

PARK PLANNING AND WILDERNESS PERCEPTION

by

GERARD CHESTER BENTRYN

B. A., Newark State College, N. J., 1970.

Accepted by the Faculty of [redacted]

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in the Department

of

Geography

We accept this thesis as conforming
to the required standard

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ACKNOWLEDGEMENTS

I wish to thank my supervisor, Dr. Bryan Farrell, for his assistance in the development of this thesis. I must also thank Dr. Robert Lucas and Mr. Robert Ahrens, of the U. S. Forest Service and the British Columbia Parks Branch respectively, for their advice and aid. I thank Mr. J. Masselink of the planning department of the British Columbia Parks Branch and the workers at the Parks Branch Workshop who provided much appreciated assistance.

My special thanks to my wife, Joan, who helped me conduct my field survey and who typed all the drafts of this thesis, and to my young son, Ian, for his perserverance. My thanks also to Camilla and Rodney Mitchell who proof-read the final draft. I thank Mr. John Bryant for his advise on the design and execution of the maps, and to Mr. Ian Norie, who also advised me on map design and who printed the maps and photographs.

I am grateful for the support of a University of Victoria Fellowship which made this study possible.

Supervisor: Professor Bryan H. Farrell

ABSTRACT

The changing patterns of outdoor recreation, coupled with the startling increase in numbers of recreationists, has resulted in a multiplicity of conflicting ideas as to what wilderness is and how it should be managed. In an attempt to clarify this problem, the interaction of the park site and the recreationists' perceptions of the park are studied.

The attitudes and perceptions of hikers in Strathcona Provincial Park are examined. A composite mental picture of the park and its trails is developed and mapped. This composite mental picture is then compared with the features of the site. Two of the trails, the Elk River Trail and the Forbidden Plateau Trail, having been subjected to intensive field study, are examined to see what relationships exist between trail features and the points at which hikers believed they had entered wilderness.

It is clearly shown that hikers' perceptions of the areas they visited differ greatly from their attitudes towards parts of the park they had not seen. When estimating the probability of the existence of wilderness in the unseen areas, hikers indicated the need for a minimum distance from roads and boundaries. When describing where they felt they had entered wilderness, hikers indicated that distance was unimportant, as long as some other barrier between wilderness

and non-wilderness was provided.

Changes in trail character appear to act as perceived barriers or "doorways" into wilderness. By utilizing site features properly, it is possible to route trails in such a way as to create these perceived doorways, rather than leaving their location to chance. It is possible therefore, to maximize user satisfaction by locating these perceived doorways close to the trail head.

Maximum utilization of present parks will help to keep these facilities from being overwhelmed by the growing tide of recreationists.



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INTRODUCTION

Increasing numbers of people have come to realize the rarity of a landscape unaffected by man. With this realization, wild areas have come to be valued as a refuge from the pressures of urbanization, pollution and the sheer cacophony of modern human existence.

The term "wilderness" has lost its earlier negative connotation and has come to be synonymous with the entire spectrum of values which form the goals of the new army of recreationists. However, the fact that the term wilderness encompasses such a wide variety of often contradictory meanings, contributes to many park planning and management problems. Simply asking people what constitutes wilderness leads only to confusion, as conflicting personal values negate each other.

By combining wilderness perception study techniques as developed by Robert C. Lucas, with an analysis of park characteristics, this study attempts to discover those features of a park and its trails which are most significant in determining the perceived wilderness of hikers. The decisions relating to the development and management of wilderness parks are therefore made less ambiguous. Specific recommendations are made concerning park design and trail planning in general, and for Strathcona Provincial Park in particular.

A wilderness perception study was carried out in the

Fall of 1971 using a mail questionnaire. The names and addresses of the respondents were collected at self-registration stations at the beginning of each trail. During the same hiking season, detailed surveys were conducted on the Forbidden Plateau Trail and the Elk River Trail. The trails were drawn in longitudinal cross section and annotated with all features noted during the field survey.

The comparison of perceived wilderness entry point* distributions between the individual trails, and between the trails and the questionnaire responses, provided the most meaningful results of this study. Of somewhat more limited value was the section of the study which examined hiker's attitudes towards those parts of the park they had not seen. The areas delineated by hikers as being wilderness were correlated with park features. The simplicity of the factors which determined "perceived" wilderness in these cases was incongruous with the effort involved in their determination.

* Perceived wilderness entry points -- are those places along a trail where hikers indicated that they believed wilderness began. They are referred to in detail in Chapter V.

CHAPTER I

WILDERNESS

What is Wilderness?

One might as well ask, "What is beauty?," and reasonably expect each person questioned to answer differently. Yet, within every culture there is relative agreement as to what constitutes beauty and ugliness. So too, in our culture there is much agreement as to the combination of conditions that can be called wilderness. When Audubon or Natural History magazines advertize wilderness outings, there is obviously sufficient agreement as to the meaning of the term wilderness, that both advertizer and reader understand its meaning. The attempts by conservation groups to protect specific areas from development on the grounds that they are wilderness areas of unique value, demonstrates again, agreement within at least a segment of the population as to what wilderness is. Finally, the creation by the U. S. Forest Service of areas managed as wilderness, shows that those who believe in the protection of wilderness, have enough political power to obtain a voice in land management decisions. This power could not have been achieved, if wilderness did not have sufficient common meaning to allow common action.

It is in the translation of concept to reality, that a dichotomy of ideas arises. For with the creation of statutory wilderness, the ephemeral nature of conceptual wilder-

ness becomes evident. Now that specific areas have been labelled wilderness, the meaning of wilderness is no longer so all-encompassing. The term wilderness which once described a negative and undesirable state of nature, has evolved to mean a condition of nature sought after by increasing numbers. This shifting from a negative to a positive value cannot continue in the future. The legal definition of wilderness has both narrowed and frozen the concept of wilderness. More important is the question inherent in the legal interpretation of the original concept; -- how closely does a designated wilderness area meet the individual preconceptions of those who are responsible for its creation? Is there enough agreement among wilderness enthusiasts to allow any one area to satisfy the full range of desires? In an attempt to answer some of the questions that arise, both sides of the physical -- conceptual dichotomy will be examined.

Physical Wilderness

Whenever men have attempted to state the basic physical preconditions for wilderness, the concept of area size, and/or its correlate, distance from roads arises. Aldo Leopold, in 1921, spoke of areas over 500,000 acres.¹ L. F. Kneipp specified a roadless area of 230,000 acres in 1926, but was overruled by Chief Forester, W. B. Greeley of the U. S. Forest Service. Greeley did not feel that size was important.² However, in 1936, Robert Marshall called for minimum roadless areas of 500,000 acres in arid areas, or 300,000 acres in

forested areas.³ When the U. S. Forest Service issued regulation U-1 in 1939, 100,000 acres became the minimum area for officially designated wilderness areas in national forests.⁴ The U. S. Park Service is far less restrictive, calling for a minimum distance of one-half mile from any road. There is no attempt here to imply that area or distance are the only, or even the primary criteria, in each of the above cases. The persistent appearance of these terms in these and other wilderness definitions, shows how deeply this concept has permeated the thinking of recreational planners.

Greeley's disagreement with Kneipp raises an interesting point; "The size of the wilderness area is not, in my judgment, important or subject to standardization. It must be determined by natural factors and roads needed for protection."⁵ The U. S. Park Service seems to agree with this when they say, "The quality of wilderness is experienced within an expansive roadless area, in a narrow glen, or even close to a major highway, if shielded from the effects of mechanized civilization."⁶

To the U. S. Forest Service, size and distance are an absolute prerequisite for the existence of wilderness. Yet, the U. S. Park Service is satisfied that wilderness can exist within any area which is further than one-half mile from all roads. The management decisions of these two U. S. Government agencies are bound to be quite different; -- which decisions are more appropriate to the real situation? Does the minimum size requirement mean that much genuine wilderness

that is under the Forest Service jurisdiction is left open to commercial use, because it has been bisected by roads? Or conversely, do Park Service management criteria allow road construction into wilderness areas resulting in their destruction.

"Wilderness is Also a State of Mind"⁷

Apparently realizing that wilderness is not a physical property of an area, but rather a value imposed by man, Robert C. Lucas embarked upon his pioneer study on wilderness perception.⁸ By going to the recreationists who used the park and asking them where they entered wilderness, Lucas was able, for the first time, to obtain a picture of how the public saw a park. After mapping his data, Lucas obtained a wide range of insights into wilderness perception. But, most important to this discussion is his statement that, "Remoteness - distance from the access point or end of the road - did not have any apparent effect on wilderness perception."⁹ Lucas was working in an area where rivers and lakes constituted the "off the road" routes. Consequently, when he speaks of distance, he speaks in terms of the sequence of lakes from the road into the interior, and not in terms of miles traveled. This tends to make comparison of his observations with the Forest Service and the Park Service criteria difficult.

Another possible consequence of studying an area used primarily by canoeists and boaters, is the user's tolerance

of logging. As long as logging is kept well back from the banks, it is extremely difficult to notice in such a relatively flat area.

Hendee, Catton, Marlow and Brockman, developed what they call a "wildernism scale."¹⁰ Factor analysis was used, to produce and identify clusters of statements dealing with wilderness management, formed when respondents were asked to indicate their preferences. They labeled as "antiartificialism (a negative response by wilderness purists)," hikers' attitudes toward the inclusion of such things as "private cottages," or "campsites with plumbing," within wilderness areas. Although this factor ranked as second in importance, the factor they call "escapism," which includes "remoteness from cities," "absence of people," and "vast areas and enormous vistas" was ranked last in importance. First in importance was what they labeled, "Spartanism . . . the emotionally refreshing Spartan-like type of existence implicit in wilderness use."

A far more significant deterrent to the perception of wilderness than logging, was what Lucas called, "inappropriate recreational use." For example, he found that the presence of power boats on a lake greatly lessened the percentage of users perceiving wilderness. Sommarstrom reaches much the same conclusion when he states, "Respondents seemed to object less to the number of hikers than to the evidence they have left of their presence."¹¹ This is also noted by Juurand.

Trampled vegetation, muddy trails, and refuse may be associated with crowding even though there is no one present other than the observer. Crowding therefore is not only the simultaneous presence of other recreationists, but also consists of evidence of previous use by recreationists. (12)

Priddle's Views of Wilderness

G. B. Priddle, working in Algonquin Park, Ontario, modified Lucas' approach. Instead of asking users where they had entered wilderness, and interpolating values between the observed points, as did Lucas, Priddle asked users to identify those parts of the park they considered to be wilderness. Even though users were asked to evaluate areas with which they were not familiar, Priddle states that, ". . . this was the respondent's perceived wilderness." He goes on to say that, "Lucas was inferring people's 'Wilderness' from a few isolated points." Priddle also says that, "In spite of these differences the results were similar and the maps from both studies illustrated the same factors as being critical in determining 'Wilderness' or 'Non-wilderness'."¹³

However, when Lucas' maps are compared with Priddle's, there are clear differences. These differences can best be illustrated by contrasting Lucas' map of paddling canoeists, with Priddle's map of canoeists.¹⁴ It should be mentioned that Lucas differentiated between canoeists using motors and paddling canoeists. On Lucas' map, there are isolines indicating where ten, fifty, and ninety percent of the users perceived wilderness, respectively at each point. These

isolines are often parallel and often adjacent, (apparently one mile apart). Even in those areas where this is not true, the intricacy and alignment of the isolines of perception have little in common with those on Priddle's map. On this map, different values are ascribed to the isolines, but this does not obscure the fact that the pattern resulting from this study is far less intricate, and with almost no sign of parallelism of isolines. This seemed to indicate that despite the apparent similarity of the two studies, they were measuring different things. Just what these things are, and their relative importance, later became evident.

Most significantly, if Priddle's map is used as the criteria, remoteness and size are very important to user perception of wilderness. For in this case, there is a distance component to wilderness perception. This is demonstrated by the consistently greater distance between isolines of perceived wilderness shown on Priddle's map in comparison with Lucas' map.

Why the differences between maps? Also, why the variation in distance between isolines on Lucas' map?

Juurand's Examination of Wilderness Trail Characteristics

In an attempt to find which trail features or characteristics had the greatest effect on wilderness perception, P. Juurand asked hikers if they had entered wilderness while hiking. The percentage of users who considered the area to

be wilderness was made the dependent variable in multiple regression analysis. Such trail characteristics as elevation gain, trail length, and use, are examined together with seventeen other variables.

The level of explanation contributed by the trail characteristics was insignificant. Juurand concludes:

Thus by including a description of the environment in the analysis, statistical explanation of satisfaction in wilderness recreation has not been increased by an appreciable amount. The fact that presence or evidence of other recreationists seems to have the greatest effect of wilderness perception confirms findings in the earlier canoeing wilderness by Lucas and Priddle, (15)

Park Planning and Wilderness Perception

In speaking with park administrators in the British Columbia Parks Branch, a prime concern seems to be the anticipation of increasing numbers of users of a relatively fixed amount of parkland. Their problem is how to satisfy more recreationists with the land they already have.

From this standpoint, the wilderness user appears to be a wasteful consumer. For if he is only satisfied with large roadless areas, and if only a minimal percentage of the wilderness users find their wilderness within the first mile, or a few miles of the trail beginning, then, it is obvious that there exists around each large roadless area, a belt of land which is useless to most recreationists. Useless because it is too close to the access point to satisfy the hikers.

Unuseable by the car camper because if it were to be developed into campgrounds, camp sites, or parking areas, the effect would be to shrink further the wilderness of the hiker.

But what of Lucas' findings that remoteness is not a primary factor in wilderness perception? That inappropriate use is far more significant? What about the utilization of the physical characteristics of the site? Can inappropriate recreational use be separated from more appropriate use by wise utilization of the available terrain? Or is the answer to be found in the re-education of North American hikers so that they will be satisfied with far less wildness in their wilderness, as are their European counterparts?

These are problems of management unrelated to those of size and distance. Area size is determined initially and is often difficult to modify. The best use of the site is what management is all about.

CHAPTER II

RATIONALE AND PLAN

Past studies indicate that the factors of distance, remoteness, and area size, are not particularly related to perceived wilderness. Yet, large areas of the U. S. Forest Service lands are managed as if these factors were of paramount importance. Furthermore, there exists the apparent conflict between Lucas' and Priddle's maps.

Lucas found that logging which was unobtrusive, was less of a limiting factor to the perception of wilderness than were other types of recreationists, whose activities were conflicting. This is paralleled by Sommarstrom's finding, which was noted earlier, that it was not the number of other hikers that individual hikers found objectionable, but rather the "signs of their presence."

On viewing these findings, it was felt that it should be possible to combine the techniques utilized by Lucas and Priddle to see if they were indeed measuring the same thing. At the same time, it was necessary to investigate the possibility that certain characteristics of the areas utilized by wilderness users, were of some importance in determining wilderness perception.

Area Characteristics

Lucas found the effects of logging to be inconsequential, primarily because it was relatively unnoticeable. This was a consequence of the low viewpoint of the canoeists, and of the relatively flat terrain. Both the route level and the flatness are physical characteristics of the area. It is not difficult to see that dense vegetation will tend to separate, both visually and audibly, different or conflicting recreational activities. Rock or compact soil will be more resistant to trampling, footprints, and erosion. Also, high local relief may tend to screen recreationists from each other, or it may have adverse effects, as when logged areas are visible from a distance. Finally, the trio of distance, size, and remoteness are also characteristics of an area; and as such, can be compared with other characteristics to see which, if any, are most important.

Hypothesis

The hypothesis to be tested is:

That the observable characteristics of an area are more significant determinants of user perceived wilderness than are area size, cross sectional distance, and remoteness.

Purpose of the Study

If observable characteristics are significant determinants of user perceived wilderness, and if their importance can be assured after the characteristics are identified;

both the establishment and management of wilderness parks can be carried out in a more rational manner.

Specifically, in the case of Strathcona Provincial Park, the site of this study, the development of a map of user perceived wilderness will be a guide for future administrative decisions. Those areas already discounted as being non-wilderness, will cause the least disruption in park values if they are utilized for any increases in non-primitive recreational facilities. Conversely, those areas with high wilderness ratings should be disturbed least of all.

Experimental Plan

A park was selected for study which had a reasonable potential for being considered wilderness by its users. It had to contain a wide range of possible deterrents to the perception of wilderness. The greater the variety of roads, mines, and similar features, the clearer the picture must be of their effects on wilderness perception. Chapter III describes the conditions within the park and shows how well it meets the above criteria.

With Dr. Lucas' permission, registration stations patterned after those he developed for the U. S. Forest Service were set up on the four active trail systems within the park.¹⁶ These stations were composed of a large white sign, three feet by four feet, mounted on a tripod, to which a message and an explanation were attached (Fig. 1).

Hikers were asked to fill out the names and mailing

SPECIAL BACKCOUNTRY STUDY
ALL VISITORS REGISTER
HERE

To protect and manage wilderness, we need to know more about you, the wilderness visitor - what you do, and what you think.

Write the name and address of each person over 16 in your party on a card from the box and drop it through the slot.

Some of you will be picked as sample visitors and mailed a questionnaire. If so, please complete it and send it back. Thank you.

Gerard C. Bentryn
Geography Department
University of Victoria

In co-operation with the British Columbia Department of Recreation and Conservation, Parks Branch.

Figure 1

addresses of all members of their party, sixteen years of age or older, on forms provided. The completed forms were collected every Monday during the period of the study, which ran from snowmelt to snowfall -- July 17, to October 13, 1971.¹⁷

More than 800 useable registrations were obtained. It is difficult to be precise, because while "Mickey Mouse" or other fanciful names could be discounted, there were many names without addresses and their validity is problematical. On this basis, it was estimated that roughly 1,000 hikers used Strathcona Provincial Park trails during the three month period of the study.

One member of each group that hiked in the park and registered was selected to receive a questionnaire. 255 persons met these criteria, and questionnaires were sent out to them on November 5, 1971. Of these, 195 were returned, or 76.5 percent.¹⁸

Questionnaire

The most important parts of the questionnaire were a pair of maps of the park, (Appendix 1). Respondents were asked to draw a line indicating the parts of the park they considered to be wilderness. A grid of 420 segments was superimposed over a master map of the park, and a smaller acetate grid of corresponding scale was superimposed over each questionnaire map received from respondents. Each time a grid segment was considered wilderness by a respondent, it

received a single score. Total scores for each segment were calculated and written on the master map. Isolines were then drawn connecting points of equal value, at ten percent intervals. One line showed where ten percent of the respondents considered wilderness to begin, another twenty percent, another thirty, and on to the eighty percent level.

Each segment was then scored for a variety of factors. Local relief, predominant vegetation, distance from roads, distance from boundaries, location of trails, mines, and powerlines, all were calculated and considered. These scores were then subjected to stepwise regression analysis with the respondent segment scores as the dependent variable.

Next, the respondent's maps were rescored; this time each map was scored only for the point at which each respondent felt he entered wilderness. Therefore, each respondent was answering the question on the basis of his actual experience. These answers were then plotted in relation to their distance from the beginning of each trail.

Building upon Lucas' concept of entrance points into wilderness, it was decided to see what relationship existed between wilderness entry points and those area characteristics experienced by the trail user.

Respondents were asked about their mental picture of the entire park, and their specific perceptions of the area with which they became familiar. By combining the techniques of Priddle and Lucas, it was possible to compare the results of each method.

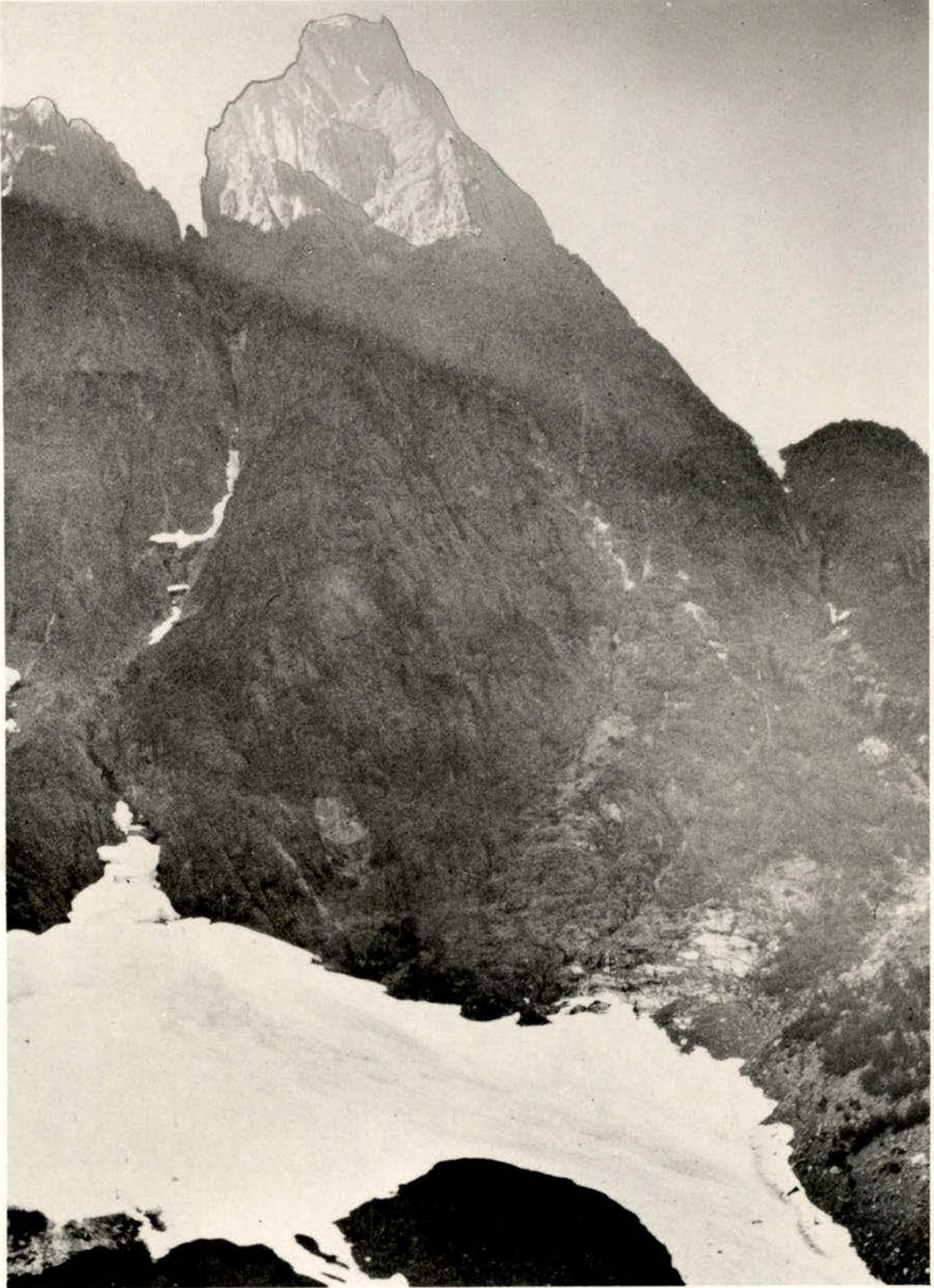
CHAPTER III

STRATHCONA PROVINCIAL PARK

Within the boundaries of Strathcona Provincial Park are the following: a highway; a hydro line; a reservoir; a mine, complete with paved access road; a logging camp and logging roads; substantial cut-over areas; and many, as yet undeveloped, mining claims. At the other extreme are the untouched parts of the park within the nature conservancy areas. These areas are as wild as any found as close as this to a metropolitan center, in North America. Rugged, sharply eroded mountains, form unconnected ridges poorly suited for hiking, -- unlike those of the Rockies or the Alps. Jagged and steep-sided, they allow minimal penetration by hikers (Plate 1.). In place of the rolling meadows of many mountain wilderness parks, these ridges more often serve as barriers between the darkened tree filled valleys. These in turn, are difficult to penetrate through the network of ^{logs} fir (Pseudotsuga menziesii), hemlock (Tsuga mertensiana), and salal (Gualtheua shallon).

In an assessment of the park, Trew states that:

Undoubtedly, Strathcona Park possesses scenery which is awe inspiring in its sheer ruggedness, but this very ruggedness is somewhat frightening. It is a very realistic display of the terrific forces of nature not just of the past, but even now threatening those who carelessly venture into these mountains.



Mount Colonel Foster at the end of the Elk River Trail illustrates the rugged character of the interior of the park. This photograph, taken from the glacier at 3,500 feet elevation, shows the near vertical rise to the peak at 6,810 feet.

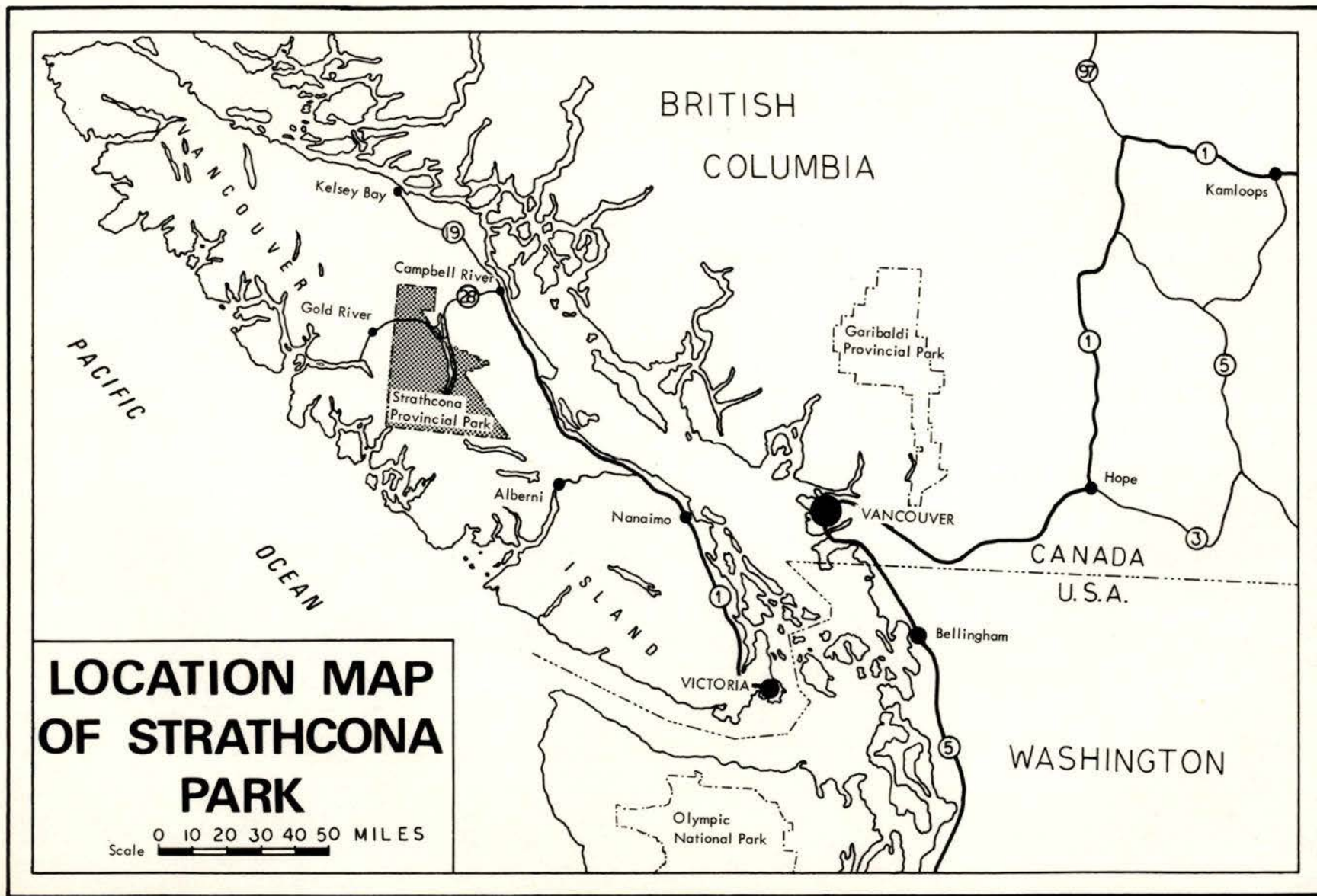
This psychological factor is important to consider in our recreational planning. It is important not only because we wish to provide the best type of recreation desirable, but because it is simply good business to invest our park funds where they will do the most good and be the most appreciated. The feeling of freedom, of being able to wander hither and yonder, is an important part of the enjoyment in the larger parks. This is readily feasible in the high alpine mountain ranges of most Dominion parks and our larger parks, but it is not so in Strathcona Park. The generally broken terrain will require considerably more trail work than in open alpine country to make the area easily and safely accessible to the average person. If the recreation values are high the expenses may be warranted, but this has still to be proven for much of Strathcona Park. (19)

This illustrates, that despite the mine pit and highway, Strathcona Provincial Park encompasses much that is still wild.

The park lies 170 miles north of Victoria, the capital of the Province of British Columbia, and even closer to Vancouver, the largest city. It is also within a day's drive of Seattle in the United States (Fig. 2).

However, the lack of trail development and publicity have combined to cause little use of the park by hikers. This is borne out by comparison of an estimate of approximately 1,000 adult hikers during the 1971 season, with 1969 estimates running as high as 2,000 skiers per weekend in the adjoining Wood Mountain Ski Park.²⁰ With the release this year by the Provincial Parks Branch of a descriptive pamphlet and map, many more prospective hikers will hear of the park. However, limited funding has prevented the extension of the present trails into anything like a functional system.

Figure 2



Thus, the newly attracted hikers may begin to crowd the available trails, although other areas in the park remain little used.

Created in 1911, Strathcona Park is the oldest of British Columbia's Provincial Parks. Its overall area is 530,000 acres, with 302,795 acres being included in the more completely protected nature conservancy areas.

Forbidden Plateau

The Forbidden Plateau was not originally a part of the park. Its 64,000 acres were added in 1967. The land was deeded from a railroad land grant to the province for use as a park, and excluded areas of marketable timber. The original holders, the Esquimalt and Nanaimo Railroad, stipulated that all mineral rights would be retained by the holding companies.

The established borders of the Forbidden Plateau addition reflect these conditions in that they follow an intricate and irregular line. When the present boundaries of the Forbidden Plateau addition are superimposed upon a topographic map, shaded to indicate forest cover, it becomes quite clear that almost all stands of commercially important timber have been excluded. Actual field investigation shows however, that the areas indicated on the map as being unforested are in fact, covered at varying densities with unmarketable Alpine Fir (Abies lasiocarpa).

Hydroelectric Development

With the construction in the 1950's of hydroelectric dams on the Campbell Lakes -- Buttle Lake system, the power potential of streams originating in the park was realized. The original decision to dam the streams and raise the lake levels did not include any plans to remove the timber which would be flooded. In other parts of the province where flooded timber has been allowed to stand, it is extremely unsightly; standing for years and making water sports activity difficult and hazardous.

Conservationists opposing any flooding of Buttle Lake, on the grounds that it lay within the park, compromised by acquiescing to the flooding, contingent upon a program of shore clearing. This clearing cost the province \$9,000,000.²¹

Despite this expenditure, at maximum draw-down in late summer, many stumps punctuate the wide expanse of muddy flats that separate the access road from Buttle Lake.

The fluctuating lake level, with resultant barring of tributary spawning gravels, together with tailings from Western Mines Ltd., has been blamed by area fishermen for an apparent decline in the number and size of trout in the lake.²² However, if the decline has indeed taken place, it may be the result of the larger number of fishermen who are now able to reach the lake as a result of improved road access.

Logging

Before the creation of the park, licenses to cut timber

had been granted by the Crown. (Timber licenses are no longer granted. All timber sold on Crown lands is now sold by sealed bids.) The majority of these timber licenses were purchased by the government from their private holders in 1929, in an attempt to preserve the integrity of the park. One of the major timber license areas within the park which was not repurchased was the lower watershed of the Elk River which flows into Upper Campbell Lake from the west. As the flooding of the lower valley by dam construction had already compromised the integrity of the area, repurchase of the timber license seemed unadvisable. This area was clearcut by the Elk River Logging Company in 1955.²³ The combination of the still active logging camp, logging roads, and miles of cut-over slash, separate the northern-most part of the park from the larger southern part. This separation was intensified by the construction of the Campbell River -- Gold River Highway, Number 28, parallel to an established Elk River Logging Company road.

Much of the land for which timber licenses had been repurchased in 1929, was utilized for timber trades later. (By trading off the park timber for potential park land owned by logging companies elsewhere, the province acquired prospective park sites without having to purchase them.) The majority of these exchanges are located near the park's borders, adjacent to company owned timber licenses and removed from public road access. An example of this exchange policy, is the controversial exchange of an estimated \$10,000,000. worth of

timber within Strathcona Provincial Park, for \$300,000. worth of land at Cape Scott at the northern tip of Vancouver Island.²⁴ In defense of this policy, the Parks Branch notes that the reported value of the timber does not take into consideration the cost of harvesting which in the above case, may be more than the value of the timber. Also, those areas which have been traded do not form an integral part of the parks they are in. One cut-over area which is visible from the highway is located on the east shore of Buttle Lake. Although a strip of trees has been left along the road, the cutting on the surrounding slopes is easily seen.

Mining

Although the park was totally protected from commercial use for its first seven years between 1911 and 1918, ambitious plans for lodge construction were drafted, but were abandoned with the advent of World War I. At the same time, mineral prospecting was allowed to begin. Some gold was discovered in the vicinity of Della Falls, which is Canada's highest waterfall. Near the south shore of Buttle Lake a relatively high grade of copper, lead, and silver ore was found.

In 1961, Western Mines Ltd. was permitted to mine within the park boundaries.²⁵ An access road was constructed along the east shore of Buttle Lake, and around its southern end. Tailings from the mine's operation were directed into Buttle Lake. This provoked the ire of conservationists, fishermen,

and the majority of the townspeople of Campbell River, who use the lake as a source of drinking water. Increasing amounts of metal salts have been detected in the water and in the flesh of trout caught in the lake, but authorities minimize any danger.²⁶ Roughly, in this same area between the existing mine and Della Falls, lies Cream Lake, where ore from silver claims is of minable quality.

Nature Conservancy Areas

Webster's New World Dictionary defines "park" as, "A large area known for its natural scenery and preserved for public recreation by a state or national government."²⁷ In the United States, this definition is on the whole true. The national and state parks normally are not logged or mined. Areas where economic development exists side by side with recreation, are generally called national or state forests to differentiate them from the more completely protected parks.

In British Columbia, in the past, large areas have been set aside as parks, but pressure for economic development has been so great, that mining, logging, and grazing have been allowed in many of these parks. Other parks have received more complete protection and more closely resemble the American pattern.

Faced with this multiplicity of degrees of protection, the decision was made to retain park status for all of the areas previously so designated. In order to differentiate

between the degrees of protection each type of park was to enjoy, a system of park classifications was developed. Class A Parks are highly protected and most closely fit the dictionary definition. Class B Parks allow multiple use and approximate American national or state forests. Class C Parks are operated by a board of local citizens for municipal recreational purposes.

Quite often within Class B Parks, there exist areas which are suitable for complete protection for recreation purposes. These sub-areas however, because of reasons of size, location, or administrative tradition, are seen as integral parts of the larger area. In order to afford these areas the complete protection needed for certain recreational uses without separating them from the larger administrative unit, various terms have originated. In the United States, the Forest Service manages these as "Wilderness Areas" or "Primitive Areas." In British Columbia, the Parks Branch has created the analogous term "Nature Conservancy Area." B.C. Those parts of Class B Parks which retain an unspoiled character and contain "outstanding examples of scenery and natural history," are given this additional protection.²⁸

In Strathcona Provincial Park three such areas were created; Big Den to the north, Central Strathcona, and Comox Glacier to the south-east.

Recreation

There are two developed campgrounds in the park. The

recently enlarged Ralph River Campground at the southeast end of Buttle Lake has tables, fire pits with grills, tent areas, and individual parking spaces. The same is true of the Buttle Lake Campground, at the northwest end of Buttle Lake. Both campgrounds provide pit toilets, and both are without piped water facilities. In 1970, 15,936 visitors used these campgrounds.

After roadside camping, fishing is next in popularity. Trolling with bait is the usual method, except when the fish move up the streams to spawn, at which time fly casting and spin casting bait or lures are popular. Buttle Lake has in the past been a good producer of rainbow trout.

Trout fishing is excellent in other lakes in the park such as Donner, McKenzie, and Moat, but these are accessible only by hiking trails.

Wilderness Use of the Park

Those lakes which are accessible to canoeists are also accessible to power boats. The only navigable river in the park, the Moyeha, is not approachable by road, therefore, wilderness canoeing is almost nonexistent.

The wilderness users of the park are primarily hikers and hiker -- fishermen. This of course ignores those users who, though not actually entering wilderness areas, are psychologically dependent upon the knowledge of the existence of nearby wilderness in order to enjoy their activities at the periphery of that wilderness. This includes the many

car campers and boaters who use the park.

Trail development consists of a network of trails upon the Forbidden Plateau area of the park; and outside the Plateau three individual trails, Elk River, Marble Meadows, and Flower Ridge, which are well marked and maintained (Fig. 3). Two other trails, which exist but are not maintained, are difficult to locate and are; the trail to Della Falls, and the trail to the Red Pillar.

The Elk River Trail and the Flower Ridge Trail were constructed by the Provincial Parks Branch. The Marble Meadow Trail was constructed by the Vancouver Island Mountain Ramblers as a club project.

The trail system on the Forbidden Plateau is the result of the combination of individual effort and club construction, superimposed upon trails laid out by the operators of the Forbidden Plateau Lodge when the lodge used the area for horseback trips for its guests. With the addition of the Plateau area to the park, the trail system was accepted as it existed and only minor modifications were made (Plate 2.).

The Plateau is by far the most popular hiking area, with more than half of the total number of hiker registrants being recorded here. This traffic has taken its toll with extensive accumulation of litter at some camping spots, and heavy wear on the trail itself. Four-wheel-drive vehicles have utilized the first part of the trail, with extensive erosion resulting on the slopes. There is also some administrative difficulty with trail bikes illegally using the trail. This

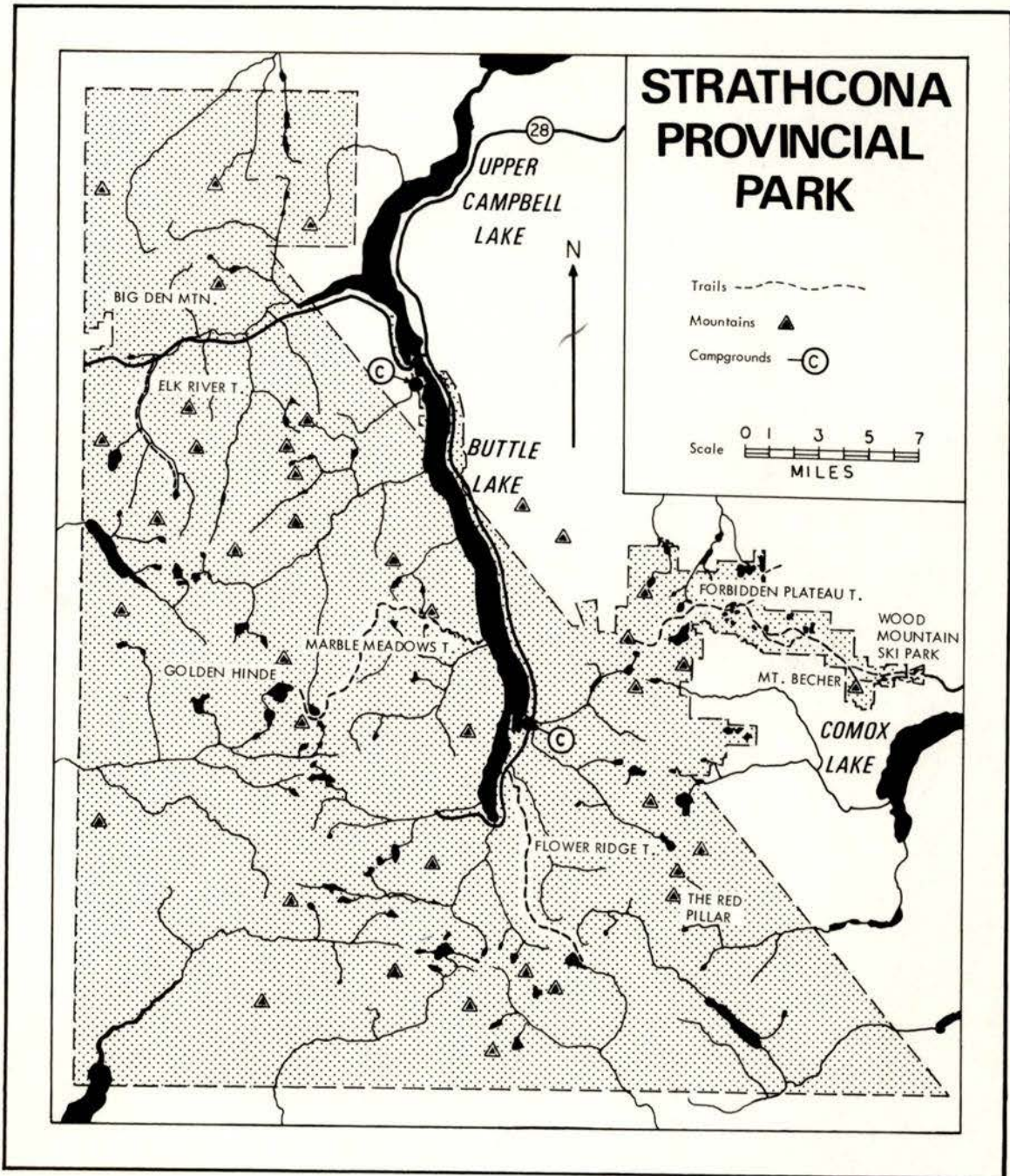


Figure 3



The first true meadow on the Forbidden Plateau Trail at 5.5 miles. Seventy-seven percent of the hikers believed they had entered wilderness by this point.

and litter were the most frequently received complaints from trail registrants. It was on this trail that the only true vandalism with the registration stations was experienced. Many fishermen hike into the area to enjoy a day of superb fishing in season.

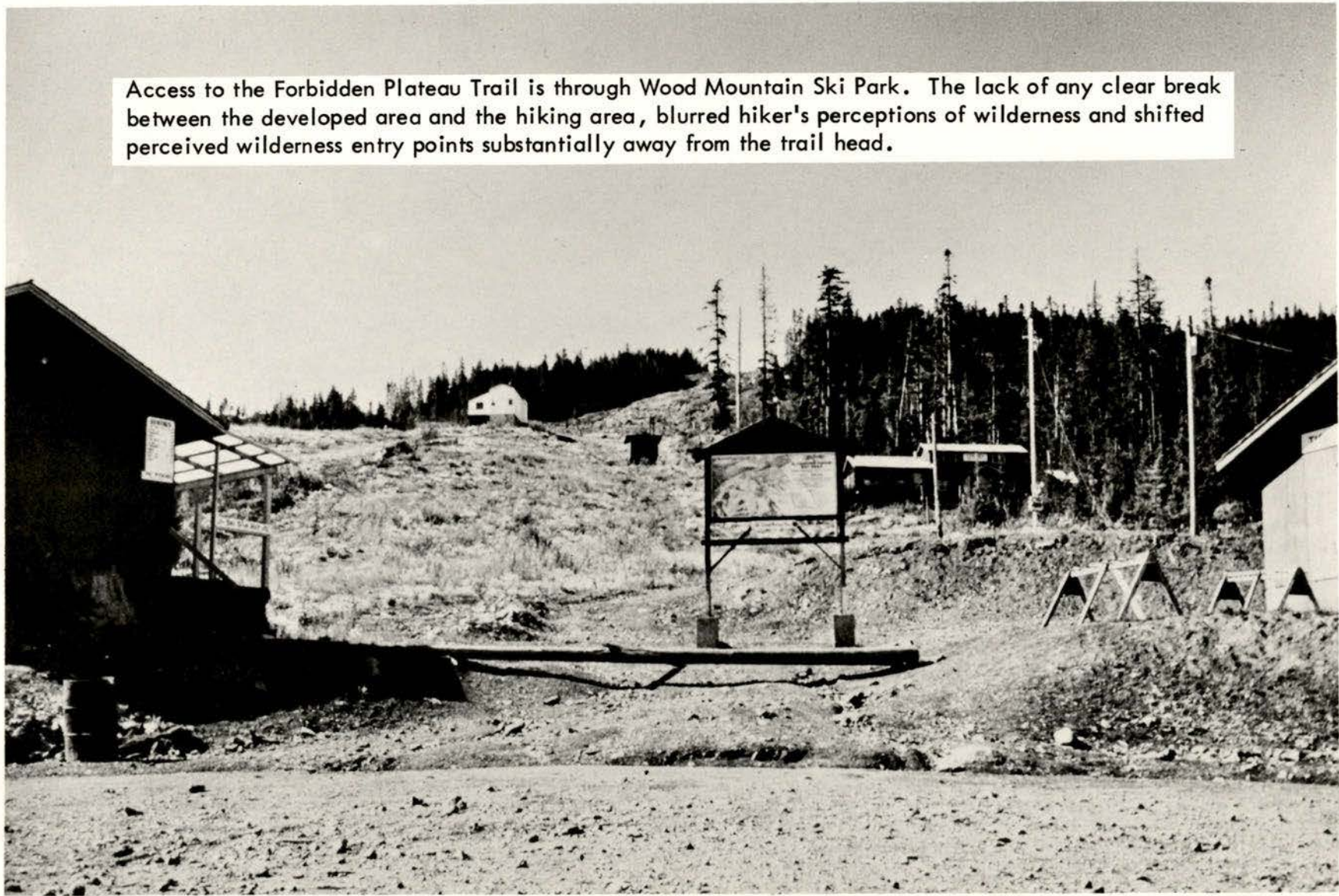
Extensive work has been done by clubs to provide bridges, cleared camping areas, poles, camp furniture, and rafts. This may offend wilderness purists, but was favorably commented upon by many registrants.

As the Forbidden Plateau is essentially an arm of the park protruding into an area of commercial timberland, there are other means of access in addition to the official trail. Fishermen in particular, use the surrounding private logging roads as a means of eliminating the long hike to the lakes. This easy access may be a reason for the occurrence of litter concentrations deep within the Plateau area.

A far greater proportion of hikers on the Plateau are day hikers, from Courtenay or Comox, than is the case with the other three trails. These day hikers usually were unwilling or unable to indicate what they considered to be wilderness areas on the questionnaire map.

The beginning of the Forbidden Plateau Trail is obscured by the ski area construction of the Wood Mountain Ski Park. Ski lifts, buildings, roads, and areas cleared for skiing, are scattered about with no clear sign of where the hiking trail starts (Fig. 3, Plate 3.). If the would-be hiker is unable to find the beginning of the trail at the parking lot,

Access to the Forbidden Plateau Trail is through Wood Mountain Ski Park. The lack of any clear break between the developed area and the hiking area, blurred hiker's perceptions of wilderness and shifted perceived wilderness entry points substantially away from the trail head.



he can purchase topographic maps and be given information at the Forbidden Plateau Lodge about one mile from the park.

Prospective hikers on the other trails in the park are not this fortunate. The Flower Ridge Trail is usually marked with tape and a rock cairn at the side of the road. But, there are no signs or other trail information available in the park. The Marble Meadows Trail has several signs at its beginning, but this is on the opposite side of Buttle Lake from the area where one must park and launch a boat or canoe. No information is provided at the launching point as to where the trail lies.

The Elk River Trail is even more difficult to find. Maps indicate that access is possible from the main highway. In actuality, it is necessary to drive two miles along a posted private logging road, parallel to the highway, and then, to turn off at an unmarked intersection. At the end of the summer, tape banners guided the hiker across a power-line cut to the trail, but earlier in the season the tape banners were missing. These conditions resulted in several respondents indicating that the trail they used was their second choice, as they were unable to find the trail they originally chose.

CHAPTER IV

USER PERCEIVED WILDERNESS
WITHIN STRATHCONA PROVINCIAL PARK

To develop a picture of perceived wilderness within the park, a user-based rating system had to be developed. As it was hoped to compare the work of Priddle and Lucas, Priddle's method of analysis was used for this first step. This involved the division of the park into segments by superimposing a grid overlay. When a hiker indicated on his questionnaire map the area that he considered to be wilderness, the corresponding numbered grid segments, as observed on a clear plastic overlay sheet, were noted and recorded.

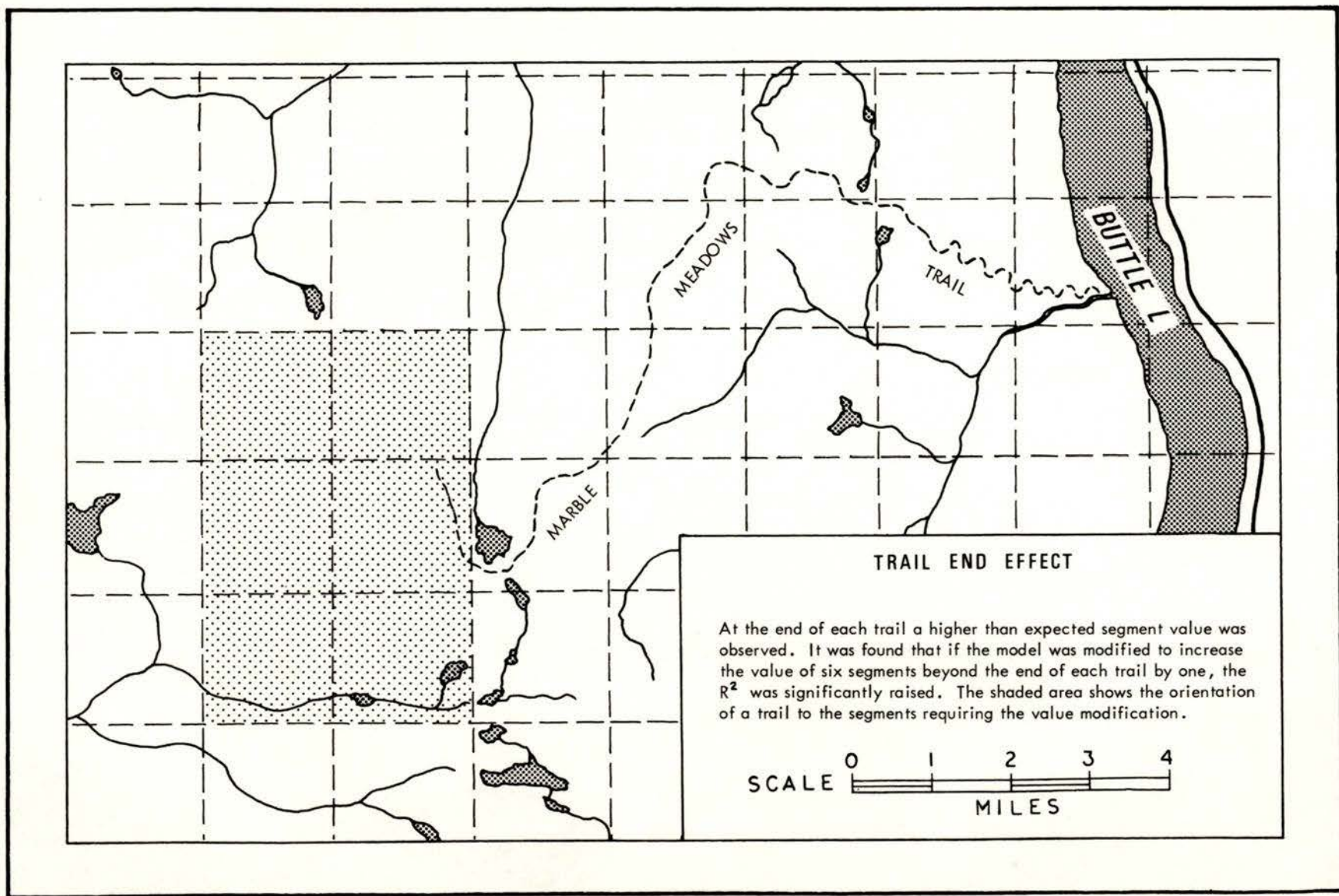
As an aim of this study was to discover any existing relationship between perceived wilderness and the physical characteristics of the area, it was necessary that the grid segments be of an optimum size. Priddle's maps indicate the use of a fairly coarse grid segment size. Apparently he did not consider grid segment size to be critical, because he does not mention either the area of each segment, or the number of segments he used. It became clear that if each segment was scored for its physical characteristics, it would mean that each grid segment should contain a coherent assemblage of physical features. A segment large enough to contain both an isolated valley, and a highway, would not be a good

choice. Similarly, a segment which showed little local relief because it encompassed a small area, either on a ridge or a valley bottom, would not present a true picture for analysis. Reasoning that a segment which encompassed either a cross section of a valley, or of a ridge, would be satisfactory, — an average of valley to valley and ridge to ridge distance was determined. This average distance of one and one-third miles was made the length of each grid segment side. The resulting grid was plotted to slightly overlap the boundaries of the park, and resulted in the creation of 420 segments (Fig. 4).

Questionnaire Scoring

Using this grid pattern in the manner outlined in Chapter II, perceived wilderness scores for each grid segment were obtained. By converting these raw scores into percentages of the number of respondents answering the map question, it was possible to interpolate the location of isolines showing the percentage of hikers perceiving wilderness at that point (Fig. 5).²⁹ The map of perceived wilderness that resulted, closely resembles those developed by Priddle. While the result is interesting and may be of use in developing a plan for Strathcona Provincial Park, its interpretation must be subjective and there is no precise way to utilize this information in another park. What was wanted was a way to predict the results of a survey of this type so that it would be possible to construct a park model in the laboratory and derive

Figure 4



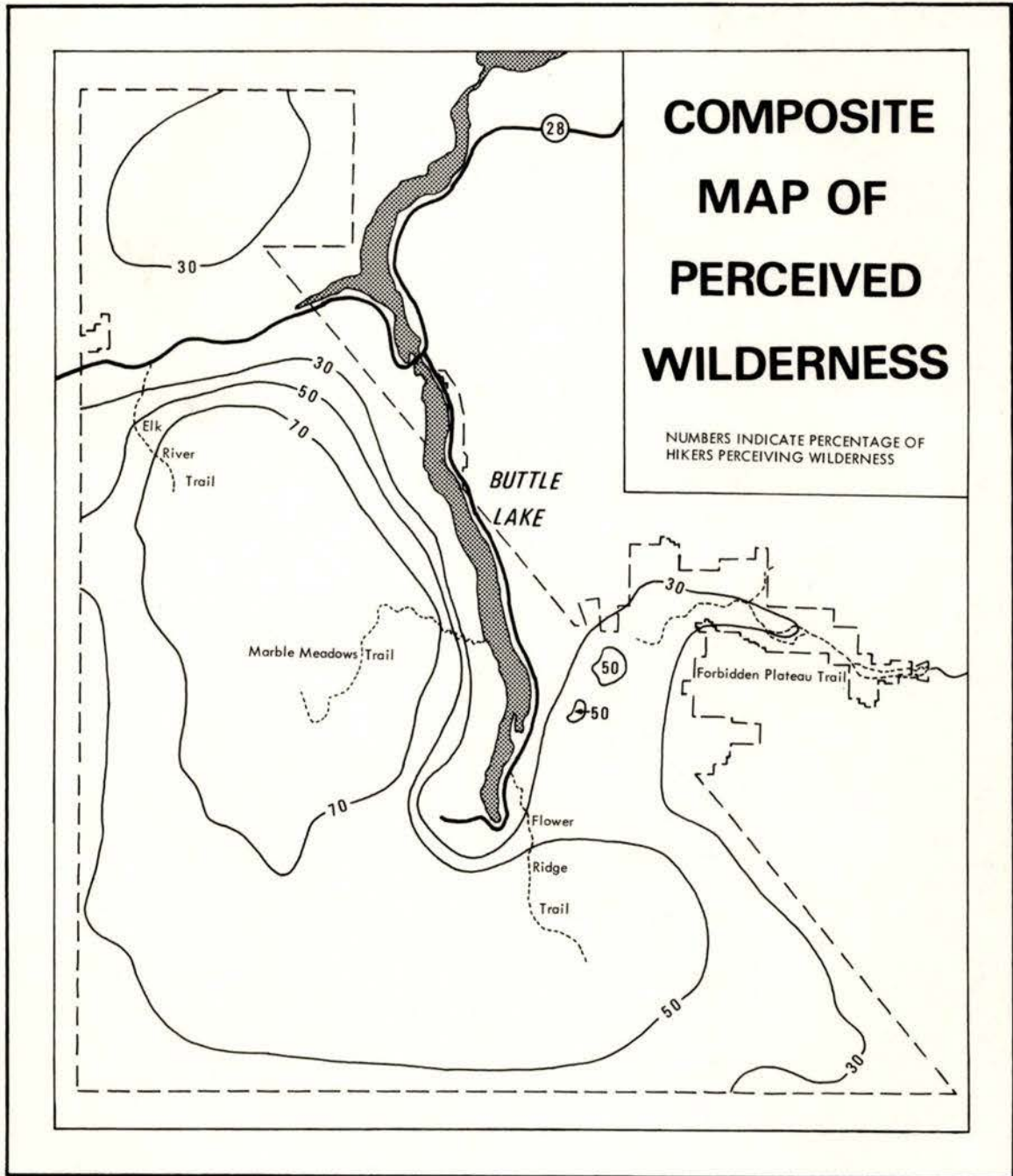


Figure 5

a predictive picture of user perceived wilderness.

Development of the Model

In the development of all models, a balance point must be reached, at which the model retains sufficient complexity to insure accuracy in varying situations; while retaining sufficient simplicity to justify its existence as a clarifier of reality. That is, to explain the greatest amount with the simplest formula. Striving for this simplicity, the segments were scored for physical characteristics.

Using the map of perceived wilderness (Fig. 5), it became quite clear that certain physical characteristics were unrelated to user perceived wilderness. Local relief, for instance, fluctuated over a narrow range of values per grid segment. Except of course, for those segments which encompassed only water. There was absolutely no relationship discernible between clearly patterned perceived wilderness values and the amorphous patterns developed by plotting local relief per segment.

All the area characteristics which were considered, were plotted and compared with the map of perceived wilderness. If the resulting pattern appeared to be unrelated to the perception map, the area characteristic was not considered further. This element of subjective interpretation at this point in the analysis was necessary to preserve the simplicity of the resulting model.

Under this criterion, dominant tree species per segment

was rejected, as was the location of the tree line (altitudinal limits), segments containing glaciers, and segment distance to the nearest town.

The Effects of Roads and Boundaries

The thirty percent isoline on the map of perceived wilderness, bears much of the same relationship to the park boundaries and roads as a water table does to the physical surface above it (Fig. 5). In each case, the resultant "subdued relief" indicates a possible cause and effect relationship. This same effect is true of the other perception isolines, and therefore, it is also true of the perceptions of the hikers.

Subjectively then, the indications are that park boundaries and roads are prime negative determinants of perceived wilderness. To verify this observation mathematically and to develop a model, it was necessary to score each grid segment for its distance from the nearest road and its distance from the nearest boundary. The road scores, and the boundary scores considered singly, resulted in poor agreement with the map of perceived wilderness. For example, a segment located near the south end of Buttle Lake might have a high value based on its distance from the nearest boundary. However, very few hikers considered the area to be wilderness (Fig. 5). This problem was easily dealt with by combining the road and park boundary scores. In each segment, the lower of the two possible values was considered significant. The higher value

was ignored.

It can be seen that the thirty and fifty percent isolines cross the boundaries in several places (Fig. 5). Indeed, the thirty percent isoline extends beyond the park boundaries in most of the western and southern parts of the park. In no case do any isolines cross a road. Therefore, the logical conclusion is that roads have a far stronger negative effect upon wilderness perception than do park boundaries. Obviously, a differential method of segment scoring had to be developed in which distance from roads was more significant than distance from park boundaries.

Although the map of user perceived wilderness was useful up to this point in the conceptual development of a model, in order to more precisely determine the relative effects of roads and boundaries it was necessary to refer to the original segment scores obtained from the questionnaires. In the southwestern area of the park where road distance segment scores were highest (indicating that the boundaries were the prime negative determinant), lines were drawn perpendicular to the park boundaries. The change in value of user perceived segment scores was then noted along each line. This same technique was applied to the segments along the south end of Buttle Lake. Lines were drawn perpendicular to the road, and the change in values were noted. Several possible progressions of increase in segment values were obtained, (Appendix 2).

Many respondents indicated that wilderness existed, for

them, in an area just beyond the end of the trail they had hiked on. In the composite map of perceived wilderness, this resulted in perceptual peaks just beyond the end of each individual trail. This also had to be considered in developing a predictive model (Fig. 4, Fig. 6).

There appears to be a steepening of the perception surface or compression of the isolines in certain areas; to the east of the Elk River Trail, at the Marble Meadows Trail, and the entire area on the south end of Butte Lake (where the open pit mine is located) (Fig.5). One might hypothesize that this is caused by a tendency of respondents to orient their perceptions on the basis of the few specific landmarks of which they are aware, -- the trails, and the mine, and to be more conservative where they are unsure of the area. This proved to be too elusive a concept to pursue; and no simple formula for modifying the segment scores to account for this phenomena became apparent.

Method of Analysis

Several systems of segment scoring were now possible, dependent upon which combinations of distance decay functions for the negative effect of roads and boundaries were most valid. Each system of scoring would necessarily create a different model. In order to choose the best model, stepwise regression was utilized.

Normally, in stepwise regression the computer selects the variable which gives the highest level of explanation

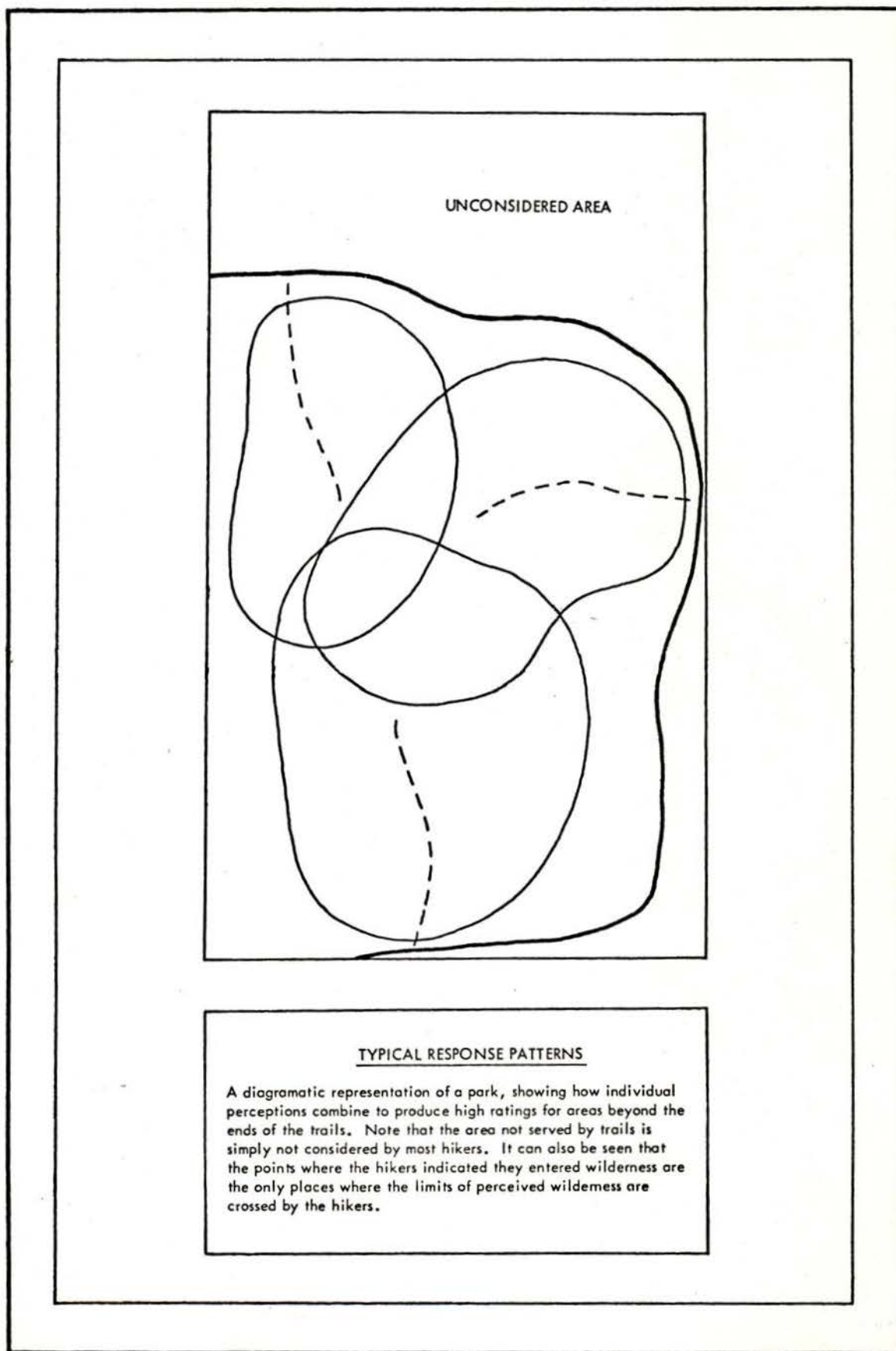


Figure 6

and then adds the increments in the level of explanation obtained by utilizing successively less significant variables. By allowing the computer to do this and then ignoring all but the first variable chosen, it is possible to select the best model. By then utilizing simple regression, residuals are generated which can be examined for information useful in modifying the model.

These steps were taken and the location of the residuals were plotted. A concentration of residuals at the end of each trail confirmed earlier observations. The model was modified to consider this effect, and the new scores were again subjected to simple regression.

It became obvious that it was possible to discover the degree of agreement or disagreement between the park users and the park managers. This was done by identifying those grid segments which fell within the nature conservancy areas of the park. These represented the wilderness as perceived by the park managers in that these areas were considered sufficiently unaltered to warrant special protection. Allocating a value of one to those segments included in the nature conservancy areas, and a value of zero to those segments not included, the resultant degree of explanation could be compared with that of the other proposed models.

Results of the Analysis

The correlation matrix, shows the relationships of the eight variables used (Table I). Variable one, the dependent

TABLE I
CORRELATION MATRIX OF ALTERNATIVE SEGMENT SCORES

Variable Number	1	2	3	4	5	6	7	8
1	1.000	0.605	0.615	0.763	0.607	0.765	0.801	0.800
2		1.000	0.429	0.546	0.433	0.509	0.548	0.536
3			1.000	0.810	0.221	0.641	0.747	0.683
4				1.000	0.465	0.754	0.858	0.801
5					1.000	0.880	0.680	0.810
6						1.000	0.894	0.965
7							1.000	0.924
8								1.000

Source: Author's field survey and laboratory calculations.

variable in the regression analysis, is made up of the segment scores as determined from the questionnaire. Variable two, represents the segment scores determined by the location of the nature conservancy areas. Variables three through eight, each represent a system of segment scores based on different distance decay functions. In this figure, variable seven has been modified to include the previously mentioned "trail end effect."

Using stepwise regression, the computer selected the variable with the best level of explanation. This was variable seven with an R^2 of .6418. Although the program went on utilizing all the variables to reach a total R^2 of .7145, this increase in R^2 is invalid, as all but variable two are simply permutations of each other. Variable two can be considered, and it raises the R^2 to .6810. But the nature conservancy areas upon which variable two is based are not parts of most wilderness parks, while adjacent roads, boundaries, and trails are.

By roughly approximating the distance decay function of the negative effect upon wilderness perception of roads and boundaries, it was possible to develop a very simple predictive model, which by using simple regression, gave an explanation of sixty-four percent. It would seem that when a hiker is asked to comment on the existence of wilderness in parts of a park with which he is unfamiliar, distance from boundaries and roads becomes the prime determinant.

The Model

Variable seven proved to be the best of the models developed. In this model, the segments through which roads run are given a value of zero. Following a line perpendicular to the road, the segment value progression is 0, 2, 3, 4, 5, 6, 7. The progression from the park boundaries is 3, 4, 5, 6, 7. The six segments at the end of each trail are increased by a value of one (Fig. 4). Where road and boundary values differ, the lower value is chosen.

The Effects of Trails

The extreme northwestern area of the park was considered wilderness by only thirty percent of the respondents (Fig. 5). Yet, park administrators consider this area (Big Den Nature Conservancy) to be one of the wildest areas in the park. The question arises, why the discrepancy? In answer, it is useful once again to consider the pattern of hiker replies. The majority of the respondents did not consider the entire park when they indicated their wilderness. They dealt with the areas they had visited plus varying amounts of surrounding terrain. A diagrammatic representation of this is shown (Fig. 6). Although this explains the resultant map pattern, it does not explain the reason for this type of response.

Possibly, the respondents were intellectually honest enough to answer only for the areas in which they had personal experience. Several respondents did make reference to this saying, ". . . can't say for the rest of the park." However,

if this is the case, why did the majority indicate the existence of wilderness far beyond the limits of where they actually hiked?

Areas without trails are unseen by most hikers. However, whether or not these areas are considered wilderness, depends upon their relationship to areas which do have trails. Areas beyond the reaches of existing trails are considered to be wilderness even more often than the trail area actually observed by the hiker (Fig. 6). At the same time, equally wild areas, with a similar lack of hiker penetration, are not considered wilderness. As obvious as this is, it has proven an elusive concept to apply to the model without entering into complicated unrewarding modifications.

CHAPTER V

INFLUENCE OF TRAIL FEATURES
ON THE PERCEPTION OF WILDERNESS

The simple but successful model developed in Chapter IV, is able to predict perceived wilderness primarily on the basis of distance; -- distance from roads and distance from boundaries.

This is logical, in that, if man's economic activities are antithetical to wilderness, increasing distance from these activities can only increase the perception of wilderness. Indeed, persons who attempt to define wilderness for administrative purposes imply distance, when they suggest minimum requirements of 100,000 acres without a road as an official definition of wilderness.³⁰ Researchers too, emphasize the importance of distance when they ask hikers how far from the road do they find wilderness.³¹

We assume that hikers seek such things as, natural beauty, solitude, and an environment believed to be unaltered by man; which together may be called wilderness. If hikers must travel a minimum distance from the trail beginning to find their wilderness, then there exists a belt of semi-wilderness around each true wilderness area. Clawson recognized this, and argued for the recognition of this situation, with the creation of a management plan based on a concentric

pattern. A central wild or wilderness area, to be surrounded by zones of increasing economic activity.³² The Sierra Club (a well known California based, international conservation organization) conversely, fights for the acceptance of the principle of wilderness to the road.

Can wilderness touch the road? Or is there a minimum distance which hikers must travel before they perceive or experience wilderness?

Distance From the Road

If distance from the road is the primary determinant of perceived wilderness, individual trails will show nearly identical distributions of perceived wilderness entry points. For example, twenty percent of the hikers might find their wilderness after hiking one mile, sixty percent at two miles, and eighty percent at three miles, but this hypothetical distribution would be nearly the same for all trails.

On the same questionnaire-map used to identify perceived wilderness within the park as a whole (Chapter IV), hikers were asked to indicate the trails they hiked upon. The point on the trail where each hiker indicated he had entered wilderness was recorded and plotted according to its distance from the trail beginning. The trails were divided into half-mile intervals. For each interval, the number of hikers reporting wilderness were recorded and plotted as a percentage of all hikers on that trail, who responded to the questionnaire. The distributions of these perceived wilderness entry

points, for the four trails studied, were then compared (Table II). The first three trails, Elk River, Marble Meadows, and Flower Ridge, show closely related distributions. This is clearly demonstrated when the wilderness entry points are graphed cumulatively (Fig. 8). The three trails describe similar curves. Just as clearly shown is the completely different curves described by the fourth trail, The Forbidden Plateau Trail. The difference between the trail distributions is particularly obvious within the first two miles of trail length. This area should not be considered wilderness by hikers if distance from the road is a critical factor. On the Elk River Trail, sixty percent of the hikers considered the first half-mile of the trail to be wilderness. Most importantly, the fact that the distributions of wilderness entry points are so different shows that distance from the trail head does not determine the limits of perceived wilderness.

The Significance of

Observable Trail Characteristics

If perceived wilderness entry points are determined by the location of observable trail characteristics, they will tend to cluster together and not be randomly distributed. Conversely, the tendency of wilderness entry points to cluster indicates the existence of a commonly accepted causative factor. Using Kolmogorov-Smirnoff tests, it is shown that the distribution is non-random in three of the four cases

TABLE II
COMPARISON OF WILDERNESS ENTRY POINTS PER TRAIL SEGMENT

Miles	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	
Elk River	60	60	65	65	65	80	80	80	80	80	90	90	100	%
	60	0	5	0	0	15	0	0	0	0	10	0	10	%
Marble Meadows	41	48	53	75	75	85	85	92	97	97	97	97	97	%
	41	7	5	22	0	10	0	7	5	0	0	0	0	%
Flower Ridge	33	46	46	69	75	85	85	85	85	85	91	91	91	%
	33	13	0	13	6	20	0	0	0	0	6	0	0	%
Forbidden Plateau	3	11	14	29	35	53	54	64	64	67	77	86	86	%
	3	8	3	15	6	18	1	10	0	3	10	9	0	%

Upper line shows the cumulative percentages of hikers perceiving wilderness.

Lower line shows the percentage of hikers perceiving wilderness within that segment.

Source: Author's field survey and laboratory calculations.

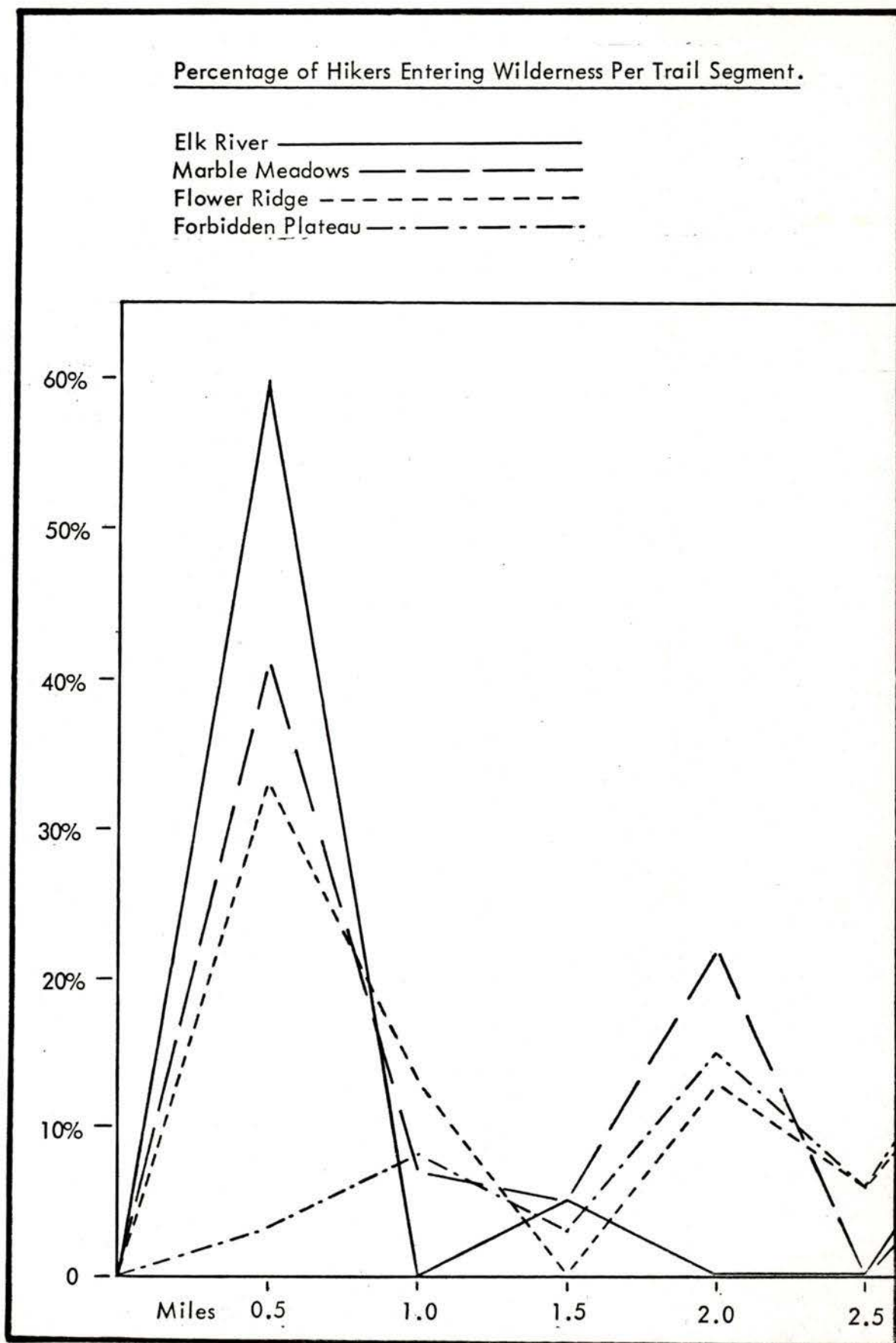
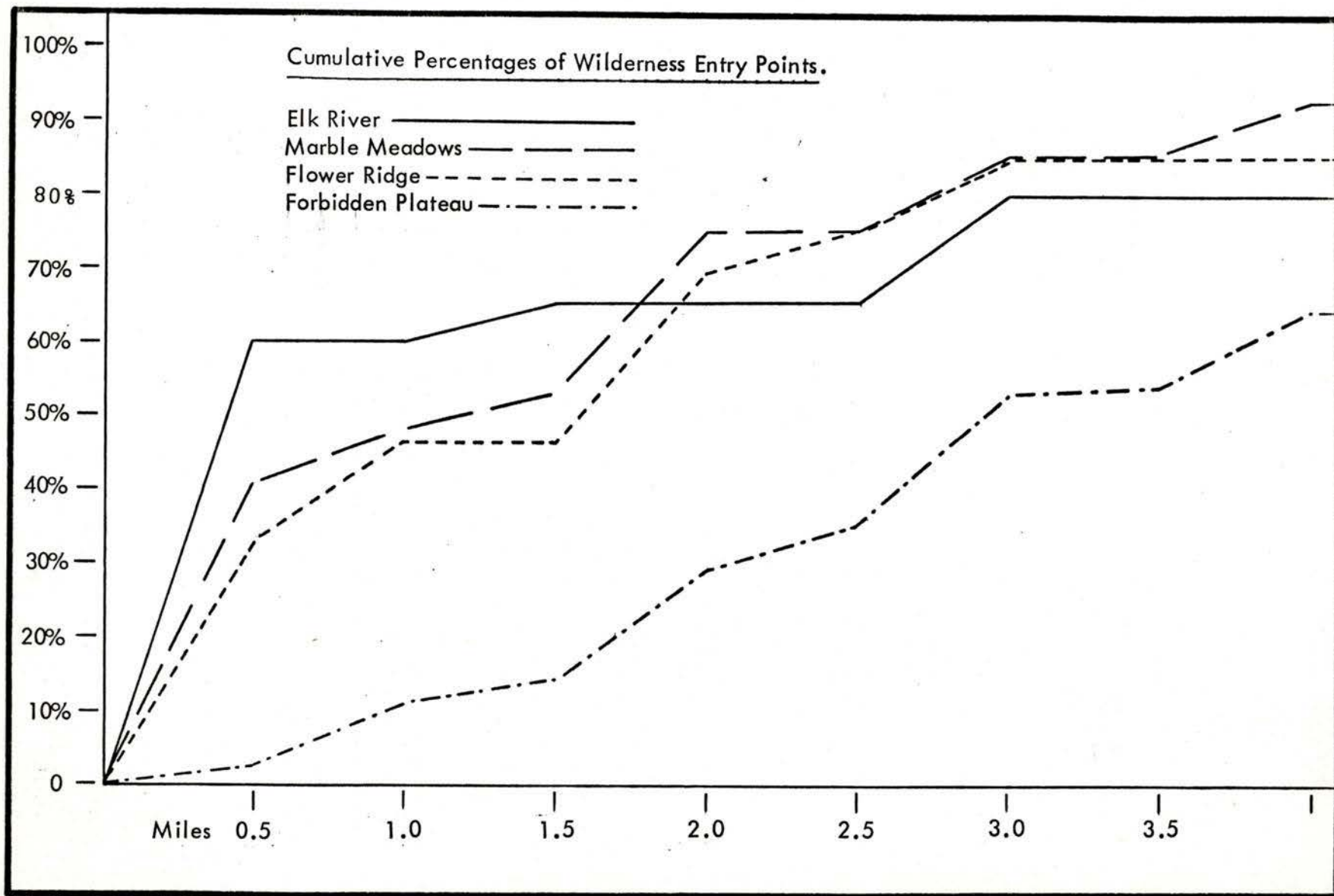


Figure 7

Figure 8



(Tables III, IV, V, and VI). The distributions that are non-random are not so because of any culturally induced minimum distance from the road. If this were true, the distributions would not differ between trails. The conclusion is that something seen and experienced by the hikers, on the trail, caused this clustering.

The trails are shown in longitudinal cross-section (Figures 9, 10, 11, and 12). It can be seen that the majority of wilderness entry points occur around major trail features. The difficulty of putting relative numerical values on such things as, a change in grade, a stream crossing, or a change in trail character (eg. official trail ending), preclude mathematical verification of the evident correlation between major trail features and the perceived wilderness entry points.

In answer to the question, -- "Can wilderness touch the road?" -- it is only necessary to examine the statistics for the Elk River Trail. Sixty percent of the hikers found their wilderness within one-half mile of the road. If the perception of wilderness does involve traveling some minimum distance, then that distance must be no greater than, and possibly less than, one-half mile. Therefore, the concept of wide buffer strips of semi-wilderness as being necessary to preserve the "true" wilderness within, is falacious.

All indications are that trail characteristics determine perceived wilderness entry points within the first two miles of trail length. However, as distance increases, the

TABLE III

KOLMOGOROV-SMIRNOV TEST FOR THE ELK RIVER TRAIL

Miles	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Wilderness Entry Points Per Trail Segment	12	0	1	0	0	3	0	0	0	0	2	0
Theoretical Distribution	$\frac{1.5}{18}$	$\frac{3}{18}$	$\frac{4.5}{18}$	$\frac{6}{18}$	$\frac{7.5}{18}$	$\frac{9}{18}$	$\frac{10.5}{18}$	$\frac{12}{18}$	$\frac{13.5}{18}$	$\frac{15}{18}$	$\frac{16.5}{18}$	$\frac{18}{18}$
Observed Distribution	$\frac{12}{18}$	$\frac{12}{18}$	$\frac{13}{18}$	$\frac{13}{18}$	$\frac{13}{18}$	$\frac{16}{18}$	$\frac{16}{18}$	$\frac{16}{18}$	$\frac{16}{18}$	$\frac{16}{18}$	$\frac{18}{18}$	$\frac{18}{18}$
Difference	$\frac{10.5}{18}$	$\frac{9}{18}$	$\frac{8.5}{18}$	$\frac{7}{18}$	$\frac{5.5}{18}$	$\frac{7}{18}$	$\frac{5.5}{18}$	$\frac{4}{18}$	$\frac{2.5}{18}$	$\frac{1}{18}$	$\frac{1.5}{18}$	$\frac{0}{18}$
D max. =	$\frac{10.5}{18} = .583$											

When $N = 18$ the critical value for a .01 level of significance is .371. As $.583 > .371$, the distribution is not random.

Thus, a null hypothesis which states, there is no difference other than that due to chance, between the distribution of wilderness entry points as observed, and a purely random distribution, must be rejected. This is true in all cases where the test is used when the calculated value exceeds the critical value for the level of significance chosen, at the appropriate value of N .

Source: Author's evaluated questionnaire returns.

TABLE IV
KOLMOGOROV-SMIRNOV TEST FOR THE MARBLE MEADOWS TRAIL

Miles	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Wilderness Entry Points Per Trail Segment	17	3	2	9	0	4	0	3	2	0	0	0
Theoretical Distribution	$\frac{3.3}{40}$	$\frac{6.6}{40}$	$\frac{10}{40}$	$\frac{13.3}{40}$	$\frac{16.6}{40}$	$\frac{20}{40}$	$\frac{23.3}{40}$	$\frac{26.6}{40}$	$\frac{30}{40}$	$\frac{33.3}{40}$	$\frac{36.6}{40}$	$\frac{40}{40}$
Observed Distribution	$\frac{17}{40}$	$\frac{20}{40}$	$\frac{22}{40}$	$\frac{31}{40}$	$\frac{31}{40}$	$\frac{35}{40}$	$\frac{35}{40}$	$\frac{38}{40}$	$\frac{40}{40}$	$\frac{40}{40}$	$\frac{40}{40}$	$\frac{40}{40}$
Difference	$\frac{13.7}{40}$	$\frac{13.4}{40}$	$\frac{12}{40}$	$\frac{17.7}{40}$	$\frac{14.4}{40}$	$\frac{15}{40}$	$\frac{11.7}{40}$	$\frac{12.2}{40}$	$\frac{10}{40}$	$\frac{6.7}{40}$	$\frac{3.4}{40}$	$\frac{0}{40}$
D max. =	$\frac{17.7}{40} = .442$											

When N = 40 the critical value for a .01 level of significance is .26.
As .44 > .26, the distribution is not random.

Source: Author's evaluated questionnaire returns.

TABLE V
KOLMOGOROV-SMIRNOV TEST FOR THE FLOWER RIDGE TRAIL

Miles	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Wilderness Entry Points Per Trail Segment	10	4	0	4	2	6	0	0	0	0	2	0
Theoretical Distribution	$\frac{2.3}{28}$	$\frac{4.7}{28}$	$\frac{7}{28}$	$\frac{9.3}{28}$	$\frac{11.7}{28}$	$\frac{14}{28}$	$\frac{16.3}{28}$	$\frac{18.7}{28}$	$\frac{21}{28}$	$\frac{23.3}{28}$	$\frac{25.7}{28}$	$\frac{28}{28}$
Observed Distribution	$\frac{10}{28}$	$\frac{14}{28}$	$\frac{14}{28}$	$\frac{18}{28}$	$\frac{20}{28}$	$\frac{26}{28}$	$\frac{26}{28}$	$\frac{26}{28}$	$\frac{26}{28}$	$\frac{26}{28}$	$\frac{28}{28}$	$\frac{28}{28}$
Difference	$\frac{7.7}{28}$	$\frac{9.3}{28}$	$\frac{7}{28}$	$\frac{8.7}{28}$	$\frac{8.3}{28}$	$\frac{12}{28}$	$\frac{9.7}{28}$	$\frac{7.3}{28}$	$\frac{5}{28}$	$\frac{2.7}{28}$	$\frac{2.3}{28}$	$\frac{0}{28}$
D max. = $\frac{12}{28}$ = .428												

When $N = 28$ the critical value for a .01 level of significance is .32.
As $.428 > .32$, the distribution is not random.

Source: Author's evaluated questionnaire returns.

TABLE VI

KOLMOGOROV-SMIRNOV TEST FOR THE FORBIDDEN PLATEAU TRAIL

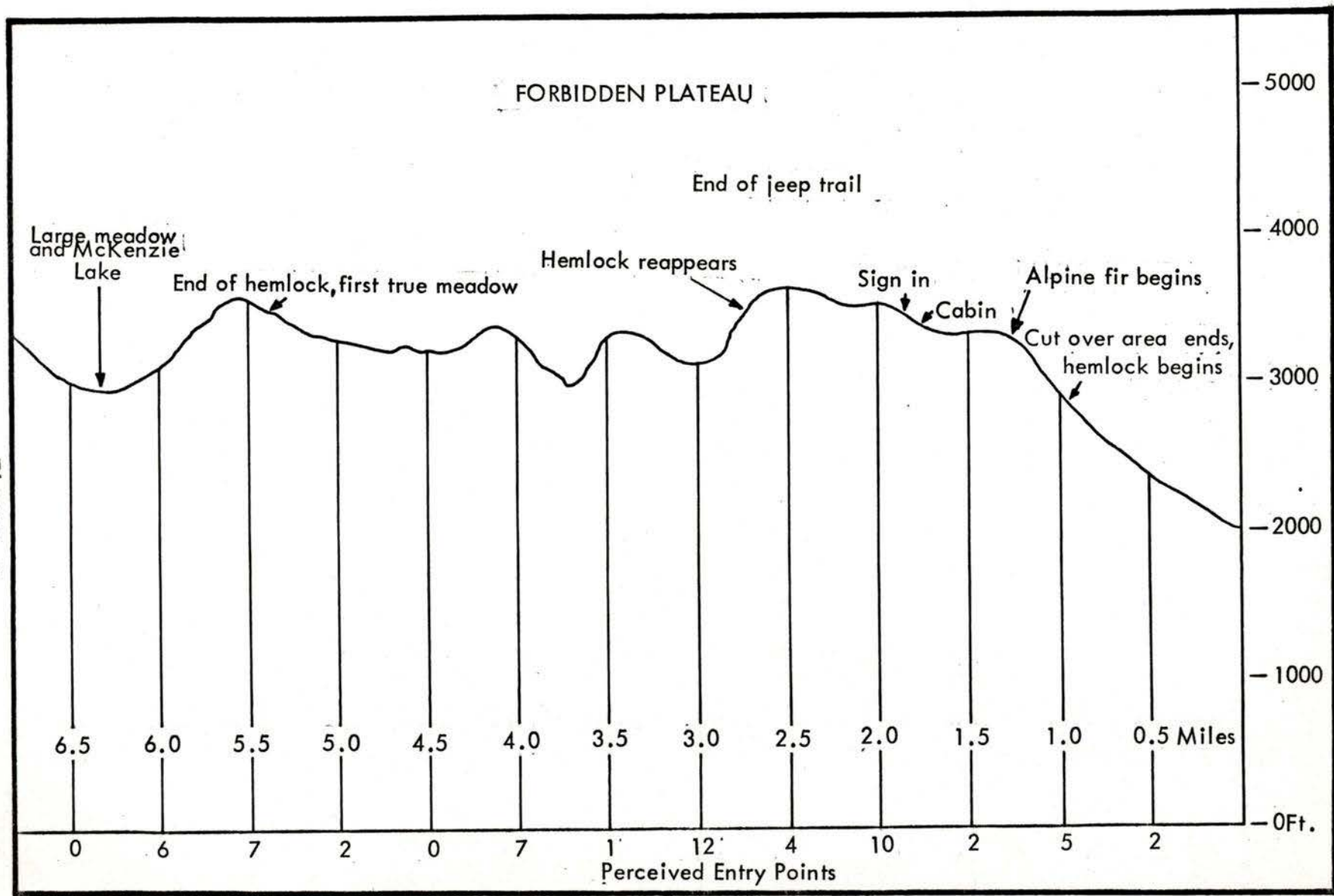
Miles	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Wilderness Entry Points Per Trail Segment	2	5	2	10	4	12	1	7	0	2	7	6
Theoretical Distribution	$\frac{4.8}{58}$	$\frac{9.7}{58}$	$\frac{14.5}{58}$	$\frac{19.3}{58}$	$\frac{24.5}{58}$	$\frac{29.0}{58}$	$\frac{33.8}{58}$	$\frac{38.6}{58}$	$\frac{43.5}{58}$	$\frac{48.3}{58}$	$\frac{53.1}{58}$	$\frac{58.0}{58}$
Observed Distribution	$\frac{2}{58}$	$\frac{7}{58}$	$\frac{9}{58}$	$\frac{19}{58}$	$\frac{23}{58}$	$\frac{35}{58}$	$\frac{36}{58}$	$\frac{43}{58}$	$\frac{43}{58}$	$\frac{45}{58}$	$\frac{52}{58}$	$\frac{58}{58}$
Difference	$\frac{2.8}{58}$	$\frac{2.7}{58}$	$\frac{5.5}{58}$	$\frac{0.3}{58}$	$\frac{1.2}{58}$	$\frac{6.0}{58}$	$\frac{2.2}{58}$	$\frac{4.4}{58}$	$\frac{0.5}{58}$	$\frac{3.3}{58}$	$\frac{1.1}{58}$	$\frac{0}{58}$
D max. =	$\frac{6}{58} = .10$											

When $N = 58$ the critical value for a .20 level of significance is .14.
As $.10 < .14$, the distribution may be random.

Source: Author's evaluated questionnaire returns.

$$\begin{array}{r} 4.9 \\ 12 \\ \hline 58 \\ 49 \\ \hline 58.8 \end{array} \quad \begin{array}{r} 4.8 \\ 12 \\ \hline 58 \\ 48 \\ \hline 57.6 \end{array}$$

Figure 9



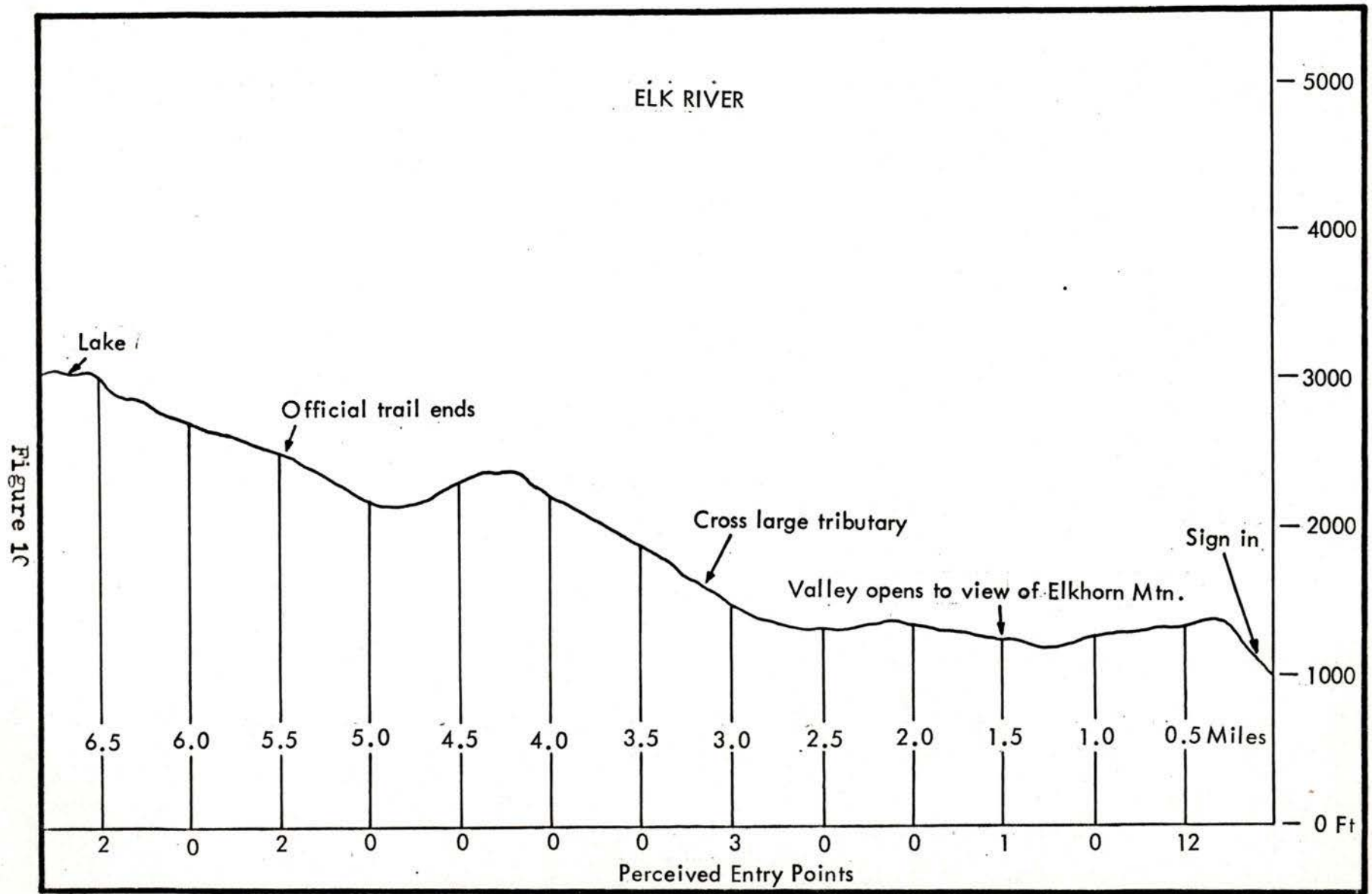


Figure 11

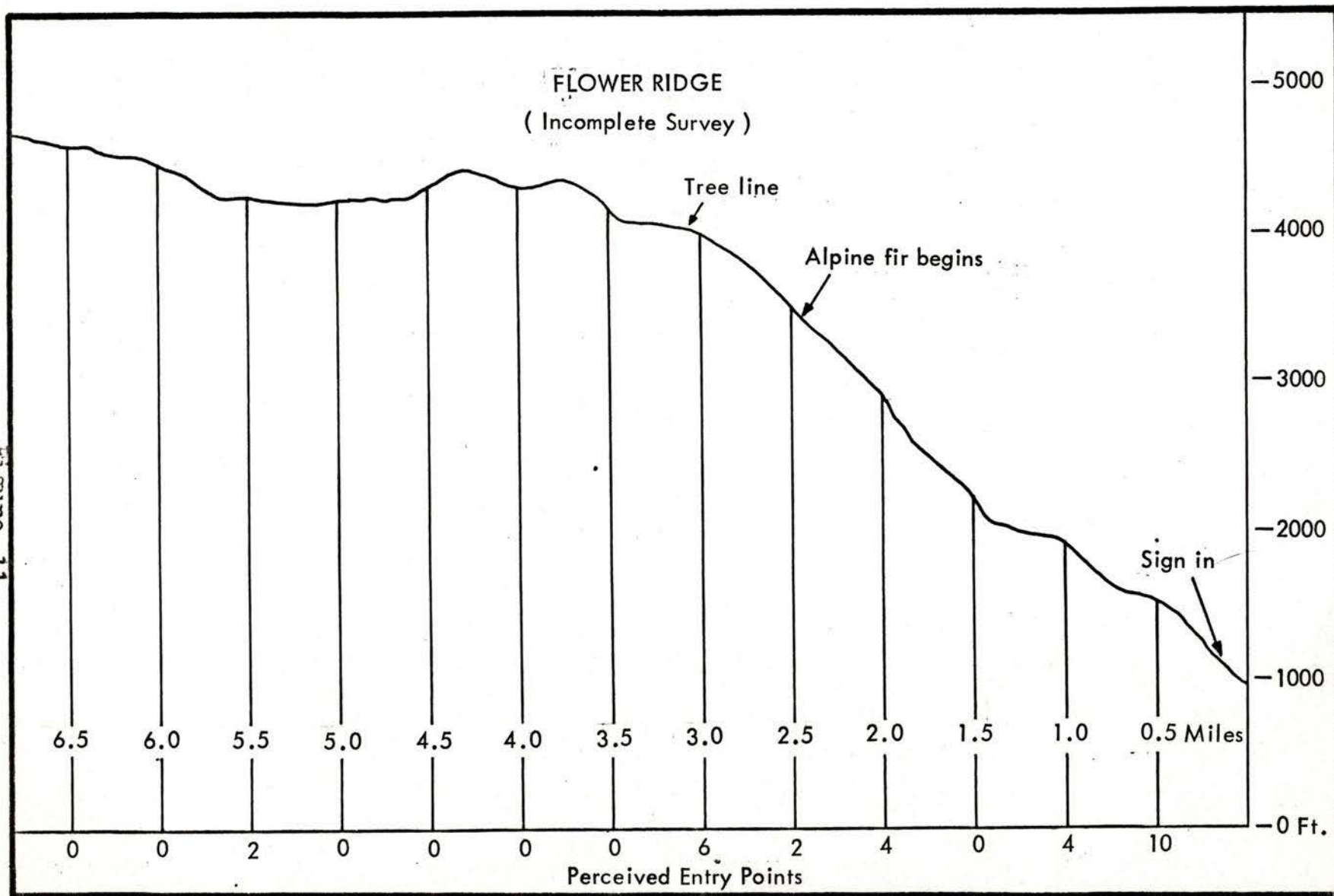
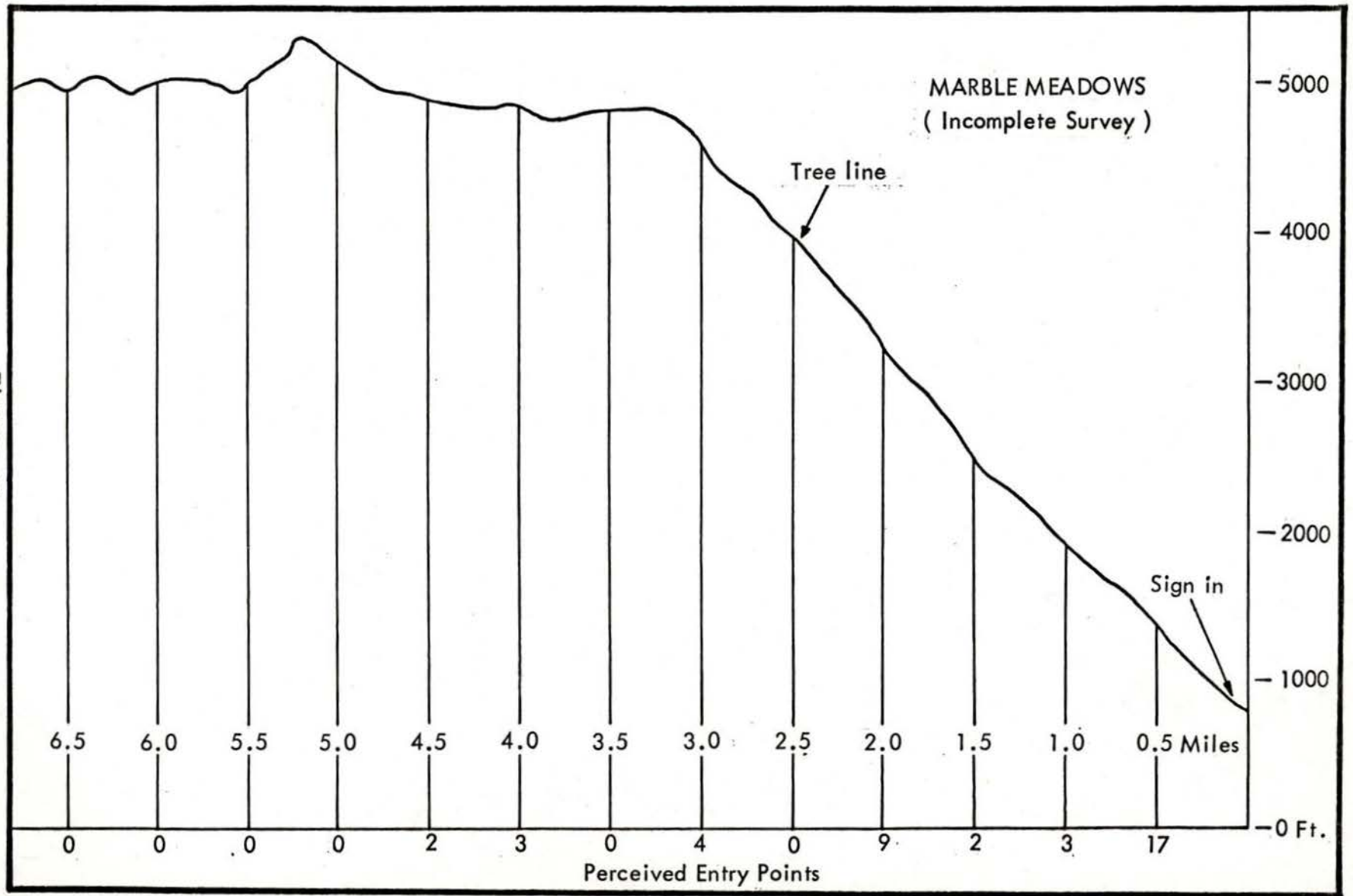


Figure 12



distributions begin to look more alike (Fig. 7). There is a peak in all four distributions at the three mile point (Table II). From this point on, the trails become more similar in terms of wilderness entry point distribution.

The Forbidden Plateau Trail, which showed a possibly random distribution earlier, is a special case. It is the only one of the trails where extensive use by off the road vehicles is evident. Where such evidence of human activity is present, it may overwhelm natural trail features and perceived wilderness entry points may be keyed more to distance. Apparently, when other trail features are not distinct and readily observable, distance from the trail head becomes the dominant trail characteristic.

CHAPTER VI

CONCLUSION

Composite Perception of the Park

Every hiker forms a mental picture of a park on the basis of similar information. This information is a combination of the intimate knowledge of a specific area gained while hiking, together with the commonly available knowledge acquired from maps, books, pamphlets, or conversation. A hiker's conception of the park area beyond the trail he hiked on, must be based upon the limited information available from the printed guides. He perceives directly only the area he actually experiences. By considering the combination of perceived and conceived images, it is possible to predict the composite mental picture of a park. Since all hikers have been subjected to similar types of information, it is only necessary to determine the relative significance of the factors identified in the commonly available information, to develop a predictive model. This model, being determined by culturally determined values, should be valid wherever North American sub-culture predominates. In the case of Strathcona Provincial Park, the commonly available information was information from other hikers and a topographic map; later in the season some hikers used a map-pamphlet issued by the Parks Branch.

Analysis of completed questionnaires indicated that distance from both roads and park boundaries was the most important factor in determining the pattern of user perceived wilderness. Trail location was significant, in that areas not penetrated by trails seldom received consideration by respondents. Also, the area beyond the end of each trail was considered wilderness more often than a model based only on road-boundary distance would indicate (Fig. 4). Therefore, the model was modified to take into consideration these peaks in the perception surface.

Initially, it was hoped that some relationship between the natural features of the parksite and user perceived wilderness would become apparent, and that this relationship would contribute significantly to the development of a predictive model. As the analysis of the questionnaire-returns progressed, the futility of this became obvious. Contrary to Priddle's view that this type of study gauges the users' perceptions of the park as a whole, it is certain that it is the user's attitude towards roads and boundaries that is being measured. Except in the areas actually visited and experienced, this type of study shows the user's conception, not perception, of the park as a whole.

As the pattern of hiker responses is examined, it can be seen that the park is differentiated into three types of areas. The first type, such as Big Den Nature Conservancy in this park, is both unseen and unconsidered by most hikers (Fig. 6). Despite the opinion of the park managers that it

is one of the wildest areas in the park, only one-third of the hikers considered it wilderness. Unable to experience it directly, and with little information available, the majority of the hikers were unable to form an opinion of the area.

The second type areas are those both seen and considered by hikers. These are the areas around and including the trails. These areas typically receive a higher wilderness rating than the first type areas.

Type three areas are those which are unseen by hikers, yet they are considered. These are the areas previously discussed, which lie beyond the end of each trail. These areas received the highest wilderness ratings of all. Possibly they represent the unattained goals of the hikers, and as such, dominate the perceptions of the respondents. It is also possible, but unlikely, that they did not consider these areas until asked to by the questionnaire.

Trail Perception

When the areas which the hikers actually experienced are examined, a far different picture emerges. There is a great deal of difference between hikers' perceptions of individual trails. These differences become particularly clear when hikers' perceptions of the first two miles of each trail are compared. The clustering of perceived wilderness entry points, around observed changes in trail character and prominent trail features, indicate that these trail features are the

most significant determinant of perceived wilderness within the initial section of the trails. After the first three miles, the percentage of hikers who believe they have entered wilderness becomes more alike for all the trails. At this point, the individual trail perception patterns begin to approximate the pattern predicted by the model developed earlier. As this model was based primarily on distance, it is reasonable to conclude that after the first three miles of trail length, trail character and trail features become less significant determinants of perceived wilderness as sheer distance from the trail-head overwhelms other perceptions.

As mentioned, the points at which respondents indicated that they entered wilderness tend to cluster around points of change in the trail character. This is true despite the fact that these changes in trail character were not shown on the questionnaire-map. Quantitative verification of this clearly observable tendency was impossible due to the difficulty of mathematically weighting such things as a sudden change in grade, versus a sudden change in vegetation, given the design of the experiment. Even so, the evidence is too obvious to be ignored. By designing a new experiment centered on examining and weighting trail features, it may be possible to develop a relative scale of significance of trail feature influence on wilderness perception.

The Need to Organize Space

A hiker, moving into what he considers to be wilderness, probably wishes to impose as little as possible of the man-dominated system he is leaving behind. Yet the one thing he must impose upon the wilderness is a limit, if only to differentiate between wilderness and non-wilderness. The hiker is also psychologically impelled to establish reference points about himself. Hall states, "Man's feeling about being properly oriented in space runs deep. Such knowledge is ultimately linked to survival and sanity. To be disoriented in space is to be psychotic."³³ Man's need to organize space is so great, that he is forced to organize even that space that he seeks out as a refuge from the man-dominated outside world.

Speaking on the psychological implications of architectural design, Izumi states:

Other insecure situations relate to being lost, or to a feeling of being dislocated in space and time. For example, a white out is very critical in the North, particularly during flight. Where does the sky begin and the land start? Or where does the street end? Where does the room end? All these questions which come to mind in insecure physical situations are related to the question: 'When do we come to the end?'. (34)

What more potentially insecure situation exists than an unknown hiking trail in what the individual considers wilderness? When indeed does he come to the end, or to the beginning?

If we accept the need to impose limits and borders as an inherent human characteristic, we must then ask if there

is any controlling factor which dictates the location of these limits. Studying the reactions of people asked to comment on a walk around a city block in Boston, Lynch observes, "The spaces remembered afterwards seemed to be either those which were clearly defined in form, or which made evident breaks in the general continuity."³⁵ This is precisely the same reaction observed, in the hikers' responses, in this study. The hikers had used the same cognitive reasoning that they used in other activities. Sudden changes in trail character, such as changes in grade or vegetation, are the "breaks in the general continuity."

Among hikers themselves, there is agreement with the concept of perceived "gateways" into wilderness. Paul Brooks in his book Roadless Area, puts it this way:

Early in every wilderness trip there comes a moment of awareness, a sudden sense that you are there. I felt it in the Olympics at the end of our fifteen-mile walk through the rain forest; in the canoe country when we had put three or four portages between us and the last settlement. It is as if somewhere along the way, a door has silently opened and you have been invited to come in. (36)

The "silent door" mentioned by Brooks exists for every hiker, though usually at a far shorter distance from the road. These doorways are indicated by hikers as occurring at those places on the trail where a significant change in trail character occurs. It is impossible to say whether or not these doorways or wilderness entry points were immediately recognized as such by the hikers, because they had traveled past these points both when entering and when leaving. It

is possible to say that the hiker's long term mental pictures of the trails are strongly influenced by the breaks in the trail character.

Colin Fletcher, in The Complete Walker, relates his first experience with wilderness this way:

. . . I do know that I felt I had gone as far as a man could go. So I just stood there looking out beyond the edge of the world. Except for a wall of thick, dark undergrowth, I am no longer sure what I saw, but I know it was wild, wild, impossible country. It still looms huge and black and mysterious in the vaults of my memory. (37)

Whether experimentally discovered or intuitively deduced, the principle is clear, the borders of perceived wilderness are not dependent upon distance from the trail beginning. Perceived wilderness begins at points of sudden change in trail character.

Wilderness Doorways and Park Planning

The role of the park planner is to maximize user satisfaction while preserving the natural characteristics of the park. A trail such as the Elk River Trail is certainly more satisfying with its wilderness near the road character, than is the Forbidden Plateau Trail where most hikers walked for miles before reaching wilderness. The prime difference between the two trails is, the distinct break between the man-dominated world and the park interior as seen on the Elk River Trail, and the extensive area neither man-dominated nor wild which blurs perceptions on the Forbidden Plateau. The power line cut at the beginning of the Elk River Trail

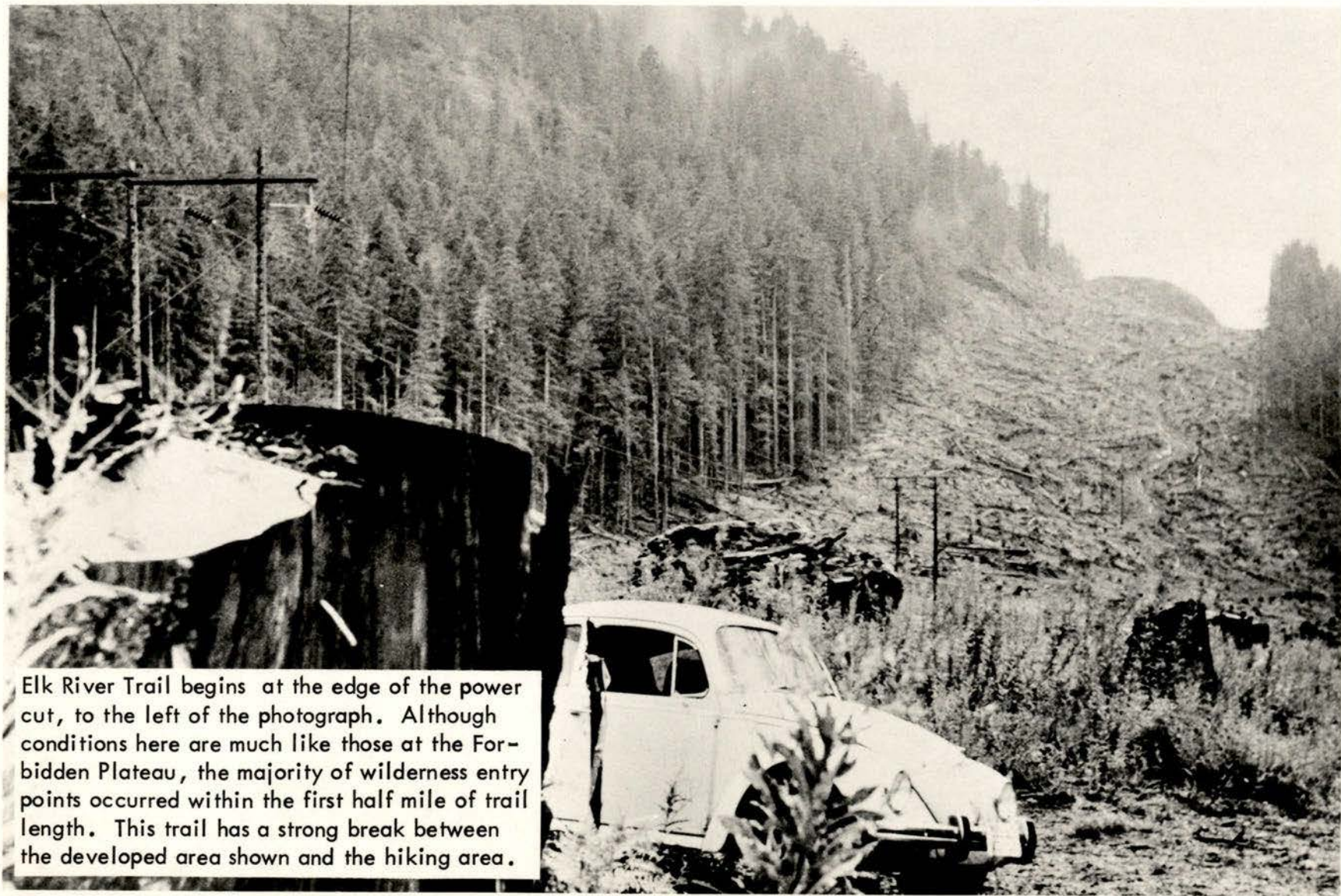
is no more aesthetically pleasing than is the analogous cut under the ski-lift at the beginning of the Forbidden Plateau Trail (Plates 3, 4). But on the Elk River Trail there is a sudden change in the trail character soon after the beginning of the trail. A ridge is crossed, creating both a visual and a psychological barrier -- a doorway into wilderness -- and a barrier between the hiker and the rest of humanity, perceived by sixty percent of the persons using the trail.

Gutman says that, "Site plans acquire some of their significance from their capacity to facilitate or thwart the use of the senses;" ³⁸ A break in trail character facilitates the perception of the goal of wilderness while thwarting the perception of the man-dominated world behind.

Specific Recommendations for Strathcona Provincial Park

There is no sense in routing a supposedly wilderness hiking trail through a skiing complex and then along a vehicular road, as seen on the Forbidden Plateau Trail. Either the road must be made passable for passenger cars and parking facilities provided at its end, or it must be blocked to all traffic. At any rate, parking for hikers must be provided above the ski area. Ideally, all facilities must be quickly blocked from view by proper use of the terrain and vegetation.

Both the Marble Meadows and Flower Ridge Trails should be rerouted to emulate the pattern of the Elk River Trail. ms
Soon after leaving the road or lake front the trails should



Elk River Trail begins at the edge of the power cut, to the left of the photograph. Although conditions here are much like those at the Forbidden Plateau, the majority of wilderness entry points occurred within the first half mile of trail length. This trail has a strong break between the developed area shown and the hiking area.

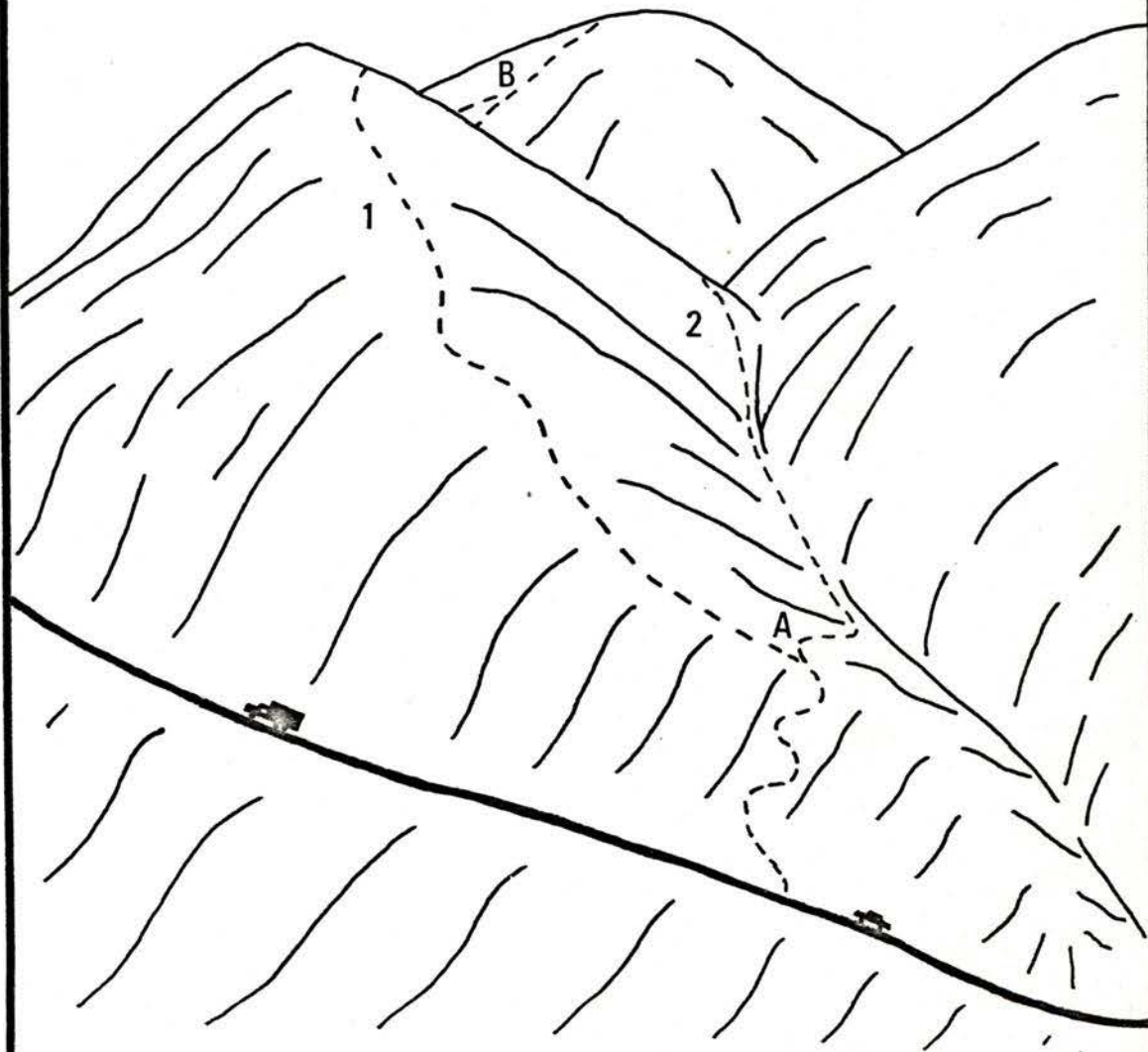
first rise and then drop down into the valleys of the associated streams, Phillips Creek and Henshaw Creek. The trails should once again ascend the peaks but out of the line of vision to the Buttle Lake valley floor (Fig. 13). This would create a barrier separating the developed Buttle Lake area from the wild hinterland.

Further development within the park boundaries such as campground or lodge construction should be restricted to those areas already discounted by hikers as being non-wilderness. In this way, the carrying capacity of the park can be increased without infringing upon the wilderness areas.

Using this study as a base, it should be possible to check the effects of increased use and/or better management techniques. Any shift of wilderness entry point distributions would be significant. If the distributions shift towards the trail head, it would indicate that management techniques were improving. If the shift was away from the trail head, the opposite would be true.

Areas such as Big Den Nature Conservancy, not presently served by trails should be the object of future trail construction. Conversely, no effort should be made to completely bisect the park with trails. The retention of several "wilderness core areas" beyond the reach of the trail system will psychologically heighten the perception of wilderness within the park as a whole.

PSYCHOLOGICAL BARRIERS AND TRAIL DESIGN



Wilderness trails are commonly constructed without considering possible psychological factors. Trails normally ascend to alpine areas by the most direct route compatible with good construction practices (example 1). It was found that if the terrain was utilized to create a physical and psychological barrier near the beginning of the trail (point A), perceived wilderness entry points occurred just after the barrier was crossed. The trail (2) ascends into the alpine area at point B, where hikers cannot see the road. By this simple expedient perceived wilderness is moved closer to the borders of the park increasing its effective size.

Figure 13

Changing Perceptions

The idea, that wilderness exists and has a positive value, is culturally determined. As cultural values shift with time, so will the concept of wilderness. A Western European idea of wilderness might be quite different from that of North America, while to an Asian the entire idea may be inconceivable. The North American may be educated to accept a less stringent definition of wilderness as population pressures increase to present European levels.

Alternatives

The question, -- How will the quality of wilderness parks be maintained in the future? -- can be answered in many ways. The re-education of hikers, the creation of more parks, and a quota system, all have been advocated from time to time. Most of these things are either beyond the capabilities of the park planner or are politically untenable at present. One of the avenues that is presently open is maximum utilization of the site. It is to this goal, that this thesis has been addressed, and it is hoped that the concepts developed herein aid the park planner in its realization.

FOOTNOTES

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- 7 National Park Service, op. cit., footnote 6, p. 7.
- 8 R. C. Lucas, "Wilderness Perception and Use," Natural Resources Journal, Vol. III, No. 3 (January, 1964), pp. 394-411.
- 9 R. C. Lucas, "User Concepts of Wilderness and Their Implications for Resource Management," New Horizons for Resources Research: Issues and Methodology (Boulder, Col.: University of Colorado Press, 1964).
- 10 J. C. Hendee, W. R. Catton Jr., L. D. Marlow, and F. Brockman, Wilderness Users in the Pacific Northwest -- Their Characteristics, Values, and Management Preferences (Portland, Oregon: U. S. Forest Service, Pacific Northwest Forest and Range Experiment Station, 1968), pp. 29-30.
- 11 A. R. Sommarstrom, "The Impact of Human Use on Recreational Quality: The Example of the Olympic National Park Backcountry User," Unpublished M. A. Thesis, Department of Geography, University of Washington, 1966, p. 24.
- 12 P. Juurand, "The Relation of Trail Use to the Wilderness Trail Experience," Unpublished M. A. Thesis, Department of Geography, University of Western Ontario, 1971, p. 21.
- 13 G. B. Priddle, "Recreational Use and Wilderness Perception of the Algonquin Park Interior," Unpublished M. A. Thesis, Department of Geography, Clark University, 1965, p. 33.

- 14 Priddle, op. cit., footnote 13, p. 42.
Lucas, op. cit., footnote 9, p. 371.
- 15 Juurand, op. cit., footnote 12, p. 46.
- 16 R. C. Lucas, and J. Oltman, "Survey Sampling Wilderness Visitors," Journal of Liesure Research Vol.3, No.1, (Winter, 1971), pp. 33-35.
- 17 Attached to the front of the sign was a red box with a hinged lid. Beneath the hinged lid was a compartment filled with registration forms. A slot was provided in the front of the box for the hikers to drop the completed form into. The boxes had removeable bottoms which allowed the removal of the filled out forms.
Registration Station No. 1, on the Forbidden Plateau Trail, was observed with binoculars from a vantage point 100 yards up the trail. This observation was carried on for three, ten hour periods. During this time, seventeen hikers passed the registration station. All seventeen were observed to stop and register. This is not to imply that 100 percent registration was obtained, but it does indicate that an extremely high percentage of hikers did comply.
- 18 Twenty-one additional questionnaires were received too late to be used in the study, for a total of 216.
- 19 D. M. Trew, Assistant Forester, "Reconnaissance Report on Strathcona Park Including the Forbidden Plateau," Unpublished Report, British Columbia Provincial Parks Branch Files (1954), p. 8.
- 20 "Conditions Fine at Nearby Ski Spots," Victoria Times, December 2, 1970, p. 22.
- 21 M. R. Henry, "Recreational Analysis and Management of Strathcona Park," Unpublished B. S. F. Thesis, Faculty of Forestry, University of British Columbia (1970), p.19.
- 22 P. McNelly, "Once Mine Started No Reason to Stop," Victoria Times, March 30, 1972, p. 15.
- 23 Henry, op. cit., footnote 21, p. 8.
- 24 Henry, op. cit., footnote 21, pp. 8-9.
- 25 Henry, op. cit., footnote 21, pp. 12-13.
- 26 McNelly, op. cit., footnote 22, p. 15.
- 27 Webster's New World Dictionary of the American Language (Cleveland and New York: The World Publishing Co., 1957)p.1064.

- 28 British Columbia Parks Branch, "Parks Branch Policies," Unpublished Report, Park Branch Files, (1963), pp. 3-4.
- 29 Due to size limitations, it is impossible to reproduce precisely the isolines generated on the original working map.
- 30 U. S. Forest Service, op. cit., footnote 4.
- 31 Thorsell notes the existence of "wilderness thresholds," but makes no attempt to relate their location to trail features.
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- 32 M. Clawson, "The Crisis in Outdoor Recreation," Resources For The Future Inc., Reprint No. 13. and, A. H. Carbart, "Planning for America's Wildlands" National Audubon Society, National Park Association, The Wilderness Society, and The Wildlife Management Institute, (1961).
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- 34 K. Izumi, "Psychological Phenomena and Building Design," Building Research, 2 (1965), p. 10.
- 35 K. Lynch and M. Rivkin, "A Walk Around the Block," Landscape, 8 (1959), p. 31.
- 36 P. Brooks, Roadless Area, (New York: Alfred A. Knopf, 1942, Ballantine Books Inc., 1971), p. 79.
- 37 C. Fletcher, The Complete Walker, (New York: Alfred A. Knopf, 1969), p. 5.
- 38 R. Gutman, "Site Planning and Social Behavior," The Journal of Social Issues, 22 (1966), p. 108.

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APPENDIX I

QUESTIONNAIRE AND COVERING LETTER



DEPARTMENT OF RECREATION AND CONSERVATION
PARKS BRANCH

Dear Hiker:

We are grateful for your past cooperation in registering for the study of hiker's attitudes and needs conducted this season in Strathcona Provincial Park. As it is impossible to contact all of the hikers who registered, your individual answers are very important if we are to obtain a true picture of hiker's needs and preferences.

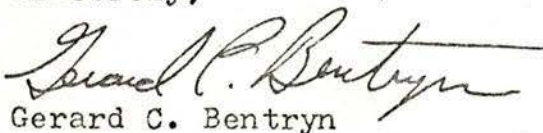
The information that you give is vital to intelligent park planning, and will be used to help make parks the kinds of places that you want them to be.

Please answer both the map and the written questions to the best of your ability. We want to know what you think, so please, make it an individual effort. All answers and comments will remain confidential.

Mail the questionnaire back to us as soon as possible in the enclosed envelope, which is self addressed and post-paid.

Thank you for your cooperation in this study.

Sincerely,



Gerard C. Bentryn

Enclosure



All of the following questions require answers based upon your personal experience while hiking on _____ trail, in Strathcona Provincial Park, about _____, 1971.

1. How many people hiked with you on this trip? _____
2. About how many other people did you see while hiking? _____

Would you say you saw:

- | | |
|--------------------------------------|--|
| <input type="checkbox"/> Far too few | <input type="checkbox"/> Too many |
| <input type="checkbox"/> Too few | <input type="checkbox"/> Far too many |
| <input type="checkbox"/> About right | <input type="checkbox"/> It didn't matter to me. |

3. Besides hiking, did you:

- Mountain climb (using ropes, etc.)
- Fish
- Swim
- Nature study (bird watching, rock study, etc.)
- Take pictures. Of what? _____.
- Other (describe _____).

4. While hiking, did you see:

- | | |
|-------------------------------|--|
| <input type="checkbox"/> Bear | <input type="checkbox"/> Bald eagle |
| <input type="checkbox"/> Elk | <input type="checkbox"/> Squirrel |
| <input type="checkbox"/> Deer | <input type="checkbox"/> Other (describe _____). |

5. Did you stay overnight in the back country area of this park?

- Yes No.

If yes, how many nights? _____.

6. Have you seen maps or guidebooks of Strathcona Park?

- Yes No.

Did you use them while hiking? Yes No.

What kinds? _____

 _____.

7. Have you hiked in Strathcona Park before? Yes No.

If yes, how many times? _____.

Would you say the park is getting -

Better

Worse

No change.

Why? _____

8. For what reasons did you choose to hike in this park? _____

9. In terms of your own personal satisfaction, how would you rate the area you hiked in?

Very good Good Fair Poor Very poor.

What was there about the area that made you feel this way?

10. Please list anything which tends to limit your appreciation of Strathcona Provincial Park as a true wilderness area.

A. That you personally saw: _____

B. That you are otherwise aware of: _____

11. Of all your recreational activities, would you rank wilderness hiking as being your:

First

Third

Second

Less than third choice.

12. Comments:

STRATHCONA PARK

1. Using ball point pen, please indicate the route you hiked. Mark your campsites with an "X".

2. Using pencil, please draw a line on the maps showing the area(s) you personally consider to be wilderness.

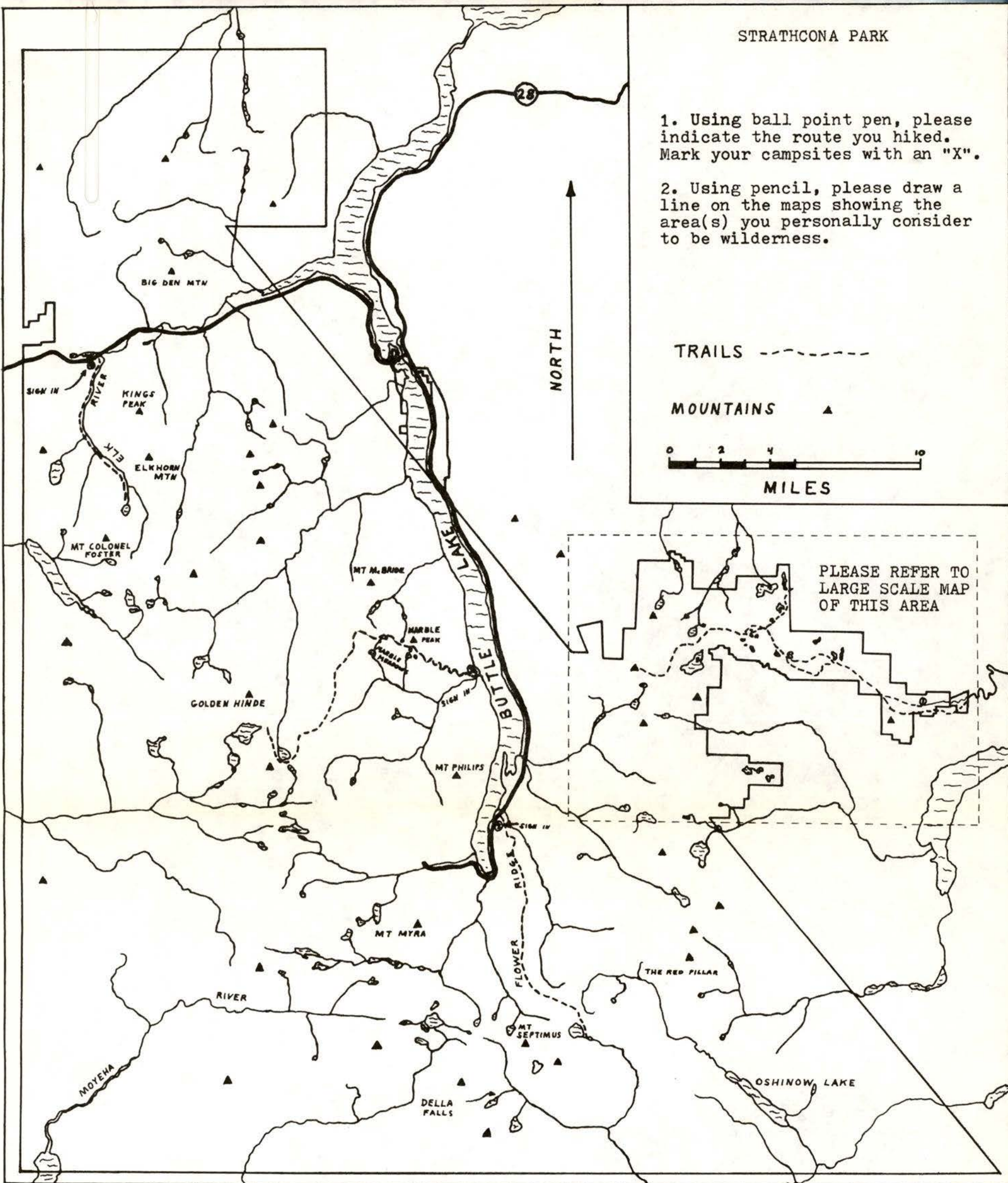
TRAILS - - - - -

MOUNTAINS ▲

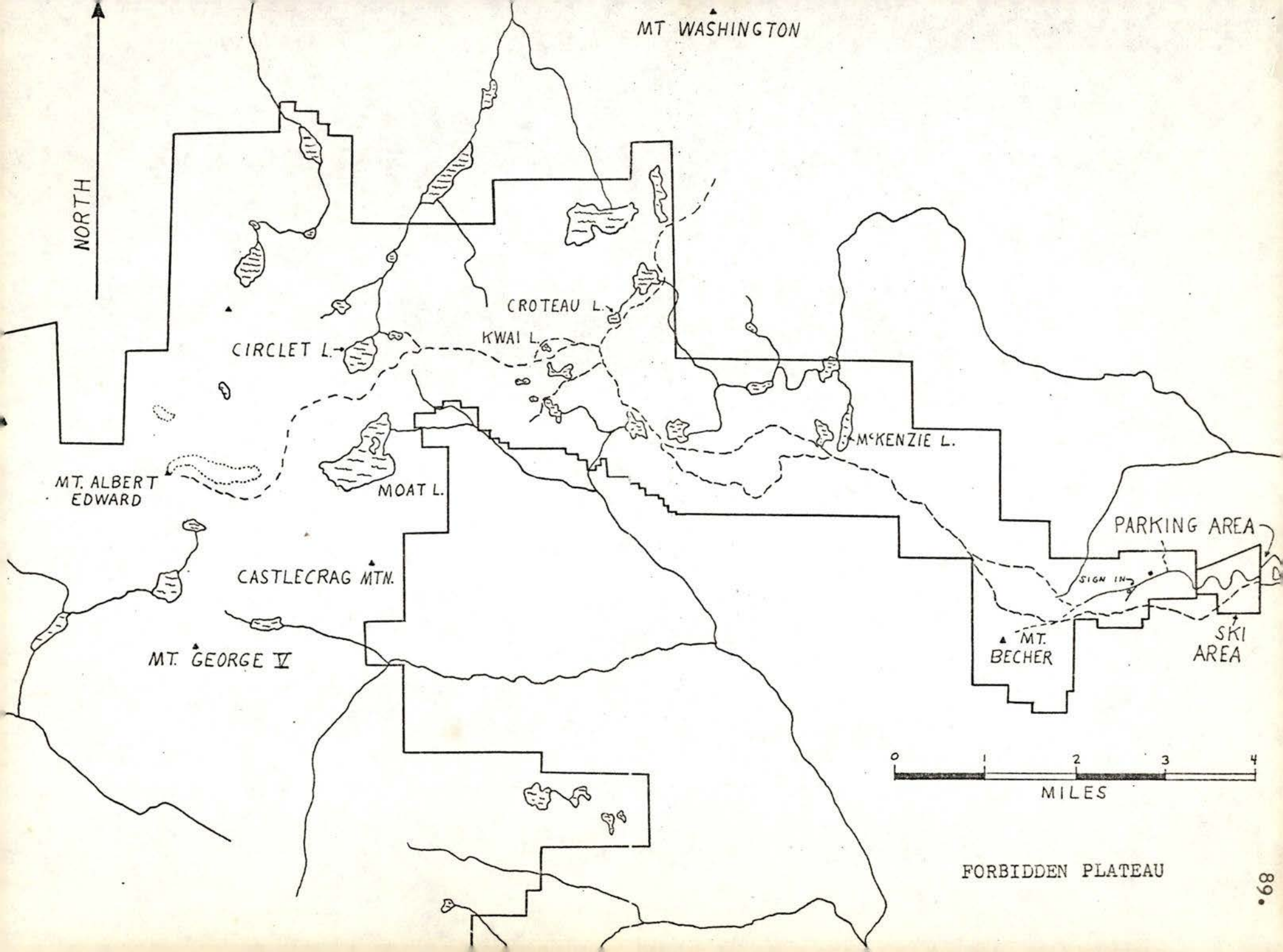


MILES

NORTH ↑



PLEASE REFER TO
LARGE SCALE MAP
OF THIS AREA



MT WASHINGTON

NORTH

CROTEAU L.

KWAI L.

CIRCLE L.

MCKENZIE L.

MT. ALBERT EDWARD

MOAT L.

PARKING AREA

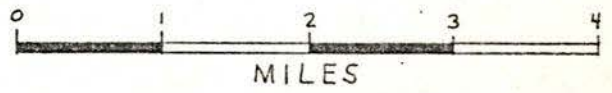
CASTLECRAG MTN.

SIGN IN

MT. GEORGE VI

MT. BECHER

SKI AREA



FORBIDDEN PLATEAU

APPENDIX II

ALTERNATE SEGMENT SCORE SEQUENCES

In the first attempt, all segments which either contained or contacted a road or a boundary, were given a value of one. Adjacent segments were given a value of two, then three, four, etc. . . , reaching a maximum value of ten from the roads, and eight from the boundaries. Minimum values for each segment were then derived, (eg. A road distance score of ten and a boundary distance score of one, resulted in a segment score of one.). In this attempt and all the following attempts, when a particular segment score was in question, the lowest value was used. This occurred when a road cut at an angle through the segments, resulting in many segments being scored consecutively, one, two, two, three, three, etc. . . , instead of the simpler one, two, three, four, etc. . . .

A second attempt was made in which the boundary scores were begun at three, instead of one. This shifted the area of "predicted wilderness" to the west as was needed, but observation indicated a need for yet another modification. In the third attempt, boundary scores were begun at a value of one, but were increased geometrically in the series, one, two, four, seven, eleven, sixteen, etc. . . . In actuality, it was only necessary to go to a value of seven, because of minimum segment values resulting from road distance. This progression of segment values was determined to be optimum by averaging the distance decay factor slope from the western boundary of the park, where road influence was at a minimum.

Surname: BENTRYN Given Names: GERARD CHESTER

Place of Birth: BAYONNE, N. J. Date of Birth: NOV. 6, 1939

Educational Institutions Attended, with Dates of Entering and Leaving:

NEWARK STATE COLLEGE, UNION, N. J. 1966 to 1970
_____ to _____
_____ to _____

Degrees, Diplomas, Etc., Awarded, with Dates and Names of Institutions:

B.A. 1970 NEWARK STATE COLLEGE, N.J.

Honors and Awards:

Holtz Honor Scholarship - 1969
Graduated Magna Cum Laude - 1970
Kappa Delta Pi, Honor Society - 1968
Lambda Alpha Sigma, Honor Society (Arts and Sciences)- 1970
University of Victoria Fellowship - 1970/72


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