DEVELOPMENT AND MANAGEMENT STRATEGIES

FOR

ARKANSAS-WULF LAKE

SUB-UNIT

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WR: 271

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Summary

This report outlines basic information needed in developing an area for recreation. The report gives details on such subjects as: vegetation management, trails, facilities and site plan development.

The Arkansas-Wulf Lake area is not yet well known for its recreational value. During the first stage of development, advertizing and surveys will be carried out in the area. If and when visitor use increases the sub-unit will be developed for more advanced recreation. Wider trails, more signing, winter shelters and other facilities will be constructed. All this development will take place according to demand.

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List of Illustrations

Introduction

The purpose of this report is to give a description of the potentials and limitations for recreational development in the Arkansas-Wulf Sub-Unit. The report will contain brief discussions of such subjects as: history, industry, wildlife, vegetation, visitor use, facilities, recommendations and a three-stage site development plan.

Cross-Country skiing has increased in Southern British Columbia over the last few years. This is probably due to its wide variety of terrain. Because of the increase new areas are being scouted for and developed. The Arkansas-Wulf Sub-Unit is one such place. The area offers prime intermediate and advanced skiing as well as the opportunity for ski touring and winter camping.

I. Arkansas-Wulf Sub-Unit

A. Location

The Arkansas-Wulf Sub-Unit is located 24 miles east of Salmo and 20 miles west of the town of Creston, British Columbia on highway 3. These distances are actually just to a turn off which must be taken north to get to the lakes. It is approximately 6 miles up this road to the Bayonne Lake parking area and another 1.5 miles to Arkansas Lake. Another access route which may be taken is from the Creston side following the Next Creek road. This road is a logging road that goes into the North end of Arkansas Lake.

The sub-unit is split between the Arrow Lake and the Kootenay Lake Timber Supply Area (T.S.A.). The location can be viewed on the National Topographic Series 1:50 000 maps 82F/2W and 82F/3E The aerial photographs for the sub-unit are:

B.C. 7007 NOS 00-09

B.C. 7434 NOS 182-193

B.C. 7435 NOS 331-348

B. History

1. Logging

Ever since the construction of the Salmo Creston Highway in 1964 the access to the lake unit has been easier. Presently timber harvesting is taking place at approximately 5000 feet in elevations. Up to now the logging companies have paid little attention to visual impact. Their clear-cut blocks cover extensive areas and have maximun visual impact. These impacts could be lessened if proper procedures were taken. Making the boundaries of the areas follow natural contours and curves, and featuring the edges, would help tremendously. Some alternate methods of logging could also be taken, i.e., single-tree selective logging or group selective logging would help lessen the visual impact by making the operation less obvious.

2. Mining

Mining for silver, gold and zinc in the Arkansas-Wulf Sub-Unit has been going on since the 1900's. The two mines that were opened in 1901 were later closed in the late 1930's. One of these mines, the Bayonne mine, has since reopened. Bayonne mine is located on John Bull mountain just east of Bayonne Lake. Presently the mine is underground and has little, if any, visual impact. Proper steps should be taken, i.e., zoning, to ensure open-pit mining does not occur and the visual impact is minimized. The mining company is responsible for maintaining the roads into the area. Because of the easy access logging has taken place at about 5000 ft ASL.

C. Environment

3. Geology

The Arkansas-Wulf Sub-Unit ranges is elevation from 1200m to 2150m and lies in the Nelson Range of the Selkirk Mountains. An important visual aspect of the Arkansas-Wulf area is the Three Sisters Formation which are just east of Arkansas Lake. The area is composed of folding sedimentary rock.

4. Soil

The soil found around Wulf, Curtis and Panther Lakes is of the sub group Ortho Humo-Ferric Podzol. These soils originate from colluvium material. Aound Wulf Lake they are generally deep and moderately coarse textured. Around Curtis and Panther Lakes the soils are somewhat shallower.

Soil information of the other five lakes in the sub-unit was not available but are probable of the same origin. This tells us that the soil is relativly stable and could with-stand moderate use.

5. Vegetation

Tree species dominant in the study area are: Engelmann Spruce (Picea engelmanii) and Sub-alping Fir (Abies lasiocarpa). Species that can be found at the lower elevations but seldom dominate a stand are: Western Red Cedar (Thuja plicata); Western Hemlock (Tsuga heterophylla) and Western Larch (Larix occidentalis). Throughout the sub-unit at various elevations I Douglas Fir (Pseudotsuga menziesia), Lodgepole Pine (Pinus contorta) and Western White Pine (Pinus monitcola) can be found. The areas above tree line are dominated by scrub shrubs and alpine herbs.

The understory vegetation consists of blue huckleberry (Vaccinium ovalifolium), black huckleberry (Vaccinium membranace), white rhododendron (Rhododendron albiflorum), mountain ash (Sorbus sitchensis), indian paintbrush (Castilleja spp.), mountain valerain (Valeriana sitchensis), labrador tea (Ledum groenlandieum), and monkshood (Aconitum columbianum). The area immediately surrounding the Bayonne Lake area is marshy. The plants that dominate here are members of the Equisetum family and various types of mosses.

This vegetation lends itself to the hiker and ski tourer who love to venture into the high alpine. On a clear day, when above tree line, the visitor can see for miles. It should be noted that because of the elevation and alpine terrain the vegetation is very sensitive to abuse. If proper signing is erected asking the visitor to respect their environment the area could withstand heavier use and be beautiful for many more years.

6. Fisheries

Angling is the main attraction to the Arkansas-Wulf Sub-Unit. All the lakes have fish in them. Due to the long winters, and the limited breeding areas, the productivity and size of the fish suffer. A large fish caught from these lakes is about one foot. In the mid seventies the Creston Fish and Wildlife branch stocked the lakes with Cutthroat trout (Salmo clarki lewisi). Regular stocking is not done because of the high elevation of the lakes. A liminology study of the lakes should be done to determine if the fish productivity could be improved.

7. Wildlife

A great variety of animal species inhabit the Arkansas-Wulf Sub-Unit. Cougar (Felis concolor), bobcat (Lynx rufus), lynx (Lynx canadensis canadensis), elk (Cervus canadensis), deer (Odocoileus spp.), beaver (Castor canadensis), black bear (Ursus americanus), and grizzly (Ursus arctor horribilis) are the most common. Hunting for these species is covered under the British Columbia Hunting Regulations. An animal of significance that is found in the sub-unit is the Selkirk Mountain Caribou (Rangifer tarandus montanus). The Arkansas-Wulf area is prime habitat for the caribou. The elevation and food supply are adequate to support the small herd. Since this herd is small and the alpine environment does not play favorites, steps to preserve the herd should be taken. The Fish and Wildlife branch should post signs in the area that state that the caribou are a protected species. Other steps would be to limit the industry activity in the area or have work only be special criteria i.e. selective logging. The selective logging methos would still allow for the removal of the timber and leave enough shelter and food for the herd.

8. Potable Water

The water in all the lakes is clear, but to date no test have been done to test their quality. At lakes where toilets are located these test should be mandatory to determine the amount, if any, of seepage. If the amount is high, the toilets should be relocated. Frequent testing should be done to provide data for future reference.

D. Present Facilities

9. Access

The access road up to Bayonne, Unnamed and Silver Lakes is classifies as a high-centered, two-wheel-drive road by forest service standards. This means that small pick-ups and some cars with good clearance can make it up to these lakes. From these 3 lakes to Arkansas Lake, another 1,5 miles, the road is poor and should be classifies as a four-wheel drive road. The road to Carolina Lake is classified as a two-wheel-drive road up to the point marked on the sub-unit map. (Fig 1). From this point an unclassified logging road takes over and goes to within approximately half of a mile of the lake. This logging road is not recommended for two-wheel-drive use but four-wheel-drive vehicles can make it. This section of road should be classified as a four-wheel drive road.

LEGEND

1	Bayonne Lake
2	Unnamed Lake
3	Silver Lake
4	Arkanasas Lake
5	Carolina Lake
6	Panther Lake
7	Curtis Lake
8	Wulf Lake
---	trail
~	2-wheel drive road
=	4-wheel drive road
•	existing sites

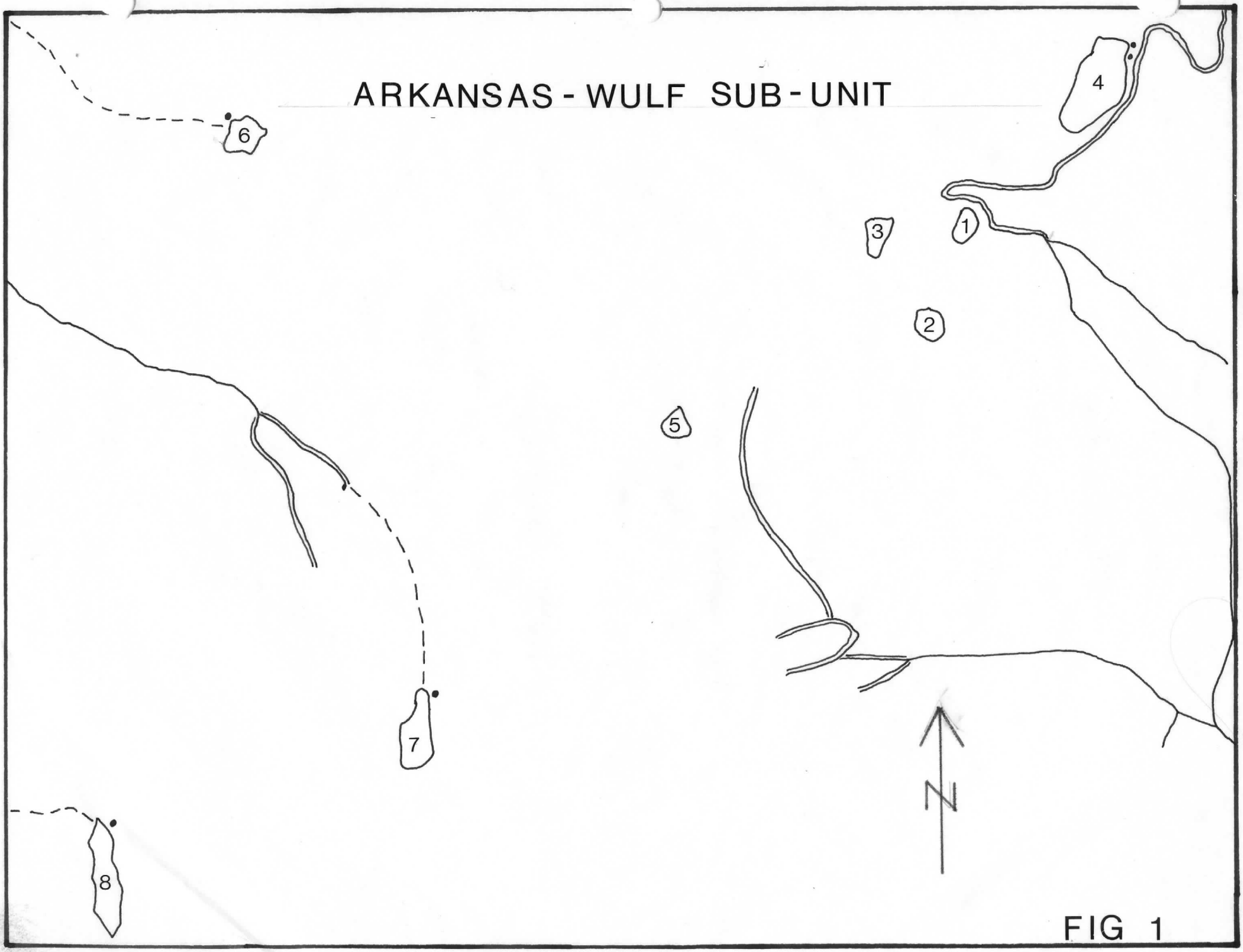


FIG 1

Road access to Wulf and Panther Lakes is passable by two-wheel-drive vehicles but high clearance is recommended. The access road to Curtis Lake is a two-wheel-drive road up to the point marked on the sub-unit map (Fig 1); then it turns into a four-wheel drive road and should be classified as that.

10. Trails

The walk from the parking area at Bayonne Lake to the lake is very short. An existing trail connects Bayonne to Unnamed and Unnamed to Silver Lake. There is an unmaintained trail between Silver to the main road, but it should be phased out because of the cost to upgrade it and the fact that there is no parking area at the switch back where the trail starts. The trail that connects the three lakes is of class III Forest Service Standards. This means that the trail is anywhere from 18 to 24 inches wide. A moderate amount of maintenance is needed on these trails. Some re-routing and brushing back is required at this time. Presently no developed trails exist around any of these lakes. It is recommended that trails between Bayonne and Silver Lakes be constructed in three stages according to demand and budget. (Fig 2,3,4)

Panther, Curtis and Wulf Lakes are all within a hour hiking time from their parking areas and are all easy hikes. The hike up to Panther Lake is the longest of the three. All the trails are good and require minimal maintenance. Some rerouting around swampy areas is necessary. There are existing trails around all three of these lakes. Maintenance is needed on all these trails i.e. brushing back.

From the parking area at Carolina Lake it is an hour and half hike tothe lake, All of this time is spent brush wacking because no trail exists. A fisherman trail exists around the lake, but it is unmaintained and needs much upgrading.

The four-wheel-drive road stops right at Arkansas lake; therefore, no hiking is required. A rustic trail exists around the lake, but it also needs maintenance work.

11. Campsites

Wulf, Curtis, Panther and Arkansas Lakes have Forest Service Recreation sites at them (Fig 1)

The site at Wulf Lake does not have any facilities but was located in a good area with respect to drainage and daylight hours.

The site at Curtis Lake is very poorly located and is frequently flooded. A fire ring and table are present, but no further facilities were available.

The site at Panther Lake consistes of a poorly constructed table that does not meet with Forest Service standards and poorly located camp-site.

The site at Arkansas Lake is the best developed of all four of these lakes. The site consistes of two fully developed sites i.e., two tables, fire rings and two outhouses. These two sites are also wet at certain times of the year.

All of these sites are poorly maintained and in need of upgrading.

The other four lakes do not have established forest service sites at them but have potential for development. More information on their development will be discussed in the site plan.

12. Parking

The parking facilities at Bayonne, Arkansas, Panther and Wulf Lakes are limited. All of these are muddy throygh most of the year and require upgrading. Carolina and Curtis Lakes do not have parking areas. Minimal facilities are required and widening of the road would prove to be sufficient. Steps to improve the present areas should be taken. The parking area at Bayonne Lake is to be moved to the east side of the access road (Fig 3) where it has less crown cover and more expansion room. Other recommendations such as opening the crown cover to allow more sun penetration or artificial filling, i.e., gravel, are just two steps that could be taken to dry up the area.

E. Fire Management

Presently the only policies for fire control in the Arkansas-Wulf Sub-Unit are standards set by the Forest Service. People will be encouraged, by means of a brochure, to take special care in putting out all campfires. The brochure will include both the zenith number for reporting fires and the number of the Creston Ranger station. Procedures to prevent fires will be taken by the Forest Service i.e., removing snage and heavy underbrush and constructing fire rings at the campsites.

F. Vistor Management

All sites should have minimal development to maintain the solitude and wilderness atmosphere about the sub-unit. Steps to be followed include putting up user maintain signs and enforcing them. All high-impact or environmentally sensitive areas should be avoided entirely. The trail connecting Bayonne Lake to Silver Lake (Fig 3) is one such example. Bayonne Lake receives the heaviest use of the three lakes, so, in an attempt to draw the attention to Silver Lake, a bigger, less sensitive lake, the trail should be put through.

A visitor use survey should be conducted to gain data on the areas usage and to establish carring capacity data.

User surveys are necessary in the Arkansas-Wulf Sub-Unit to determine if the proposed expansion is warranted. A survey will give data showing vistor numbers, use levels, present recreation activities, other visitor statistics and general comments.

Visitor use statistics can be obtained in several manners. Registration boxes are most popular. These are placed at the parking lot or trail head. The information can also be gathered by maintenance or survey crews who visit the area regularly and talk with the visitors. This method is also good for public relations. In the Arkansas Lake area the requistration box would be most practical because of the travel time required to reach the area. Two or three times a season, or when ever the maintenance crews arein the area, the crews could gather additional information.

Although the best time to do these surveys is in the summer months from May to September, to get a balanced count of users and their activities, surveys should also be done in the off seasons. This will ensure that all types of users are taken into account.

G. Forest Service Objectives

The Forest Service Objectives are:

1. All facilities should meet with Forest Service standards.
2. All development should be minimal.
3. To protect aesthetic values, potential recreational areas and natural resources on both crown and private lands.
4. To maintain environmental quality.
5. All new access roads should no be greater than 500 meters.
6. All roads and trails should be narrow and winding and one way where possible.
7. To utilize natural openings where possible.

SITE PLAN

FOR

BAYONNE, UNNAMED, AND SILVER LAKES

II. Site Plan

A. Introduction

This portion of the report strictly deals with the development and management of Bayonne, Unnamed and Silver Lakes (site plan). Discussion concerning access, trails, facilities and recommendations will follow. A three-stage development plan for the site will also be included (Fig 2,3,and 4)

B. Stages of Development

1. Stage 1

In the first stage of the development plan (Fig 2) little construction is being done. All the sites Δ will be brushed out and cleaned up, but none are to be developed. The reason for this is to give time for a recreational survey to be carried out and the carring capacity to be formulated.

Also during this stage the trees along the trails will be pruned to a geight of 3 meters to allow for the option of winter recreation. Steps should also be taken to keep the road plowed in the winter up to within 3 kilometer of Bayonne Lake.

2. Stage 2

In this stage (Fig 3) the sites at Bayonne, Unnamed and Silver Lakes will have been developed. This will include providing them with a picnic table and a fire ring at each site. Additional sites at the south east end of Silver Lake and on the south east side of Unnamed Lake will have been added. These sites are not developed. A trail will be constructed between Silver and Bayonne Lake. This is to disperse the impact from Bayonne Lake to other areas in the sub-unit. The parking lot at Bayonne Lake will be moved to the east side of the road. This move is to provide more room for parking and to avoid the wet area where the parking use to be. A trail head sign will be put in its place. Two bridges, one at Unnamed Lake and the other at Silver Lake, will be constructed in this second stage of the development.

If winter recreation activity in the area is becoming more popular and the road is being kept clear a removeable, adjustable sign should be erected at the winter parking lot.

3. Stage 3

In stage III (Fig 4) of the development plan the parking area will be expanded to accommodate at least 5 or 6 cars. Out-houses have been placed at all lakes where two sites exist together. One of the sites at the south east end of Unnamed Lake will be developed.

LEGEND

* Emergency Shelter

1 Bayonne Lake

2 Unnamed Lake

3 Silver Lake

△ primitive sites

▲ established sites

swampy area

--- trail

bridge

= 4-wheel drive road

□ sign

outhouse

PA parking area

Scale 1: 6336

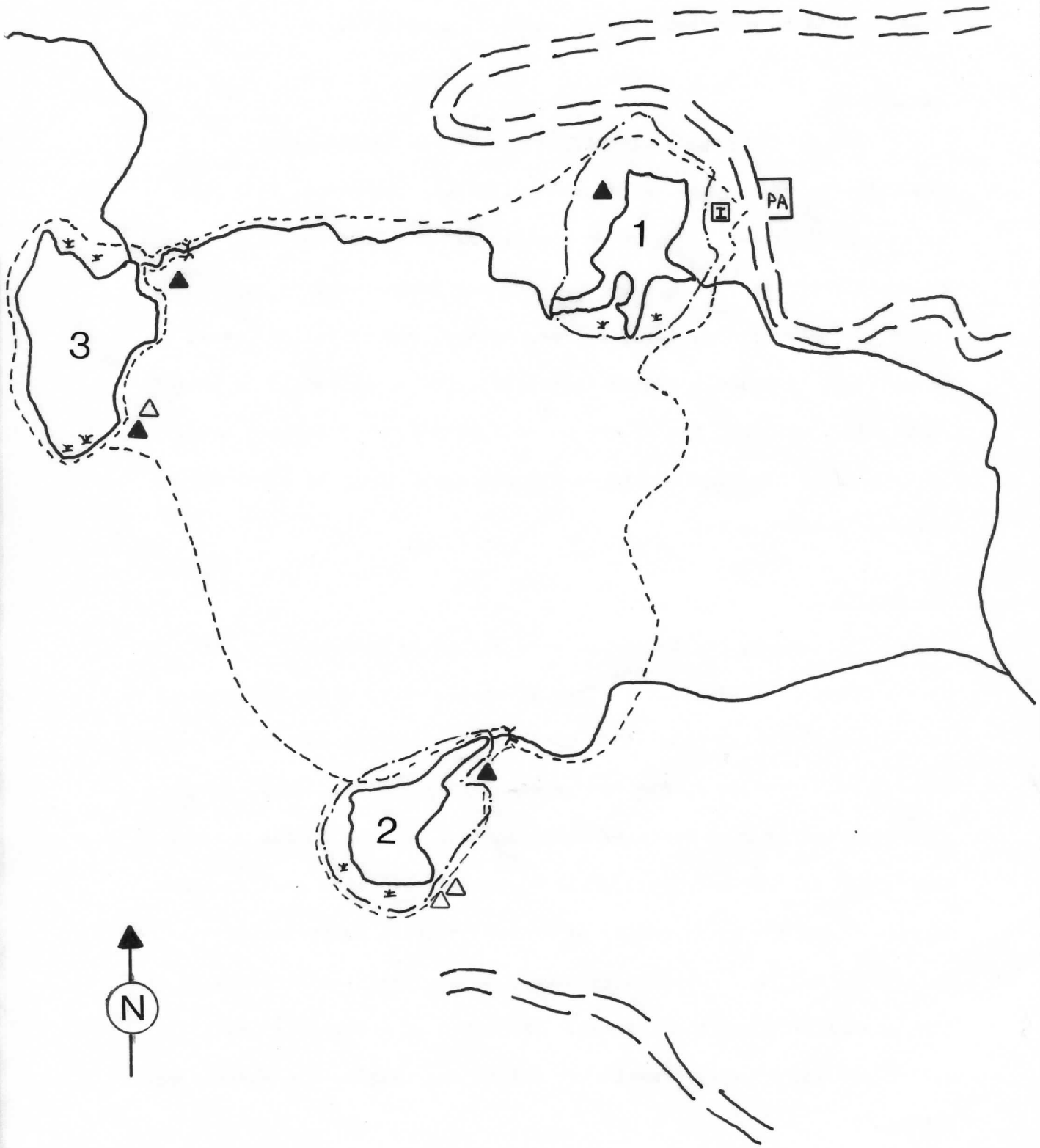
emergency

Stage 1 Site Plan Development

Scale 1:6336

FIG 2

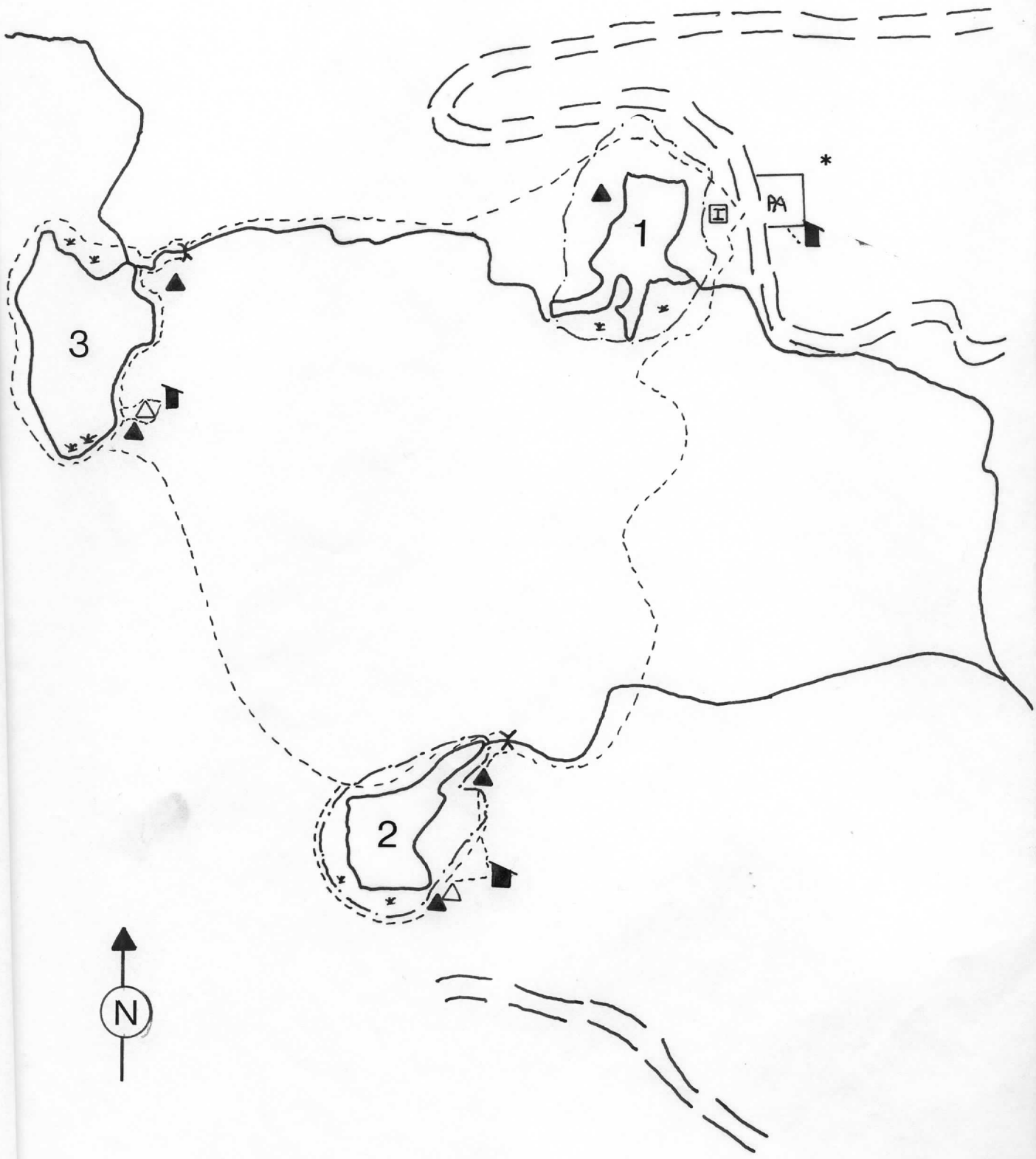
Stage 2 Site Plan Development



Scale 1:6336

FIG 3

Stage 3 Site Plan Development



Scale 1:6336

FIG 4

Also during this stage a winter shelter is to be constructed at Bayonne Lake behind the parking area. All the trails are to be widened to a Forest Service class II standards.

C. Access

Due to the access classification in the Arkansas-Wulf Sub-Unit the vistor use is naturally limited; therefore, the environmental impact is kept to a minimum. For this reason I recommed that the road not be upgraded any further but be kept clear of obstructions, i.e., slides, slumps, rocks, fallen trees, etc. Also, to promote winter recreation, the roads should be plowed regularly throughout the winter up to within 3 km of Bayonne Lake. At this point the road should be widened about 10 ft to allow for parking in the winter.

D. Trails

All present trails in the area should be up-graded to the Forest Service standard of a class II trail. This class as compared to a class II^{I} trail (the width of which is anywhere between 18 and 24 inches) will provide option for cross-country skiing. Some rerouting and/or some means of bridging must be done on the present trail, and all the new trails will be constructed with problem areas in mind. Any new cutting down of trees for trail construction must be closed to the ground so stumps do not protrude at times of little snow or through wet areas. The width of a class I^{I} trail will allow for two-way travel when skiing and walking two abreast when hiking.

The minimal width of a class II trail is 3 feet and the maximum width is 4 feet.

E. Signing

Signing in the site-plan area should be kept to minimum so not to destroy the visual aesthetics. Some signing is manatory for the safety and convenience of the recreationalist. These include trail identification markers, distance signs, and directional signs. Allarge removable sign showing a map of the trails, their classifications, distances and any other important information should be placed at the winter recreation parking lot. It should be removable because it is unnecessary to have this type of sign in the summer. Another such sign should be located at Bayonne Lake. At each trail junction there should be a trail identification marker. (Fig 6) On these signs the trail's name, classification and distance should be writen.

Along the trails, small trail markers should be placed about 2.5 to 3 meters above the highest snow level. These signs will give the skiier a sense of security by allowing them to realize that they are on a marked trail.

Trail Head Signs

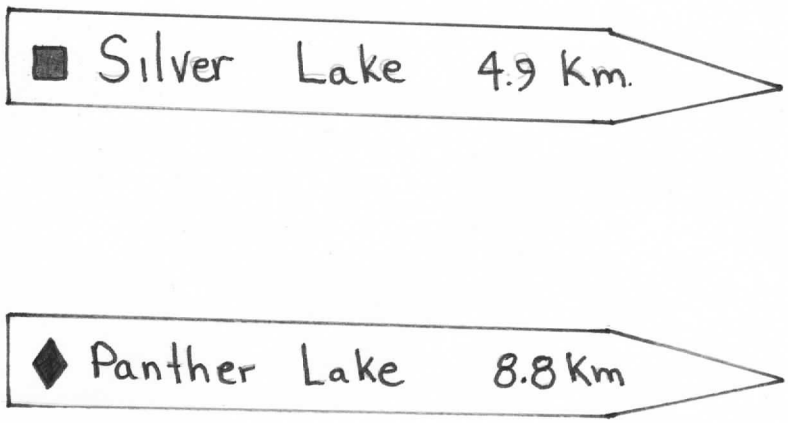


Fig 6

F. Critique

The trails around Bayonne, Silver and Unnamed Lakes are of beginner caliber but are classified as intermediate because of the 3 km ski to them. These trails are short and relatively flat. Directly west of the lakes is a magnificamt rock wall which gives the area a sense of enclosure.

The trail to Arkansas Lake is an intermediate trail. There is only one climb between Silver and Arkansas Lake. Once on the ridge the climber can see for miles.

All the other trails are classified as intermediate to advanced. These trails follow the ridge west of Silver Lake which is relatively flat on top. From this elevation the climber can view all the lakes except for Arkansas Lake.

G. Vegetation Management

All high recreational areas around the sub-unit should be checked for hazardous trees. Such trees include snags (which act as lightening rods), over-hangs or severely leaning trees and wind falls. The wood from the trees can be used for firewood at the sites or for the building of tables, etc. It should be indicated at the sites that fire wood is not always provided.

Other high-use areas such as the parking lots, trails and campsites also require a lot of special care. Because the area is frequently muddy and has a high water table these areas get bogged out and trampled. Proper drainage proceedures should be carried out.

in these areas or reroute around them to allow for natural succession to occur. If this does not happen then artifical means of regeneration will have to be under taken, i.e., drainage ditches or colverts put in and vegetation seeded.

H. Publications

A type II brochure should be developed for the site plan. This brochure should contain minimal information about facilites, geology, fauna, flora, history, trails, access and aesthetic values, etc. They should be available at Forest Service offices, Chamber of Commerce offices, visitor-service centers and on the main sign board at the winter parking area.

I. Site Limitations

Areas surrounding the site plan have limitations to their development potential because of the moisture-holding capacity of the soil and the short growing season. Because the area is so moist throughout the year its rehabilitation rate is slower than that of an area which has good drainage. All trails must be located so that they do not interfere with the natural drainage patterns and, where this is impossible, proper bridging must be constructed to minimize environmental impact.

Another hazard arises because of the high water table in the area. Many of the trees have developed root rot. These trees do not pose immediate problems but should be inventoried regularly over the next few years.

III. Winter Recreation

Winter recreation is virtually non-existent in the sub-unit area, although some snow mobiling and cross-country skiing do exist. A conflict does occur between these two recreational activities; therefore, areas should be designated as eith for motorized or non-motorized use. The recommendation is that the main road be kept clear up to within three kilometers of Bayonne Lake. At this point a parking area, main trail signs and zoning signs should be put up. Beyond the parking area to the lakes would be designated for the skiers. Here they could ski up the road and follow the trails around the lakes etc. (Fig 5) The portion from the highway to the parking area could be for the snowmobilers. Trails could be developed or they could just utilize the logging roads and surrounding country side.

The zoning sign would indicate which area the skiers have and which the snowmobilist have.

J. Demand for Cross-Country Skiing

Cross-country skiing has increased drastically over the last five years according to local retail stores. The increase can also be noted by the increased number of cars parked at the already established areas. If the sales and rentals of ski equipment continues increasing and the current trails remain busy, one can assume that demand for more cross-country and ski touring trails systems will increase.

Proposed Ski Trail System

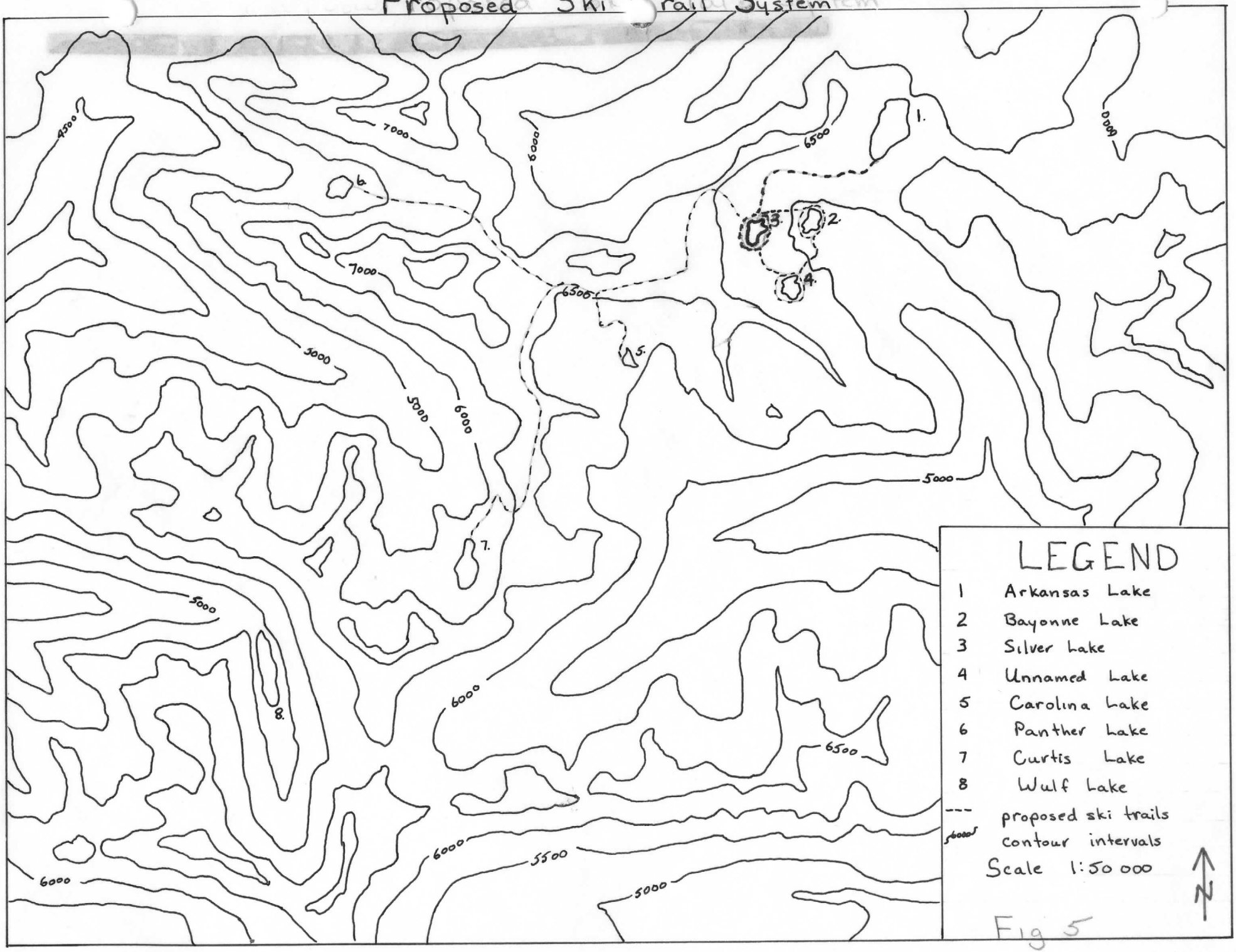


Fig 5

IV. List of Recommendations

1. Mining and Logging

Set criteria for the industrial use in the area to follow, taking into account wildlife, aestetics and recreational values.

2. Wildlife

a. Post signs outlining that the Mountain Caribou are protected.

b. Limit industrial activities in the area.

3. Access

a. No further road development.

b. Maintain, but do not upgrade, present roadways.

4. Trails

a. Upgrade trails from a class III standard to a class II standard.

b. Build a trail from Silver to Bayonne Lake to lessen the impact on Bayonne Lake.

c. Maintain quality of trails to accommodate the winter-recreation activities.

d. Put in a series of cross-country ski trails as marked out in Figure 5.

e. Construct a trail from the road to Carolina Lake.

f. Construct trails around lakes as indicated in report.

5. Campsites

a. Rehabilitate existing Forest Service sites.

b. Upgrade areas around site plan as indicated by the three stage development plan. (Fig 2,3, and 4)

c. Move outhouses that are too close to the water and contribute seepage into the water.

6. Parking

a. Upgrade parking at all lakes.

b. Move the Bayonne Lake parking area to the east side of the road.

7. Fire Control

a. Remove all hazard trees, i.e., snags, leaning trees and any heavy concentration of underbrush.

8. Fisheries

a. Do an inventory on fish productivity in all lakes.

b. Stock lakes when necessary.

9. Water

a. Do a water-quality study of all the lakes to determine seepage.

10. Visitor Management

a. Do a visitor use survey and/or put up registration boxes.

11. Publications

a. Print and circulate to the agencies indicated in the report a type II brochure discribing the recreation for the Unit.

12. Signing

a. Trail signs for skiing must be put up along the trails.

b. Visitor maintain signs at all lakes must be readily visible.

13. Vegetation

a. Remove all hazard trees.

b. Rehabilitate damaged areas.

14. Winter Recreation

a. Designate areas for motorized and non-motorized activities.

b. Keep road clear of snow up to withen the three km mark before Bayonne Lake.

15. Limitations

a. Avoid very sensitive areas by re-routing around them.

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6. Jones B. "Ski Touring Trails for Kootenay Pass" Selkirk College Technical Report, 1981.

APPENDICES

APPENDIX A

Recreation Capability Classification

Land Unit Arkansas. Lake unit Date:

Rec. Features	Category	Initial Value	Limitations (describe)	Lim Avg	Net Value.
A	H	23	Wind. 6; Accessibility 6; Productivity 5	6	17
I	H	23	Traversing 3; Rewards 5; Camping 8	5	18
Q	H	23	Activities 8; Quality 8; Season. 5	7	16
V	H	23	Variety 6; Extent 8; Uniqueness 6	7	16
W	H	23	Habitat 5; Terrain 6; limitations 5	5	18

Average 17

class 2

Drainage Name Wolf Lk.

Map Reference.

map symbol 25 I W A

Examiner Jody Ashdown

RECREATION CAPABILITY

CLASSIFICATION

LAND UNIT: ARKANSAS LAKE UNIT DATE: SEPT. 30/81

Rec. Feature	Cate-gory	Initial Value	Limitations (describe)	Lim. Avg.	Net Valu
1. A	H	23	WIND-3, ANGLACC.- 0, F.P.C. 5	3	20
2. I	H	23	TRAV-EASE -0, [illegible] -5, RYC AREA - 5	3	20
3. M	H	23	TRAVEL BETWEEN-4, [illegible] - 5, DEV. POT. 10	6	17
4. K	H	23	ORGANIZED. - 7, DEVELOPMENT AREA-8, W.QUALITY- 4	6	17
5. S	H	23	[illegible] SEASONS AVAIL. - 6	5	18

Remarks:

18.4
Average

Drainage Name: UNNAMED LAKE

Map Ref.:

Photos:

3
Class

Examiner's Name: G. McCALL

35 A I Q
Map Symbol

RECREATION CAPABILITY

CLASSIFICATION

LAND UNIT: ARKANSAS LAKE DATE: October 1, 1981

Sc. Figure	Category	Initial Value	Limitations (describe)	Lim. Avg.	Net Value
A	H	23	Wind 5, Access 3, Production 5	4	19
C	H	23	ATTRACTIONS 8, HAZARD 0, Season 5	4	19
H	H	23	Significance 5, Condition 8, Size 8	7	16
I	H	23	EASE 3, Rewards 5, Camping 5	4	19
J	L	20	Abundance 5, Cover 8, Terrain 5	6	14
K	H	23	Activities 5, Development 0, Water 5	3	20
M	H	23	Travel 3, Aesthetics 5, Development 10	6	17
O	H	23	Success 8, Mobility 3, Cover 6	6	17
Q	H	23	Activities 8, Attractions 5, Season 2	5	18
S	H	23	Snowfall 3, Aspect 0, Slope 6, Topo 3, DEV 5	6	17
	H	23	Variety 5, Extent 8, Unique 5	6	17
W	H	23	Production 5, Terrain (Deer 3), CARIBOU 3, Limit 5	4	19
X (Y)	L	20	Access 5, Aesthetic 8, Variation 6	6	14

Remarks: Area suitable for x-country skiing

19.2
Average

Image Name: BAYONNE LAKE

Ref.:

Cos:

Planner's Name:

2
Class

2U A K I
Map Symbol

RECREATION CAPABILITY

CLASSIFICATION

LAND UNIT: ARKANSA LAKE DATE: _____

Rec. Feature	Category	Initial Value	Limitations (describe)	Lim. Avg.	Net Value
A	H	23	WIND 3; ACCESS 4; PRODUCTION 7;	5	18
I	H	23	TRAVERSING 5; REWARDS 3; RESTING 8;	5	18
J	L	20	ABUNDANCE 7; VEG. 4; TERRAIN 6;	6	14
K	H	23	ACTIVITIES 7; DEVELOPMENT 10; WATER 0;	6	17
M	L	20	TRAVEL 6; AESTHETICS 5;	5	15
~~R~~	~~=~~				
Q	H	23	ACTIVIES 6; QUALITY 2; SEASON 3;	5	18
V	L	20	LANDSCAPE 5; VIEW 2; UNIQUENESS 4;	5	15
	L	20	HABITAT 5; TERRAIN 6; COVER 5;	86	14

Remarks:

17
Average

Drainage Name: CAROLINA

Map Ref.:

3
Class

Photos:

Examiner's Name: B. ESPENHAIN

3s A I Q
Map Symbol

RECREATION CAPABILITY

CLASSIFICATION

LAND UNIT: Arkansas lake unit DATE: 09/30/81

Rec. Feature	Category	Initial Value	Limitations (describe)	Lim. Avg.	Net Value
ANGLING	H	23	Wind 5; access 1; cap. 5	4	19
BEACH	L	20	Quality 8; wind 5	6	14
HIKING	H	23	EASE 2; REWARDS 5; RESTING, 4	4	19
CAMPING	H	23	ACTIVITIES 2; DEVELOPMENT 8; WATER 0; AVAILABLE	5	18
SUMMER RECREATION	H	23	ACTIVITIES 3; ATTRACTIONS 3; SEASON AVAILABILITY 5;	4	19

Remarks:

17.8
Average

Drainage Name: Arkansas Lake

Map Ref.:

Notes:

Examiner's Name: GORD

3
Class

35 A/I/Q
Map Symbol

RECREATION CAPABILITY

CLASSIFICATION

LAND UNIT: Arkansas Lake unit DATE: _____

Rec. Feature	Category	Initial Value	Limitations (describe)	Lim. Avg.	Net Value
A	H	23	Wind 5; Accessibity 3; Production 6	5	18
I	H	23	Traversing 6; Rewards 3; Resting Areas 8	6	17
O	H	23	Success 5; Mobility 6; Cover 9	7	16
Q	H	23	Activities 8; Quality 3; Available 2	4	19
V	H	23	Variety 9; Extant 8; Uniqueness 7	8	15
W	H	23	Habitat 5; Terrain 6; Limitations 4	5	18

Remarks:

19
Average

Drainage Name: Curtis Lk.

Map Ref.:

...os:

Examiner's Name: Jody Ashdown

2
Class

25 Q A V
Map Symbol

J. Ashdown

RECREATION CAPABILITY

CLASSIFICATION

LAND UNIT: Arkansas Label unit. DATE: 09/30/81

Rec. Feature	Category	Initial Value	Limitations (describe)	Lim. Avg.	Net Value
A	H	23	Wind, 2; Angling Acc, 3; Fish Prod, 7;	4	19
I	H	23	Traversing Ease, 3; Rewards, 6; Rest Area, 8;	6	17
M	H	23	Bwt Lakes, 3; Aesthetics, 8; Dev. Potential 0;	7	16
S	H	23	Snowfall, 0; Slope 0; Dev. Area, 5	2	21
[illegible]	H	23	Activities Possible, 8; Quality of Attraction, 8; Season Available 2;	6	17
					90
K	H	23	Activities 9; Dev. Area 2; Water Quality 7	6	17
V	H	23	Landscape Variety 8; Extent of view 7; Uniqueness of View, 5.	7	16
W	H	23	Wildlife Habitat, 5; Terrain (Flat) ~~3~~ 5; limitations 4; Forest Cover, 4	5	18

Remarks:

18
~~90~~
Average

Drainage Name: Silver Lake

Map Ref.:

[illegible]s:

Examiner's Name: Jody Ashdown

3 M
Class

3s A I M
Map Symbol

RECREATION CAPABILITY

CLASSIFICATION

LAND UNIT: Arkansas Lake Unit DATE: _____

Rec. Feature	Category	Initial Value	Limitations (describe)	Lim. Avg.	Net Value
A	H	23	Wind 5; accessibility 4; Production 4	4	19
I	H	23	traversing 4; Rewards 4; Rest Areas 8	5	18
O	H	23	Success Cap. 5; mobility 6; Cover 6	6	17
Q	H	23	Activities 7; Quality 4; Season 2	4	19
W	H	23	Habitat 5; Terrain 6; limitations 5	5	18
✓	H	23	Variety 9; Extent 8; Uniqueness 7	8	15

Remarks:

18
Average

Drainage Name: Panther Ck.

Map Ref.:

3
Class

Notes:

Examiner's Name: Jody Ashbourn

35 A Q I
Map Symbol

APPENDIX B

4.7
Cross Country Ski Trails

4.7.1
Form of Trail Layout

Generally the best forms of layout for day-use ski trails are the stacked loop, the satellite loop, the spoked wheel and the maze forms. These can provide a variety of routes with different degrees of difficulty and distances and can accommodate a wide range of skiers. The layout should be arranged such that trails can be used for partial day-use, full day-use and for return visits, i.e. opportunities for different routes on subsequent visits.

Overnight ski trails of linear or loop form can also be developed.

4.7.2
Trail Length

Listed below are distances covered in an hour by various categories of skiers. These distances can be used as a basis for trail length calculation.

Categories of Skiers/Average Distance Covered

Slow tourers 4 - 5 km/h
Average tourers 5 - 6.5 km/h
Fast tourers 8 - 9.5 km/h
Racers 9.5 - 13 km/h
(Canadian Ski Marathon, Quebec, 1972).

Short base loops should be provided for partial day-use and for use by slow and novice skiers. Working from the above figures, and assuming that some novices will be slower than slow tourers, base loops should be between 3 and 5 km.

For full day-use a minimum distance of 15 to 20 km is recommended. The maximum distance depends upon the class of skier. For average tourers 22 km will probably be adequate (four hours skiing at 5.5 km/h); for fast tourers 36 km (four hours skiing at 9.0 km/h).

Total length for a trail system will depend on how many alternative loops are provided.

4.7
Pistes de ski de fond

4.7.1
Tracé des pistes

Généralement, les meilleurs tracés pour les pistes de ski d'utilisation diurne sont ceux en boucles contiguës, en boucles satellites, en forme de roue de charette et en labyrinthe. Ces tracés peuvent offrir plusieurs parcours comportant divers degrés de difficultés et différentes distances, et peuvent accommoder plusieurs types de skieurs. Les pistes devraient être aménagées afin de pouvoir être utilisées pour seulement une partie de la journée, pour toute la journée et pour les visites suivantes de façon à ce que les skieurs aient la possibilité d'emprunter différents tracés.

Il est également possible d'aménager des pistes de ski avec séjour en forme linéaire ou en forme de boucle.

4.7.2
Longueur des pistes

Vous trouverez ci-après une liste des distances parcourues dans une heure par diverses catégories de skieurs. Ces distances peuvent être utilisées comme point de référence pour calculer la longueur des sentiers.

Catégories de skieurs/Distance moyenne parcourue

Excursionnistes lents 4 - 5 km/h
Excursionnistes moyens 5 - 6.5 km/h
Excursionnistes rapides 8 - 9.5 km/h
Coureurs 9.5 - 13 km/h
(Marathon canadien de ski, Québec, 1972).

Il faudrait aménager de courtes boucles de base pour l'utilisation partielle diurne et pour des skieurs lents ou débutants. En se basant sur les chiffres mentionnés précédemment et en tenant compte du fait que quelques débutants seront moins rapides que les excursionnistes lents, la longueur des boucles de base devrait être de 3 à 5 km.

Pour l'utilisation diurne complète, nous proposons une distance minimum de 15 à 20 km. La distance maximum dépend de la catégorie de skieurs. Pour les excursionnistes moyens, la distance adéquate serait probablement de 22 km (soit quatre heures de ski à 5.5 km/h) et pour les excursionnistes rapides, de 36 km (quatre heures de ski à 9.0 km/h).

La longueur totale du réseau de pistes dépendra du nombre de boucles offertes.

On overnight cross-country ski trails accommodations should be located at intervals that can be readily covered within a day's travel time. This will depend upon the difficulty of the trail and the expertise of the skiers. Basing calculations on the average tourer, and using a travel time of four hours at 5.5 km/h, accommodations should be located at intervals of not more than 20 km. Intervals of 15 km allows for more flexibility of use. This is also important for safety reasons because adverse weather conditions can greatly reduce the distance that skiers can travel.

4.7.3
Grades

A 40 percent grade should be considered the maximum even for expert skiers. On general use trails a 10 percent slope should be the maximum except for very short drops, where there is no chance of skiers losing control.

Steep runs should be relatively short so that speeds do not become too great. Adequate 'runout' room should be provided at the base of slopes to allow skiers to slow down before curves. Intersections with other trails or roads should not occur at the bottom of downhill runs. On steep slopes trail surfaces should be relatively smooth and curves should be gentle.

Where curves occur on long slopes the sections preceding the curves should be leveled out or run slightly uphill to assist skiers in reducing speed. Sharp curves should be tilted to the inside.

To ensure the safety of skiers trails should be marked to indicate the degree of expertise required. The base loop of a trail system should be suitable for novices, while secondary loops can be used to provide conditions suitable for more experienced skiers. Requirements for three different trail categories are:

Pour les pistes de ski de fond avec séjour, il faudrait aménager des installations à des intervalles qui peuvent être facilement parcourus dans une journée. Cela sera déterminé par les difficultés de la piste et l'expérience des skieurs. En se basant sur le skieur moyen et en utilisant une vitesse de déplacement de 5.5 km/h pour une durée de quatre heures, les installations devraient être aménagées à des intervalles ne dépassant pas 20 km. Des intervalles de 15 km permettent une utilisation beaucoup plus souple. Ce facteur est également important pour des raisons de sécurité en raison des conditions climatiques qui peuvent grandement réduire les distances que les skieurs peuvent parcourir.

4.7.3
Déclivités

Une déclivité de 40 pour cent devrait être le maximum, même pour des skieurs expérimentés. Pour les pistes d'utilisation générale, la déclivité maximum devrait être de 10 pour cent sauf pour de très courtes pentes où les skieurs n'ont aucune chance de perdre le contrôle.

Les descentes raides devraient être relativement courtes pour que la vitesse ne devienne pas trop grande. Il faudrait fournir suffisamment d'espace pour ralentir à la base des pentes avant que les skieurs ne prennent les courbes. Il ne devrait pas y avoir d'intersections avec d'autres pistes ou des routes au bas des pentes. Dans les pentes raides, les surfaces des pistes devraient être relativement égales et les courbes devraient être faibles.

Lorsque les courbes se présentent sur des pentes allongées, les tronçons précédant les courbes devraient être nivelés ou aménagés de façon à remonter la pente pour permettre aux skieurs de réduire leur vitesse. Il faudrait incliner les courbes aiguës vers l'intérieur.

Pour assurer la sécurité des skieurs, il faudrait coter les pistes pour indiquer le degré d'expérience requis. Les pistes de base en boucle d'un réseau devraient convenir à des débutants tandis que les boucles secondaires peuvent être aménagées en fonction de skieurs plus expérimentés. Les exigences relatives aux trois différentes catégories de pistes sont les suivantes:

Novice
Downhill runs should have a maximum grade of 10 percent. Slope surfaces should be fairly smooth and curves should be wide and gentle. Several short slopes are preferable to long slopes. With short slopes speeds do not become too great and climbing is not tiresome. Descents with steep side-slopes are difficult for inexperienced skiers and should be avoided.

Intermediate
Maximum grade for downhill slopes should be 25 percent. Curves may be sharp, but ample room should be left for "overshooting". Up to one third of the trail may be uphill with some steep, but short, climbs.

Expert
Maximum grade for downhill slopes shouls be 40 percent. Gentler grades should be used on long runs where the trail surface is rough or where there are sharp curves. Adequate "runout" distance should be provided at the bottom of steep or long slopes. Up to one half of the trail may be uphill.

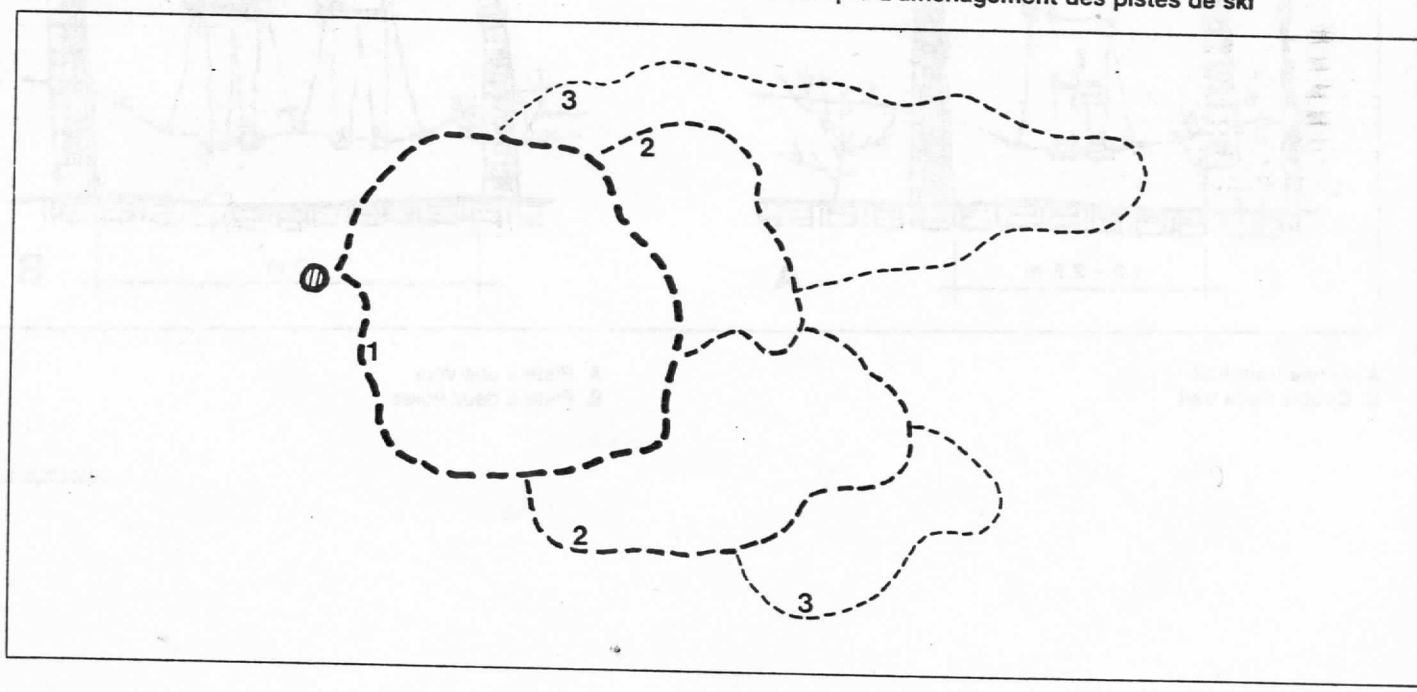
Novice
Les pentes descendantes devraient avoir une déclivité maximum de 10 pour cent. La surface des pentes devra être relativement unie et les courbes devraient être larg et douces. Il est préférable d'aménager plusieurs courte pentes que quelques longues pentes. La vitesse des skieurs ne s'accroît pas trop rapidement sur de courtes pentes qui sont par ailleurs beaucoup plus faciles à monter. Il faudrait éviter les descentes raides en travers des pentes, qui sont difficiles pour les skieurs inexpérimentés.

Intermédiaire
La déclivité maximum des pentes descendantes devrait être de 25 pour cent. Les courbes peuvent être accentuées, mais il faudrait laisser suffisamment d'espac de "jeu". Près du tiers de la piste peut être aménagé su des montées et peut comporter quelques montées raides mais courtes.

Expert
La déclivité maximum des pentes descendantes devrait être de 40 pour cent. Il faudrait se servir de déclivités plus faibles pour les longues distances lorsque la surface de la piste est accidentée ou que les courbes sont raides Il faudrait allouer un espace suffisant pour ralentir au bas des pentes raides ou longues. Près de la moitié de la piste peut être aménagée sur des montées.

Example of Ski Trail Layout

Exemple d'aménagement des pistes de ski



1 Novice
2 Intermediate
3 Expert

1 Novice
2 Intermédiaire
3 Expert

Under adverse conditions, e.g. deep fresh snow or icy conditions, it may be necessary to close trails or to advise use by experts only. Trail classification should be indicated at trail heads and trail junctions or on handout maps.

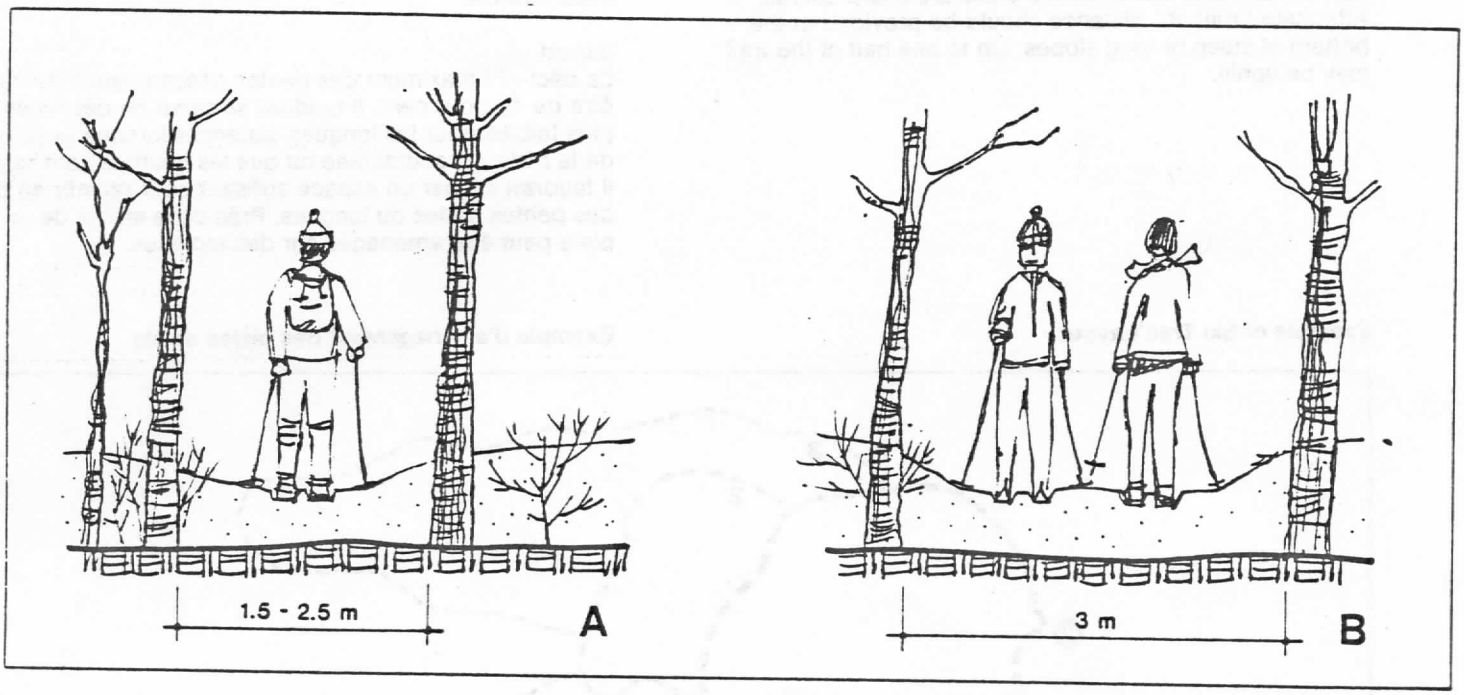
4.7.4
Right-of-Way Clearing
For single track trails, widths of 1.5 to 2.5 m are recommended. The narrowest width should only be used for minor trails.

For main trails, where intensive use is expected, there should be enough room for two or three sets of tracks. The minimum width for two tracks is 3 m and for three tracks 4 m.

Lorsque les conditions sont difficiles, par exemple lors d'une neige nouvelle profonde ou de pistes glacées, il peut s'avérer nécessaire de fermer les pistes ou d'en recommander l'usage aux experts seulement. La classification des pistes devrait être indiquée au début ou aux jonctions des pistes ou sur des cartes "format de poche".

4.7.4
Dégagement de l'emprise
Pour les pistes à une voie, la largeur recommandée peut varier entre 1.5 à 2.5 m. La largeur minimum devrait être utilisée seulement pour les pistes secondaires.

Pour les pistes principales, qui sont très fréquentées, il devrait y avoir suffisamment d'espace pour aménager deux ou trois voies. La largeur minimum pour deux voies est de 3 m et pour trois voies de 4 m.



A Single tract trail
B Double track trail

A Piste à une voie
B Piste à deux voies

Where grooming equipment is to be used a minimum width of 2.5 m is required. This allows enough space for efficient operation and safeguards trees from being scraped.

On slopes sufficient clearance should be allowed for the safety of falling skiers and to allow skiers room to 'herring bone' or side-step up. This will also provide room for ascending skiers to step out of the way of downhill skiers. On slopes exceeding 10 percent the tread width should be a minimum of 3 m.

Adequate room should be allowed on the outside of downhill curves for skiers to 'overshoot' curves and to stop safely.

On long runs widened sections should be provided at intervals to allow skiers to control their speed by stopping or running off the trail.

Clearing should be carried out to provide adequate views from the top of slopes of trail sections ahead.

Materials cleared should be removed flush with the ground so that they will not endanger falling skiers.

Lorsqu'un surfaceur-traceur est utilisé, la largeur minimum du sentier devrait être de 2.5 m. Cela donne suffisamment d'espace pour travailler de façon efficace et empêche les arbres d'être éraflés.

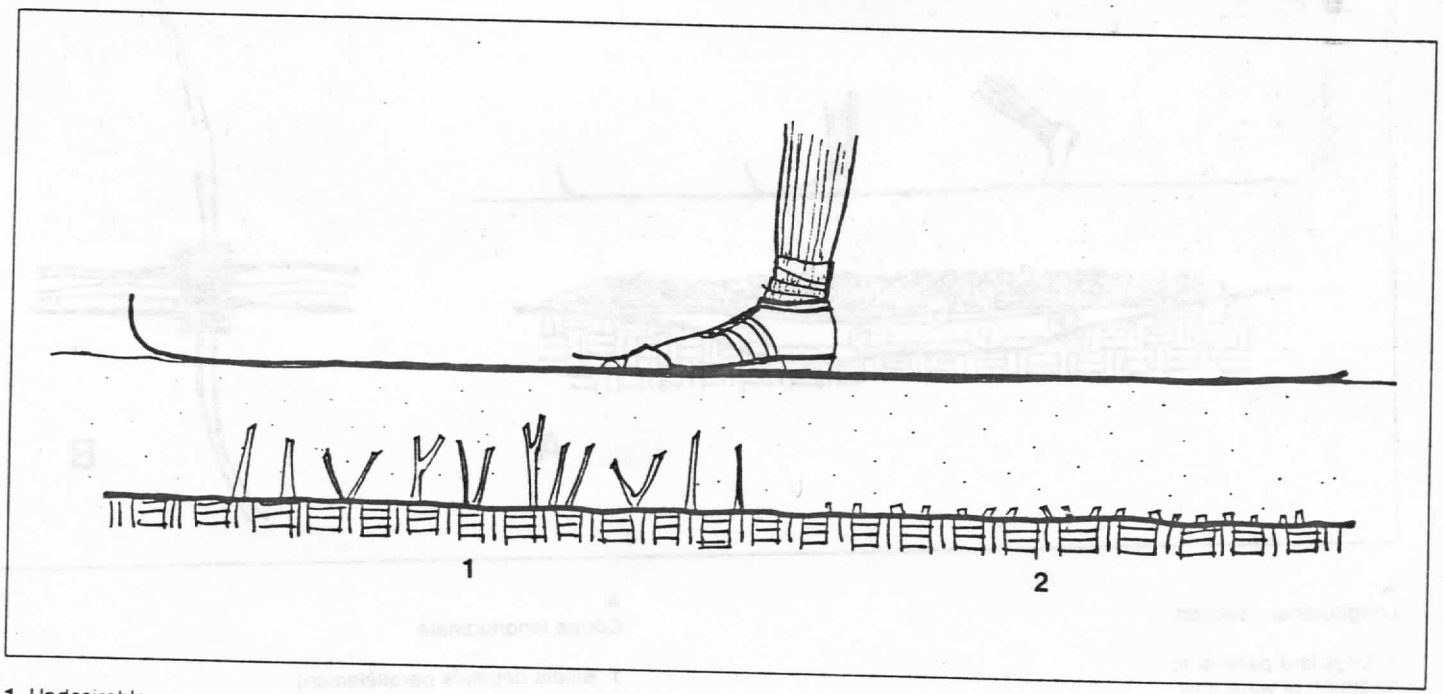
Sur les pentes, il faudrait accorder suffisamment d'espace pour assurer la sécurité des skieurs qui tombent et pour permettre aux skieurs de se ranger sur les côtés de la piste. Il y aura ainsi suffisamment d'espace pour que les skieurs qui montent puissent s'enlever facilement du chemin des skieurs qui descendent la piste. Lorsque la déclivité des pentes dépasse 10 pour cent, la surface de la piste devrait être d'au moins 3 m.

Il faudrait laisser suffisamment d'espace sur l'extérieur des courbes descendantes pour permettre aux skieurs d'aller au-delà des courbes et de s'arrêter en sécurité.

Dans les longues descentes, il faudrait aménager des tronçons plus larges à certains intervalles pour permettre aux skieurs de contrôler leur vitesse en arrêtant ou en sortant de la piste.

Il faudrait dégager la végétation pour que du haut des pentes les skieurs puissent bien voir les tronçons de la piste vers laquelle ils se dirigent.

Il faudrait enlever les matériaux qui ont été dégagés jusqu'au niveau du sol, afin de ne pas mettre en danger le skieur qui tombe.



1 Undesirable
2 Desirable

Clearing height should be 2.5 m plus the maximum snow depth expected. Where branches are likely to droop under the weight of snow or ice extra room should be provided.

1 Non souhaitable
2 Souhaitable

Le dégagement de la végétation devrait être fait jusqu'à une hauteur de 2.5 m en comptant l'épaisseur maximum de neige. Le dégagement devrait être plus haut aux endroits où les branches vont probablement ployer sous le poids de la neige ou de la glace.

4.7.5
Structures

Small streams which freeze solidly can be crossed without bridging; however if bridges are installed the trail season can be extended.

Bridges should be wide enough for track and poles. Railings should be included on narrow bridges which are of sufficient height to be dangerous. Bridges should be strong enough to support trail grooming equipment.

For shallow streams where bridges are not required during other seasons, brush fill crossings can be used. Piles of brush are stacked across streams in late autumn. These must be thick enough to ensure that the snow layer will be well above the water level.

Bridges should not be located at the bottom of downhill runs and approaches should be reasonably straight and level.

4.7.5
Structures

Les petits cours d'eau qui gèlent solidement peuvent être traversés sans pont; cependant, si on aménage des ponts, la période d'utilisation d'une piste peut être prolongée.

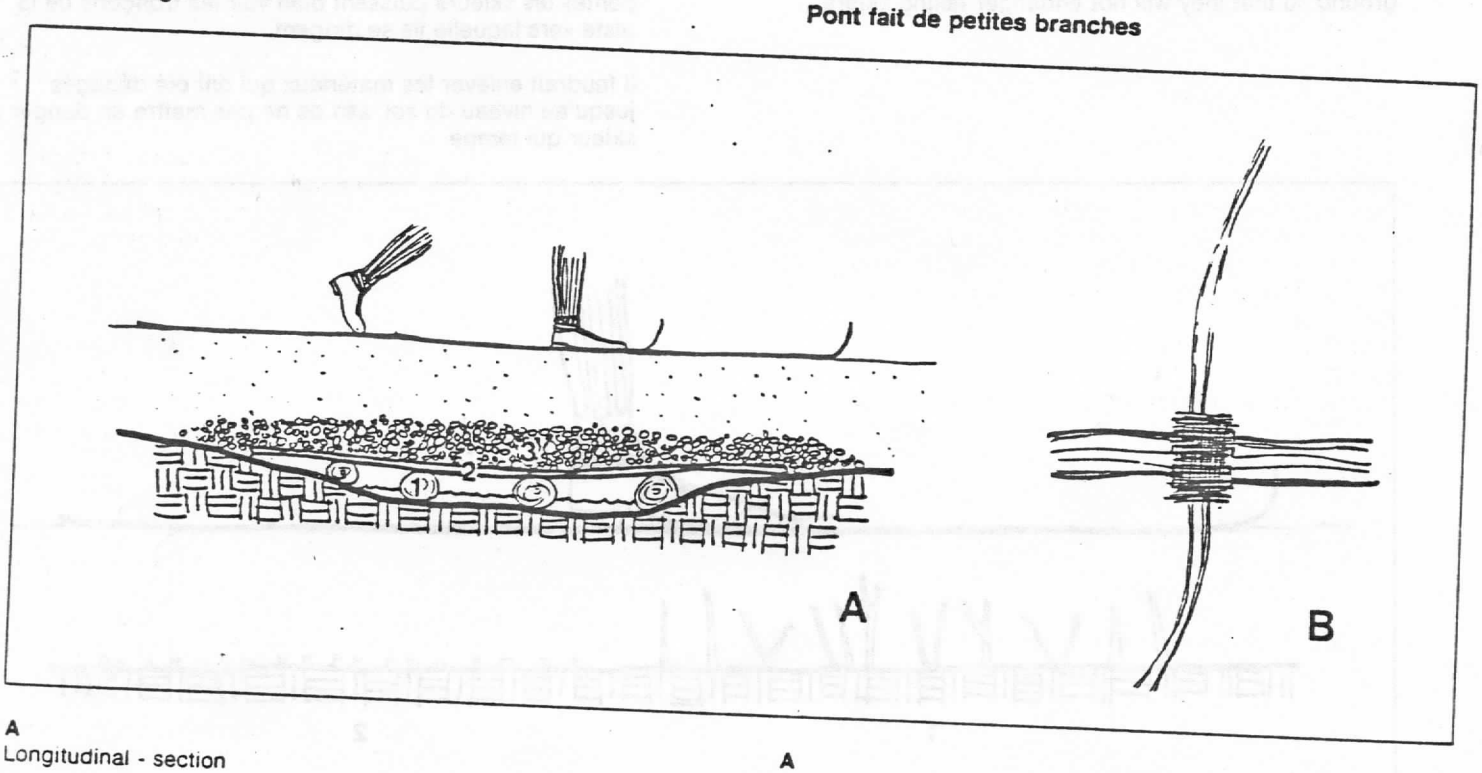
Les ponts devraient être suffisamment larges pour tracer la voie et laisser le libre passage des bâtons. Il faudrait ajouter des garde-fous lorsque des ponts étroits et élevés pourraient être dangereux. Les ponts devraient être assez solides pour supporter le matériel d'entretien des pistes (surfaceurs-traceurs).

Pour les cours d'eau peu profonds, qui ne nécessitent pas de ponts durant les autres saisons, il est possible d'utiliser de petites branches d'arbres pour traverser. Il suffit de les empiler en travers des cours d'eau vers la fin de l'automne. Ces amas doivent être suffisamment épais pour assurer que la couverture de neige sera bien au-dessus du niveau de l'eau.

Les ponts ne devraient pas être aménagés aux pieds des descentes et leurs abords devraient être raisonnablement droits et au niveau.

Brush Bridge

Pont fait de petites branches



A
Longitudinal - section

1 Logs laid parallel to direction of waterflow
2 Saplings laid at right angles over logs
3 Brush laid at right angles over saplings

B
Plan view

A
Coupe longitudinale

1 Billots déposés parallèlement à la direction du courant
2 Jeunes arbres déposés à angle droit au-dessus des billots
3 Petites branches déposées à angle droit au-dessus des jeunes arbres

B
Vue en plan

4.7.6
Facilities
On day-use trails consideration should be given to providing shelters or cabins with stoves where skiers can stop for lunch. Toilet facilities should be provided at these locations. Such rest stops should be strategically located so that they can be used by a maximum number of skiers, e.g. at main trail junctions.

4.7.7
Trail Marking
The classification of trails (novice, intermediate, expert) should be indicated at trail heads and trail junctions or on 'handout' maps. This can be indicated by signs or by marker symbols (shapes or colours). Trails should also be identified along their routes by names or marker symbols so that skiers do not become lost. Information such as lenghts of trails, layouts of trails and locations of facilities can be indicated at trail heads or on 'handout' maps.

In areas of large snow accumulation trail marking is a problem because markers can become buried. One method to overcome this, presently used in some of the Western parks, is to use bamboo poles that can be easily reset as snow depths increase.

Paint should be used rather than plastic or cloth flags since animals sometimes eat the flags and this can cause the animals to choke or can block their digestive tracks.

4.7.8
Additional Locational Factors
Ski trails should be located in areas where there will be consistent snow cover for several months. A minimum snow depth of 15 cm is recommended but 60 cm or more is desirable to give adequate cover over rocks, logs, etc.

For route selection consideration should be given to the orientation of slopes. South facing slopes will be warmer but may lose their snow earlier in the spring. Where trails are located on such slopes alternative routes should be used for spring skiing when snow has melted from the exposed trail sections.

Trails should be protected from prevailing winds, i.e. the leeside of hills or in tree cover, for the comfort of skiers and to reduce drifting and wind packing of snow.

4.7.6
Commodités
Sur les pistes d'utilisation diurne, il faudrait fournir des refuges ou des cabanes munis de poêles où les skieurs peuvent s'arrêter pour manger. Il faudrait aussi y installer des toilettes. Ces stations de repos devraient être bien situées afin que le plus grand nombre de skieurs puissent les utiliser, par exemple aux croisements de la piste principale.

4.7.7
Indication des pistes
La classification des pistes (novice, intermédiaire, expert) devrait être indiquée au début et aux croisements des pistes ou sur des cartes "format de poche". Des signes ou des symboles (formes ou couleurs) pourraient servir d'indication. Les pistes devraient être aussi identifiées le long d'un parcours par des noms ou des symboles afin que le skieur ne se perde pas. Des renseignements tels que la longueur des pistes, leur tracé et l'emplacement des commodités peuvent être indiqués au début des pistes ou sur des cartes "format de poche".

Dans les endroits soumis à de grandes accumulations de neige, les indications peuvent être enterrées. Un moyen de venir à bout de ce problème, employé actuellement dans quelques parcs de l'Ouest, consiste à utiliser des poteaux en bambou qui peuvent facilement être replacés à mesure que la couche de neige s'épaissit.

Il serait préférable d'utiliser de la peinture au lieu de drapeaux en tissu ou en plastique, étant donné que les animaux mangent parfois ces drapeaux qui peuvent les étouffer ou même obstruer leur système digestif.

4.7.8
Autres facteurs liés à l'emplacement
Les pistes de ski devraient être aménagées dans les endroits où la couche de neige durera plusieurs mois. La couche de neige devrait être d'au moins 15 cm mais il est préférable qu'elle soit de 60 cm et plus afin de recouvrir adéquatement les rochers, les billots, etc.

Avant de choisir les parcours, il faudrait considérer l'orientation des pentes. Les pentes orientées vers le sud seront plus chaudes mais pourront perdre leur couche de neige plus tôt au printemps. Lorsque les pistes sont localisées sur de telles pentes, il faudrait offrir d'autres parcours pour le ski de printemps au moment où la neige a déjà fondu.

Les pistes devraient être protégées des vents dominants, par exemple en les aménageant du côté des collines à l'abri du vent ou à l'intérieur de la forêt, pour assurer le confort des skieurs et pour réduire la poudrerie et l'accumulation des bancs de neige.

Before the trail route is set effects of wind and sun should be observed during a complete winter season. Temporary trails can be established for this purpose.

The first sections of trails should be sheltered and uphill so that skiers warm up quickly.

Slopes at the end of long or difficult trails should be gentle since the lighting in the late afternoon can be poor, conditions can be icy and skiers may be tired. Long easy runs are most appreciated at the end of the day.

In areas where development is to be fairly intensive and trails will be close together, an attempt should be made to provide separation by using hills and groups of evergreen trees to screen views between trails.

Consideration should be given to potential environmental impacts. Sensitive areas, where compaction of snow cover may cause damage to vegetation or may cause erosion, should be avoided.

Consideration should be given to developing multi-use trails, i.e. trails suitable for skiing as well as for hiking, bicycling or horseback riding. This will affect routing, grades, the design of bridges, etc. In some cases it may be appropriate to provide alternative routings where the requirements of the uses cannot be jointly accommodated, e.g. a ski trail diverging from a hiking trail where grades are too steep.

Avant de fixer les parcours d'une piste, il faudrait observer les effets du vent et du soleil durant tout un hiver. Des pistes temporaires peuvent être aménagées dans ce but.

Les premiers tronçons des pistes devraient être abrités et ascendants afin que les skieurs se réchauffent rapidement.

Les pentes à la fin des pistes longues ou difficiles devraient être peu accentuées étant donné que l'éclairage en fin d'après-midi peut être faible, les pistes glacées et les skieurs fatigués. A la fin de la journée, les longues distances parcourues facilement sont très appréciées.

Dans les endroits où les aménagements seront nombreux et où les pistes seront rapprochées les unes des autres, il faudrait essayer d'utiliser des collines et des groupes de conifères afin d'y masquer la vue.

Il faudrait également tenir compte des répercussions possibles sur l'environnement. Il faudrait éviter les écosystèmes fragiles où le compactage de la neige peut causer des dommages à la végétation ou entraîner de l'érosion.

Il faudrait songer à aménager des sentiers à usages multiples, c'est-à-dire des sentiers qui peuvent convenir au ski aussi bien qu'à la marche, aux randonnées à bicyclette ou à cheval. Les choix du parcours, des déclivités, du design des ponts, etc. seront établis en fonction de ces sentiers. Il sera parfois approprié de fournir d'autres parcours lorsque les besoins des utilisateurs ne se recoupent pas; par exemple, une piste de ski de fond sera séparée d'un sentier de randonnée lorsque la déclivité est trop accentuée.

Features To Include In A Trail System

1. Varied terrain & variety of grade, approx. 1/3 uphill, 1/3 downhill, 1/3 flat	-variety prevents monotony
2. Points of historical, geographical or environmental interest	-makes trails more interesting
3. Treed northern slopes	-snow will remain later into spring -less crusting of snow
4. Vista & Views	-increase visitors experience

Features To Be Avoided In A Trail System

1. Large areas of steep slope	-long steep slope too strenuous and unsafe -difficult to groom
2. Exposed southern slope	-early snow loss -crusting conditions -increased maintenance costs
3. North-west slope	-susceptible to wind sweeping -increased wind chill -(trees will lessen these effects)
4. Large areas of swamp	-shortened season -often remain open during winter -rapid growth of underbrush -environmentally sensitive
5. Small poorly drained areas	-will cause wet trails & icy spots -shortened season
6. Any body of moving water	-ice is thinnest at these points -increased trail construction costs due to bridges or culverts -less than 10 cms of ice should not be skied on -season is shortened
7. Large open fields or lakes	-often wind swept (snow is blown off trails) -wind chill factor is high
8. Long & steep side slope traverses	-makes diagonal stride difficult -difficult to groom -high construction costs
9. Sharp dips and turns	-hazardous -result in broken stride -difficult to groom
10. Thick groves of conifers	-prevent snow from reaching the ground -snow melting off branches leaves ice and foilage on trail
11. Roads and fences	-dangerous to cross -roads damage skis & remove wax -cause skiers to break stride
12. Uneven ground surface	-high construction costs -uneven trails require more snow & grooming
13. Trails beneath steep slopes	-avalanche danger

TRAIL CONSTRUCTION

If you have preplanned your trail and have walked the site carefully flagging and marking the exact route you wish to follow, the construction aspects of trail development should be made easier. What exactly is required for proper trail construction and how can this be accomplished effectively and inexpensively? To begin with, having the proper tools and knowing how to use them can greatly assist initial trail construction and future maintenance programs.

The following is a list of basic tools one might consider for ski-trail construction:

Hand Tools
- Chainsaw
- Gas-powered brush cutter
- Brush hooks or saws (with extensions)
- Single blade axe
- Polaski
- Pruning shears (long handled)
- Fire rake

Mechanized Equipment
- Small garden tractor
- Bobcat (less than
- Morrison trail blazer 1.5m blades)

Heavy Duty Equipment
- Backhoe digger
- Caterpillar D-4 (2.7m blade)
- John Deere 450 (2.1 m blade)

Note

Extreme care should be taken if heavy duty equipment is being used, because the surrounding environment can be easily damaged through carelessness and the end trail product will not be as enjoyable to ski.

The key to minimizing trail construction costs and future maintenance problems lies with making sure the final trail route avoids any major physical problems that can cause trail erosion, or other trail use problems (ie: trail located in severe exposure or in dense coniferous forests, etc.)

Furthermore, as cutting and clearing the trial gets underway, should unforeseen problems arise, there should be a certain amount of flexibility to re-route the trail to avoid the problems or be prepared to put more effort into overcoming the problem.

TRAIL CREWS

To help speed the cutting process a well-organized trail crew using 3 - 5 people is advantageous, especially if these crews can be organized before reaching the site, making sure everyone understands their particular function.

A simple trail crew can be made up of the following people:

First person — Chain saw cutter goes through cutting out major fallen logs and trees that have previously been marked for felling.

TRAIL CLEARING TECHNIQUE

1. Mark all trees that are to be cut beforehand so the cutter doesn't cut unnecessary trees. Be conservative in the number of trees that should be felled.

   Note: Depending on trail location and other site factors some trees may be felled to fall across the trail, to discourage use by motorbikes or snowmobiles, especially at the trailhead.

2. Using a fire rake, polaski or similar tool, brush should be cut out by the roots to prevent further growth. As it is cut it should be cleared to the downhill side of the trail and packed to provide a more even surface especially if on a slope. Dirt thrown on top from uphill will root grass and stabilize any erosion. A slight cross-slope of 5 or 10 degress can make it difficult to use snowmobiles for tracksetting since they slip laterally. Try to ensure that the trail surface is fairly level, even if you are traversing a hill.

3. As you go along, ensure that all sharp projections to the side of the trail are cut off so a falling skier will not impale himself on cut branches or catch his ski in tree roots.

4. Sharp depressions should be filled or cut back to provide even contours. If there are channels for water run-off, try and find old culverts which can be placed in them before filling. This will prevent a washout each year.

5. Turns should be widened and slightly banked to assist the skier in turning, especially if going downhill.

6. If cutting the trail and the growing season has not finished, plant fescue or clover in the earth cut track sections to prevent erosion and to make it pleasant to hike and train on.

7. Try not to locate the trail under a thick cover of conifer trees as snow depth underneath may not be sufficient to pack a proper trail. If the trail must go through a conifer thicket trim some of the overhanging branches so that more snow will fall on the trail.

INCORRECT TRAIL CLEARING

- Narrow Trail
- No Banking on Curve
- Plant Material not Cleared
- Sharp Angles on Banks

CORRECT TRAIL CLEARING

- Widened Trail on Curve
- Well Banked
- Curve Cleared of Plant Material

CLEARING HEIGHT

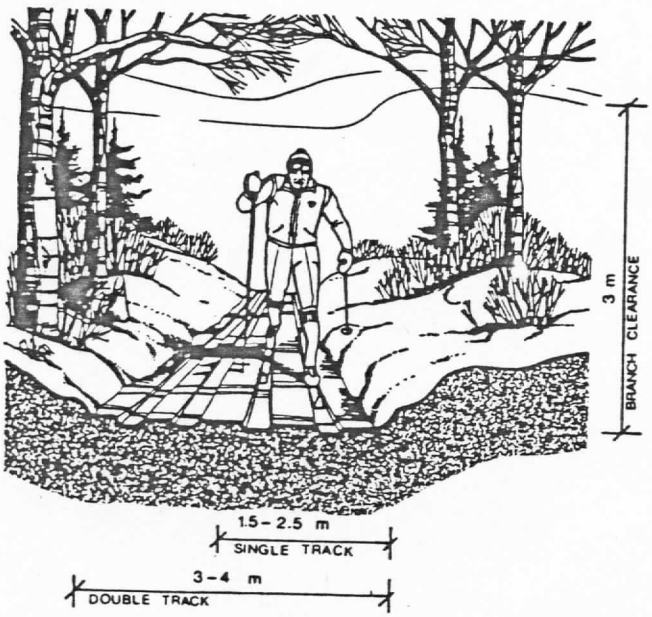
Brush and trees should be cut to a height of about 3 m keeping in mind average winter snow depth for the area through which the trail is being planned.

RIGHT-OF-WAY CLEARING

For single track trails, widths of 1.5 to 2.5 m are recommended. The narrowest width should only be used for minor trails.

For main trails, where intensive use is expected, there should be enough room for two or three sets of tracks. The maximum width for two tracks is 3 m and three tracks is 4 m.

CLEARANCE DISTANCES



If major events are being planned or a lot of use is anticipated, the first ¼ km of the trail system may be cleared to an even wider width to accommodate 5 - 10 skiers (at least 8 - 10 m wide).

Where grooming equipment is to be used, a minimum width of 2.5 m is required. This allows enough space for efficient operation and safeguards trees from being scraped by machinery.

On slopes, sufficient clearance should be allowed for the safety of falling skiers and to allow skiers room to herringbone or side-step up. This will also provide space for ascending skiers to step out of the way of downhill skiers. On slopes exceeding 10 percent, curves should be banked and left clear of trees in order to allow skiers to stop safely.

On long runs widened sections should be provided at intervals to allow skiers to control their speed by stopping or running off the trail.

OPERATIONS AND MAINTENANCE

Once a trail has been built what should be done before the first snow falls?

The key to the success of your trail system comes with a clear understanding and practice of maintenance and operation techniques. Someone from the community, ski-club or other organization that is developing the trails should appoint or designate a certain individual or individuals to be responsible for trail maintenance. Whether one person does it or a rotating group of people undertake it, it is imperative that pre-seasonal checks be made.

FALL MAINTENANCE

During the fall the trail should be walked in order to clear any deadfall or trees that may obstruct the trail during the ski season. As well, the trail should be checked out for water erosion and corrected by filling the problem areas with dirt or deadfall. Make sure the staging/parking area is ready for use. Make sure your sanitary facilities (whether it is a pit privy or a chemical self-contained unit) is ready for use.

Make sure all signs are in place.

SIGNING

Trail signs are essential to safety on the trail system and also help make it more interesting and more convenient. All public trails should be signposted with trail signs and markers that are officially approved for use in the area. The most important of these recommended signs are trail identification markers, trail blazer reassurance markers, and directional signs (Bombardier Ltd. 1972).

Remember, a well constructed and maintained trail is its own best marker. Over-marking of the trail constitutes a form of visual pollution, detracts from the trail setting, and is unnecessary. (Alberta Forest Service 1977).

Signs should be placed within the eye level zone, between 140 cm and 170 cm. On winter use trails, signs should be placed 140 cm to 170 cm above the average snow level. Signs should be placed on the edge of the trail clearing so they are readily noticeable. Signs could be placed on removable wooden stakes so as not to damage any trees.

Necessary signing information and locations should include:

a) Trail heads:

   1) Trail Type (ie: single access, linear or single loop trail) — trail name, length (total distance), degree of difficulty (elevation change, and maximum grade — optional).

   2) Multi-access, or multi-looped trails — require a map sign showing the layout of the trail, trail name or segment names, stream locations, lakes, high point, locations of facilities, and length of the various segments of trails. In addition elevation change, maximum grade, and rules and regulations should be posted.

b) Junctions — names of different trails joining as well as distances and signs identifying points of interest off the trail with distances to them.

c) Direction of trail in areas where the user may get lost (particularly where fresh snow may obliterate the trail).

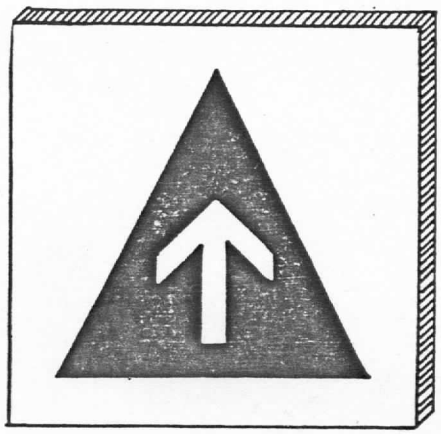
d) Warning of special hazards.

e) Location of water sources if scarce.

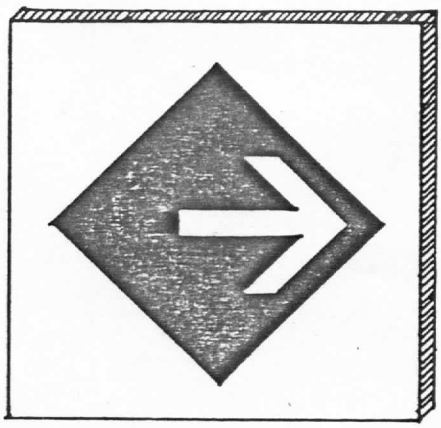
Note:

At the trail head be sure to have a sign that states your trail is a cross-country trail. Place some rules and regulations pertaining to ski-use of that trail. Try to avoid putting up NO SNOWMOBILES as psychologically this will only encourage certain snowmobilers to run over your track. Perhaps a separate snowmobile trail with separate signing for that activity is possible in conjunction with the cross-country trail. (Refer to section on Additional Factors for information on controlling snowmobile use).

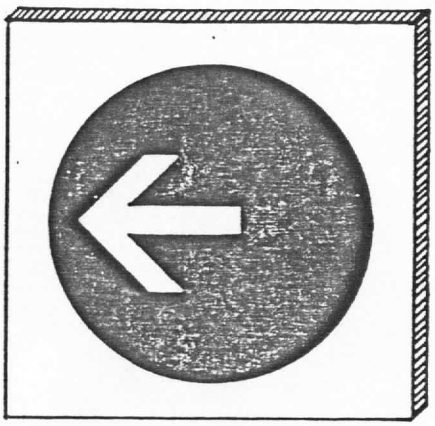
Signs can be made locally using simple designs as illustrated here, or they can be obtained from certain distributors or agencies. Sometimes the breweries distribute small styrofoam directional signs as part of their winter promotion program. Getting in touch with the Provincial or National Ski Association may also identify sources for signs.



ADVANCED
RED



INTERMEDIATE
BLUE



EASY
GREEN

SIGNAGE

WINTER TRACK SETTING

For good skiing, whether touring or racing, a set of ski tracks increase the pleasure to be had through this sport. The following points should be considered before setting a ski track:

1) At first snowfall begin by running over the trail route with a packing machine to pack down the snow. This may take 2 or 3 runs to pack the snow sufficiently for track-setting.

2) Once the snow is packed go over the route again using a track-setter. Depending on snow conditions this might also have to be repeated 2 or 3 times in order to get a firm track established.

3) Snow has the peculiarity of, when being disturbed, combining together and forming a more solid mass after a period of 24 hours. This fact is utilized by setting tracks at least a day ahead of when they are to be used so the skis can run in firm tracks and the poles do not sink into the snow. (Buss 1972).

4) Where possible on a trail, a pair of tracks should be set. This allows for the slower skier to step aside into the second set which gives him good directional skiing while the faster skier travels on without a break in stride. However, on hill corners skiers will invariably take the flattest turn. The tracks should be set so they come into the corner high on the outside and cut low to the inside. On slow, less tight turns parallel sets of tracks can still be used. On sharp steep corners no tracks should be set.

ALLOW TRACKS ON MODERATE SLOPES TO COME HIGH ON THE OUTSIDE AND CUT LOW TO THE INSIDE.

DO NOT SET TRACKS ON SHARP STEEP CORNERS.

5) As the snow builds up during the winter, twigs and branches which could not be reached in the fall could well be brushing the taller skiers' faces. A check around the course with saw and pruners will eliminate these painful objects.

6) The ski trail is not packed again until the tracks are really well worn and no longer hold the skis. A heavy snowfall makes poling too hard and obliterates the track therefore requiring track setting.

7) The snow on either side of the ski track must be well packed so that the poles can be planted firmly without giving way.

Note:

To ensure that a good ski track is developed and to ensure that it remains for a long time (sometimes long into the spring) **regular** track setting procedures should be followed. The key is to start **packing** a trail with the first adequate snowfall and to continue packing that ski trail on a regular basis.

If the course gets too icy, obtain a cutter to lift up the icy sections and re-shape it with fine crushed snow. Ultimately the track itself should be quite firm with a thin covering of loose/powdered snow on top for grip.

To know when to pack and when not to pack is a problem. When it is very mild, packing can cause squeezing of water to the surface, thereby creating ice. Thoroughly wet snow should be allowed to freeze and dry up a little before packing and track setting.

After a thaw, hand shovelling is sometimes necessary to fill wash outs and drifts should either be broken down by cross-checking or shovelling. Snow will not freeze until it has been disturbed, so all major movement of snow or trail changes has to be done well in advance of the day the trail is being skied.

Mechanical grooming or any disturbing of snow should not be carried out with immediate anticipation of freezing rain. The cushion of snow mixed with crust can then be broken up and mixed together to create passable skiing immediately following such a storm. Turns in trails should be sweeping curves, if possible, to accommodate the turning radius of grooming machines. Short hummocks or hollows should be filled with short logs to remove wash board effect from the trail and also permit undersnow drainage.

On steep slopes going into curves **don't** set any tracks in the curve itself. This allows the unsure skier a chance to snowplow or side-step through without any problems.

TRACK SETTERS

There are a number of different track setting machines and equipment available today that greatly advance the art of establishing a **good** ski-track.

The equipment ranges from self-contained, self-powered BOMBARDIER BOMB/SNOW MACHINES that do everything including packing the trail, cutting ice, setting the ski-track, and fluffing up the snow; to simple hand-made tracksetters that are pulled/dragged behind a snowmobile (see diagrams and photos).

Basically a track setter is very much like a heavy sled, with a fixed hitch that is dragged behind a snowmobile. Protruding through the bottom of the track setter are two plates which cut tracks the width of each ski and six inches apart on the inside edges.

There are some deluxe versions of these drag units such as the BOCHLER track-setter (in operation in Jasper National Park) which also cuts through ice, fluffs up the snow and resets a firm track. However, it is expensive and perhaps a custom design could be made locally for much less.