

The Steeprock River Valley:
An Evaluation Of Its Potential As
A Manitoba Provincial Wilderness Park

by

Kurt G. Saunders

A Practicum
Submitted in Partial Fulfillment of the Requirements
for the Degree,
Master of Natural Resources Management

Natural Resources Institute
The University of Manitoba
Winnipeg, Manitoba, Canada
May, 1991



National Library
of Canada

Bibliothèque nationale
du Canada

Canadian Theses Service Service des thèses canadiennes

Ottawa, Canada
K1A 0N4

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-315-77040-6

Canada

THE STEEPROCK RIVER VALLEY: AN EVALUATION
OF ITS POTENTIAL AS A MANITOBA
PROVINCIAL WILDERNESS PARK

by

KURT G. SAUNDERS

A practicum submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of Master of Natural Resources Management.

@ 1991

Permission has been granted to the LIBRARY OF THE UNIVERSITY OF MANITOBA to lend or sell copies of this practicum, to the NATIONAL LIBRARY OF CANADA to microfilm this practicum and to lend or sell copies of the film, and UNIVERSITY MICROFILMS to publish an abstract of this practicum.

The author reserves other publication rights, and neither the practicum nor extensive extracts from it may be printed or otherwise reproduced without the author's permission.

ABSTRACT

The Manitoba Provincial Parks Branch has a mandate to establish, develop and maintain a system of provincial parks. This Practicum was in response to a request from the Parks Branch for an evaluation of the resources of the Steeprock River area and of its potential as a Provincial Wilderness Park. The study reviews the concept and management of wilderness and wilderness parks in North America; delineates a wilderness park's objectives and selection criteria; then, identifies and inventories the significant natural, cultural and recreational features of the area under consideration; and finally, evaluates these resources and determines that the area warrants designation as a Provincial Wilderness Park. Provisional park boundaries are recommended and development and management strategies which are compatible with wilderness park objectives and themes are identified.

ACKNOWLEDGEMENTS

The author wishes to extend appreciation to the following for their part in the production of this Practicum.

The Practicum Committee: Mr. Bruce Bremner, Manitoba Parks Branch; Dr. W.R.Henson, Natural Resources Institute, University of Manitoba; Dr. Harvey Williams, Faculty of Education, University of Manitoba; Mr. David Witty, Hilderman, Witty, Crosbie, Hanna and Associates, Landscape Architects and Planners. For direction and advice. Especially Prof. Thomas Henley.

The students and staff of the Natural Resources Institute, for inspiration, assistance, humour and goodwill.

Gord Jones, for suggesting the topic and providing the initial impetus; and his employer, Manitoba Parks Branch, for providing research funding.

My parents and family, for always being there.

Cindy Joan Mitchell, for warmth, patience, understanding, support and all of the other things which make up love.

and Robbin.

CONTENTS

ABSTRACT i
ACKNOWLEDGEMENTS ii

Chapter page

I. INTRODUCTION 1

Statement of Problem 5
Objectives 6
Methodology 8
Delimitations 13
Significance of the Study 14
Client 15

II. WILDERNESS IN ACADEMIC LITERATURE 16

Historical Perspectives on Wilderness 16
Wilderness Aesthetics 19
Definitions 21
Summary of Wilderness Criteria 33

**III. CANADIAN PARKS AGENCIES' WILDERNESS POLICY
GUIDELINES 36**

Objectives 37
Selection Criteria 38
Management Guidelines 40
Development 41
Summary of Policy Guidelines 42
Manitoba's Wilderness Park Policy 44

IV. RESOURCE INVENTORY 48

Climate 48
Physiography 51
Geology 55
Soils 56
Vegetation 57
Hydrology and Fishes 61
Fauna 66
Prehistory 69
Recent History 70

V.	RESOURCE EVALUATIONS	72
	Natural Resource Values	74
	Recreational Resources	79
	Resource Evaluation Summary	83
VI.	CONCLUSION	87
	Boundaries	91
	Future Research and Study Recommendations	94
	LITERATURE CITED	95
	PERSONAL COMMUNICATION	100
	<u>Appendix</u>	<u>page</u>
A.	PROPOSED MANAGEMENT STRATEGIES	101

Chapter I

INTRODUCTION

Wilderness is a resource which can shrink but cannot grow. Invasions can be arrested or modified in a manner to keep an area useable either for recreation, or for science, or for wildlife, but the creation of new wilderness in the full sense of the word is impossible. (Aldo Leopold, 1966)

The parks of Manitoba are an important natural resource that belong to all the residents of the province. The Provincial Parks Branch has a mandate to establish, develop, and maintain a system of provincial parks so that all Manitobans and visitors to Manitoba may enjoy these lands. To facilitate the establishment of Provincial Parks that will fulfill this objective, the Parks Branch requires that background research be undertaken in areas where new parks may be established. This research was in response to a request from the Manitoba Parks Branch for an evaluation of the resources of the Steeprock River area and of its potential as a Provincial Wilderness Park.

Manitoba has a very diverse land base. Manitoba Parks Branch has divided the province into twelve distinctive natural regions and hopes to create a parks system which will represent this regional diversity. At the same time the Parks Branch wishes to develop a greater variety of parks

including recreational parks, wilderness parks, heritage parks, natural parks, recreational trailways and waterways, parkways, wayside parks and marine parks.(Manitoba,1986.) At present, the Manitoba Provincial Parks system is not complete. Certain areas are under consideration and could become parks in the future.

In the past twenty-five years the concept that the wilderness in North America is a diminishing resource, and one worth saving from extinction, has evolved to become a celebrated cause, frequently occupying a prominent position on the editorial pages of the daily newspapers in cities across the continent. It has become a fact that the wilderness is now a limited resource competing for its survival in a world that is rapidly diminishing in size. Manitoba is especially lacking in its appreciation of this valuable resource. A recent 'report card' by the Canadian Nature Federation, a respected national citizens' group, awarded the province a failing grade of F with respect to its record of park establishment and wilderness preservation. (Canadian Nature Federation, 1985) With its diverse land base, Manitoba, more than any other, could be a leader in this field, with wilderness parks established in the few remaining unique and exciting wild areas that may be found in the province.

The Steeprock River watershed, located approximately 560 kms (350 miles) northwest of Winnipeg in the Porcupine Mountains, is such an area.(see Fig.1) Situated along the

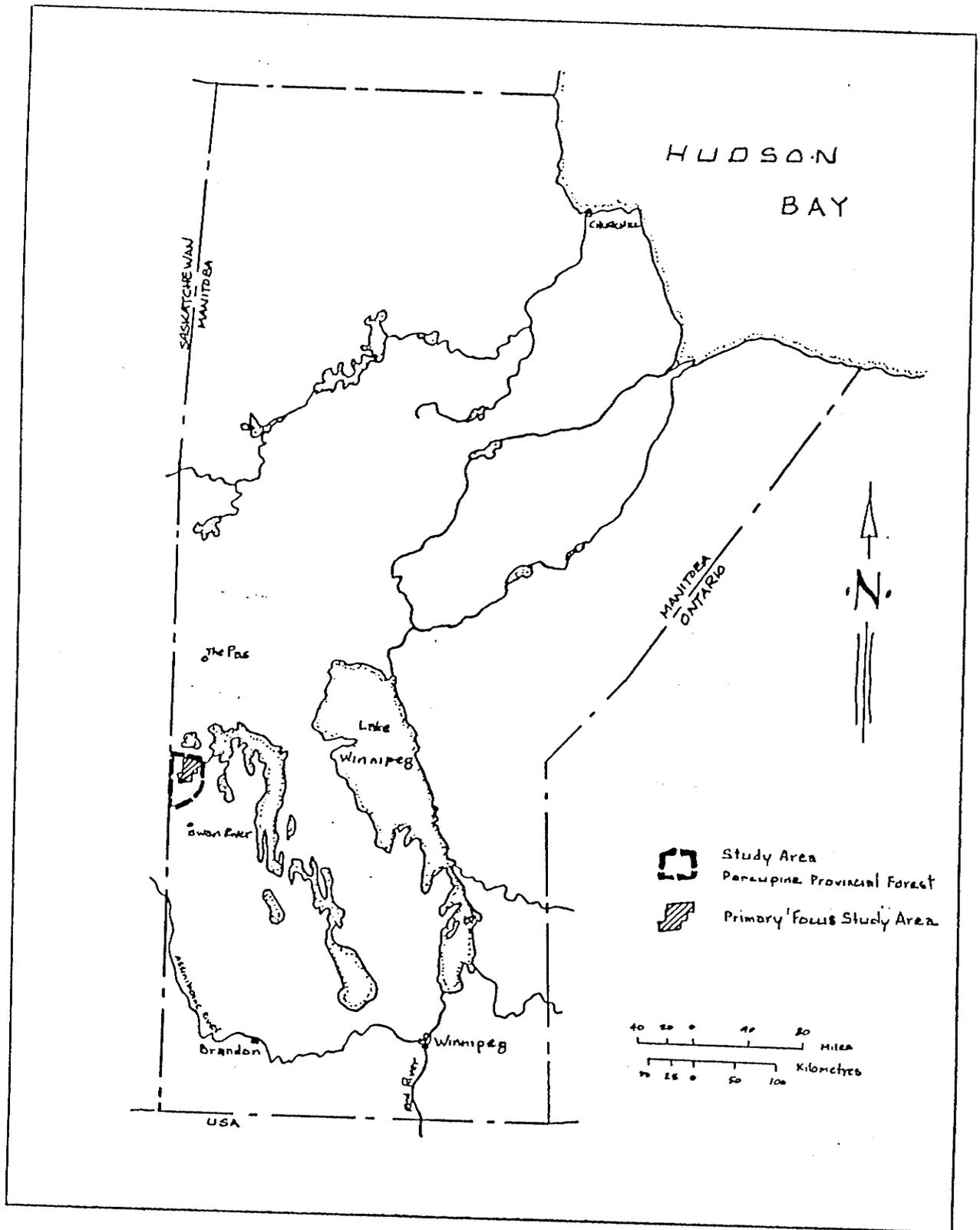


Fig. 1 Study Area Location

Manitoba-Saskatchewan border this watershed is an excellent example of the scenic and wildland qualities of what the Parks Branch labels the Western Upland Natural Region. (Manitoba,1986) "This region is characterized by the highest and most visually apparent relief in Manitoba. Bedrock consists of Mesozoic shales and sandstones and outcrops are common. Glacial till mantles the area and the main vegetation consists of Aspen-Spruce boreal forest - here making its major appearance in Manitoba." (Manitoba,1986) The Steeprock River valley in particular has deep canyons, fast-flowing clear streams, exposed clay and sandstone cliffs, and towering stands of virgin white and black spruce. Brook trout may be found in the streams, while elk and moose range throughout the valleys.

The Provincial Park Systems Plan identifies this area as having potential as a Wilderness Park.(Manitoba,1986) The Systems Plan defines a Wilderness Park as a park which may

...encompass outstanding land areas and their associated plant and animal communities. Largely untouched by man, wilderness areas provide superior recreational opportunities compatible with wildland character and experience. All weather roads and major commercial resource extraction/harvest activities are not permitted in wilderness parks. (Manitoba,1986)

Before such a designation can be achieved however an evaluation of the resources of the region must be undertaken. Such an assessment can provide the necessary background information on the region and determine whether or not the area meets Wilderness Park criteria.

1.1 STATEMENT OF PROBLEM

The decision to designate a parcel of valuable land as a provincial park is not an easy one. There are many considerations involved, several of which often conflict. These may include unique and significant features, high quality recreational resources, and natural resource utilization possibilities (future forestry, mining plans). In order to identify significant resource features and to minimize possible conflicts it is necessary to study closely the area under consideration.

The background study delineates a wilderness park's objectives or Manitoba Wilderness Park criteria; then, identifies and inventories the significant natural, cultural, and recreational features of the area under consideration; and finally, evaluates these resources and determines whether the area warrants designation as a Provincial Wilderness Park. This provides some insight as to how the area may best be utilized and managed.

1.2 OBJECTIVES

The primary objective of the research was to evaluate the potential of the Steeprock River area as a Manitoba Provincial Wilderness Park. In order to achieve this, wilderness park criteria applicable to the Manitoba situation have been developed. The study area's resources; natural, cultural, and recreational, were then inventoried. As part of this inventory, features which are rare, unique, and representative were identified and described. Particular attention was directed to an area approximating the Steeprock River watershed, the area the Manitoba Parks Branch identified as the Primary Focus Study Area.(see Fig.2)

In the third phase of the study the inventory and description of the Primary Focus Study Area's resources were assessed, with respect to the established wilderness park criteria, to determine the value of the Steeprock River area as a potential Manitoba Wilderness Park.

In the final analysis and summary of findings, it was concluded that wilderness park status is recommended for the area; provisional park boundaries were recommended and development and management strategies which are compatible with wilderness park objectives and themes were identified. These alternative strategies are also compatible with the Manitoba Provincial Parks Systems Plan and are reasonable with regard to their implementation.

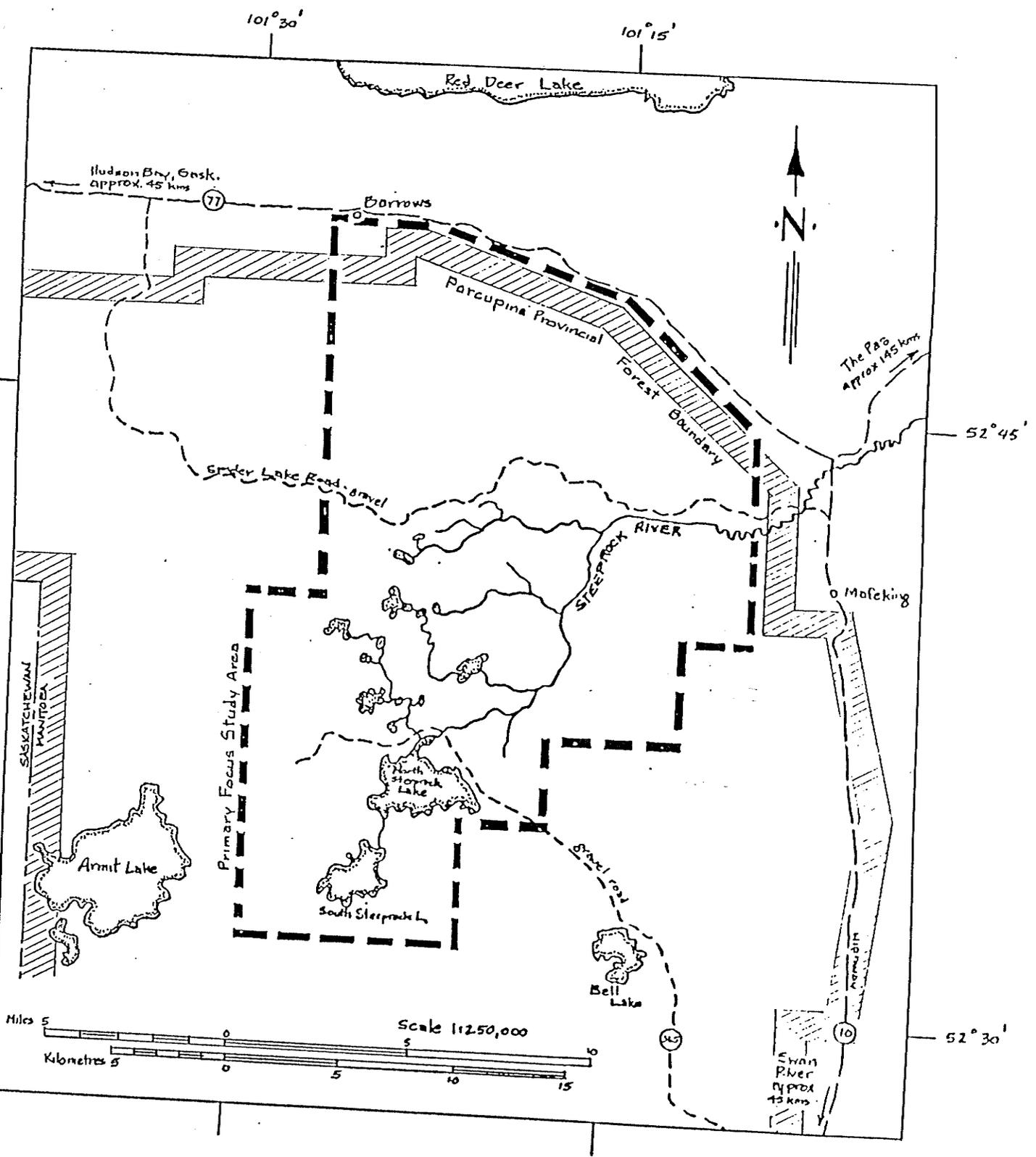


Fig. 2 Primary Focus Study Area

Specific objectives were:

1. to develop wilderness park criteria applicable in the Manitoba situation.
2. inventory the natural, cultural, recreational resources of the Steeprock River watershed area.
3. to assess the significance of the natural, cultural, recreational resources, features and values relative to the established wilderness criteria.
4. to make recommendations regarding establishment of a wilderness park. And, to recommend development and management strategies for the area.

1.3 METHODOLOGY

The initial phase of the study reviewed the existing literature available on the topic. A wealth of material exists related to wilderness parks planning, and park management in general. (e.g. Bates, 1978, Eagles, 1984, or Piagram, 1983) From this research a working definition of wilderness was developed, one that may be applied to the Manitoba situation. Through the use of both this academic literature, and a review of the criteria used by other administrative bodies experienced in the field of wilderness planning, guidelines for evaluating the wilderness potential of the Steeprock Valley area were synthesized.

The second phase of the study involved an inventory of the natural and cultural resources of the Porcupine Mountains area, with an emphasis placed on the Steeprock River watershed. The natural resource categories include:

1. Climate
2. Hydrology
3. Limnology
4. Geology
5. Geomorphology
6. Soils
7. Vegetation
8. Wildlife

Cultural resources are those areas or features which have been influenced by human activity and are noted as either prehistoric, historic or contemporary. Examples of this are; native settlement, road development or forestry operations.

Baseline data and resource inventories were obtained from other research bodies concerned with the region however they were scarce and/or general in nature.(e.g. Barto,1978 or Weir,1983)

Much of the small scale land classification and resource inventory data was obtained through the land use/land cover interpretation of existing low level aerial photographs and topographic maps. These photographs and maps are available as recent productions and can be obtained easily. The interpretation utilized methodology typical of Biophysical Land Classification (Mills et al,1976), the United States Geological Survey (Avery,1977), and the Canada Land Inventory (Canada Land Inventory,1969).

To supplement existing studies and land classification data, interviews with regional resource managers were conducted. Foresters, fisheries and wildlife managers and park specialists were contacted to ensure the completeness and timeliness of the resource inventory. This inventory provided a database from which an evaluation of the wilderness potential, park area and boundary was achieved.

In order to evaluate the potential of the study area, a typical natural resource decision making model was utilized. Such a model is outlined in the "Guidelines For The Preparation Of The Canadian Heritage Rivers System Nomination Document" (Parks Canada, 1980). For example, one component of the model recommends examining a river's recreational resources under the following criteria.

Diversity : The range or variety of land and water based recreational opportunities and activities afforded by the river environment on a year round basis.

Concentration : The number of complementary recreational activities which currently exist or could be developed while at the same time conserving the natural and human heritage resources located within the river corridor.

Integrity : The quality of a recreational experience. The experience is influenced by such things as the river's characteristics water quality and conflicting land uses.

Representativeness : The recreational and tourist activities along the nominated river as it relates to provincial, territorial, and regional recreational activities. For example, a river could be selected on the basis of the manner on which it represents outstanding angling activity within a designated area.

Uniqueness : Areas that provide rare or singular settings for specific types of recreational and tourist activities, either existing or potential, should be identified as one measure of the river's uniqueness. River corridors that have rare or outstanding opportunities for recreational and tourist activities should receive high consideration for the Canadian Heritage Rivers System.

Naturalness : The potential for recreational activities such as canoeing, scenic viewing and photography in an attractive setting where man's influence on the landscape is minimal.

Other components of the model evaluate the river's natural and cultural resources in much the same way.

By adapting these guidelines for use with wilderness criteria the potential of the Steeprock River watershed was assessed.

The final phase of the study makes recommendations regarding establishment of a wilderness park. This follows the conclusions of the decision making model. As the wilderness designation appeared appropriate, further analysis was undertaken. This identified activities and land uses which are compatible with the park's theme and satisfies its objectives. This was achieved through the integration and analysis of the resource data, review of appropriate literature and consultation with individuals and agencies which have experience with the art and science of wilderness park planning. Through the experience of others a framework of ideas and strategies was formed. From this database a plan for the establishment, development and management of the proposed park was briefly outlined.

The documentation of the research study and evaluation follows a standard format, acceptable to both the client (Manitoba Department of Natural Resources, Parks Branch) and the University of Manitoba (represented by the Natural Resources Institute).

Specific methods included:

1. a review of the existing literature on the topic to determine wilderness park criteria. The literature review also formed an integral segment of the resource inventory process.
2. land use/land cover classification of existing aerial photographs and survey maps of the Porcupine Mountains area, with emphasis placed upon the Steeprock River watershed. Some ground truthing was achieved through two site visits.
3. through information gathered from the first two methods compilation of an inventory of the natural, cultural, and recreational resources of the Porcupine Mountain area.
4. following a typical natural resource decision-making model in order to evaluate the study area's potential as a provincial wilderness park.
5. identifying activities and land uses which will be compatible with the theme of a wilderness park and will satisfy its objectives.
6. providing a final report and communications package suitable for presentation by the client.

1.4 DELIMITATIONS

This study did not attempt to undertake a socio/economic assessment of the proposed wilderness park's establishment. Nor did the study attempt a detailed ecological analysis of the species distribution and community structure of the area. Additionally, the study did not attempt a cost/benefit analysis of the implementation and management of the proposed park. The study does, however, offer an overview of these topics and notes related literature where appropriate.

Public participation and user/visitor questionnaires were not an element of the study, however, pertinent, unsolicited input was noted, where appropriate.

1.5 SIGNIFICANCE OF THE STUDY

The Parks Branch of the Manitoba Department of Natural Resources has identified the evaluation of the wilderness park potential of the Steeprock River Valley as a necessary and time-specific task. The inventory and evaluation of the resources of the area are integral components of the planner's database required to consider establishment of the park. This research will enable the full potential and opportunity of the region to be utilized, in an effective and knowledgeable fashion. Additionally, such research will prove invaluable in the area's development and its management planning decision-making.

Provincial parks are an important investment in the future of Manitoba. This research will greatly enhance and protect such an investment.

1.6 CLIENT

The research and related findings and conclusions are of interest primarily to the Parks Branch, Manitoba Department of Natural Resources. However, the research will be of interest to other administrative and/or research oriented bodies. These include the Water Resources Branch, Forestry Branch, and Wildlife Branch of the Manitoba Department of Natural Resources; the various municipal governments which would be affected by a proposed park; and those bodies in the adjoining province of Saskatchewan who may be affected.

Chapter II

WILDERNESS IN ACADEMIC LITERATURE

2.1 HISTORICAL PERSPECTIVES ON WILDERNESS

As the first civilizations domesticated animals and initiated agriculture (taming the land) they drew a line between wilderness and non-wilderness. Essentially early humans were reducing the risks in life (inherent in wild lands) and benefitting themselves and their community. They were afraid of what could happen to them in the wild landscapes, a feeling which has pervaded through evolution.

A select few braved the wilderness as history evolved, but always their intent was to tame the wilderness, to bring the wildlands under their control. More often than venturing forth, a shield was built for protection from this wilderness. Typically, the medieval cities had walls to protect their homes as much from the beasts and demons in the surrounding wild forests as from the armies of other states.

Mankind dominated the landscape; they designed structured gardens so as to push out any wilderness left in nature; they stayed away from the mountains and remained fearful of the dark forests. This was a result of both practical sensibilities and religious devotion. Continued fear and

reluctance to explore the natural world was reasonable, the wilderness did contain dangers and life was difficult enough without recklessly camping in inclement weather amongst the bears and wolves.

The Europeans' views on nature changed substantially with the Romantic movement in the 18th and 19th centuries, however wilderness was still to be subjugated by their control. People may have enjoyed the out of doors, gardens and lawns, but only so long as they were ordered and safe. The landscape architecture and painting of the period shows this in its geometric, planned gardens and neo-classical romantic posturing. However, the religious association of God and His wilderness coupled with the breakthroughs in scientific thought which showed the harmoniousness and complexity of nature subtly changed the views of western man. Wildlands, mountains, the raging sea, came, in time, to be seen as wondrous; the sublime had as equal place in the world of God as did the ordered world of the European Romantics.

The New World with its wild frontier was seen to embody this sublime character. However it was not the Romantics who emigrated to North America, it was hardworking pioneers, people in a situation where they had every reason to fear the wilderness. It was their view that they had to subdue the wildlands, to provide safety and sustenance for themselves. The wilderness was a resource, one to be exploited for those things which could be physically extracted from

it, i.e. timber, agricultural land, water, furs, meat. These frontiersmen had no time to revel in the beauty of nature, they had to survive within it.

The frontier settlers pushed back what they viewed as the wilderness in North America, subjugating the land as they moved persistently westward. A few solitary voices decried the rapidly diminishing resource; Thoreau admonished his fellow New Englanders to go out and appreciate nature, Audobon saw in the early years of the 19th century that the utilitarian destruction of the forests of America would ravage the beauty of the land, George Catlin chronicled the disappearance of the wild bison and the Indians of the plains. Catlin, who is often credited with proposing the National Park philosophy, felt that this wilderness was deserving of preservation in a magnificent park, for its own sake, to remain unaltered as an historical show-piece. (Knudsen, 1980) These people and the others that followed felt that wilderness could only be saved in small pieces, as industry's need for resources would increase, but that wilderness in itself was precious and valued and some areas should be maintained as wildlands.

2.2 WILDERNESS AESTHETICS

The cry for preservation led to the establishment of wilderness areas to be reserved, mostly in the form of National Parks; for their scenic beauty and uniqueness. But as the North American continent has been overrun by settlement and the demand for land and its bounty has increased the wilderness reserves have continually been under pressure from those who cannot appreciate their value.

The North American frontier ethic of utilitarian use of the natural resources does not attach a substantial measure of value to unquantifiable resources such as wilderness aesthetics. The utilitarian cannot understand this denial of the obvious benefits of the extractive resource use (forestry, mining, hydro-electric dams) and this is what causes the controversy. The extractive resource users are willing to allow multiple use of the lands but wilderness lands, by their very definition deny such use. (Council of the Society of American Foresters, 1976) Land that has been trampled by man is no longer wilderness, it cannot withstand multiple use. (Wilkes, 1979)

Krieger maintains, "Natural environments are likely to be named when there are unnatural environments and are likely to be noted only when they are outnumbered by these unnatural environments. The wildlands of the past, which were frightening, were plentiful and were not valued. The new

wilderness, which is a source of revitalization, is rare and so valued that it needs to be preserved."(Krieger,1973) Krieger, and other writers, value wilderness for its source of revitalization. Sigurd Olson, quoted in Nash(1982), wrote in 1949 that wilderness had deep significance as a stabilizer and sustainer, a fact that he would never have understood had he not had the experience of living amidst cities and cars and whistling locomotives. Henry David Thoreau admired wilderness because it was reality compared to the delusion of Paris and London, New York and Boston in the 19th century. More recent writers include Roderick Haig Brown who says that flyfishing in the wilderness makes him "feel larger, and better and stronger for it, in ways that have nothing to do with any common gain in practical knowledge." (Haig Brown,1946)

Joseph Sax writes of the value of wildlands, in a more quantitative fashion, "While nature is not a uniquely suitable setting, it seems to have a peculiar power to stimulate us to reflectiveness by its awesomeness and grandeur, its complexity, the unfamiliarity of untrammelled ecosystems to urban residents, and the absence of distractions. The special additional claim for nature as a setting is that it not only promotes self-understanding, but also an understanding of the world in which we live. Our initial response to nature is often awe and wonderment; trees that have survived for millennia; a profusion of flowers in the seeming steril-

ity of the desert; predator and prey living in equilibrium. These marvels are intriguing but their appeal is not merely aesthetic. Nature as also a successful model of many things that human communities seek: continuity, stability and sustenance, adaptation, sustained productivity, diversity, and evolutionary change. The frequent observations that natural systems renew themselves without exhaustion of resources, that they thrive of tolerance for diversity, and they resist the arrogance of the conqueror all seem to give confirmation to the intuitions of the contemplative recreationist."(Sax 1980)

To these writers wilderness, as it exists in their minds, and on the ground has intrinsic qualities which are beyond measurable value. Wilderness is to them a significant element of modern life. Without wilderness, to appreciate and possibly visit, people cannot see where it is that they have been, and where it is that they are going.

2.3 DEFINITIONS

In the past many attempts have been made to establish a definitive meaning of wilderness. Definitions have ranged from wholly objective to subjective, from general to specific, from vague to prescriptive, from metaphysical to physical. A corollary of this is that one person's wilderness has often not been accepted as a recognizable, definitive wilderness by others interested in environmental planning.

This has led to disagreement regarding the significance of important areas of wildland in North America, wildland that is rapidly disappearing. Without general agreement on what may be considered typical of wilderness the planning and management of such areas cannot be easily facilitated. This portion of the study will review some of the definitions used by interested parties in the past thirty years and will attempt to show that they may be synthesized into a working definition which will be applicable in the Manitoba situation.

Early work on the definition of wilderness in North America was based on the conservation ethic, as expounded by people such as Aldo Leopold. Leopold's A Sand County Almanac contains a chapter on wilderness wherein he made a case for preserving "the raw material out of which man has hammered the artifact called civilization."(Leopold,1966) Leopold saw wilderness as a sanctuary for recreation, a place where experiences can, to a large degree, "differ from and contrast with workaday life."(Leopold,1966) He also viewed wilderness as having importance to science, as a laboratory of norms for the study of land-health. Wilderness areas have value as sanctuaries for wild animals and natural plant communities. Through his reasoning for why such areas should be preserved, based upon his explanation of the usefulness of such wildland, he implied a definition of wilderness. "Wilderness is a resource which can shrink but not

grow. Invasions can be arrested or modified in a manner to keep an area useable either for recreation, or for science, or for wildlife, but the creation of new wilderness in the full sense of the word is impossible."(Leopold,1966) Leopold had not given a rigorous definition of his idea of wilderness but rather had implied that it is land that remains a natural community of life, retaining its primeval character, unaffected by man.

As such land disappeared and more pressure mounted to have wilderness areas preserved a definitive description of wilderness became necessary. A study by the Wildland Research Center under the auspices of the Outdoor Recreation Resources Review Commission reported on the state of wilderness in the United States in 1962. The study reviewed definitions in use by various agencies at the time and attempted to produce a workable definition of wilderness, applicable by all.

The study found that the U.S. National Park Service approached the problem by utilizing two definitions; one emphasizing ecology, and the other based on wilderness as a state of mind. The ecological definition included such phrasing as,

A wilderness is an area whose predominant character is the result of the interplay of natural processes, and large enough and so situated as to be unaffected, except in minor ways by what takes place in the non-wilderness around it. (The Wildland Research Center,1962)

The second half of the National Park Service definition was more philosophical in nature,

Wilderness also needs to be regarded as a quality - defined in terms of personal experience, feelings, or benefits. In this, it is even more difficult to define wilderness in exact terms that will satisfy the sensibilities of all people. But, certain general qualities must be present to provide that type of experience which the national parks were established to perpetuate.

Criteria were then listed.

These include all of the following,

1. A scene or vista of unusual natural interest or beauty unaffected by obvious man-made intrusions.
2. An area secluded or removed from the sight, sounds, and odors of mechanization.
3. A spot where one can feel personally removed from modern civilization.
4. A place where you can experience a feeling of adventure such as the pioneer might have felt in conquering the frontiers.
5. A condition where perception, physical skill and ability to be self reliant in the enjoyment of nature replace mechanical civilized skills.

In this sense, wilderness does not necessarily require vast areas of undeveloped or rugged topography, dense forests unopened by modern man, or a wild jumble of mountain peaks. 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. (The Wildland Research Center, 1962)

The two definitions were then summarized in this way,

Wilderness is an ecological condition. Wilderness is also a state of mind. Both concepts are important - the former in matters of protection and management, the latter in evaluating the benefits

of wilderness, both in planning for the intelligent and beneficial use of this important cultural and recreational resource. (The Wildland Research Center, 1962)

The U.S. National Park Service succeeded in identifying the duality inherent in any description of wilderness. To be truly wilderness the area had to be considered in terms of both the ecological completeness of its landscape, and the state of mind which it produced.

The U.S. Forest Service approached the problem of defining wilderness in a different manner. Rather than attempt to explain the reasoning underlying a wilderness definition the Forest Service simply gave criteria for designation and guidelines for management. The criteria included such things as size limitations (areas no less than 100,000 acres[40469 ha] were to be labelled wilderness while areas less than 100,000 but greater than 5,000 acres[2023 ha] are to be called wild lands), roadlessness, an absence of private and commercial development, etcetera. (The Wildland Research Center, 1962)

Neither this nor the Park Service definition was acceptable to the Wildland Research Center. The U.S. National Park Service definition with its criteria for identifying a 'state of mind' was too subjective and did not give enough emphasis to values other than recreation. The U.S. Forest Service definition was judged too selective in terms of size restrictions and administrative control. The Forest Service

stated that areas could only qualify as wilderness if they were previously subject to administrative stipulations limiting public use. (The Wildland Research Center, 1962)

The Wildland Research Center, for the purpose of their inventory and concept analysis on the state of wilderness, defined wilderness in their own way. A Wilderness Tract is,

a tract of land, including interior bodies of water, open to overnight public use and entry by foot, horseback, or hand propelled vessel; primarily in public ownership; in the continental United States:

1. not less than 100,000 acres [40469 ha] in extent;
2. containing no roads - (a) constructed for passenger car traffic, in mountainous terrain, (b) suitable for passenger car traffic in deserts or plains;
3. existing as a single unit with boundaries reasonably free of indentation;
4. with its succession of major ecological stages not interrupted by on-site human interference, except that - (a) effects of domestic livestock are acceptable, (b) effects of selective logging before 1920 are acceptable east of the 98th meridian, (c) ecological effects of fire suppression are acceptable in all areas. (The Wildland Research Center, 1962)

The Research Center emphasized that the criterion of 100,000 acres minimum size was really only "an approximation of what is necessary to permit reasonable complete ecological dynamics." More important than actual acreage was that the boundaries of the wilderness area be delineated in such a way so as to contain complete ecological units and ensure

freedom of natural processes.(The Wildland Research Center,1962) Also emphasized in the report was that wilderness had certain values which accrue to both the individual user and to society. These included; recreation values, i.e. camping, hunting, solitude; and environmental values, i.e. conservation, scientific uses, watershed uses, and the idea that wilderness simply exists.

The growing concern in the United States about the diminishing wilderness resulted in the Outdoor Recreation Resources Review Commission Study Report 3, and in turn the conclusions of the study were used as basis for the Wilderness Act of 1964. The Act applied much of the same concepts and terminology as the ORRRC and enabled the American Congress to designate Federal lands as 'wilderness'. In doing so it provided an all encompassing definition of such wilderness.

The Act defines wilderness as "an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain."(Frome,1974) Wilderness is specifically,

an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which

1. generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticable;

2. has outstanding opportunities for solitude or a primitive and unconfined type of recreation;
3. has at least 5,000 acres [2023 ha] of land or is of sufficient size as to make practical its preservation and use in an unimpaired condition, and;
4. may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. (Frome, 1974)

This definition covers essentially the major criteria identified by the ORRRC Study 3, i.e. that the land must be in a natural, unaltered state; that it has good opportunities for solitude and primitive, low-impact recreation; that it contains natural features which impart to the area a special significance, and; that it is of enough area to contain and maintain the features which give it its character.

The U.S. Wilderness Act of 1964 was an attempt to provide a definition of wilderness which would be applicable throughout the United States. The criteria were therefore left broad and general in nature. Since the Act was passed there has been much discussion of the parameters of wilderness. The focus of this discussion has been to narrow the criteria, or to reason why emphasis should be given to one criterion rather than to another. Such discussion is typified by Bates (1978) who argues that "wilderness areas" in Ontario should be of not less than 750 square miles (120,000 acres [48562 ha]) in area. Bates said that a key consideration in the designation of a wilderness area is that it

should be ecologically self-regulatory. "It should contain sections in all successional stages and must be able to resist the impact of normal ecological forces such as fire, pests, predators, droughts, windstorms, and floods with little and preferably no intervention by man." (Bates, 1978) Other writers argued along the same lines, of size being dictated by the completeness of the natural community included in the reserve and that a minimum of 5,000 acres (2023 ha) is probably not large enough. They then go on to prescribe specific size minima. (Falls, 1971; Sullivan and Shaffer, 1975)

Another group of writers suggest that a wilderness definition should be adaptable, that is, each individual site being judged independently, on its own merits or demerits. These definitions are based on criteria which include no arbitrary minimum size. The reasoning behind this approach can be both ecological and somewhat metaphysical. The size requirements for a shifting dune, desert community to remain self-regulatory and ecologically complete may be quite dissimilar to those for a self-regulatory, ecologically complete ocean coastline, boreal forest, or arctic tundra. (Piagram, 1983) This type of wilderness definition, emphasizing the ecological importance of the reserve, must be adaptable to different circumstances and therefore not arbitrary in designating a minimum size for wilderness. It must be useful in one circumstance but not so discriminatory in others that significant areas might go unrecognized. (Nash, 1972; Stankey, 1978)

Another aspect of wilderness which must be considered when attempting to form a workable definition is that to many people it is essentially a state of mind. The condition of wilderness depends upon the emotions which the area of land may produce in the observer. Roderick Nash in Wilderness and the American Mind (1973) says, "The term designates a quality that produces a certain mood or feeling in a given individual and, as a consequence, may be assigned by that person to a specific place." Gardner (1978) suggests that wilderness is "a condition and a state-of-mind" and that, "past associations, personal preferences, and expectations pervade conceptions of wilderness." He defined wilderness as an area in which "the probability for discovery is high; that the probability for discovery is related to variation and the chance of encountering the unexpected. Variation and the unexpected are relative terms defined on the basis of the usual and the expected which vary through time and between people." (Gardner, 1978) To define wilderness in this way is to refer to concepts such as the 'feel' of remoteness and wildness, rather than specific ecological examples. (Bodsworth, 1971)

Some would have wilderness defined more by the experience gained by the user than by the physical qualities of the landscape. The qualities of experiences can be peace, solitude, surprise, fear, communion with nature, etcetera. (Gardner, 1978; Marsh, 1969) This again presents a problem

however. By defining wilderness conceptually rather than in physical terms wilderness becomes too subjective and too much an individual matter, the definition is not a definition at all.(Nash,1972)

Perhaps the simplest way to form a definition of wilderness is to conceptualize it in broad terms. One should consider a spectrum of landscapes, with the artificial urban city at one end, rural agricultural at the center, and unaltered, natural environments at the opposite end. This gives an easy understanding of what is totally wild, that is, the landscape which falls at the extreme end, while allowing progressively less wild environments (more human influence) to be evaluated, and ranked, relative to the spectrum.(American Foresters,1976; Bates,1978; Marsh,1969; Nash,1972) It is generally simple to judge whether one landscape is more or less wild than another, and to place it accordingly on the scale, however a difficulty arises with the question of when a landscape is no longer classified a wilderness. Wilderness grades into rural, it is a somewhat gray area.

Obviously any workable definition of wilderness needs to be sensitive to both ecological standards and philosophical, aesthetic qualities. It must also be adaptable to the many different landscapes and environments to which it may be applied. Also it must be remembered that, as John Marsh writes,"...landscapes having wilderness qualities grade

gradually into those without, making precise delimitations of the wilderness very difficult."(1969) The best method for definition seems to be to utilize a general statement, in broad terms, that explains the concept of wilderness. The definition would then emphasize the significance of both ecological and philosophical, aesthetic qualities. Selective criteria would then be used to further delineate these qualities.

2.4 SUMMARY OF WILDERNESS CRITERIA

The U.S. Wilderness Act of 1964 provides the most broad, adaptable definition. It refers to both ecological and aesthetic qualities and covers most of the criteria identified by the academic literature.

The Act defines wilderness as "an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain." (Frome, 1974) Wilderness is specifically,

an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which

1. generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticable;
2. has outstanding opportunities for solitude or a primitive and unconfined type of recreation;
3. has at least 5,000 acres (2023 ha) of land or is of sufficient size as to make practical its preservation and use in an unimpaired condition, and;
4. may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. (Frome, 1974)

This definition refers to land that is "untrammelled by man", which "appears to have been affected primarily by the forces of nature", and "is of sufficient size, as to make practical its preservation and use in an unimpaired condi-

tion."(Frome,1974) Many authors would prefer that the language be more specific so as to insure that the wilderness area encompassed the self-regulatory ecological unit typical of the environment which it represents. (Bates,1978; Johnson and Weichel,1982; Piagram,1983; Pimlott,1971; Stankey,1972,1982; Wildland Research Center,1962; Witty,1973) Indeed some writers demand that the area be very large, with size perhaps dictated by the range of the farthest roaming species which may be typical of the particular wilderness.(Bates,1978; Eagles,1984; Sullivan and Shaffer,1975) Others define wilderness size with more recreationist criteria. The area should be large enough to contain one days walk (Piagram,1983), or two days (Pimlott,1971), or several days foot travel (Marsh,1969).

There should be no roads, the land must remain untouched and unaltered by man.(The Council of the Society of American Foresters,1976; Hilderman,1969; Johnson and Weichel,1982; Pimlott,1971; Stankey,1972,1982) There should be no services within the wilderness area, i.e. administration buildings, campgrounds, commercial lodges, however, some primitive trails are acceptable. (Bates,1978; Johnson and Weichel,1982; Knudsen,1980; Nash,1973; Piagram,1983; Pimlott,1971; Sax,1980; Stankey,1982; Witty,1973) These specifics are found later in the Act.(Frome,1974)

The U.S. Wilderness Act defines wilderness as having "outstanding opportunities for solitude". This is an impor-

tant quality of wilderness to many writers. (The Council of the Society of American Foresters, 1976; Hilderman, 1969; Littlejohn, 1971; Nash, 1973; Stankey, 1972) The Act does not, however, refer specifically to 'remoteness' in its text. Many authors feel that this is a quality which emphasizes the idea of wilderness; that it was a great distance from any access points; that the influence of non-wilderness environments is left behind. (The Council of the Society of American Foresters, 1976; Hilderman, 1969; Lucas, 1964; Nash, 1973; Piagram, 1983; Stankey, 1972; Wildland Research Center, 1962) This is one significant criteria in which the U.S. Wilderness Act is lacking.

Wilderness Criteria For Use In This Report

- the wilderness area must encompass the self-regulatory ecological unit typical of the environment which it represents.
- the land must be unaltered by man-made intrusions.
- the area affords outstanding opportunities for solitude and a feeling of remoteness.
- the area is of sufficient size or nature to make practical its preservation and use in an unimpaired condition.

Chapter III

CANADIAN PARKS AGENCIES' WILDERNESS POLICY GUIDELINES

The format of the policy declarations of the different provincial agencies and one federal agency responsible for wilderness park administration and management in Canada is generally similar. This similarity is evident whether the declaration is contained in a simple, short policy statement or a more detailed policy document such as a systems plan. Typically the declaration will outline the objectives of the wilderness park designation; the criteria used to select one area of land rather than another; the guidelines for management of the wilderness area; and, the development options available.

This section of the study will attempt to briefly compare the wilderness policies of the various agencies to see if a trend is common amongst them; one that may be useful and applicable in the Manitoba situation.

3.1 OBJECTIVES

The agencies share a common objective; to preserve representational natural landscapes while providing for recreation that is suitable in a wilderness setting. The purpose of Wilderness Parks in Saskatchewan as outlined by their Provincial Park Classification System document is an example.

- to provide large tracts of undisturbed lands which have high potential for quality, solitary wilderness recreation activities including canoe-tripping, backpacking, and crosscountry skiing.
- to protect representational landscapes in the province which display the variety of ecological characteristics and features found in Saskatchewan. (P.R.P.Consulting, 1985)

The duality inherent in this statement, that is, conservation and recreational use is typical of wilderness park objectives. The parks are created to satisfy two requirements which often conflict. Recreational use may often impair the natural landscapes, the preservation requirement may inhibit recreational activities; the ideal is to achieve a reasonable balance.

Some agencies, most notably Ontario, state a third objective, that of heritage appreciation. This objective is to provide for the exploration and appreciation of the natural heritage of the province. Such opportunities will allow users and other interested persons to learn and experience the meaning and purpose of wilderness within Ontario's society and culture. (Ontario, 1978)

3.2 SELECTION CRITERIA

The criteria used by the administrative agencies in Canada with respect to selection of wilderness parks are similar throughout the country. The primary criterion is that the area must be representative of the natural heritage of its region. For example, a wilderness park situated in a boreal forest region should display all the natural features or attributes typical of such an ecosystem. For any such region these may include examples of flora, fauna, ecology, geomorphology, geology, hydrology, etcetera. In the selection of a park most agencies also consider unique and/or rare natural features and note their significance. The presence or absence of such features may decide the selection of one area rather than another.

One criterion which is not generally accepted or agreed upon is that of size. Ontario prescribes that wilderness parks should be of a minimum size of 50,000 hectares (124,000 acres)(Ontario, 1978), while British Columbia recommends "preferably greater than 5,000 hectares (12,400 acres).(British Columbia, 1986) Other agencies are not so arbitrary in their choice of size limits but rather they let the circumstances dictate the boundaries of the area. For example, Newfoundland states in its Provincial Parks Policy that "the site must be of sufficient size to encompass the particular feature(s) and provide a surrounding buffer zone to protect it and maintain its integrity." (Newfoundland

and Labrador, 1985) Obviously the size of each park will be different and dependant upon both the features it protects and the possibility of influence from its surrounding area. This policy of site specific size evaluation means that areas worthy of wilderness status, if they meet other requirements such as being self-contained ecological units, may not be excluded because they are a few acres less than the minimum size. (see also; G.D.Boggs,1976; P.R.P.Consulting,1985)

A selection criterion which parallels the issue of park size is the determination of area boundaries. Some agencies point out in their policy statements that this is a necessary consideration. Saskatchewan states that "boundaries shall recognize the integrity of natural features being considered for protection and conservation." (P.R.P.Consulting,1985) This emphasizes the criterion of self-contained ecological units, that is, the park boundaries should reflect the natural boundaries of the ecological unit they are designed to protect.

Another important criterion, inherent in the wilderness park objective, is that the area must be able to sustain wilderness-type recreational activities. These activities are characterized by low impact, low density uses which emphasize solitude, self-reliance, a sense of isolation, and personal integration with nature. (Alberta,1985; Boggs,1976; Ontario,1978; P.R.P.Consulting,1985) The concepts of solitude and isolation will vary from user to user

however much research is ongoing in the area of psychological carrying capacity and some standards have been recognized (see Knudsen,1980; Lucas,1964; Stankey,1972).).

3.3 MANAGEMENT GUIDELINES

The management guidelines for wilderness parks, as outlined by administrative agencies, reflect and further clarify the park's objectives and selection criteria. The guidelines serve to protect and ensure the preservation of the natural resources of the park while at the same time ensuring the quality of the recreational experience.

To facilitate the parks objectives some agencies advocate the use of a zoning plan.(Boggs,1976; Ontario,1978; Parks Canada,1983) This ensures that the bulk of the park's area is maintained in a primitive state while still allowing for other uses. Examples of other zones may be: access zone, where entry to the park is facilitated; nature reserve zone, where the primary concern is the preservation of the natural resources vis a vis recreation; special preservation zone, where unique and/or rare features may be maintained and protected from harmful influence of any kind.

The most widely emphasized wilderness park management policy for Canadian agencies is that of allowing natural succession to evolve unhindered and unaltered by man's intervention. (Boggs,1976; Ontario,1978; Parks Canada,1983)

Many guidelines restricting 'unnatural' activities are instituted to ensure that these landscapes remain pristine. For example, motorized transport within wilderness areas of the park is often prohibited (Alberta,1985; Newfoundland and Labrador,1985; Ontario,1978; P.R.P.Consulting,1985) underlining that the area should be left as a roadless tract of land.

The extraction of resources from wilderness parks, e.g. mining, forestry, is prohibited in many jurisdictions (Alberta,1985; Boggs,1976; Newfoundland,1985; Ontario,1978; Parks Canada,1983; P.R.P.Consulting,1985), however hunting and sport fishing are not. Alberta's Department of Recreation and Parks is the only agency in Canada to manage its wilderness parks without sport fishing (Alberta,1985) while Ontario's Ministry of Natural Resources, Nova Scotia's Department of Lands and Forests, and Parks Canada remain the only agencies to ban hunting from their wilderness parks. (Boggs,1976; Ontario,1978; Parks Canada,1983) Ontario and Nova Scotia recommend that trapping be phased out within their wilderness parks.(Boggs,1976; Ontario,1978)

3.4 DEVELOPMENT

An absence of developed facilities is one of the chief characteristics of a wilderness park (Bates,1978; Knudsen,1980; Nash,1973; Sax,1980; Stankey,1982; etc.) and most administrative agencies keep development in their wilderness

areas to a minimum. Many facilities required by visitors to the park, such as commercial outfitting services, car parking areas, interpretation and registration services are restricted to the periphery of the wilderness. (Alberta, 1985; Boggs, 1976; Newfoundland, 1985; Ontario, 1978; Parks Canada, 1983; P.R.P. Consulting, 1985) Such improvements as trails, portages, designated campsites, privies, and fire-grates are sometimes allowed (Ontario, 1978; Parks Canada, 1983; P.R.P. Consulting, 1985), but just as often it is agency policy to forego any development within the wilderness. (Alberta, 1985; Boggs, 1976; Newfoundland, 1985) The reasoning behind the provision of such primitive services by the Saskatchewan Parks Branch is that they "primarily serve the function of resource protection as opposed to visitor comfort." (P.R.P. Consulting) With increasing use of the wilderness by recreationists this policy will more likely be reviewed by other agencies as a management alternative to mitigate growing visitor impact.

3.5 SUMMARY OF POLICY GUIDELINES

There is typically a dual objective; to preserve representational natural landscapes while providing for recreation that is suitable in a wilderness setting. The selection criteria reflect this objective: the area must be representative of the natural heritage of its region; the significance of unique and/or rare natural features is not-

ed; the area must be able to sustain wilderness type recreational activities. There is some disagreement as to the minimum size required for a wilderness park but general agreement for the concept that the park must encompass a self-regulating ecological unit. Also, park boundaries should reflect the natural boundaries of the ecological unit they are designed to protect.

Management and development guidelines serve to further clarify and enhance the park's objectives, and protect the wilderness resources. A zoning plan is often used to delineate areas of the park which may accommodate certain activities and uses. 'Unnatural' activities are kept removed from the wilderness core of the park (e.g. mining, forestry, motorized transport, etc.) while the overall management scheme is an attempt to maintain the area as pristine and allow natural succession to evolve. Hunting and sport fishing are often allowed as wildlife management tools, but just as often are not allowed. Primitive improvements(trails, designated campsites, privies, firegrates) are allowed in some jurisdictions however the intent is resource protection as opposed to visitor comfort.

3.6 MANITOBA'S WILDERNESS PARK POLICY

Manitoba's Department of Natural Resources' policy on wilderness parks is not all encompassing or definitive. Policy does exist in the form of a general, broad definition for classification purposes, contained in Manitoba's Systems Plan for Manitoba's Provincial Parks,

wilderness parks are parks which encompass outstanding land areas and their associated plant and animal communities. Largely untouched by man, wilderness areas provide superior recreational opportunities compatible with wildland character and experience. All weather roads and major commercial resource extraction/harvest activities are not permitted in wilderness parks. (Manitoba, 1986)

As well, the Parks Act Regulation 199/74 defines Provincial Wilderness Parks this way,

areas which, through their management and use, will be perpetuated in a primitive state, free of development, and accessible only by non-mechanized means. (Manitoba, 1974)

Again, this is a broad definition, in general terms, which does not delineate specific objectives, selection criteria, or management and development alternatives.

At present there exists one Provincial Wilderness Park in Manitoba, Atikaki Provincial Wilderness Park, located east of Lake Winnipeg in the Canadian Shield. Designated in 1985, Atikaki is a million acres of "rugged jack pine forests, granite outcrops, glassy lakes, and remote rivers" (Manitoba, 1985) approximately 200 km (122 miles) north east of Winnipeg. Management planning for Atikaki is ongoing and no firm guidelines have been outlined as yet however some

precepts are being considered. These include; low intensity recreational uses (canoeing, remote camping, angling), fly-in tourist lodges and outcamps, trapping, hunting, mining exploration and road construction by special permit. (Manitoba, 1985)

Manitoba's Parks Branch has also designated a Wilderness Zone within a Provincial Natural Park. The activities promoted in the 320 sq km (123.5 sq mile) wilderness zone in Whiteshell Provincial Natural Park include; canoeing, hiking, cross-country skiing, primitive camping and other activities which do not require mechanized access. Forestry and mining are not permitted. Development of all-weather roads is not permitted. Fishing is permitted, hunting is not. Cottaging, snowmobiles, motorboats, and aircraft for recreational purposes are not permitted in this wilderness zone. (Manitoba, 1983) Other areas of Whiteshell Provincial Natural Park receive intensive recreational use and through the use of zoning a balance may be achieved which satisfies conflicting demands.

The Manitoba Parks Branch feels that a broad definition, in general terms, which does not delineate specific objectives, selection criteria or management alternatives is the best policy to follow for the future. Rather than adhere to a prescriptive and restrictive policy, the Parks Branch prefers to leave its wilderness park guidelines general and broad. This will allow for site-specific planning and man-

agement, on a park to park basis. Each park will have its own character and special circumstances and can be managed accordingly. (Jones,1988 ; Wilson,1988) For example, fly-in fishing camps may be suitable in one park but not in another. Future resource exploitation concerns are not disregarded in every wilderness park. Hunting may be a suitable activity in some wilderness parks while not acceptable in others. This allows that wilderness parks may be established in some areas which a more restrictive policy would reject as unsuitable.

CANADIAN AGENCIES WILDERNESS PARKS POLICY	B.C.	Alta	Sask	Ont	N.S.	Nfld	Parks Canada	Man
<u>Objective</u>								
preservation of natural ecosystems	Y	Y	Y	Y	Y	Y	Y	Y
wilderness recreation	Y	Y	Y	Y	Y	Y	Y	Y
<u>Selection Criteria</u>								
representative landscape	Y	Y	Y	Y	Y	Y	Y	Y
ecologically self-contained	NA	NA	Y	Y	Y	Y	NA	Y
able to sustain wilderness recreation	Y	Y	Y	Y	Y	N	NA	NA
minimum size	Y	NA	N	Y	N	N	N	NA
<u>Management</u>								
zoning	NA	NA	Y	Y	Y	N	Y	NA
mining	N	N	NA	N	N	N	N	N
forestry	Y	Y	NA	N	N	N	N	MB
roads	N	N	N	N	N	N	NA	MB
motorized transport	NA	N	N	N	N	N	N	MB
airplane	NA	N	NA	N	N	NA	N	MB
hunting	Y	N	Y	Y	Y	NA	N	MB
sportfishing	NA	N	Y	Y	Y	NA	Y	Y
trapping	NA	N	Y	N	N	NA	N	MB
horseback riding	NA	N	NA	N	NA	NA	Y	MB
<u>Development</u>								
outfitters available within wilderness	NA	NA	NA	N	NA	NA	Y	MB
outfitters available in access zone	NA	NA	NA	Y	NA	NA	Y	MB
car parking in access zone	Y	NA	Y	Y	Y	NA	Y	MB
car parking within wilderness	N	N	N	N	N	N	NA	MB
interpretation within wilderness	NA	NA	NA	N	N	N	NA	MB
interpretation in access zone	NA	NA	NA	Y	Y	N	Y	MB
registration prior to entrance	NA	NA	NA	NA	Y	NA	Y	MB
designated trails, portages	NA	N	Y	Y	Y	N	Y	MB
designated campsites, privies, firegrates	NA	N	Y	Y	Y	N	Y	MB

Y - yes

N - no

NA - not addressed in policy

MB - may be allowed

note : N.W.T. and P.E.I. do not have a wilderness park policy.

: Yukon, Quebec and New Brunswick policy is not available at this time.

Chapter IV

RESOURCE INVENTORY

4.1 CLIMATE

The climate of the Porcupine Mountains lies within the Koeppen classification category of Humid Continental, characterized by severe winters and short warm summers, and moist all seasons. (Manitoba, 1956) Due to the wide variations in topography, temperature and precipitation can vary considerably from the upland escarpment to the lowland flats. Information for the Duck Mountains, eighty kilometers to the south, indicates that summer and winter temperatures in the upland areas are 3 to 4 degrees F. cooler than the lowlands. As well, precipitation in the forested uplands may be as much as fifty percent higher than on the lowlands, while the growing season is 20 - 30 days shorter in the uplands. (Manitoba, 1956) The situation in the Duck Mountains may be considered analogous to the Porcupine Mountains region. (Shay, 1988)

The climate data available for Birch River (35 kms [21 miles] south of the Steeprock River Valley, on the lowlands), shows a climate moderately colder than that of the region surrounding the city of Winnipeg. The mean annual temperature is 0.4 deg C. (2.2 deg C. colder than Winnipeg);

the mean annual range is -6.0 deg C. to 6.8 deg C. (compared to -2.7 to 7.8 in Winnipeg); and, the absolute range is -48.3 deg C. to 39.4 deg C. (-44.4 to 37.0 in Winnipeg).

Precipitation in Birch River is 474.5 mm total with a mean snowfall of 169.8 mm, while on the uplands it maybe as high as 700 mm total, including 2.5 meters of snow. (Winnipeg receives 490.7 mm total precipitation with 108.1 mm of snow). Frost-free days on the lowlands number 70-87, with likely only 50 days frost-free in the upland areas. (Winnipeg averages 123 frost-free days annually).

OVERVIEW OF CLIMATIC VARIABLES IN THE GENERAL VICINITY OF THE STUDY AREA

<u>Temperature (deg C.)</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
mean daily max	-15.0	-9.4	-3.2	8.1	17.0	21.8	25.5	23.1	16.6	10.5	-1.4	-10.6
mean daily	-21.2	-16.3	-10.2	1.9	9.9	14.7	17.5	15.9	10.2	4.9	-6.4	-16.1
mean daily min	-27.3	-23.0	-17.2	-4.5	2.7	7.6	10.6	8.7	3.9	-0.8	-11.3	-21.5
ice free dates, rivers				10	30
<u>Precipitation (cm)</u>												
rain	0.4	0.1	1.0	13.1	30.0	77.2	58.4	57.5	45.0	16.8	3.0	0.0
snow	18.9	21.9	33.8	18.5	5.5	0.0	0.0	0.0	0.5	11.3	30.3	29.1
total	19.3	23.66	35.3	32.3	33.0	77.2	58.4	57.5	45.5	26.6	35.5	30.3

Annual Values

<u>Temperature (deg C.)</u>	
mean	0.4
mean range	-6.0 to 6.8
absolute range	-48.3 to 39.4
Frost free days	70 - 87 days
longest	106
shortest	66

<u>Precipitation (mm)</u>	
mean snow	169.8
mean rain	302.7
mean total	474.5

days with rain, mean	56
days with snow, mean	49
days with precipitation, mean	105

source: Environment Canada, 1986.

note: temperatures may be 1.5 deg.C. lower and precipitation fifty percent higher in the uplands.

4.2 PHYSIOGRAPHY

The Porcupine Mountains are the northernmost expression of the Manitoba Escarpment which separates the Manitoba Lowlands from the Western Uplands. (see Fig.3) At the Porcupine Mountains the escarpment rises from approximately 304 meters (1000 ft) above sea level in the lowlands to an average of 762 m (2500 ft) a.s.l. in the upland region. A rise of 366 m (1200 ft) in one km (1 mile) is not uncommon. The highest point in the Porcupine Mountains is Harte Mountain at 823 m (2700 ft), located approx. 12 km (7.5 miles) south of North Steeprock Lake. This point is only a few meters lower than Duck Mountains' Mount Baldy, at 831 m (2727 ft) the highest point in Manitoba.

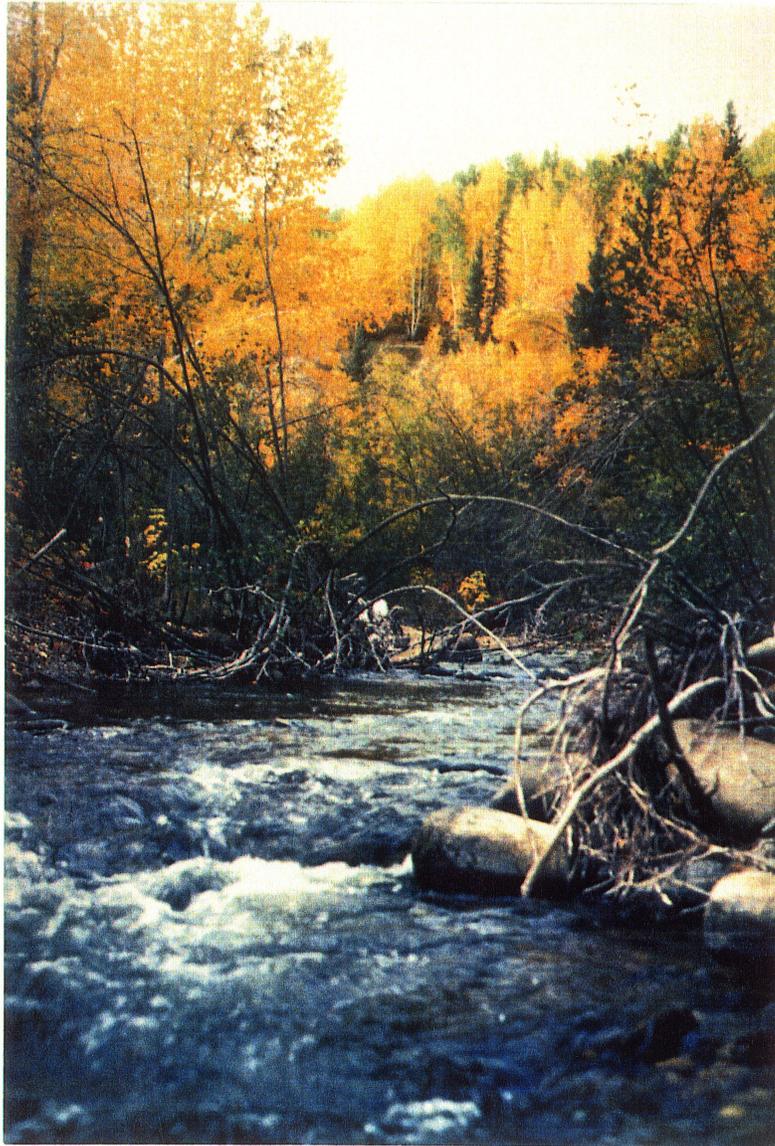
The Steeprock River Valley gorge is one of the most distinct of the river valleys which flow north and east off of the escarpment. The upland gorge is approximately 14 km (8.75 miles) in length beginning in the rolling topography at the top of the escarpment and spilling out eastward onto the lowlands below, and on into Dawson Bay and Lake Winnipegosis. The river drops nearly 335 m (1100 ft) in this distance, resulting in extensive erosion and dramatic canyons. Valley walls are often 99 m (325 ft) high and approach vertical in places.

The topography in the upland region of the Porcupines is hummocky rolling terrain interspersed with hills and numer-

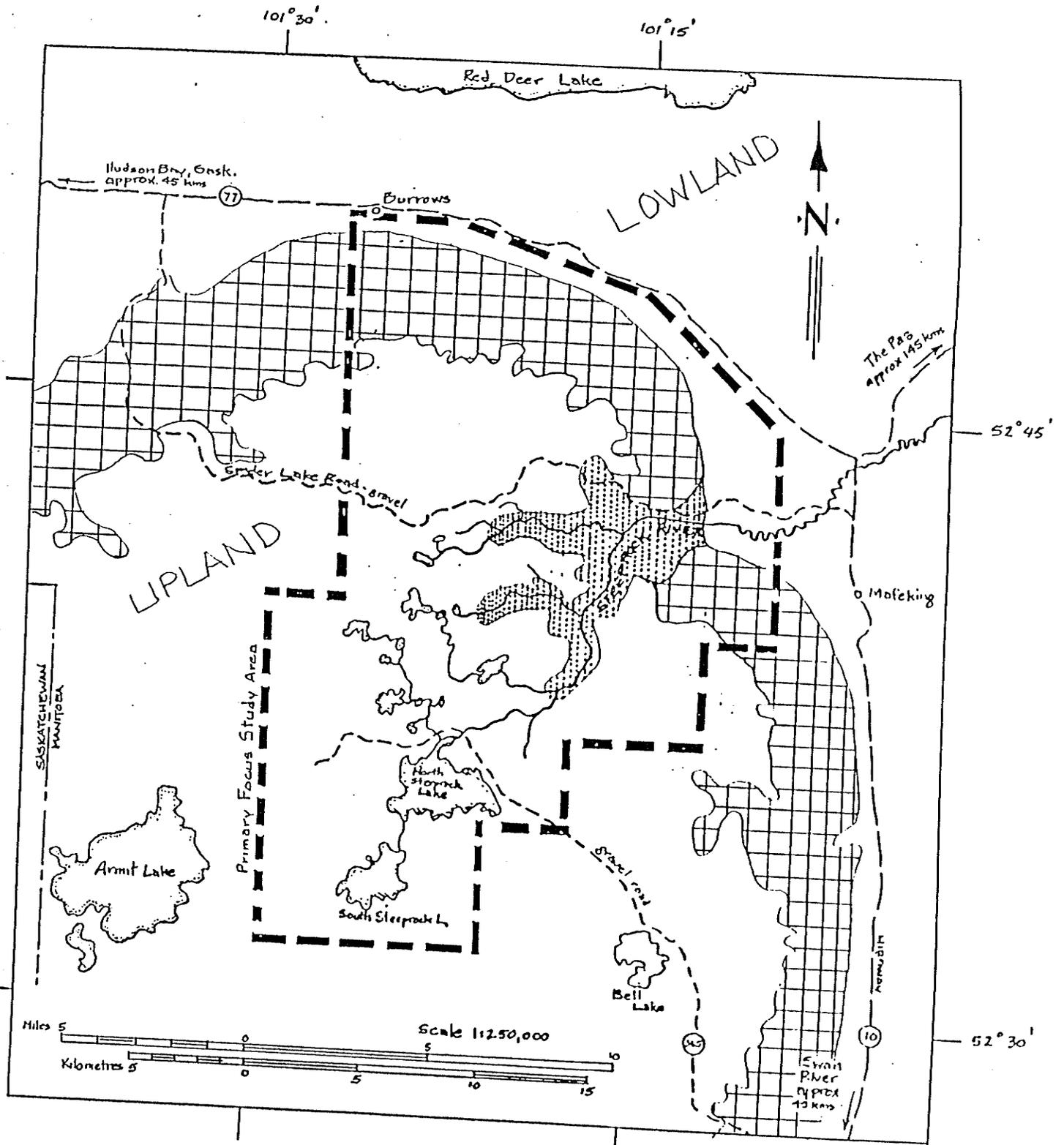
ous small to medium- sized lakes and bogs. The varied , undulating topography results in an erratic drainage pattern, and a complex vegetation cover. (Ellis, 1938)



Landscape typical of the upland portion of the Study Area. Note the poor drainage, bog conditions, complex vegetation cover.



Smaller branch of the main Steeprock River channel. Note the high (30 meter) valley walls and the tangled, regularly flooded vegetation on the valley floor.



-  Steeprock River Valley
-  Escarpment

Fig. 3 Physiography

4.3 GEOLOGY

The area of the Porcupine Mountains was under salt water in the Cretaceous period (60-130 million years B.P.) as was much of south and central Manitoba. Silt and sediment was carried onto this seabed and compacted in shales. The sea bed eventually became uplifted and the waters receded, resulting in what is known as the the Riding Mountain Formation. This Formation is composed of two members; the Millwood overlain by the Odanah. The underlying Millwood is a soft greenish-grey shale with a high bentonite content that breaks down rapidly under weathering. The upper layer, the Odanah, is a grey hard siliceous shale. The lower layer, the Millwood has eroded more rapidly resulting in the eastern face of the Manitoba Escarpment.

Large rivers, the Valley River and the Swan River cut through this Riding Mountain Formation dividing it into three distinct mountain areas; the Riding, Duck, and Porcupine Mountains. The shale in these mountains varies from 30m to 334m (100 ft to 1100 ft) thick. (Davies, 1962) In the Pleistocene period glaciers advanced and retreated through these uplands leaving behind ground and end moraines. Sometimes up to 258 m (850 ft) thick, this till is derived mostly from Mesozoic shales with a few small bedrock outcrops. There are large areas of hummocky stagnation moraine and till plains. (Weir, 1983)

At the bottom of the escarpment Glacial Lake Agassiz created glacial landforms 10,000 years ago. Evidence of wave washing, such as beach ridges and silt plateaus was formed giving the terrain a series of gently rising steps to the base of the escarpment.(Weir,1983)

Economic mineral resources in the Porcupine Mountain area are of limited extent. The Saskatchewan Cement Company Limited operates a limestone quarry 12.8 km (8 miles) north of Mafeking on the lowlands. The quarry was opened in 1956 and has produced a high grade limestone, however due to its distance from the Forest Reserve the quarry should not conflict with resource plans in the mountain region.

Manganiferous ironstone nodules occur in the Cretaceous shales of the Porcupine Mountains, and in some places manganese bog deposits have been derived from them. The deposits were investigated during World War II but due to the low grade of the material they are not considered to be of an economic nature.(Davies,1962)

4.4 SOILS

The soil type common to the Riding, Duck, and Porcupine Mountains is a luvisolic, grey wooded soil. It has generally well defined A and B horizons and is slightly acidic to acidic. This soil type develops from base saturated parent material under forest vegetation.(Weir,1983) Due to the gla-

cial drift, boulders and stones are present in all layers of the soil profile.

Information particular to the Porcupine Mountains is not available however specific soil types have been described for the Duck Mountains and the situation is analogous to the Porcupines. These soil types include: (i) sandy textured soils with pockets of gravel and sand, well to imperfectly drained with a low natural fertility, (ii) Peat soils, found in low areas depending upon the vegetation type, slightly to strongly acidic and maybe as much as 70 cm deep. In these areas the water table is generally high, (iii) eroded slopes complex soils found on steep river and stream valley slopes. These are well drained clay and loam soils, moderately calcareous. (Schewe, 1981)

4.5 VEGETATION

The Porcupine Mountains are in the Mixedwood Section of the Boreal Forest Region of Canada. (Rowe, 1972) As the name implies the Section is composed of a mixed wood forest with the Porcupine Mountains being covered with a mixture of predominately trembling aspen (Populus tremuloides), balsam poplar (Populus balsamifera), white spruce (Picea glauca), black spruce (Picea mariana) and jack pine (Pinus banksiana).

Merchantable Species Composition

For Porcupine Provincial Forest

Species	Percent
Trembling Aspen	33.8
Black Spruce	28.0
Jack Pine	12.0
White Spruce	10.0
Balsam Poplar	9.2
White Birch	3.8
Balsam Fir	1.7
Tamarack/Larch	0.4
other hardwoods	0.2

	100

Jack pine is found in the drier, gravelly and sandy situations. Black spruce and tamarack larch (Larix laricina) are found generally in the more moist areas, and in low-lying locations are associated with sphagnum bogs. Aspen, poplar, birch and balsam fir are found throughout. (Ellis, 1938)

Beaked hazel (Corylus americana) is the dominant shrub, with dogwood (Cornus stolonifera), willow (Salix spp.), alder (Alnus rugosa), and high bush cranberry (Viburnum opulus) abundant. Chokecherry (Prunus virginiana) saskatoon (Ame-
lanchier alnifolia), pincherry (Prunus pennsylvanica) and rose (Rosa spp.) are common. Herb cover is typically made up of sarsparilla (Aralia medicaulis) wild strawberry (Frag-
ria virginiana), wild lily-of-the-valley (Maianthemum spp.), Lindley's aster (Aster ciliolatus) and dewberry (Rubens
pubescens). In the bog and swamp areas ground cover associ-
ated with black spruce and tamarack is typical. This

includes labrador tea (ledum groenlandicum), club moss (Lycopodium spp.) and sedges (Carex spp.). (Schewe, 1981)

Unlike the lowland areas to the east and south of the Duck and Riding Mountains, which support a forest cover of mixed deciduous hardwoods such as bur oak (Quercus macrocarpa), elm (Ulmus americana), mountain ash (Sorbus scopulina), and Manitoba maple (Acer negundo), the Porcupine Mountain Boreal Forest vegetative cover extends onto the lowlands below the escarpment. The deciduous species common to the lower alluvial beach ridges of the escarpment in the more southern areas are present in the Porcupine area but not in as significant numbers.

One rare vascular plant has been identified in the Porcupine Mountains. Moschatel (Adoxa moschatellina), classified as rare in Manitoba, was recorded here in 1976. This plant is wide ranging in Alaska and the Northwest Territories but is rare in more southerly locations. (White, 1980) Other rare plants have been recorded throughout the Duck Mountains. These include; Touch-me-not (Impatiens noli-tangere), scratchgrass (Muhlenbergia andina), silkgrass (Oryzopsis canadensis), dwarf bilberry (Vaccinium caespitosum) and a sedge (Carex macloviana, var. festwella microptera). Twayblade (Listera auriculata) and adder's mouth (Malaxis monophyllos var. brachypada) are classified as threatened and are protected under CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora). (White, 1980)

Extensive research has been carried on in the Duck Mountain area but very little botanical work has been done in the Porcupine area. It may be assumed that rare or threatened species would also be found in the Porcupine Provincial Forest if a field inventory was conducted. (Johnson, 1988)

Forestry Evaluation

The Porcupine Provincial Forest covers an area of 207,947.9 hectares (513,839.3 acres) or 2,079.5 square kilometers (802.9 miles). Of this total area 5.4 percent is covered with open water, 3.7 percent is classed as non-forested (prairie, muskeg, roads, beaver floods, etc.) and 5.6 percent is classed as non-productive (treed muskeg, willow, precipitous slopes, etc.).

The total productive land is 85.3 percent of the Provincial Forest, 177,416.5 hectares (438396.2 acres) or 1774 square kilometers. Of this productive land 64.7 percent is forested and 35.3 percent is classified by the Forestry Branch as Class O - forest land not restocked following fire, cutting, windfall, or other major disturbance.

Seventy-six percent of this Class O land or 26.9 percent of the total productive land in the Forest Reserve was lost to timber production in the fires of 1980. An insignificant amount has burned since that time. With respect to the primary focus study area (see map 3, p.6) the 1980 fire surrounded South and North Steeprock Lakes but was held at the

gravel roadway on the north and west shorelines of these lakes.

Historically the forest cover in the primary focus area burned periodically until the early part of this century. Recently the forest was devastated in 1884 and 1894 and again in 1926. However, due to the depth of the Steeprock River gorge the trees near the bottom were not affected. (MacKenzie, 1988) Since the Second World War forest losses due to fire have been negligible in this area and the vegetation has grown to mature stages. Fifty inch diameter (1.3m) (at breast height) white spruce have been reported in the Steeprock River Valley. (MacKenzie, 1988) The species composition in these mature areas is trembling aspen, balsam fir, white spruce and black spruce, typically in roughly equal proportions.

4.6 HYDROLOGY AND FISHES

The rolling morainic topography of the upland region of the Porcupine Mountains has resulted in a myriad of small to medium sized lakes and an erratic drainage pattern. These lakes and streams vary considerably in size and depth and are of either an oligotrophic, eutrophic or lotic nature. The oligotrophic lakes (deep lakes containing low nutrients) are not extensive in the Porcupines and in the vicinity of the study area may be restricted to perhaps four small lakes located close to the Saskatchewan border. These lakes (Fishing, Mirror, Pickerel and Vini) range from 22.2m (72.8

ft) to 33m (108 ft) in depth and 20 ha (49.4 acres) to 120 ha (296 acres) in area. Not much is known of their fish populations however it may be assumed that there are northern pike (Esox lucius), perch (Perca fluviatilis), and sucker (Catostomus commersoni) in all, with the possibility of pickerel (Stizostedion stirium) and whitefish (Coregonus clupeaformis) in small numbers. (Manitoba, 1979) Due to the paucity of data other lakes of similar depth and fishing quality may exist but be as yet unrecorded. (Valiant, 1988)

Eutrophic lakes (shallow, high nutrient lakes) are numerous throughout the uplands of the Porcupine Mountains. These lakes are shallow and warm, with weedy, muddy bottoms. They range in size from Armit Lake at 2820 ha (6965 acres) and North Steeprock Lake at 920 ha (2272 acres) to small ponds of less than one hectare (2.47 acres). The typical lake size, excluding the two largest lakes, is approximately 35 ha (86 acres). A typical depth for the eutrophic lakes in this region is 9 meters (29.5 ft) at their maximum depths.

The fish populations in these lakes consist of primarily northern pike and perch, and some pickerel in the larger water bodies. Overall recreational success is high (Valiant, 1988) and Master Angler awards for northern pike have been recorded in North Steeprock Lake, e.g. 5.10 kg (11.24 lbs) July 1987. (Manitoba, 1988) Whitefish were netted commercially in the late 1970's and early 1980's in this lake as

well, e.g. 4050 kg (9070 lbs) in 1979, (Manitoba, 1979) but this enterprise has been discontinued.

Rainbow trout (Salmo gairdneri) have been stocked regularly in Gass Lake and Nick Lake but the overwintering success in these small (10 ha-24.7 acre), shallow (12.9 m-42 ft) lakes has been minimal. (Valiant, 1988)

The lotic (fast running) streams and rivers flow south, east and north off the Porcupine Mountain, down the Manitoba Escarpment. In the study area the watercourses flow east and north. These include the Bell, Birch, Rice, Little Woody, Armit, and Steeprock Rivers; and, the numerous creeks and streams such as Mafeking, Campbell, Homestead and Camp Seven Creeks.

The Steeprock River is by far the largest of these rivers. It has a drainage area of 301 sq kms (187 sq miles) and a mean discharge of 2.8 cubic meters per second (98.8 cfs) at the point where it crosses under Provincial Trunk Highway #10. Extreme flows as high as 138 cubic meters per second (4873 cfs) have been recorded at this point, (July 6, 1958).

Steeprock River Monthly Mean Discharges

mean 1954-86 (cubic meters per second)

Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Mean
0.60	2.06	6.07	4.55	3.07	2.10	2.37	2.33	2.80

These figures are the highest for any river with a comparable drainage area, along the escarpment or elsewhere in Manitoba. (Environment Canada, 1987) The outflow of North Steeprocks Lake has been regulated by a weir since 1958. The intention is to regulate the level of the lakes at the headwaters of the Steeprocks River. This constitutes a small portion of the river's watershed area and has not significantly reduced the streamflow of the Steeprocks River.

The Steeprocks River is regarded as a high value trout stream. It has been stocked regularly with rainbow and brook trout (Salvelinus fontinalis) since 1951. Stocking locations vary from the crossing at PTH#10, upstream to Roger's Creek, and on to below the dam at North Steeprocks Lake. Twelve thousand brook trout fingerlings were introduced at Rogers Creek in September 1987 however the average is three to four thousand per year. The recreational yield is high even though the limited and difficult river access restricts use. (Valiant, 1988)

The Steeprocks River trout population overwinters well relative to the other rivers and lakes in the Porcupine - Duck Mountain region. (Valiant, 1988) The cold winters in

this part of the province do lead to a high mortality, especially in the lower portions of the stream, but with continued stocking the Steeprock River will remain a favorite trout stream with local fishermen.(Valiant,1988)

4.7 FAUNA

The wildlife populations of the Porcupine Mountains are typical of the Upland and Boreal Forest Regions of Manitoba. The thick bushcover can be expected to support a balance of ungulates, furbearers, small rodents and birds. (Weir, 1983) However, this same bushcover, i.e. tall, mature spruce and aspen combined with an understory of hazel and other dense bushes, makes any precise census of the animal populations difficult if not impossible. Certainly the monetary cost of such surveys prohibits their undertaking. (Bell, 1986) Relatively accurate guesswork based upon knowledge of terrain, hunter success and other factors is therefore used in the management of the resident and migratory species. (Bell, 1986)

The 1980 forest fire which covered a large portion of the southeast quadrant of the Forest Reserve improved ungulate habitat substantially. The post-fire bloom in understory bushes created a generous browse for the moose (Alces alces), elk (Cervus canadensis manitobensis), and white-tailed deer (Odocoileus virginianus) on the mountain. This same habitat is suitable for a variety of other mammals including black bear (Ursus americanus), coyote (Canis latrans), wolf (Canis lupis), lynx (Lynx canadensis), and small furbearers such as mink (Mustela vison), red squirrel (Tamiasciurus hudsonicus), and marten (Martes americana).

Ungulates

The 1988 populations are estimated at approximately 600 moose, and 200 elk or wapiti. (Davies, 1988) The moose density is thought to be low relative to the other suitable moose habitat in the province, while the elk population densities are gauged at medium. (Weir, 1983) White-tailed deer are assumed to be in the medium dense range (Weir, 1983) but nothing is known with certainty as no surveys are undertaken of this species. (Davies, 1988) Hunter success of these animals has remained constant or dipped slightly in the last few years. Annually about 70 moose, 12 elk and 30 white-tailed deer are killed by licensed hunters. (Davies, 1988)

Furbearing Mammals

There are a large variety of mammals found in the Porcupine Mountains, many with high population densities relative to the rest of the province. (Weir, 1983) Mammals of high population density are; beaver (Castor canadensis), coyote (Mustela erminea), and red squirrel. Mammals of medium population density are; fisher (Martes pennanti), mink, muskrat (Ondatra zibethica), red fox (Vulpes fulva), and lynx.

The black bear is pursued by licenced hunters in the Porcupine Mountains and in an average year 55 to 65 animals are killed, slightly half that number by non-resident hunters. Provincial wildlife specialists approximate the Porcupine Mountain black bear population at around 400 animals.

There are registered traplines throughout the Porcupine area. The number of registered trappers fluctuates slightly from year to year but averages at twenty-one active trappers. These trappers harvest pelts from almost all the furbearers with beaver, ermine, muskrat and squirrel being the primary targets. Furs are also harvested with success from the bear, coyote, fisher, mink, otter, lynx, and wolf populations. The average total number of pelts annually in the period September 1984 to August 1987 was 1640 for an average total income of \$29684.00 .

Average Number of Pelts per Year - Sept 1984 to Aug 1987

<u>Species</u>	<u># of Pelts</u>
bear	20
beaver	430
coyote	16
ermine	234
fisher	13
fox	6
lynx	1
marten	45
mink	63
muskrat	428
otter	9
raccoon	6
squirrel	366
wolf	2
total	<u>1640</u>

There are two registered traplines in the primary focus study area. Each had two registered trappers annually in the period Sept 1984 - Aug 1987. The average incomes for these traplines in this period are \$3353.00, or 11.2 percent of the Porcupine Mountain total, and \$3193.00, or 10.8 percent of the total. (Manitoba, 1987)

Avifauna

The Porcupine Mountains support a wide variety of bird species. The diversity of vegetation and the "wildness" of the terrain provides ideal habitat for many of the eagles, hawks and owls. Other birds common to a Boreal Forest environment such as jays, woodpeckers, crows and ravens are also resident. The many lakes are home to a number of birds however few lakes support large populations of ducks, as may be found on the lowlands. Of the species that are found loons, buffleheads and gulls are probably the most common. (Manitoba, 1973) Other typical birds are the ruffed grouse, barn swallow, robin, sparrow, heron, and cormorant.

4.8 PREHISTORY

Pollen diagrams from lakes on the Porcupine Mountain suggest that prior to 4000 years ago much of the plateau was grassland. The vegetation community then changed to a birch-poplar-oak association and 2000 years ago it changed to it's present type, a spruce-birch- poplar forest. (Simpson, 1970) It is believed that the cultural change of the prehistory of the escarpment correlates with this history of changing vegetation. (Simpson, 1970) A key archaeological site on the shore of North Steeprock Lake has proven invaluable in providing artifacts and information from which this sequence and correlation has been derived.

The presence of camping areas, tools, remnants of clay pottery indicates different types of use through prehistory. Evidence shows that the earliest occupation of the area was by a Paleo-Indian group known as the Agate Basin people approximately 8,000 years ago. The marginal grassland of the mountain would have proven inhospitable to them and it was merely a migratory occupation at best. Shortly after 8000 years ago a Plains-Archiac people migrated northward from Wyoming and evidence of these well-equipped big game hunters has been found at the Steeprock Lake site. These people occupied the Steeprock Lake area for some time and the last remnants of their culture date from 4000 years ago. The remaining prehistory is one of various groups of people moving through the area, following a migratory hunter-gathering subsistence pattern. No groups have stayed in the Porcupine Mountain region for long since. (Simpson, 1970)

4.9 RECENT HISTORY

The most recent history of the mountain is similar in pattern to the rest of the province, i.e. furtrading and agricultural expansion. The area was first reached by Europeans as the Hudson's Bay Company traders moved westward in the 19th century. A Hudson's Bay Company post, Fort Pelly, was established 24 kms (15 miles) west of the present day Manitoba-Saskatchewan border and from this fort the furs of the Duck and Porcupine mountains were exploited. In 1835 a

fishery was established on Whitefish Lake at the southern end of the Porcupine Mountains. Records show that between 2000 and 3000 fish were taken in a ten day period.(Swan Valley Historical Society,1984)

Throughout the 19th century resource exploitation ,i.e. forestry, trapping, and fishing was confined to the southern slopes of the Mountain. It was not until the early part of the twentieth century that settlers moved northward, past the Duck Mountain and Swan River Valley to the lowlands on the east and north sides of the Porcupine Mountain. In 1908 the Canadian National Railway reached the Pas. This transportation link attracted lumber companies to the forests on the east and north slopes and a large sawmill was set up at Barrow on the south shore of Red Deer Lake. This mill operated extensively until 1926 when it closed due to a lack of accessible merchantable timber. In 1938 the provincial highway was completed through to the Pas, running along the base of the escarpment. Today activities such as logging, fishing, and hunting in the Provincial Forest are primarily in the south and eastern portions of the mountain. A small amount of logging, a forestry road and a primitive five-acre provincial wayside picnicing park on North Steeprock Lake exist within the primary focus study area however most of the area remains untouched. (McComb,1988)

Chapter V
RESOURCE EVALUATIONS

Underlying the establishment of a wilderness park there is typically a dual objective: to preserve a representative landscape while providing for recreational activities which are suitable in a wilderness setting. In order to qualify as a wilderness park an area must have resources which are of such a quality that they reflect this dual objective. Selection criteria are; that, (i) the area must be representative of the natural heritage of its region, (ii) the area must be able to sustain wilderness-type recreational activities while remaining essentially unaltered, and (iii) the area should be relatively self-contained. There is some disagreement among parks management agencies as to the minimum size required for a wilderness park but there is general agreement that, (iv) the park must encompass a self-regulatory unit, and , it is understood that with respect to these criteria the area of land will necessarily be a relatively large one.

In order to maintain the park's resources while upholding the dual mandate of preservation and recreation specific management guidelines are instituted. These allow for the exclusion of destructive activities and provide a direction-

al framework for park development. For example, roadlessness is a quality inherent to wilderness parks; mining is an example of an extractive activity which is not allowed in a wilderness park.(see page 47) The criteria by which the suitability of the resources of the Steeprock River Valley primary focus study area may be evaluated for wilderness park status are based upon these policies of other Canadian parks agencies. If the Steeprock River Valley resources meet these criteria then a wilderness park in this area would compare favourably with other wilderness areas in Canada.

A simple and effective way to further evaluate the primary focus study area is to use the format of the Canadian Heritage Rivers evaluation guidelines. These guidelines have been developed by senior levels of government and used to evaluate the heritage resources of rivers and their environments throughout Canada. This format and its terms is used as a model in this evaluation due to its acceptance and successful use in the Manitoba context. (see Dodds,G. 1987)

The values for Canadian Heritage Rivers are adapted from riparian environment criteria to match and expand upon the selection criteria of wilderness parks. These value terms are related, in general, to any natural environment which may also be considered for recreational uses, and as such are easily adaptable and applicable to the evaluation of wilderness in Manitoba. The degree to which the primary

focus study area meets the guidelines is rated on a scale ranging from very high to low.

5.1 NATURAL RESOURCE VALUES

Diversity: Diversity is primarily concerned with the range of features or habitats characteristic of any one area found in the Wilderness Park. A wilderness park should contain a large number of representative earth and life science features that are characteristic of the particular environment that the park represents.

Very High: The primary focus area includes the three sections characteristic of the escarpment landscape i.e. hummocky, rolling hills at the top; river gorges with steep valley walls in the middle section; and, mixed wood forest and flatlands in the bottom section. There is a wide range of diverse natural resource features, with each section being completely and very different from the other two.

Concentration: This is a measure of the number of groups of like features or natural history phenomena located in

close proximity to one another. An area that contains a large number of representative, unique or outstanding examples of natural history themes would receive high consideration.

Very High: The primary focus area contains a large number of natural resource features concentrated in a relatively small area. The upper section of the escarpment is characterized by the presence of water. Numerous small to medium sized lakes and swamps cover most of the landscape, each surrounded by rolling hills. The middle section is characterized by the dramatic cliffs and unique old growth white spruce. This old growth forest is an outstanding example of the vegetative cover which existed on the escarpment prior to logging. The lower section is representative of the alluvial outwash plains found along the toe of the Manitoba escarpment. Here the mixed wood deciduous forest provides a contrast to the predominantly spruce boreal forest found at the higher elevations. Within a small area is concentrated a number of representative, unique and outstanding examples of natural history themes.

Integrity: To evaluate an area's integrity it is necessary to illustrate that the Wilderness Park is of sufficient size to contain the necessary elements which represent the key aspects of a given theme or process; and ensure that the

Wilderness Park contains those themes or resources required to provide continuity among those features, habitats and species which are to be conserved and interpreted. In short, Wilderness Parks should be of sufficient size to contain the key heritage values which demonstrate the outstanding processes, features or activities for which they have been nominated.

Medium: The key heritage values of the primary focus study area are; the dramatic topographical and elevational change, from the top of the escarpment through the Steeprock River gorge in the middle section to the lowlands at the bottom, and ; the old growth large diameter white spruce forest in the gorge area, and; the inherent "wilderness" aspect of the landscape. The primary focus study area reflects all these values and a park which included and totally encompassed the watershed of the Steeprock River, west of PTH #10, would be of sufficient size to conserve and adequately represent this heritage. The watershed is most likely not large enough to provide a complete range for the variety of wild animal species which choose to inhabit the Steeprock area. The fact that the primary focus area is remote and surrounded on three sides by a large area of boreal forest should ensure that the species would not be restricted to and ecologically isolated in a relatively small, designated wilderness area.

Representativeness: This is a measure of the degree to which the Wilderness Park's natural resources reflect the characteristic processes, features, habitats or species of a particular natural history theme or geographical area.

Very High: The primary focus study area is one example, albeit a most dramatic and outstanding one, of the natural processes, features, habitats and species to be found along the edge of the escarpment in Manitoba's "mountain" areas. Many other streams flow down off the escarpment to the lowlands below, creating deep erosional gorges and providing excellent habitat for species typical of Manitoba's boreal forest lands. However, the fact that the Steeprock River watershed is still in a relatively natural and wilderness state means that it provides a very high measure of the representativeness of these characteristics.

Uniqueness: Rare or outstanding natural phenomena, formations and features, or areas of exceptional natural beauty, such as outstanding examples of ecosystems, habitats or natural features, views of plant and animal concentrations, sweeping vistas or exceptional combinations of the above may be considered as measures of uniqueness. Areas in which populations of rare or endangered species of plants and animals are found should be assigned a high uniqueness value.

High: The primary focus area is not unique in terms of its topography, indeed it is more "representative" of many other escarpment areas in Manitoba. It is however unique with respect to the existence of old growth, large diameter white spruce in the gorge area along the Steeprock River. It should be noted that many rare and unique plants may be found in the Duck Mountains and that it has been theorized that a detailed botanical census of the Steeprock Valley would uncover a similar situation. (Johnson, 1988)

Naturalness: This is a measure of the degree of man-induced modifications. Wilderness Parks are valued for their natural state; therefore the least modified areas should be considered the most desirable. For example, areas which are unsettled or inaccessible, or are free from man-made modification would be considered as having a high naturalness value.

High: The primary focus area has a high naturalness value. There is a definite absence of man-made modification throughout most of the area. Exceptions to this include: the picnic area and small weir at North Steeprock Lake, and the forestry road along the north and west boundary of the watershed. Forestry operations are threatening the naturalness of the watershed from the south west and the northern areas of the Forest Reserve.

5.2 RECREATIONAL RESOURCES

Diversity: The range or variety of land and water based wilderness oriented recreational opportunities and activities afforded by the wilderness environment on a year round basis.

High: The primary focus area presently offers a great variety of diverse recreational activities. These range from snowmobiling, boating, and sportfishing to cross-country skiing, backpacking and primitive camping. Wilderness parks due to their sensitive nature can only afford the most low-impact of these recreations.

Concentration: The number of complementary recreational activities which currently exist or could be developed while at the same time conserving the natural and recreational resources within the area.

Low: Recreational activities such as hiking, primitive camping, backpacking, angling, non-motorized boating, photography, nature study, cross-country skiing and snowshoeing are examples of low-impact opportunities which exist in the Steeprock River watershed. These activities are compatible with the undisturbed, natural wilderness environment. Rec-

reational activities in wilderness parks must necessarily be unconcentrated. The presence of other visitors in close proximity can often belittle a 'wilderness experience'. This fact limits the development of recreational activities and restricts such activities to those which require an absence or a bare minimum of developed facilities. Such activities which require the development of facilities could be accomodated outside the park boundaries.

Integrity: The quality of a recreational experience. The experience is influenced by such things as the Wilderness Park's characteristics, level of use, recreational facilities, natural qualities and conflicting land use.

High: The primary focus area should provide for a high quality recreational experience, from a wilderness perspective. The natural resources, the diverse and dramatic landscape and the remoteness of the area are all of high value to wilderness and wilderness recreation. There is a low level of use at the present time and wilderness park status would necessarily regulate conflicting man-induced landuses.

Representativeness: The recreational and tourist activities within the Wilderness Park relative to provincial, ter-

ritorial and regional recreational activities. For example, a Wilderness Park could be selected on the basis of the manner in which it represents outstanding backcountry camping within a designated area.

Medium: The recreational activities which may be enjoyed within the primary focus study area are those which are representative of wilderness parks. They also represent activities which are typical of the escarpment terrain. There is however, due to the relative small size of the watershed, an absence of an abundance of opportunities for lengthy (greater than 50 km [30 mile]) backcountry hiking or skiing trails. The steep, rough terrain and a good trail design should provide the element of difficulty inherent in most wilderness travel and offset the small size of the area.

Uniqueness: Areas that provide rare or singular settings for specific types of recreational and tourist activities, either existing or potential, should be identified as one measure of the Wilderness Parks's uniqueness. Wilderness areas that have rare or outstanding opportunities for recreational and tourist activities should receive high consideration as Wilderness Parks.

Very High: The backcountry hiking potential in the Steep-rock River watershed is unique in Manitoba. The steep val-

ley walls in the gorge section are unparalleled in the province and would provide a dramatic backdrop for a trail system. The mature boreal forest is also a rare feature in Manitoba and provides a singular opportunity for resource interpretation.

Naturalness: The potential for recreational activities such as primitive camping, scenic viewing and photography in an attractive natural setting where man's influence on the landscape is minimal.

Very High: The undisturbed nature of the majority of the landscape within the Steeprock River watershed provides a very high measure of naturalness. The fast flowing rivers and streams, dramatic valley gorges, mature forests and other natural features found in the watershed should provide excellent opportunities for 'primitive' wilderness type recreation.

5.3 RESOURCE EVALUATION SUMMARY

The primary focus study area (see page 54) may be divided into three zones; upland, middle and lowland. The upland area ranges in elevation from 680 to 770 meters (2230 to 2525 ft) above sea level and is on the top of the escarpment. It is characterized by hummocky rolling terrain, small to medium sized lakes and bogs. There has been some intrusion by logging in this zone. The middle area is the river gorge, located in the elevation range of 380 to 680 meters (1245 to 2230 ft). The land falls abruptly as the rivers spill off the escarpment. This landscape is dramatic with steep valley walls, fast flowing rivers and streams, and mature old growth boreal forest. Exciting backcountry hiking and skiing opportunities exist in this zone. The lowland area is the outwash plain of the rivers and streams which flow down off the hills. This landscape is relatively flat and gentle; a deciduous oak-aspen forest interspersed with cleared agricultural areas.

The natural resources, features and values of the Steep-rock River watershed have been assessed under the criteria of diversity, concentration, integrity, representativeness, uniqueness, and naturalness; relative to wilderness situations. The resources score 'medium' to 'very high'. The recreational resources assessed under these criteria score much the same way, that is, on the upper portion of the scale. The ratings may be given numerical values equal to :

Very High = 3, High = 2, Medium = 1, Low = 0. This chart shows that the value of the natural resources scores close to the highest possible in terms of both natural and recreational resource appraisals. The primary study area, the Steeprock River watershed, exhibits a high potential as a provincial wilderness park.

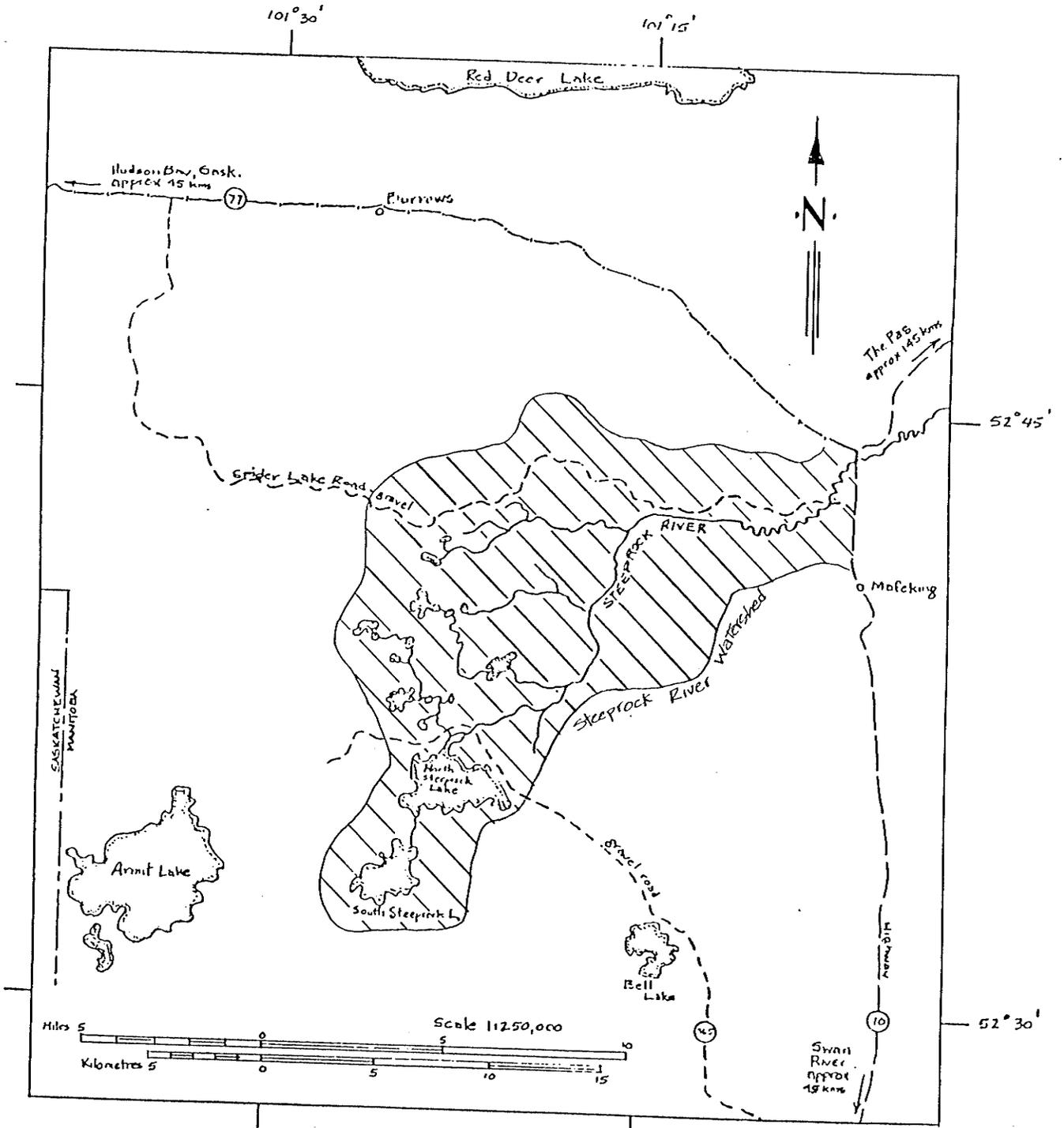


Fig. 4
Steeprock River Watershed

Wilderness Resource Ratings

Natural Resources

	Rating	Actual	Potential
Diversity	Very High	3	3
Concentration	Very High	3	3
Integrity	Medium	1	3
Representativeness	Very High	3	3
Uniqueness	High	2	3
Naturalness	High	2	3
		<u>14</u>	<u>18</u>

Recreational Resources

Diversity	High	2	3
Concentration	Low	0	0
Integrity	High	2	3
Representativeness	Medium	1	3
Uniqueness	Very High	3	3
Naturalness	Very High	3	3
		<u>11</u>	<u>15</u>

It should be noted that in terms of 'concentration' the recreational resources are assessed a 'low' rating. This is simply because the greater the number of visitors, the less wild an area becomes. If an area has a great concentration of recreational activities a visitor can no longer experience the feeling of solitude and remoteness which is a significant part of the wilderness experience (see wilderness criteria p.35).

Chapter VI

CONCLUSION

The selection criteria for a wilderness park reflect the dual objective of its establishment: to preserve a representative natural landscape while providing for recreational activities which are suitable in a wilderness setting. To qualify as a wilderness park an area must have resources which are of such a quality that they reflect this dual objective. Section criteria are: that, (i) the area must be representative of the natural heritage of its region, (ii) the area must be able to sustain wilderness-type recreational activities while remaining essentially unaltered, and (iii) the area should be a self-contained, self-regulating ecological unit. These criteria are common to all of the 'definitions' of a wilderness park outlined in the literature review.

A portion of the primary focus study area, the Steeprock River watershed, meets these criteria. The Steeprock River valley is most certainly representative of the natural heritage of its region, the Manitoba Escarpment. The numerous small lakes and bogs, fast-flowing rivers, the steep and sudden rise from lowland to upland, the varied forest cover, extensive wildlife, high precipitation; all combine to well

represent the Manitoba Escarpment. Even more significant, the dramatic cliffs and mature forest cover make this area unique in Manitoba and an extensive ecological inventory would uncover many more rare and outstanding features.

Additionally, there exists the opportunity for high-quality wilderness-type, low-impact recreational activities, particularly backcountry hiking, fly-fishing and cross-country skiing. Free from man-made intrusions, the area, and its remoteness, can foster the feeling of solitude and the 'wilderness state-of-mind' so important to wilderness recreation. Appropriate management control can sustain and preserve these recreational values.

Because there exists a complete, relatively large watershed, substantially unaltered by man's hand, the third criteria is satisfied. The watershed can be considered an ecological unit; self-contained and self-regulating. This is particularly significant for the on-going preservation of the wilderness values.(see Fig.5)

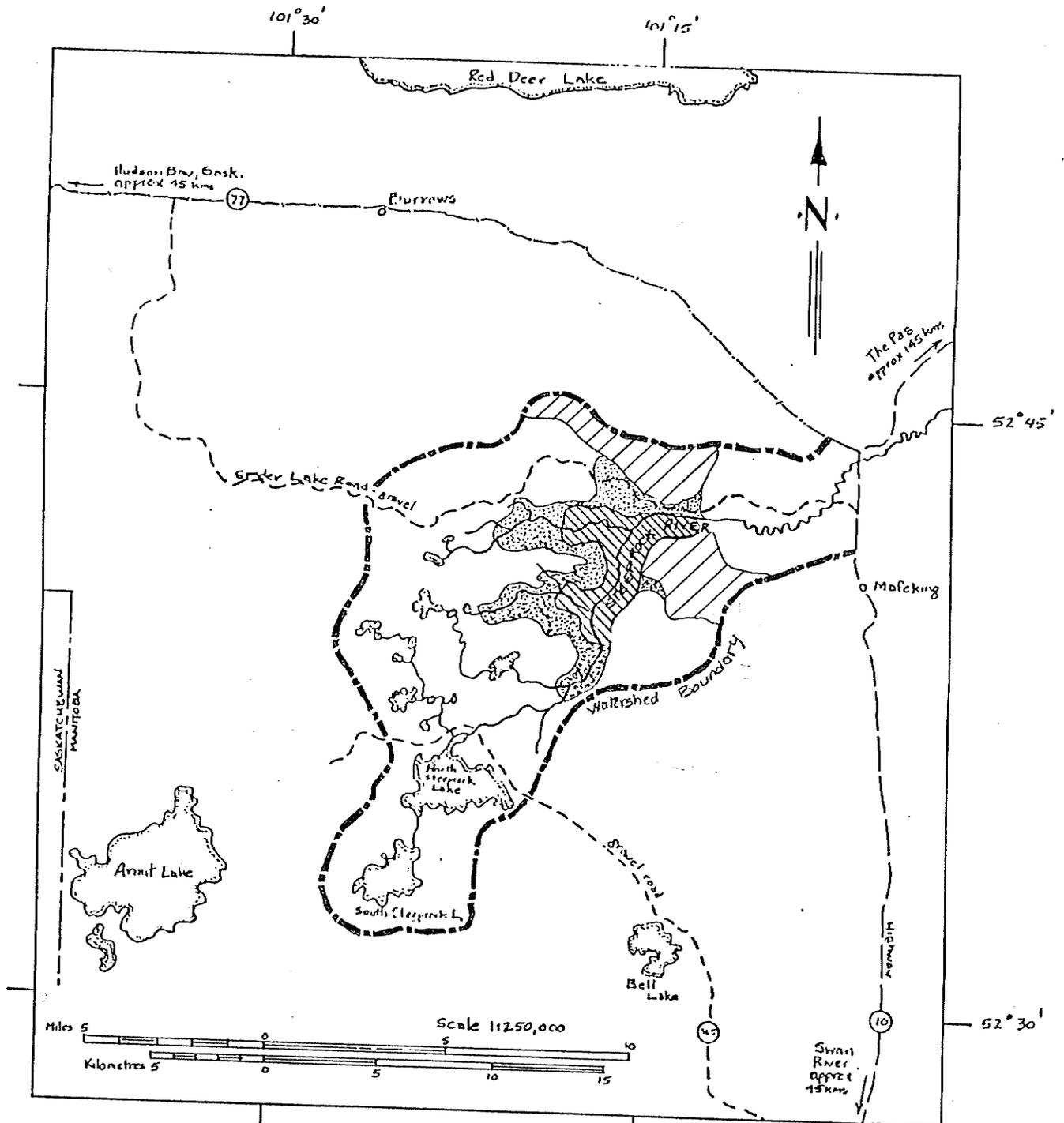


Fig. 5

Primary Wilderness Values

-  Old Growth Area
-  Escarpment Area
-  River Valley Area

Through the utilization of an adapted version of the Canadian Heritage Rivers Selection Criteria, an evaluation of the natural and recreational resources of the primary focus study area has been made. The resources of the watershed score highly on the value scale of this model. The highest rated natural resource values are those of 'diversity, concentration, and representativeness'; the highest rated wilderness recreation resource values are those of 'uniqueness and naturalness'.

The natural and recreational resources of a portion of the primary focus study area meet the selection criteria of a wilderness park and score highly in the resource evaluation model, hence, the Steeprock River Watershed should be considered for designation as a "wilderness park" in Manitoba's park system. This area does match the definition of a wilderness park in Manitoba's Provincial Park Systems Plan: a park which may "...encompass outstanding land areas and their associated plant and animal communities. Largely untouched by man, wilderness areas provide superior recreational opportunities compatible with wildland character and experience." (Manitoba, 1986) Although it is not a large, expansive tract of land, the proposed wilderness park, if managed sensitively, would compare favourably with other wilderness parks, such as Atikaki, or in other park systems. This study recommends the establishment of a Manitoba Wilderness Park at the Steeprock River watershed.

6.1 BOUNDARIES

Wilderness park boundaries should reflect the natural watershed limits. A selection consideration is that the "boundaries shall recognize the integrity of natural features being considered for protection and conservation" (P.R.P.Consulting, 1985). Exact boundary delineation will depend upon the discretion of the Manitoba Parks Branch however boundaries which satisfy the criteria are:

Starting at NW corner, NE quarter of Township 43, Range 28, running south to NE corner, NW quarter of Township 42, Range 28, running west to NW corner, Township 42, Range 28, running south to NW corner, SW quarter of Township 41, Range 28, running east to NE corner, SE quarter of Township 41, Range 28, running north to NW corner, Township 41, Range 27, running east to SE corner, SW quarter of Township 42, Range 27, running north to NE corner, SW quarter of Township 42, Range 27, running east to NE corner, SE quarter of Township 42, Range 27, running north to NW corner, Township 42, Range 26, running east to West Boundary Mountain Local Government District, running north along West Boundary Mountain Local Government District to Southern boundary Township 44, Range 26, running west to NW corner, NE quarter of Township 43, Range 28.

Such boundaries, i.e. following established Township and Range lines, are easily identified and surveyed. By conserving the entire Steeprock River watershed found within the Provincial Forest the natural ecology of the wilderness area is best preserved. The wilderness park would contain a complete ecological unit and ensure the unalteration of natural processes.

This area(see Fig.6), approximately 39,370 hectares (97,280 acres), would encompass the watershed but also

enclose a small portion of land selectively logged and lightly tracked with two or three logging trails. (see Canadian dept. of Energy, Mines and Resources Map 'Mafeking 63/11 ed2 scale 1:50,000) Such already altered terrain could be allowed to return to a natural state and would act as a buffer zone between the true wilderness section (in the river valley) and the extractive activities which continue in the rest of the Porcupine Forest Reserve. The "true" wilderness zone would be that portion of the primary focus study area which falls south of the Spider Lake forestry road, north of the Steeprock Lakes access road, and within the eastern and western boundaries of the Steeprock River watershed. This area would cover approx. 12,140 ha (30,000 acres), large enough to satisfy most estimations of wilderness park size, particularly considering the ruggedness of the terrain in the Steeprock River valley. (see Fig. 7)

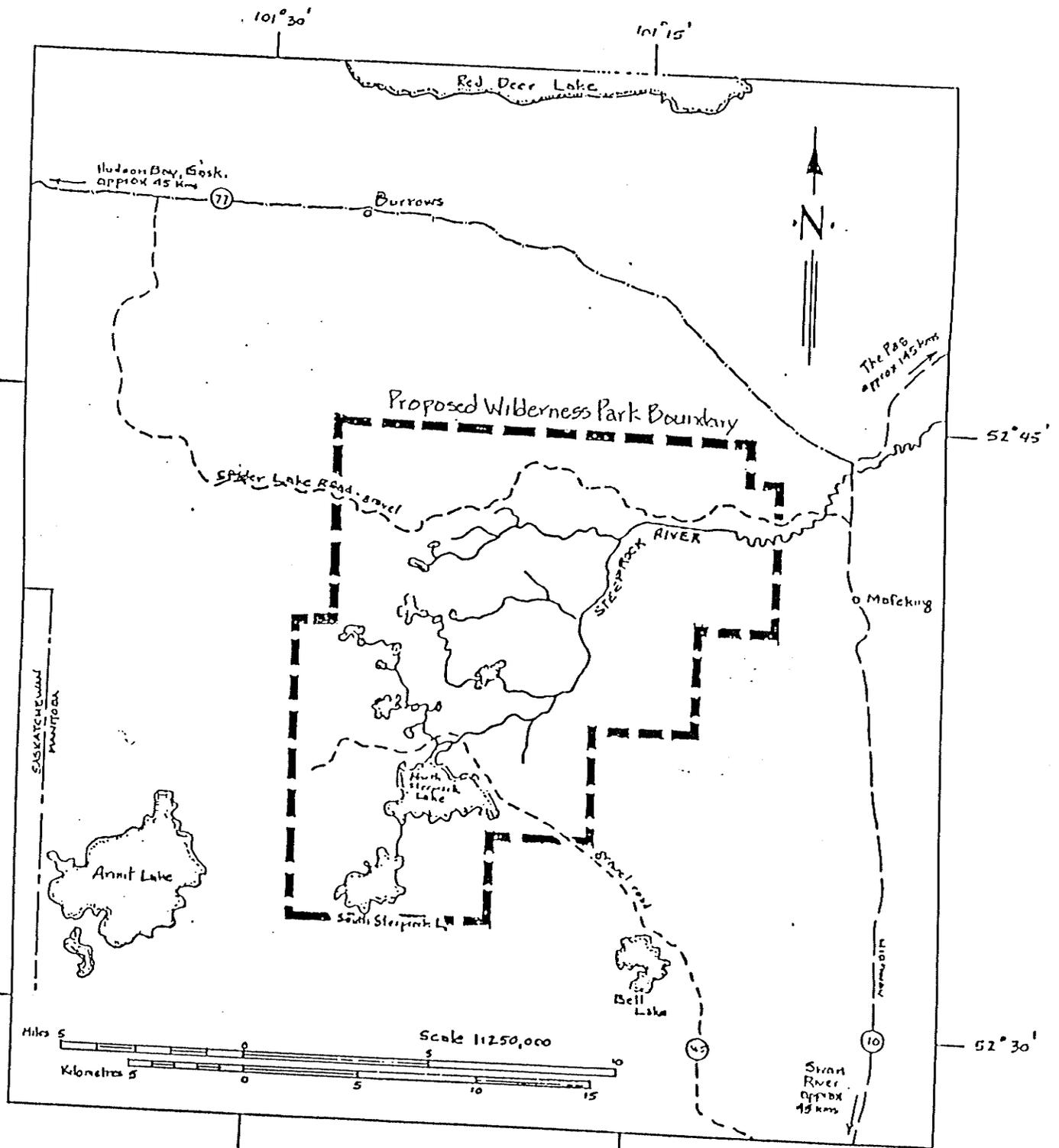


Fig. 6

Proposed Steeprock Wilderness Park Boundary

6.2 FUTURE RESEARCH AND STUDY RECOMMENDATIONS

Recommendations for further study/research in the Steeprock River watershed include:

- 1) An indepth field investigation and inventory of the ecological resource processes within the proposed Wilderness Park boundaries is necessary to confirm the amount of forest depletion due to logging and fire. The review of forest inventory maps which was part of this practicum should be confirmed by more extensive groundtruthing.
- 2) A botanical inventory of the proposed Park area should be initiated to confirm the theory of the existence of rare and endangered flora.
- 3) A resource management scheme should be developed to protect the fragile resources of the proposed Park. A trail design with designated camping areas and a policy on indiscriminate backcountry camping, i.e. camping outside of designated campsites, should be immediate concerns. This would control overuse of the resources, once the decision has been made to conserve them. Further policy development on resource management in the area would follow.
- 4) Socio-economic studies exploring public support, interest and/or involvement in a provincial Wilderness Park in the Steeprock River watershed would provide much needed planning data. This could include public surveys in the local area and other user group areas e.g. Winnipeg.

LITERATURE CITED

- Alberta. 1986. Alberta Recreation and Parks Land Development and Management System: An Overall Management Strategy. Alberta Recreation and Parks. Edmonton.
- Alberta. Wilderness Areas, Ecological Reserves and Natural Areas Act. RSA 1980,cW-8.
- Avery,T.F. 1977. Land Information Systems and Land Cover Mapping: Interpretation of Aerial Photographs. Minneapolis: Burgess Publishing Company.
- Ball,G. 1986. 1984 Western Region Moose Report. Manitoba Department of Natural Resources. MS Report No.86-10.
- Barto,W.P. and C.G.Vogel. 1978. Agro-Manitoba Information Package. Manitoba Department of Mines, Natural Resources and Environment, Lands and Surveys Division. Winnipeg.
- Bates,D. 1978. "Wildlands: Size, Number, Location and Potential", Contact, Vol 10, No 1 (Spring).
- Bodsworth,F. 1971. Why Wilderness. Toronto: New Press.
- Boggs,G.D. and Associates. 1976. Proposal for the Subdivision of the Parks and Recreation System. Nova Scotia Department of Lands and Forests. Halifax.
- British Columbia. 1986. The Wilderness Mosaic. Wilderness Advisory Committee. Vancouver.
- Canada Land Inventory. 1969. Land Capability Classification for Outdoor Recreation. Department of Regional Economic Expansion, Canada Land Inventory, Information Canada. Ottawa. Report 6-1969.
- Canadian Nature Federation. 1985. "Report Card : 1985" Nature Canada 14(3) 46-48.
- The Council of the Society of American Foresters. 1976. "Forest Wilderness: A Position of the Society of American Foresters", Journal of Forestry, Vol.74, No.2.
- Davies,J.F.,Bannatyne et al. 1962. Geology and Natural Resources of Manitoba. Mines Branch, Department of Mines and Natural Resources. Winnipeg.

- Dodds,G. 1987. The Seal River Canadian Heritage River System Background Study. practicum (M.N.R.M.) University of Manitoba.
- Eagles,P.F. 1984. The Planning and Management of Environmentally Sensitive Areas. New York: Longman Group Ltd.
- Ellis,J.H. 1938. The Soils of Manitoba. Economic Survey Board, Province of Manitoba.
- Environment Canada. 1986. Canadian Climate Normals, Temperature and Precipitation, 1951-1980, Prairie Provinces. Atmospheric Environment Service.
- Environment Canada. 1987. Historical Streamflow Summary, Manitoba to 1986. Inland Waters, Water Resources Branch. Ottawa.
- Falls,J.B. 1971. "The Importance of Nature Reserves," Why Wilderness, ed. B.M.Littlejohn and D.H.Pimlott. Toronto: New Press.
- Frome,M. 1974. "Text of the Wilderness Act," Battle For The Wilderness. New York: Praeger Publishers.
- Gardner,J.S. 1978. "The Meaning of Wilderness: A Problem of Definition," Contact, Vol.10, No.1, Spring.
- Haig Brown,R. 1946. A River Never Sleeps. New York: William Morrow and Company.
- Hamre,G.M. 1987. An Overview of Territorial Parks in the Northwest Territories. Department of Economic Development and Tourism. Yellowknife.
- Hilderman,M.G. 1969. The Whiteshell Provincial Park. M.L.A. Thesis, University of Manitoba.
- Knudsen,D.M. 1980. Outdoor Recreation. New York: MacMillan Publishing Co.
- Krieger,M.H. 1973. "What's Wrong With Plastic Trees ?", Science, Vol.179.
- Leopold,A. 1966. A Sand County Almanac. New York: Oxford University Press, Inc.
- Lucas,R.C. 1964. The Recreational Capacity of the Quetico-Superior Area. U.S.Forest Service Research Paper LS-15. Forest Service, U.S.Department of Agriculture.
- Manitoba. 1956. Forest Resources Inventory-Mountain Forest Section, Report No.4. Department of Mines and Natural Resources. Winnipeg.

- Manitoba. 1973. Outdoor Recreation Master Plan, Duck Mountain Provincial Park. Department of Tourism, Recreation, and Cultural Affairs, Parks Branch. Winnipeg.
- Manitoba. 1974. The Parks Act, Regulation 199/74. Manitoba Gazette. Winnipeg.
- Manitoba. 1979. Porcupine Mountain Forest Reserve Lake and Stream Recreation Study. Department of Natural Resources, Parks Branch. Unpublished Report.
- Manitoba. 1983. Report for Forest Management Unit 14. Manitoba Department of Natural Resources, Forestry Branch. Unpublished Report.
- Manitoba. 1983. Whiteshell Provincial Natural Park Master Plan. Department of Natural Resources. Winnipeg.
- Manitoba. 1985. Atikaki:World-Class Park in the Making. Department of Natural Resources. Winnipeg.
- Manitoba. 1986. A System Plan For Manitoba's Provincial Parks. Department of Natural Resources, Parks Branch. Winnipeg.
- Manitoba. 1987. Fur Harvest Information System. Record of Corp and Value of All Furs, 1984-1986. Department of Natural Resources, Wildlife Branch. Unpublished Report.
- Manitoba. 1988. Fishing Adventure and Master Angler Awards '87. Travel Manitoba, Department of Business Development and Tourism. Winnipeg.
- Marsh, J. 1969. "Maintaining The Wilderness Experience In Canada's National Parks," Canadian Parks In Perspective, ed. J.G.Nelson. Toronto: Harvest House.
- Mills, G.F., H.Velhuis, D.B.Forrester and R.Schmidt. 1976. A Guide to Biophysical Land Classification in Manitoba. Manitoba Department of Renewable Resources and Transportation Services and Canada-Manitoba Soil Survey.
- Nash, R. 1973. Wilderness and the American Mind, revised ed. New Haven: Yale University Press.
- Newfoundland and Labrador. 1985. Newfoundland and Labrador Provincial Parks Policy. Parks Division, Department of Culture, Recreation and Youth. St.John's.
- Ontario. 1978. Wilderness Parks. Parks and Recreational Areas Branch, Ministry of Natural Resources. Toronto.

- Parks Canada. 1980. Guidelines For The Preparation Of The Canadian Heritage Rivers System Nomination Document. ARC Branch.
- Parks Canada. 1983. Parks Canada Policy. Minister of the Environment. Ottawa.
- Piagram, J. 1983. Outdoor Recreation and Resource Management. New York: St. Martin's Press, Ltd.
- P.R.P. Consulting. 1985. Provincial Park Classification System. Draft Report. Parks Branch, Saskatchewan Parks and Renewable Resources. Regina.
- Rowe, J.S. 1972. Forest Regions of Canada. Minister of the Environment. Ottawa.
- Sax, J. 1980. Mountains Without Handrails. Ann Arbor: The University of Michigan Press.
- Schewe, A.M. 1981. Vegetation and Ungulate Response to Forest Clearings in the Duck Mountain, Manitoba. M.Sc. Thesis, University of Manitoba.
- Simpson, A.A. 1970. "The Manitoba Escarpment Cultural Sequence", Ten Thousand Years, Archeology in Manitoba, ed. W.M. Hlady. Manitoba Archeological Society
- Soper, J.D. 1961. "The Mammals of Manitoba" The Canadian Field Naturalist, Vol 75, No 4.
- Stankey, G.H. 1972. "A Strategy for the Definition and Management of Wilderness Quality," Natural Environments: Studies In Theoretical And Applied Analysis, ed. J.V. Krutilla. Baltimore: The Johns Hopkins University Press.
- Stankey, G.H. "Response," Contact, Vol 10, No 1, Spring.
- Sullivan, A.L. and M.L. Shaffer. 1975. "Biogeography of the Megazoo," Science, Vol 189, No 4196.
- Swan Valley Historical Society. 1984. Lasting Impressions. Friesen and Sons: Altona, Manitoba.
- Weir, T.R. (ed.). 1983. Atlas of Manitoba. Surveys and Mapping Branch, Department of Natural Resources, Province of Manitoba. Winnipeg, Manitoba.
- The Wildland Research Center, University of California. 1962. Wilderness and Recreation - A Report on Resources, Values, and Problems. Study Report 3, Outdoor Recreation Resources Review Commission, Washington, D.C.

White,D.J. and K.Johnson. 1980. The Rare Vascular Plants of Manitoba, Syllogeus No.27. National Museum of Canada. Ottawa.

Wilkes,B. 1979. "The Myth of the Non-Consumptive User", Park News. National and Provincial Parks Association of Canada. Toronto.

Witty,D.R. 1973. Parkland Types: The Development Of A Classification System. paper presented at the Park Management and Administration Program. Forest Technology School, Hinton, Alberta.

PERSONAL COMMUNICATION

- Jones, Gordon. February, 1987. Chief of Planning, Parks Branch. Manitoba Department of Natural Resources.
- Wilson, Rick. April, 1987. Park Systems Planner, Parks Branch. Manitoba Department of Natural Resources.
- Davies, D. May, 1988. Wildlife Specialist, Western Region, Wildlife Branch. Manitoba Department of Natural Resources,
- Johnson, Dr. K. May, 1988. Manitoba Museum of Man and Nature. Winnipeg.
- MacKenzie, R. May, 1988. Regional Forester (retired), Western Region, Forestry Branch. Manitoba Department of Natural Resources.
- McComb, G. May, 1988. Regional Forester, Western Region, Forestry Branch. Manitoba Department of Natural Resources.
- Valiant, H. May, 1988. Regional Manager, Western Region, Fisheries Branch. Manitoba Department of Natural Resources.

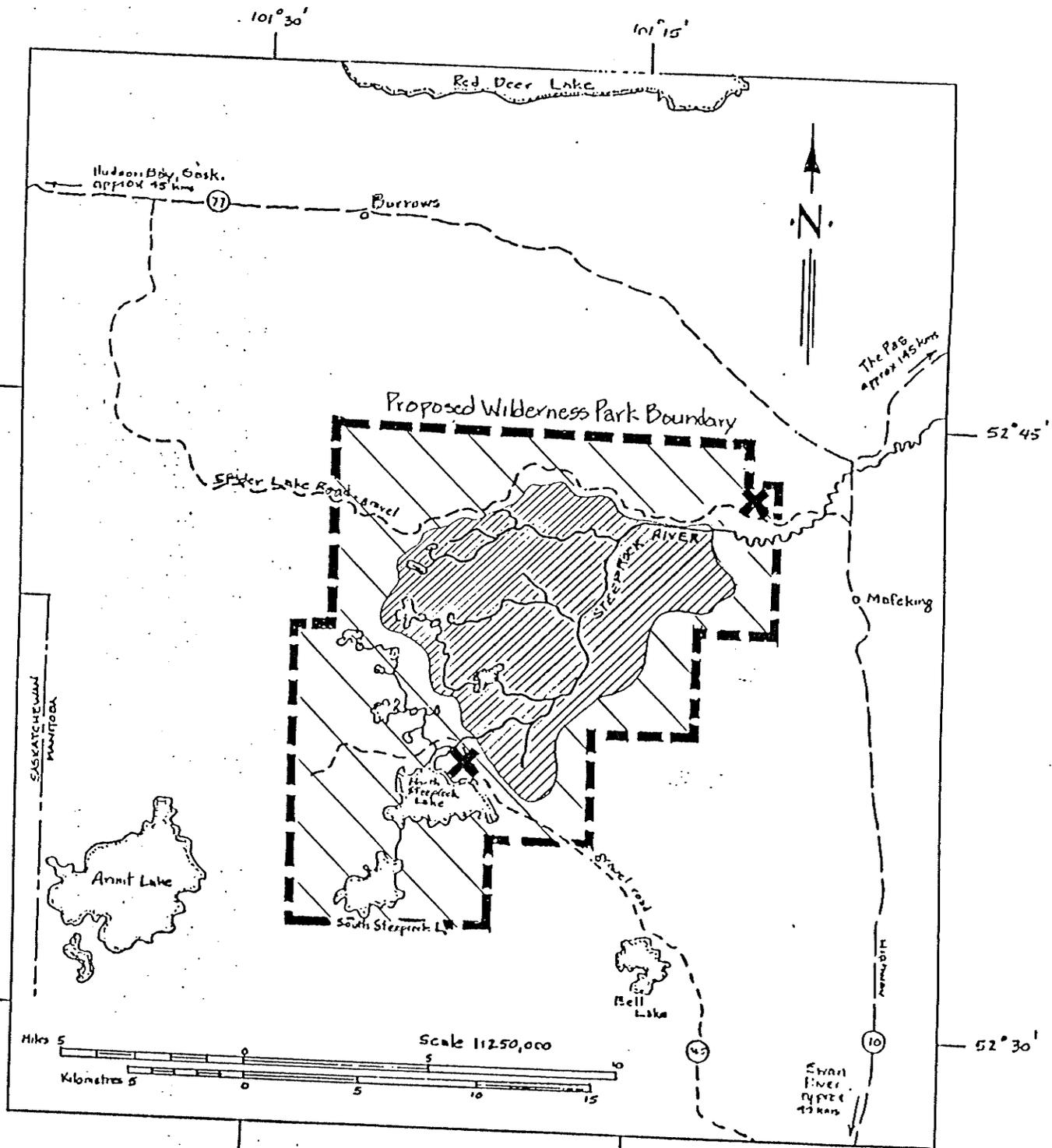
Appendix A

PROPOSED MANAGEMENT STRATEGIES

Management strategies should reflect the dual objective of a wilderness park: to preserve a representative landscape while providing for recreational activities which are suitable in a wilderness setting. The overall scheme should be to maintain the area as pristine and to allow natural succession to evolve. To develop management 'policy' typically requires a lengthy process. An interim strategy should be one of preservation.

Zoning (see Fig.7)

- all lands within the proposed park must be designated as parklands.
- delineate an area of core wilderness surrounded by a buffer zone of semi-wilderness (backcountry).
- establish staging areas in the buffer zone; at Steeprock Lake day use area, and, at that point where the Spider Lake road crosses the west boundary of the Mountain Local Govt. District.



-  Staging Area
-  Wilderness Core
-  Backcountry Zone
(Buffer Zone)

Fig. 7
Wilderness Park Zoning

Development Policies

- restrict all motorized traffic within the park except on Steeprock Lakes access road.
- extractive activities should be restricted to areas outside the park. Such activities would include mining, forestry, hunting, trapping. - developments in the wilderness core should be restricted to the designation of primitive trails, camping areas, firepits, privies.
- developments at the staging areas should be limited to those which encourage use for short duration, for interior visitors upon entering or leaving the wilderness zone. These include primitive camping areas, vehicle parking, orientation and interpretation signage.
- wilderness recreation is dependent upon a feeling of self-reliance on the part of the user. Accordingly, care should be taken so as to not 'overdevelop' the park.