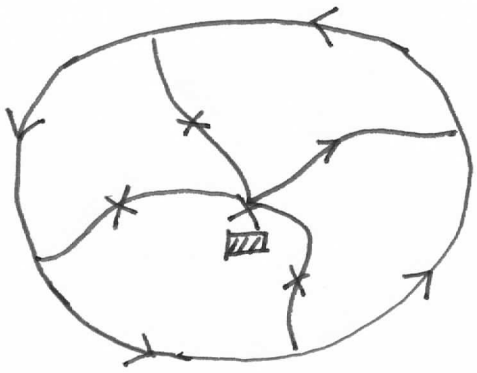
This design allows for various trail lengths and difficulties to meet different skiers needs. An example of this type of trail system can be found at Mud Lake. The trails in this area are marked as the short, medium and the long loops.

3) Satellite Loop



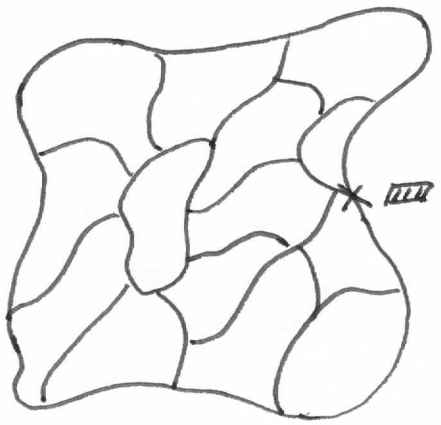
Each loop may be different in length and difficulty. This system offers a wide variety in skiing terrain and each skier can satisfy his own needs. This is very similar to the system which will be developed on the Castlegar Golf Course.

4) The Spoked Wheel



This format makes it possible for a skier to head back to the starting point at various different locations along the trail. The problem with this design is that there will be skiers going in both directions along one trail.

5) The Maze



This pattern allows for incredible variety in skiing routes. Both directional and distance signs are required so that the skier does not get lost or does not over-exert himself.

6) Branches

There is no pattern to this type of trail system. These types of trails typically follow old logging roads and are quite often suitable for back-country skiing. By connecting some of these trails, loops can be formed for a more organized and easier to follow trail system.

4.12 TOURING TRAILS

A touring trail should have several loops of varying distances and difficulties. The trails should be developed with consideration being given to both scenic vistas and towards the developing

of trails that will be more attractive to more experienced skiers. Touring trails should conform to minimum widths and grades. Distances may vary from 5 km. to 30 km. in length. Overnight shelters are recommendable for the longer trails. A shelter should be located at the half way point of a longer ski trail.

4.13 BACK COUNTRY TRAILS

A back country, or wilderness trail is an unmarked and unset route. Skiers may require the use of a map and compass to find their way along such a trail. The lengths of these trails are typically quite long. Overnight shelters should be spaced out along the trails at regular intervals of no more than 15 km. A skier should be able to reach a shelter in an easy day of skiing.

4.14 RACING TRAILS

A racing trail is usually more difficult than a touring trail as the slopes and grades are usually longer and steeper. Racing trails are one directional and almost always have two sets of tracks. Two sets of tracks are neccessary for passing and for avoiding conglomerations of skiers. Racing trails should be well groomed and set, usually on the day before a scheduled race. The corners of the downhills should be banked so that the skiers can stay in the set grooves. This type of trail should conform to C.S.A. or International Ski Competition regulations in regards to length, grade and width specifications. Signs marking each Kilometer of the trail should be used in order to give the skier some idea of where he is and how much further he has to go.

4.2 TRAIL CLASSIFICATION

4.21 BEGINNER TRAILS

Beginner ski touring trails should be no longer than 5 kilometers with a maximum grade of 5 percent. Total vertical climb should be no more than 100 meters with a maximum single climb of 5 meters.

4.22 INTERMEDIATE TRAILS

Intermediate trails should be about 15 kilometers in length and can approach eighteen percent grades. The total vertical climb should be no more than 600 meters with a maximum single climb of 50 to 75 meters.

4.23 ADVANCED TRAILS

Advanced skiers can comfortably ski about 30 kilometers a day over any type of terrain. Total vertical climb should be no more than 1500 meters

with a maximum single climb of 100 meters.

5.0 SKI TRAIL DEVELOPMENT

5.1 TRAIL LOCATING

Preliminary locating of trails should be done with the use of airphotos and contour maps. When locating a ski trail, the things which must be taken into consideration are; how far the ski area is from the skiers, how large the area is, how attractive the area is in terms of terrain and vegetation, and space for a parking area. The trail should be run through scenic areas and points of interest. The trail should be located where there will be consistent snow cover for several months. Although South slopes are warmer, they also lose their snow earlier. The trail should thus be protected from the sun and prevailing winds,primarily on

South facing slopes. The slopes at the end of long and difficult runs should be gentle as the skier may be tired and the light may become dim in the late afternoon. Different trails that run close together should be separated by stands of evergreen trees so that skiers on one trail do not see skiers on another. Compaction of snow may cause damage to underlying vegetation. In the case of a golf course the damage would be to the playing surface and therefore the trails should be placed on existing roads, trails, or alongside and through open tree stands.

5.2 TRAIL CONSTRUCTION

The most critical part of trail construction is the slope of both uphill and downhill sections. On the downhill sections the length of a steep hill should not be too

long and there should be adequate run-out room before sharp corners. This is so the skier does not pick up too much speed and does not run off the trail. Corners should be banked inwards on the sharper curves. The standard slope for general trails is a 10% grade. Any hills which are steeper than 10% should be wide enough to allow adequate room for snow-plowing down and herringboning up. The downhill should be 6 - 8 feet wide. The uphill should be 6 - 8 feet wide for herringboning and 8 - 10 feet wide for side stepping. A ski trail should be divided evenly with 1/3 level terrain, 1/3 downhill and 1/3 uphill. The uphill and downhill portions should be spread out throughout the entire course. A downhill should always follow an uphill to allow adequate recovery time for a skier.

The width of a trail will vary depending on the number of tracks that are set. The width of a trail with 1 set of tracks is 2.5 m, 2 tracks is 3 meters wide, and a trail with 3 tracks should be about 4 meters in width. Branches on either side of the trail should be cleared to a height of 2.5 meters above the maximum snowfall expected. When clearing through heavily treed areas open patches should be utilized to avoid unneccassary tree cutting. This will help to ensure good snow cover. Heavy trees should be cleared through to join the open patches. Material cleared from the trail should be carefully placed along the lower side of the trail. This will help prevent sliding earth and foliage.

5.3 TRAIL GROOMING

The grooming of trails is very important

and must be done with special care. The first step involves the packing of the skiing surface. This can be done either manually or mechanically. Manually packing the trails would involve using snowshoes to go over the trails. Not only is this a very time consuming method, but it is also not a very good one. Mechanically grooming a ski trail involves driving a ski-doo over the entire width of the trail. The heavier and wider the snow mobile is, the better. Double-tracked ski-doos are the best for this job. The snow mobile should make several passes over the trail to ensure a firm snow base. The speed of the snow mobile should be fairly slow (a fast ski-doo tends to tilt) to ensure an even skiing surface. After the trail has been packed, the grooves must be cut. This is done by attaching a track setter to the back of the snow mobile and then driving around the trail.

The track setter sets two grooves which are 6 inches apart, two inches deep, and about 3 inches wide. Where the grooves are set on a trail is very important. The grooves should be set in as straight a line as is possible and there should be adequate room for poling on both sides of the track. Around sharp corners the grooves should be laid out in as wide a radius as possible so that the skiers will not have to step out of the tracks. On steep uphills and downhills the tracks should be set as far to the right as possible so that skiers who must herringbone or snowplow will have sufficient room to do this to the left of the tracks. After the tracks have been used over a long period of time the grooves are misshaped and become firm or even icy. When this happens the

tracks must be reset. When the trails are very icy it is best to drag a grader behind the ski-doo before using the track setter. A grader is a piece of equipment which has many parallel blades, running in the same directions as the trails, which break up the ice into small chunks. The trails should be re-set after each heavy snowfall.

5.4 TRAIL SIGNAGE

At the starting point of each trail system there should be some sort of map that shows the different trail routes, their distances and also their difficulties. The trails should be coded in different colours, or by assigning the trails names. At each intersection and junction there should be signs showing which trail is which. On a racing trail each kilometer should be marked so that the skier knows how much farther he has to go. Most signs should be nailed

to the trees alongside the trail and should be placed on the right hand side of the trail. The signs should be made of plastic coated wood to prevent weather and animal damage.

5.5 TRAIL REGISTERS

Registers placed at the trail heads can be used to see how many skiers use the area, what types of skiers use the area, and how often they make use of the trails. They are also useful in getting suggestions as to any improvements which can be done to the trail system. Separate registration boxes can be placed at different trails to compare the use at each site.

CONCLUSION

The only ski trails which are presently being used by Castlegar residents are at Mud Lake and Nancy Greene Lake. These areas are about 30 km. from Castlegar and it is therefore very inconvenient and also expensive for a person to get much use out of these areas. Between the two trail systems, the Mud Lake trails are used the most. This is because they offer the greatest variety of skiing, and because the touring trails are quite good.

The Castlegar Golf Course is only 5 km. out of Castlegar and is therefore a much more accessible area. The area has the potential of holding ski trails which will be able to suit the needs of both tourers and racers. The area overlooks the entire Castlegar valley and therefore offers great scenery. The actual skiing surface is very smooth, the hills are not too steep and the course not too difficult. The area will support many different loops which run through both wooded

and open areas. The ski trails will be set and maintained on a regular basis. Signs located throughout the trail system will indicate the distances of each individual loop. The Castlegar Golf Course ski trail system is relatively level and will be intended primarily for the use of beginner skiers. In the future there may be further trail extensions which will better suit intermediate to advanced skiers but for now the present ski trail system will offer quite enjoyable skiing for the local residents of Castlegar.