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AN ROS BASED INVENTORY METHODOLOGY FOR
NORDIC SKIING OPPORTUNITIES

By

Richard M. Vander Voet

A.B., Colgate University, 1982

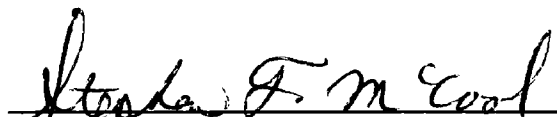
Presented in partial fulfillment of the requirements

for the degree of

Master of Science

1987

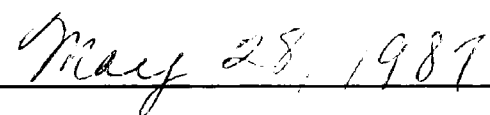
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Preface

A healthy man, indeed, is the complement of the seasons, and in winter, summer is in his heart.

from H.D. Thoreau, "A Winter Walk"

I imagine that some people will think, "This guy got a Masters degree for spending a winter on skinny skis?" Well I readily admit that this project began with grand visions of research by participation. Unfortunately, and contrary to popular opinion, I spent most of the winter behind a desk.

I hope that this disclaimer will not discourage other researchers from examining nordic skiing. Nordic or cross-country skiing is certainly a neglected subject in wildland recreation management. Winter is no longer an indoor season, even in Montana. Every winter, the number of cross-country skiers increases. Many of these skiers look to the public lands for high quality skiing opportunities. Public land managers are responsible for serving these people with summer in their hearts.

My heartfelt thanks go to many nordic skiers in the Flathead Valley. The people listed in Appendix A took the time to answer questions, thereby providing information which was critical to this project. I would also like to thank all the people at the Hungry Horse Ranger District for their genuine interest in the project. Among these, Resource Forester Fred Flint deserves special mention. Over the winter, large piles of paper and a grumpy graduate student occupied his office.

Final thanks go to the remaining members of my graduate committee: Steve McCool, Bob Ream, Lloyd Reesman and Tom Roy. They served with patience when I finally did get the chance to do some skiing.

Chapter 1

INTRODUCTION

1.1. The Current State of Nordic Skiing

Cross-country or nordic skiing remains one of the fastest growing recreation activities in the United States. National surveys conducted in 1977, 1978 and 1979 identified a boom in cross-country skiing as well as the potential for continued growth into the 1980's (Newby and Lilley 1980, Stynes 1980). In Montana, a 1985 survey of state residents showed a significant increase in cross-country skiing participation from 1979 levels (Frost and McCool Forthcoming). Like the earlier national surveys, the Montana study indicated that growth in this activity will continue. The authors suggest that about seventeen percent of Montana adults will participate in cross-country skiing in the year 2000.

Recreation area managers can certainly support these national and regional trends. For example, the Wood River - Sawtooth Valley in Idaho experienced a twenty-nine percent increase in nordic skiing visits from the 1978-79 winter to the 1984-85 winter (Britton 1985). In Glacier National Park, cross-country skiers were the only group of visitors which increased in number from 1984 to 1985, by eleven percent (Hungry Horse News 1986). However, an obvious growth trend is only one aspect of change in nordic skiing.

A rapid change in technology is underway in nordic skiing. Today wood

skies are all but antiques. In fact, nordic skis, boots, bindings and poles become more specialized and sophisticated every season. Equipment development is not limited to racing as backcountry skiers can also choose stiffer boots, stronger bindings, and a wide variety of metal edge skis; not to mention winter camping and avalanche safety equipment (Montana Nordic 1985). For those who prefer machine made tracks, high technology grooming equipment has replaced the snowmobile trailing a homemade sled. Destination nordic ski areas now offer trails which were designed specifically for track skiing and daily machine grooming.

Oftentimes a high quality groomed trail means more than a nice set of double tracks. Today the skating technique threatens to replace the traditional diagonal stride. Thus, some nordic areas now set a smooth, wide, "trackless" track for the skaters. Yet to learn the proper nordic skiing technique, the neophyte may still begin with the diagonal stride in machine made, parallel tracks. Skating or striding, teachers and lessons abound. The days of self-taught skiing appear to be gone. The friendly old invitation, "If you can walk you can cross-country ski," was recently characterized as "the most fraudulent claim ever made about cross-country skiing" (Allan 1980). More advanced skiers can challenge their abilities by skating faster and farther. Alternatively, the brave and advanced can undertake guided adventure tours, helicopter nordic, or extreme telemark turns on their own. Many cross-country skiers still look for a nice saunter in the great outdoors. However, few will deny that the sport is changing.

Indeed one might question whether these various styles of nordic skiing constitute a single, definable sport. Traditionally, free heel skiing defined the

nordic competitive events of biathlon, ski jumping and cross-country racing. These styles of skiing are associated with the Scandinavian countries, thus the "nordic" adjective. In contrast, "alpine" skiing employs fixed heel equipment and is associated with the steep mountains found in the Alps. Alpine events include the familiar slalom, giant slalom and downhill. Americans tend to simplify the distinction by speaking in terms of downhill versus cross-country skiing.

In recent years the line between alpine and nordic skiing has blurred, especially in the U.S. Some people now "norpine" or "three-pin". In other words, they ride up the chair-lifts, but go down the ski runs on nordic or free heel equipment. The most popular and elegant method for accomplishing this feat is the telemark turn. Others trudge uphill on releasable alpine style bindings. These mountaineering forays can be called "alpine touring" (Alpine Research Inc. 1986). In any case, the many nordic-alpine combinations make for a myriad of rather loose definitions.

One purpose of this paper is to standardize the description of various nordic skiing opportunities. For now, nordic, or as a synonym, cross-country skiing will be defined primarily by location. That is skiing which occurs outside of alpine ski areas (Vail, Big Mountain, etc.), and where travel is by skis and muscle power only. In effect this means at least free heel capability. Chair lift and helicopter telemarkers are not included. However, one can catch a helicopter ride to begin a hut to hut nordic ski trip. This definition will allow a further narrowing of focus in a recreation management context. Telemarking and ski mountaineering become different styles of nordic skiing which are related to the more traditional, but also

rapidly changing ten kilometer race.

Therefore, as befits a booming recreational activity, rapid changes in nordic skiing technique parallel rapid changes in technology. The private sector is of course on the forefront of this change. Businesses offer for a price what the nordic customer demands in terms of equipment, groomed track (A trail pass costs \$8.00 per day at Royal Gorge California !), lodging, backcountry accommodations, guiding and instruction. Public land managers, however, have been accused of ignorance concerning the boom in nordic skiing. Some critics view agencies like the Forest Service as unprepared to serve this growing segment of the recreating public (Shimek 1985).

1.2. Problem Statement

A large amount of nordic skiing takes place on the National Forests. In 1983, Region 1 of the U.S. Forest reported 153,000 recreation visitor days¹(Bowles 1984). On a national basis, the Forest Service administers approximately 200 commercial permits which in some way involve cross-country skiing (Ski Industries America 1985). As mentioned above, these numbers are likely to grow. The Forest Service is, and will continue to be, a significant supplier of nordic skiing opportunities. However, numbers say little about how well nordic skiing is managed on the public's land.

¹A recreation visitor day is one person skiing for twelve hours, or twelve people skiing for one hour, or any combination thereof. Region 1 contains Montana, portions of Northern Idaho and Western South Dakota. On a Regional basis, annual RVD's represent an aggregate best guess. This figure also includes a negligible amount of snowshoeing.

Critics like Shimek point to a general lack of agency knowledge concerning the new cross-country skiing. In many cases this results in poor relations with private groups who are trying to develop or promote nordic skiing. Overall, a lack of knowledge means that public land managers can not be effective in meeting the needs of nordic skiers.

The quality of nordic recreation management is also affected by a lack of emphasis. While recreation represents an important part of the Forest Service's land management mission, winter recreation other than alpine skiing has historically not received much attention. The Forest Service does have a functional recreation program based on research and management experience. Certain National Forests have even become acknowledged leaders in managing other rapidly growing recreation opportunities. Alpine skiing, backpacking, and white water boating eventually attracted increased management and research attention. Nordic skiing will be no different.

But at the present time, public land managers simply do not have the tools necessary for integrating nordic skiing into a recreation program. Several National Parks recently discovered that they have significant winter recreation problems including overuse, recreation-wildlife conflicts, and conflicts between users (Whitney 1985). The occurrence of these problems is not surprising. Neither is the lack of applicable recreation management tools for input to problem solving. Both managers and researchers are just now learning about the increasing numbers of new and different cross-country skiers. In fact, there is a dearth of recreation management literature which specifically concerns nordic skiing. Thus

the need for basic research such as the effort described here.

The research problem addressed in this paper is: How can the nordic skiing recreation resource be described and inventoried ? One of the initial steps in managing any recreation resource should be an inventory of opportunities. The premise being that a resource can not be effectively managed until the appropriate basic information about that resource has been collected and made available to the manager. Currently, no such inventory methodology exists for nordic skiing. Therefore, the inventory methodology developed here breaks new ground in the discipline of recreation management. In addition, the inventory methodology is tested, and the results reported. The inventory and the analysis of its results are based on a social-psychological framework for recreation management already in use. Thus this inventory project will not only help fill an existing literature gap in recreation management, but also help the Forest Service meet the needs of the nordic skiing public.

Chapter 2

NORDIC SKIING AS RECREATION BEHAVIOR

2.1. Conceptual Framework for Describing Recreation Opportunities

Recreation researchers and managers have developed a behaviorally based framework for talking about the interaction between recreationists and the environment. This conceptual framework centers on the recreation experience rather than a simple recreation activity like hiking or nordic skiing. The most established version of the framework depicts the opportunity for a recreation experience as a product. Thus recreation managers produce and supply units of experience opportunities.

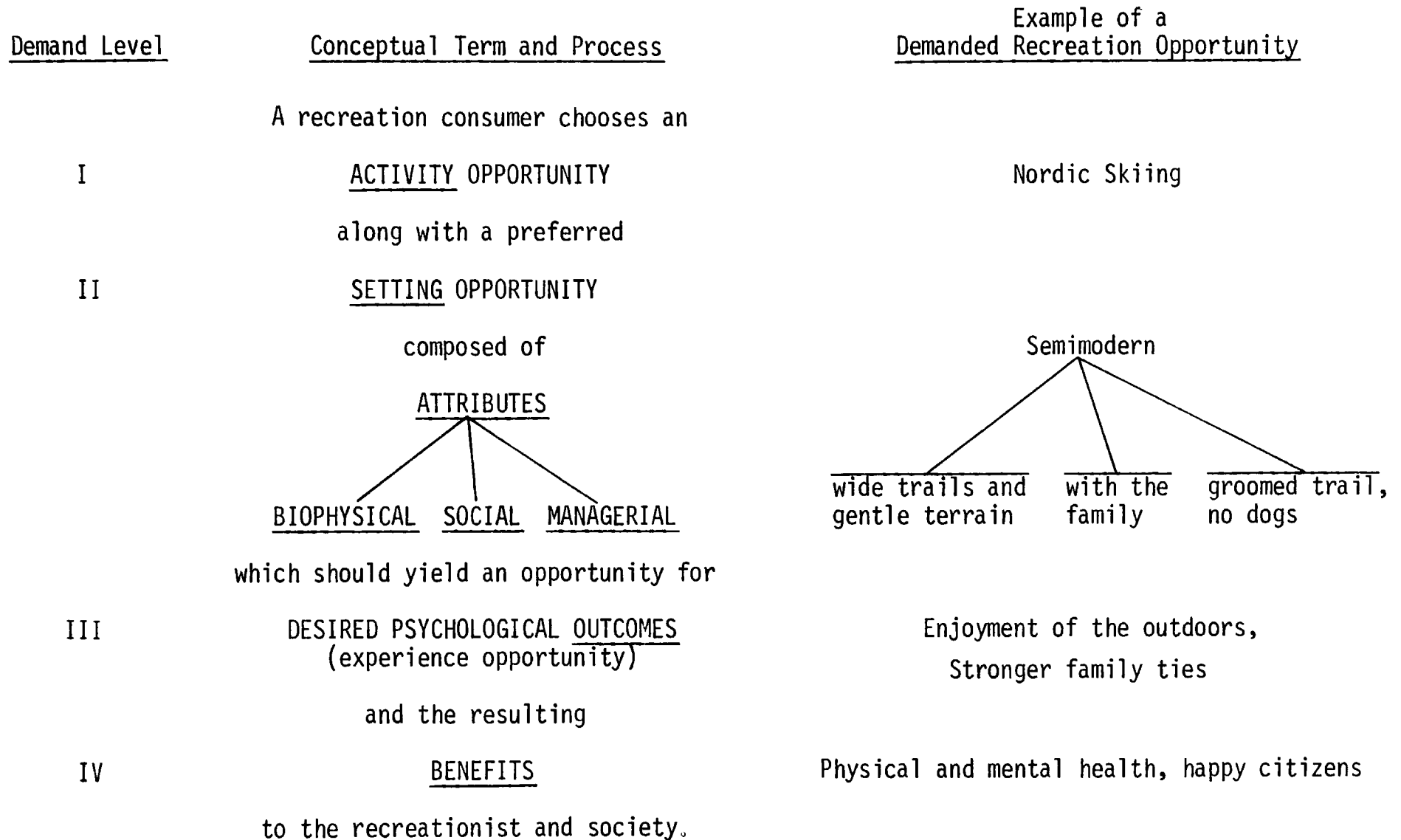
Likewise, recreation consumers can be said to demand opportunities for experiences. In what has become a classic article in leisure behavior research, Driver and Brown (1978) articulated the recreation opportunity demand hierarchy. The demand hierarchy modeled a generalized recreation experience as a social-psychological process. Driver and Brown asserted that recreationists choose a recreation opportunity not only by activity, but also by weighing alternative environmental settings. Thus, a person chooses to cross-country ski at a particular place. The combination of an activity with a setting results in psychological outcomes. In this way, a recreationist "demands" psychological outcomes which vary for a particular activity as the setting varies.

The most highly valued psychological outcomes are referred to as experience opportunities. If recreationists experience these desired outcomes, then they gain satisfaction from a recreation opportunity. This satisfaction leads to personal and social benefits such as physical and mental health, enhanced work performance, or commitment to conservation efforts. Driver and Brown depict this framework in four hierarchical levels because recreation consumers are most aware of their demand for activities and least aware of their synchronous demand for benefits. Figure 2-1 shows the entire demand hierarchy.

This inventory project deals with demand levels I and II. As such, the classification of setting opportunities ("semimodern" Figure 2-1) will be addressed in a later section. For the present, please note that three types of attribute define a setting. Biophysical, social and managerial attributes constitute a logical taxonomy for describing an environmental setting. For example, part of a recreationist's mental calculus for choosing a nordic skiing opportunity might be the desire for social setting attributes such as; seeing a few other small groups nordic skiing, but no snowmobilers. Important biophysical attributes might include snow conditions, vegetation, terrain and wildlife.

Managerial actions can affect both biophysical and social conditions. For example, nordic skiers may value setting opportunities characterized by regularly groomed ski trails and enforcement of regulations which prohibit unsocial behavior. Both of these managerial attributes are results of intentional actions. However, managerial attributes also include inadvertent changes in the environment brought about by management activity.

Figure 2-1: Recreation Opportunity Demand Hierarchy



Each recreationist will have an individual perception and valuing process for setting attributes. Thus the three types of attributes are not intended to be mutually exclusive categories. Nonetheless, researchers have surveyed nordic skiers to identify preferred setting and experience opportunities (Ballman 1980, Hass et al. 1980, McLaughlin and Paradice 1980, Rosenthal et al. 1980).

I have paraphrased Driver and Brown's model with the intent of defining terms and showing the basis for managing recreation experiences rather than activities. It should be pointed out, however, that the framework is probabilistic, not deterministic (McCool et al. 1985). Much recreation research has focused on the questionable linkages between the upper levels of the hierarchy. In fact, several new models for recreation choice behavior are being developed (see entire proceedings McCool et al. 1985, and Mackay Forthcoming). Such questions are well beyond the scope of this paper. Yet, there is great intuitive appeal to the notion that recreation ultimately produces individual and social benefits. In a sense, this framework lends some social justification to recreation managers who try to provide the experience opportunities demanded by the public.

2.2. ROS – The Demand Supply Nexus

The recreation opportunity spectrum (ROS) will be used here to focus on the supply of recreation opportunities. Driver and Brown (1978) were also the first to formally name the ROS concept in the same classic article. A companion article proposed methods for using the ROS concept in recreation inventories and planning (Brown et al. 1978). However, a latter paper by Clark and Stankey (1979)

provides a more developed dissertation on ROS. Clark and Stankey built upon the behaviorally based concept of opportunity demand to construct a system for recreation inventory, planning and management.

Essentially, ROS characterizes the diverse range of recreation opportunities which people use for recreation experiences. The spectrum refers to a continuum of opportunities between two poles. Figure 2-2 illustrates a hypothetical display of nordic skiing opportunities which are arrayed along a grooming spectrum. Clark and Stankey use six factors to define their ROS (Figure 2-3):

1. Access
2. Other nonrecreational resource uses
3. Onsite management
4. Social interactions
5. Acceptability of visitor impacts
6. Acceptable level of regimentation

Notice that all six factors can be interpreted in terms of setting attributes. As the attributes and settings they define vary along a continuum, so may the recreation experience vary across the spectrum of opportunities.

Figure 2-2: Hypothetical Grooming Spectrum

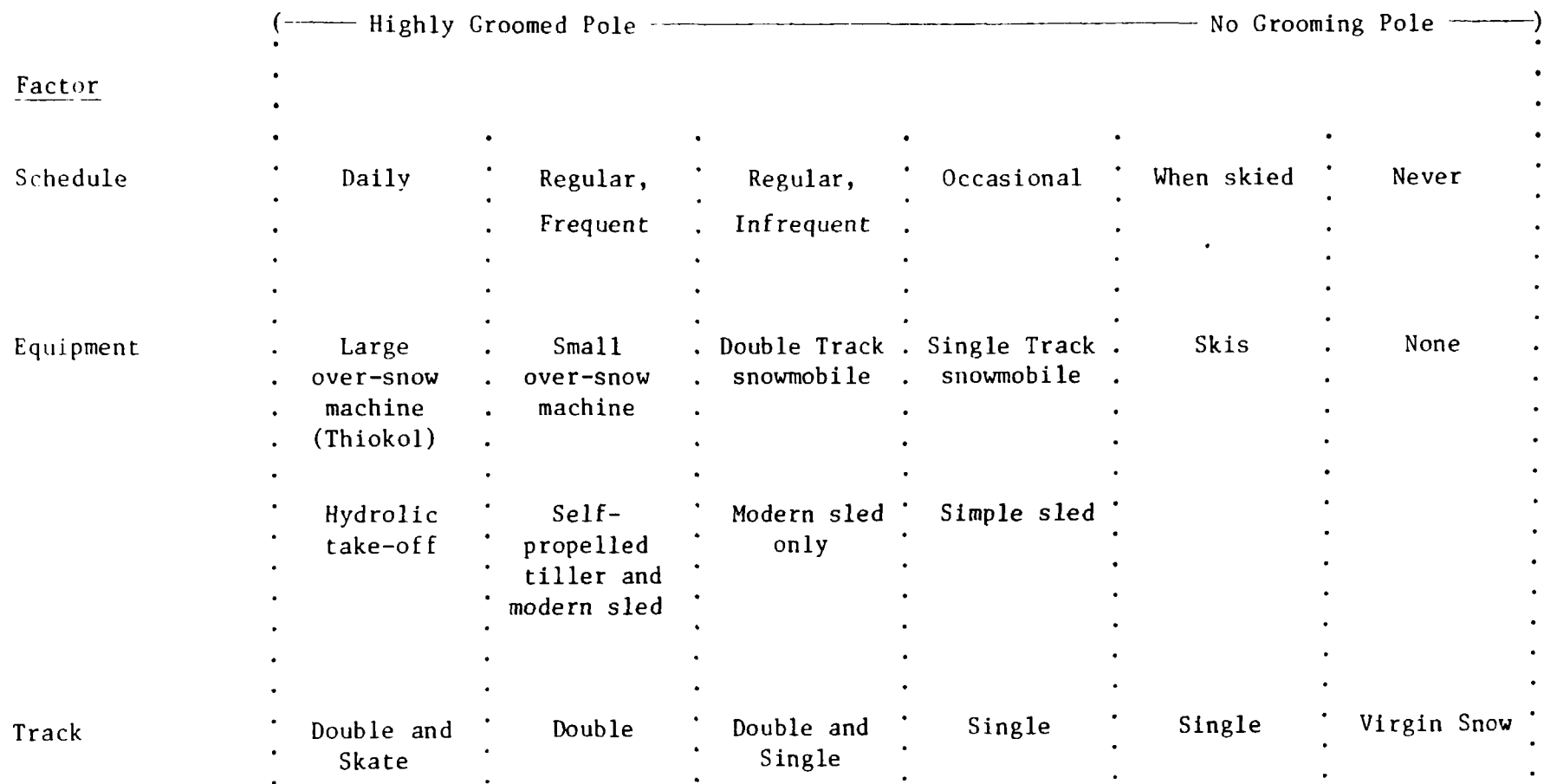
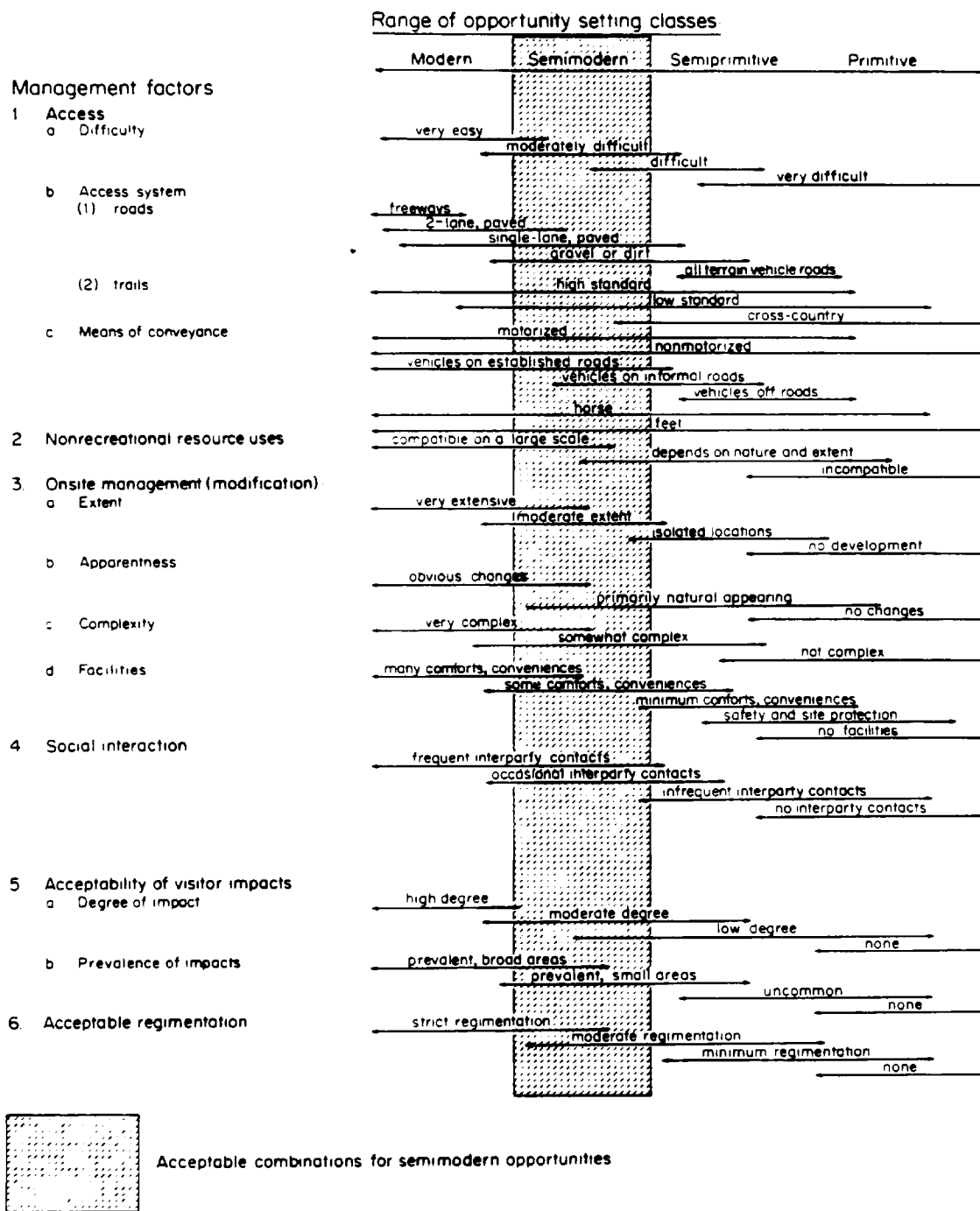


Figure 2-3: Factors Defining Outdoor Recreation Opportunity Settings



Thus a manager can classify sites or larger land areas according to the type of recreation experience likely to result from the combination of setting and activities. Figure 2.3 represents a general spectrum applicable to any land area and many recreation activities. Figure 2.2 is activity specific and limited to existing or planned nordic skiing sites. But both spectrums exemplify a major principle explicit in ROS. To quote Clark and Stankey, “. . . quality in outdoor recreation is best assured through provision of a diverse set of opportunities.” In other words, providing diversity is the best way of trying to keep every recreationist happy.

Obviously, a given land manager may not be able to provide an entire spectrum of opportunities. However, conducting an opportunity supply inventory will at least tell the manager what is currently provided. The traditional inventory approach is to map established ROS opportunity classes and then add up the acres of each class (USDA Forest Service No Date). Managers can then continue to use ROS in several ways which depend on specific goals and objectives.

If the traditional opportunity classes are too broad, the manager may wish to subdivide an opportunity class into a finer continuum (Stankey et al. 1985). Alternatively, a wider scope may be called for. A regional planning area inventory would show the opportunities provided by a variety of government agencies and the private sector, thus helping to define the appropriate role of each supplier. Yet another application is analyzing the effects of multiple use on the amount, type and distribution of recreation opportunities. Finally, an inventory will yield information about setting attributes which recreationists can use to find specific opportunities.

Both the USDA Forest Service and Bureau of Land Management use an ROS system for inventory, planning and management (Buist and Hoots 1982). However, nordic skiing has yet to be adequately integrated into public land recreation management, let alone into an ROS system. A recent bibliography of ROS oriented literature listed only one article out of the eighty-two total which dealt specifically with nordic skiing (Stankey et al. 1986). An ROS based opportunity supply inventory is a logical first step toward integrating nordic skiing into recreation planning and management.

2.3. ROS, General Inventory Problems and the Case of Nordic Skiing

ROS as a concept can be separated from ROS as a management tool with various integrated applications. The concern here is not with the concept of a continuum of opportunities, but rather with the traditional application of the ROS concept in recreation supply inventories. On a general level, there are several problems with ROS based supply inventories. Narrowing the focus to nordic skiing creates additional difficulties. However, the ROS framework allows for flexibility in application as well as for improved methodology based on experience (Clark 1982). In addition, basing an inventory on the existing ROS concept should appeal to managers who are already familiar with its application.

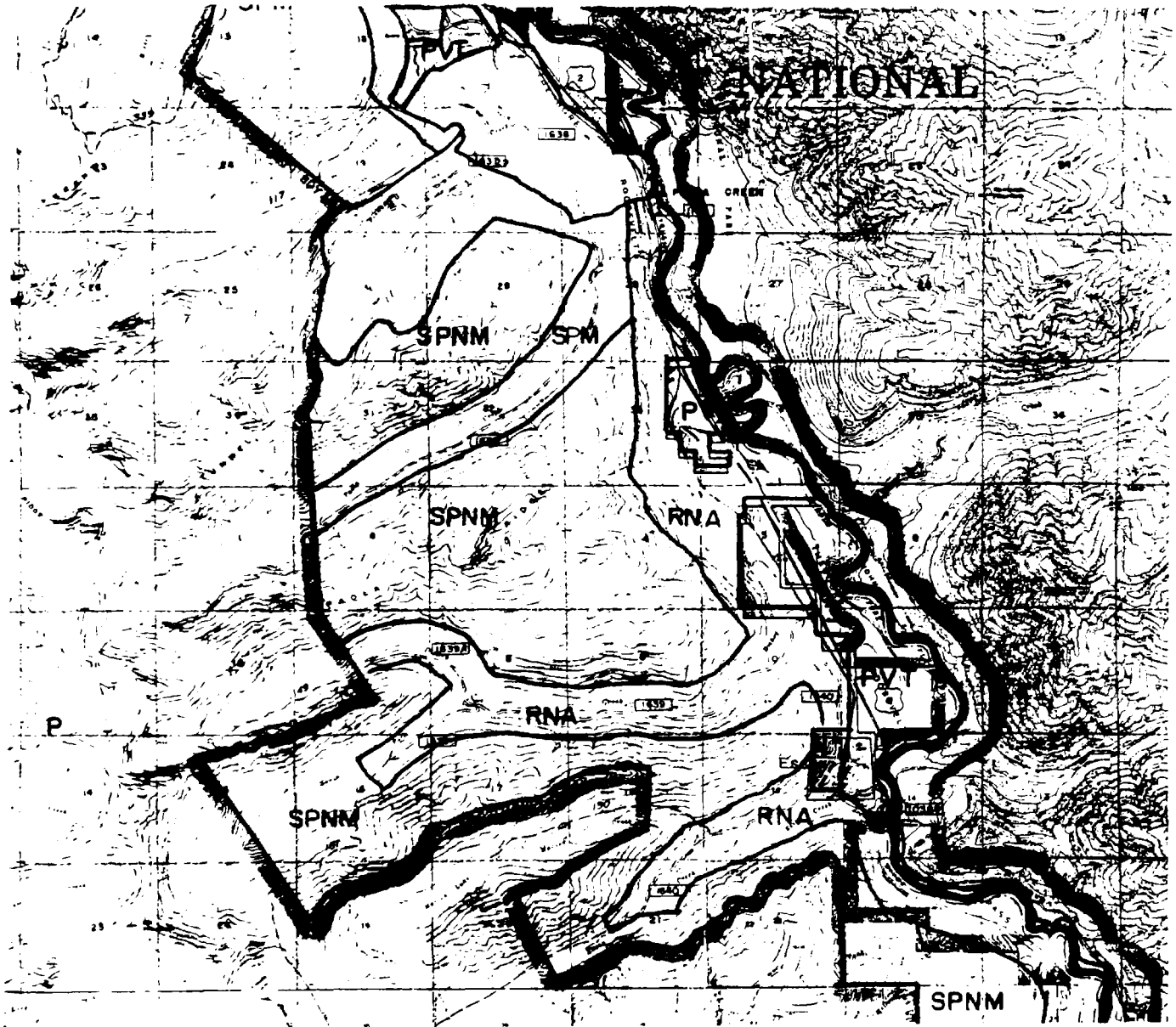
The Forest Service has made extensive use of ROS in their national planning effort. An ROS Users Guide (USDA Forest Service No Date), standardizes inventory input to the land and management planning required by the Forest and Rangeland Renewable Resource Planning Act of 1974 as amended by the National Forest

Management Act of 1976. For the most part, the Guide follows Brown et al.'s (1978) system by classifying land into six types of probable recreation opportunity (Figure 2-4). The Guide's standardized inventory process allows Forest to Region to National aggregation of land classification and further application for planning or management as described above. For example, Figure 2-5 shows a visitor information sheet for a nordic skiing opportunity within the roaded natural opportunity classification.

The Guide and its application of ROS have provided an adequate inventory tool for this broad level of planning and management. Most Forests have completed such a recreation opportunity inventory. Figure 2-4 also shows part of a topographic map with several ROS classes delineated. Mapping is the standard method of displaying and storing ROS inventory data. But despite wide acceptance and use within the agency, the Forest Service's version of an ROS inventory has a few problems. Among these is the mapping technique.

Mapping is valuable for analyzing location, distribution, access, and acreage of opportunities. However, the attribute information which led to lines on an ROS map is often unavailable. If available, this information will be in the form of a map overlay. Other important attributes may not lend themselves to mapping. These include some attributes which may be important to nordic skiers. Thus to produce a visitor information sheet like Figure 2-5, a person would have to perform, in a sense, another inventory. A second examination of sites within a mapped opportunity class seems at the least inefficient.

Figure 2-4: Mapped ROS Classes



Recreation Opportunity Spectrum					
Primitive	Semi-Primitive Non-Motorized	Semi-Primitive Motorized	Roaded Natural	Rural	Urban

Cross-Country Skiing



United States
Department of
Agriculture
Forest Service

Superior National Forest
LaCroix Ranger District
Cook, Minnesota
(218) 666-5251

BIRD LAKE TRAIL

RECREATION OPPORTUNITY CLASS

Roaded Natural

LOCATION

The Bird Lake Trail runs from the east end of Hoyt Lakes approximately 5 miles south-east to Bird Lake.

ACCESS

There are two parking areas. One on the east end of Hoyt Lakes and the other at Bird Lake off of County Road #569.

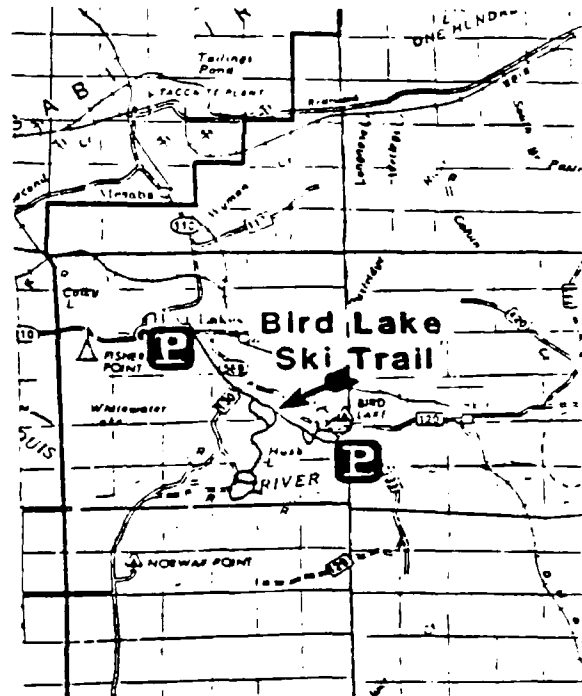
FACILITIES/ATTRACTIONS

This trail system contains 18 miles of groomed trail. The trail crosses other travelways which may be skied, but are not groomed.

County Roads #565 and #569 are plowed regularly during the winter. Forest Roads #130, #128 and #790 are not plowed unless they are being used by loggers involved in nearby winter logging operations.

The trail winds and meanders through typical, beautiful, Minnesota northwoods country. It traverses both upland and lowland, passes through dense stands of black spruce, climbs and descends hills of aspen and birch and forges across flat, open bogs.

The Bird Lake loop offers a challenge to more experienced skiers, whereas the St. Louis



River loop provides a nice flat course for beginners or racers. Birch Run is a particularly pretty stretch of trail, and Hush Lake is noteworthy as it features the only portion of trail in the system that crosses a body of water.

A Special Note:

Motorized vehicles of any kind are prohibited (except for grooming and administrative use). There is good reason for this rule. Snowmobiles will ruin a ski trail track and disrupt skiers' use of the trail. Wheeled vehicles, when driven on the trail during the snow-free season, will damage the trail

In addition to classification by mapping, McCool (1983) raises some other problems with the traditional application of ROS. Of these, this project investigates the potential overemphasis of development as a characteristic of recreation opportunities. However, the intent is to create a workable, nordic skiing opportunity inventory and not a comprehensive critique of ROS. Indeed, the current applications of ROS were not designed to address the problems of managing experiences for a single activity. Such a critique would be inappropriate. I do intend to retain the benefits of using the ROS concept in designing an inventory specifically aimed at nordic skiing. Instead of using an ROS model which includes a wide range of setting choices for many types of activities, the model developed here applies to multiple styles of a single activity. A wide range of setting and experience opportunities still exist within this context.

Chapter 3

DEVELOPING THE INVENTORY

3.1. Process Overview

The development of an inventory methodology represents the largest part of the work associated with this project. Creating a new process is far more difficult than adopting, modifying or replicating an existing standard procedure. To the best of my knowledge, nobody has published a method for inventory of nordic skiing opportunities. Therefore, this project can be viewed as a first attempt. Future research will build upon and thereby improve what is presented here.

There are two basic questions that this inventory was designed to answer. First, what is the current supply of nordic skiing opportunities in a study area ? Second, how can these opportunities be described in a classification system which is useful to recreation managers and researchers ? Of course, the ultimate purpose of the inventory and subsequent classification process is to provide land managers with a much needed tool.

In this case, the land managers are responsible for the Hungry Horse Ranger District of the Flathead National Forest. The Hungry Horse Ranger District served as the focus of the study because they initiated and funded this project. However, the Hungry Horse District does not provide nordic skiing opportunities in a market vacuum. The District's recreation managers must take into account the

opportunities provided by the private sector, County, State, Glacier National Park, and the rest of the Flathead National Forest. These suppliers also provide nordic opportunities for the skiers who recreate on the District. Flathead County was therefore used as a convenient and logical study area for the Hungry Horse Ranger District (Figure 3-1).

The next step was to identify nordic skiing sites within the County wide study area. A list of popular sites and those with groomed trails was compiled from various brochures and local publications describing opportunities in the area, a brief descriptive inventory put together by Elliot and Associates (1985), and personal nordic skiing experience in the area. Undeveloped, primitive or backcountry sites are almost unlimited in the County and were therefore addressed less extensively. Nonetheless, a variety of undeveloped sites was sampled on the Hungry Horse District for the purpose of opportunity classification. By definition, a variety of opportunities was needed for constructing a complete nordic skiing opportunity spectrum.

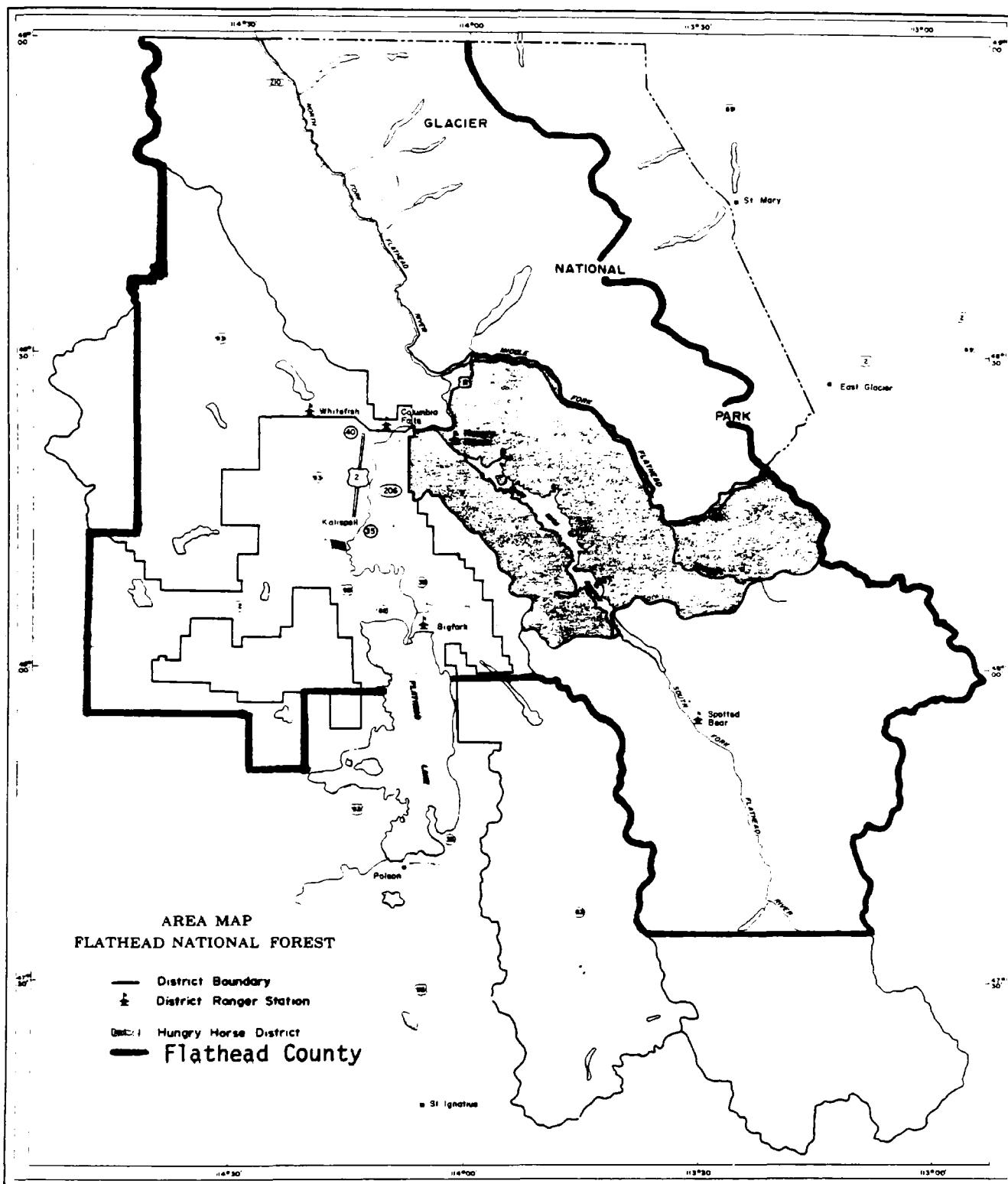


Figure 3-1: Map of the Study Area

The first real challenge came in deciding which setting attributes the inventory should measure. At the level of a recreation site, no formal methodology exists for identifying important attributes (Clark 1986). The following section describes the heuristic process used for selecting inventory attributes. Attribute selection was based in part on the concurrent development of a nordic skiing opportunity spectrum. Measurement of the selected attributes was an iterative process which required testing and revision of both an inventory form and a nordic skiing opportunity spectrum.

As a first attempt, this inventory concentrates on attributes which are important and present instead of how much of a particular factor is at a particular site. The level of resolution is more qualitative than quantitative. This research is therefore more akin to the ecological, grounded inquiry approach (Downing and Clark 1985) than the systematic and often quantitative inventory methods described by Brown et al. (1978) and McCool (1983).

3.2. Defining and Selecting Attributes for the Inventory

Given Driver and Brown's (1978) framework, a logical way to start defining attributes would be to survey nordic skiers. A survey might reveal the setting attributes sought by nordic skiers and the resulting experiences they demand. The inventory of opportunities could then be based on objectively determined, user defined attributes.

Unfortunately, surveys are expensive and time consuming. Moreover, the ubiquitous use of visitor surveys for examining many recreation management

problems is a questionable research practice (Clark 1977). Existing nordic skiing survey data is at least seven years old (Ballman 1980, Hass et al. 1980, McLaughlin and Paradise 1980). This data predates many of the recent changes in nordic skiing. In addition, these surveys are from widely scattered geographic areas and for specific locations. Therefore, results from these surveys have only limited value for generalization to Northwest Montana.

Nonetheless, the attributes which were defined and measured in these earlier studies provide a list of potential attributes with some basis in the technical, academic literature. This list was supplemented with attributes derived from popular literature², personal nordic skiing experience and a large number of unstructured interviews with a wide variety of nordic skiers (see Appendix A). Table 3-1 shows this extensive list of site attributes. Some attributes are, synonyms, mentioned in more than one category, subdivisions, or related in other ways.

The problem now was to reduce the list to a workable size for inventory purposes. A complete census of every possible attribute would make for an unappealing, impractical research instrument and management tool. Thus several evaluative criteria were applied to the list.

²Popular literature includes equipment catalogs, advertising circulars (e.g. Montana Nordic 1986), tourist oriented brochures, guide books and magazines like Sierra, Cross Country Skier, Outside, Summit, etc. Among these, the Ramar 86 catalog (Alpine Research Inc. 1986) makes an interesting point. Paul Ramar believes that catalogs can play an important role in changing people's lifestyles. As an example, he cites the historical influence of the turn of the century Sears catalog in, "the technical advancement of society for millions of rural Americans." Ramar's catalog includes a substantial communication section which describes the cutting edge of backcountry skiing experiences.

Table 3-1: Potential Inventory Attributes

<u>Managerial</u>	<u>Biophysical</u>	<u>Social</u>
(Ballman 1980)		
-trail length	-seeing wildlife	-encountering crowds
-trail difficulty	-no man made developments	-encountering few people
-trail configuration	-powerlines	-encountering nobody else
-moderately steep hills	-residential developments	
-trails requiring a high degree of skill	-sounds of autos	
-downhill runs with curves at the bottom	-wooded areas	
-pocket trail maps	-open areas	
-trail route signs	-distance from home	
-distance and difficulty signs	-remote, hard to reach area	
-warming houses	-breaking trail through unbroken snow	
-rest stops	-trails tracked only by other skiers	
-warning signs before steep hills and junctions		
-ski patrol on trails		
-developed overnight facilities		
-primitive winter camping facilities		
(McLaughlin and Paradise 1980)		
-heated shelters at the parking area	-presence of public cabins	-solitude (not seeing many other people except those in your party)
-more parking	-presence of private cabins	-little evidence of previous visitors
-more publicity for area	-presence of logging activities	-seeing an individual involved in non-motorized recreation
-a snack bar	-clear sunny weather	-seeing individual involved in motorized recreation
-more groomed trails	-complete silence	
-better trail guides	-seeing wildlife	
-a supply of maps	-scenic overlooks	
	-dry, cold snow conditions	

Table 3-1: Potential Inventory Attributes (Cont.)

<u>Managerial</u>	<u>Biophysical</u>	<u>Social</u>
<ul style="list-style-type: none"> -hot tub or sauna -quality of grooming and track setting -trails designed specifically for nordic skiing -public transportation to site -access road plowed for logging -helicopter access -level of outfitter and guide service -type of cabin or hut available -yurts available -amount of cabin rental fee -cooking equipment available -firewood provided 	<ul style="list-style-type: none"> -flowing water for camp -good snow cave sites -open woods -closed woods -large trees, old growth -firewood availability -total distance traveled for overnight trips -natural hot springs 	<ul style="list-style-type: none"> -races, clinics, or other organized activities held on site -number of people per guide -sharing camp, food chores -friends with overnight equipment and knowledge -sharing facilities with other overnight groups

Table 3-1: Potential Inventory Attributes (Cont.)

<u>Managerial</u>	<u>Biophysical</u>	<u>Social</u>
(Rosenthal et al. 1980)		
<ul style="list-style-type: none"> -trail sections with moderate slope -trail sections where no effort is required to keep moving -trail sections where hard braking or sharp turns are necessary to control speed -three sided windbreaks along trail -parking lots -trailhead registration -milage markers -outhouses at trailhead -snow accumulation fences 	<ul style="list-style-type: none"> -views of stream valleys -views of mountains -views of lakes -trails following streams -trails going through forests -trails going across meadows -old structures (mining sites abandoned cabins) -modern structures like contemporary wooden cabins -distant views of urban areas -distant views of cars on road 	<ul style="list-style-type: none"> -presence of a few other skiers -presence of more than a few other skiers -dogs on the trail -presence of a few snowmobiles -presence of more than a few snowmobiles -snowmobile tracks on snow -noise of snowmobiles
(Author's list from popular literature)		
<ul style="list-style-type: none"> -hours area is open -lighted trails -skating lanes -one-way skiing -equipment rental -lessons available -quality of access road -bulletin board -phone available -bar nearby -grocery nearby 	<ul style="list-style-type: none"> -elevation -aspect -avalanche hazard -long, steep open slopes -distance from parking to telemarking -railroad noise -good early season snow -spring corn snow -mountaineering challenges -golf course environment 	<ul style="list-style-type: none"> -presence of litter -seeing people other than skiers -seeing primarily racing oriented skiers -seeing primarily wool and wood skiers -seeing primarily beginning skiers -seeing many families -congestion at parking area -social pressure for ski etiquette -likely to meet friends

Table 3-1: Potential Inventory Attributes (Cont.)

<u>Managerial</u>	<u>Biophysical</u>	<u>Social</u>
<ul style="list-style-type: none"> -more trails -longer trails -loop trails -small open shelters along the trails -outhouses along the trails -more trail markers -regular patrolling by the U.S. Forest Service -emergency help throughout the area -the use of volunteers to assist in area management and maintenance -more nature interpretation along the trails -manicuring the trails -encouraging large groups to use the area -limiting the number of people using the area -requiring an entry permit to use the area -setting user fee for use of the groomed trails -discouraging use of the area by large groups 	<ul style="list-style-type: none"> -cold snowy days -views of mountains -hearing highway noise -wind blowing through trees -untracked open meadows -viewing water -presence of mining -groomed trails -seeing elk -rugged terrain -seeing Bald Eagles 	<ul style="list-style-type: none"> -seeing groups involved in non-motorized recreation -seeing groups involved in motorized recreation

It should be pointed out, however, that evaluative criteria were not applied sequentially or in a well defined process. Rather, the author began with the entire list and tried to measure the attributes at several sites. At the same time, he used the literature in attempting to judge the relative importance of various attributes, made large tables on flip charts for comparing sites, discussed nordic skiing sites with many people, and went skiing during any remaining free time. In this way the entire list was examined, refined, and continually tested in the field. This "best judgement" method of identifying and defining important attributes risked the dangers of subjectivity and researcher bias. Nonetheless, the method was felt to be practical and appropriate for the original nature of the project.

One criterion helped considerably in paring down the list. This was the elimination of attributes which could be viewed as functions of other inventoried attributes. This criterion alone eliminated most of the social attributes from further consideration. The number and type of people a skier is likely to contact appeared to be, for the most part, a function of managerial and biophysical factors.

For example, high quality, groomed trails tend to attract large numbers of skiers. Indeed this is the business basis for charging a fee at nordic touring centers. Likewise, the types of skiers one is likely to see at a particular site: fastidious racers complete with full clothing regalia on the skating track, wool and wood tourers on the scenic Forest Service road, and telemarkers on their way to open, high elevation, north facing slopes. Skiers should not see other types of recreationists (e.g. snowmobilers) on groomed trails because they are prohibited by regulation. Use restrictions also apply to less developed opportunities like Glacier Park and Jewel Basin.

Another difficulty with social attributes is measuring them. One can tally use, number, or type of encounters only by being physically present at a site. For legitimate results, observations must be made over the entire day and on a number of representative days. The alternative is an expensive camera system which could be used at only a few sites. Neither of these methods satisfied a "practical to measure" criterion.

Overall, the practical measurement criterion was closely related to defining the appropriate resolution of each attribute. Should the inventory record a long, fairly steep hill with a sharp corner on the bottom ? Or, a 100 meter length of trail with an average gradient of seventeen percent, ending in a left hand turn to the south of 160 degree radius ? Perhaps the entire trail could simply be characterized as most difficult or more difficult depending on the direction of travel. In any case, an attribute was defined in specific enough terms to yield useful information upon inventory, yet in broad enough terms to be practically measurable. An inventory which could be completed over a single field season was desired.

Finally, care was taken to retain attribute saliency. Saliency is the importance to the recreationist of a given outcome or setting attribute in the recreational engagement (Stankey and McCool 1984). While design criteria were necessary, the inventory's conceptual framework required that attributes be salient to nordic skiers. In all cases, saliency was hypothetical because it was based on the best judgement of the author. The literature did provide some guidance here. For example, Ballman (1980) found significant variation among Minnesota skiers in

preference for various trail characteristics. Out of fifty-two tested preference items, Ballman found significant differences on only fifteen. Six of these were trail such as length, difficulty and degree of grooming.

On the other hand, certain attributes will have a different type of saliency to managers. Managers undoubtedly are concerned with what the visitor wants. However, the manager may be concerned with wildlife disturbance on winter range whereas the visitor would like to see some elk. In addition, managers have control over certain site attributes and can thereby tailor a site to best meet the needs of a certain group of nordic skiers. Thus the inventory attributes had to be salient to users as well as useful to managers in characterizing different nordic skiing opportunities.

3.3. Concurrent Construction of a Nordic Skiing Opportunity Spectrum

Perhaps the criterion of greatest concern in choosing attributes to inventory was whether a single attribute varied along some sort of continuum. This variance was examined by measuring attributes at different sites and then comparing the measurements. An example of continuous variance is sites with no amenities (ski rental, bar, hot tub), to sites with many amenities. Individual continuous attributes were then added together to construct a meaningful spectrum of opportunities. Several methods of constructing a spectrum were investigated.

Clark and Stankey (1979) simply add all their factors together in a unidimensional manner. Figure 3-2 shows such a unidimensional addition process for three attribute continuums; A, B, and C. Measurements from one site are shown

as X, Y, and Z. All three attributes fall into a range or classification when their measures are added together. However, single dimension spectrums were rejected because only a small number of broadly defined nordic attributes seemed additive. Final ranges were often quite large. As an analogy, unidimensional spectrums added apples (A and B) and oranges (C) when fruit was not useful as a resulting classification.

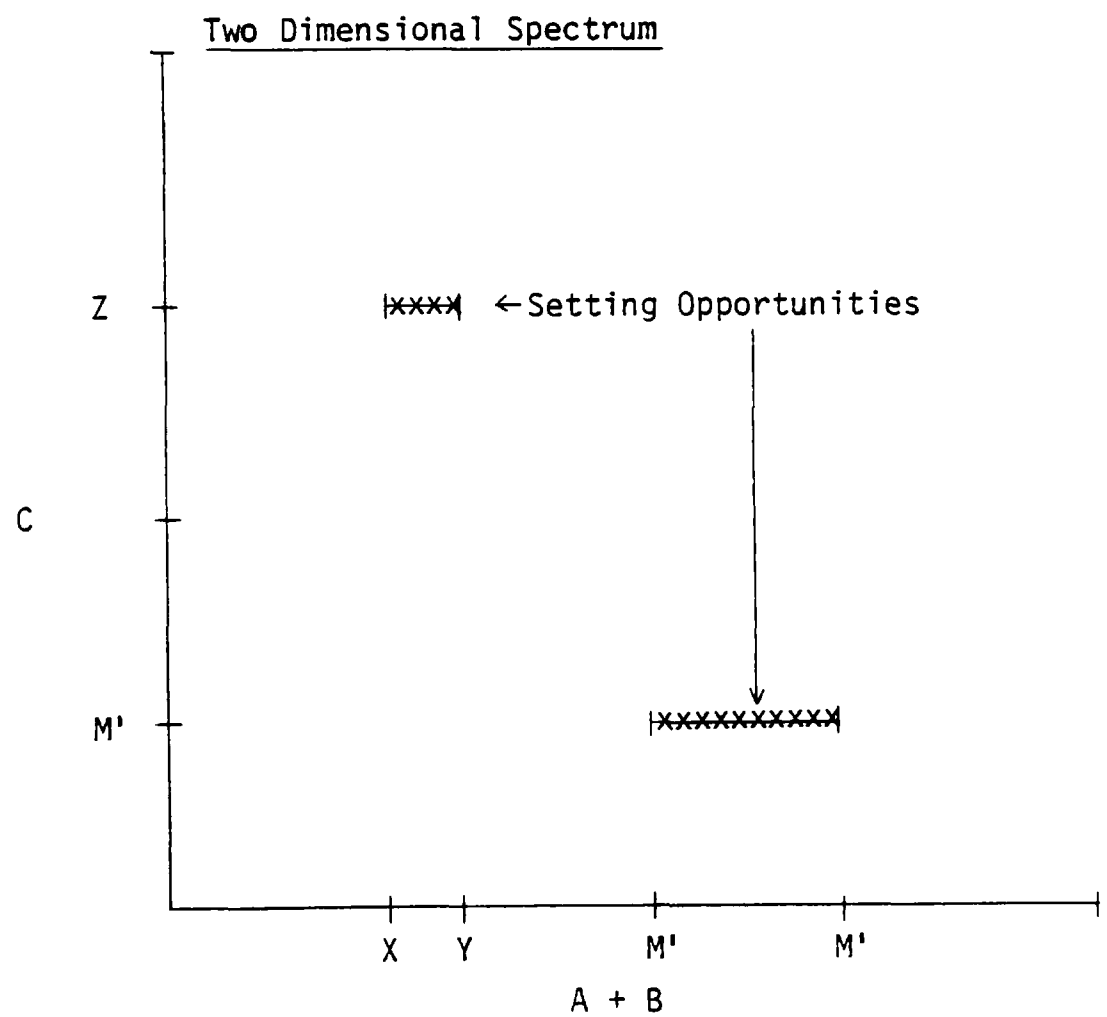
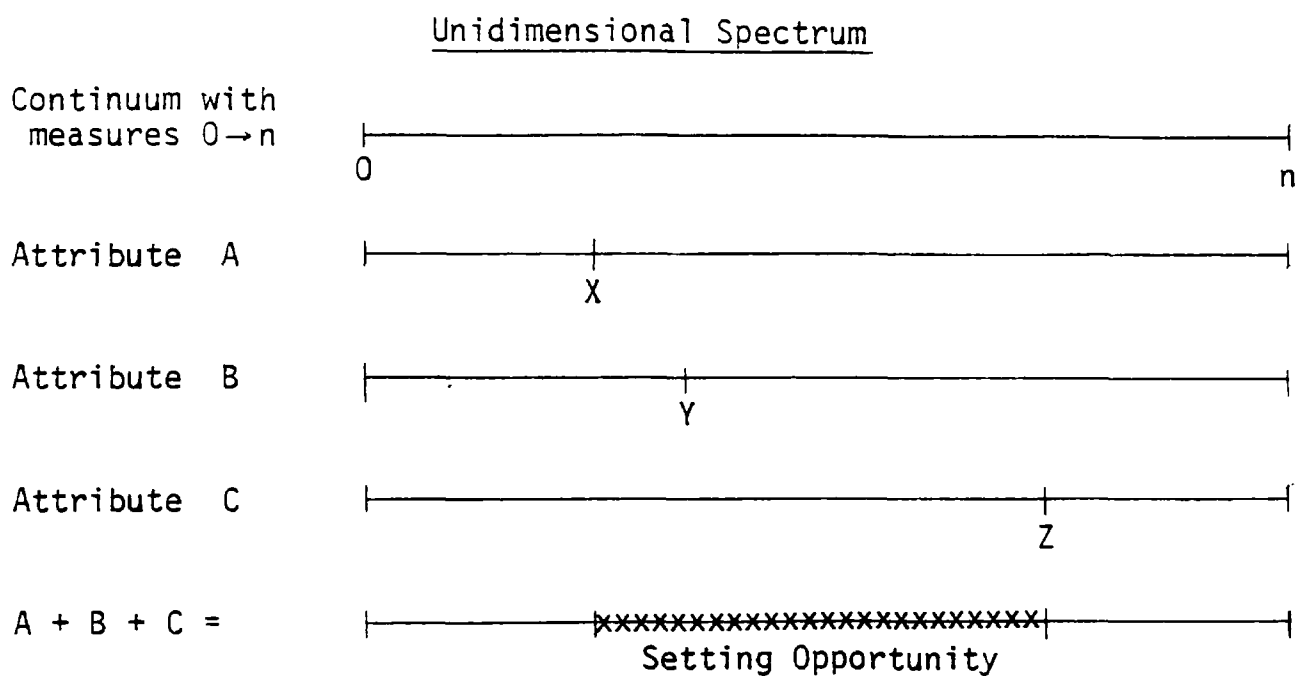
Multi-dimensional spectrums were considered as a means of constructing a more descriptive spectrum. Modern computer technology includes tantalizing possibilities for n-dimensional analysis. Yet even a three dimensional spectrum was judged to be overly complex for practical management applications.

A two dimensional spectrum offered a nice compromise between meaningful, detailed description and simple visual display. Thus, attribute measurements X, Y, and Z are graphically displayed as a setting opportunity (Figure 3-2). Different measurements on A and B (M') can still result in a broad range (long line). This is desirable if the range does not mask important characteristics. For example, a day skiing site which offers many different kinds of trails can be described as having a broad range of trails.

While moving toward the concept of a two dimensional spectrum, it became obvious that day opportunities and overnight opportunities were best characterized by two different spectrums. For day trip skiing versus an overnight excursion, attributes had different measurements, functional relationships, and levels of salience or resolution. Moreover, there was a clear paucity of overnight opportunities in the study area. This meant that an overnight spectrum would

depend on opportunity descriptions from literature rather than inventory data generated from the study area.

Figure 3-2: Dimensions of a Graphic Opportunity Spectrum



An overnight opportunity will be defined as, nordic skiers and/or their guide service carrying food and sleeping gear down the trail. Thus winter camping, hut to hut, yurt³ and ski mountaineering trips are included in overnight opportunities. Day trip skiing from an automobile accessed hotel or lodge is not. A two dimensional spectrum for describing overnight opportunities was developed. The overnight spectrum used "level of service and facilities" to describe the attribute continuums aggregated on one axis with "difficulty of skiing" labeling the other.

Day skiing opportunities were depicted by site facilities and amenities on one axis and trail characteristics on the other. Both spectrums were finalized during the development of the inventory methodology. Although several pads of graph paper were consumed before arriving at these final spectrums, only the finished product will be described. The final spectrums were used to classify the raw data produced by the actual inventory. A description of spectrum mechanics therefore follows a description of the inventory form.

3.4. The Inventory Form

The day skiing inventory form is also the end result of an evolutionary process. At first, long winded field notes were kept for each visit to a site. Then several prototype forms were tested and revised concurrent with attribute selection and spectrum construction. Figure 3-3 shows the final form.⁴ Readers

³A yurt is a glorified, circular wall tent of mongolian origin.

⁴The form shown here is scaled to fit within margin requirements. Forms used in the field were printed front and back on standard 8-1/2 X 11 paper. Water proof paper and a pencil are recommended.

may wish to refer to Figure 3-3 throughout this section.

Overall, items on the form are grouped to aid placement of the site on the spectrum. Most of the form is self-explanatory. However, definitions, a brief description of each item and the reasoning for including it are described below.

A site number was assigned for filing purposes. This number also keys to a map of Flathead County which shows all of the inventoried day opportunities.

Figure 3-3: Inventory Form
DAY SKIING OPPORTUNITIES

Site # _____ Name _____ Managed by _____ Date _____

(1) PARKING

Plowed Spaces _____ by _____ expandable to _____

Facilities (X)

bulletin board _____ --> map _____ manners-rules _____ interp. _____
 shelter _____ --> heated _____ restrooms _____
 registration _____ handout _____ phone _____

(2) SITE AMENITIES (X) , if absent nearest _____

bar _____ , _____ restaurant _____ , _____ grocery _____ , _____
 patrol _____ lessons _____ hot tub, sauna _____
 ski rental _____

(3) TRAILS AND TRACK

Groomed: N Y--> frequency _____ quality H M L
 type K's: T _____ D _____ S _____ Sk _____ total _____

Ungroomed: K's _____ --> Ski tracks C L U

Total K's _____ % trails: Ea _____ More _____ Most _____

Telemarking: Ex Go Po None distance from parking _____ K's

Facilities (X)

markers: route _____ direction _____ location _____
 difficulty _____ distance _____ interp. _____
 rest areas _____ shelters _____ --> heated _____ bathrooms _____
 lighting _____ --> K's _____

(4) OTHER

snow cover 1p -->5e _____ Avalanche Danger H M L N

Fee type _____ , \$ _____ per _____ ROS class _____

Parking CC _____ Trail CC _____ Est. seasonal use _____

Notes: _____

(5) Terrain _____

(6) Vegetation _____

(7) Sights and Attractions _____

(8) Construction - Maintenance _____

(9) Future, Negatives, Other _____

Name refers to the common, accepted name for the site.

The agency or private organization responsible for the site is named in the "managed by" line. These people usually perform the grooming, signing, and administration of the area. Sometimes a variety of parties cooperate in management. This can be explained in the notes section at the bottom of the form.

Date records when the site was inventoried. This space was also used for recording the date of manager interviews.

Parking is an important characteristic of a nordic setting which is often overlooked. In most cases people drive to a ski site. Parking therefore determines how many people can use the site at one time. Quite often parking is expandable simply by plowing a larger area. However, the county or state road crew may plow the parking area as a favor. Additional plowing may be prohibitively expensive or physically impossible.

Parking facilities play a role in the nordic recreation experience. These range from elaborate bulletin boards complete with registration forms and free brochure-map handouts, to a single inconspicuous trail marker. Some bulletin boards display interpretive information. The aforementioned surveys found interpretation signs to be a desirable perk (Ballman 1980).

Taken together, site amenities help characterize the overall development of a site. Items listed in this second category are attractive to some skiers. For example, many nordic skiers like to retire to the bar after a hard run in the tracks. Some of these amenities are located close enough to the ski area to have some

influence on site choice. Otherwise, the nearest public establishment gives some idea of the site's remoteness.

The third section contains items which were used to describe the type of skiing an area offers. The most important distinction is whether the trails are groomed and a track set. If groomed, the frequency is critical. Some areas are groomed daily, some after every snowfall, and some only a few times a season. The quality of grooming and track setting was subjectively rated from high to low. Quality was rated apart from frequency and includes considerations such as the equipment used, the ability of the equipment operator; and a smooth, even, yet sharply defined track.

Several types of track are set. The number of paired tracks, from single to triple, gives some indication of trail width. A smooth, flat skating lane will be at least six feet wide. One common set up is a skating lane with a single track alongside.

Nordic skiing has always been a metric sport, perhaps due to the heavy European influence. In any case, all distances were reported in kilometers. Distances were often available from brochures, or the area manager. Otherwise distances were estimated by skiing.

Ungroomed areas and trails were characterized by the probability of finding user established ski tracks. Certain means a visitor would probably find a well defined track or tracks. Likely means a single, well used track, perhaps with a little snow fall since the last skier. Unlikely means a faint track to virgin snow. This is the only attribute measure on the final form which can be interpreted as a social

attribute.

Trail difficulty was rated according to published standards (Pekuri 1985, Ski Industries America 1985). Easiest, more and most difficult is the accepted classification scheme although some prefer advanced, intermediate and beginner. Note that percentage of trails in each category was recorded. Thus an area having three trails, each fitting into one category, was shown on the form as "Easiest 33% More 33% Most 33%." An area having only one trail which is easy except for a single nasty section was entered as Most 100%.

The most popular form of off-trail skiing is, of course, bombing down a hill. Telemarking opportunities were rated from excellent to none. Factors considered in the rating included: steepness, length of the slope, open routes with room to turn, deep snow and skiing access.

Nordic ski trails vary from unmarked routes through the woods to oversigned, well developed race tracks. Trail route markers are usually blue diamonds posted at intervisible distances. These may be supplemented with "you are here" maps, difficulty labels and hazard warnings, a timing marker every kilometer, and interpretive signs. Many areas prefer that skiers travel in only one direction. One way skiing is due to trail design, safety considerations and a desire to reduce contact between skiers. In addition to markers, trail facilities like rest areas were also inventoried.

Some other items were inventoried for general information or because they might be of interest to managers. Thus average snow cover was rated from poor to excellent relative to the Flathead Valley area. Avalanche danger was a measure

of both starting and run out zones which might threaten a nordic skier using the area. Fees included voluntary contributions, vehicle parking stickers as well as daily use charges.

The traditional ROS opportunity class was recorded for each area. This information was readily available for Forest Service land. ROS class was estimated for other land ownerships. The intent was to compare the traditional ROS class to the nordic skiing opportunity spectrum.

Parking carrying capacity was calculated by multiplying each parking space by 2.5 people. Parking carrying capacity could then be compared to trail carrying capacity. A variety of approximate trail carrying capacities were computed using estimates of skiers per kilometer for different kinds of trails. Both the Elliot and Associates (1985) inventory and area managers provided estimates of total seasonal use. Estimated seasonal use is an individual head count of visitors and not a recreation visitor day. None of the "other" section items were used in placing an area on the opportunity spectrum.

A notes section elaborated on items from the front of the form. A few examples of notes include: directional skiing indicated on bulletin board but not on trail markers, sources for information about a particular item, parking lot not plowed but supposed to be, and great cheesecake at the restaurant. The three completed inventory forms contained in Appendix B provide additional examples of appropriate notes.

The reverse side of the form contains five narrative sections. Narratives served as a safety measure in inventory form development. If important attributes

were lost or overlooked during the attribute selection process, then this might show up as trends in the narratives. In addition, the narratives recorded information which might be useful in putting together a visitor information program. Finally, the narratives were used for noting items which might affect future management of the area. For example, terrain and vegetation might affect the potential for upgrading trails, improving grooming or expanding the area. Terrain and vegetation narratives also played a small role in placing opportunities on the spectrum. In any case, the intent of the narratives was to record as much valuable information as possible while visiting the site.

The original plan was to inventory every site in the field. However, a late start and early spring combined to make this impossible. Therefore alternative methods of completing the form were tested. A few sites were walked instead of skied. Brochure-map information was used to fill in some items. All remaining information came from interviewing managers and skiers (see Appendix A).

All of the inventoried day sites were marked on a standard Forest Service map (Appendix C). The map serves as a simple visual tool. With a glance one gains a rough idea of location and distribution of the various inventoried opportunities. Closer inspection shows the proximity of population centers, road access and distances from points of interest. A notebook containing the map and completed forms was used for data storage.

3.5. Mechanics of the Nordic Spectrum

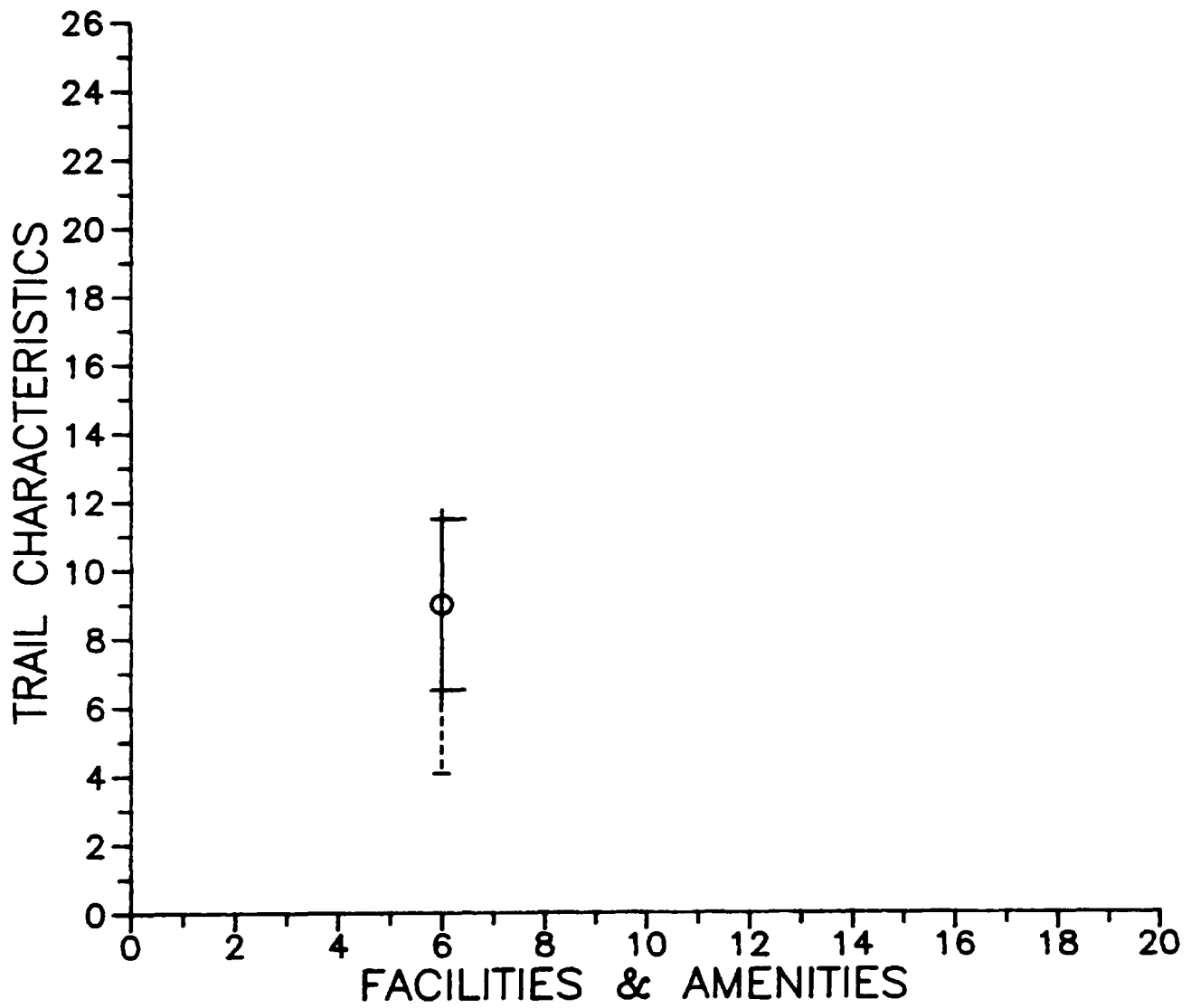
The transfer of inventory data from the form to the day nordic spectrum requires only simple addition. Points were assigned to attribute measurements on the form. These points were correlated to the position of the attribute on a continuum. Summing the points resulted in scores for each inventory site. Scores or coordinates were then graphed with each axis of the graph representing a spectrum dimension.

The X axis characterized the facility and amenity components of a nordic setting opportunity. First, points were assigned for the number of parking spaces according to the categories in Table 3-2. Then, one point was added for each parking facility and amenity marked on the form. Thus a site with twenty parking spaces, a simple bulletin board, an outhouse and three other checks scored six on the X axis (Figure 3-4). With an optional point for items listed in the notes section, scores on the X axis could range from zero to twenty.

Table 3-2: Parking Space Points

<u>Spaces</u>	<u>Points</u>
<10	0
11-25	1
26-50	2
>50	3

Figure 3-4: Placement of a Site on the Spectrum



The vertical or Y axis depicted trail characteristics. Trail attributes were first divided into the five groups shown in Table 3-3. Points from each group were then added to yield a score. Coordinate scores on the Y axis could range from zero to twenty. As an example, the site displayed in Figure 3-4 could represent: groomed trails, but only an occasionally set single track, with two trail facilities marked off on the form. This accounts for nine points on the Y axis.

Table 3-3: Trail Characteristic Points

<u>Group</u>	<u>Factor</u>	<u>Points</u>
1	-Not groomed, ski tracks likely	1.5
	-Not groomed, ski tracks certain	3
	-Mechanical grooming and track setting	8
2	-Biweekly to weekly grooming	1
	-More than weekly grooming	2
3	-Medium quality grooming	1
	-High quality grooming	2
4	-Machine set double track	1
	-Triple track or skating lane	2
5	-Trail and track facilities, .5 points for each, including notes section	0-6

A point on the spectrum (6,9) was defined by the coordinate scores for the X and Y axes. The next calculation fixed a range about the Y axis coordinate score. The range line indicates the diversity of trail and off-trail skiing at an inventory site (see Section 4.2). If a site offered only groomed, or only ungroomed skiing, then range points were tallied directly from the four groups in Table 3-4. If a site

offered both groomed and ungroomed skiing, then kilometers of groomed trails were used for Group 1) - Total Kilometers of Trail. The solid line for the site in Figure 3-4 could represent twelve kilometers of groomed trails, with all trails being more or most difficult, and some excellent telemarking nearby. This yields a total of five range points.

Table 3-4: Trail Range Points

<u>Group</u>	<u>Factor</u>	<u>Points</u>
1) Total Kilometers of Trail	<5	0
	6-10	1
	11-15	2
	16-20	3
	21-25	4
	26 +	5
2) Easiest, More, Most Difficult Trails	-Any two categories	1
	-All three categories	2
	-At least 20% in each category	3
3) Telemarking	Good	1
	Excellent	2
4) Trails use of terrain and Vegetation	Good	1
	Excellent	2

Finally, points for ungroomed trails were added to the bottom of the range score. Table 3-5 shows this continuum of points. The dotted line in Figure 3-4 shows three points which correspond to twelve kilometers of ungroomed trails. Therefore, an asymmetric line extending toward the X axis represented opportunities which offer both groomed and ungroomed trails. The asymmetric range shows that these opportunities offer ungroomed trails which are associated with a lower coordinate score. The maximum length of such a range line was sixteen units. While mathematically possible, it was unlikely that asymmetric ranges would extend below the X axis, given the automatic eight points for any grooming and the common presence of trail facilities. The range line for a few opportunities which offered only ungroomed trails did extend below the X axis. However, these ranges were plotted as originating at the X axis.

Table 3-5: Ungroomed Trail Range Points

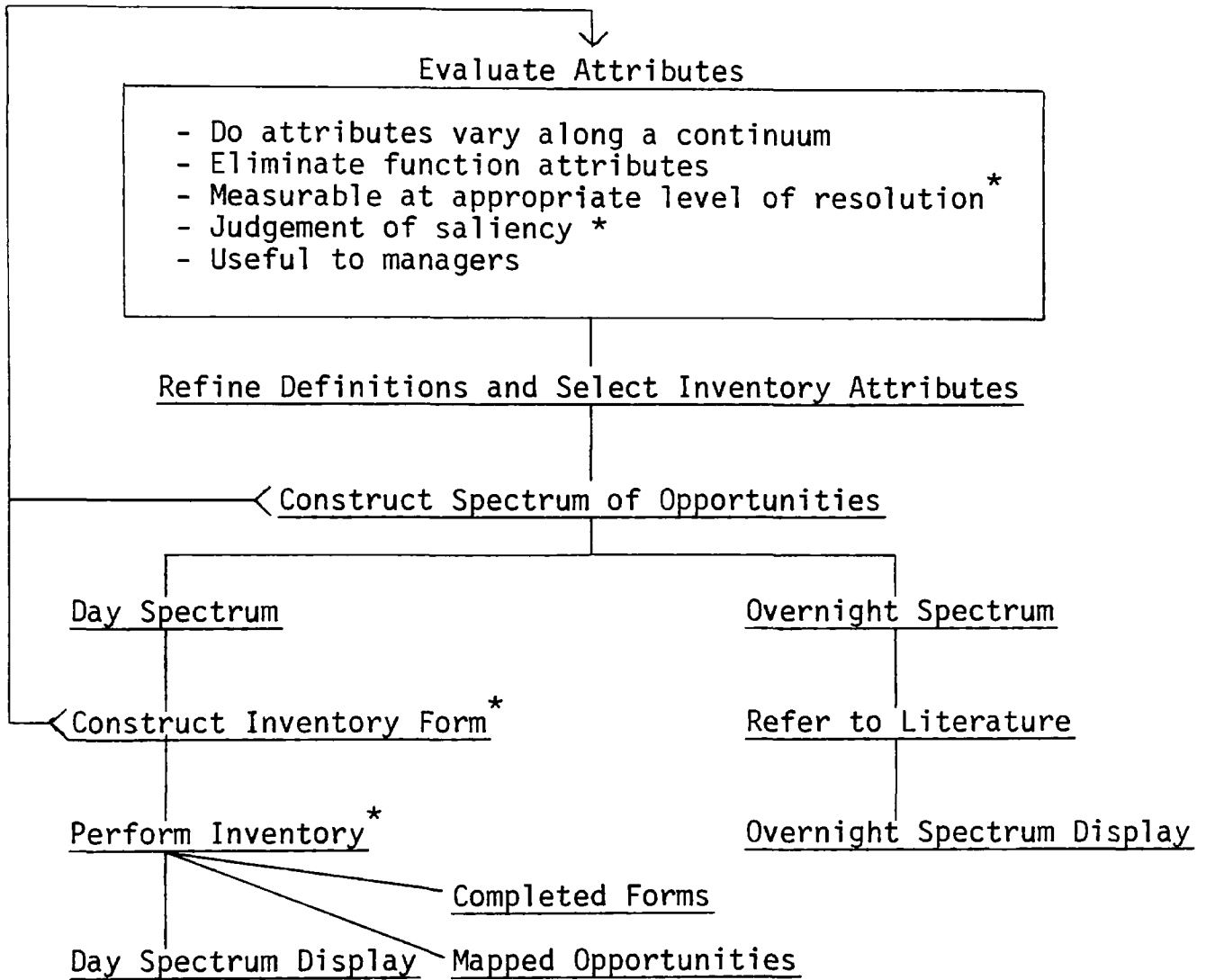
<u>Kilometers</u>	<u>Points</u>
<5	1
6-10	2
11-15	3
15+	4

The points and tallied scores described above are not for exacting numerical comparisons. These numerical values reflect best judgements of attribute saliency as well as the attributes relative importance in distinguishing between opportunities. There are several mathematical paths for arriving at the same place on the spectrum.

This two dimensional spectrum is, of course, the desired end product of the inventory methods proposed in this project. The following chapter examines the test results of applying these proposed inventory methods. As a summation, Figure 3-5 shows a flow chart for the process used to develop the inventory and nordic skiing spectrum.

Figure 3-5: Summary of Methodology

- Determine appropriate study area
- Identify and define inventory sites
- Develop list of potential inventory attributes*



* Tested in the field

Chapter 4

RESULTS OF THE INVENTORY

4.1. Data From the Day Site Inventory Form

The final inventory form proved to be an efficient method of gathering information. Table 4-1 shows the twenty-two sites for which a form was completed. The form was certainly a major improvement from skiing through the woods with a clip board, writing all the while. In fact, a detailed, personal examination of the site was not required.

Many sources exist for the information specified on the form. A phone call to a knowledgeable manager often provided all of the information necessary for spectrum placement. Alternatively, some fanatic local skiers possessed the greatest amount of knowledge about a particular opportunity. Local skiers were perhaps the best source of information for undeveloped opportunities. Ski area brochures and maps are yet another source. However, I found some mistakes and instances of outdated information among the brochures for this study area.

Table 4-1: Inventoried Day Skiing Sites

<u>Site #</u>	<u>Name</u>	<u>Managed by</u>	<u>Source of Information</u> ¹	<u>Use</u> ²
1	Foothills	County	B,C	2,700
2	Blacktail	County	A	1,800
3	Cedar Lake	F.S. Glacier View	A,B	400
4	Herron Park	County	B,C	4,200
5	Buffalo Hills	County	C,D	3,000
6	Round Meadows	F.S. Tally Lake	A,C,E	3,500
7	Meadow Lakes G.C.	Golf Course	B,D	300
8	Whitefish G.C.	Glacier Nordic	C,D,E	10,000
9	Garry Lookout	F.S. Hungry Horse	A	100
10	Jewel Basin Road	F.S. Swan Lake	A,D	250
11	Eagle Bend G.C.	Golf Course	C	500
12	Lone Pine State Park	County	B,C	300
13	Izaak Walton Inn	The Inn	A,E,	5,000
14	Lion Lake	F.S. Hungry Horse	A	200
15	West Glacier	F.S. Hungry Horse	A	50
16	Marias Pass	Glacier Park	A,E	800
17	Camas Road	Glacier Park	A,C	1,000
18	Going to the Sun Road	Glacier Park	A,C	2,000
19	Logan Pass	Glacier Park	A	1,000
20	Stanton Lake	F.S. Hungry Horse	A	150
21	Hungry Horse	F.S. Hungry Horse	A	300
22	Desert Mountain	F.S. Hungry Horse	A	30
			Total	37,780

- ¹A) Field visit ski
 B) Field visit walk
 C) Manager interview
 D) Skier interview
 E) Brochure information

²Estimated skier visits, 1985-86.

Combining and comparing all sources turned up discrepancies which could be examined in person. Personally skiing the entire site at different times throughout the winter yielded the most accurate information, not to mention the most enjoyment. For the purpose of filling out the form, only three of the sites were not examined in person. Skiing a site is very time consuming. Because this inventory methodology evolved through continuous experimentation, it involved more skiing than was actually necessary.

The information found on many forms came from the process of form development. Approximately half of the sites were inventoried before the completion of the final form. Thus some prototype forms ended out as completely filled out forms once the final format existed. The primary information sources listed in Table 4-1 show the sources which were used in filling out the final forms.

Walking the site sans snow was the only method of gathering information which required supplement by another source. Such factors as grooming and plowed parking could not be observed without snow. Moreover, walking a trail without skies added uncertainty to the already somewhat subjective measures of trail difficulty. Walking did allow for observation of vegetation, off season maintenance problems and the potential or difficulty of cutting new trails in the area. For curiosity's sake, several sites were walked even though their forms had been completed. Overall, the value of off season examination seems to depend on the observer's ability to visualize how the area would ski.

Walking a few sites was necessary because of an early spring in the Flathead Valley. Nonetheless, most of the inventoried sites clustered in the higher relative

snow cover categories (Table 4-2). Regular snowfall is good for grooming. Early season snow seems to be more important than late season snow. More skiers were observed in the fall than in the spring.

Table 4-2: Snow Cover

<u>Relative Snow Cover</u>	<u>Number of Sites</u>
1 Poor	2
2	3
3	5
4	6
5 Excellent	6

Table 4-1 shows some admittedly rough use estimates for day skiing in the study area. Flathead County keeps a count of skiers for the individual areas they manage (Jerry Jones, County Recreation Director, personal communication). Glacier Park only estimates the number of skiers park wide. All other estimates are a rough guess based on some combination of manager interviews, personal observation, and the Elliot and Associates inventory. The Whitefish Golf Course was far and away the most popular skiing site in the study area. As a comparison, The Big Mountain alpine ski area near Whitefish had about 250,000 skier visits over the same winter (U.S. Forest Service, Region 1, News Release). Again for the same winter, Missoula's Snowbowl reported about 40,000 skier visits.

The total nordic skier visits shown in Table 4-1 does not include an unknown number of backcountry day skiing visits. There are literally hundreds of uninventoried, Garry Lookout type opportunities in the study area. Indeed, many people's back yards constitute a decent nordic opportunity.

In any case, 868 plowed parking spaces access the inventoried sites in the

study area. Additional plowing could increase the number to approximately 1,320 spaces. Using 2.5 people per vehicle, there is a parking carrying capacity of 2,170 skiers at one time, expandable to 3,300 people with additional plowing. If fifteen people per kilometer is used as a measure of trail carrying capacity⁵, then the inventoried sites could theoretically handle 4,515 people at one time. These types of analysis can be repeated for any of the individual inventory sites.

At the time of the inventory, almost all of this skiing potential was provided free of charge. The exception was county sites which required a three dollar per season parking sticker. The Whitefish Golf Course solicited donations for maintenance expenses.

Other findings included the narrative descriptions of each site. The narrative side of the form initially served as an aid in form development. However, the narratives also allowed for the collection of interesting or unique data. As a generalization of narrative data, the inventoried sites showed an impressive diversity of terrain, vegetation and scenery.

Finally, the inventoried opportunities were located in all of the traditional ROS classes. The distribution between five of the six classifications was for the most part equal. The exception was the Roaded Natural category which tallied twice the sites of any other category. However, recording traditional ROS classes proved to be a nebulous undertaking.

⁵This is a ballpark number based on figures from Ski Industries America (1985) and John Elliot (personal communication). Capacity estimates should include such factors as the type of track, unidirectional skiing, screening, and the type of experience the area is supposed to offer.

For example, many opportunities included land in more than one classification. Thus opportunities had to be proportioned between classifications on the inventory form. Moreover, ROS maps exist only for Forest Service land. This made proportion estimates difficult for non-Forest Service opportunities. These mechanical problems added to the questionable accuracy of the traditional ROS classes.

The existing Flathead Forest ROS maps only note the location of some nordic skiing opportunities. The maps do not address the changes which winter brings to the environment. Access, evidence of human modification and interactions between recreationists are all very different in the winter. These changes from the mapped classification were often obvious while visiting sites. The result was generally an unmapped shift of winter ROS classifications toward the primitive end of the spectrum. In terms of remoteness, sixteen sites did not have a store, bar or restaurant on site. For these sites, distances to the nearest public business ranged from one half to twenty-seven miles, with the average being seven miles. A winter season ROS map (Clark and Stankey 1979, U.S. Forest Service No Date) could have facilitated more meaningful comparisons between traditional ROS classification and the nordic skiing opportunity spectrum developed in this project.

4.2. Display of the Day Skiing Spectrum

The twenty-two inventory forms give a detailed description of the study area. While this level of detail has applications, the day skiing spectrum aggregates most of the form's raw data into a single display. One graph

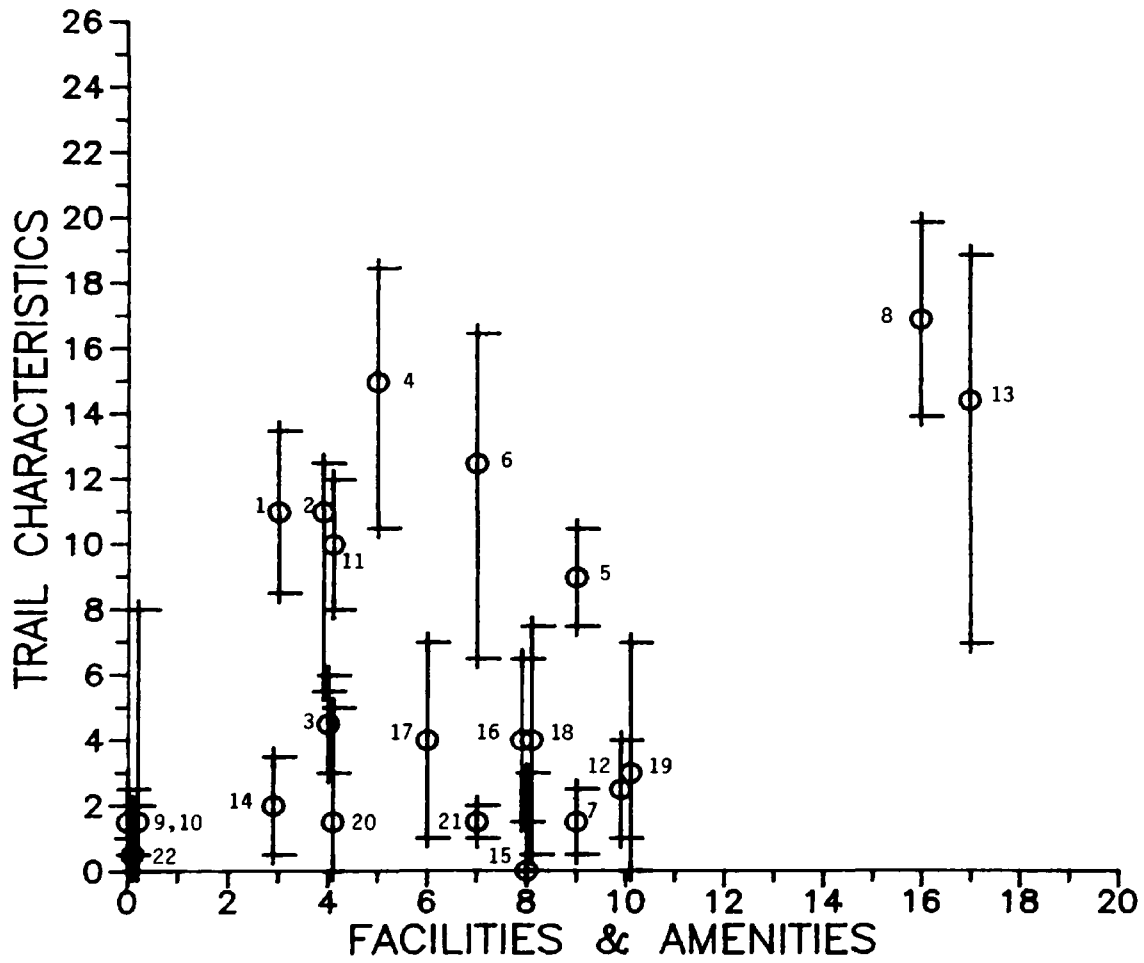
summarizes the current state of the resource.

Figure 4-1 shows the results of the spectrum placement calculations described earlier. Each line represents a nordic skiing opportunity. Long lines are associated with a large amount and wide variety of trail conditions. The presence of machine groomed trails roughly corresponds with the area above nine on the Y axis. Asymmetric lines extending below the circle coordinant indicate the presence of both groomed and ungroomed trails.

As an example, site #11 (Eagle Bend Golf Course) has: limited parking, a few facilities, lessons but no on site apres ski, and a four kilometer, single track trail system which was groomed biweekly. Site #2 (Blacktail Mountain) overlays site #11. The overlay is due to site #2 offering some off track skiing and more kilometers of trail. Sites #9, 20, and 22 are all unplowed Forest Service roads which lead to points of interest.

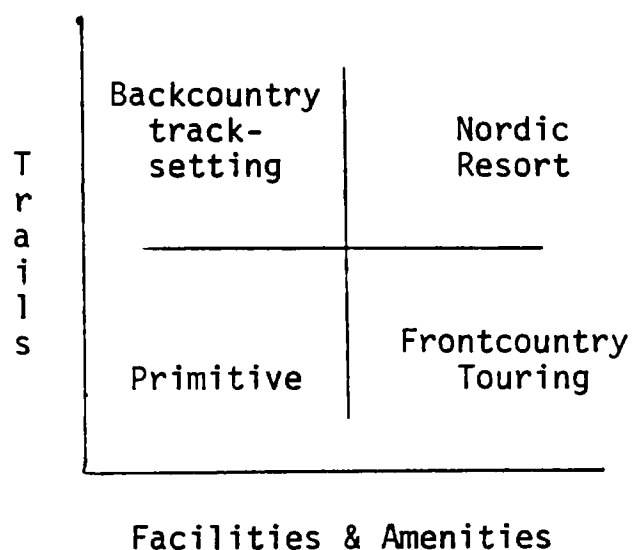
Perhaps the most striking feature of the study area spectrum is the isolation of opportunities #8 and #13. Site #8, the Whitefish Golf Course, has the best maintained tracks in the study area as well as The Grouse Mountain Lodge. However, site #13 offers a wider variety of skiing, expecially on ungroomed trails. It is interesting to note that these two sites also have the highest use figures in the study area. Opportunities #8 and #13 represent the only nordic touring centers in the study area.

Figure 4-1: Study Area Day Spectrum



By itself, the spectrum is a classification system. Similarity between opportunities is based on the numerical description of a line. However, it is also possible to divide the spectrum into sub-areas. Groups of similar opportunities can then be labeled with narrative descriptions, the alphabet, numbers or simple names (Figure 4-2). The spectrum display for the study area shows lines in every quadrant. A diversity of opportunities exists, even though most of the sites cluster in the primitive quadrant.

Figure 4-2: Spectrum Quadrants

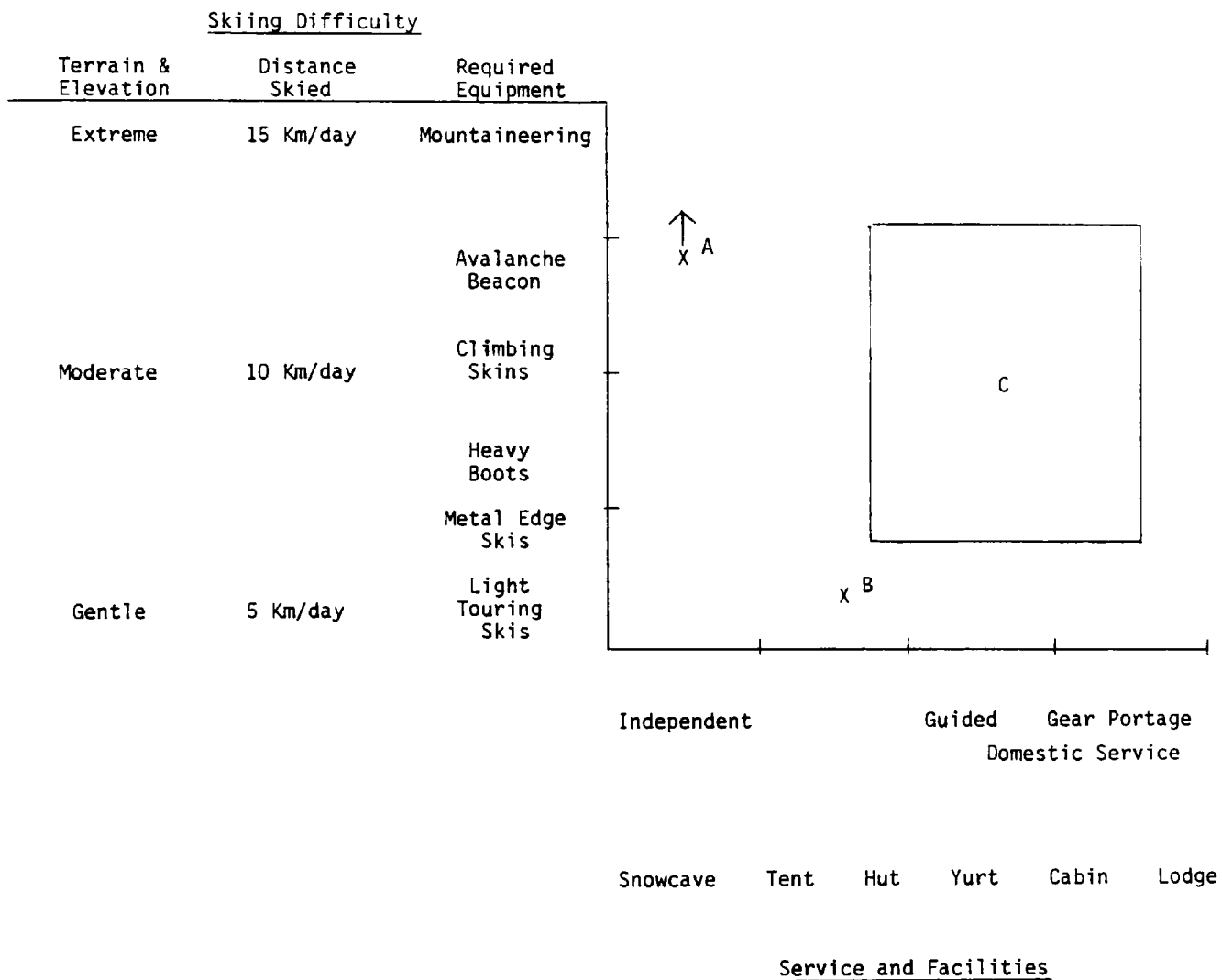


4.3. The Overnight Nordic Spectrum

A relatively small amount of overnight skiing takes place in the study area. No active guide service nor backcountry facility rentals existed at the time of the inventory. Glacier National Park, which might appear to be an attractive winter camping destination, handed out only fifty-seven overnight permits (108 skiers) for the 1985-6 season (Alan Oneill, Acting Park Superintendent, personal communication). Despite the outstanding potential, there was little overnight skiing to inventory.

At the same time, the popular literature and other areas in the Northern Rockies advertised a wide variety of overnight opportunities. Incorporating these opportunities into a spectrum resulted in a more conceptual display than the quantitative day skiing spectrum. Figure 4-3 shows this proposed overnight nordic spectrum. Three example opportunities, A, B, and C are described below.

Figure 4-3: Overnight Nordic Spectrum



Opportunity A represents a weekend winter camping trip to the Jewel Basin Hiking Area. It is similar to many potential excursions in Flathead County. Due to the steep, mountainous terrain, skis require the assistance of climbing skins or rope climbers. Each member of the party should carry an avalanche beacon and shovel. However, ropes, ice axes and crampons are not necessary unless the party wishes to take advantage of extreme skiing opportunities. The vertical arrow extending from A indicates the potential for "if you fall you die" styles of nordic skiing. Access to Jewel Basin requires skiing approximately twelve kilometers and a vertical rise of 3500 feet. Camping facilities consist of a snow cave or tents.

Opportunity B offers a small, rustic cabin in the Beaverhead National Forest. Hogan's Cabin is located six kilometers away from a state highway and about three kilometers from the continental divide. A skier established track follows a fairly gentle trail to the cabin. The Forest Service includes firewood, a Coleman stove and cooking utensils in the cabin rental fee.

The rectangle defining opportunity C is a depiction of the variety of guided trips offered by the Leonard-Ayer Company of Stanley, Idaho. Although Leonard-Ayer guides some snow camping trips, their business centers on several huts and yurts near the Sawtooth Wilderness. Customers often ski from hut to hut. Some huts feature luxuries like hot tubs. All huts have a kitchen area, lounging area near the stove, and bunks for sleeping.

All Leonard-Ayer trips are guided. However, customers can choose to carry their own belongings or have everything except a day pack transported by the company. Likewise, customers can choose between trips featuring no domestic

chores, to sharing in cooking and cleaning; to providing, carrying and cooking all food. Fees vary according to the type of trip. Trail breaking and skiing difficulty also vary with the ability and desire of customers.

Other styles of overnight opportunities can easily be placed on the spectrum. Readers are invited to visualize nordic trips involving winter camping followed by a night in a ski accessed backcountry lodge, snowmobile supported ski trips, and beginning winter camping. Like the day skiing spectrum, the overnight spectrum includes a complete range of opportunities. The important attributes are different, yet both spectrums use similar additive continuums. Although the spectrums include a variety of skiing, luxury and perhaps comfort, no judgement of experience quality is implied.

Chapter 5

DISCUSSION

5.1. Broadening the Applications of ROS

The Director of Recreation Management for the Forest Service states that, "ROS is not a land classification system; it is a management objective, a way of describing and providing a variety of recreation opportunities . . ." (Introduction to 1986 ROS Book). ROS is certainly not just a land classification system. The inventory methodology developed here is based on this broad interpretation of ROS. The inventory simply extends the applications of ROS. The two dimensional nordic spectrums reduce inventory data into a meaningful display. Nordic sites placed on the spectrum become a fraction of a complete range of opportunities.

Performing the inventory yields a current description of a recreation resource. Prior to this inventory, there was no systematic method for distinguishing between different types of nordic opportunities. Spared the chore of creating a form and spectrum, nordic managers can easily repeat the inventory. Spectrum mechanics can be adjusted without changing the base data contained on the forms. Replication in another market area would serve as a true test of the inventory's accuracy and utility.

Questions have been raised concerning the role of development in distinguishing between recreation opportunities (McCool 1983, Driver 1986). The

nordic spectrums ended out being very development oriented. This might reflect the influence of popular literature and its consumption orientation. Yet development, or lack of development, appears to be a critical distinguishing factor. Nordic skiers view the sport's development trend with either dismay or enthusiasm. Managers are also interested in distinctions between levels of development. A nordic touring center located on public land may require significant administration commitments. Development is at least a functional way to distinguish between opportunities in this inventory context.

Measurement of development attributes does not impart a more is better designation to nordic touring centers. Instead, the spectrum contains a wide range of setting opportunities. It is easy to get caught up in the technology and promotion fervor of the new nordic skiing. The spectrum reminds us that some people seek an appropriate setting for a slow paced shuffle through the woods.

The position of an opportunity within the spectrum facilitates the comparison of setting opportunities. One way of looking at the spectrum is that opportunities in the primitive quadrant represent traditional cross-country settings. The new, high technology nordic tends to concentrate in the nordic resort quadrant. A trend in nordic opportunities can then be envisioned as movement along a forty-five degree line between these two quadrants.

Proposed changes in the study area support this trend. Opportunity #13 plans to upgrade its trail network with new trails and new grooming equipment. A volunteer group hopes to begin grooming opportunity #7 during the 1986-7 winter. New nordic trails and grooming are also in progress at site #15 and near the Big

Mountain Alpine area. Flathead County has bought new grooming equipment which they will use on four of the inventoried sites. These changes would show up as a more even distribution of opportunities on an updated spectrum.

The other two day spectrum quadrants, backcountry track-setting and frontcountry touring, are still part of a complete range of opportunities. This, despite the few study area opportunities which fell into these areas of the spectrum. Other regions of the country might offer more opportunities characterized by this part of the spectrum.

It is important to note that the spectrum characterization may not be the same characterization as the mental image a particular nordic skier forms about a potential recreation site. For example, site #4, Heron Park shows up in a unique position on the spectrum. But the spectrum does not indicate that Heron Park seems to be a nice area for family skiing. While this type of information is available from form notes, other common site classifications exist which are not based on a continuum. The nordic inventory is simply a systematic method of distinguishing between opportunities.

The inventory and spectrum provide managers with two tools. Applied together, they also provide managers with a basic description of the resource. In turn, managers can then use this basic information to define the opportunities which they provide to the public.

5.2. Input to Management Decision Making

After defining current supply, a public lands manager is prepared for making many types of management decisions. The decision to perform the inventory in itself expresses the need for information. Inventory results can be used in a number of ways. Ultimately, objectives for nordic skiing management determine which management actions are taken.

No coordinating management body exists in the study area. However, the Forest Service does sponsor occasional nordic meetings which include Flathead County, the State, and representatives from the private sector. At one of these meetings, February 11, 1986, participants identified seven priorities for the study area:

1. Make the areas we have better. This idea means we should focus our dollars and manpower on quality not quantity of areas.
2. Increase maintenance funding
3. Regular scheduled grooming
4. Improved cooperation among organizations
5. Increased private business and community involvement
6. Develop a master plan for the Flathead Valley
7. Professional design of nordic facilities

The inventory results give some valuable input to discussion of these priorities.

The first three priorities mean that the nordic managers in the study area want to see some existing areas move up vertically in the spectrum. Instead of adding new areas to fill gaps in the spectrum, they desire a different distribution of opportunities. The inventory form narratives contain information about the potential upgrading of grooming and trail design at individual sites. In addition,

site attributes like location, existing trail characteristics, terrain, and vegetation will determine the cost effectiveness of improvements.

All of the priorities require additional funding from yet to be determined sources. High quality grooming is especially expensive. Given the sorry state of government budgets, money will probably have to come from the private sector. The Flathead Forest Plan (1985, p. 11-16) states that the management direction for the Forest is to develop additional ski trails where increased demand exists. However, the Forest intends to encourage the private sector to develop ski trails and do the grooming.

Apparently, the potential for nordic skiing entrepreneurship exists in the study area. People with private sector capital may want to look at what is currently provided in the market area. Then investors can make decisions about the types of setting opportunities which might be marketable and profitable. The inventory and spectrum lend a logical taxonomy to the discussion of differences between nordic opportunities.

The study area inventory does suggest that a strong demand exists for high quality, professionally designed nordic trails. The inventory also characterized an obvious lack of variety in overnight opportunities. These two findings indicate both business opportunities and recreation opportunities which public land managers need to consider. The inventory's standardized descriptions facilitate cooperation and communication between the private sector and public land managers. Who wants to do what to a particular setting is clearly defined in terms which are measurable on the ground.

In addition, a manager of part of the inventory area now has a better idea of what all the other managers in the market area are providing. A District Ranger or County Recreation Planner can use the inventory information in combination with demand estimates. Is the manager providing the opportunities demanded by the public? Is the land area capable and suitable of providing certain types of opportunities, or should a more appropriate manager take the lead? Are there areas of the spectrum which are under-represented in the market area and which the manager is in a unique position to fill? Managers now have a framework for forming and carrying out nordic skiing objectives.

Finally, the inventory methodology is a means of tracking nordic opportunities in aggregated areas. If many market area inventories were performed, then it would be a simple task to aggregate these inventoried opportunities at the level of National Forest Region. This might foster cooperation between different agencies and the private sector. An example might be a directed effort at promoting nordic skiing as an economically important form of winter tourism in Montana.

Certainly, many potential uses of the nordic inventory and spectrum exist. Indeed, others may recognize a valuable application which was not even hinted at in this paper. Hopefully, nordic managers and recreation researchers will improve on what was developed in this project and thereby improve and increase the utility of the nordic inventory and spectrum.

5.3. Future Research

Perhaps the area of greatest conceptual concern in this project was the saliency of inventory attributes to nordic skiers. Unfortunately, the small amount of existing literature did not provide much guidance in this area. While managers and skiers can be expected to view nordic sites in different ways, managers should at least be aware of the setting attributes which nordic skiers deem important. The assumptions and judgements made about saliency are ripe for testing. Social attributes could turn out to be more important in recreationists' site choice decisions than in the distinctions made by the inventory. A survey of nordic skiers could substantiate or refute some of the hypotheses which were used in developing the inventory.

At the same time, a nordic survey could examine a variety of recreation behavior topics. A recent paper proposes that use patterns, experience levels, and participation motives of winter wilderness users are different from summer wilderness users (Hammit et al. 1986). Are nordic skiers unique, or similar to other recreationists in choosing a setting? The rapid changes in nordic skiing seem to include specialization in different styles of the same activity. Is years of skiing experience or the nordic setting related to this specialization?

If the projected increases in nordic skiers materialize, then public land managers will be faced with a new, sizeable interest group. Nordic skiers may make demands for resource allocations in the already tight distribution of land resources. Research on integrated resource management might improve nordic recreation experiences while at the same time fostering multiple use. Examples

include how to turn a timber sale into a specific type of nordic setting and designing ski trails to avoid wildlife or snowmobile conflicts.

A computer software program would aid all of these research projects as well as replications of the inventory. A program which could automatically display inventory data on a spectrum would be particularly valuable. Proposed changes in nordic settings could then be viewed as changes in the spectrum of opportunities for a given area. Computerization would also be an aid to inventory aggregation. The format and simple mechanics of the nordic inventory should present few problems to an experienced computer programmer.

5.4. Conclusion

No matter the resource, a basic description is essential for sound management. This project has identified different types of nordic skiing opportunities, characterized the factors which distinguish between these opportunities, and classified the opportunities themselves as part of a nordic skiing spectrum. Recreation managers and researchers can now examine the nordic skiing resource within a consistent, systematic framework.

The inventory methodology was designed to be easily replicated. Performing the inventory should be fairly inexpensive. It is certainly a cost effective way to get a basic description of a resource. Fringe benefits of performing the inventory may include familiarity with other providers of nordic opportunities, contact with the nordic skiing public, and even some ski time on the job. Managers should also find the ROS conceptual basis familiar. Researchers can ponder over the validity

of the inventory and the extended applications of ROS.

Yet this project may prove to be most valuable as a recreation management monograph on nordic skiing. Recreation researchers have only begun to focus on nordic skiing. Likewise, recreation managers have not given nordic recreation experiences the attention they will undoubtedly require in the future. As a first attempt, the nordic skiing inventory should encourage others to think about nordic skiing in recreation management terms. There is some urgency in doing this. Increasing numbers of nordic skiers will create land management problems. A preventative problem solving posture should be preferred over reacting to problems as they arise.

Appendix A

List of Interviews

Managers

Homer Boles, Recreation Management Specialist, Region 1, Forest Service

Rob Dyerberg, Recreation Forester, Spotted Bear Ranger District, certified nordic ski patroler

Bob Hurd, Recreation Forester, Glacier View Ranger District

Jerry Jones, Flathead County Recreation Director

Dennis Kennedy, Resource Forester, Glacier View Ranger District

Neil Malkasian, Resource Forester, Talley Lake Ranger District

Alan Oneill, Acting Park Superintendent, Glacier National Park

Gerry Osborne, Snow Ranger, Talley Lake Ranger District

Becky Smith, Recreation Programmer, Flathead County, PSIA certified cross-country ski instructor

Skiers

Joe Ashor, beginning nordic skier

Steve Bergland, Flathead Nordic Ski Patrol

Brian Nichols, backcountry skier

Mark Shaply, backcountry skier

Members of the Glacier Nordic Club

Many skiers contacted at inventory sites

Nordic Skiing Industry

John Elliot, Nordic Skiing Consultant

Mike and Rhonda Fitzgerald, Glacier Mountaineering, Glacier Nordic Club

Al Hodges, Nordic Outfitter, East Glacier

Joe Ocker, Eagle Bend Golf Course

Don Scharf, Rocky Mountain Outfitters

Tom Thompson, Glacier Highland

Larry Vielleux, Izaak Walton Inn

Appendix B

Examples of Inventory Forms

DAY SKIING OPPORTUNITIES

'86

Site # 9 Name Garry Lookout Managed by Forest Service UMAD Date Jan. 1

(1) PARKING (Cascadilla Cr)

Plowed Spaces 8 by State Hwy Dept expandable to 0

Facilities (X) None

bulletin board ___ --> map ___ manners-rules ___ interp. ___
shelter ___ --> heated ___ restrooms ___
registration ___ handout ___ phone ___

(2) SITE AMENITIES (X), if absent nearest ___

bar 3 restaurant 15 grocery 15
patrol ___ lessons ___ hot tub, sauna ___
ski rental ___

(3) TRAILS AND TRACK

Groomed: (N) Y--> frequency _____ quality H M L
type K's: T ___ D ___ S ___ Sk ___ total ___

Ungroomed: K's 8 --> Ski tracks C (U)

(1) Total K's 8+ % trails: Ea ___ More 100 Most ___

Telemarking: Ex (Go) Po None distance from parking 5 K's

Facilities (X) None

markers: route ___ direction ___ location ___
difficulty ___ distance ___ interp. ___
rest areas ___ shelters ___ --> heated ___ bathrooms ___
lighting ___ --> K's ___

(4) OTHER

snow cover 1p --> 5e 4 Avalanche Danger H M (L) N

Fee type None, \$ ___ per ___ ROS class RN

Parking CC ___ Trail CC ___ Est. seasonal use 50

Notes: (1) Two roads constitute aproximately 7 k's, in addition there are fire lines and a powerline corridor which may be skiable depending on conditions and at least Advanced intermediate ability. Same applies to Cascadilla Creek - one way F.S. system trail accessed from same general parking area, trail (old road) hasn't been worked in ten years.

(5) Terrain A graded road to the top of a small
mountain, little variety, the up-down syndrome.
Fairly steep slopes away from road, some are
skiable through open woods. A nice track makes
for fast downhill.

(6) Vegetation Most of area is part of Crystal Creek
Fire (84), some salvage logging occurring but
otherwise open woods for the most part, some
track lodgepole, mostly spruce - fir...at top.

(7) Sights and Attractions Beautiful view of Park and Great
Bear Wilderness from top-end of road. Was a
lookout site at one time.

(8) Construction - Maintenance Roads were clear, might
consider maintaining Cascadilla Cr. trail a little
more frequently for variety.

(9) Future, Negatives, Other View from old lookout the
main attraction.

DAY SKIING OPPORTUNITIES

Site # 11 Name Eagle Bend G.C. Managed by Country Club Date 5/15/86 (^{*1})

(1) PARKING

Plowed Spaces 20 by the club expandable to 100+

Facilities (X)

(^{*2}) bulletin board ___ --> map ___ manners-rules X interp. ___
shelter ___ --> heated ___ restrooms ___
registration ___ handout ___ phone X

(2) SITE AMENITIES (X), if absent nearest ___

bar ___ , 1 mile restaurant ___ , 1 mile grocery ___ , 1 mile
patrol ___ lessons X hot tub, sauna ___
ski rental ___

(3) TRAILS AND TRACK

Groomed: N (Y-->) frequency ~ bi weekly (^{3*}) quality H (M) L
type K's: T ___ D ___ S X Sk ___ total 4

(^{4*}) Ungroomed: K's ___ --> Ski tracks C L U

Total K's 4 % trails: Ea 50 More 25 Most 25

Telemarking: Ex (Go) Po None distance from parking < 1 K's

Facilities (X)

(^{5*}) markers: route ___ direction ___ location ___
difficulty ___ distance ___ interp. ___
rest areas ___ shelters ___ --> heated ___ bathrooms ___
lighting ___ --> K's ___

(4) OTHER

snow cover 1p --> 5e 2 Avalanche Danger H M L (N)

Fee type None , \$ ___ per ___ ROS class R -> U

Parking CC 50 Trail CC ___ Est. seasonal use 500

Notes: (1) interview Joe Ocker, contracted independent agent for all ser.
(2) Only pro shop open one day per week, plus wax guys and them.
(3) Grooming by county, on call basis when they do Earth's.
(4) Available, but discouraged to prevent damage to golf course.
(5) Bridges on cart paths used over water ways

(5) Terrain Good variety of topography, used for running enjoyable trails

(6) Vegetation Typical Golf course, some mixed conifer woods on ridge which trail goes through.

(7) Sights and Attractions Many good views of Jewe' Pass - part of Swan Range. Located next to Swan River and near Flathead Lake. Eagle sightings frequent as are Grouse and deer

(8) Construction - Maintenance Routes take advantage of cart paths, fairways, bridges over man-made lakes.

(9) Future, Negatives, Other Plans for significant expansion next year, including more trails, own grooming equip., ski rental etc. Fairly long history of public use when there is snow.

186

Field visits 11/30

1/13

1/14

2/20

DAY SKIING OPPORTUNITIESSite # 13 Name Izak Walton Managed by Izak Walton Date _____

(1) PARKING

(Essex)(Forest Service Land)Paris Service Dispersed opportunity.Plowed Spaces 50 by the Inn expandable to 75Facilities (X)bulletin board X --> map X manners-rules X interp. X
shelter X --> heated X restrooms X (railroad Paris)
registration X handout X phone X(2) SITE AMENITIES (X), if absent nearest _____bar X, _____ restaurant X, _____ grocery _____, 1 mile (skiable)
patrol _____ lessons _____ hot tub, sauna X
ski rental X

(3) TRAILS AND TRACK

Groomed: N (Y-->) frequency when needed, approx. every other day quality H (M) L
type K's: T _____ D 15 S 5 Sk 6 total 20(1)*(2)* Ungroomed: K's 10+ --> Ski tracks (C) L UTotal K's 30 % trails: Ea 50 More 30 Most 20Telemarking: (Ex) Go Po None distance from parking 9 ¹⁰ K'sFacilities (X)markers: route X direction _____ location X
difficulty X distance _____ interp. _____
rest areas _____ shelters _____ --> heated _____ bathrooms _____
lighting _____ --> K's _____

(4) OTHER

snow cover 1p --> 5e 5 ⁽³⁾ Avalanche Danger H M (L) NFee type None, \$ _____ per _____ ROS class BN -> R(4) Parking CC _____ Trail CC _____ Est. seasonal use 5000Notes: (1) Room for skating - although not specifically groomed for on wider trail(2) Lots of nearby skiing continue on trails into park and Great Bear Wilderness can literally ski forever - merge into overnight-camping trips, lots of backcountry opportunities.(3) Avalanche danger increases to extreme the farther you travel in backcountry from Izak Walton.(4) Additional limited parking available at Walton Ranger Station across highway.

(5) Terrain Network runs through two steep, rather narrow drainages, most trails are not built for skiing, are graded, thus the up-down road syndrome. Part of super steep challenging terrain, skins and avalanches if you want. Some sections of existing network may be too steep and involve a safety problem.

(6) Vegetation Both Essex and Dickey Cr drainages have been extensively logged in the past. Dickey Cr is brushy, Essex Creek still has some big spruce trees, and dense woods. For the most part a nice variety of surrounding vegetation.

(7) Sights and Attractions Nice, but not exceptional views of ridgeline both in Park and Great Bear Wilderness. Essex creek is a pretty, year-round stream. Not much wildlife in area. Trail down by Middle Fork of the Flathead offers nice view of river. Good place for railroad buffs.

(8) Construction - Maintenance No mechanical maintenance allowed in the Great Bear Wilderness, trails here and in Park are not groomed, otherwise some clearing of blowdown every year. Some steep - salty problems to be addressed. Some parts of current trail network are on private land.

Railroad tracks and highway pose obstacles.

(9) Future, Negatives, Other Major plans for expansion, upgrading of trails and grooming in Essex Creek, warming hut and rest areas could be added as well as other expansion. Potential for a healthy, full scale nordic touring center by 1990.

Appendix C

Map of Inventoried Sites

Map in Back Pocket

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