SUBSISTENCE IN THE HUDSON BAY BIOREGION: LAND USE, ECONOMY AND ETHOS

BY

HELEN BARBARA FAST

A Thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

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ABSTRACT

Canada's subsistence societies exist at the margins of the dominant Euro-Canadian society, continually buffeted by the political, economic, cultural and social forces of the larger society. Their presence was perceived to impede the flow of settlers across the country in the nineteenth century, and continues to be a source of irritation and frustration a century later. The purpose of this research is to study subsistence in arctic and subarctic areas of the Hudson Bay bioregion. Its objectives are to evaluate the validity of land use studies documenting subsistence land use practices; to characterize the economies and ethos of subsistence societies; and to assess the extent, persistence and future viability of these societies.

Three case studies support the analysis. The first case study, based on York Factory First Nation in North Central Manitoba, adopts a historical focus. The second is a spatial analysis of the contemporary land use of the Omushkego Cree in Northern Ontario. The third assesses the types of demands to be placed on the Inuit of Nunavut as they assume resource management responsibilities.

The study found that: (1) different land use studies for the same area produce consistent results; (2) subsistence societies continue to harvest bush food, often over extensive ancestral hunting grounds; (3) the value-in-kind of bush food is significant relative to the overall economy of northern regions; (4) the ethos of subsistence societies in the Hudson Bay bioregion continue to be based on strong bonds of kinship and close relations with the land.

The study concluded that: (1) land use studies are replicable and are an appropriate methodology for establishing land use over time; (2) analyses of subsistence economies

premised on the commoditisation of land and labor are inadequate; (3) there is no inherent incompatibility between the application of modern technological resource management strategies and subsistence ethos, provided the choice and application of technologies is not imposed; (4) a fundamental distinction between subsistence ethos and the ethos of the larger society is that the former does not allow for the commoditisation of human labor and land; and (5) subsistence ethos will be severely challenged in the transition to self-government.

ACKNOWLEDGEMENTS

Undertaking interdisciplinary research poses unique challenges. It involves crossing boundaries and drawing heavily on the willingness of others to support such endeavors as they evolve. For one ill-suited to the confines of a disciplinary degree, the support for interdisciplinary research offered by Dean K. Hughes of the Faculty of Graduate Studies very early in the process was greatly appreciated. Subsequently Dr. Fikret Berkes, Director of the Natural Resources Institute, agreed to act as supervisor and helped secure financial support for this work. Once Dr. Mary Benbow, Department of Geography, and Dr. Fred Shore, Department of Native Studies, had agreed to sit on my committee I was able to begin work in earnest. In retrospect, it is hard to imagine a more positive experience than that which has been provided to my by this small group, and I wish to express my heartfelt thanks to them.

During my term as a graduate student I was affiliated with the Natural Resources Institute (NRI) as a Research Associate, where I was provided with office space. Financial support to conduct this research was provided by a University of Manitoba Fellowship, a SSHRC research grant awarded to Dr. F. Berkes, the Hudson Bay Programme of the Canadian Arctic Resources Committee (CARC), and the Nunavut Wildlife Management Board. Travel costs were covered by a grant from the Northern Studies Training Program.

The digitized basemap of Canada used extensively in Chapter 3 and elsewhere in the thesis was provided courtesy of Natural Resources Canada. Chapter 4 is based on research cooperatively undertaken with York Factory First Nation, with some support-in-kind provided by that community. Chapter 5 is based on research cooperatively undertaken with the TASO Program (Technology Assessment in Subarctic Ontario) based at McMaster

University, with digitized landcover maps provided courtesy of PRSO (Provincial Remote Sensing Office, Ontario Ministry of Natural Resources). John Turner from Moose Factory provided information on goose harvesting sites which was used to validate the methods used, and CEOS (Centre for Earth Observation Science, Department of Geography) provided the computer facilities needed to complete the analysis for this chapter. This financial assistance and support-in-kind is gratefully acknowledged.

In closing I would also like to thank Glen Okrainetz, formerly of CARC, for giving me the opportunity to participate actively in the Hudson Bay Programme, and Donald Saunders, Joan Godé and the community of York Landing for making me welcome. Finally, I wish to acknowledge the debt I owe David Mosscrop, who has been a source of continuing professional and personal support throughout the past four years.

Inter-disciplinary research it turns out, is a humbling experience.

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Chapter 1

Introduction and Context

1.1 Problem Statement and Objectives

Subsistence societies in Canada exist at the margins of the dominant Euro-Canadian society, continually buffeted by the political, economic, cultural and social forces of the larger society. Their presence impeded the flow of settlers across the country in the nineteenth century, and continues to present a problem to the larger society a century later. Subsistence societies are not well understood, and the sense of irritation and frustration Euro-Canadians feel toward their non-conformist neighbors is growing. Though small in population numbers and lacking in political influence, these societies continue to survive, and more recently are negotiating substantial settlements of long-standing claims against the larger society.

The purpose of this research is to study subsistence in arctic and subarctic areas of the Hudson Bay bioregion. Its objectives are to evaluate the validity of land use studies documenting subsistence land use practices; to characterize the economies and ethos of subsistence societies; and to assess the extent, persistence and future viability of these societies.

1.2 Significance of the Study

A study of subsistence is needed for two reasons. First, subsistence societies deserve to be recognized as legitimate societies by the larger society. This study seeks to examine critically the inherent integrity and credibility of subsistence societies so that members of the

larger society can develop an appreciation for their unique character. Second, there is a search in the larger society for behaviors that will reduce the high levels of environmental degradation and destruction resulting from many of its current activities. Though these outcomes are most often attributed to thoughtless resource use practices, they may be indicative of a moral crisis (Ophuls & Boyan 1992; Devall & Sessions 1985). Lack of regard for one another and for the environment has led to an "open season" on both. More sensitive attitudes and behaviors are needed. There is evidence to suggest that the ethos and economics of subsistence societies may be conducive to the development of more positive relations—with one another and with the environment—than has so far occurred in the larger society (Callicott 1982). This study of the ethos and economy of subsistence societies attempts to provide a source of insight for members of the larger society as they re-shape their own ethos and economic relations.

1.3 Plan and Structure of the Study

Chapter 1 presents the problem statement, objectives and significance of the study. It outlines the study's organizational structure and the geographic scope of the areas studied, and concludes with definitions of words and phrases relevant to the material in the thesis. Chapter 2 characterizes the nature of subsistence ethos. Chapter 3 analyzes changes in the land use of subsistence societies in the Hudson Bay bioregion (Figures 1.1 and 1.2), and synthesizes available data on the extent and relative importance of the subsistence economy. Chapters 4 through 6 provide case studies of the land use behaviors and practices of three band/subsistence societies in the Hudson Bay bioregion (Table 1.1). Chapter 7 presents conclusions based on the study's findings.

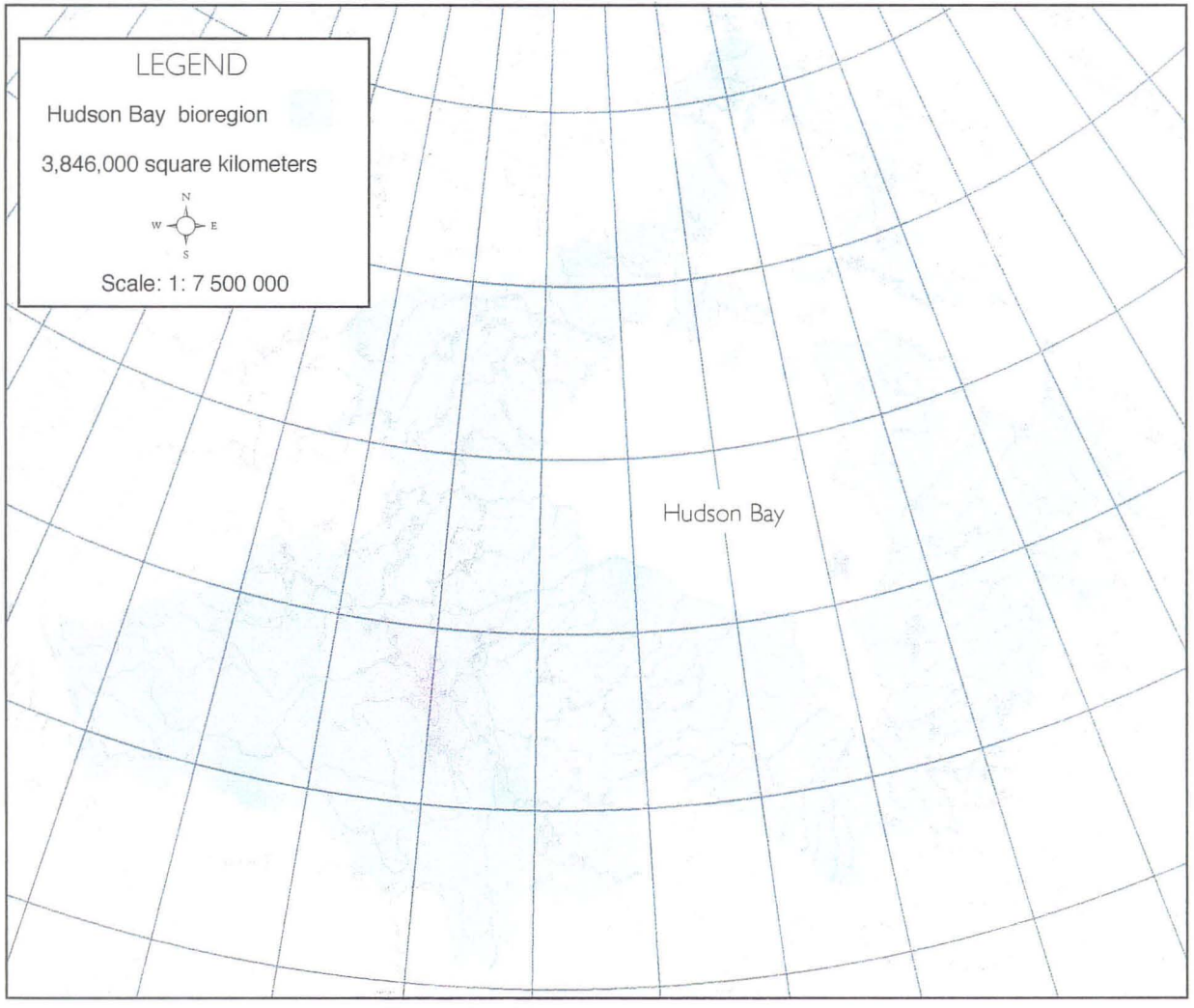


Figure 1.1: Hudson Bay bioregion.

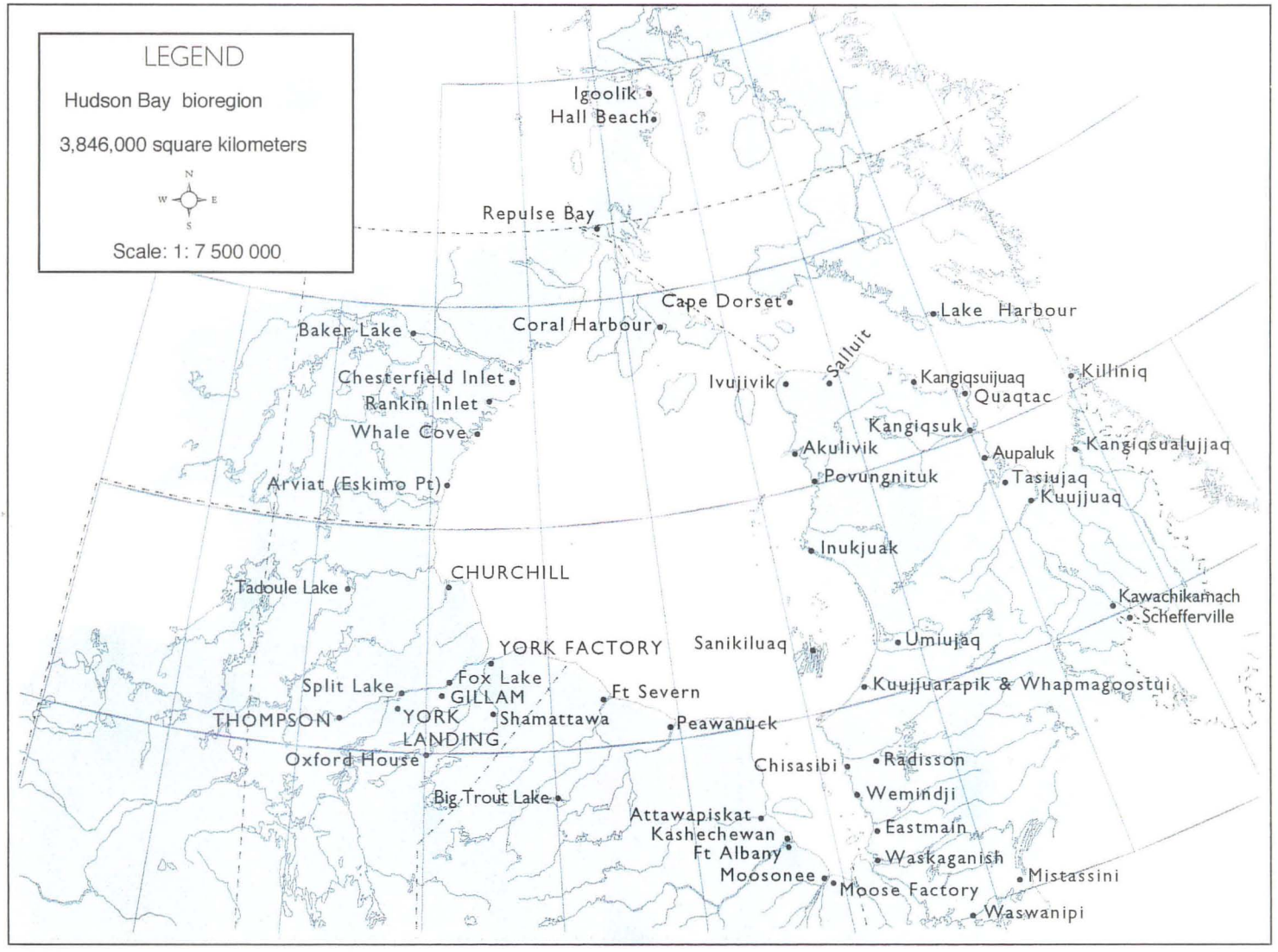


Figure 1.2: Arctic and subarctic communities of the Hudson Bay bioregion.

Table 1.1: Comparison of three case study areas (continued).

Characteristic	York Landing	Mushkegowuk Region	Nunavut Settlement Area
Region	subarctic	subarctic	arctic
Geographic Area	North Central Manitoba	Mushkegowuk Region of Northern Ontario	Nunavut Region
Population	350 (1994)	6470 (1990)	17,500 Inuit origin (1995)
Culture	*Mushkego* or *Omushkego* (Swampy Cree)	*Mushkego* or *Omushkego* (Swampy Cree)	Inuit
Institutions	York Factory FN Band Council	Mushkegowuk Council; band councils	Tungavik Federation of Nunavut (TFN); Regional Designated Inuit Organizations (DIOs); Hunters' & Trappers' Organizations (HTOs); and hamlet councils.
Land Use Extent	members continue to conduct small seasonal hunts in traditional hunting lands along the Hudson Bay coast; no land base since 1957; a treaty land entitlement of 14,000 acres is being negotiated, and a 19,000 acre resource management area has been awarded under the Northern Flood Agreement	hunters continue to use traditional hunting grounds which extend very significantly beyond reserve boundaries; wildlife harvesting and other land use activities are practiced in an area of approximately 250,000 sq. km., of which less than .4% is reserve land	granted ownership of a total of 136,000 348,000 sq. km. of which 14,000 square 36,000 sq. km. includes ownership of the sub-surface under the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada* signed in 1993
Land Base Intrusions	York Factory FN was re-located from its traditional hunting grounds on the Hudson Bay coast to North Central Manitoba in 1957; the surrounding lands and waters have been physically altered through extensive development	forestry, mining and hydro-electric development have occurred in the southern part of the region; the northern part of the region has been much less disturbed.	little industrial development has occurred in this region

Table 1.1: Comparison of three case study areas (concluded).

Characteristic	York Landing	Mushkegowuk Region	Nunavut Settlement Area
Country Food Obtained per capita (kg./yr.)	52[1] (1983-84)	106 (1990)	224 - Keewatin (1984-85) 344 - Baffin (1984)
Imputed value of subsistence bush meat/household (1991 Constant $)	$1,600[2] (1983-84)	$7,500 (1990)	$16,000 (1984-85)[3]

1. Includes the communities of: Berens River, Cross Lake, Hollow Water, Mathias Colomb (at Pukatawagan), Split Lake and The Pas. Excludes agricultural communities.
2. As in Footnote 1.
3. Keewatin Region.

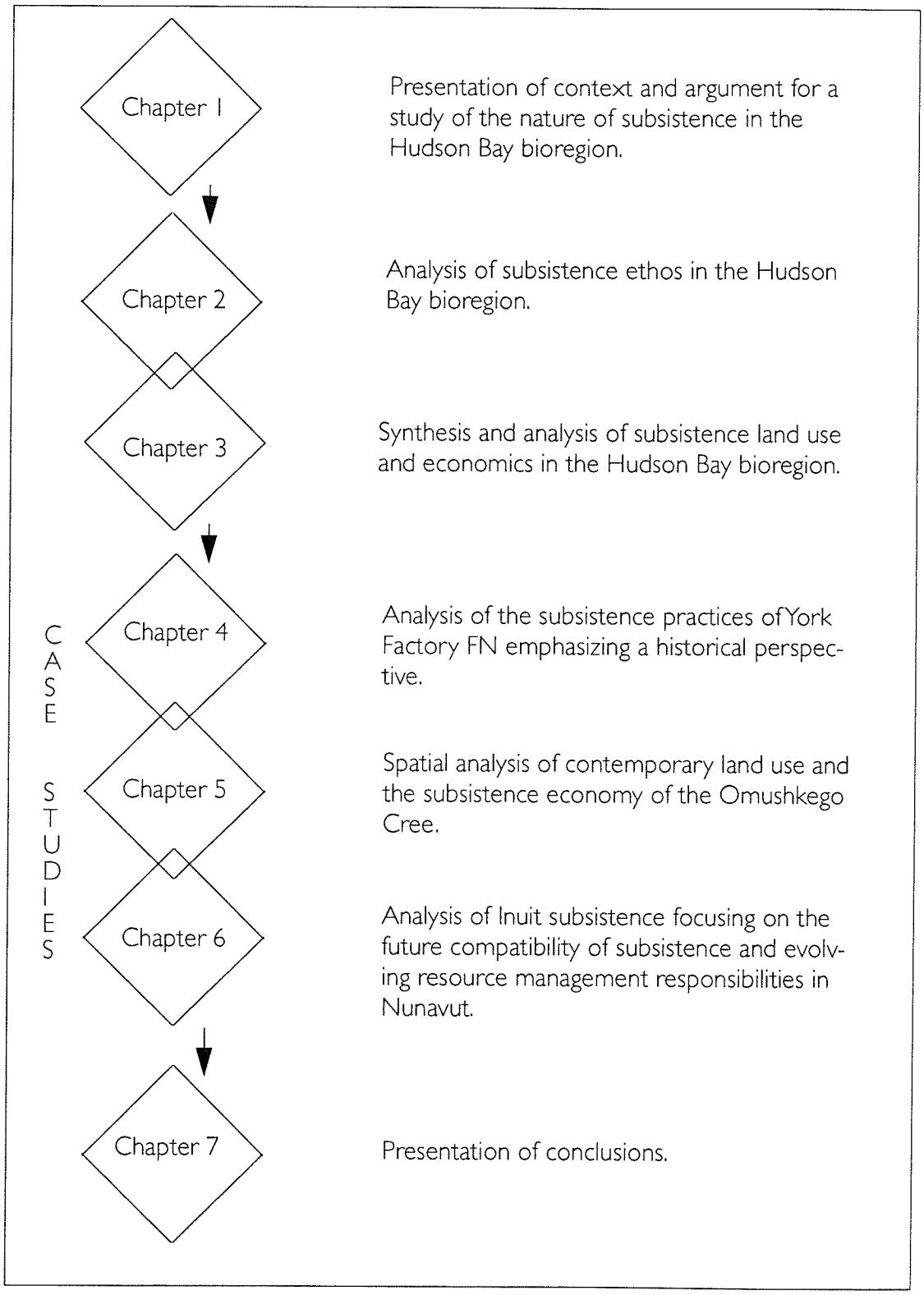
The first case study is based on York Factory First Nation (FN), a Cree subsistence society in North Central Manitoba. This study's emphasis is from a historical perspective, and covers the time period beginning prior to the fur trade and continuing to the present. The second case study, Chapter 5, is based on a spatial analysis of the land use practices of four Cree communities in the Mushkegowuk Region of northern Ontario. This study covers the time period from 1981 to 1990, and provides a contemporary perspective of subsistence land use in these societies. The final case study in Chapter 6 examines aboriginal land use in the Nunavut Region, located in the northern reaches of the Hudson Bay bioregion. The focus of this chapter is the future viability of subsistence, and serves to illustrate the implications for subsistence societies of assuming increasing responsibilities for the management and control of large land and resource use areas.

Chapter 7 presents the study's conclusions concerning the extent, persistence and future viability of subsistence ethos and economics in the Hudson Bay bioregion. It is based on a synthesis of the material presented in the preceding chapters. A flow chart summarizing the structure of this thesis is provided in Figure 1.3.

1.4 Study Methods

The methods used to conduct this study included a synthesis of harvest and land use reports and pertinent literature; field work involving unstructured interviews and map biographies; land use analyses using digitized data bases, GIS and image processing software; participation in CARC's (Canadian Arctic Research Committee) Hudson Bay Programme; and the design of a harvest study. The methods used vary by chapter, and for this reason those particular to each are described in detail in each of the chapters.

Figure 1.3: Structure of thesis.



1.5 Geographic Scope of Study

The geographic scope of this study includes the arctic and subarctic areas of the Hudson Bay bioregion. In its entirety, the bioregion encompasses 3,846,000 sq. km., an area equivalent to almost 40% of Canada's total land area. Approximately four million people live in this bioregion, most of them in the southern agricultural area. Of the approximately 32,000 aboriginal people presently living in these areas, most are Inuit or Cree, with the Inuit occupying the area north of the treeline, and the Cree living in the tundra, open woodland and boreal forest zones to the south (Berkes & Fast in press). Aboriginal peoples have occupied the arctic and subarctic regions of the Hudson Bay bioregion for centuries, and traditional occupation of the bioregion is depicted in Figure 1.4. Sly (1995) has observed that while much data and other information exist describing this region, there is by no means a comprehensive understanding of its ecology: "While there may appear to be a significant amount known about the Hudson Bay region, it should be recognised that information is frequently available only from a few specific locations and the density of information is extremely low. Often the ability to link sets of information between sites and over time is very tenuous. The extent of knowledge, particularly about the ecology of the basin, is more apparent than real" (Sly 1995, p. 1).

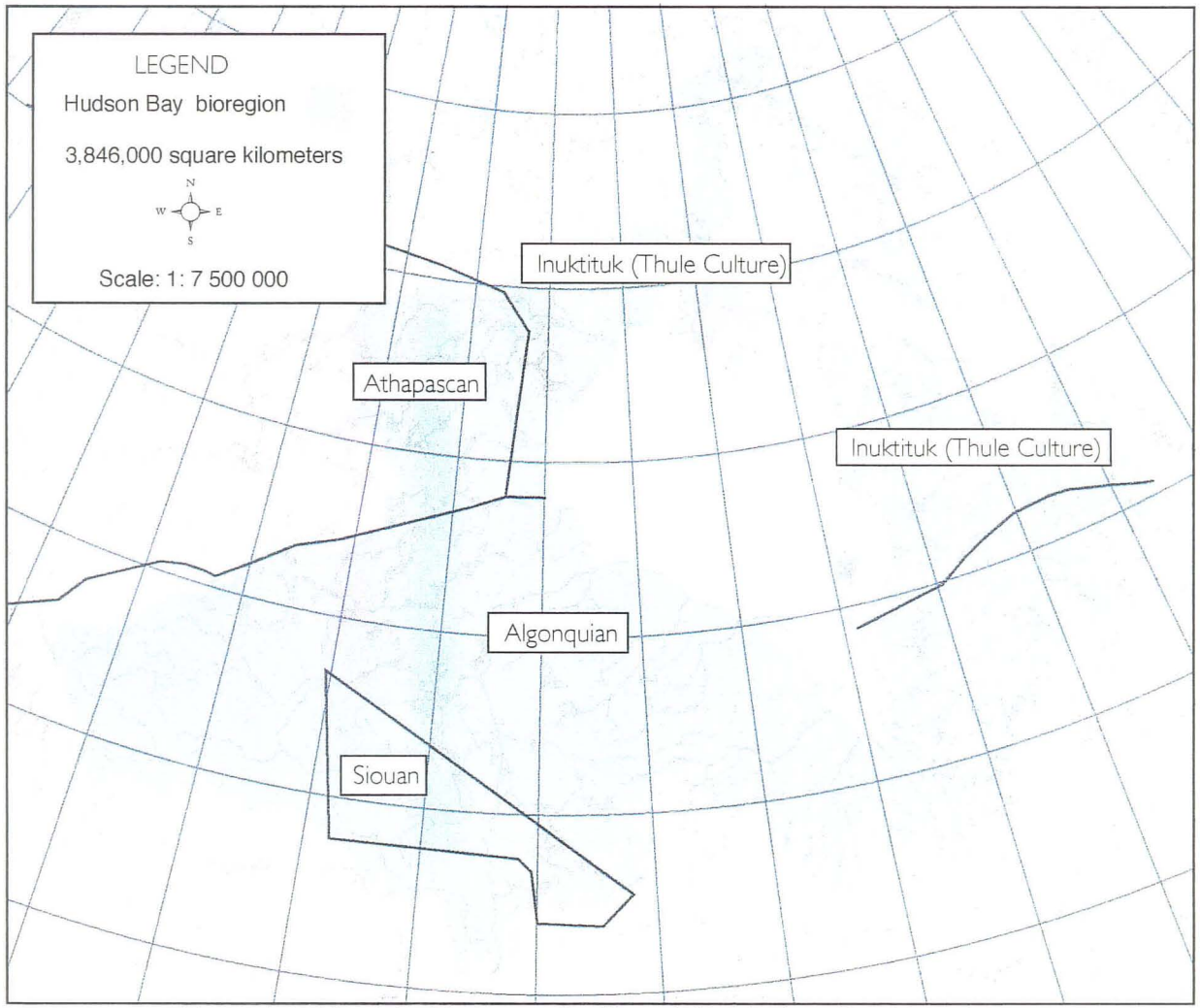


Figure 1.4: Aboriginal language families of the Hudson Bay bioregion in the 17th century. After McMillan 1988, and Harris 1987.

An ecological zone, namely the Hudson Bay bioregion, was deemed a more appropriate choice for demarcating this study than were political boundaries for several reasons. First, the subsistence societies on which this study is based have much more in common with one another than they do with their southern neighbors. The bioregion more accurately reflects their commonality. Secondly, their subsistence life-style has depended for survival on an intimate knowledge of the topography, vegetation, wildlife and climate of the areas in which they foraged for food. Political boundaries have never had the same vital significance for these societies.

The three subsistence societies chosen for detailed study represent a significant cross-section of subsistence societies in the bioregion's arctic and subarctic zones, and exemplify the land use practices of both Cree and Inuit cultures. Three distinct geographic regions are involved in this study: the Hudson Bay Lowland, formerly home to the York Factory Band, and still home to the Omushkego; the inland area around the community of York Landing in North Central Manitoba, site of the York Factory Band Reserve; and Canada's Central and Eastern Arctic areas, i.e., the Nunavut Settlement Area. These three study areas are shown in Figure 1.5, and a brief description of the physical geography of each is provided below. More details are provided in subsequent chapters.

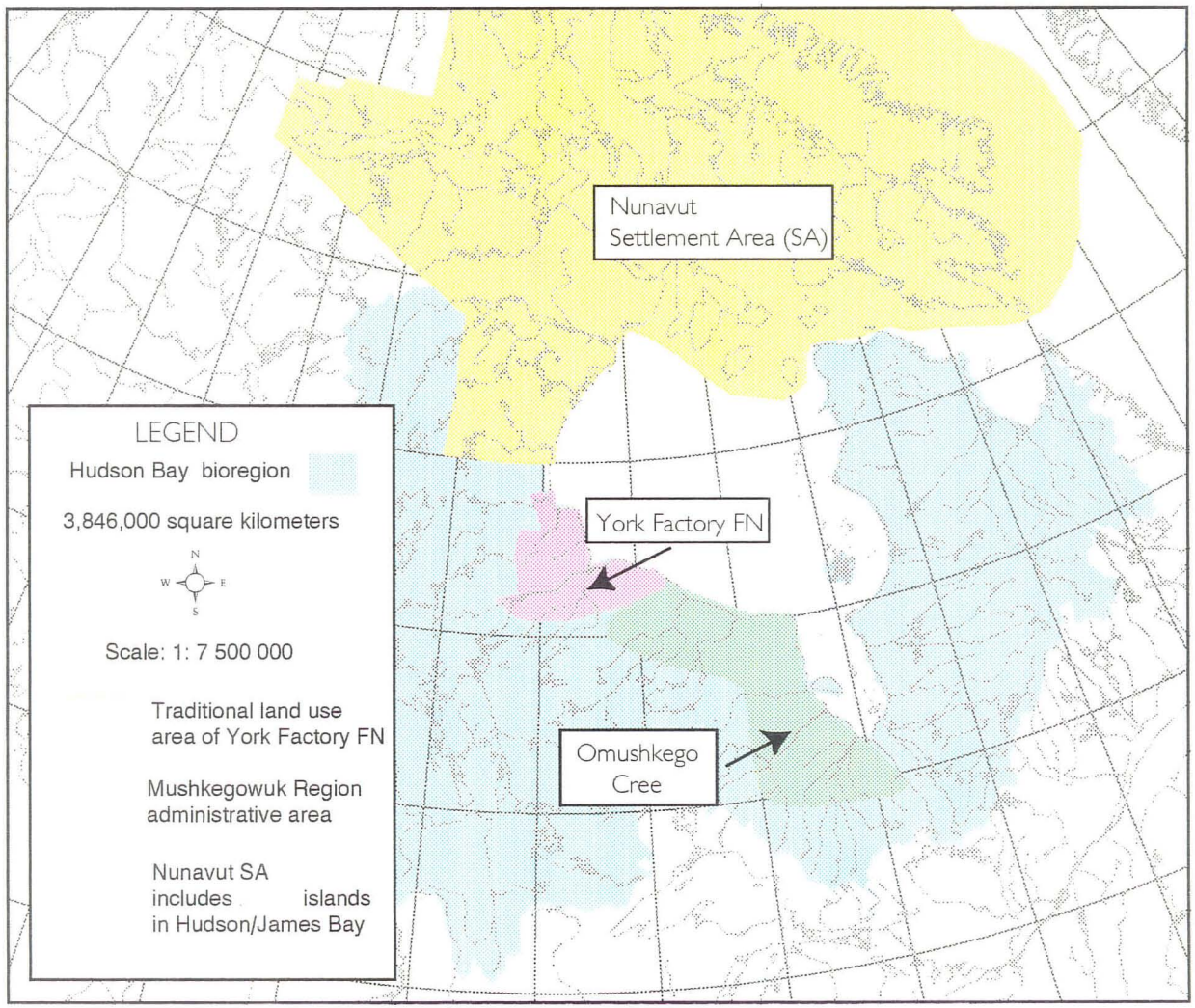


Figure 1.5: Location of three case studies.

1.5.1 The Hudson Bay Lowland

The Hudson Bay Lowland occupies approximately 325,000 sq. km. along the Hudson Bay coast (Julig 1988, p.121), and extends approximately 200 to 300 km. inland. It figures predominantly in two of the studies: it was home to the York Factory Band (*Mushkegowuk* or Swampy Cree) for centuries prior to their relocation inland to York Landing in 1957, and continues to figure largely in their current and planned future subsistence activities. The same Lowland has been home to the *Omushkego* (Swampy) Cree of northern Ontario for centuries. York Factory was situated toward the northern end of the Lowland, and served as the northern hub of the Hudson Bay Company's trading empire, beginning in the seventeenth century. Moose Factory, situated at the southern portion of the Lowland, administered the southern hub of the Company's trading activity.

Covered by glaciers until 10,000 years ago, the Lowland is one of the largest wetland peat regions of the world (A. Jano Oct. 1994, pers. comm.). It is a flat swampy plain, approximately 152 m. lower than the adjoining Precambrian Shield. The 8% of the region which is dry land is adjacent to the rivers and larger streams (levees). Most of the northeastern area of the Lowland is in continuous permafrost. Elsewhere the permafrost is discontinuous but widespread. The unique vegetative cover of the area ranges from mudflats, marshes—intertidal; supertidal and freshwater—to shrubs, tundra, fen, plateaus and bogs, conifer, sand, gravel and bedrock (A. Jano pers comm. Oct. 1994). The trees are small and stunted, though larger trees grow along the riverbanks. Major river valleys and beach deposits provide the only relief, with isostatic rebound occurring at a rate of about 80 cm. per hundred years (Hilderman *et al.* 1986, p. 46).

Four major river systems are located along the northern section of the Hudson Bay Lowland: the Churchill; the Nelson; the Hayes; and the Fort Severn. Both the Churchill and Nelson Rivers have been extensively developed for hydro-electric power. Eight small communities are located along the coast: Churchill; Fort Severn; Peawanuck; Attawapiskat; Fort Albany; Kashechewan; Attawapiskat; Moosonee; and Moose Factory.

1.5.2 North Central Manitoba

The community of York Landing is situated at the mouth of the Aiken River on Split Lake, part of the Nelson River waterway. It is located 250 km. inland from York Factory, 690 km. north of Winnipeg, and 116 km. by air from Thompson. There is no all-weather road in York Landing, but the community has an airstrip and daily flights to Thompson. During the summer a ferry service operates between York Landing and the community of Split Lake, 20 km. to the north. York Landing is home to approximately 350 of the York Factory Band's 700 members. Vegetation in the area is predominantly wetland, bog, peat, fen, spruce and deciduous forests. A 2,390 acre reserve for York Factory FN was officially recognized under the terms of the Indian Act on April 1990, and the outstanding treaty land entitlement (TLE) is presently being negotiated.

The Band's resettlement from the coast in 1957 coincided with the commencement of a massive hydro-electric project, the Kelsey Generating Station, a few miles upstream of their new home. Other such projects followed. Their combined effects have had significant physical, social, and economic repercussions for the York Factory Cree. As a result, over the last thirty-five years Band leaders have become astute negotiators in context of the larger society as they attempt to protect the welfare of their members and ensure the cultural

survival of their Band in the maelstrom of these intrusions. One of five communities extensively affected by this hydro-electric development, York Factory FN ratified an Agreement settling claims under the Northern Flood Agreement on November 2, 1995. Under the Agreement, Manitoba Hydro, Manitoba, and Canada have agreed to provide land and money in exchange for a release from further obligations to the Band.

1.5.3 Canada's Central and Eastern Arctic

The third case study examines arctic aboriginal societies in the Nunavut Settlement Area. The Area lies north of the 60th parallel and coincides with the treeline. The NWT (Northwest Territories), which made up 37 percent of Canada's land mass, became part of Canada in 1870. In 1993 former Prime Minister Brian Mulroney signed an agreement dividing this vast territory into two new territories. One territory, the Mackenzie Valley, is occupied by non-Natives, Dene, Metis and Inuvialuit. The other territory, Nunavut (The People's Land), will come into being on April 1, 1999. Occupying approximately one-fifth of Canada and 2,000,000 sq. km., it encompasses the Central and Eastern parts of the former NWT. Under this Agreement the Inuit will "be given ownership of 350,000 square kilometres of land, 36,257 square kilometres with subsurface mineral rights, and $580,000,000 (1992 dollars)" (Hamilton 1994, p. 3).

Nunavut had a population of approximately twenty-one thousand people in 1995. Eighty percent of the population, or over seventeen thousand people, are Inuit, and speak Inuktitut. Means of long-distance travel are by air and ship. Extreme fluctuations between winter and summer temperatures are typical, with storms and high snowfall reaching extremes in the Eastern Arctic. The Central Arctic experiences the coldest temperatures,

however, because of the strong winds that blow off the Hudson Bay. Snow and ice remain year round in the high country, while grasses, sedges and low shrubs grow in the lowlands. Permafrost, thought to be as much as 800 to 1500 feet deep in some places, covers most of the arctic and consequently drainage is very limited (Encyclopædia Britannica 1985, pp. 2-4).

1.6 Definitions

This study draws on the disciplines of geography and anthropology, and the interdisciplinary fields of resource management and native studies. Terms and concepts from history, economics and ecology are used as well. For this reason, it is necessary to define a number of technical terms in order to facilitate understanding of the study's content. These definitions are provided below.

band societies

Subsistence societies were historically comprised of three or four loosely connected bands, which included several extended families who depended on one another for survival.

bioregion

"An area that differs ecologically from other areas in terms of topography, microclimates, vegetation cover, or species composition. Thus, it may be considered the equivalent of ecoregion or ecological region. However, the biological meaning of the term has been overlaid by consideration of human use or human perception of ecologically distinct areas, and in this sense becomes the equivalent of eco-cultural region" (Dasmann 1995, p. 83).

bioregional approach

"The value of the bioregional concept is primarily educational. If people can become familiar with the conditions for life and the other living species in the area in which they live, presumably they will be equipped to exercise greater care in the use they make of their bioregion, and may take a greater interest in protecting its natural diversity. A knowledge of the ecological constraints imposed by climate, topography, rock structure, soil types, hydrology, and vegetation could prevent the kind of misuse of land, water, and resources which has caused serious ecological damage in many parts of the world and has made some areas virtually uninhabitable....

A bioregional approach has value also in the management of natural resources. Within a single bioregion, all government and private agencies are working with similar biotic communities. Awareness of this fact may facilitate cooperation and coordination of activities aimed at conservation and sustainable use of living resources, as well as the sharing of information among separate jurisdictions" (Paehlke 1995, p. 84).

common property resources

"Class of resources for which exclusion (or control of access) is difficult, and where each user has the potential of subtracting from the welfare of all other users" (Berkes 1995, p. 373).

culture

"A group's culture appears as the customary, acceptable patterning of relationship between people and members of that group and their larger environment. It therefore includes the behaviours, values and attitudes possessed by any people and considered important enough by them to be systematically passed on to the succeeding generation....a core of essential elements, constituting the basis of a person's self-perception of who he is, and why his group is distinctive and worthy....Cultures are dynamic and evolving realities, such that loss or transformation of some elements may be more than compensated for by greater cultural value being accorded to elements that do remain" (Freeman 1981, p. 258).

ethos

"The guiding beliefs, standards, or ideals that characterize or pervade a group, a community, a people, or an ideology: the complex of fundamental values that underlies, permeates, or actuates major patterns of thought and behavior in any particular culture, society or institution" (Gove 1986).

harvest studies

Harvest studies can be designed to achieve a variety of objectives. In addition to determining harvest levels, these studies can provide: biological data for wildlife management; indigenous knowledge for community objectives; data to enable nutritional evaluations; data for economic evaluations (e.g., value of harvest); data for socioeconomic profiling (employment and income); data to

assess commercial harvesting opportunities; and data to assess potential impacts of development projects.

kinship system

"The goal of a kinship system is the security of life. It functions in contexts of subsistence, offense, and defense and protection in general. It focuses upon certain times in a person's life when assistance is especially needed: birth, naming, puberty, marriage, sickness, and death. Teaching and training children to carry on life-sustaining activities in subsistence, offense and defense, and medicine—to hunt, fish,...fight, cure sickness, to acquire proficiency in the arts and crafts—are functions of a kinship system...It relates person to person in order to promote social solidarity, as well as to obtain the benefits of mutual aid in activities in which the external world is directly concerned. But solidarity is not an end in itself, it is a way of making a group more effective in the conduct of life, and hence a way of making life more secure" (White 1959, p. 119).

land use

"Areas in which harvesting takes place, as well as other activities that native people themselves consider significant, including transportation routes, camp sites, burial grounds, and other culturally sensitive areas" (Fast & Berkes 1994, p. 2). In this study of subsistence, the meaning of the term is akin to Leopold's (1949) land ethic: "All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent

parts....The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land. It is inconceivable to me that an ethical relation to land can exist without love, respect, and admiration for land and a high regard for its value (Leopold 1949, pp. 208-209).

land use studies

Land use studies document present and/or traditional land use activities. When using the map biography method, relevant areas are sketched by knowledgeable harvesters, or by interviewers under the direction of these individuals, on transparencies placed over topographic maps. Composite maps are then created from individual biographies to summarize collective land use for the group. Most often maps used are at the 1:250 000 scale. Information recorded pertains to present and/or traditional land use activities. Most aboriginal land use studies are based on the methodology introduced by Freeman (1976), which involves the documentation of land use in living memory by producing map biographies of active harvesters and elders.

made beaver

The standard measure of the value of trade goods was in "made beaver" or MB. For example, the value of furs traded was expressed in terms of MB, relative to the value of European goods, i.e., the value of one prime beaver pelt might have been equivalent to the value of one hatchet, or seven beaver pelts might have been equivalent to the value of one "No 1 blanket".

market economy

"An economic system controlled, regulated, and directed by markets alone; order in the production and distribution of goods is entrusted to this self-regulating mechanism. An economy of this kind derives from the expectation that human beings behave in such a way as to achieve maximum money gains. It assumes markets in which the supply of goods (including services) available at a definite price will equal the demand at that price. It assumes the presence of money, which functions as purchasing power in the hands of its owners. Production will then be controlled by prices, for the profits of those who direct production will depend upon them; the distribution of the goods also will depend upon prices, for prices form incomes, and it is with the help of these incomes that the goods produced are distributed amongst the members of society. Under these assumptions order in the production and distribution of goods is ensured by prices alone" (Polanyi 1944, p. 68).

potential edible weight

The estimated amount of edible meat available from harvested animals. It is derived by multiplying the number of animals harvested by an average edible weight per animal.

subsistence

"Means of supporting life, livelihood. What one lives on or by" (Berkes 1988, p. 319).

subsistence economy

"Non cash values from the bush" (Fast and Berkes 1994, p. 2).

"An economy which is not based on money, in which buying and selling are absent or rudimentary though barter may occur which commonly provides a minimal standard of living" (Gove 1986).

subsistence society

"a group of people whose production, use and consumption of local resources occurs in ways that are consistent with traditional patterns maintained by kinship-based social structures. Such societies possess detailed traditional knowledge of their environment, and particularly those resources important in their food-producing and ceremonial activities" (Freeman 1993, p. 245).

traditional ecological knowledge (tek)

"A cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. Further, TEK is an attribute of societies with historical continuity in resource use practices; by and large, these are non-industrial or less technologically advanced societies, many of them indigenous or tribal" (Berkes 1993, p.3). The term is used interchangeably with traditional knowledge and indigenous knowledge.

Chapter 2

Subsistence Ethos

2.1 Introduction and Context

The ethos of subsistence societies has always been characterized by kinship systems and close relationships with nature. "The American Indian posture toward nature was, I suggest, neither ecological nor conservative in the modern scientific sense so much as it was moral or ethical. Animals, plants, and minerals were treated as persons, and conceived to be coequal members of a natural social order" (Callicott 1982, p. 310). Their survival has traditionally depended on these relationships, and not surprisingly the European goods offered to them by traders as incentives to bring in furs had limited effectiveness. As a consequence of the high value they have always placed on relations, the ethos of subistence societies have evolved very differently from those which developed in market economy societies, where the accumulation of personal wealth is valued more highly than relations with others and with the land. The ethos of traditional subsistence societies continues to characterize subsistence societies to the present time, and continues to set them apart from members of the larger society.

This chapter analyzes the nature of the relations which characterize subsistence ethos, and is comprised of two main sections. The first section describes the origins and attributes of these relations. The second addresses the imputation that aboriginal hunters decimated beaver and caribou populations in subarctic areas of the Hudson Bay bioregion at the turn of the eighteenth century, and that the ethos ascribed to subsistence societies by Callicott and others failed to curb what has been considered by some to be excessive killing.

2.2 The Ethos of Subsistence Societies

Subsistence societies were historically comprised of three or four loosely connected bands, which included several extended families who depended on one another for survival. For thousands of years they have lived by hunting, fishing, trapping and gathering.

> Cultural Man has been on earth for some 2,000,000 years; for over 99 per cent of this period he has lived as a hunter gatherer. Only in the last 10,000 years has man begun to domesticate plants and animals, to use metals, and to harness energy sources other than the human body. *Homo sapiens* assumed an essentially modern form at least 50,000 years before he managed to do anything about improving his means of production. Of the estimated 80,000,000,000 men who have ever lived out a life span on earth, over 90 per cent have lived as hunters and gatherers; about 6 per cent have lived by agriculture and the remaining few per cent have lived in industrial societies.
>
> To date, the hunting way of life has been the most successful and persistent adaptation man has ever achieved (Lee and DeVore 1968, p. 3).

Traditional hunting bands/subsistence societies of necessity had a mobile existence because they depended entirely on sparsely distributed wild resources for survival. Mobility, however, had benefits beyond foraging. It resulted in extensive familiarity with the environment and made life more varied and rich. It also served to resolve social problems; members with severe disagreements simply moved apart. Social and political institutions were simple. Small band size required nothing more. Hunting, skinning, tanning, and cooking skills were shared by all members of the group, and decisions were usually made by consensus, led by those with the requisite levels of skill needed for a particular decision.

Subsistence societies remained small for several reasons. First, their informal structures were viable only when the groups were of a size which allowed members to deal with one another personally. Larger groups broke apart as a result of social tensions. Second, the

relative scarcity of food dictated the limited number of people who could live in an area: "throughout the world hunter densities rarely exceed[d] one person per square mile; most of the accurate figures reported...ranged between one and 25 persons per hundred square miles" (Lee & DeVore 1968, p. 11).

Subsistence societies in the Hudson Bay bioregion were not exposed to European philosophical views until religious missionaries sought to convert them to Christianity. Instead, their animistic theology taught them to revere plants and animals, treating them as equals and partners. In describing pre- and post-contact Indian land use in North America, Brightman (1987) noted that they shared "a genuine respect for the welfare of other life-forms". (p. 186). Callicott (1982, pp. 302-307) concluded similarly that the "family-like relatedness of all creatures" was almost universally shared by all American Indians, as was the belief that all things in nature had a spiritual essence. Human properties were routinely projected onto non-human things and beings, and so it was common to have social relations with non-humans.

How this worldview was actualized is described by Freeman (1985a, 1985b). The aboriginal hunter's understanding of the natural environment, he wrote, was more complex than that allowed by models of "carrying capacity" or "maximum sustainable yield" (1985b, p. 246). Rather, ecosystems were perceived as circular, complex, interrelated, dynamic and fluctuating. The relationship between the hunter and the hunted encompassed more than the economics associated with procuring food. His/her relationship with the hunted animal was part of a larger series of inter-relationships with the community, the group's values and belief systems, and even with the past, in addition to providing food needed to survive

(Freeman 1985a, p. 276). The hunter's self-identity, the source of purpose and meaning for his/her life, was symbolized by the land on which he/she hunted, and by the animals which were hunted. Consequently, "the loss or diminution of any resource may constitute a weakening of the complex fabric that represents the full measure or meaning of life in these specialized hunting societies" (Freeman 1985b, p. 259). There was no distinction between the hunter and his/her environment. The "environment" was in fact not "out there", for it was self-evident that whatever was done to "it", the hunter did to him/herself. The relationship between humans and the environment was not one of subject-object, but rather one of mutual participation; not I-it, but I-Thou.

Because humans were understood to be part of a larger web of relationships with the environment, there was no concept of private land or resource ownership. Instead, "*everyone [had] free access to the resources of nature*....[and] thus we find that the basic property institutions in primitive society [made] for equality, equality of privilege and opportunity, and equality of obligation to labor and to support one's self. This [meant] freedom too, of course, since equality precludes the possibility of the rule or exploitation of one class by another" (White 1959, p. 252).

A subsistence society's survival depended on group effort. There was no incentive for one to succeed at the expense of another. Members recognized, consciously or unconsciously, that their survival depended on continuity in the natural environment, and ensured that their relations with nature were circumspect. They consumed primarily renewable resources as needed to provide food, clothing and shelter, and for the most part, tended to live "in rough equilibrium" with the Earth's resources (Ophuls & Boyan 1992, p. 183).

For centuries the mobile, non-consumptive lifestyle of subsistence societies limited the extent of the changes they made to the environment. At the turn of the nineteenth century, however, there was a drastic reduction in both beaver and big game populations in the Churchill River drainage area and other areas south and west of the Hudson Bay (Brightman 1993, p. 245). What precipitated this decline has been the subject of extensive debate among anthropologists and other researchers, but the role aboriginal hunters may have played in the decline is most often at the centre of the debate. Reconciling what is known about the ethos of traditional subsistence societies, namely the high value they placed on relations with all other living beings—including the beaver and caribou—with reports of what by today's standards include slaughtering excessive numbers of animals, is problematic. The following section examines this question in more depth.

2.3 Factors in the Decline of Animal Populations at the Beginning of the Nineteenth Century

By the early 1800s beaver and big game, both of which had been in great abundance a century before, had been seriously depleted in the Hudson Bay Lowlands (Brightman 1993, pp. 244-245). William Cook who was in charge of York Factory at the time wrote "the scarcity of furs in all directions around the Factory is without a parallel" (cited in Lytwyn 1993, p. 384). Though definitive explanations for what had been a drastic drop in animal populations in areas south and west of the Hudson Bay are not known, various factors have been implicated. These include: deviant weather patterns; the fur trade rivalry; the introduction of new hunting technologies; and finally, an apparent breakdown in the ethos of subsistence society hunters. Each of these is discussed below.

2.3.1 Effects of Climate Fluctuations

Extremely unusual weather conditions which occurred in this region between 1714 and 1850 must be considered as a cause of the declining animal populations. These unusual weather patterns included the "Little Ice Age" from 1650 to 1850, which peaked around 1769 in central Canada. Global warming consistent with the end of that Age occurred by 1850. Instrumental records kept at York Factory beginning in 1770, and journals kept by the Chief Factor from 1788 to 1802 describe extreme hardships caused by severe weather conditions in the 1780s and 1790s. "Cold and extreme snow conditions that fluctuated between no cover and extreme depths led to a lack of game for food. The natives and Company men suffered from shortages and references to starvation dominate the [Chief Factor's] journals" (Ball 1992, pp. 64-66).

The work of Peter Scott (cited in Ball 1992) supports these findings. His results showed "1760 as pivotal in climate trends for that region [Churchill]. They further show[ed] that the period from 1760 to 1820 was one of variability as the climate oscillated from temperate to arctic conditions" (p. 70). At York Factory the weather conditions from 1770 to 1800 were very wet and variable: "A notable feature of this period was winters with either a great deal of snow or virtually none. This seriously reduced the wildlife population with terrible impact on people dependent on these resources for food and economy". Unfortunately, climatic records for the period 1800 to 1810 are incomplete. The attention previously given to record keeping gave way during this period to other more pressing concerns "as the Company struggled with the changes created by the harsh conditions of the 1780s and 1790s" (Ball 1992, pp. 70-71).

The Lowlanders at York Factory reported that many beaver had drowned as a result of widespread flooding in the spring of 1792. An extended drought occurred in 1793, and resulted in extensive fires around York Factory the following year. Once again, many animals died. This drought continued for seven years, and massive fires were reported around York Factory yet again in 1799. Then, in 1806 to 1807 York Factory experienced the mildest winter anyone could remember. Another serious drought followed in 1808 and resulted in water levels which were the lowest anyone could remember (Lytwyn 1993, pp. 395-8).

Ray (1974) recognized the importance of hunting pressures caused by the fur trade in decimating fur populations, but also attributed some of the reduction to natural causes: "The historical record shows that natural disasters, primarily disease, fires, and droughts, often took heavy tolls" (p. 120). Brightman (1993) concurred with Ray's assessment, and added "the boreal forest is a type case of a specialized ecosystem, exhibiting short food chains, low species diversity with relatively large numbers of each species, and high entropy rates manifested in extreme fluctuations in animal populations. Apart from the effects of human predation, animal populations in the boreal forest are subject to both random and cyclic fluctuation of varying duration and regional extent" (p. 246).

The argument that the collapse of animal populations may have been partly due to the synergistic effects of variable weather patterns, forest fires and disease is supported by Holling's (1986) conceptual framework of ecosystems which assumes that the element of "surprise", such as discontinuous and abrupt changes in ecosystems, is actually "normal", and that perceptions by contemporary resource managers that they can eliminate such perturbations are misguided. In sum, there is ample evidence to support the argument that

natural causes played a significant part in the decline of beaver and caribou populations in subarctic areas of the Hudson Bay bioregion.

2.3.2 The Fur Trade Rivalry

A second major cause of the decline in animal populations has been attributed to outcomes of the fur trade rivalry. The Charter of 1670 which granted the HBC exclusive trading rights in Rupert's Land did not specify its boundaries. While the HBC claimed that it had been awarded trading rights for all of the Hudson Bay drainage basin, this claim was not accepted by French traders who had already established trading posts in the interior from Lake Superior to the junction of the North and South Saskatchewan Rivers. These French traders formed the North-West Company (NWC) in the 1780s, and violent competition between the HBC and the NWC followed (Payne 1989, pp. 19-20). This period of competition coincided with the devastating decline in animal populations.

With the commencement of their intense fur trade rivalry, both the HBC and the NWC directed the Cree living in the Lowlands to kill as many furbearers as possible, and especially beaver. This fierce competition extended throughout the northwestern interior of the continent, and continued for forty years. By the time the fur trade activity peaked between 1790 and 1810, furbearer populations had been much reduced in the St. Lawrence Valley. To offset the decline in furs available for trade, NWC traders employed hundreds of Indians to go to the borders of the Lowlands "to hunt up all the beaver" (Lytwyn 1993, p. 382), effectively forcing open access conditions on these resources.

The implications of this shift were significant, for it fundamentally altered land use behaviors in the area. Traditionally the Lowland Cree had shared the land and the animals

with one another, and lived in accordance with the rules of nature—following the caribou during their spring and fall migrations, travelling to prime fishing areas in summer, and dispersing along the coast and inland for the winter. Population numbers remained fairly stable over time, in large part because the land could not support larger numbers. Hunters who were successful in bringing home bush food shared it with those who had not been successful. In other words, they treated the land and animals as "common-property resources". Berkes (1995) has characterized these common-property resources as tending "to be indivisible, that is, not separable into commodities in time and space....these resources require collective decision making, cooperation in resource use, and enforcement of agreed-upon rules among group members" (p. 371).

When hundreds of other hunters moved into the Lowland, the cooperative resource use practices which had dictated the behavior of Omushkego Cree hunters until that time were no longer viable, and gave way to uncontrolled access. "Competition for animals and shifts in populations and territorial boundaries could lead to disregard for boundaries and usufructuary rights, within or between different societies. Without such boundaries, the animals spared by one group might be taken by others, obviating the need to harvest selectively" (Brightman 1993, p. 259). The Cree had lost control of the land base and the result was overexploitation. Traditional rules concerning the rights and duties of hunters and trappers to the land and animals were overrun.

Other important factors pertaining to the fur trade influenced the number of animals being harvested as well. One of these was the HBC's inland expansion concomitant with the increasing rivalry between the two trading companies. As a result, the Company's

dependance on country provisions increased significantly, and in order to get additional food for the fort and its traders the Lowland Cree were encouraged to hunt more caribou. Over the next few years four inland posts were set up to trade caribou meat. In earlier times the Cree had hunted caribou intensively in the spring for their own use, and in the fall for trading purposes. The increased, year-round hunting pressures caused the caribou to become less predictable by the turn of the century.

It has been postulated that a desire for trade goods grew so strong among these aboriginal hunters that they abandoned their traditional behaviors toward animals in order to be able to take more furs to the post. Brightman (1993), however, has concluded that killing more animals than could be used was not motivated by such a desire:

> First, their [the Indians] demand for [trade] goods remained largely unchanged from the 1700s until 1821 when the Hudson's Bay Company merged with its competitors and established a monopoly....Second, competition kept the price of goods low. As a result, it is likely that the Crees and other Indians involved in the depletions could have satisfied their desires for trade goods without increasing rates of predation to a level that caused population declines in animal resources....The animals were depleted, presumably as a result of the Indians' fur trade involvements, but the Indians' motivation for depleting them remains obscure" (Brightman 1993, p. 245).

This argument is consistent with reports by James Isham, an experienced HBC trader, who wrote that paying higher prices for furs would in practice result in fewer furs being traded because the Indians had not acquired the desire to accumulate European goods. Attempts by the English to create markets for goods beyond powder and shot and what the Indians considered to be "necessaries"—tobacco, alcohol, cloth, beads, ice chisels, snowglasses and hatchets—were unsuccessful. The Cree enjoyed toys, dolls, raisins and prunes, but only accepted them as presents, not as items of trade. Even oatmeal, often important to survival

in the lean winter months, was not considered an item to be traded. If and when it was needed the Cree assumed it would be provided to them if they returned to the fort (Rich 1960, p. 49).

If more trade goods were not of much interest to the Cree, "two exceptionally significant incentives were alcohol and tobacco for which the Cree traded in sizable quantities". These items had acquired a status "coordinate with that of the most preferred meats. Animal resources had prehistorically been the means through which good men and women routinely affirmed the doxic axiom of generalized reciprocity, just as they were the means—in larger or more continuous quantities—for eminent men to cultivate and exhibit their leadership. All this became true historically for rum and tobacco and they were routinely shared at drinking parties with whomever was present" (Brightman 1993, pp. 263-264). The desire for alcohol and brandy, then, seems to have led to an increase in the number of furs traded at the posts.

2.3.3 The Introduction of New Hunting Technologies

Another potentially important factor in the decline of animal populations was the adoption of new and more effective hunting technologies by Cree hunters. As a result of their ease of use, guns and steel traps, in other words, may have resulted in too many animals being killed. Callicott (1989) has argued that these new tools would have been a major source of cultural stress, for "to adopt a technology is, insidiously, to adopt the world view in which the technology is embedded...the adoption by Indians of Western technologies was accompanied by massive and aggressive disruption of their traditional belief systems by Europeans and Euro-Americans....Technologies are never cognitively and axiologically

neutral. They are embedded in an engendering and sustaining system of ideas. To buy guns, motors, and mackinaw jackets is to buy, however unintentionally, a world view to boot" (1989, pp. 205, 212). If Callicott is correct in his perception that the worldview of Cree hunters would have been altered by the introduction of these new technologies then it would be reasonable to conclude their behaviors might also change. Peterson & Matsuyama (1991) concluded similarly that the introduction of new technologies and commoditisation sooner or later introduced fundamental changes into foraging societies:

> Although all trade seems to have its origins in the exchange of luxuries, sooner or later some or all of the luxuries take on the form of necessities. At that point, or soon after, the threat to a self-sustaining economy begins and a compulsion enters the production for exchange since it is through the exchange that the necessities for life come to be obtained. In the case of foragers this compulsion can arise quite rapidly since the production of goods for exchange usually competes with the daily requirement, for at least some part of the active workforce to forage for food. Even if people can remain self-sustaining in food they may become dependent on introduced technology if they are to carry out both activities. Thus commoditisation can quickly become involved in activities essential to survival and therefore integral to the nature of social life.

Freeman (1981) however, countered this position by observing that cultures are continuously evolving, and that changes in "technology, social organization and economic pursuits" do not necessarily imply a change in the essential nature of that culture.

> Despite the adjustments occurring at that time [following the introduction of rifles and fox trapping] in their contemporary culture including, for example, the concomitant loss of certain organizational features (such as collective caribou hunts) and the bow and arrow, they still hunted intensively and shared their hunting returns, used the same kinship system, spoke the same language, and prepared their footwear and skin clothing in "traditional" fashion using "traditional" materials, and travelled even greater distances with even more dogs. It is hard to evaluate whether the new and continuing cultural assemblage has resulted in a "weakening" or otherwise significant change in the culture (Freeman 1981, p. 265).

This view is shared by George & Preston (1987) who concluded that "until very recently the Cree economy and culture have been at once resilient and adaptable in the face of European technology. They have readily incorporated both items of physical capital (for example, tools and equipment) and economic and social institutions (for example, the fur trade, debt, and transfer payments) into their lifestyle" (p. 452).

Brightman (1993) also considered the influence European hunting technologies might have had on the over-exploitation but concluded that there was not reason to suppose that the introduction of these technologies would have caused the Indians to kill animals unnecessarily: "It appears that the trade and technology may have reduced rather than intensified foraging labor", because the Indians were not inclined to unnecessary effort, and if their needs were met more quickly through improved technology and/or higher prices, there would be no need to kill more animals (1993, p. 251). The use of guns, however, did result in larger harvests with less effort than was possible with bows and arrows, and guns were particularly effective in hunting waterfowl. Their use would have had less impact on caribou hunting strategies. Nonetheless, guns, steel traps and the use of animals for trade exacerbated the potential for overhunting which had always existed (Brightman 1987, p. 129).

2.3.4 Aboriginal Ethos

Though some historical records indicate that the Cree wasted many animals, opinion remains divided on whether such wastage actually occurred. Rich (1960) for example, seems to think that the Indians killed animals indiscriminately and were responsible for wiping out beaver populations in the area inland from the Nelson River (p. 46). Brightman

(1993) acknowledged that the Cree killed more animals than they could use, when the opportunity presented itself. "The slaughter of big game animals in excess of what the hunters could consume, transport, or trade has been documented in the eighteenth century, carried on by the "Home Guard" Crees employed at the coastal forts..." (p. 255).

Failure on the part of the Cree to reduce beaver harvesting to sustainable levels has been regarded critically as indicative of excessive behavior which is difficult to reconcile with the deep respect for the land and animals often attributed to these societies. It is possible, however, that this deep respect could co-exist with behaviors which appear excessive by other standards. The hunting ethos of Waswanipi Cree hunters on the East side of James Bay for example, have been described thus: "The body of the animals the hunter receives [that is, kills] nourishes him, but the soul returns to be reborn again, so that when men and animals are in balance, the animals are killed but not diminished and both men and animals survive" (Feit 1987, p. 3). Another native worldview was premised on the assumption that if more animals were killed, even more would be provided, and so may actually have encouraged excessive slaughter.

> They [the Indians] have no Dependance upon the Fruits of the Earth for their Subsistence, living entirely on the Animals they take in Hunting or Trapping, at which they are very dexterous. They make prodigious slaughter every Season among the Deer, *from an unaccountable Notion that the more they destroy, the greater Plenty will succeed*; therefore sometimes they leave three or four hundred dead on the Plain, taking out of them only their Tongues, and leaving their Carcasses either to rot, or be devoured by the wild Beasts. At other times, they attack them in the Water, and kill prodigious numbers, which they bring down on Floats to the Factories (Ellis 1968, pp. 182-3) (Italics added).

Brightman (1993) has also postulated, that the Indians might have assumed any shortages they encountered were local and temporary, and/or that large game and beaver were infi-

nitely renewable resources whose numbers could neither be reduced by overkilling nor managed by selective hunting. For this reason it was thought to be proper to kill large numbers of animals and retrieve only delicacies, and also to kill as many animals as possible. Then, when new hunting technologies were combined with increasing market demands, rates of predation rose to levels that caused populations to decline. The Cree, however, continued to hunt as before because they did not initially construe the two processes to be related (Brightman 1993, p. 280). Failure to recognize that resources could be depleted, if such there was, is not unique to subsistence societies in the Hudson Bay bioregion. Johannes (1991) for example, studied the behaviors and views of the islanders of Torres Strait and found no awareness among these fishermen that fish stocks could be exhausted. By maintaining small stable human populations over time they had never encountered a decline in fish populations. Recently, however, following the introduction of motorized fishing boats, one species of fish has been noticeably reduced. "But nothing in the Islanders' cultural experience would logically lead them to suspect that their own actions might be a contributing factor" (p. 205).

Whether the Cree would have realized that they were depleting animal populations remains unclear. Animals were believed to reincarnate after death and so "it cannot be assumed that Crees and others involved in game depletions initially understood their own role as determinants. Rather than inhibiting overkill, religious definitions of the human-animal relationship encouraged it insofar as they premised an environment of primordial abundance in which game could not be destroyed but only temporarily displaced" (Brightman 1987, p. 132).

Finally, Callicott (1989) has argued, the apparent overkilling must be viewed as an aberration caused by various cultural stresses.

> To point to examples of wastage—buffaloes rotting on the plains under high cliffs or beaver all-but-trapped-out during the fur trade—which are supposed to deliver the coup de grace to all romantic illusions of the American Indian's reverence for nature is very much like pointing to examples of murder and war in European history and concluding therefrom that Europeans were altogether without a humanistic ethic of any sort.....Examples of occasional destruction of nature...and even the extirpation of species, especially during periods of enormous cultural stress, as in the fur-trade era, do not, by themselves, refute the assertion that the American Indian lived not only by a tribal ethic but by a land ethic as well, the overall and usual effect of which was to establish a greater harmony between Indians and their environment than that enjoyed by their European successors (Callicott 1989, pp. 194-195).

2.4 Summary and Conclusions

Beaver and caribou populations in subarctic regions of the Hudson Bay bioregion declined dramatically at the beginning of the nineteenth century. This decline cannot be attributed to a disintegration of the ethos of subsistence societies, even though hunters from these societies played a role in precipitating the reduction in numbers. The decline appears to have resulted from the concursion of numerous factors which included unstable weather patterns, extensive fires, direct and indirect outcomes of the fur trade, more effective hunting technologies, and cultural and physical stresses on subsistence societies.

Erratic weather patterns which occurred throughout the eighteenth century no doubt put a very great strain on subarctic animal populations. The northern environment is more susceptible to depletion due to lower levels of biological productivity than more southerly environments, and the climatic conditions described may have combined with other factors to tip the balance of natural limits.

The fur trade rivalry which commenced in earnest in the 1780s was responsible for

an increase in the number of caribou and beaver being harvested, and exacerbated the decline initiated by unstable weather patterns and forest fires. Additional animals were sought for trade purposes and to provision the traders with food. Cree hunters also enjoyed some benefits by having the trading posts near at hand, and killed more animals than they had prior to the fur trade in order to acquire "necessaries" as well as alcohol and tobacco. They had little interest in acquiring other imported possessions since their transient lifestyle would have been encumbered by a larger collection of goods. Just as beaver populations were in decline, however, the Cree were forced to rely on them as an alternative source of food to the caribou which were also in decline, and there were no beaver left to re-populate the colonies (Brightman 1993, pp. 268-269).

A series of challenges to the underlying ethos of subsistence societies also played a part in the decline, since some of these challenges were tolerated less well than others. Guns and steel traps had been in use since the 1600s without the apparent occurrence of reduced numbers of animals, and would not likely have been a major factor in declining populations. To what extent they affected the worldview and so ethos of these subsistence societies is open to question. The creation of "open-access" to resources in the Lowlands as occurred when outsiders moved in and sought to maximize personal profits toward the end of the fur trade, would, however, have forced the Lowlanders to abandon their cooperative resource use practices. They had lost control over the situation and there was little they could do about it, but their response to this situation is not indicative of a breakdown in ethos.

A similar decline in beaver populations during the 1920's and early 1930's in the

Waswanipi region of Quebec has been documented by Feit (1986a, p. 58). The elders there attributed the depletion "to over-hunting on their part. The reasons for their over-hunting [were]....that outside non-Native trappers began to enter the region during the period of high fur prices in the late 1920's and that they depleted one hunting territory after another of fur bearers. Unable to stop the progressive depletion of the fur resources, the Waswanipi appear to have over-hunted the beaver and marten rather than let outside trappers take them all" (Feit 1986a, pp. 58-59). Finally, at their request, the provincial government closed the region to beaver trapping and the Waswanipi set about re-establishing beaver populations.

There is not convincing evidence that the Lowland Cree were responsible for the devastating decrease in animals which occurred at the turn of the eighteen century—they had quite literally no reason to destroy them, particularly since they suffered greatly because of the shortage of animals. There is also not convincing evidence that the ethos of Cree subsistence societies as they pertain to relations with one another and with the land were permanently altered by the changes forced upon them. The Waswanipi Cree, for example, continue to have ritual feasts in honor of the first beaver caught in a season, and senior stewards who supervise the hunting territories, as well as hunters, continue to have very detailed knowledge about the beavers in as many as 100 colonies. These behaviors are indicative of a very close association with the land, and there are many other examples that the ethos of subsistence societies have not fundamentally changed over time. Elders from communities around the Hudson Bay, for example, continue to speak with respect and humility about the animals they hunt, and are deeply concerned about passing their tradi-

tional values and knowledge on to the next generation. It is likely that these hunters are for the most part aware that their behavior may be a determining factor in animal population numbers, but they have always known this at some level, as in the recognition that they had obligations to the animals who could choose not to be caught if these obligations were transgressed.

This chapter has characterized the ethos of subsistence societies as being based on respect, kinship and affection. These same attitudes toward life and one another have shaped subsistence societies' land use practices over time. Chapter 3 which follows examines the relationship between these land use practices and the economies of subsistence societies across the Hudson Bay bioregion.

Chapter 3

Subsistence Land Use and Economies[1]

3.1 Introduction and Context

Canada's arctic and subarctic subsistence societies have been part of the world market economy since the 1600s when they first began bringing furs to the European traders and helping the whalers hunt whales. They participated in the wage economy as couriers, store employees, by hauling freight and provisioning the HBC's forts. They experienced first hand the effects of the 1929 disintegration of the world economy, for it led to the collapse of their fur markets. They felt the vicissitudes of international markets repeatedly thereafter, and in the twentieth century have been caught up in the forces of industrial development, often losing their land base and/or enduring extensive degradation of their land, water and food supplies.

During the last fifty years these subsistence societies have moved off the land and into settlements. Their populations have grown in size, and their social and political institutions have become much more complex than was previously the case. Present day subsistence societies are comprised of anywhere from several hundred to several thousand people sharing a common language and culture. Members of these societies continue to engage to some extent in the subsistence life-style of their forefathers, though they have

1. Much of the material in this chapter has been developed into a technical report for the Hudson Bay Programme, Canadian Arctic Resources Committee (CARC), Environmental Committee, Municipality of Sanikiluaq and Rawson Academy of Aquatic Science. Co-authored by H. Fast and F. Berkes, it is titled *Native Land Use, Traditional Knowledge and the Subsistence Economy in the Hudson Bay Bioregion.* Funding for this research was provided to the primary researcher by CARC.

come to depend on modern technologies such as snowmobiles, guns and rifles to conduct the hunt. They have also come to depend on a cash income to supplement the income-in-kind they derive from the bush, and even to support the costs of hunting. Despite the changes brought by this acculturation, Freeman (1993) has described these societies as "a group of people whose production, use and consumption of local resources occurs in ways that are consistent with traditional patterns maintained by kinship-based social structures" (p. 245). That is, they have retained the characteristics of a subsistence society, and their affinity to subsistence values continues to the present time. It continues, Freeman elaborates, because "subsistence satisfies particularly important non-economic needs" which cannot be met by other means, even when the activity cannot be justified economically (Freeman 1993, p. 248).

This chapter provides a synthesis and analysis of the nature and extent of the subsistence land use economy in arctic and subarctic areas of the Hudson Bay bioregion. A description of the methods used to develop this chapter is followed by analyses of the impacts of the market economy, European settlers, and development projects on early subsistence societies. Land use practices and their economic significance and outcomes are analyzed next, based on a synthesis of completed land use and harvest studies which have been undertaken in the bioregion since the 1970s.

3.2 Methods

This chapter is based on an analysis and synthesis of literature and other documents pertaining to subsistence land use in the Hudson Bay bioregion. An extensive body of land use and harvest study reports was reviewed, and the data, extracted were synthesized and

compiled to produce regional summaries of harvest data including the imputed value of subsistence harvests and the relative importance of the bush sector to the overall economy. As well, land use studies of the Hudson Bay bioregion were compiled for the first time in tabular and cartographic formats.

Maps of the Hudson Bay bioregion at a scale of 1:7 500 000 were produced using a digitized base map provided courtesy of Natural Resources Canada in *DXF* (*Drawing Exchange Format*) format. This vector format was converted and imported into the *Idrisi* GIS package using the Idrisi *DXfidris* function on a DOS operating system. Using a paper map of the Hudson Bay bioregion at the same scale, the Hudson Bay bioregion was digitized using the *TOSCA* (named after the Genoese geographer Paolo de Toscanelli) digitizing module distributed with the *Idrisi* package. The two images were displayed using the *Plot* function, and prepared for export using the *Outpost* function which creates *PostScript* files from vector files. By copying the images onto a 90 MB removable disk using a *Bernoulli box*, the images were transferred to a Macintosh computer and imported into *Adobe Illustrator*, a desktop publishing software package. Here the images were registered using the bounding box produced by *Idrisi*, enhanced, and color added to fill the polygon represented by the bioregion and other areas of interest. Using the layering capabilities of *Adobe Illustrator*, various layers were placed over the image, including one layer for the legend, and one for each of the various titles, etc. In some cases additional information was digitized on-screen with the pencil tool. Using *freedomofpress*, a PostScript language interpreter printing software package for use with non-PostScript printers, the images were printed on a Canon Color Bubble Jet Printer, BJC-800.

3.3 Impacts of the Market Economy on Early Subsistence Societies

Though Canada's subsistence societies have been part of the market economy for centuries, their life-style limited the extent to which they would or could adopt the values of the larger society. For example, until recently possessions encumbered their nomadic life-style, and traders were not successful in instilling a desire for material goods beyond the "necessaries"—a word used at that time to describe trade items regarded as essential to survival. The notion of private ownership was not viable, for survival depended on reciprocal sharing of food and other necessities of life with one's kin. One's capacity for generosity was honored in band societies; not one's capacity for hoarding. Those individuals who had demonstrated sound leadership abilities over time were the ones called "elders", and accorded the greatest respect; not those who had the largest tent.

These subsistence societies posed problems for the Canadian government in the late nineteenth century, for the new government sought to establish claim to vast areas of the prairies by filling it with settlers. Means had to be found to constrain the movements of these far-ranging subsistence hunters and gatherers, and ultimately a variety of methods were used by the European "invaders" in their attempts to destroy the traditional institutions and values of the subsistence societies they encountered in the Hudson Bay bioregion. These methods included creating dependence on European hunting technologies; and taking, altering and/or destroying the traditional hunting grounds of these societies. The implications of these changes were far-reaching, however, for

> the economic function is but one of many vital functions of land. It invests man's life with stability; it is the site of his habitation; it is a condition of his physical safety; it is the landscape and the seasons. We might as well imagine his being born without hands and feet as carrying on his life without land.

> And yet to separate land from man and organize society in such a way as to satisfy the requirements of a real-estate market was a vital part of the utopian concept of a market economy....
>
> Whether the colonist needs land as a site for the sake of the wealth buried in it, or whether he merely wishes to constrain the native to produce a surplus of food and raw materials, is often irrelevant; nor does it make much difference whether the native works under the direct supervision of the colonist or only under some form of indirect compulsion, for in every and any case the social and cultural system of native life must be first shattered [in order to subordinate land as a commodity to the market mechanism] (Polanyi 1944, p. 178).

The tragic consequences which have occurred to Canada's subsistence societies as they became victims of the market economy through the introduction of European hunting technologies are illustrated by the Naskapi of Labrador, just outside the bioregion. Prior to the traders' arrival, the Naskapi had depended on the caribou for survival. Great skill and endurance were required to move through the very deep snow typical of Labrador winters in order to conduct a successful hunt. Very soon after being given guns and gunpowder, however, the Naskapi lost their traditional hunting skills. That loss, wrote Peter Newman (1991), also marked the end of their independence:

> Because the HBC controlled the supply of ammunition, the Naskapis were obliged to spend part of their time trapping furs, mainly marten, whether or not they preferred to hunt caribou. When they abandoned their traditional techniques of hunting caribou for the new technology of guns and ammunition, they gave themselves into the traders hands. There was no return (A. Cooke cited in Newman 1991, p. 28).
>
> ...so the Indians were caught in a vicious circle: they could hunt caribou—their sustaining food supply—with guns and ammunition that the traders would provide only if they turned in good marten skins. But they couldn't keep themselves alive long enough to trap the pelts because that diverted them from pursuing the caribou (Newman 1991, p. 28).

In 1843 three Naskapi families starved to death within sight of Fort Nascopie. In 1846 36

more died, and "in the winter of 1848 there was mass starvation in the area. Most of this was caused by Henderson's [the HBC Manager at Fort Nascopie] denial of enough ammunition to the local hunters" (Newman 1991, p. 29). Within six years the number of Naskapi had been reduced from 276 persons to 166. Famines occurred again in the 1850s. Responsibility for this devastation was again linked to the HBC manager who refused to provide ammunition for the Indians to use to hunt caribou (Newman 1991, pp. 29-30). The profit motive born of the Industrial Revolution in Europe quickly wreaked havoc in this remote arctic society a continent away.

Limiting access to and/or destroying a community's land base was another very effective means used to achieve the disintegration of shared community values. Such loss of a land base has special significance for subsistence societies in the Hudson Bay bioregion who signed a total of ten land use treaties with the Canadian Government between 1871 and 1930 (Figure 3.1). During this time the Government sought to confine subsistence societies to reserves in order to free up land for agricultural development by the colonists. So began the beginning of the end of unconstrained and wide-ranging movement across thousands of miles of wilderness, tundra and ice by generations of Cree and Inuit.

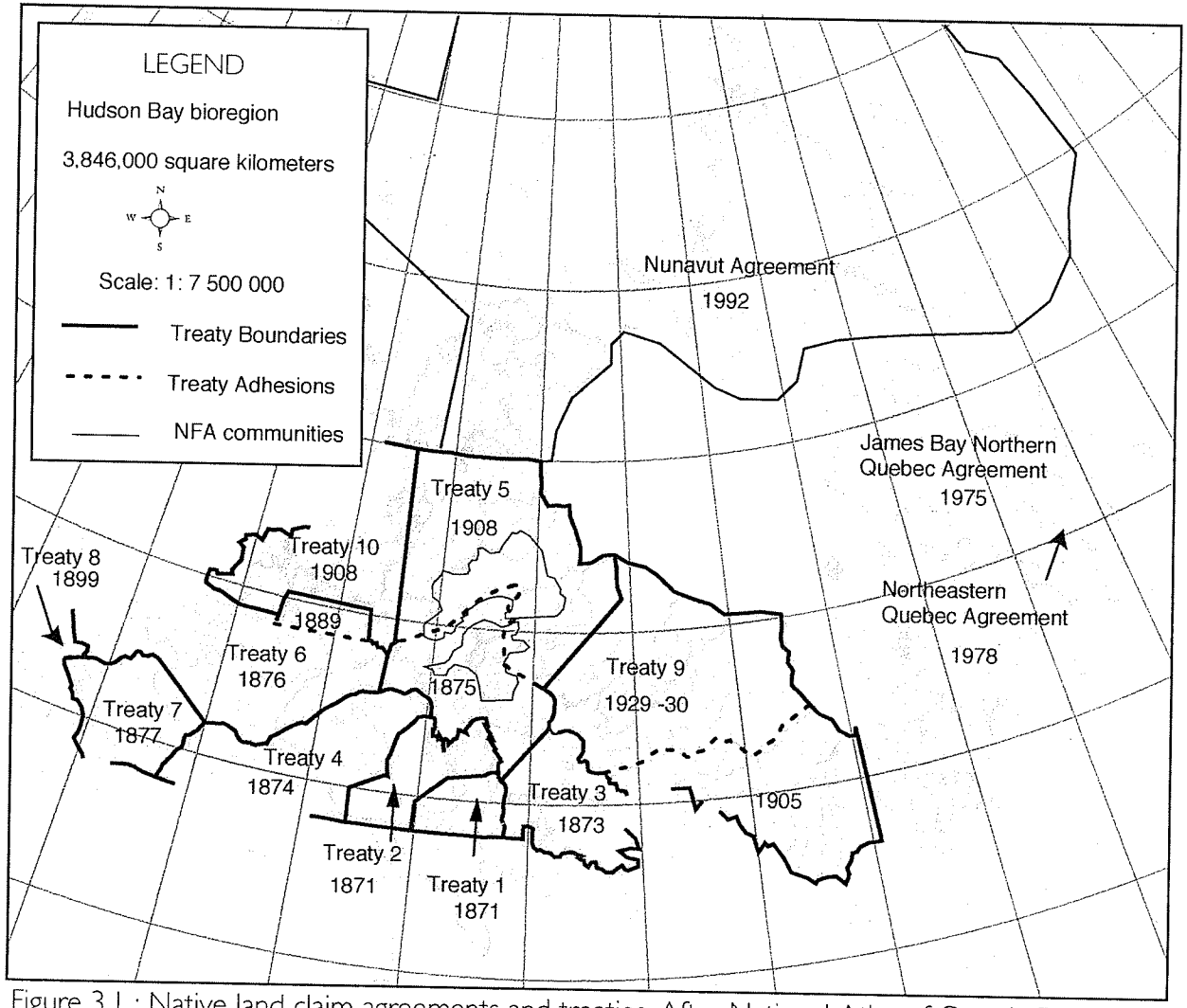


Figure 3.1 : Native land claim agreements and treaties. After National Atlas of Canada 5th Edition 1991. Note: The Nunavut Settlement Area includes islands in Hudson/James Bay.

3.4 Subsistence Land Use in the Twentieth Century

Since the 1970's, at least 20 subsistence land use studies have been undertaken in Canada. Seventeen of these studies include parts of the basin. Figure 3.2 depicts the areas covered, and Table 3.1 summarizes these studies by location, time period, objective, coverage and method(s).These studies include Freeman's land (and water/ice) use maps from 1976, and Riewe's recent Nunavut maps, the TASO study of Northern Ontario, and a number of land use studies of more limited geographical coverage, including Weinstein's map for Fort George (Chisasibi), and studies in Manitoba by researchers at the Natural Resources Institute at the University of Manitoba and Manitoba Keewatinowi Okimakanak (MKO). Some areas, particularly the Mushkegowuk Region and the West Hudson Bay, have been covered by more than one study.

Objectives of the studies were mainly to document aboriginal land claims (e.g. Freeman 1976; Riewe 1992); some to assess environmental impacts (e.g. Kayahna 1985); and one for regional planning and resource co-management (Berkes *et al.* 1995), but many aboriginal land use studies go beyond the merely utilitarian function of documenting aboriginal occupancy of land, or the impact of development (Nakashima 1991; Feit 1991). They also document the meaning of land for groups of aboriginal people, and help record aboriginal cultures and traditional ecological knowledge for the benefit of future generations. For example, Brody's (1981) work showed the feasibility of using maps to record the worldview or mental "maps" of relationships of people to places, other people and animals. "Places" are very important for cultural identity, as in the —*miut* groups (the people of —) of the Inuit. Most, if not all, aboriginal groups define their identity, as the Inuit do, in terms of the places in which they hunt, gather, live, and travel through the annual cycle.

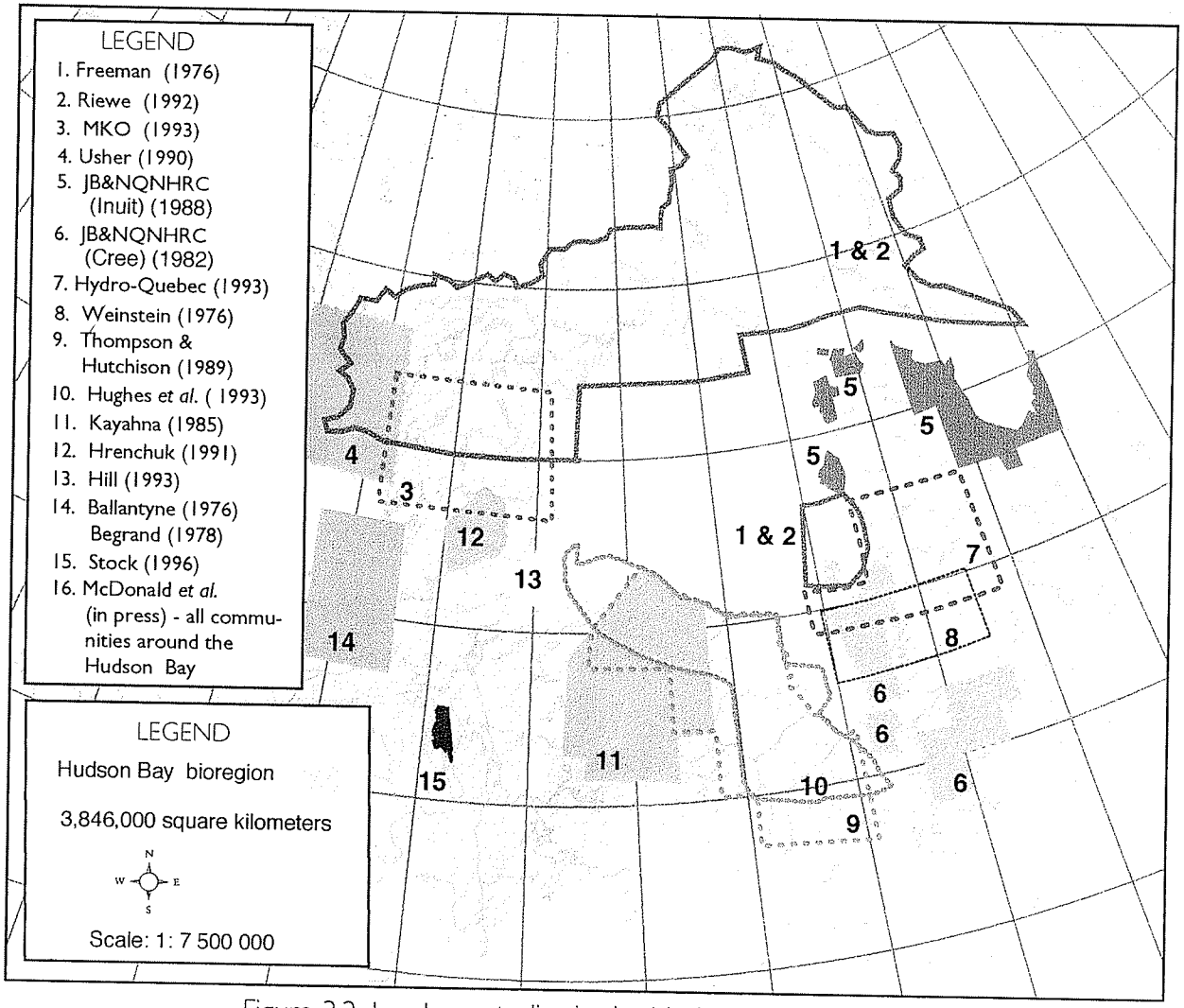


Figure 3.2: Land use studies in the Hudson Bay bioregion.

Table 3.1: Land use studies in the Hudson Bay bioregion (continued).

Location	Year(s)	Objective	Coverage	Method	Reference
Northwest Territories	Period I: Pre-1925-35 Period II: 1925(35)-1955(67) Period III: 1955(67)-1974	to record Inuit land use and occupancy in the Northwest Territories of Canada	land use and occupancy over time, including hunting, trapping, fishing, fowling trails, berry harvests, habitation sites and travel routes	Map biographies and interviews were collected from 1600 respondents of Inuit parentage (or those similarly acceptable as a member of one of the 33 communities) and including every male head of household, some of their older sons, and a few widows who support their families by hunting and trapping. Base map scale used was 1:500 000 (1:250 000 for the Mackenzie Delta); scale of published maps is 1:2 000 000. A comprehensive, systematic land use database was established using the UTM grid system.	Freeman (ed.) 1976

Table 3.1: Land use studies in the Hudson Bay bioregion (continued).

Location	Year(s)	Objective	Coverage	Method	Reference
Nunavut Settlement Area	Based on maps produced in the Inuit Land Use and Occupancy Project, supplemented with current land use information	to assist the Inuit in preparing for land claim negotiations with the federal government	• index map of the Nunavut Settlement area • geographical extent and intensity of current Inuit land use in each of the communities • details of Inuit land use intensity and wildlife distribution in the Nunavut Settlement Area including campsites; domestic and commercial fishing sites; outpost camps; major travel routes; caribou calving grounds, waterfowl nesting and staging areas and distribution, seasonal ranges and migration routes of various species of animals harvested by the Inuit • regional maps depicting lands retained by the Inuit after ratification of the Nunavut Final Agreement	• supplementing previously published information and interview data (Freeman 1976), interviews were conducted with harvesters in each Nunavut community in 1986 and 1987; coverage ranged from 40 to 80%. • the map scale used for the interviews was 1:500 000, published maps are reduced to a scale of 1: 1 000 000.	Riewe (ed.) 1992

Table 3.1: Land use studies in the Hudson Bay bioregion (continued).

Location	Year(s)	Objective	Coverage	Method	Reference
Tadoule Lake and Lac Brochet	1990-91	to map land use of the Manitoba Denesuline over time (1920-1991) for use in negotiations relating to settlement and the boundary dispute between Denesuline Nene and the Nunavut Settlement Area, and for negotiations concerning future land management processes	land use including travel routes and habitation	Map biographies were collected from a stratified random sampling of male residents 18 years of age or older; respondents were classified as: intensive, active, partially active, and inactive. Female heads of households were also interviewed. Maps scales used were 1:250 000 and 1:50 000.	MKO 1993
Use of Northwest Territories by the Fond du Lac, Black Lake and Hatchet Lake Bands	1989-1990	to document current and recent land use and occupancy for purposes of establishing aboriginal title	land use including travel routes and habitation	Ninety-one map biographies depicting current and recent land use were collected from presently and formerly active hunters and trappers using a stratified random sampling method. Map scale was 1:1 000 000.	Usher 1990.

Table 3.1: Land use studies in the Hudson Bay bioregion (continued).

Location	Year(s)	Objective	Coverage	Method	Reference
Inuit communities in Northern Quebec: Chisasibi; Kuujjuarapik; Akulivik; Ivujivik; Salluit; Kangiqsujuaq; Quaqtac; Kangirsuk; Aupaluk; Tasiujaq; Kuujjuaq; Kangiqsualujjuaq; and Killiniq	1973-1980	to determine present levels of Native land use subsequent to implementation of the 1975 James Bay and Northern Quebec Agreement (JBNQA)	land use based on distance from the community—"near" or "away"	Hunters' recall of harvests over a previous one or two-year period (1973-1975) were collected using a questionnaire. Actual harvests by species and geographical zones were self-collected by providing hunters with resource calendars to be updated weekly (1976-1980), with year-end collection of data by field workers. Potential hunters included any males 18 years of age or older and able to hunt during the study period. Statistical sampling methods were used to collect data on current harvest levels and to estimate total harvests.	JB&NQNHRC 1988
Cree Communities in Northern Quebec: Great Whale, Fort George, Paint Hills, Eastmain, Rupert House, Nemaska, Mistassini and Waswanipi	1974-1979	to determine the present level of native land use as a result of the 1975 James Bay and Northern Quebec Agreement (JBNQA)	harvests of 32 species were reported for defined geographical areas and periods of time.	Hunters' recall of harvests from 1972/73 and 1978/79 were collected using diary/calendars and questionnaires/interviews at the community level. The study population included all resident adult Cree men 18 years of age and older. In Phase I of the project a one-third sample was sought, and 31% was achieved.In Phase II full coverage was sought, and 75% was achieved. A total of 4,524 interviews were conducted, all in Cree.	JB&NQNHRC 1982

Table 3.1: Land use studies in the Hudson Bay bioregion (continued).

Location	Year(s)	Objective	Coverage	Method	Reference
Grande riviére de la Baleine, Quebec	completed in 1993	to predict the project's environmental impacts and describe the measures to be taken to reduce the negative repercussions and increase positive spinoffs	• cumulative impacts on land use by the Cree of Whapmagoostui & Chisasibi, and the Inuit of Kuujjuarapik and Umiujaq	Technical/economic and environmental studies conducted by Hydro-Québec.	Hydro-Quebec 1993
Chisasibi	1972-1974	to document occupancy, the extent of dependence on subsistence resources, and adaptations made to recent outside intrusions in order to assess the impacts of the James Bay Hydroelectric Project on the subistence economy	• harvests and harvest locations • family and household composition including incomes • costs of living and costs of subsistence activities	Interviews were conducted with 307 hunters. Scale of maps used was 1:250 000.	Weinstein 1976

Table 3.1: Land use studies in the Hudson Bay bioregion (continued).

Location	Year(s)	Objective	Coverage	Method	Reference
Mushkegowuk Region, Hudson Bay Lowland, Ontario	1981-1983	to determine the amount and location of native and non-native resource use in the Ontario Hudson Bay Lowland	• effort and extent of participation in resource use activities • distribution and intensity of resource use by the communities	A "How Much" Questionnaire was used to collect data concerning the quantitative harvest of food and fuelwood gathered. A "Where" Questionnaire was used to collect information concerning major areas of food and fuelwood collection. Questionnaires were stratified using the criteria of native and non-native. Coverage of 100% of male hunters 18 years of age or older was attempted in all communities north of Moose Factory and Moosonee.	Thompson & Hutchison 1989
Mushkegowuk Region	1989-1991	to compile land use and wildlife harvesting information	distribution and intensity of land use by community; by hunter type; and by species	A detailed questionnaire was administered to 716 hunters, i.e., males over 18 years of age. The data collected were used to create a computerized relational database for use with a digitized basemap. Scale of maps is 1:250 000.	Berkes *et al.* 1995c

Table 3.1: Land use studies in the Hudson Bay bioregion (continued).

Location	Year(s)	Objective	Coverage	Method	Reference
North Central Ontario: Wunnummin Lake; Kingfisher Lake; Big Trout Lake, Fort Severn, Kasabonika Lake; Long Dog Lake; Wapekeka Lake	1920-1975 1925-81	to demonstrate from a social perspective the logic of land utilization and tenure of the Nishnawbe-Aski in response to the Reed Pulp and Paper development proposal to clear-cut	• land use over time, including travel routes and habitation • distribution of different types of land among different groups • maintenance of stability of use and control • transfer over generations of customary rights to use lands • genealogies	Map biographies showing the full extent of an individual's land-use activities over his/her lifetime were collected from almost all the households at a scale of 1:250 000. Questionnaires were used to record quantitative data and general discussions with interviewees were taped. Genealogies were gathered from key individuals in the community.	Kayahna Tribal Area Council 1985
South Indian Lake, Manitoba	Pre-1946 to 1990	to document land-use activities over time	land use, both pre-and post-flooding, including travel routes and habitation	Personal interviews were conducted with 47 respondents, and 36 map biographies were gathered from trappers, hunters and fishermen representative of the community, using an open-ended questionnaire. Pre- and post-flooding effects were recorded. Various scales were used for the maps: 1: 250 000; 1:1 000 000; 1:50 000; 1:750 000; 1:1 250 000; 1:350 000; 1:125 000.	Hrenchuk 1991
Fox Lake First Nation	1957 to the present	to document land use activities over time	land use over time including travel routes and habitation	Individuals with knowledge of specific resource use areas were interviewed, and map biographies collected. Map scales used were 1:250 000 and 1:50 000.	Hill 1993

Table 3.1: Land use studies in the Hudson Bay bioregion (concluded).

Location	Year(s)	Objective	Coverage	Method	Reference
The Churchill and Reindeer Rivers: Deschambault, Pelican Narrows, Sandy Bay, Southern and Stanley Mission	1977	to identify traditional and current land use areas of Metis and non-status Indians in the five communities potentially affected by a reservoir included as part of Saskatchewan Power's proposal to build a hydro-electric generating station at Wintego rapids on the Churchill River	land use including travel routes and habitation	Twenty-eight trappers, fishermen and hunters in the directly affected areas plotted current land use on maps. The map scale used was 1:250 000. Interviews recording the opinions of 195 people regarding the Wintego proposal were also gathered.	Begrand 1978
Waterhen	1991-1992	to document land use activities over time	land use	Map biographies and interviews were used to collect land use information.	Stock 1996
Hudson/ James Bay communities	1992-1994	to collect information concerning traditional ecological knowledge management systems	sea ice, currents, rivers, polar bears, whales, Canada geese, snow geese and settlements	Workshops were held with community working groups, program personnel and advisors	McDonald *et al.* in press

3.4.1 Changes in West Hudson Bay

The massive cultural changes precipitated by the influence of southern institutions, values and technologies on the Inuit of Arctic Canada over the last fifty years have been described by Stenbaek (1987) and Duffy (1988). The north was made much more accessible to southern influences following the Second World War when a number of northern air bases were converted into commercial airports. The political issue of arctic sovereignty arose during this time, and the federal government responded in part by relocating Inuit from the west coast of northern Quebec (especially from the area of Inukjuak) to Resolute Bay and Grise Fjord. A famine in the Keewatin and Ungava districts in the late 1940s and early 1950s contributed to the development of centralized communities in these regions, and centralized health, educational and social services were extended to the residents of these growing settlements, as central administrative structures were established.

The trend of diminishing land use which arose during the period of sedentarization which followed in the late 1960s and early 1970s, however, has not continued. Usher (1990) in his study of the traditional harvesting activities of the Chipewyan-Denesuline Bands in the NWT noted that land use activities have continued to be an important aspect of life in aboriginal communities. This finding is consistent with MKO's report (1993) which concluded that the current land use patterns of the Denesuline, in large measure, reflected the land use patterns of many generations of Denesuline harvesters (as they pertain to sites, areas and resources). The earlier nomadic existence which had been based on the search for caribou, however, was modified with the establishment of permanent settlements in the southern area of their territory, near former fur-trading posts to which the Denesuline typically trav-

elled in the summer to trade and collect treaty monies.

The extent of Inuit land use in Northern parts of the Hudson Bay bioregion over time is documented in Freeman (1976) and Riewe (1992). Freeman (1976) sought to identify land use patterns of the Inuit residents of 33 communities in the Northwest Territories for three specific periods in living memory: 1) the years prior to the local arrival of traders (pre-1925 to 1935); 2) the fur trade period (1925-35 to 1955-67); and 3) the period of sedentarization (post 1955-67). (Figures 3.3, 3.4 and 3.5). Riewe (1992) mapped Inuit land use in 1986-87, using Freeman's work as a basemap. (Figures 3.6, 3.7 and 3.8). These land use maps show a good deal of overlap in land use between neighboring communities, and very little land (mainly in the far north, outside the Hudson Bay bioregion) on which harvesting does not take place.

Though extensive subsistence land use is still the case in the far north, this area has also been impacted by development projects over the last twenty-five years. For example, the residents of Baker Lake began expressing concern in 1969 concerning the effects of uranium exploration when prospecting permits were issued for about one-third of a 78,000 sq. km. area of land around Baker Lake. While little exploration activity had occurred up to that time, some diamond drilling was underway. Later, in 1977, Polar Gas filed an application to construct a pipeline to transport natural gas from the Arctic to southern markets. The proposed pipeline would cross over this same area, and the Inuit believed that pipeline activities and mining developments posed a serious threat to caribou populations in the region. While coastal Inuit depended on sea mammals for most of their diet, the Inuit of Baker Lake, the only inland Inuit community in Canada, depended on

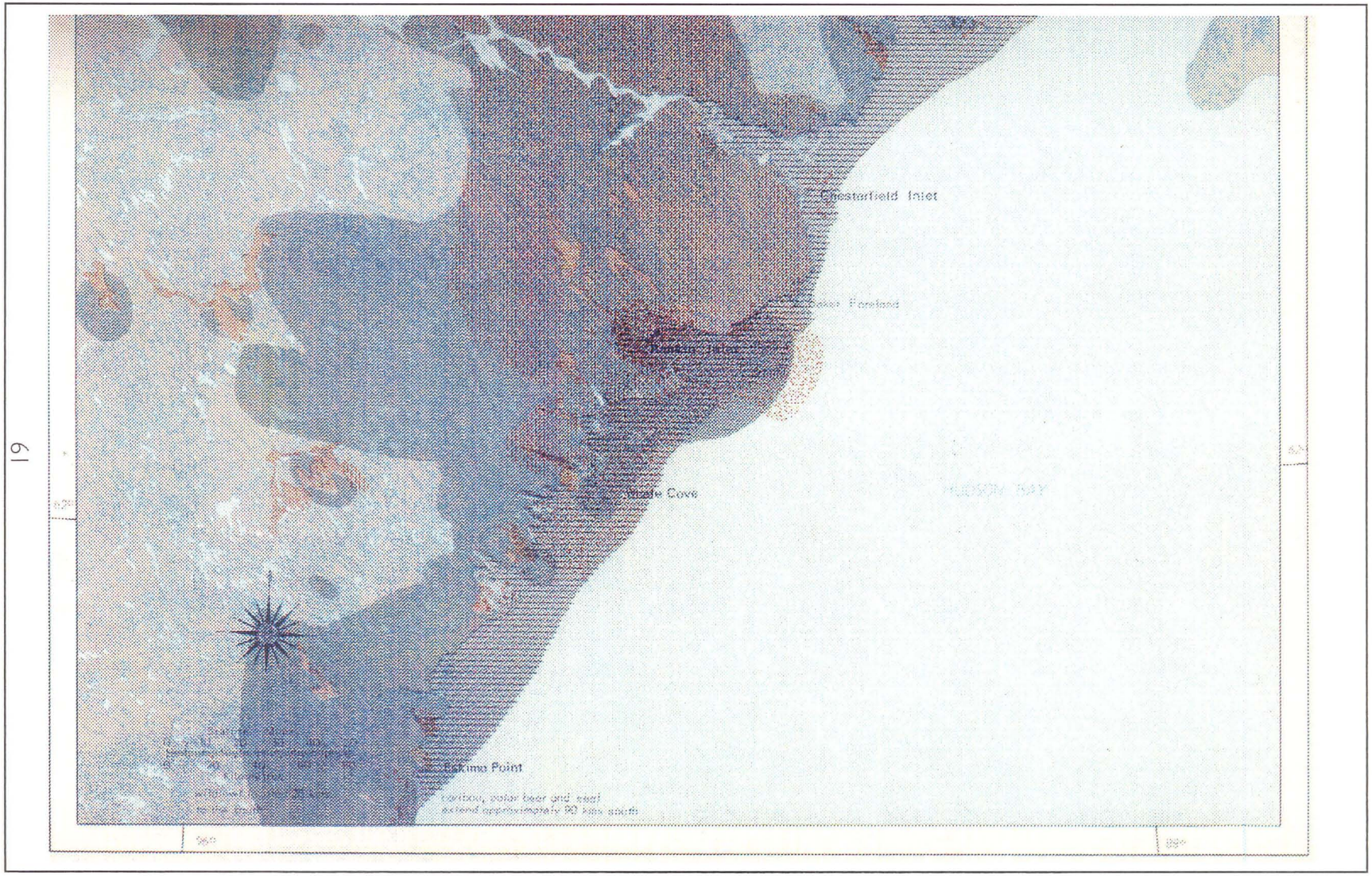


Figure 3.3: Rankin Inlet hunting - period III (1956-1974). Source: Freeman 1976.

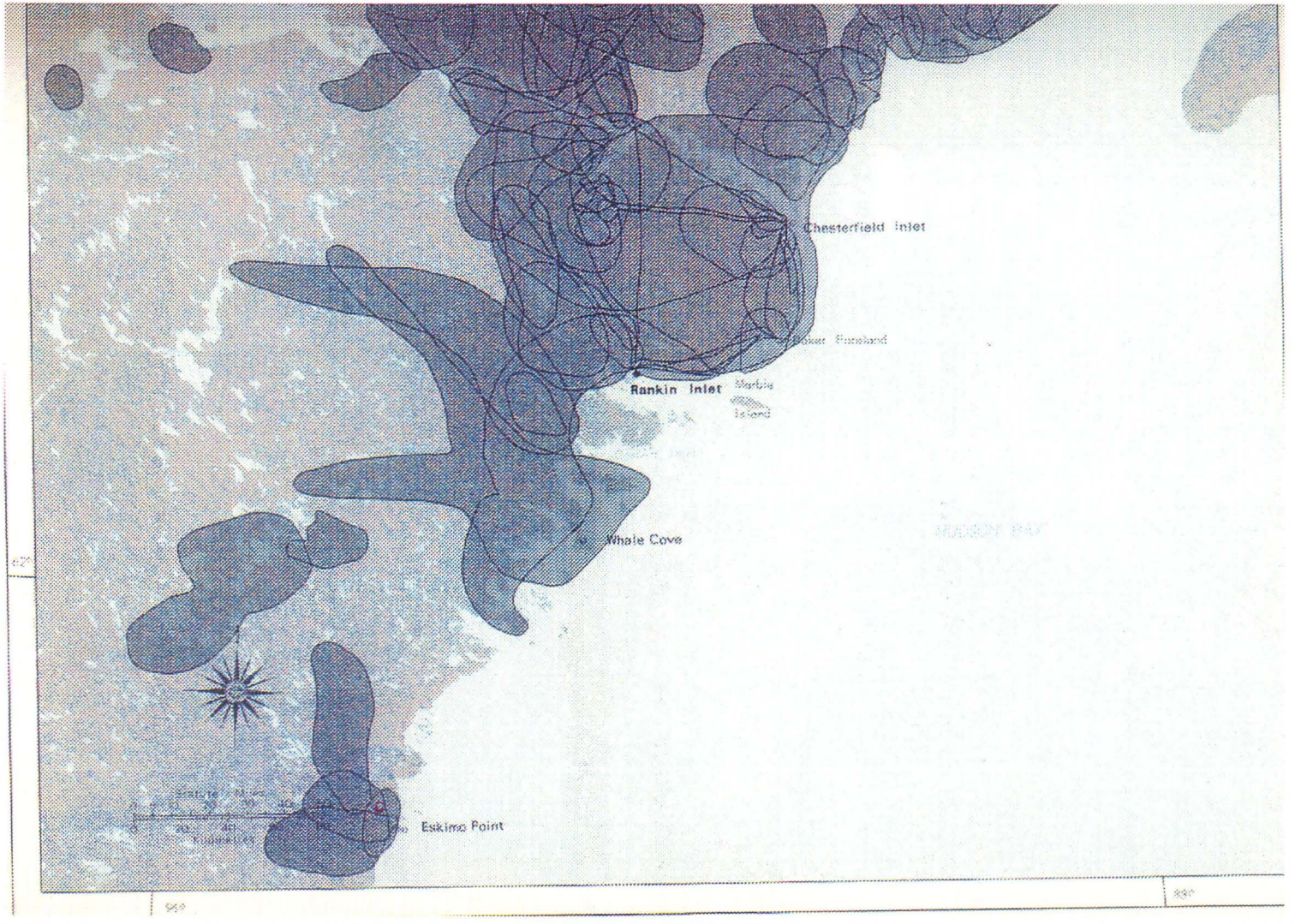


Figure 3.4: Rankin Inlet trapping - period II (1924-1959). Source: Freeman 1976.

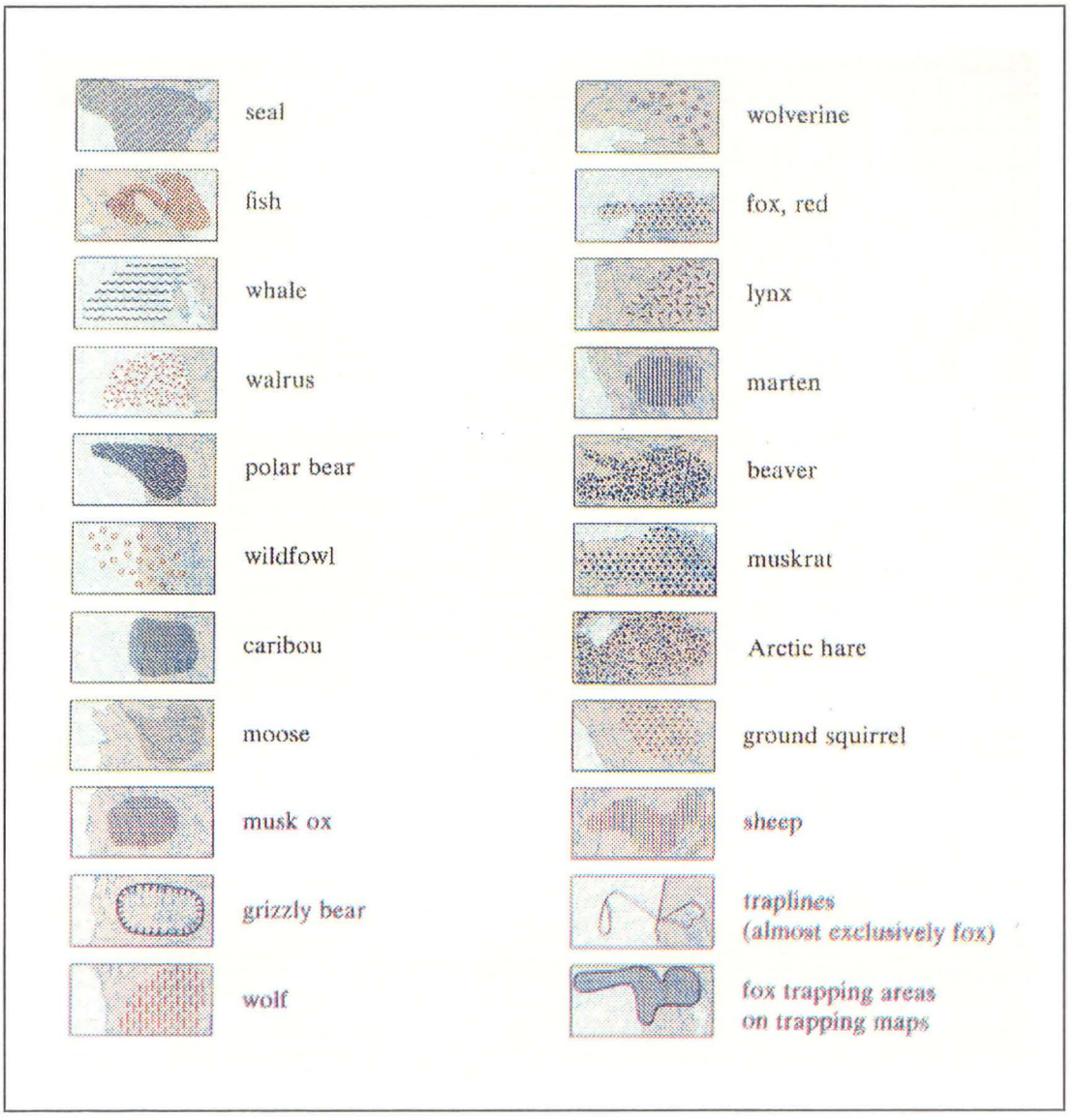


Figure 3.5: Legend for settlement land use maps in the Inuit Land Use and Occupancy Project. Source: Freeman 1976.

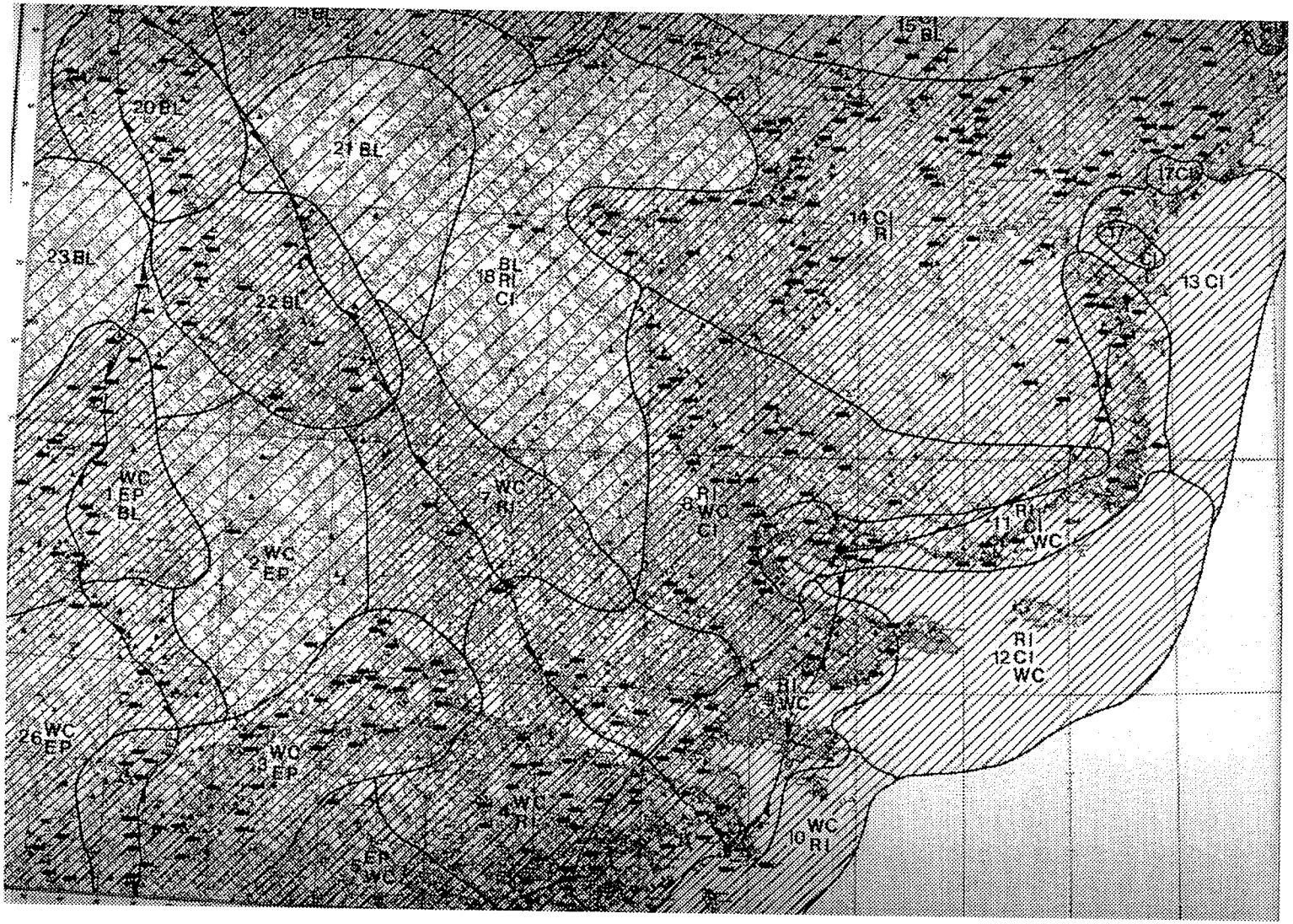


Figure 3.6: Rankin Inlet land use overlay. Source: Riewe 1992.

Figure 3.7: Rankin Inlet wildlife overlay. Source: Riewe 1992.

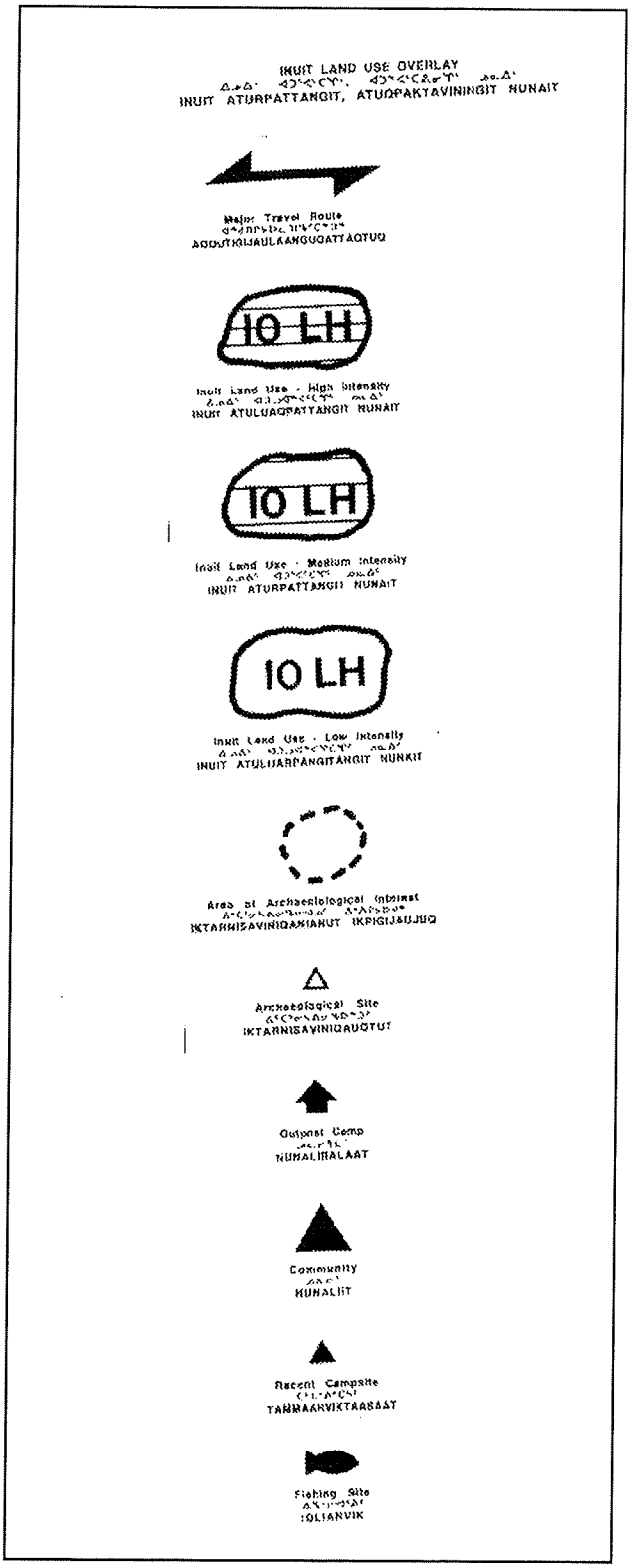


Figure 3.8: Legend for land use overlays.
Source: Riewe 1992.

caribou for over 30% of the 1977 real income of households, and over 42% of the 1977 real income of heads of households (Musk-Ox 1978). The Inuit believed that caribou population declines were linked to uranium exploration activities, citing the use of low-flying aircraft, drilling and blasting as a source of severe disturbance to the caribou.

To protect their main source of food and their way of life, in 1974 the Inuit petitioned both the federal and territorial governments to stop exploration. The following year they demanded a development freeze around Baker Lake pending resolution of land claims. In February 1977 the Minister of DIAND declared a one-year moratorium on mineral exploration and ordered a study on the effects of exploration in the area. The ensuing report supported the Inuit position that the area contained important calving grounds for caribou, and that they used the area intensively for hunting and fishing. An interim injunction was invoked at the expiration of the moratorium. At that time the Inuit sought an injunction prohibiting the issuance of prospecting permits, the granting of mining leases, the recording of claims and the issuance of mining exploration permits in the area.

This injunction was lifted in November 1978 in a federal court decision. In its place, the judge imposed protective measures restricting land use by requiring a 4.8 km buffer around the four critical areas identified by the authors of the report: 1) major caribou migration corridors to calving grounds; 2) calving grounds; 3) areas of post-calving aggregations; and 4) caribou water crossings. Despite losing the case, the defendants noted that this was the first time the courts had recognized aboriginal title to Inuit occupied land in the NWT (Musk-Ox 1978; Thompson 1980). Shortly after the Baker Lake decision uranium ceased to be an issue because of a market downturn.

The Manitoba Cree also experienced first-hand the impacts of southern influences with the start up of major resource development projects beginning in the 1960s. This event marked the first phase of hydro-electric development on the Nelson River (Lithman *et al.* 1992). Subsequent hydro electric development led to diversion of the Churchill River and the impoundment of South Indian Lake in 1976. As a result, the mean lake level rose 3 m. in that community. Prior to impoundment, South Indian Lake had largely been a self-sufficient community, with the largest commercial fishery in Northern Manitoba. Since impoundment this fishery has remained the largest single source of gross income for the community, but its value has declined (Wagner 1984). Significant effects were observed on fishing activities, and post-flood catches dropped dramatically from those which had been the norm prior to flooding (Bodaly *et al.* 1984). The hunting of geese and ducks was directly altered by the flooding, since the shooting and retrieval of waterfowl was hampered by higher water levels. Moose were more difficult to see as well, and therefore harder to hunt. It was also observed that habitat for these species was reduced following impoundment. The majority of those community harvesters interviewed by Hrenchuk (1991) indicated they spent less time in the bush than they had at a younger age, and it was apparent that social and wage-earning opportunities afforded by town life had reduced the family component of bush life in this community. He concluded, however, that resource harvesting continued to be an important part of community life in South Indian Lake.

The Fox Lake FN in Northern Manitoba is another community whose traditional land use area north of Gillam was flooded in the early 1970s, in this case by the Kettle Dam reservoir (part of the Nelson River hydro-electric development project). In subsequent

years two additional dams were built further downstream. The impacts of these developments on the Fox Lake Cree were identified by Hill (1993) and included the following: the loss of wildlife habitat; reduced hunting, fishing and trapping opportunities; disruption of travel routes; disturbed environmental and social conditions; and displacement from traditional settlement areas. It was further noted that the Fox Lake Cree had not experienced a higher standard of living as a result of the development, nor had they enjoyed the long-term employment opportunities available to non-aboriginal residents of the region. The construction of major hydro projects in Manitoba continued with the Limestone Dam, commissioned in 1990, but construction of the massive Conawapa Dam scheduled for the 1990s has been put on hold.

Although fewer studies have been conducted on the impact of development projects in Saskatchewan on subsistence land use, Waldram (1988) has documented some major social and cultural changes. As well, the traditional and current land use areas of the Metis and non status Indians on the Churchill River in northern Saskatchewan were studied by Begrand (1978) as part of a background study for hydroelectric development at Wintego Rapids on the Churchill River. He concluded that traditional land use activities continued to play an important role in the lives of the aboriginal people of this area.

3.4.2 Changes in East James Bay

Changes in land use experienced by the James Bay Cree have been described by Scott (1988) and Feit (1979, 1986b). Sixty years ago beaver and marten stocks throughout much of Northeastern Canada were depleted as a result of the combined behaviors of both aboriginal and non-aboriginal hunters. Non-aboriginal trappers were lured north by high fur

prices and overhunted the area. Realizing that stocks would be cleaned out by the white hunters, Indian hunters responded by trapping the animals out first. As a result, those groups of Indians which depended on beaver for food faced starvation.

The provincial government concluded that restoration of the indigenous tenure system of trapping was desirable, both for the aboriginal people and for purposes of conserving the provinces' fur resources. Beaver preserves were subsequently established, and aboriginal hunting territories were recognized as "registered traplines".The federal government assumed the perspective that it retained ownership of these lands, however, and only allowed aboriginals the right to hunt on Crown lands. Nothing more. As beaver populations regenerated, traplines were mapped jointly by federal and provincial government representatives in the communities, and formal traplines established, based on existing territorial systems.The government also recognized Cree stewards, called tallymen, and paid them an annual honorarium to count the number of active beaver lodges in a territory.These stewards were responsible for allocating the harvest among the hunters each allowed to use the trapline assigned to him.

The concept of registered traplines with exclusionary and rigid boundaries conflicted with Cree land use patterns. It was customary for Cree to allow one another movement from one territory to another, in order to ensure that all families obtained their basic food requirements and that resources were equitably distributed. Initially, however, since adherence to registered traplines was not enforced, the policy did not interfere with Cree hunting practices. The government also established band governments in each community, and began issuing rations and eventually social assistance for band members. In the late 1930s

and early 1940s, Indian agents were sent to each community by the Department of Indian Affairs to establish an official band membership list and to elect a chief and council. In this manner, the locus of "home" for the Cree gradually changed from the bush to village settlement (Preston, 1986).

In the 1950s and '60s, the government moved to "open the north" by making the region more accessible for purposes of resource exploitation. Rail networks which had been extended into the James Bay area (Ontario and Quebec) initially in the 1920s were extended in the 1950s and 1960s. Several mining towns were incorporated, each disrupting one or more Cree hunting territories (Feit 1986b). As a result, the Cree reported, land animals were disturbed by the noise, and fell ill from chemical sprays and pollution from mine wastes. Fish and aquatic animals were frequently found dead, and many animals tasted different.

In 1965 a pulp and paper mill went into operation in Lebel-sur-Quevillon, and released significant quantities of mercury into the streams leading into the Bell River and into airborne emissions. Then, in the 1970s, the Federal Department of Health and Welfare advised the Cree to stop eating fish from the region. Because fish was an important part of the Cree diet this recommendation led to a demand for research which could provide more specific advice regarding safe consumption levels. The unhappy situation was exacerbated some years later by evidence that acid rain might be increasing the amount of mercury leached from the bedrock into the water systems and hence into the food chain (Feit1986b). A similar story was being played out in the meantime in Northwestern Ontario where mercury from a pulp mill north of Kenora was contaminating the English-Wabigoon

river system heavily used by the local Ojibwa people for fishing and hunting (Hutchison & Wallace 1977; Shkilnyk1985).

In 1971 the Quebec government announced its proposed James Bay Hydro-Electric Development Project.The first of three phases of the proposed project included a 700 km. road across the hunting lands of six Cree communities; airports; communication infrastructures; construction camps; a new town; mines and forestry operations; the diversion of three major rivers; the construction of four main dams, 130 km. of dikes; eight main reservoirs flooding 8,722 sq. km. (five percent of the land surface); and the construction of power transmission corridors 960 km. long. In early 1972 the James Bay Cree and the Northern Quebec Inuit used legal means to force the Province of Quebec to discuss the implications of this project for their communities. In 1973, Mr. Justice Malouf ruled that

> the Cree and Inuit people did appear to have an Indian title to the land; that they had been occupying and using the land to a full extent; that hunting was still of great importance, constituted a way of life, and provided a portion of their diet and incomes; that they had a unique concept of the land; that they wished to continue their way of life; and that any interference with their use compromise[d] their very existence as a people; and that the project was already causing much interference. He ruled that the province was trespassing (Feit1986b).

Ultimately, the James Bay and Northern Quebec Agreement (JB&NQA) was signed in 1975 following negotiations for aboriginal rights impacted by the proposed development.

Ten years after implementation of the JB&NQA, Feit (1986b) reported four general findings about the Agreement: 1) it was beneficial to the Cree hunting economy because it specified and strengthened hunters' rights; 2) it had positive economic, social and political effects on the Cree community because it decentralized decision-making powers to local and regional governments; 3) the records of both federal and provincial governments in

support of the agreement were mixed; and 4) the Cree became politically more autonomous after the signing of JB&NQA, but threats to their self-government and self-determination remained because expropriation clauses in the agreement allowed the Quebec government to build additional hydro projects.

George *et al.* (1995) conducted a historical and contemporary analysis of Cree land use and harvesting in the Moose River Basin in western James Bay in northern Ontario. They reported that non-aboriginal incursions into the upper Abitibi and Mattagami Rivers became extensive early in this century, and extended as far north as the lower Moose River soon thereafter. Spearheading these incursions were three railway lines, all of which affected traditional Cree hunting areas by 1915. Of these three, the TNO (Temiskaming and Northern Ontario) Railway, also known as the "colonization railway", paved the way for development of the Ontario northland. The local Cree were rarely hired for other than seasonal railway work.

Another major development thrust which affected the region at this time was the building of extensive hydroelectric capacity by private companies along both the Abitibi and the Mattagami rivers. The Abitibi development began at Iroquois Falls in 1914 and had been extended to Abitibi by 1930. Mattagami hydroelectric development was associated with mining development and began as early as 1911; other hydro developments were associated with pulp and paper operations (George *et al.* 1995, pp. 75-76).

Some impacts of these projects included: flooding Indian hunting lands; disruption of aboriginal fisheries; downstream pollution by pulp and paper effluent; and social problems resulting from the displacement of the Cree from their hunting, trapping and fishing areas.

Following the Second World War, hydroelectric development on both rivers was resumed by Ontario Hydro (established in the 1930s as Hydro Electric Power Commission), and continued into the 1960s. Additional hydroelectric projects for the Moose River basin were proposed in the 1980s and hearings were held in 1990-1991 but no construction has yet taken place. The extensive resource development projects undertaken in this area hastened the settlement of Cree in villages and increased their reliance on wage employment or social support incomes. Despite significant disruption to hunting and trapping lands and resources, traditional harvesting pursuits continued to be highly valued. For example, in Moose Factory (a predominantly aboriginal community) 89% of all adult males participated in some kind of hunt; 64% did so in nearby Moosonee (a non-aboriginal town) in 1990 (George *et al.*, 1995).

Extensive use of the land by North Central Ontario Ojibwa Indians is described in the Kayahna Region Land Utilization and Occupancy Study (1985). The authors reported, as a primary finding, that the social organization of the Nishnawbe-Aski in Ontario was enduring despite the influence of strong external forces. Traditional social organization was evident in their communal hunting lands, the areas used by families related through the male line, and the shared living areas of two or three households (called a co-residential unit) which continued to be the land controlling group. The Study reported that the Nishnawbe-Aski continued to hunt in adjacent parts of Quebec and Manitoba, as was typical of earlier land activities, and served as further evidence that traditional harvesting patterns continued to be used to the present time.

3.5 Relative Importance of the Subsistence Economy

Despite widespread skepticism about the efficacy and economic viability of subsis-

tence harvesting, Usher (1989) observed that wildlife harvesting and processing provided food, fuel and other material needs for northern villagers, and provided adequate protein intakes for many northerners. "This", he wrote "is of considerable importance in a region in which there is virtually no agricultural production....Wildlife is thus the nutritional basis of health and well-being for most Native northerners, and remains today the foundation of a distinctive Native economy..." (Usher 1987).

This section synthesizes the harvest data collected in regional harvest studies and analyzes the economic significance of reported subsistence land use.

3.5.1 Potential Edible Meat Harvested per Capita

Studies which have been undertaken to establish the extent and intensity of wildlife harvesting activities in the Hudson Bay bioregion are summarized by region in Table 3.2 Indications are that in most regions the value of wild meat, fish and waterfowl caught ranges from 50 kg. to 350 kg. of potential edible meat per capita per year, whereas more northerly Inuit communities seem to range between 200 and 350 kg. per capita per year. In most areas Inuit wildlife harvests represent not only very high values compared to the quantity of meat and fish eaten by Canadians in the south, but also a higher quality of nutrition since wild meat is thought to be healthier food (Waldram 1985, p. 41; Schaefer and Steckle 1980), even though there have been problems with arctic food chain contamination (Kinloch and Kuhnlein 1988; Cameron and Weiss 1993). A harvest of some 300 kg. of meat per year for every man, woman and child corresponds to a potentially available food weight of about 1.2 kg. (2.5 lb.) meat, and 300 g. of protein per adult-equivalent per day (explanations and conversions may be found in Berkes *et al.* 1994 p. 354). The protein value of 300 g. per

Table 3.2: Wildlife harvest studies by region.

Region	Year	Potential Edible Weight (kg.)[1]	Population	Per capita (kg./year)	Reference
Baffin Region[2]	1984	924,635	2,689	344	Pattimore 1985
Keewatin[3]	1981-82 1982-83 1984-85	829,440 793,003 895,298	[4]3,769 3,882 3,999	220 204 224	Gamble 1984, 1987 a,b Gamble 1984, 1987 a,b Gamble 1984, 1987 a,b
Arviat	1977	143,864	834	172	McEachern 1978
Resolute & Kuvinaluk	1976	34,856	179	195	Kemp *et al.* 1977
Northern Quebec Inuit[5]	1976 1977 1978 1979 1980	1,403,846 1,181,159 852,432 1,096,408 1,100,179	[6]3,427 3,530 3,636 3,745 3,857	410 335 234 293 285	JB&NQNHRC 1988 JB&NQNHRC 1988 JB&NQNHRC 1988 JB&NQNHRC 1988 JB&NQNHRC 1988
Northern Quebec Cree[7]	1974-75 1975-76 1976-77 1977-78 1978-79	918,182 783,909 876,954 766,964 809,181	6 267 6,462 6,626 6,870 7,022	147 121 132 112 115	JB&NQNHRC 1982 JB&NQNHRC 1982 JB&NQNHRC 1982 JB&NQNHRC 1982 JB&NQNHRC 1982
Hudson Bay Lowlands[8]	1981-82 1982-83	[9]350,147 351,595	[10]4,700 4,700	75 75	Thompson & Hutchison 1989
Mushkegowuk[11]	1990	686,713	6,470	106	Berkes *et al.* 1994
Northern Manitoba[12]	1983-84	355,529	6,808	52	Wagner 1985

1. Calculated by converting the number of animals harvested into food weights. Does not include berries, wild rice or waterfowl eggs.
2. Foxe Basin only. Includes Cape Dorset, Hall Beach, Igloolik, Lake Harbour and Sanikiluaq.
3. Includes Baker Lake, Chesterfield Inlet, Coral Harbour, Eskimo Point, Rankin Inlet, Repulse Bay, and Whale Cove.
4. Population given only for 1983. Other years estimated on the basis of 3% per year adjustments.
5. Includes Great Whale [Kuujjuarapik], Inukjuak, Akulivik, Salluit, Kangiqsujuaq, Quaqtaq, Kangirsuk, Aupaluk, Tasiujaq, Kuujjuaq, Kangiqsualujjuaq, Killiniq, and Fort George [Chisasibi].
6. Population given only for 1976. Subsequent years are estimated on the basis of 3% per year increase.
7. Includes Great Whale [Kuujjuarapik], Fort George [Chisasibi], Paint Hills, Eastmain, Rupert House, Nemaska, Mistassini, and Waswanipi.

8. Includes Moose Factory, Moosonee, Winisk (Peawanuck), Fort Severn, Attawapiskat, Kashechewan, Fort Albany, and Moose River Crossing. Some communities did not participate in the study and their harvests were estimated on the basis of adjacent communities.
9. Beaver, muskrat and sturgeon (considered commercial species) were not included in the questionnaire.
10. Resident native population (Indian status), OMNR Moosonee District (OMNR, 1985).
11. Includes Moose Factory, Moosonee, New Post, Fort Albany, Attawapiskat, Kashechewan, Peawanuck and Fort Severn.
12. Includes the communities of Berens River, Cross Lake, Hollow Water, Mathias Colomb (at Pukatawagan), Split Lake and The Pas. Excludes agricultural communities. Wagner's harvest numbers were converted into potential edible weights using conversions in Berkes et al., 1994.

adult-equivalent per day compares very favorably with Nutrition Canada's minimum adequate standard of 49 g. protein per day for a 70 kg. person (Berkes & Farkas 1978, p. 50). These harvest levels also compare favorably with wildlife harvest estimates for other northern native people (non-Inuit), which have ranged mostly between 50 and 150 kg. per capita per year.

Values for Quebec Cree communities fell between 100 and 150 kg. per capita per year (in the 1970s). These numbers are consistent with meat intakes elsewhere in the region. The Keewatin Inuit have been reported to have a per capita value of 224 kg. per year (in 1984-85), and northern Quebec Inuit are reported to have a per capita value of meat of 285 kg. per year (in 1980). The Ontario Cree (Mushkegowuk region) averaged 106 kg. per capita per year (in 1990), or the equivalent of 97 g. protein per adult per day in 1990 (Berkes *et al.* 1994, p. 354).

The figure of 52 kg. per capita per year for Northern Manitoba Cree appears low in comparison to these figures. There are no detailed regional studies for Saskatchewan groups or for the Dene of Manitoba and Saskatchewan though there are some studies on fish harvests in Saskatchewan. These have been summarized in a synthesis of aboriginal subsistence fishery studies by Berkes (1990). While the hunters' "homes" have changed from bush to settlement, and patterns of harvesting activity have changed (Usher 1976, p. 106), based on Table 3.2 there is not evidence to suggest that wildlife harvests are in decline.

3.5.2 Imputed Value of Subsistence Harvest

Wildlife harvesting is socially and culturally important for the Inuit (Usher 1976 and 1987; Berkes & Freeman 1986; Wenzel 1991; Müller-Wille 1992; Freeman 1993), but

cultural values are difficult or impossible to quantify. What *can* be quantified in economic terms is the income-in-kind or the "imputed value" of wild meat which is based on the cost of an equivalent amount of store-bought meat that would otherwise be needed if wild meat were not available (Berger 1977; Quigley and McBride 1987). If store prices are known, data in the form of harvested weights can be converted into imputed food values.

Usher (1987, 1989) estimated that wildlife was a main source of food for 80% of native households in the NWT in 1987. This percentage equates to 4000 households, 5500 active harvesters and several thousand women who prepared the meat for consumption. He further estimated that a harvester's average kill amounted to between 1000 and 1500 kg. of meat and fish annually, with an imputed value of $10,000 to $15,000. This estimate is consistent with the $11-12,000 (1981-85) imputed value of harvests for households in the Keewatin Region (Gamble 1987a, 1987b) shown in Table 3.3, a summary of the imputed value of subsistence bush meat in various parts of the Hudson Bay bioregion. It shows a range of values from almost $18,000 per household per year (in constant 1991 dollars) in the Keewatin Region, to a low of $1,600 for Manitoba communities. Ontario and Quebec Cree communities are in the $7,500 to $9,000 range. Should available values for fuelwood, berries and fur be included for the Mushkegowuk Cree, the annual value per household would be increased by $1,000 (Berkes *et al.* 1994, p. 356). Any conclusions drawn on the basis of imputed values per household, however, must be tempered with the realization that northern costs are much higher than are comparable items in the south. As well, assumptions made in the calculation of these values must be kept in mind.

Table 3.3: Imputed value of subsistence bush meat.

Region	Year	Total Cash Economy per Year		Imputed Value of Native Traditional Activities[1]			Reference
		Current $ (Yr. of Study)	Constant $ (1991)	Current $ (Yr. of Study)	Constant $ (1991)	Cash Economy to Traditional Economy	
Mushkegowuk[2]	1990	25,370,880	26,893,133	8,372,400	8,874,744	1:0.33	Berkes *et al.* 1994; Farley 1992.
N. Manitoba	1985	178,827,600	236,052,430	[3]22,367,500	29,525,100	1:0.13	NMEDC 1992
Waswanipi[4]	1968-70 1982	251,315 [5]1,814,451	774,050 2,739,821	209,665 684,667	645,768 1,033,847	1:0.83 1:0.38	Feit 1991; Feit 1991
Wemindji	1975-76 1978-77	625,000 1,184,000	1,687,500 2,960,000	531,000 732,000	1,433,700 1,830,000	1:0.85 1:0.62	Scott 1982; Scott 1982
Pinehouse	1983-84	2,101,289	2,878,766	[6]1,135,281	1,555,335	1:0.54	Tobias & Kay 1994

1. Includes all bush products for which data are available. These include meat, fur, fuelwood, berries, and wild rice.
2. Includes Moose Factory, Moosonee, New Post, Fort Albany, Attawapiskat, Kashechewan, and Peawanuck. Excludes Fort Severn which was not included in the Mushkegowuk Region cash economy data.
3. Edible meat only. Comparable data for fish, fur and fuel not available.
4. Excludes fuelwood, berries; includes fur, handicrafts, sales-tourism.
5. Includes payments of $915,851 under the Income Security Programme (ISP). There was no ISP in 1968-70.
6. Of this value, $451,307 is for bush meat, $108,307 is for other income-in-kind, and $575,667 is for commercial fisheries, fur, wild rice and other commodities.

Despite these cautions, the calculations provided in Table 3.3 are a useful and practical way of quantifying the value of the subsistence economy. For example, the average household cash income in the Mushkegowuk region is estimated at $25,500 for 1990/91. This includes $10,000 in wages (formal employment), $13,000 in income support (including transfer payments), and $2,500 "other" (Farley 1992). The average imputed value of the subsistence economy for households in this region is $7,500.

Table 3.4 represents imputed values of the harvest as a ratio of the cash economy. These ratios range from a high of 1:0.85 in Wemindji (Quebec) to a low of 1:0.13 in Northern Manitoba (for which information is not adequate). The table includes commercial fisheries only in Pinehouse, and excludes a range of bush commodities and incomes such as handicrafts (except in Waswanipi), tourism and recreation including aboriginal-run outfitting camps, and medicinal products. Feit (1991, p. 257) lists several other products of bush camps which are not accounted for in cash values and are not included in his calculations or in Table 3.4: the value of housing and fuel while in bush camps; clothing such as mitts and moccasins for own use; and camp equipment made from bush products such as snow-shovels, snowshoes and net floats.

3.5.3 Cash Costs Associated with Harvesting

The activity of harvesting incurs direct costs, particularly those related to transportation which today includes snowmobiles, canoes with outboard motors, charter aircraft, trucks where roads are available, and all-terrain vehicles. The move to centralized communities has increased the travel involved in harvesting and so also the costs. Actual cash outlays have been estimated, with Usher (1989) estimating the annual capital and operating costs

Table 3.4: The bush sector in the overall economy.

Region	Year	Total Cash Economy per Year		Imputed Value of Native Traditional Activities[1]			Reference
		Current $ (Yr. of Study)	Constant $ (1991)	Current $ (Yr. of Study)	Constant $ (1991)	Cash Economy to Traditional Economy	
Mushkegowuk[2]	1990	25,370,880	26,893,133	8,372,400	8,874,744	1:0.33	Berkes *et al.* 1994; Farley 1992.
N. Manitoba	1985	178,827,600	236,052,430	[3]22,367,500	29,525,100	1:0.13	NMEDC 1992
Waswanipi[4]	1968-70 1982	251,315 [5]1,814,451	774,050 2,739,821	209,665 684,667	645,768 1,033,847	1:0.83 1:0.38	Feit 1991; Feit 1991
Wemindji	1975-76 1978-77	625,000 1,184,000	1,687,500 2,960,000	531,000 732,000	1,433,700 1,830,000	1:0.85 1:0.62	Scott 1982; Scott 1982
Pinehouse	1983-84	2,101,289	2,878,766	[6]1,135,281	1,555,335	1:0.54	Tobias & Kay 1994

1. Includes all bush products for which data are available. These include meat, fur, fuelwood, berries, and wild rice.
2. Includes Moose Factory, Moosonee, New Post, Fort Albany, Attawapiskat, Kashechewan, and Peawanuck. Excludes Fort Severn which was not included in the Mushkegowuk Region cash economy data.
3. Edible meat only. Comparable data for fish, fur and fuel not available.
4. Excludes fuelwood, berries; includes fur, handicrafts, sales-tourism.
5. Includes payments of $915,851 under the Income Security Programme (ISP). There was no ISP in 1968-70.
6. Of this value, $451,307 is for bush meat, $108,307 is for other income-in-kind, and $575,667 is for commercial fisheries, fur, wild rice and other commodities.

for a harvester in the range of $5,000 to $10,000. Some source of cash income is required to offset these costs to enable the harvesting activity to occur. Quigley and McBride (1987, p. 210) have recommended cash supplements for this purpose. The JB&NQA established an ISP (Income Security Program) for this purpose (Scott 1982, p. 54). George *et al.* (1995) have concluded that some financial support, coupled with rotational employment opportunities and flexible work periods would result in more self-reliance for those Cree in the Mushkegowuk Region of Ontario who choose to continue to hunt.

Quigley & McBride (1987, p. 210) concluded that support for the continuation of the harvesting sector was critical to the future well-being of the community. Hunting was important not only for food procurement, but also for employment of Sanikiluaq's rapidly growing population, assuming sustainable levels of harvesting. They maintained that access to credit would not satisfy the need for capital to outfit a hunter since loans must ultimately be repaid. Cash support which allowed households to remain predominantly in the traditional sector, however, would result in an increase in the harvesting of bush food and could help develop the community's overall economy. Cox (1987, p. 260-261) observed that financial supports were necessary to the survival of an aboriginal mixed economy, despite increasing populations. It was his conclusion that the overall health and well-being of northerners depended to a large extent on bush food.

It has been argued that the costs associated with harvesting exceed the value of the food taken, but further complicating this issue is the fact that not all transportation costs can be attributed to harvesting. This argument is supported by a comparison of the communities of Fort Albany and Kashechewan. These communities had similar populations but in 1990

Kashechewan reported a total of 11,386 person-days of harvesting (one of the highest in the Mushkegowuk region), while Fort Albany (one of the lowest) reported 1,780 person-days. Means of transportation for heads of households in the form of motor-canoes and snowmobiles in the two communities, however, was almost identical (Berkes *et al.* 1994, p. 358). It is therefore not possible to conclude definitively that harvesting activity is not cost-effective.

3.6 Summary and Conclusions

As data summarized in Tables 3-3 and 3-4 show, there are very few studies on the value of the bush economy and its importance in overall community economies. The studies that do exist do not allow for comparisons over time in any one area, nor do they allow comparisons of different communities for a given period of time. This makes it very difficult to study quantitatively the loss of subsistence resources on the local economy. Even though the evidence which does exist might indicate subsistence economies have declined in certain areas, such as in many parts of Northern Manitoba, the compilation of data from several dozen studies has produced a substantial body of evidence documenting the extent and vigor with which hunting and trapping continue to be practiced across the Hudson Bay bioregion. There has not been a significant decline in interest in pursuing this lifestyle, despite the changing world in which subsistence societies live, and subsistence continues to be practiced in all the arctic and subarctic societies studied.

Though local economies have a greater cash flow than in earlier times, the socio-economic problems of development and social change have been very costly. Despite government policies to that effect in the 1950s, 1960s and the early 1970s, the Northern

economy has not been converted into a "modern" one. Instead, local and regional economies everywhere in the arctic and subarctic regions of the Hudson Bay bioregion may be characterized as mixed economies (George & Preston 1987, p. 458). It is apparent that subsistence continues to have economic importance to these societies, for it provides food which would otherwise have to be purchased using the meagre cash resources available.

Harvesting activities continue to be practiced for reasons other than their economic value, however, for they also provide an opportunity for the community to practice the subsistence ethos of their ancestors. By providing an opportunity for harvesters to live to some extent as their forefathers did, i.e., in close relationship with the land and animals, all members of the society are able to reap emotional, spiritual, mental and physical benefits: bush harvests provide opportunities for traditional patterns of social interaction within the community. Sharing the harvest, for example, entails building kinship relations, exchanging information and sharing oral traditions, thereby strengthening the whole community.

The following three chapters provide case studies which examine in more depth the subsistence ethos and land use economics of subsistence societies in the Hudson Bay bioregion. The first two studies exemplify the relationship between subsistence ethos and economics over time, and from a contemporary perspective. The third case study examines the viability of subsistence in the future.

Chapter 4

Subsistence Over Time: The York Factory Cree of Northern Manitoba[1,2]

4.1 Introduction and Context

This chapter provides the first of three in-depth analyses of subsistence societies in the Hudson Bay bioregion, and examines the historical and contemporary land use practices of the York Factory Cree in York Landing, a subarctic region in North Central Manitoba (Figure 4.1). This case study encompasses more than three centuries, and provides confirmation of the enduring nature of subsistence for a small society in Northern Manitoba. This Band's land use practices over the centuries serve to characterize the subsistence ethos of this small society.

Once the methods used to develop this chapter have been described, an analysis of the historical land use patterns of mobile hunting and gathering societies along the Manitoba coast of the Hudson Bay is provided, followed by a study of their transition to the twentieth century. This period is not well documented for the York Factory Cree, so this section is based on oral histories. This chapter provides further depth to the study of subsistence in the Hudson Bay bioregion begun earlier, and concludes by assessing this society's future viability against a historical backdrop which has proven this society's capacity to endure and adapt despite the massive cultural, social, economic and environmental changes which have occurred over the last several centuries.

1. The material in this chapter has been developed into a book for use in the school curriculum in York Landing. Co-authored by H. Fast and D. Saunders from York Landing, it is titled *From Kihciwaskahikanihk to York Landing: A land use history of the People of York Factory First Nation.* The project was completed at no cost to York Factory FN as part of the researcher's responsibility to the community.
2. Appendix I provides a list of Cree technical words and species names.

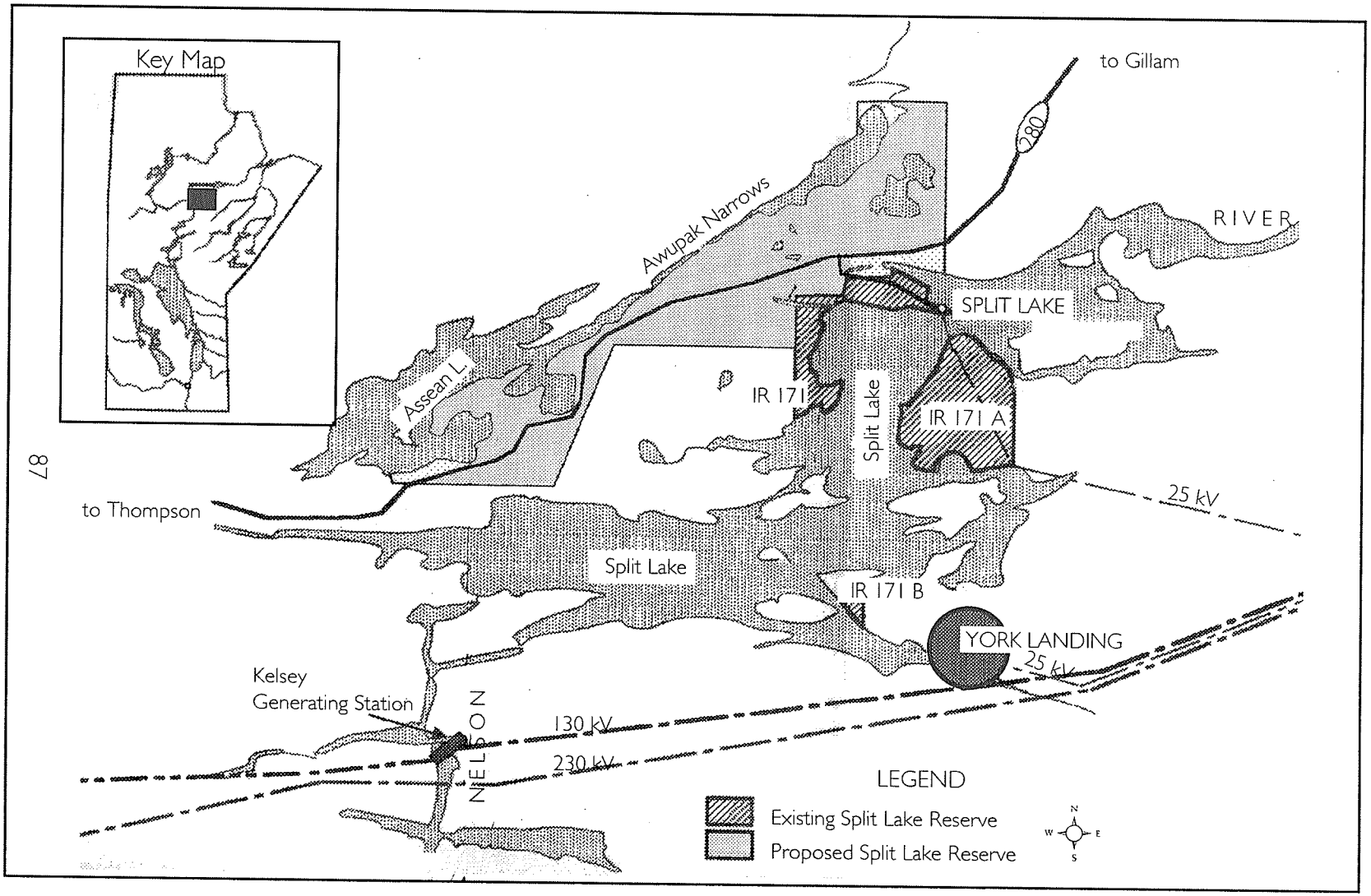


Figure 4.1: Community of York Landing. After Manitoba Hydro 1992.

4.2 Methods

This chapter is based on a historical review; fieldwork involving informal interviews and map biographies in York Landing and Thompson; map verification at the offices of MKO; comparative studies at the communities of Cross Lake and Churchill; participation in CARC's (Canadian Arctic Resources Committee) Hudson Bay Programme; and the production of maps to illustrate findings.

4.2.1 Conducting Historical Research

Most literature pertaining to the York Factory Cree is based directly or indirectly on records kept by the Hudson Bay Company (HBC), or on journals kept by HBC employees. Consequently, the historical research reviewed existing scholarly materials of the Hudson Bay archives during the fur trade period and various journals of fur traders and explorers. Very little has been written about the period following the fur trade to the present time, and for this reason oral histories figure largely in documenting this time period since numerous members of York Factory FN still have vivid memories of life on the coast and of their move to York Landing. Gathering oral histories involves documenting land use in living memory by producing map biographies of active land users and elders. These biographies, marked directly on maps and annotated, summarize the respondent's recollections of activities on the land, such as hunting, fishing and gathering, as well as travel areas, camping locations, and burial and other culturally important sites. Composite maps are then created from individual biographies to summarize collective land use for the group. Some interviews were conducted in Cree with the assistance of a local Cree interpreter, and some were conducted in English.

4.2.2 Conducting Fieldwork

Four fieldwork visits were made to York Landing: September 21 to 28, 1993; November 12 to 23, 1993; May 1 to 6, 1994 and August 3 to 5, 1994. The first visit was made in conjunction with the Hudson Bay Programme, and the first day was spent in a meeting with representatives from York Landing, Fort Severn and Shamattawa. The purpose of the meeting was to document the knowledge of elders and harvesters concerning the wildlife and environmental conditions along the Hudson Bay coast of northern Manitoba and Ontario, and to identify patterns and changes relative to their traditional knowledge of this area. The remainder of the visit was spent in getting to know members of the community.

During the second visit in November of that year a second Hudson Bay Programme meeting was held with the same participants. In addition to attending the meeting, nine informal interviews and map biographies, as appropriate, were conducted with various members of the community including elders, harvesters and women. During this visit the researcher was approached by Donald Saunders to collaborate with him in the preparation of a land use history of the York Factory Band for use by the community. It was agreed that seven Cree oral history interviews previously collected and translated by D. Saunders, would be provided to the researcher to supplement the interviews already gathered.

During the May 1994 visit two days were spent in Thompson. During this time Bert Brown, a former school teacher from York Factory, was interviewed. As well, half a day was spent in the offices of MKO reviewing map biographies of members of York Factory FN previously collected by MKO staff. This visit gave the researcher an opportunity to verify the maps being collected independently. The remainder of the time was spent in York Landing.

Two additional interviews were conducted, and time was spent collaborating on the joint project with D. Saunders.

The final visit in August of 1994 focused on a lengthy interview with Fred Beardy, an elder from York Landing, who provided additional information concerning the map biographies, and provided extensive information on the current land use practices of York Factory FN members. As well, two other interviews were conducted, and time was spent collaborating with D. Saunders on the research project.

In addition, a field trip to the aboriginal community of Cross Lake FN from July 5 to 8, 1994 was undertaken for comparative experience, in the company of NRI (Natural Resource Institute) researchers planning a harvest and land use study. This community is situated along the Nelson River system to the south of York Landing and is also a signatory to the Northern Flood Agreement. Two days were spent in meetings with various members of the community and local harvest study staff. The visit also provided an opportunity to observe a second subsistence community heavily impacted by hydro-electric development.

In February of 1993, the researcher undertook a week-long trip to Churchill, 150 km. northwest of York Factory. This trip provided the opportunity to experience first-hand the climate on the Hudson Bay Coast at the coldest time of the year, and so to gain another perspective on the survival skills which must have been required of the York Factory Cree who had lived along this coast for centuries. As well, a collection of archival items from York Factory were on display at the Churchill tourism office and a documentary on life at York Factory was available for viewing. However, the focus of the material largely overlooked the role of aboriginal people in the fur trade. This matter is now being addressed by Parks Can-

ada (Bob Coutts Mar. 1994, pers. comm.).

4.2.3 Working with the Hudson Bay Programme

The Hudson Bay Programme was created to consolidate the traditional knowledge of elders, harvesters and others from communities around the Hudson Bay in order to document what is known by these "aboriginal scientists" concerning the wildlife, land, and environment in which they live. Specific objectives included the intent to identify trends and changes over time by synthesizing this knowledge; to provide a means for aboriginal people to become involved in decision-making; and to influence policy makers concerning decisions related to the northern environment. The researcher participated in three Hudson Bay Programme meetings and two workshops, and produced the proceedings for both workshops.

The first workshop was held in Econiche, Quebec, from February 3 to 5, 1994. It was attended by aboriginal representatives from York Landing; Chisasibi; Sanikiluaq; Fort Severn; Peawanuck; Moose Factory; Whapmagoostui/Great Whale River; Repulse Bay; Arviat; Inukjuak; Salluit; Lake Harbour; Thompson; Moose Factory; Chesterfield Inlet; Saskatoon; and Edmonton. Three days were spent listening to aboriginal representatives describing their relationship with the environment, their distaste for the word "management", and their observations concerning rivers, whales, geese, and polar bears. Considerable attention was also given to how the document detailing the material which was being collected would be used, and what media should be used to distribute it, and to whom it should be distributed. Econiche is similar to a field station, and all those attending the meeting lived in the same building. Consequently, when not in meetings, less formal interactions continued into the evening. During one of the breaks an informal interview was conducted with Fred Beardy

from York Landing to learn more about the strategies he has adopted to travel up the Nelson River to York Factory since the dams built along this river have severely altered water flows.

The second workshop was held in Winnipeg from April 29 to May 1, 1994. The objective of this meeting was to bring aboriginal "scientists" together with biological and social scientists in order to begin developing cross-linkages of knowledge between the study's findings and scientific research. The issues on which these linkages were attempted included current flows, changes to and loss of habitat, effects on animal populations, migration changes, land use, traditional economies, changing values, contamination of the human food web, changes in human health and life-style, and the cumulative effects of socio-cultural changes. This meeting was attended by aboriginal representatives from York Landing, Fort Chisasibi, Sanikiluaq, and Peawanuck, and by biological and social scientists from Winnipeg, Ottawa, Edmonton, Montreal, Waterloo, Ottawa and Hamilton.

4.2.4 Map Production

The maps produced in this chapter included the PRSO maps described earlier, as well as a digitized basemap of Northern Manitoba provided by CEOS (Centre for Earth Observation Science) at the University of Manitoba. This map was provided in *Idrisi* format, and imported into *Adobe Illustrator* where text and other layers were digitized as appropriate using the pen tool. The graphic provided by Isaiah Saunders was scanned into *Adobe Photoshop*, and imported into Adobe Illustrator where text was added. The map of York Factory was provided by P. Hackett in digitized format in *Adobe Illustrator* format. All maps and figures were printed using a Canon Color Bubble Jet Printer, BJC-820.

4.3 The Hudson Bay Lowland Cree: Coasters and Inlanders

The *Mushkego* (Swampy Cree) have occupied parts of the Hudson Bay Lowland for at least 1,500 years (Pilon after Lytwyn 1993, p. 105). Describing this coastline in 1906, Owen O'Sullivan (1906) wrote that "from a geological point of view there is nothing very interesting to be seen along that part of the Hudson Bay coast which we traversed [York Factory to Severn River]. Nothing but mud flats and boulders looking seaward, and marshes, dunes, ponds and muskeg, bordered by stunted evergreen woods, chiefly small spruce, looking landward" (p. 75). The Cree who lived along this "uninteresting" coast dispersed into various bush settlements during the winter, but congregated for the summer months at Marsh Point, the confluence of the Hayes and the Nelson Rivers.

European fur traders first arrived on the shores of the Hudson Bay in the late 1600s. The first European fur trading post was established on James Bay at Rupert River in 1668. Two years later, Charles II signed a British Royal Charter granting exclusive trading rights and limited government over a vast territory known as "Rupert's Land" to the HBC. This Charter gave the private trading company "sole Trade and Commerce of all those Seas Streightes Bayes Rivers Lakes Creekes and Soundes in whatsoever Latitude they shall bee that lye within the entrance of the Streightes commonly called Hudsons Streightes" (Slattery 1979, p. 379). One of the HBC's key fur trading posts, York Factory, was first built on this flat strip of land in 1682 (Figure 4.2).

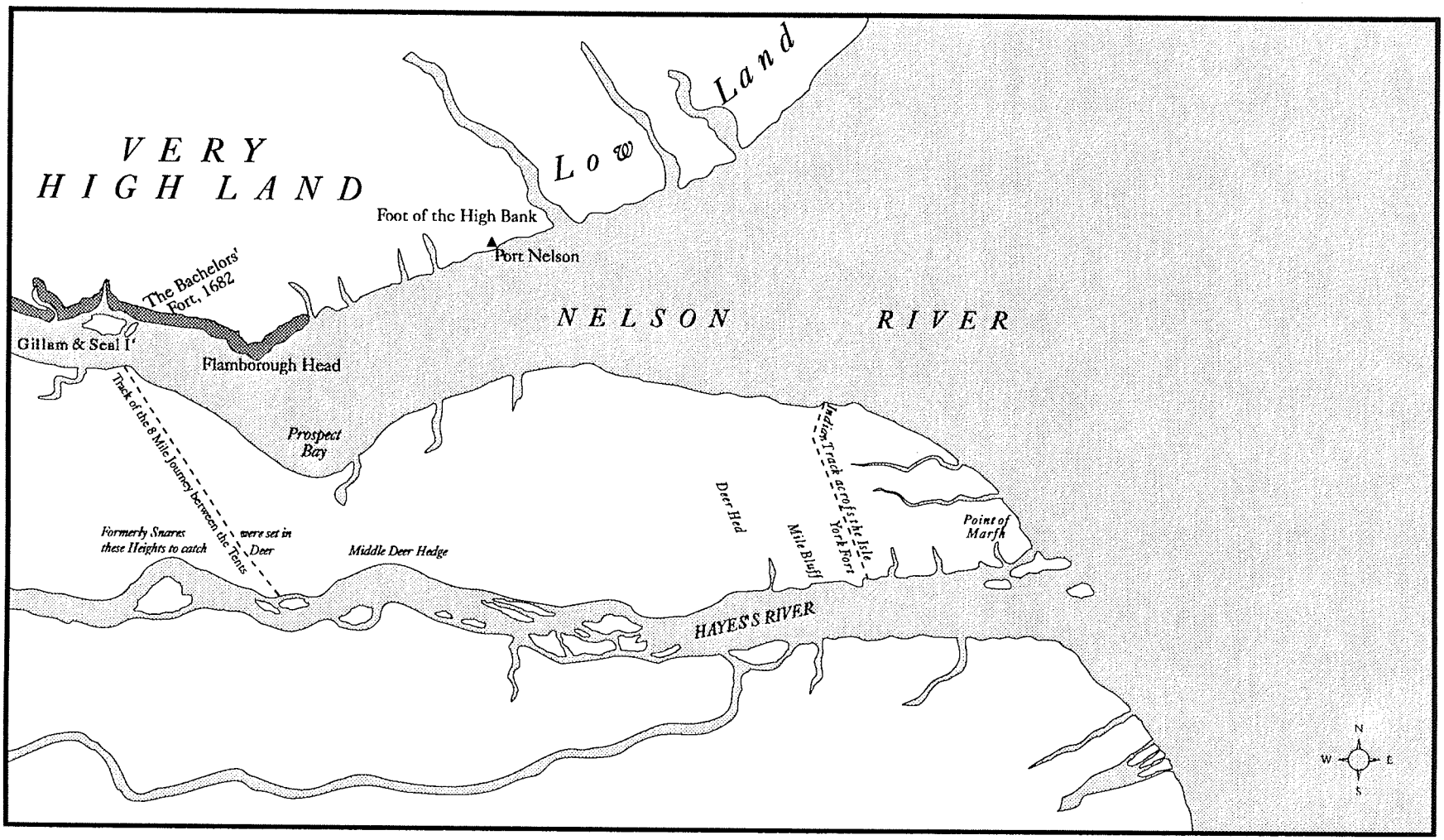


Figure 4.2. Marsh Point and York Factory in the eighteenth century. Source: Robson 1752, digitized version courtesy of P. Hackett.

European fur traders called the indigenous people of the swampy Hudson Bay Lowlands *Lowland Indians*, or *Low Country Natives* because the land they occupied was flat, but also to distinguish them from the *Upland Indians* who lived further inland. The Lowland Indians included both the *Inlanders* and the *Coasters*. The Inlanders lived along the rivers of the interior, while the Coasters lived along the coastal region. Coasters used canoes less than the Inlanders did because their land use activities led them across the coastal plain, rather than along rivers and streams, and because they lacked the materials needed to build canoes. For them, travel on foot, and later by dog-team, was more important than travel by canoe (Lytwyn 1993, p. 41).

British explorer Henry Ellis (1968), writing in the 1700s, described the Lowland Cree he encountered in this area in his journal:

> The Natives of this Land are of a middle Size, Copper Colour, with black Eyes, and long lank Hair of the same colour, but their Features vary as in *Europe*. They are of a chearful Disposition, good natured, affable, friendly and honest in their Dealings. They live in Tents covered with Moose, and Deer-Skins sewed together; as their Time is spent chiefly in Hunting, Fishing, and Fowling, they change their Habitations, according, as they find the Game plenty or scarce. They do not live in any great Numbers together, for the same Reason; because it would be more difficult to provide Necessaries to feed and clothe them.... (Ellis 1968, p. 181).

Their social and political organizations were informal, with experience and wisdom being the characteristics sought in their leaders. Edward Umfreville (1954), a writer for the HBC in the late 1700s wrote that "personal courage, patience under hardships, and a knowledge of the maners and country of their adversaries, are the qualifications sought after in the choice of a leader" (p. 23). Individuals were free to make their own decisions, but in practice decisions were usually made by consensus, and were generally consistent with the advice of the lead-

ers. Ellis (1968) described how they governed themselves:

> they [the Native people] have no Body of Laws to regulate their Conduct; but are influenced in their Behaviour, by a natural Rectitude of Disposition, that restrains them from all Acts of Violence and Injustice to one another, as effectually as the most rigid Laws could. The Chiefs in every Family or Tribe, who generally speaking are chose from amongst the most ancient of the People, but chiefly for their Skill in Hunting and Experience in Trade, Domestic Affairs, or Valour in War, which they often wage with the *Eskimaux*; direct those who reside with them in their different Employments of Hunting, Fowling, Fishing, etc. yet their Advice is followed rather through Deference than Obligation, for, in Point of Exemption from Power, they may be truly called a free People" (Ellis 1968, pp.181-182).

From 1682 until the fort was finally closed in 1957, European fur traders at York Factory relied heavily on the Coasters for provisions. They called them "Homeguard Indians", with the first written reference to "home Indians" made in 1690 by British explorer Henry Kelsey (1929) when he described the Indians living near York Factory (p. 2). The York Factory Homeguard Cree for the most part stayed within about 100 miles of the post, and called York Factory *Kihciwaskahikanihk*, place of the great house (Tough 1987, p.1).

Over the next three centuries these Homeguards were often employed by the HBC in capacities such as hunters, couriers and boat crews, but most maintained a seasonal pattern of harvesting. During the winter they lived in small kinship groups in their winter hunting grounds. Those who lived near the Fort visited it several times during the winter in order to sell furs and food provisions to the post. With the arrival of spring they all moved closer to the coast in order to trade furs, visit with other Coasters and the European traders, and most important of all, to take advantage of the return of migratory birds and caribou. Toward summer the Homeguard began to hunt game, fish and gather wild plants along the coast. In fall they returned to the large rivers and river mouth marshes to hunt caribou and

geese before dispersing once again to their winter trapping grounds (Lytwyn 1993, pp. 62 & 198).

4.4 Early Lowland Cree Land Use

The Lowland Cree depended on caribou, waterfowl, small game, fish, furbearers and plant life for their existence. To a much lesser extent they also used marine mammals. Caribou was the staple food for both Coasters and Inlanders until the early 1800s when the caribou (*attik*)[1] were no longer available in large numbers.

The annual cycle of hunting started toward the end of March, when caribou from the upland forest crossed the Nelson, Hayes and Severn Rivers on their way to spring breeding grounds as far away as Akimiski Island. In fall the caribou returned to the upland forests by the same route. Reports of these migrations estimated numbers of caribou at up to 800 in a herd, with over 10,000 caribou said to have crossed the Hayes River in two days (Lytwyn 1993, pp. 200-204). During the summer the Lowland Cree followed them back down the coast to Fort Severn, 240 miles from York Factory. Andrew Graham (1969) who was employed in the Bay-side posts of Churchill, York Factory and Severn from 1767-91 described the caribou travel routes in his journals: "They [the caribou] go along the coast past York Fort and Severn settlements in large herds in the months of May and September; but contrary to the birds of passage and other migratory birds they go to the southward in

1. The English orthography of Cree words is taken from two sources. The first is based on Rev. E. A. Watkins 1865 *Dictionary of the Cree Language as spoken by the Indians in the Provinces of Quebec, Ontario, Manitoba, Saskatchewan and Alberta*, using the Swampy Cree dialect spoken in Northern Manitoba when possible. The second source is Fred Beardy (Aug. 1994, pers. comm.). Note that spelling varies with the author.

the beginning of summer, and to the northward at the approach of winter" (p. 14). Caribou continued to travel along the coast late into the nineteenth century and George Ponask, a former York Factory Homeguard Cree confirmed that Graham's description was accurate into the twentieth century. The caribou did indeed follow the route he described. When asked why they would go along the coast rather than move the shorter distance from the bush to the coast and back he replied that his grandfather had explained it to him by saying that "they [the caribou] were put there to look after the people" (Aug. 1994, pers. comm.).

Caribou passed over frozen rivers easily during their spring migration, crossing the Hayes and Nelson Rivers about 20 to 60 miles south of York Factory, and some large herds were even observed from York Factory. Group effort was needed to hunt caribou and large communal camps were set up near migration routes prior to the annual spring hunt. Here the Cree built fences or hedges one to two miles in length to stop the herd. In fall caribou were killed with spears, bayonets, knives, arrows or pointed sticks as they swam back across the rivers (Graham 1969, pp. 14-16). Fall caribou were very desirable for food, having grown fat on coastal grasses over the summer, and having recovered from spring fly infestations. Fur traders wanted the Indians to hunt caribou only at this time, when their pelts were in prime condition, but the Indians hunted them year-round because they needed food and clothing year round (Lytwyn 1993, pp. 209-210).

During the winter caribou were hunted in the river valleys at a considerable distance from the fort. Before 1805 sleds were most often hauled by men, and so venison was too heavy to be dragged from the inland wintering areas to York Factory. Once dog sleds were routinely used for transporting supplies, however, a number of significant adaptations

became possible.

> In the late 1800s, the pattern of frequent residential movement during winter began to be modified by the construction of log cabins built in imitation of those used by white trappers; these replaced the conical lodge as the usual winter dwelling. This increasing sedentarization was made possible by the introduction of dog traction and thus greater winter mobility, greater commitment to food preservation, and the availability of flour and some other foods from the white traders. Log cabin hamlets contained between two and eight houses, typically occupied by members of one or two winter hunting groups. In winter, men sometimes moved between the hamlet and the bush on extended hunting and trapping trips while women and children remained behind. In other cases, the entire family spent periods of the winter at hunting and trapping camps away from the hamlet. Families often built and occupied two or more cabins at different sites in their territories, one site sometimes being used as a fishing camp in summer (Brightman 1993, p. 14)

In addition to their dependance on caribou, Coasters relied heavily on waterfowl in the spring. Migratory birds were hunted even before shotguns were introduced by Europeans; they were taken during the moult using snares, nets, bows and arrows, or a club on the head. A report from the fur trade describes Indians killing three ducks at once with a single arrow. Large numbers of lesser snow geese (*wawao*), canada geese (*nis'ku*), mallard ducks, (*e'yinesip sese'p*) other ducks, brants (*ayowa'poowao*) and shore birds were common. Snow buntings (*wapanukoses*) were caught with nets and considered a delicacy. Mallard ducks (*e'yinesip sese'p*) were also used for food and trade, with the duck hunt commencing after the fall caribou hunt. Graham (1969) described in considerable detail how willow ptarmigan (*wa'piuao* or *ku'skunuches*) were captured using nets and oatmeal (pp. 40-41). Large numbers of grouse (*puspuskew*) were caught by hand with a noose attached to the end of a stick. Over 200 years later, Fred Beardy, an elder from York Factory FN can still capture grouse with a stick, a noose and a quick hand (Aug. 1994, pers. comm.).

Fishing was done at the spring and fall spawning grounds, and it was customary to catch fish while waiting for the caribou to arrive. Coasters fished close to the mouths of rivers and so depended most on the fall season when whitefish (*uti'kumak*) spawned in these areas. Pickerel and suckers were sometimes caught by hand, and sometimes by clubbing them at rapids. The Lowland Cree used nets, spears, hooks and weirs (traps or baskets) to catch them by the hundreds. Gill nets were used throughout the year in many locations, with drag nets being used only when there was no ice. During the winter the Indians set gill nets under the ice, much to the amazement of the Europeans. Burbot spawned in the winter and were caught with a hook and line using caribou meat as bait. Weirs were set up in several places along the Nelson River, both in ice and free flowing water conditions (Graham 1969, pp. 294-5; Lytwyn 1993, pp. 223-6).

Thousands of white suckers and longnose suckers were routinely caught at weirs. Though they were too bony to be desirable eating, they were used for dog food, and served as a reliable subsistence food when other fish were not available. These weirs too, were still being used by York Factory Cree in the first half of the twentieth century. Isaiah Saunders (Aug. 1994, pers. comm.) described how he and his father built a 30 metre weir across French Creek in about two days using over 100 poles for each weir. The trap itself was built about a foot deep, three feet wide and three feet long. In the later years three inch wire mesh was used to build fall weirs instead of poles. Staked onto the shore, the sixty foot long mesh wire was extended across the river by men in a canoe pulling it on a long line. Mostly they caught whitefish, jackfish, mariahs and suckers. Isaiah built his last weir around 1944.

Furbearing animals were hunted year-round (Lytwyn 1993, p. 253), and following the

decline of caribou in the 18th century the beaver (*u' misk*) became an important food source for the Lowland Cree. Other furbearing animals were eaten, and included otter (*nikik*), marten (*wa'pistan*), mink (*sa'kwasew*), wolverine (kwekwuhakao), lynx (*pi'sew*), red fox (*osawukasew*), arctic fox (*wapu'kasew*). beaver, muskrat, and lynx. Porcupines (*kak* or *kakwu*), black bears (*mu'skwa*), and polar bears (*osa'wusk*) were also used for food and other products. Snowshoe hares (*wa'poos*), another important source of food and clothing, were caught by laying snares across their paths. They were normally abundant, but every nine or ten years their population crashed. Furbearers which were eaten only when other foods were not available included the fisher (*ochak*), badgers (*we'nusk, mistunusk*), marmots, and wolves (*muhe'kun*) (Lytwyn 1993, pp. 253-60).

White whales or belugas (*wa'pumak*) were plentiful and often damaged fish nets in the Nelson and Hayes River estuaries in the summers, just after ice break-up. The Coasters hunted some marine mammals for use as dog food and oil. Seals were hunted for dog food, for leather and for purposes of trade. Marine mammals were caught with hand-woven nets, a weaving skill which Isaiah Saunders still possesses (Aug. 1994, pers. comm.).

4.5 Coasters and the Fur Trade: 1670 to 1900

4.5.1 York Factory Cree and the HBC

During the first year of operation after York Factory was built in 1682, trade totalled 4,000 MB. Within forty years York Factory had become the HBC's most important trading post and in 1730 York Factory trade peaked at about 40,000 made beaver (Payne 1989, p. 15). At that time posts were being established inland, and the fur trade was becoming more competitive. Large-scale commercial trade in caribou tongues began to develop in York Fac-

tory in the late 1740s, partly in response to increased competition from these inland posts. Once inland posts had been established few Upland Indians continued to make the trip north to trade at York Factory (Lytwyn 1993, pp. 333 & 377), and trade at York Factory had dropped to 26,000 MB by 1760, and to 10,000 MB by 1775, its lowest level in fifty years (Payne 1989, p.15).

By the mid-18th century a large number of Homeguard Cree had become increasingly involved in provisioning the Fort with geese, caribou, fish, ptarmigan and snowshoe hare, as well as with snowshoes, sleds and shoe leather, and other country food. The Europeans depended heavily on these supplies, not only because the quantities of food they could import were limited, but also because local country food was healthier and tasted better. The Homeguard Cree also hunted and sold belugas, or white whales, as well as seals, to the traders for oil to light their lamps (Lytwyn 1993, pp. 347-349).

Homeguard Cree regularly travelled between posts to visit friends and relatives, and were soon employed by traders to carry packages from one trading post to another. Over time the fur traders came to rely heavily on these means to exchange important information with each other, as the growing fur trade competition in the late 1700s increased the importance of the courier as a means of communication between posts. Edward Umfreville, a writer for York Factory from 1771-1782, commented with some amazement on their work that "after a trial of fifteen years, it is a well-known fact, that not an instance has transpired of any embezzlement being made: on the contrary, the whole of these little cargoes are delivered up with as much punctuality, as if their future welfare depended on their honesty" (Umfreville 1954, p. 95). Umfreville had little reason to be amazed, for honesty is a cultural

trait of the Cree and also typical of subsistence societies. When everything is shared, and one's unmet needs are provided for by group effort, there is no reason for theft.

In addition to provisioning the fort and working as couriers, by 1783 the Homeguard Cree were being employed to run boat brigades to the HBC's inland posts. These efforts provided the labour needed to develop a transportation network between York Factory and Lake Winnipeg (Lytwyn 1993, p. 349).

4.5.2 Responses to Loss of Animal Resources

In 1821 the NWC merged with the HBC, and ended forty years of intense rivalry. Recognizing that animal populations had been severely reduced as a result of competitive trading practices, the HBC prohibited the hunting of beaver in order to let the population replenish. The Lowland Cree needed food, however, and continued to hunt them for this purpose. Due to the shortage of both large game and fur-bearing animals, the trade in geese increased at this time. Previously, a "good year" had been one in which 10,000 to 15,000 geese were shot. By 1850 a good year was one in which 20,000 to 30,000 birds were taken. In response to the drop in activity at the fort and the decline in animal populations, some Lowland Cree chose to depend almost entirely on fishing, hunting, and trapping, often requiring few supplies from the fort. The Homeguard Cree continued to supply the fort with country provisions, but since more effort was required to subsist as a result of the shortage of animals, they had less time to be involved in the fur trade.

Still the best route to the inland posts, York Factory at this time became the capital of the fur trade in western Canada. New buildings, including the "Depot" warehouse were built (Payne 1989, pp. 21-22). The Cree enjoyed more regular employment and as a result

built clusters of cabins at traditional hunting and fishing sites near York Factory. The increasing numbers of Homeguard employed to hunt geese to provision the Fort resulted in more Homeguard staying in the area of York Factory during the spring and fall.

In 1838 the HBC was granted a new 21-year license for Rupert's Land. By the time it expired in 1859 there was less activity and less demand for manufactured goods at York Factory, because the southern trading route was proving to be a more efficient supply route to inland posts. After its licence expired in 1859, the Company continued to operate under the authority of the Royal Charter until 1870. As American settlers pushed north and westward, the new Canadian government which had been created under the *Constitution Act, 1867* moved to annex Rupert's Land. In 1868 British Parliament passed the *Rupert's Land Act, 1868* which empowered the HBC to surrender Rupert's Land to the Queen.

At that point negotiations were undertaken regarding the terms of such a surrender (McNeil 1982, pp. 2-5). The *Rupert's Land and North-Western Territory Order* was signed in 1870, and Rupert's Land was admitted into Canada on July 15th of that year. Under terms of the transfer the HBC was relieved of all responsibility for any claims by Indians to compensation for lands; responsibility for the well-being of Indian tribes was transferred to the Canadian Government (McNeil 1982, p. 11). The British government's expectations regarding Canada's obligations to Indian tribes were described in a letter from Lord Granville, the Colonial Secretary, to the Governor General of Canada:

> I am sure that your Government will not forget the care which is due to those [Indian tribes] who must soon be exposed to new dangers, and, in the course of settlement, be dispossessed of the lands which they are used to enjoy as their own or be confined within unwontedly narrow limits (cited in McNeil 1982, p. 23).

Rupert's Land was admitted to Canada at a time when York Factory was increasingly being by-passed as a transportation route, and the HBC had to take serious cost-cutting measures to offset revenues losses. In 1874 the Depot was emptied, and the remaining supplies sent to Winnipeg. In 1876 York Factory incurred a $10,000 loss, and by the early 1880s Cree labour was being used much less than had been the case since the 1800s. In addition to the loss of wage employment, food supplies continued to be inadequate. Fur bearing animal populations still had not recovered, and caribou, partridges, and rabbits were scarce. Tough (1987) wrote "there can be no doubt that York Factory's decline as a major establishment coincided with a crisis in the resource base of the native economy. The enduring nature of this crisis suggests that it was not a standard cyclical shortage" (p. 9). The York Factory Homeguard Indians were in dire straits, but the HBC was not prepared to support them. In 1883 22 Cree died, and "by August [of 1884] it was apparent that there was no work and the choice was starvation or a return to the bush" (Tough 1987, p. 10).

By 1889 most of the York Factory Homeguard Indians had returned to bush life, or had moved to Split Lake. Others crossed the 1875 treaty boundary to Cross Lake and Norway House. Attempts to re-settle around Lake Winnipeg were prevented by the combined efforts of the Methodist Church, the HBC and the Department of Indian Affairs, however, for "it would be unjust to the HBC and a serious disadvantage to the fur trade" if they lost their pool of surplus labour (Tough 1987, p.17).

4.6 Impacts of the Declining Fur Trade

The Government of Canada was able to negotiate treaties with aboriginal people quite readily in the late 1800s and early 1900s because food shortages caused by depleted

animal populations left the aboriginal groups hungry and vulnerable. Treaty Five (see Figure 3.1) to the south of the Hudson Bay Lowlands was signed by Her Majesty the Queen and the Saulteaux and Swampy Cree Tribes of Indians at Berens River and Norway House in 1875. An adhesion to this treaty was signed in 1908 by Split Lake and Nelson House.

The York Factory Homeguard Cree sought for some time to be included under Treaty Five in order to get some relief from their very harsh circumstances. Kickee-ke-sick from York Factory argued for a treaty for the York Factory Band who were becoming more destitute with every year (Tough 1987, p. 16). The Government of Canada did not want the Lowland for settlement purposes, however, and for this reason did not wish to incur the costs of signing another treaty. As an alternative to extending the benefits of Treaty Five to these people, then, the Department of Indian Affairs transferred some funds to the HBC's "sick and destitute account" instead. This account had been set up by the HBC in order to provide some relief to Lowland Cree who turned to them for help (Tough 1987, p. 17). It was not until August 10, 1910, that York Factory Band signed an adhesion to Treaty Five in York Factory. Terms of this treaty included the allocation of reserve lands up to a maximum of 160 acres for each family of five, and the right to hunt and fish in unoccupied areas, subject to government regulations. No request for a land transfer was made at the time of signing (Hilderman *et al.* 1986, p. 5).

Beginning in the early 1920s supplies were sent to York Factory annually on the Fort Severn schooner. Supplies were also transported on a gasoline motorboat which travelled from York Factory up the Nelson River to Mile 352 on the rail line. Toward the end of the decade an airplane was used to bring supplies to the Fort. From there supplies were moved

to the outposts of Kaskatamagan and Shamattawa by scows which were usually pulled by Homeguard Cree.

In 1930 the Natural Resources Transfer Act transferred all lands, mines and minerals to the Province of Manitoba. This meant that any future negotiations concerning unresolved treaty land entitlement between the federal government and the Indian Band would now require the involvement of a third party, the Province of Manitoba. In 1933 York Factory lost the status of a customs port of entry, and an out-migration of Homeguard Cree to Split Lake, Shamattawa and new sites along the railways occurred. In 1947 two different groups of York Factory Band members formed the Shamattawa and Fox Lake Bands. Some York Factory Homeguard Cree chose to stay on the coast, continuing to follow the subsistence life-style of their ancestors.

4.7 Land Use in the Twentieth Century

This section describes the changing lives of the Homeguard Cree who remained on the coast until their re-settlement in 1957. This period is not well documented in written records, but the events and circumstances that transpired are retained in the collective memories and oral culture of the Band. First-hand accounts are used also to describe their move inland and their adaptation to life in the second half of the twentieth century. The material in this section is based primarily on interviews with elders and others from the community of York Landing, and the writing style changes to a more informal style because of this shift.

4.7.1 From 1900 to 1957

During the first half of the twentieth century, the five groups of people which represented the York Factory Band continued to spend their summers in York Factory, and their winters on the trapline in the York Factory RTL (Figure 4.3). These five groups were from Port Nelson, where about ten families spent the winter trapping; Fishing Island (*Wanatawakau*) where four families wintered; Ten Shilling Creek, where another four families spent the winter; Kaska where twelve families lived; and Shamattawa where there were a number of families (Isaiah Saunders, May 1994, pers. comm.). This sub-section describes the lives of the people from Kaska, Fishing Island, and York Factory.

Life in The Kaska Settlement

Joseph Saunders (Aug. 1994, pers. comm.) was born in Kaska in 1907. His grandmother was from Attawapiskat, and his wife's family was from Big Trout Lake and later Fort Severn. Joseph's wife, born in 1910, died in 1993. When he speaks of life in Kaska he describes a family living in harmony with the seasons and the cyclical food supply. Their only means of survival was daily hunting and trapping. The caribou was still their most important source of food, but they also ate ptarmigan, rabbit and beaver. There were no lakes in the immediate area for fish, but he knew where to catch fish in the river when they were in season. Joseph hunted seals with a harpoon and used them for dog food. Sealskin was used to make ropes and to patch boots and moccasins. His family travelled together to their main trapline on the Mistgogan River, and while trapping they met other families from as far away

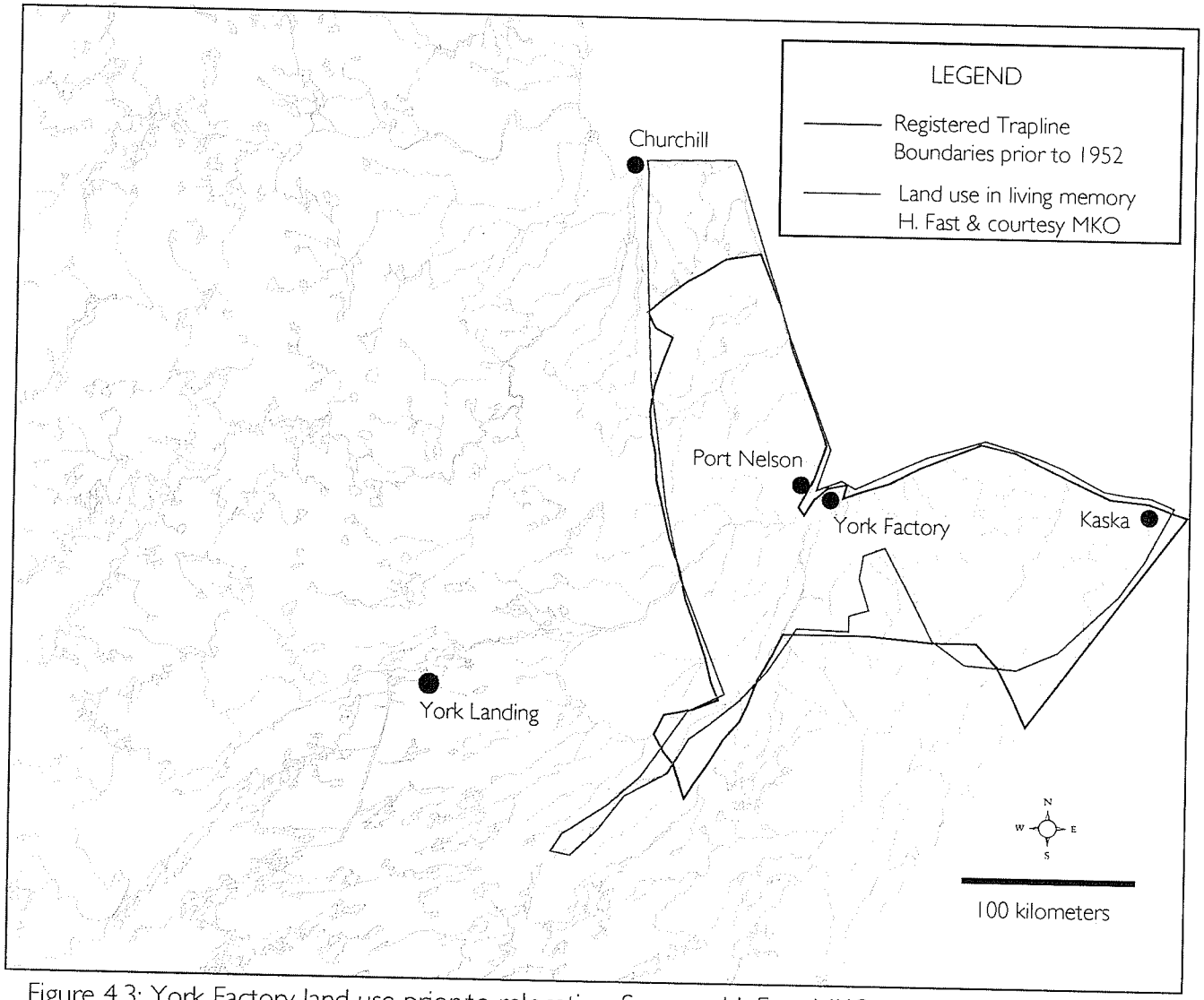


Figure 4.3: York Factory land use prior to relocation. Sources: H. Fast, MKO & Manitoba Surveys and Mapping. These maps are generalized at the request of Chief Eric Saunders (May 1994, pers. comm.).

as Fort Severn. His eight children were born on the trapline.

Life was peaceful, and the children were more settled than they seem to be today. Usually two families travelled together and they took half the food they caught to the other family's teepee. People lived by sharing. Before they could afford to buy canoes and dogs they carried supplies on their backs. After they got sleds they often pulled them themselves. The people liked this life-style, travelling to York Factory for Christmas, Easter and for the summer when the school was open.

During the summers Joseph supplied wood fuel and food to York Factory and did freighting up the Hayes River to Cross Lake, Shamattawa, God's River and Fort Severn. He also delivered mail by dog team as far as Split Lake. Joseph remembers that the people were much healthier when they lived off the land, and when the environment was healthy (Aug. 1994, pers. comm.).

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Fred Beardy (Aug. 1994, pers. comm.) and his brothers Isaiah and Thompson lived in Kaska as well. Today when Fred Beardy gets reports from people who visit the area he hears that it is still as he remembers it, and that trout still fill the creeks. When he and his brother lived there as children and young men they survived by hunting, fishing, trapping, and gathering any edible food they could find. They worked all week to feed their families but on Sundays everyone stopped work to attend church services. At the end of June Fred's family left Kaska and travelled along the coast to York Factory, hunting, trapping and fishing as they needed food. Toward the end of August they began the return journey to Kaska where they spent the winter. This settlement had twelve cabins plus the Hudson's Bay Store. Fred

remembers that in those days children followed their elders, even when out in the wilderness living in tents. No matter where they were, they were at peace with themselves. Travelling back and forth along the coast was how he lived from when he was born until after he was a grown man with his own family. He too recalls that people were much healthier then, and that there were no major illnesses such as there are today. When his family needed medicine they got it from the land. It seems that when they started buying canned food from the Hudson's Bay Store they began to notice people becoming sick.

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George Ponask's family also lived in the settlement on the Kaskattama River. George (Nov. 1993, pers. comm.) was born there in 1936, and his family travelled back to York Factory for the summer, sometimes in their boat (his father had the first out-board motor), and sometimes walking along the coast. During the rest of the year they lived in tents and cabins, using out-camps when they worked their trapline about 40 miles from the settlement toward Fort Severn. They harvested snow geese, which were gutted and salted for the winter, and toward freeze-up, and when the snow was strong enough to travel on, they went after moose. This they froze for later use. Berries were also preserved or frozen. Carrots, onions and other basic vegetables were grown as far north as Kaska and Fort Severn in the earlier years. George's father died when he was only seven or eight years old, and his grandfather moved the family back to York Factory. After that they spent their winters on a trapline along the Nelson River, living in a cabin at the mouth of Angling River and in cabins on the Weir River. Caribou and moose were plentiful in this area, and dog teams were used to pick up supplies from nearby York Factory. As before, summers were spent in York Factory.

When he was a young man George moved away to find work. He found it on the railway line from Churchill to Lynn Lake.

Life in the York Factory Settlement

Isaiah Saunders (May 1994, pers. comm.) was born in York Factory in 1925. As a small boy he sometimes went trapping with his father, George Saunders. He remembers his father using whale nets to catch whales which he used to feed the dogs. Isaiah learned how to make whale, sturgeon and other fishnets from him. Seals were also hunted for dog food, and sealskin which is very strong, was used to make dog harnesses. After he was 16 years old he went trapping with his brother-in-law. They trapped one-half of the trapping area each year, and used the other half the following year. He spent one winter at the portage of the Michachi and Kaskatama River, and he remembers that there were a lot of moose in that area.

Band members reached York Factory in early spring, to meet the schooner and earn some money by unloading its cargo into the warehouse (Isaiah Saunders Nov. 1993, pers. comm.). They were also able to earn money by hauling freight to Shamattawa on scows, and Isaiah Saunders describes how he hauled freight to Shamattawa from York Factory:

> It took four nights and five days. Each man pulled a scow with ten 100 pound weights along the shore. I made three trips each summer. We started early in the morning and camped late at night when the sun went down. We walked all day, with two meals. We walked across creeks that entered the river and we walked through the rain. There were not very many bugs to bother us. But it was often hot and hard work at the rapids. Food was paid for and I was paid $25 a trip—good money in those days. There were rapids on the way, two miles long, but we walked along the shore. My father [George Saunders] used to build scows. We used sails when the wind was from the north. A scow had long oars which four men pulled and we came back using oars. Sometimes we cut down spruce trees which we lashed onto each side of the scow and this

> way we could float down the middle of the river. My father was the captain and my father-in-law sat at the rear. We set rabbit snares sometimes so we could eat rabbits. There were lots of rabbits all over the place. There was no time to catch fish. We couldn't take a canoe which you needed to set the net (Isaiah Saunders Nov. 1993, pers. comm.).

This method of moving freight was used into the 1950s, and George Saunders built scows until the year the Band was relocated.

When not hauling freight during the summer, the Homeguard Cree fished and hunted ducks and geese. They left York Factory in late fall, but took no meat back to their winter settlements. Sometimes they returned to York Factory by dog sled in the winter, and on those occasions they sometimes took flour back with them. Otherwise they were self-sufficient and able to find enough food for their needs. An abundance of wildlife in this area was reported by O'Sullivan who wrote that "speckled trout and white fish are plentiful at the mouths of all the rivers entering the bay. When at the mouth of the Kaskattamagan, we set the net at low tide and at the following low tide had over a hundred trout and white fish, over two pounds each. Caribou and red deer [sic] are also plentiful. Ptarmigan and duck are also numerous there. Foxes and wolves were seen all along the coast"(1906, p. 76).

After he was married, Isaiah and his wife lived with her parents at Fishing Island (*Wanatawakau*) which was five miles from York Factory. People had lived on *Wanatawakau* for as long as he could remember, and he has heard that a lot of people lived there once, including a trader who bought furs. Lots of fish were caught in the fall and frozen for winter food. The area had plenty of moose, but they often went across to Port Nelson and beyond to get caribou. There were plenty of caribou there, and Isaiah and his father-in-law hunted barren-land caribou right after freeze-up. The hides were used to make ground sheets. His

father-in-law decided where they would go hunting and trapping since it was the custom for the oldest person to decide these things. They stayed out about three weeks to work the trapline, and then returned to their families in order to take them food. Often Isaiah took his family with him on the trapline, but he preferred that they stay in York Factory where his children could go to school.

The area he trapped had plenty of mink, otters, beavers, and also caribou and moose. Isaiah believes there is still plenty of wildlife in this area, but that no one traps there now. Isaiah left York Factory with his wife and four children in 1956, because he could no longer make a living from the fur market. On April 21 of that year he went up the Nelson River by dog team. He started working in May at Mile 396, living in a house that the railway provided to him. He retired in 1987. Today he lives in an apartment in York Landing.

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Maria Saunders (Nov. 1993, pers. comm.) was born in Fort Severn in 1916. In 1935 she and her father paddled from Fort Severn to Kettle Rapids from where they travelled to York Factory to join her married sister. Here she was married to Tommy Beardy, her first husband. He fished, snared rabbits and hunted geese in the fall. When he went trapping he was gone for about ten days at a time, and during his absence Maria and her mother-in-law set up nets in the Hayes River to catch fish. They caught whitefish, jackfish and trout. Other daily tasks included hauling water and chopping wood.

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Mary Saunders (Nov. 1993, pers. comm.) was born in 1930 in Shamattawa. As a young girl she travelled with her family as they hunted and trapped around Shamattawa.

They lived in a cabin in the winter, and in the summer they lived in tents which were large teepees made of poles covered with skins and moss around the base. Spruce boughs were spread on the floor. She learned to skin and clean the animals her parents brought home, and to stretch and tan the hides. Sometimes they smoked the meat and made lard out of the grease. Their trapping was very successful and she remembers skins hanging everywhere. She moved to York Factory by boat in 1947 where she was married by arrangement to Horace Saunders. They had twelve children. While her husband went out hunting and trapping she looked after the children, chopped wood and hauled water. Before they had their own house they lived with her husband's parents.

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A young school teacher named Bert Brown (May 1994, pers. comm.) shared the final years of life in York Factory with the Homeguard Cree. He remembers that the people lived mainly on what they hunted and trapped, with the Bay store carrying provisions of flour, lard and tea. The store carried no fresh meat and the only canned meat it stocked was Klik. There were still some caribou and moose in the area, but if the caribou did not come down to the fort, the hunters went further inland to get them. Geese hunted in the fall and spring were another very important source of food, and when possible waterfowl were preserved for winter use by salting them in pork barrels and by smoking them. Hunters in search of geese travelled up the coast from York Factory, leaving on one tide and coming back two tides later. If they were seriously intent on hunting they went to Fourteen's Creek, otherwise they went to Marsh Point. Ptarmigan were plentiful around the Factory and provided another food staple. Bert recalls shooting a half dozen ptarmigan from his kitchen win-

dow one morning before school, and during his first winter at York Factory in 1952-1953 he ate ptarmigan at least four days out of seven. Fishing also was not too bad. Trapping was down, but this was the case in other regions as well.

Times were hard but people did not go hungry. They were self-sufficient. The men treated the women well, and they in turn respected their husbands. The people were for the most part very healthy. A medical doctor travelled to York Factory twice a year from The Pas, though he mostly just pulled teeth. Infant mortality was very high, Bert recalls, and if babies got sick they generally died. But there was no incidence of cancer, diabetes or heart attacks, and he remembers that the people also had great endurance. By way of example Bert told the story of Horace Saunders who went out hunting with five shells one morning. He found the tracks of two moose and started to chase them down. He ran all day and toward evening he fired three shells. He missed. He ran another half hour and shot both moose. In another story Bert described how George Spence used to move freight by dog team from York Factory to Upper Fort Garry at the Forks in the City of Winnipeg. He usually needed only 16 days to travel the 1000 mile return trip (Bert Brown May 1994, pers. comm.).

4.7.2 Re-location to York Landing

The decline in fur trade activities continued steadily, and by the mid 1950s the HBC was employing only two people: the manager and a clerk (Ernie Scott July 1994, pers. comm.). The Fort Garry supply ship came in twice a year, if possible. If not, a plane might bring in supplies. If neither the ship nor the plane came in, people made do with what they had. During the 1956-57 fiscal year, sales at York Factory fell to $34,000. Low fur prices cou-

pled with low returns caused the HBC to close its operations. The federal government assumed that the Indians living on the coast depended on the fort for survival, so that with its closing it would be necessary to move these people. Five representatives from Indian Affairs went to York Factory in the fall of 1956. They called a general meeting in the Hudson's Bay Store to tell the community of the government's plans to move them inland. William Beardy, Chief of the York Factory Band, had left the community a year earlier to search for work and so only the two Councillors were left to act on behalf of the Band (Mary Saunders Nov. 1993, pers. comm.). Douglas Chapman (July 1992, pers. comm.) remembers that "it was said at this time that there would no longer be any sales of furs....'There's nothing here to support your livelihood once everything else is closed down', this is what the Bay Manager told us".

Joseph Saunders (Aug. 1994, pers. comm.) remembers that another reason given for moving the people was related to housing. They were told that they would not be able to get housing in future if they remained in York Factory, because of a shortage of timber. He points out also that people were leaving the community to look for work along the Hudson Bay Line and their numbers were declining. Nonetheless, the food harvest was plentiful and the Indian Agents were aware of this. When reminded of this the Agents said that there was an abundance of food in the new location also.

Still not convinced, the people were taken aback by the idea of being relocated, and asked why they should move when they had everything they needed—the store, the church and the school. The Indian Agents promised that if they moved a store, school and church would be provided to them, and that their trapping and other equipment would be picked

up later and flown out to them. Regarding their new home the people were told only that they would get a settlement on Split Lake, and not in the village of Split Lake.

Fred Beardy (Mar. 1991, pers. comm.) remembers that they were directed to leave behind their personal belongings, trapping equipment, sled dogs, and most of their dogs which had been their only means of transportation in those days. The agent informed them that all their personal belongings and equipment would be replaced. At least one hundred children under ten years of age, and another hundred young people and adults travelled the 250 km. inland from York Factory to York Landing. Some left by dog sled in early spring. Others left by boat in July. They left with no idea of what the new location would be like. They took with them what they could pack on their sleds or in their canoes (Mar. 1991, pers. comm.).

Travelling by way of the Nelson and Weir Rivers, or by way of the Hayes River they reached the railway. From there they took a train to Gillam, and then to Ilford. The women and children remained here while the men travelled by boat to the mouth of the Aiken River where it spills into Split Lake. The men began clearing trees and brush by hand in order to be able to start building log cabins for their families. Plywood was flown in by plane. By the time winter set in they had completed twelve 16' x 18' cabins. They received food rations but no payment for their labors (Fred Beardy Mar. 1991, pers. comm.).

Many found the first years at York Landing very difficult. Everything seemed and felt different. They had been moved from a high subarctic coastal region with forest and tundra, to a location 250 km. inland to a high boreal region covered with coniferous forest, bog and swamp. The climate here was milder, but there was also significantly more rainfall (Hilderman

et al., 1986, pp. 50-51). For a people who had depended on a detailed and intimate knowledge of their environment to survive, the unfamiliar surroundings were very disorienting (E. Scott July 1994, pers. comm.). Fred Beardy (March 1991, pers. comm.) wrote "We live on land which has such little potential for land development, land which is mostly muskeg, bog, and clay. There are no resources to continue our life styles of hunting, fishing, and trapping [that we used to survive on the coast]".

The water at their new home was different from what they were used to, and the fish tasted different too. The new environment was so different, says Joseph Saunders, that "it was like changing our way of thinking and looking at things in a different perspective. All our lives, we [had known] exactly where to go to continue living and supporting our families under our traditional life style" (Aug. 1994, pers. comm.). Their in-depth knowledge of the environment which they had relied on for survival all their lives was often not relevant in the new location (Fred Beardy Mar. 1991, pers. comm.).

The Band had been promised that they would be given everything they needed to support their families. They had been promised that their equipment would be delivered to them or replaced. It was not. It is true that during the first summer in York Landing they were given boats, and that the following winter they were given six sleds. In place of the 19 foot canoe Fred Beardy had left behind, however, he was given a boat so poorly constructed that it lasted only one season. Most of the dogs that had been used for hauling fuel and wood, for fishing, hunting and trapping had been left behind. The few that had made the journey were in poor health because they had problems adjusting to the new diet of lake fish. As a result they were not healthy enough to use for work, and transporting goods

became a major problem, even in the winter (Fred Beardy Mar. 1991, pers. comm.)

The Indian Agent had promised them an abundance of food in the new location. The caribou, moose, waterfowl, fish and berries which had been so plentiful along the coast were less so here. They had left behind an extensive trapline section, but at Split Lake they were not given a land use area of their own. Families on the coast had been able to stock a winter's supply of fish for themselves and their dogs. On the coast they had fished by seining (pulling the net) in the mouths of the Nelson and Hayes Rivers in early fall. Fred Beardy recalled times when pulling in one net would fill a twenty-foot long boat. Those quantities of fish were not available here. Instead, monthly food rations were given to the band members, but even getting the groceries from Ilford posed a difficult problem (Fred Beardy Mar. 1991, pers. comm.).

Fred Beardy (May 1994, pers. comm.) went out to find a trapping area that first winter. He learned later that the area he had chosen already belonged to a trapper from Split Lake. This trapper allowed him to continue trapping that area however, and this is the same land that Fred has used since then. Though the York Registered Trapline existed until 1973, access to this area was no longer viable on a continuing basis. On September 18, 1958 four men returned to York Factory to trap their old traplines. John Beardy and his son Simon, Albert Beardy and Horace Saunders paddled up the Nelson River to York Factory. They spent the winter there, but after that year the Split Lake Band gave them Trapline No. 13. It was not abundant with food, and could not be depended on as a source of extra money. For a few years York Factory trappers also borrowed trapline nos. 59, 58, 62, 74 and 61. They were subsequently returned to the Split Lake trappers. At present only Split Lake Sec-

tion Line No. 13 is still being used by York Factory trappers.

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Obediah Wastesicoot (Nov. 1993, pers. comm.) trapped for three years after he moved to York Landing in 1957. He used dogs in the winter and boats after spring break-up, going out twice a month from November to May. He also started fishing shortly after moving to York Landing, something he had not done in York Factory.

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Maria Saunders (Nov. 1993, pers. comm.) remembers that she and her husband lived much as they had along the coast after they moved to York Landing. Her husband went fishing, snaring, trapping and hunting caribou and moose. In the years following their arrival, however, she noticed a lot of changes after the flooding caused by hydro-electric development. The changes destroyed habitat for ducks, geese and other wild birds.

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Roderick Ouskun (May 1991, pers. comm.) says that when he first came to York Landing there were lots of wild animals, fish and waterfowl in the area, and the rivers and lakes were stable. Once Kelsey was completed in 1961, however, floating debris became a problem. This debris included big square timbers full of spikes which often damaged nets and made travel difficult. Flooding also became a big problem, particularly in the fall after the dam was shut at Kelsey, when the water rose right to the treeline around the lakes and rivers. As a result, beavers, muskrats and other animals that lived in the water died each fall after freeze up.

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Joan Godé (Nov. 1993, pers. comm.) moved to York Landing from York Factory as a young girl. At that time, she remembers, life was more difficult in some ways because they had no running water, but the log houses they lived in were warmer than the bungalows they live in now. They used oil lamps for light, and if they ran out of oil they used candles. If no candles were available they twisted a cloth around four buttons and used this as a wick which they secured on a saucer by pouring melted lard around it. Once hardened, they lit the wick. She recollects that her father had been unhappy about leaving all the trapping and fishing he had done around York Factory. Her mother too, had longed for the coast, and craved the wild food she had enjoyed there, and the ready access to furs from which she made clothing. After they moved to York Landing her father did some fishing but not much.

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Donald Saunders (Nov. 1993, pers. comm.), Isaiah Saunders' son, moved to York Landing in 1973. He remembers that at that time there was good hunting, fishing, and trapping. "Everybody was doing it." Twenty years later, however, there are no longer the resources needed to support the traditional life-style of hunting, fishing and trapping. An inadequate resource base coupled with the impacts of extensive hydro-electric development on the river systems and a growing population have played a significant role in this decline. Country food is still generally the preferred diet, but it is difficult to get country food and so store food has to be purchased. There is still a core of hunters who do the hunting and share it with others in the community. As a result, the elderly who are no longer able to hunt still very often eat country food which includes moose, caribou, fish, waterfowl,

ptarmigan, rabbits, and beavers. As well, there is an annual spring hunt for geese and ducks in the area around York Landing, and a group of hunters travels to York Factory for goose and moose hunting in the fall. In 1993 a caribou was seen on the opposite shore of Split Lake for the first time. Usually hunters have to travel 30 to 40 miles south of Ilford to get caribou.

4.7.3 Impacts of Hydro Electric Development

Kelsey Generating Station was the first major hydro-electric development to utilize part of the 2,200,000 kilowatts of hydro electric power potential of the Nelson River. It commenced operation in 1960, only 20 kilometres from York Landing. This project marked the beginning of another chapter in the lives of the York Factory Band. Much of the next 35 years would be spent attempting to negotiate compensation for damages suffered as a result of these projects. Six years later construction began on the Kettle Rapids Generating Station, approximately 120 kilometres down the Nelson River from York Landing. The Nelson River waterway was further affected by the regulation of Lake Winnipeg outflow and diversion of the Churchill River, completed in 1976. In all, 9,000 Cree and 1,500 nonstatus Indians were affected. About 213,680 ha were flooded, of which 4,730 ha belonged to Indian bands (Day & Quinn 1992, p. 107).

No baseline data on the plants, animals, birds and fish around Split Lake was collected prior to construction of the project, and no attempt to conduct impact assessments has been undertaken since the project was completed. The dewatering of the Churchill River and estuary or the effects of changed water regimes to the Nelson River and on the Hudson Bay were not studied. No pre- and post-diversion studies were undertaken to monitor wildlife habitat changes due to a lack of funds for such research. No plan to com-

pensate communities and individuals to be affected by the diversion had been considered when the licence to proceed with the Churchill River Diversion was granted on December 1, 1972. Manitoba Hydro took responsibility for replacing facilities directly affected by the diversion, but argued that compensation for loss of subsistence was the province's responsibility (Day & Quinn 1992, pp. 110-119).

In 1973 an attempt to have a restraining injunction imposed to stop the Churchill diversion project was denied on the grounds that there was not enough evidence to support the claim that people's livelihoods would be affected by the diversion. In response, five indigenous communities which would be impacted formed a legal corporation in April of 1974 called the Northern Flood Committee Inc. (NFC). During 1974 and 1975 the NFC negotiated with the federal and provincial governments concerning compensation. Neither the provincial government nor Manitoba Hydro admitted that indigenous lands would be flooded (Waldram 1988, pp. 140-141).

In February of 1976 the province finally recognized the NFC and appointed a mediator to work out a settlement and the agreement ultimately signed was dated June 1977. It provided compensation for flooded lands; project related training and employment; that local communities would get first priority to wildlife resources in the areas traditionally harvested; that Manitoba would continue to encourage subsistence activities for the current and future generations (Waldram 1988, pp. 158-160). This agreement was called the Northern Flood Agreement (NFA). On December 1, 1995 York Factory FN negotiated final settlement of this claim (Ritchie 1995).

Waldram (1985) found a significant shift in the diets of the native people of north-

ern Manitoba following completion of the Churchill-Nelson River hydro project. In the pre-project period food had come primarily from the bush; 87% of 45 female respondents indicated that the bush had been their main source of food prior to the Churchill-Nelson hydro project. By contrast, 82% suggested that "the store" was their main source of food following project completion (1985, p. 43). Usher and Weinstein (1991) also studied the loss of subsistence values and commercial incomes in the Churchill-Nelson Project area, but were not able to derive solid conclusions for lack of baseline (i.e., pre-project) data. In addition to the loss of subsistence resources which occurred as a result of flooding, bush food sources were lost through contamination, and elevated mercury levels due to increased mobilization of mercury in reservoir sediments affected subsistence fisheries in Northern Manitoba (Bodaly *et al.* 1984).

George Ponask (Nov. 1993, pers. comm.) made some first hand observations of the impacts of the Churchill-Nelson River hydro project. He noted that some Crown lands were ruined by water fluctuations causing slush, and travel became much more difficult. Equipment was lost as were animals; fish lacked oxygen and died. He also noticed, however, that animals had a capacity to adapt to changes. Even in the 1990s animals were moving away from the main river system as a result of changes to the water systems. Following construction of the Kelsey Generating Station, water levels around York Landing fluctuated every year. Slush on the shoreline caused a problem for transportation, and both water and ice conditions became very poor. One death in the mid 1970s was attributed to these conditions. Lifting fishing nets became a problem due to the ice conditions and the fish did not taste as good after the flooding.

Roderick Ouskun (May 1991, pers. comm.) observed that following diversion of the Churchill River the flooding that had occurred after Kelsey was constructed was reversed, and Split Lake went dry—there was hardly any water in it during the summer. Fishing improved, he said, and the fish tasted better as well. Jackfish, whitefish, pickerel and even sturgeon continue to be caught near York Landing. On the other hand, Donald Saunders (Nov. 1993, pers. comm.) commented that the spring run of pickerel in nearby Ripple River was reduced to being only a week long, much shorter than it used to be. Roderick Ouskun (May 1991, pers. comm.) noticed that the ducks and geese don't stay very long in the spring. When he first arrived at York Landing they stayed for quite a while, he said, both in the spring and in the fall. Now they don't even stop on their way south.

4.8 Analysis of Present Land Use

Despite the loss of a resource base, and the difficulties associated with pursuing land use activities today, members of York Factory FN are still very much aware of the presence of wildlife around Split Lake, as well as in the area around York Factory and even along the coast. As changes have occurred, people have adapted. Fred Beardy, for example has adapted to changes in the flow of the Nelson River and is once again able to travel to York Factory by way of this River all summer long. One year he made the trip eleven times. He and several others fly to Gillam from York Landing. From there they travel the 28 miles to the Limestone Generating Station where Fred Beardy has left his 18 foot 35 horsepower outboard aluminum canoe. Water is released daily at 8:00 a.m. at Long Spruce, and by 11:00 a.m. the water at Limestone is high enough to allow them to launch their canoes and paddle to Gillam Island. This stretch of the journey takes eight hours to complete. When they reach

Gillam Island they wait for the Hudson Bay tide, which comes in as far as the island, to carry them to York Factory. This part of the trip takes about two hours, and they arrive at York Factory about 2:00 a.m., a day and a half after they started. Along the way, and once at York Factory, they hunt and sometimes collect material for Parks Canada (see Figure 4.4).

Going home, they ride the tide out of York Factory at 3:00 a.m., and reach Gillam Island two hours later. The surge of water from Long Spruce is still strong enough when they arrive to let them continue southward. The trip from Gillam Island to Limestone takes nine hours, and they arrive at 2:00 p.m. Alternatively, as of 1992 the Band has permission to use the road from the Conawapa site. This means they can go by barge to Split Lake and then by road to Conawapa (Feb. 1994, pers. comm.).

Fred Beardy says that today the lesser snow geese (*wawao*) still arrive in great numbers in one main large flock at York Factory. They are nice and fat and have been a main food for Fred since he was a boy. There are also plenty of canada geese (*nis'ku*). Snow buntings (*wapanukoses*) are still hunted today and though there are some around York Landing, there are lots on the bayline. In the winter ptarmigans (*wa'piuao* or *ku'skunuches*) can be caught using nets, and Fred can still catch grouse (*mis'tikopeyao*) and "prairie chickens" (*a'kisko*) by hand using a noose attached to a stick. These birds were always plentiful along the Hudson Bay coast when he travelled there. Ducks (*sese'p*) are a good food anytime, but especially in spring (Aug. 1994, pers. comm.).

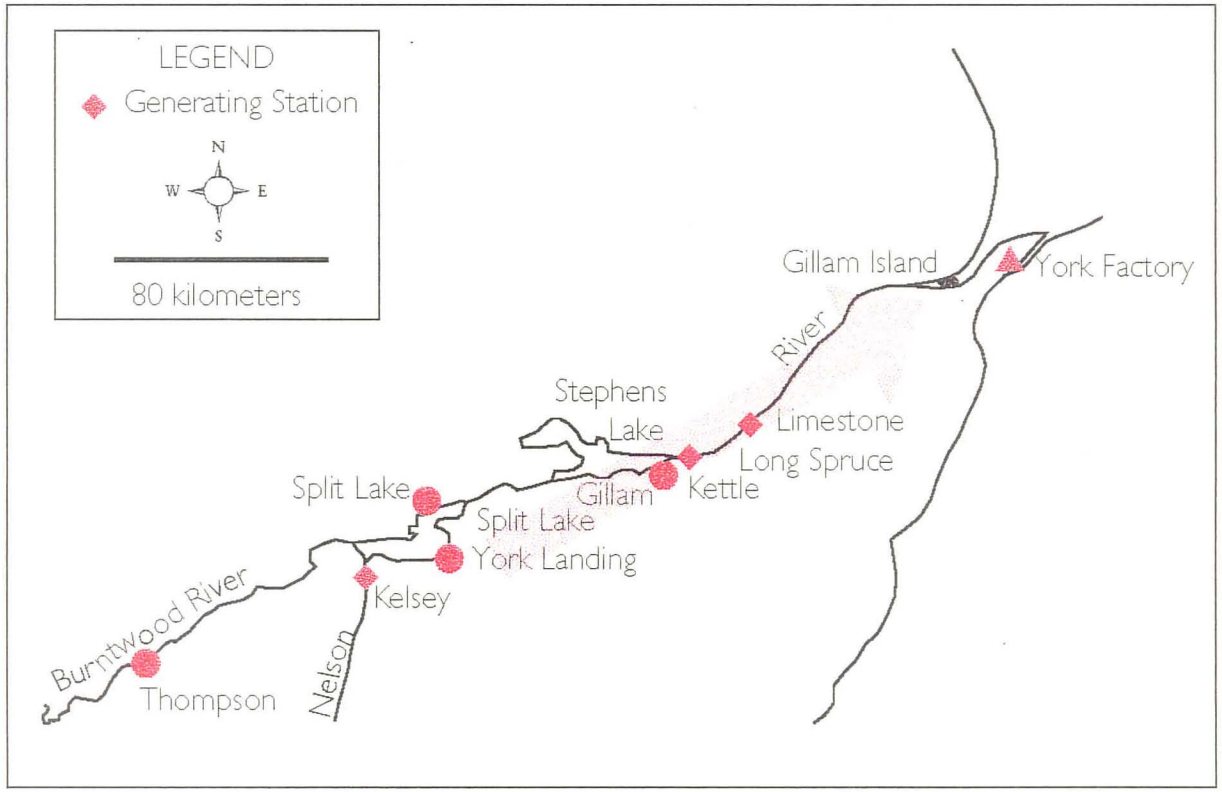

Figure 4.4: Fred Beardy rides the dam tide to York Factory.

There are many lake whitefish (*uti'kumak*) in Split Lake though they are not as tasty or nicely textured in the summer, when they are also fewer in number because they are moving to the lakes and rivers. They are good in the spring and fall. Suckers (*numa'pin*) are also caught in Split Lake. Their heads are considered a delicacy but the rest of the fish is used for dog food. Fred Beardy caught some sturgeon (*numa'o*) in 1992 below Limestone. They were good. He remembers when they used to dry them for later use. There are lots of pike (*kino'sao*) in Split Lake and Fred likes to eat them but they have a high mercury content. He has been told that the mercury levels are safe for human consumption but he is still uneasy about it (Aug. 1994, pers. comm.).

Though the population of beaver (*u' misk*) has declined, because they moved or were drowned, there are still some to be trapped. The price for a beaver pelt is not good however. Some fairly large beaver, 70 inches long, were caught in the summer of 1994. The otter (*nikik*) population has declined, and the price of an otter skin (*nikik-wuyan*) has also dropped, but they are still being trapped. Marten (*wa'pistan*) are trapped and their fur gets a good price. Mink (*sa'kwasew*) are still trapped, though the price for a mink fur is less than for marten, and their population is low. Wolverines(*kwekwuhakao*) are trapped but not eaten. Lynx (*pi'sew*) were plentiful when he first moved to York Landing but their numbers have really declined since then. They are still hunted and eaten. Red Foxes (*osawukasew*) are trapped, even though they don't bring a good price. They are not eaten. There is the odd Arctic Fox around the York Landing area but they are more plentiful at the coast. Some can be found around Gillam and north of Split Lake. There are very few skunks (*sika'kk*) in the area. Fred only recalls hearing of one skunk that was found around York Factory three years

ago. He saw some black bears (*mu'skwa*) last year, and shot two. Aboriginal people are not allowed to kill polar bears (*osa'wusk*) in Manitoba and so he has not killed any. Rabbits (*wa'poos*) are snared by hunters in York Landing and eaten. The population has been in decline for the last four or five years. Fishers (*ochak*) are still in the area and are trapped. Wolves (*muhe'kun*) are trapped using snares (Fred Beardy Aug. 1994, pers. comm.).

The preference for wild food is still very prevalent, and especially so among middle and older generations (Fred Beardy Aug. 1994, pers. comm.; Joseph Saunders May, 1994, pers. comm.; Isaiah Saunders Aug. 1994, pers. comm.; Joan Godé Nov. 1993, pers. comm; Donald Saunders Aug. 1994, pers. comm.; Obediah Wastesicoot, Nov. 1993, pers. comm.). It is customary for Isaiah Saunders, now retired from hunting and gathering, to have wild meat or fowl in his refrigerator, provided by some of the younger hunters in the community (Aug. 1994, pers. comm.). Harvesting wild meat continues to be problematic, however, especially when undertaken in the traditional lands near York Factory. While moose or caribou are killed regularly by hunters on their annual fall hunt at York Factory, it is necessary to charter a plane at a cost of about $700 to have the meat brought back to the community. Sometimes the Band Council covers these costs since the meat is shared when it arrives (Joan Godé Nov. 1993, pers. comm.).

Travel by river to York Factory is extremely difficult, as a result of the hydro-electric developments along the Nelson, and hunters usually fly to York Factory to hunt geese and big game. All their equipment, including ski-doos for winter hunting must also be flown up, and left there unprotected when they return home. As a result of vandalism to their ski-doos, these have to be replaced frequently. The costs associated with hunting on the coast

are prohibitive, but costs of hunting around York Landing are also high. In November, 1993, gas cost $1.08/litre or $25.00 for 5 gallons, whereas In Split Lake the price was $.61/litre. In Oxford House it sold for $.59/litre yet it had to be transported much further (George Ponask Nov. 1993, pers. comm.).

A few members of the band still move to outpost camps for extended periods. George Ponask and his wife Irene have a trapline which is about 30 miles square, and they have built an outpost camp at La Preuse and a log cabin on their trapline. Access is by winter road, small plane or ski-doo, and they prefer to live there year-round. During the summers George works for the provincial parks doing maintenance, carpentry and fire fighting. Winters are spent on the trap line whenever possible. George Ponask is typically out trapping from 5 a.m. to 8 p.m., and the day ends about 11 p.m. The amount of wild meat that they will be able to catch is hard to predict, though beaver catches can be estimated more accurately. They trap about one-third of their trapline every year, rotating it so that no area is trapped out, and use all parts of the animals they harvest (Nov. 1993, pers. comm.).

While George Ponask works the trapline, Irene is at home skinning, fleshing and stretching hides. Good hides are taken to the fur trade table. Those that are not marketable Irene tans and uses herself. If the meat is to be used for food Irene cleans it and cans or otherwise preserves it. She sets snares, chops wood for kindling, gets water or ice for cooking, washing and so on. Fish nets need to be checked and the fish canned, smoked or frozen. They eat jackfish (northern pike), pickerel (walleye) and whitefish. Mercury levels were a serious problem for Irene in 1986, as a result of eating fish. Since then she has cut down on the amount of fish she eats. Fish bones are used for making jewelry and beads, and inedible

carcasses are left out for scavengers. The little garbage they have they bury. An additional and important source of food is a greenhouse and a large vegetable garden. Irene grows turnips, potatoes, brussel sprouts, lettuce, strawberries, cauliflower, snow peas, bean and turnips. Food is stored in the root cellar in cardboard boxes lined with plastic and alternating layers of peat moss and vegetables. They use fish as fertilizer and bury it at least a foot deep so pests are not attracted to the smell. Candles, coal oil and kerosene lanterns are used for light, and cooking is done on wood and propane stoves. They find that it is much cheaper to live in the bush than in York Landing (Nov. 1993, pers. comm.).

4.9 Summary and Conclusions

In the 1600s the York Factory Cree adapted to the intrusion on their lands of a large, foreign, commercial enterprise. Since that time they have endured epidemics, what has been called the "little ice age", the loss of animal populations on which they depended for survival, and crashing fur markets. They adapted to forced re-settlement by a remote government against their better judgement, and came to terms with life in a totally different region with no land base. They have coped with degradation of the lakes and lands around their community caused by southern developers, adjusted to a market economy, and continue to hope for wage employment for their children. They travel by snowmobile, truck, plane or ferry, and depend on western medicine to diagnose and treat their ills. They eat white bread and domestic beef, as well as bush food when they can get it, and watch a lot of television.

Despite the processes of assimilation and integration with the larger society which have undeniably occurred, this First Nation's survival continues to depend, as it always has, on the practice of subsistence. No one understands this relationship more clearly than the

elders and other leaders who are in the process of developing a financial basis for future community development projects. York Factory leaders are in the process of regaining control over some of their traditional lands in order that their children will be able to spend time on the land as their forefathers did, should they choose to do so. Settlement of the Northern Flood Agreement on December 1, 1995 was a large step in this direction. The settlement totalled $24 million over twenty years and 19,000 acres of land selected by the elders and other members of the community. It is intended to compensate the community for impacts it suffered regarding "lost or delayed economic and social development". The areas being granted are in the area of the old York Factory registered trapline along the Hudson Bay coast (Ritchie 1995). Additional land is being sought through treaty land entitlement negotiations.

Once a land base has been re-established, the development of economic opportunities for present and future generations can commence in areas such as commercial fishing, forestry, and agriculture. The acquisition of this land base in their traditional hunting grounds is seen as vital to re-establishing a physical and symbolic connection with their past, and is an important aspect of cultural renewal.

Subsistence hunters in York Landing require cash and use of the latest technology in guns and transportation. The inherent nature of subsistence ethos, however, persists in this small society. Bush harvests continue to be shared with other band members, and feasts are held in the band council offices to celebrate holidays as a community. Rather than declining, there appears to be a growing interest in hunting, trapping and fishing activities by the people of York Factory FN, particularly in their traditional hunting grounds. They are well on their way toward re-establishing a resource base to accommodate this growing interest.

Chapter 5

A Spatial Analysis of Contemporary Subsistence: The Omushkego Cree of Northern Ontario

5.1 Introduction and Context

The second case study area is the Moosonee Administrative District of the Ontario Ministry of Natural Resources. This area coincides closely with the Hudson Bay Lowland in that province. In 1981 the estimated resident native population of West Main Cree in Northern Ontario's Hudson/James Bay Lowland area was 5,397 (Thompson & Hutchison 1989, p. 11). By 1990 this number had risen to 6,500 (Berkes *et al.* 1995c, p. 84). Of the eight settlements in the region (Figure 5.1), Moose Factory, historically a fur trade post, is the largest with a 1990 population estimated at 1750. Moosonee, pre-dominantly a non-native settlement, had a population of 1250. The other communities are: Fort Albany; Kashechewan; Attawapiskat; New Post; Peawanuck (built in 1986 after Winisk was destroyed by flood); and Fort Severn (Berkes *et al.* 1995c, p. 84). Apart from serviced airports at six of the communities, regular rail freight and passenger service is provided from Cochrane to Moosonee, with only localized roadways usable year-round, and a winter road reaching from Moosonee to Fort Albany, Kashechewan and Attawapiskat. As in previous eras, the river systems continue to provide major routes of access to hunting areas for native harvesters (Thompson & Hutchison 1989, p. 11).

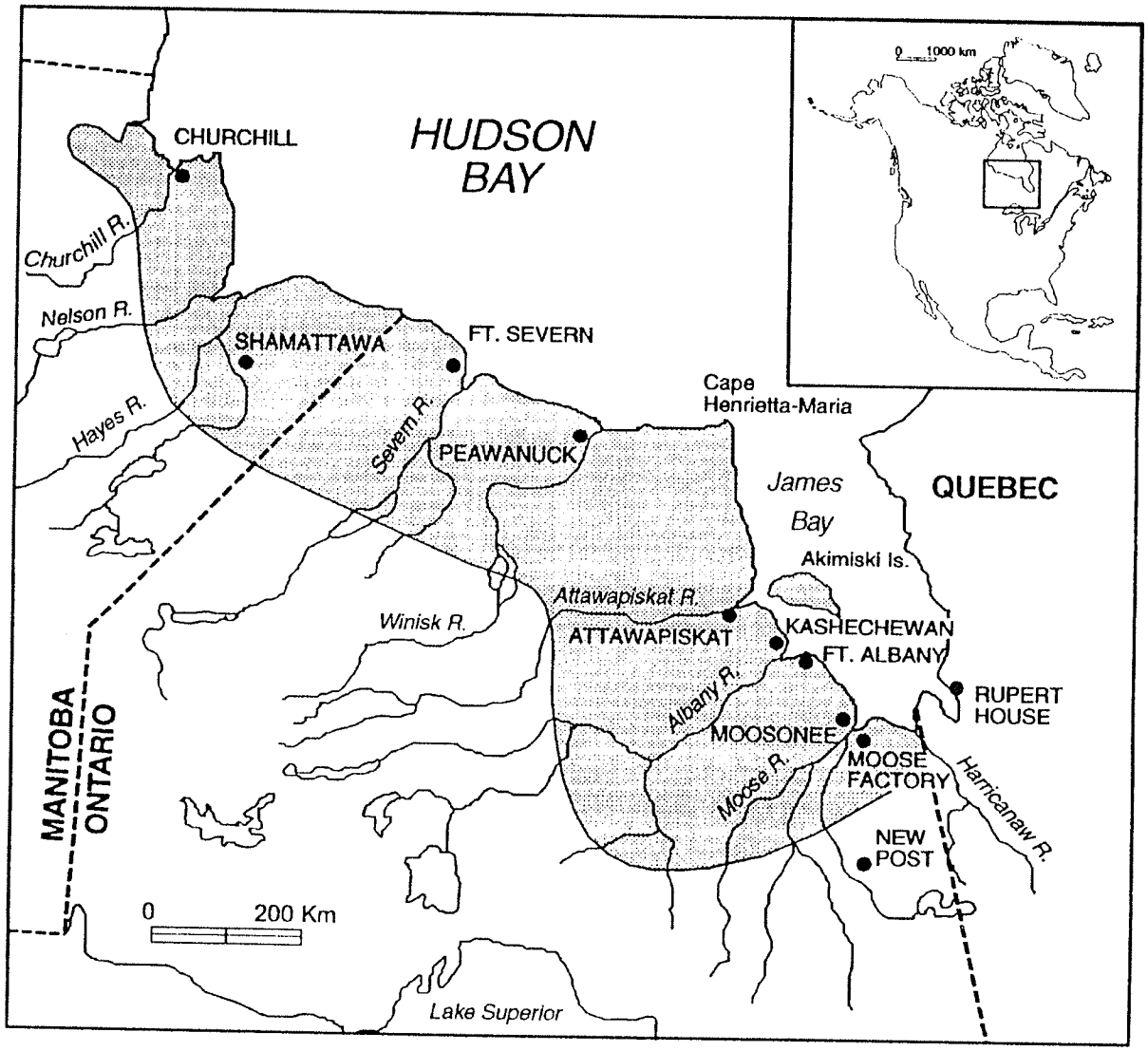

Figure 5.1: Hudson/James Bay Lowland communities.

This chapter presents evidence of the enduring nature and extent of subsistence land use among the Omushkego Cree of Northern Ontario into the present time. Relatively little research had been conducted in this geographical area prior to 1981, but since that time the Mushkegowuk Region has been the subject of two land/harvest studies: the first was conducted in 1981 by Thompson and Hutchison (1989) and the second was conducted ten years later by Berkes *et al.* (1994 and 1995c). Using the results of these two studies it was possible to complete a comparative analysis of the land use patterns and spatial extent of harvesting conducted in the area over a ten year period. Such an analysis has not been attempted elsewhere in the bioregion, apart from Riewe's (1992) use of Freeman's 1976 maps as basemaps for his own work.

The outcome of such a comparative analysis of land use practices over time is important, for it can serve to validate not only the two studies being analyzed, but also the methods used. Confirmation of the validity of the results of these studies will lend credence to the many other harvest and land use studies conducted using similar methods elsewhere in the bioregion described in Chapter 3. This chapter is based on a detailed comparative analysis of the spatial extent and intensity of waterfowl harvests reported in the two studies. A comparative synthesis of estimates of the harvests of waterfowl, big game and fish for 1981/82, 1982/83 and 1990 is also provided in order to document the quantity of bush harvests in these particular communities, and to supplement the written analysis of the relative importance of the subsistence economy to the overall economy and to the food requirements of band members.

5.2 Methods

This chapter is based on a comparative analysis of the land use patterns of the Omushkego Cree of Ontario over a ten year time span, i.e., from 1981 to 1990. Thompson and Hutchison (1989) conducted a land use study in 1981, and Berkes *et al.* (1994 and 1995c) conducted a study in the same area in 1990. Land use patterns for a variety of species were provided in the studies, but waterfowl was the harvesting activity practiced most extensively, and so it was selected for analysis. Results of the two studies were not directly comparable and some standardization had to be undertaken regarding the species reported, the size and shape of areas used to define a harvesting area, and hunting intensity levels.

5.2.1 Standardizing the Harvest Study Data

The 1989 study land use maps did not distinguish between waterfowl species, whereas the 1992 study provided seasonal goose hunting intensity maps. For purposes of this analysis waterfowl and geese were assumed to be comparable, since geese are by far the major species of waterfowl harvested. To that end, the maps of waterfowl hunting areas provided in Thompson & Hutchison (1989) were compared to the goose maps provided in Berkes *et al.* 1995c, and both are referred to as "waterfowl" for purposes of simplicity. The result of this discrepancy was to understate the waterfowl harvesting areas used in 1990. Actual harvest data was based on comparable species, however, because the tables in Thompson & Hutchison (1989) provided specific data for geese. Regarding the different shapes of areas used to define harvesting areas in the two studies, the polygons produced in the 1989 study (Thompson & Hutchison) were converted to the 10 km x 10 km. UTM grid pattern used in the 1995 study (Berkes *et al.*). The different levels of hunting intensities

reported in the two studies were standardized and classified. Thompson and Hutchison (1989) used four categories based on the percentage of hunters using a certain area: <1 to 5% of hunters; 6 to 20% hunters: 21 to 50% of hunters and 51 to 100% of hunters. Berkes *et al.* (1995c) produced maps based on the number of hunters by 10 km. grid square by season. In order to proceed with the comparative analysis, the percentages used in the 1989 study were made comparable to the classification system used in Berkes *et al.* (1995c).This was accomplished by grouping the two series into three categories: low; moderate and high. Next the data from the two studies were standardized into these three categories based on the criteria of a) a qualitative analysis of best fit and b) minimal alteration to the study data. The results are presented in Table 5.1.

In total, three data sources were needed to conduct this research: the two studies already described, and basemaps for the actual analysis. Following discussions with represen-

Figure 5.1: Standardization and classification of hunting intensities.

Season	Classification	Berkes *et al.* (1994, 1995c)	Thompson & Hutchison (1989)
		no. of hunters	% of hunters
Fall	low	1 - 5	1 - 5
	moderate	6 - 25	6 - 20
	high	26 - 60	21 - 100
Spring	low	1 - 3	1 - 5
	moderate	4 - 15	6 - 20
	high	16 - 24	21 - 100

tatives of the Provincial Remote Sensing Office (PRSO) in the Ontario Ministry of Natural Resources, that office provided digitized *LGSOWG* (a digital format used mainly by international organizations to distribute satellite image data) land cover maps of the Hudson Bay Lowlands to be used as basemaps for the comparative analysis.

5.2.2 Preparing the Basemap

The PRSO raster data included eight files, or mapsheets covering the Ontario section of the coast. Each of the files is 6000 lines (rows) of data, and 7200 pixels (columns) per line, and is 42 MB in size. Each pixel (cell) size is 30 m. The *LGSOWG* files were provided on a low-density 8 mm *Exabyte* cassette. The files which were required to provide a basemap for the study areas were identified by determining the longitudes and latitudes of the areas to be analyzed. The PRSO data were identified by Northing and Easting, and in order to determine their longitudes and latitudes the computer program *Geoconverter* was used to convert the Northings and Eastings into longitudes and latitudes. The appropriate files, nos. 6, 7 and 8, were then downloaded to an *Ambra* IBM compatible 486 DLC 66 into *Image-Mate*, a visualization program capable of manipulating the *Landsat Thematic Mapper* sensor data. Here they were saved as 8-bit uncompressed *TIFF* files (*Tag Image File Format*, a machine-independent image format useful for encoding raster image data), with each pixel of the image stored on a continuum of 0 to 255 grey levels.

The *Tifidris* function of Idrisi was used to import these files into *Idrisi* and convert them to *IDRISI* files. In order to reduce the size of the images to a size which could be viewed on screen, their resolution was changed from 30 m. to 90 m. using the *Contract* function which generalizes an image by reducing the number of rows and columns while increas-

ing the cell resolution. In order to achieve the 90 m. resolution, the contraction factor was set to 3, and every third pixel was retained. This operation also reduced the size of the files and made them more manageable to work with.

Once the three files had been treated in this manner, it was necessary to paste them together and cut away the unnecessary portions to produce the basemap for the study area. Because the files were so large, their size had to be minimized. The *Concat* function was used to paste them together, using the column and row references, i.e., the Northings and Eastings were used to ensure the desired basemap was produced. File nos. 6 and 7 were combined for the Fort Albany/Kashechewan basemap. File 8 was used for the Moose Factory/Moosonee basemap. Areas not relevant to the study were deleted.

The *Reclass* function was used to reclassify the data which was still stored on a continuum of 0 to 255 levels of grey into fourteen classes by applying user-defined limits. In other words, all pixels stored as 0-14.999 were reclassed to 0; all pixels stored as 30-44.999 were reclassed to 1 and so on. When this operation was completed, there were a total of 14 classes representing the landcover classes.

The next step was to create an *Attribute Values File*, a simple data table which classified each grid cell or pixel according to its landcover class using a numeric code. For example water was classified as 1, coastal mudflats as 2, and so on. The *Assign* function was used to create this file. The number of classes in the original dataset was 16. This number was reduced to seven for several reasons: the requirements of this analysis did not necessitate the level of detail contained in sixteen classes; the reduced number of classes reduced the complexity of the image; and because the image would be produced in shades of grey, the

information would be easier to convey if the number of shades of grey used were minimized. This image was then converted to a multi-color using the *Color* function, and the legend captions created.

It was necessary next to create a vector file of the UTM grid squares which represented the unit used to define hunting areas. This vector file was created by digitizing the grid on-screen again, using the Northings and Eastings as guides. This vector file was subsequently converted into a raster file because the study data had been collected as raster data, and the entire grid square would need to be classified according to hunting intensity levels. In order to make this conversion, it was necessary to create a basemap in raster format which would be used as the bounds of the new raster gridsquare map to be created. This was achieved by using the *Initial* function which creates new images with a constant value, i.e., it was used in this case to produce an essentially blank piece of paper with bounding lines, using the landcover map as its source of information. Using the *Polyras* function next, the grid vector polygons, or UTM grid squares, were converted to a raster representation. At this point, two layers had been created: the landcover classification map and the grid square map of the same area.

5.2.3 Integrating the Data Sources

Once the basemap had been prepared the study waterfowl data were transferred to a paper representation of the study area marked with grid squares. This facilitated the on-screen process of digitizing study data, and each UTM grid square with waterfowl harvesting activity was classified as to intensity by study. The result was three more vector layers, one representing the 1981 study data and the other two representing the 1990 spring and fall

study data. These layers were converted to raster representations using the same functions described above: *Initial* and *Polyras*. The *Overlay* function using the *Cover* operation was used to create new images by combining the study data raster files with the grid raster file. The result was that the UTM squares with hunting activity had been assigned different numbers and appeared as different colors.

In order to produce a map showing which areas were used by both study areas, it was necessary to combine the spring and fall goose hunting maps representing the 1990 study by using the *Cover* operation. Next, all grid squares with hunting activity were assigned a value of 1 using the *Assign* function. Similarly, the map representing the various hunting intensities by grid square for the 1981 study data was assigned a value of 2. The *Crosstab* function was used to cross-classify all combinations of the two single value maps. For purposes of simplicity the number of values had been reduced to 2, and the resulting image shows the locations of all combinations of the categories in the original map, that is in which grid squares hunting activity had occurred only in 1981, only in 1990, and in both years.

These maps were saved as *tiff* files using the *Tifidris* function, and downloaded electronically over the ethernet to a Macintosh 2CX with a Pinnacle RCD CD ROM writer where they were saved on a CD ROM. This CD was moved to a 640 *Quadra* Macintosh, where the files were opened in an image processing software called *Adobe Photoshop*. Here the images were rotated, thematic colors applied and the maps saved as *EPS* (*Encapsulated PostScript*, a language supported by most illustration and page layout programs) files. These images were copied to *Adobe Illustrator*, an art production and illustration tool, where they formed the first layer of a series of layers. Subsequent layers were created for text, legends

and bounding boxes, and small graphic details were applied. These images were saved in the *ai* (*Adobe Illustrator*) format, a *PostScript* file (the industry standard language for high quality printing), and the images printed using *freedomofpress*, a postscript language interpreter, on a Canon BJ 820 color printer.

Two areas were finally selected for spatial analysis: the southerly Moosonee/Moose Factory area and the more northerly Kashechewan/Fort Albany area. Digitized basemaps (PRSO 1993) were used for the analysis and the steps taken to integrate and process the various data in order to produce final maps are detailed in Figure 5.2 and Table 5.2.

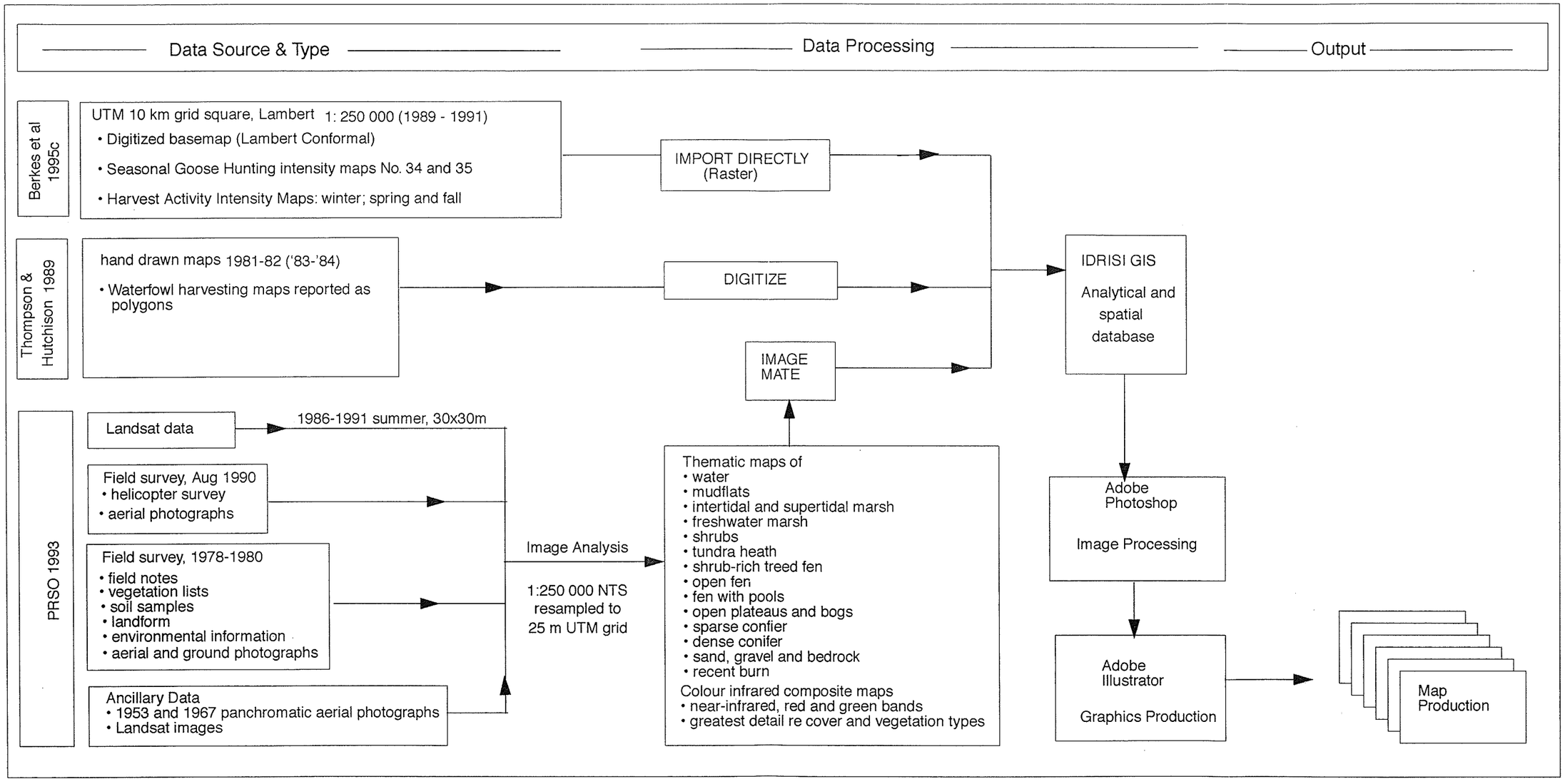

Figure 5.2: Process used to integrate, analyze and print study data.

Table 5.2: Comparison of three data sources (continued).

Study Variable	Berkes *et al.* 1994a, 1995c	Thompson & Hutchison 1989	Hudson Bay-James Bay Coast Habitat-Based Wildlife Assessment Project (PRSO)
Time Period	one year between 1989 - 1991	"How much" was harvested: 1981 - 1983 "Where" was it harvested: 1981 - 1982	various, produced in early 1990s
Purpose	to document traditional activities and determine the actual harvest of wildlife and fish resources in the Mushkegowuk region	to provide information concerning natural resources used by Native and non-Native residents in the Ontario Hudson Bay Lowland to help produce a background information document and to establish a data base for the Lands, Fish and Wildlife programs in Moosonee District	landcover classification maps produced as part of a habitat based wildlife assessment study of the Hudson Bay - James Bay coast
Area Covered	Mushkegowuk Region • 250,000 sq. km. • extends from the West coast of James Bay to the Eastern boundary of Manitoba and ranges 200-300 km. inland from the Hudson Bay coast	Moosonee District • approximately 221,164 sq. km • most lies within the Hudson Bay Lowlands of Ontario	coverage of a 100 km wide strip along Ontario's maritime coastline, total area covered excluding waters is approximately 130 000 sq. km.

Table 5.2: Comparison of three data sources (continued).

Study Variable	Berkes *et al.* 1994a, 1995c	Thompson & Hutchison 1989	Hudson Bay-James Bay Coast Habitat-Based Wildlife Assessment Project (PRSO)
Methods	• quantitative and qualitative data on hunting practices collected. • seven communities surveyed • sampling of community members in reserves conducted by selecting from band lists of resident males 18 years of age or older and any female heads of households • Moosonee is not a reserve and was sampled by generating a list of native households potential hunters were stratified into four groups: intensive, active, occasional and non-hunter • aboriginal residents only were surveyed • Cummins 1991 study of Attawapiskat was used • a total of 925 hunters were interviewed for 56% coverage	• the study population involved in land use activities was sampled using two questionnaires • 7 communities surveyed • Moosonee District selected interviewers with the cooperation of community Chief and Band Council. Attempted to interview 100% of the male hunters 18 years of age or older in Moose River Crossing; Fort Albany; Kashechewan; Attawapiskat, and Winisk. In Moosonee and Moose Factory a 40% random sample was established for Native and non-Native user groups based on band and voter lists. Less than 100% coverage was achieved and Statistics Canada data were used to estimate potential numbers of harvesters and households. • five maps used to record the food and fuelwood gathering areas: waterfowl, moose, caribou hunting, trapping fishing and fuelwood collecting areas with each linked to questionnaire using local place names. • 1434 "How Much" Questionnaires were completed • 690 "Where" Questionnaires were completed	• based on Landsat TM data, a field survey between Aug. 9 - 15/1990; a previous field survey (1978-1980); ancillary aerial photographs (1953-1967); and image analysis
Moose Factory	• population: 1750 • estimated no. of hunters: 444 • no. of hunters interviewed: 235	• population: 1200 • estimated no. of hunters: 331 • no. of hunters interviewed: "How Much" Questionnaire 1981/82: 91[1] 1982/83: 22[2] "Where" Questionnaire 1981/82: 144	

Table 5.2: Comparison of three data sources (continued).

Study Variable	Berkes *et al.* 1994a, 1995c	Thompson & Hutchison 1989	Hudson Bay-James Bay Coast Habitat-Based Wildlife Assessment Project (PRSO)
Moosonee	• population: 1250 • estimated no. of hunters: 297 • no. of hunters interviewed: 137	• population: 1564 • estimated no. of hunters: 474 • no. of hunters interviewed: "How Much" Questionnaire 1981/82: 87 1982/83: 87 "Where" Questionnaire 1981/82: 111	
New Post/ Moose River Crossing	• population: 72 • estimated no. of hunters: 20 • no. of hunters interviewed: 13	• population: 35 • estimated no. of hunters: 30 • no. of hunters interviewed: "How Much" Questionnaire 1981/82: 20 1982/83: 20 "Where" Questionnaire 1981/82: 17	
Fort Albany	• population: 625 • estimated no. of hunters: 173 • no. of hunters interviewed: 90	• population: 477 • estimated no. of hunters: 175 • no. of hunters interviewed: "How Much" Questionnaire 1981/82: 100 1982/83: 99 "Where" Questionnaire 1981/82: 125	

Table 5.2: Comparison of three data sources (continued).

Study Variable	Berkes *et al.* 1994a, 1995c	Thompson & Hutchison 1989	Hudson Bay-James Bay Coast Habitat-Based Wildlife Assessment Project (PRSO)
Kashechewan	• population: 1000 • estimated no. of hunters: 273 • no. of hunters interviewed: 168	• population: 750 • estimated no. of hunters: 218 • no. of hunters interviewed: "How Much" Questionnaire 1981/82: 190 1982/83: 206 "Where" Questionnaire 1981/82: 91	
Peawanuck/ Winisk	• population: 227 • estimated no. of hunters: 70 • no. of hunters interviewed: 44	• population: 171 • estimated no. of hunters: 63 • no. of hunters interviewed: "How Much" Questionnaire 1981/82: 21 1982/83: 25 "Where" Questionnaire 1981/82: 28	
Fort Severn	• population: 332 • estimated no. of hunters: 92 • no. of hunters interviewed: 29	• population: 200[3] • estimated no. of hunters: 70 • no. of hunters interviewed: "How Much" Questionnaire 1981/82: 0 1982/83: 0 "Where" Questionnaire 1981/82: 0	

Table 5.2: Comparison of three data sources (continued).

Study Variable	Berkes *et al.* 1994a, 1995c	Thompson & Hutchison 1989	Hudson Bay-James Bay Coast Habitat-Based Wildlife Assessment Project (PRSO)
Attawapiskat	• population: 1214 • estimated no. of hunters: 275 • no. of hunters interviewed: 209	• population: 1000 • estimated no. of hunters: 332 • no. of hunters interviewed: "How Much" Questionnaire 1981/82: 162 1982/83: 304 "Where" Questionnaire 1981/82: 174	
TOTALS	• population: 6470 • estimated no. of hunters: 1644 • no. of hunters interviewed: 925 • percent of hunters interviewed: 56%	• population: 5397 • estimated no. of hunters: 1693 • no. of hunters interviewed: "How Much" Questionnaire 1981/82: 671 or 40% 1982/83: 763 or 45% "Where" Questionnaire 1981/82: 690 or 41%	
Questionnaire	• waterfowl: spring; summer/fall • fish: winter; spring; summer/fall • furbearers: trapping season (Oct-Mar) • big game: winter; summer/fall • Small game: winter; summer/fall • questions asked re: size of harvest; location of harvest; hunting success rates; number of days of harvesting; management techniques	• "How Much": quantitative harvest of • birds, small game, moose, caribou, black bear, marine mammal, fish and trees • "Where": Major areas of food and fuelwood activities	

Table 5.2: Comparison of three data sources (continued).

Study Variable	Berkes *et al.* 1994a, 1995c	Thompson & Hutchison 1989	Hudson Bay-James Bay Coast Habitat-Based Wildlife Assessment Project (PRSO)
Data Analysis	• summary values produced re counts of each species/season/ community used to produce *reported nos.* • estimates for whole community are *projected nos.*	• "How Much": data entered into Apple III and Visicalc spreadsheets; total harvest by community was estimated based on households and a formula • "Where": data summarized using spreadsheets; land use activity data was based on the number of hunters per community that reported hunting at a specific location or in a specific area; each activity was counted separately; areas, percent of total harvesters and sample sizes were mapped separately for each land use activity	

Table 5.2: Comparison of three data sources (continued).

Study Variable	Berkes *et al.* 1994a, 1995c	Thompson & Hutchison 1989	Hudson Bay-James Bay Coast Habitat-Based Wildlife Assessment Project (PRSO)
Maps: Scale/Projection/ Grid System	• NTS 1:250 00 • UTM 10 km grid square • study area falls into UTM Zones 15 (96-90° w); 16 (90-84° W); and 17 (84-78°W) • converted to Lambert Conformal and a point dataset • digital basemap of study area used (coastline, a selection of streams and political boundaries); world map series from Hungarian National Office of Lands and Mapping • standard parallels at 32 and 64 degrees north • .vtx format converted to.dxf for export to Corel Draw • produced distribution maps by community by species by season and by hunter type • intensity maps/community/species/season/hunter type Attawapiskat data • recorded as polygons on mylar, at a scale of1:1 000 000 • converted to grid square form	• hand-drawn maps • 1 inch is slightly less than 20 miles • study area falls into UTM Zones 16 and 17	• NTS1:250 000 mapsheets resampled to a 30 m. UTM grid • study area falls into UTM zones 16 and 17 • available in LGSOWG digital format

Table 5.2: Comparison of three data sources (continued).

Study Variable	Berkes *et al.* 1994a, 1995c	Thompson & Hutchison 1989	Hudson Bay-James Bay Coast Habitat-Based Wildlife Assessment Project (PRSO)
Waterfowl	areas and intensity mapped by community: • spring goose hunting • fall goose hunting • Canada geese • snow geese • blue geese • brant • ducks	time spent/number of hunters/numbers killed/areas; all seven communities mapped incl. intensity • Canada geese • small Canada geese • snow geese • see other water birds below • ducks	
Other Water Birds	see waterfowl above	time spent/number of hunters/numbers killed/areas (Moose River Crossing; Moose Factory; Attawapiskat; Winisk - mapped incl. intensity) • brant • common loon • pacific loon • red-throated loon • swans	
Other Fauna/ Small Game	hunting areas and intensity mapped: • willow ptarmigan • sharp-tailed grouse • ruffed grouse • snowshoe hare • spruce grouse	number of hunters/numbers killed/areas • willow ptarmigan • sharp-tailed grouse • ruffed grouse • crane • owls • hawks • snowshoe hare • shorebirds	

Table 5.2: Comparison of three data sources (continued).

Study Variable	Berkes *et al.* 1994a, 1995c	Thompson & Hutchison 1989	Hudson Bay-James Bay Coast Habitat-Based Wildlife Assessment Project (PRSO)
Moose	areas and intensity mapped: • winter moose hunting areas • fall moose hunting areas	• time spent/number of hunters/numbers killed/areas • all seven communities mapped incl. intensity	
Caribou	areas and intensity mapped: • winter caribou hunting areas • fall caribou hunting areas	• all seven communities mapped incl. intensity	
Fish	areas and intensity mapped: • winter fishing • spring/summer fishing areas • summer/fall fishing areas • brook trout • whitefish • pike • walleye • suckers • sturgeon • burbot (maria)	• number of households and number of fish • all seven communities mapped incl. intensity • brook trout • whitefish • pike • walleye • suckers	
Small game	• hunting areas and intensity mapped		
Trapping	• numbers recorded • not mapped • beavers; marten; mink; coloured fox; arctic fox; wolf; otter; musk-rat; weasel; squirrel • market value of fur	• number of hunters/time spent trapping • all seven communities mapped incl. intensity	

Table 5.2: Comparison of three data sources (concluded).

Study Variable	Berkes *et al.* 1994a, 1995c	Thompson & Hutchison 1989	Hudson Bay-James Bay Coast Habitat-Based Wildlife Assessment Project (PRSO)
Trees	• fuelwood harvested (face cord)	• no. of potential harvesters and no. of trees cut • all 7 communities mapped incl. intensity	
Thematic Classes			• water • mudflats • marshes (intertidal; super-tidal; freshwater) • shrubs • tundra • fen (treed; open; shrub-rich; with pools) • peat plateaus and bogs • conifer (sparse and dense) • sand, gravel and bedrock • recent burn
Edible Weights	• potential by species and by community		
Replacement Values	• by food species group and by community • of fuelwood		

1. Non-native population did not participate.
2. Native population did not participate.
3. Based on discussions with representatives of the communities. Only Attawapiskat data were modified, i.e., increased by 30% (Thompson & Hutchison 1989, p. 116).

5.3 Land Use Studies of the Omushkego Cree

The purpose of the 1981 study was "to determine the amount and location of Native and non-Native resource use within the Hudson Bay Lowland" (Thompson & Hutchison 1989). This three-year study mapped major harvesting activities in the Mushkegowuk Region between 1981 and 1983. Data were gathered on waterfowl, bird, grouse, moose and caribou hunting areas, as well as fishing, trapping and fuelwood gathering areas. In addition, hunter effort was quantified and data on the numbers of different species harvested were collected and tabulated.

For the 1981/83 study, interviewers were given maps on which to record the land use activities described by the harvesters interviewed. An example of the maps which were subsequently produced is shown in Figure 5.3, a summary waterfowl harvesting map. This map represents the number of hunters in each community who reported hunting waterfowl at a particular location. All the waterfowl hunting activities reported by a single hunter were recorded using this method. Fewer than 40% of the Moosonee and Moose Factory residents were interviewed, and less than 100% of the other community harvesters were interviewed. For this reason the results of the spatial extent are known to be understated. Total harvests were estimated using sample data, and the reported number of hunters for each species harvested (Thompson & Hutchison 1989, p. 17-18).

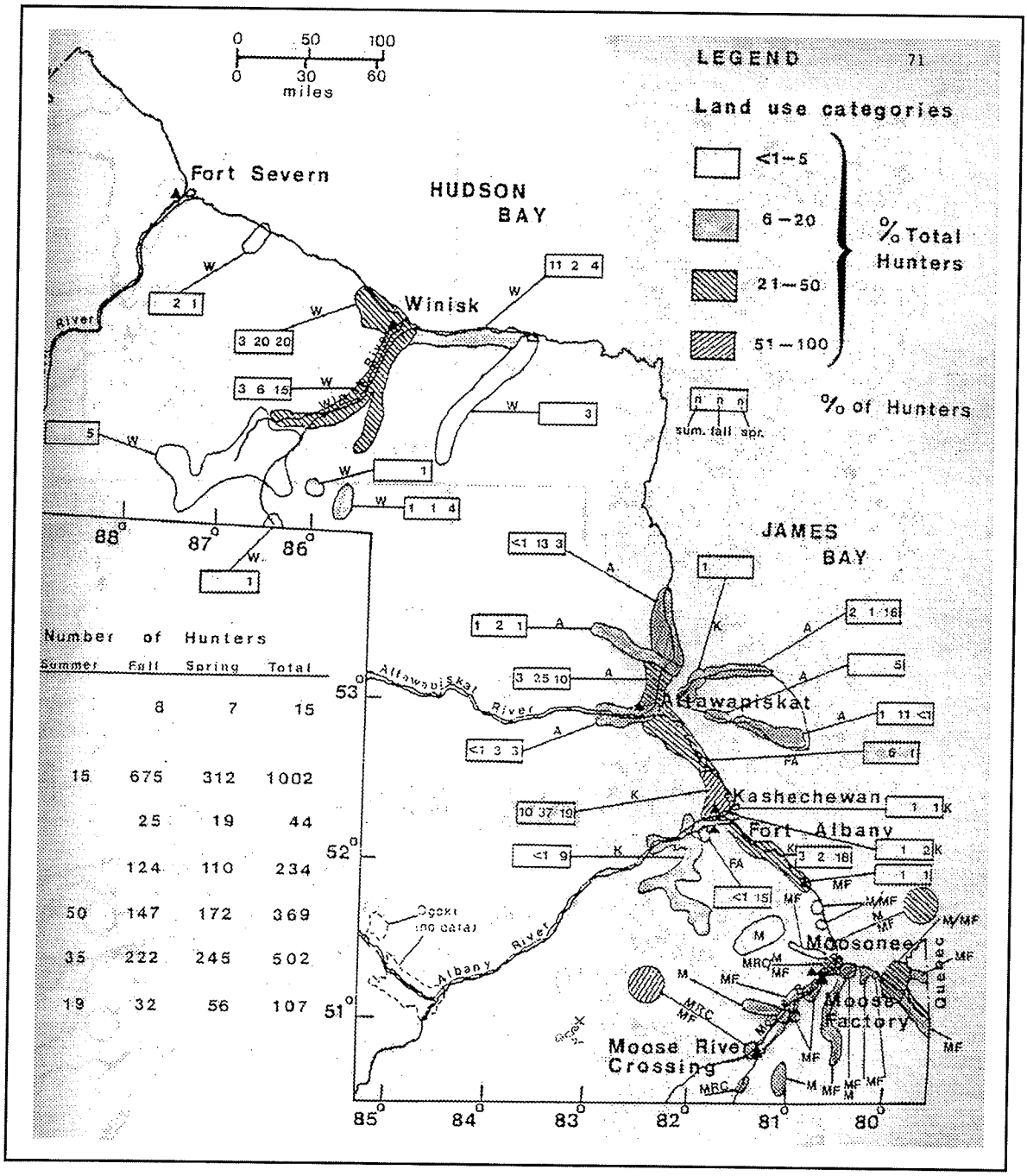

Figure 5.3: Waterfowl hunting areas used by Native hunters for the Moosonee District 1981-82. Source: Thompson & Hutchison 1989.

The purpose of the second study undertaken ten years later (Berkes *et al.* 1994, 1995c) was "to assist the Omushkego Cree in planning a community and regional economic development strategy that takes into account the traditional economy...[by developing] appropriate methodologies to investigate the quantitative importance and economic value of hunting and fishing for the Mushkegowuk region, Hudson and James Bay Lowland" (Berkes *et al.* 1992, p. 1). The study covered the 1989 annual harvesting cycle for six of the seven communities. Seasonal harvesting areas were mapped for waterfowl, moose, caribou, and fishing. Small game harvesting maps were also produced. In addition, data concerning the number of species harvested and hunter effort were also collected and tabulated.

In this wildlife harvest mapping study, potential hunters were stratified according to their level of seasonal participation in harvesting, and to specify the locations of their harvesting activities on a 1:250 000 scale map, by indicating in which UTM 10 km. x 10 km. squares he had harvested wildlife. The maps produced included seasonal distribution and intensity maps, and the summary waterfowl harvesting activity map produced is shown in Figure 5.4. The overall participation rate in this study was 56%, when Cummins' (1992) data for Attawapiskat was included. The study commenced in November 1989 for New Post, Moose Factory and Moosonee, and in June 1990 for the more northern communities (Berkes *et al.* 1995c, pp. 83-84).

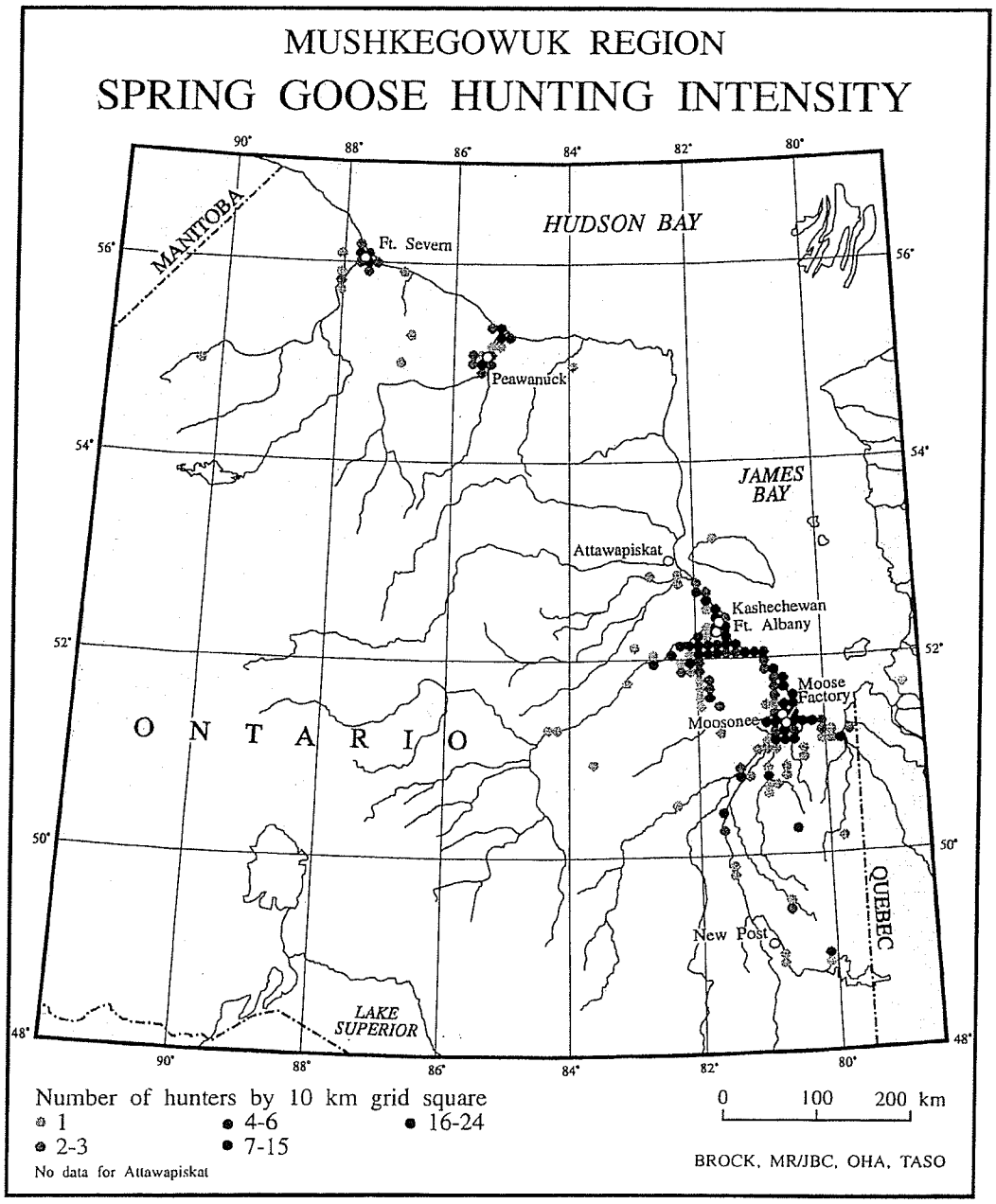

Figure 5.4: Spring goose hunting intensity in 1990.

5.4 Analysis of Land Use

Thompson and Hutchison (1989) noted a "dramatic increase" in the number of Canada and snow geese harvested from the mid 1940s to the time of their study, and from 1974/76 to 1981/83, during which time there had been a 65% increase in the number of these birds harvested (pp. 34-35). These increases were attributable in part to the sedentarization of aboriginal people into coastal communities, and to the subsequent population increases. Better guns, the introduction of outboard motors and home freezers also contributed to an increase in waterfowl harvests (p. 35). They observed further that northerly communities relied more heavily on waterfowl than did those living closer to Moosonee, where alternative foods were available due to more extensive transportation networks.

At least 84% of those interviewed in the study hunted waterfowl during the summer and fall (Thompson and Hutchison 1989, p. 18). Berkes *et al.* (1994) documented an overall participation rate in waterfowl harvesting of 80% (p. 353). Snow geese were taken in large numbers during the fall, with Canada geese being the main species harvested in the spring. Mean waterfowl bag sizes reported in the 1989 study (Thompson & Hutchison) ranged from 33 at Moose River Crossing to 221 birds per hunter at Winisk (now Peawanuck) (p. 20). Mean annual kills of geese and ducks per harvester in 1990 ranged from 28 in New Post, the most southerly community, to 176 in Fort Severn, the most northerly community (Berkes *et al.* 1994, p. 354). Harvesting activities occurred mostly along the coast and along the river systems, readily accessible by canoe to the hunters (Thompson & Hutchison 1989, p. 36).

5.4.1 Moosonee/Moose Factory

Figure 5.5 is a vegetation map of the Moosonee/Moose River area, with a 10 km. grid overlay. The area shown is approximately 270 sq. km., of which 11 of the 10 km. squares border the Hudson/James Bay coast. Figure 5.6 is a map of the same area showing only the 10 km. grid. Those squares in which spring and fall waterfowl harvesting activities occurred are shown for 1990. Some portion of a total of 52 of the 10 km. squares was used during this time period. Figure 5.7 shows the same information for the 1981/82 annual cycle. During this year 59 of the grid squares were used for harvesting geese.

Figure 5.8 provides a cross-tabulation of harvesting areas for the two periods. The use of 27 squares was common during both, and of these areas, 19 were either on the coastline or along Moose River. Harvesting intensity levels were not collected for this region in 1981, nor were harvest data collected by season. The 1990 study did provide a seasonal breakdown by activity, as well as by harvesting intensities. A total of 41 grid squares were used for spring waterfowl hunting. Ten of these were rated as having "high" intensity, 12 as "moderate" intensity, and 19 as "low" intensity. The high intensity areas were either along the coast or along Moose River, and near the settlements. During the fall waterfowl hunt five grid squares were identified as high intensity; six as moderate intensity; and seven as low intensity. Again, the most intensively used areas were along the coast and/or near the communities.

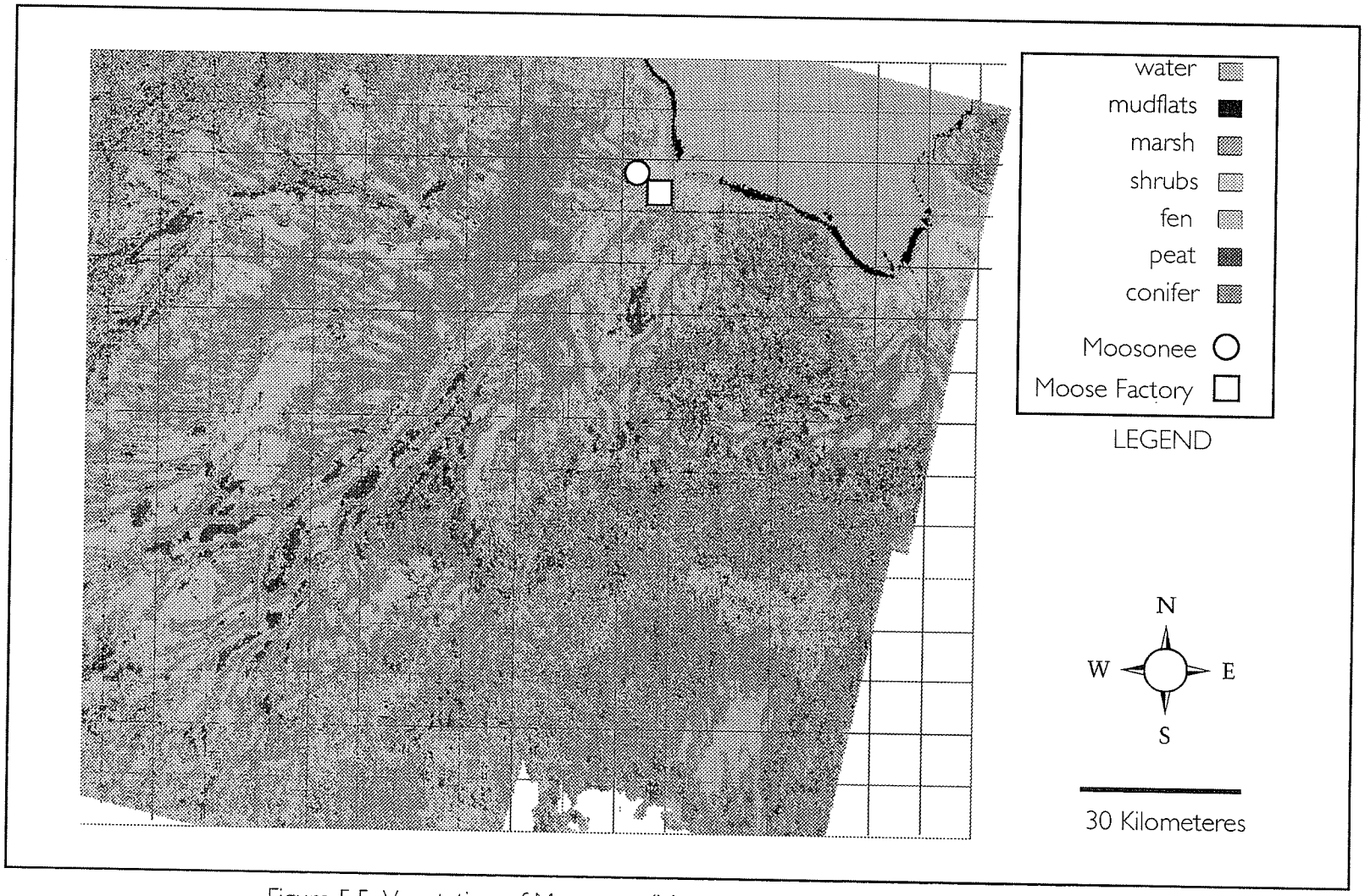

Figure 5.5: Vegetation of Moosonee/Moose River area. Source: PRSO 1993.

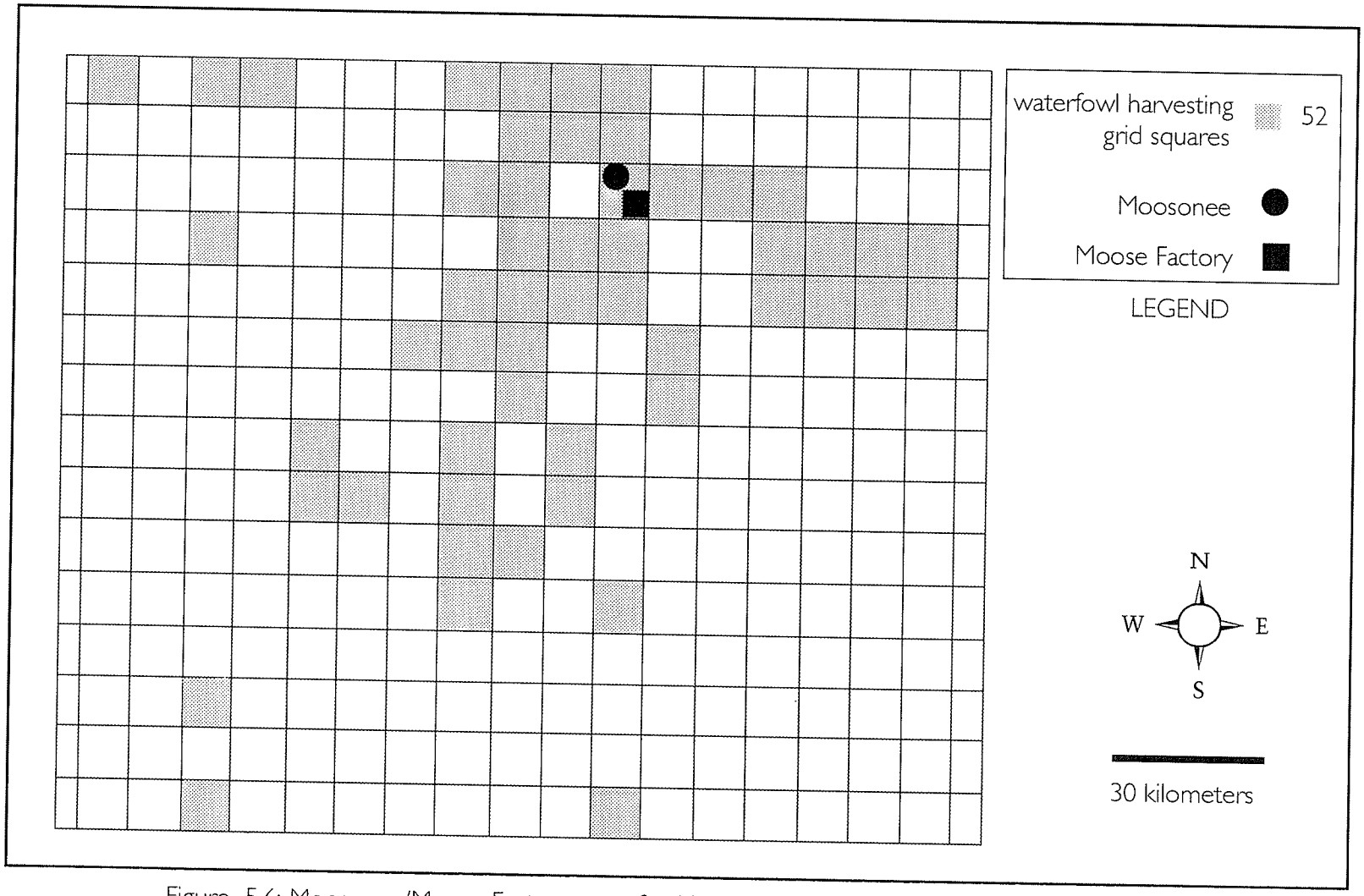

Figure 5.6: Moosonee/Moose Factory waterfowl harvesting areas by grid square for 1990.

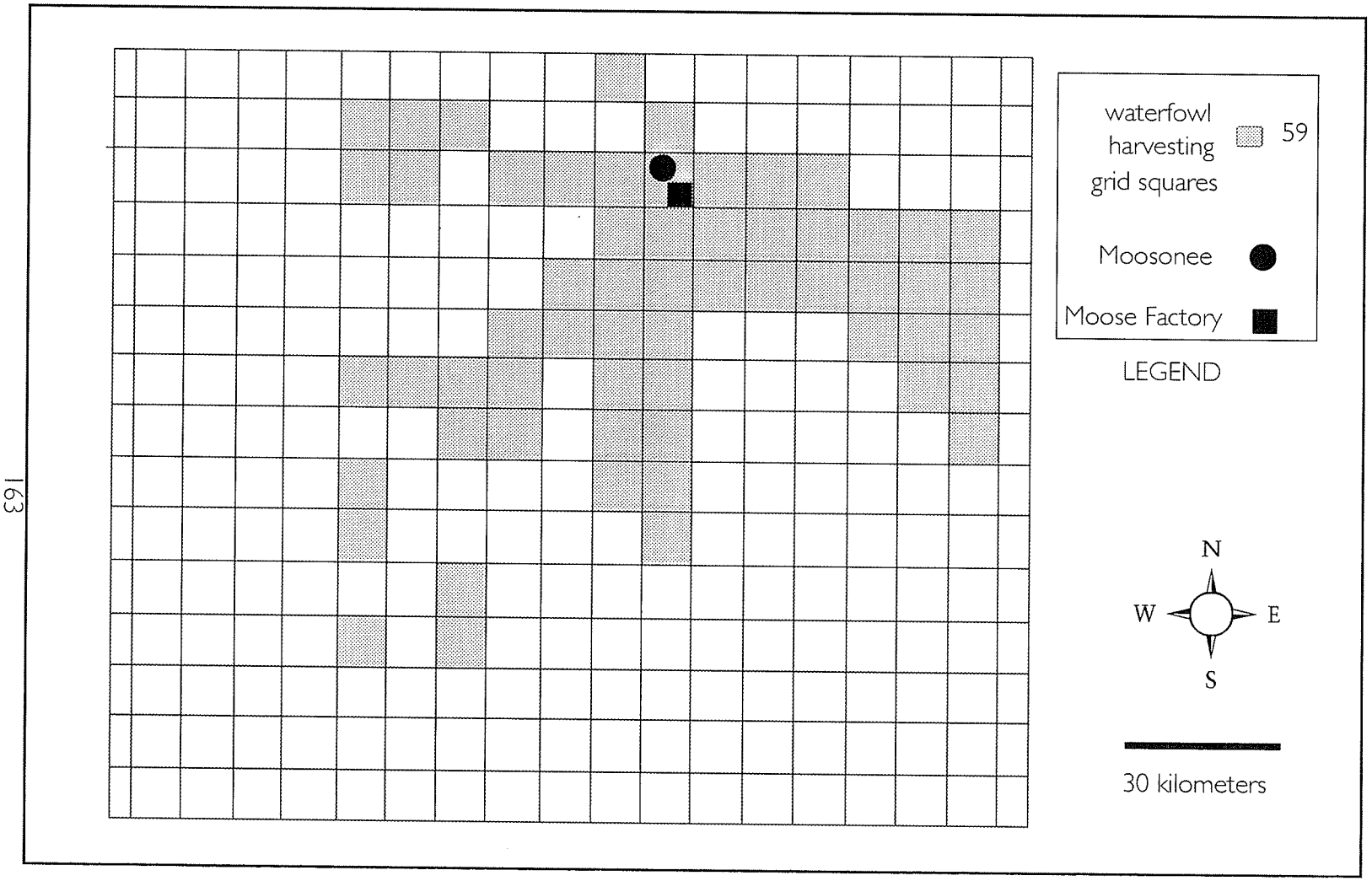

Figure 5.7: Moosonee/Moose Factory waterfowl harvesting areas by grid square for 1981/82.

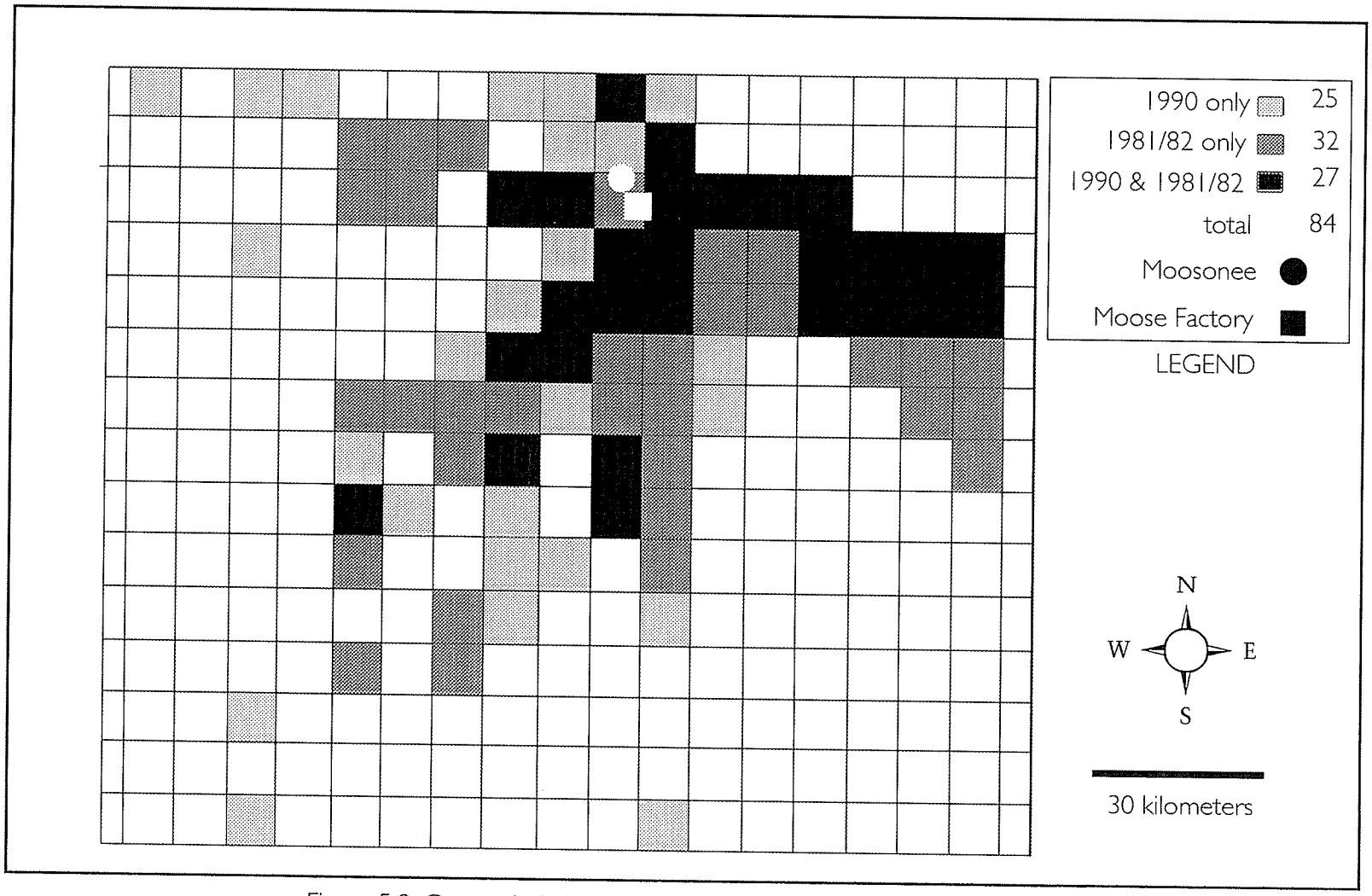

Figure 5.8: Cross tabulation of grid squares used for waterfowl harvesting in 1990 and 1981/82 by Moosonee/Moose Factory hunters.

5.4.2 Kashechewan/Fort Albany

Figure 5.9 depicts an area 184 sq. km. in size. Waterfowl harvesting occurred in 60 grid squares during 1990, and in 66 grid squares during 1981/82, as shown in Figures 5.10 and 5.11. Thus, 32 to 35% of the UTM squares in the area were used for waterfowl hunting. Data on intensity levels by season were collected in both studies for this area, with Figures 5.12 through 5.15 showing the extent of seasonal harvest areas by levels of intensity for each of the two time periods. A cross-tabulation of annual waterfowl harvesting activities for the two years as depicted in Figure 5.16 indicates that 41 squares were common to both, 19 were used during 1990 only, and 25 grid squares were used in 1981/82 only. Major hunting areas occurred along the coast and within large river systems, in close proximity to the settlements. The spatial extent of land use is similar in both areas and major waterfowl hunting activities occur in similar areas.

Figure 5.9: Vegetation of Kashechewan/Fort Albany area. Source: PRSO 1993.

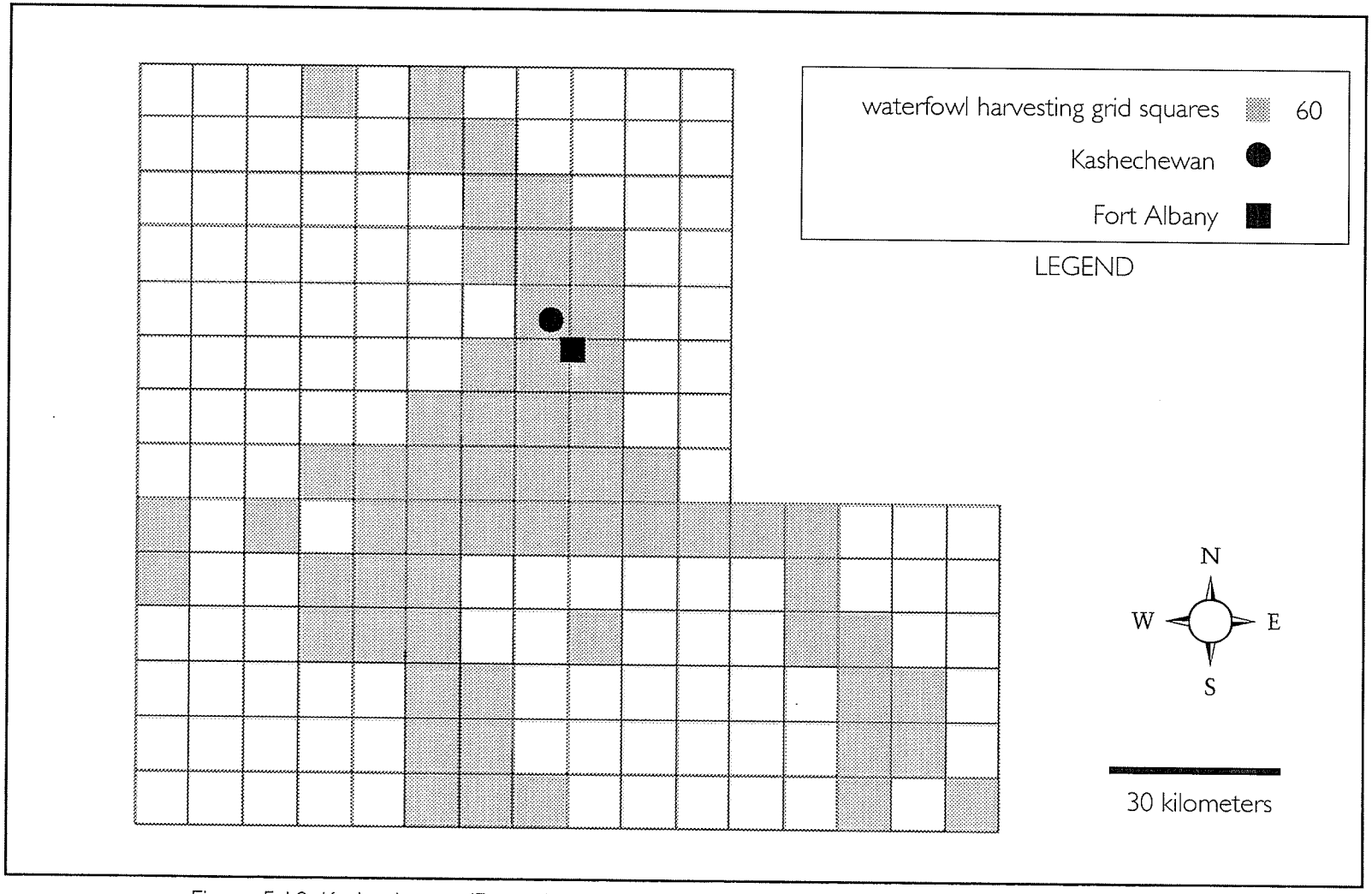

Figure 5.10: Kashechewan/Fort Albany waterfowl harvesting areas by grid square for 1990.

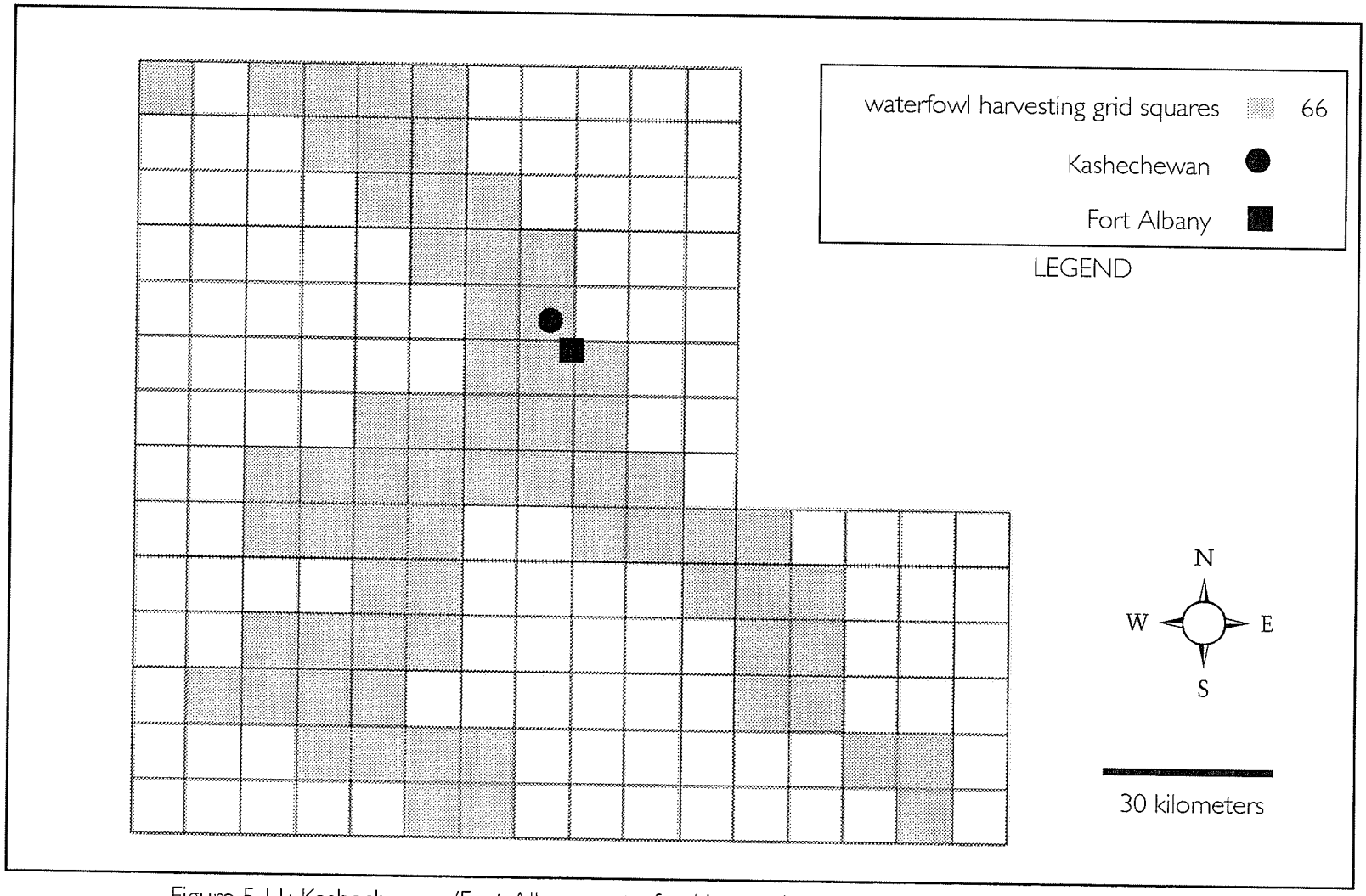

Figure 5.11: Kashechewan /Fort Albany waterfowl harvesting areas by grid square for 1981/82.

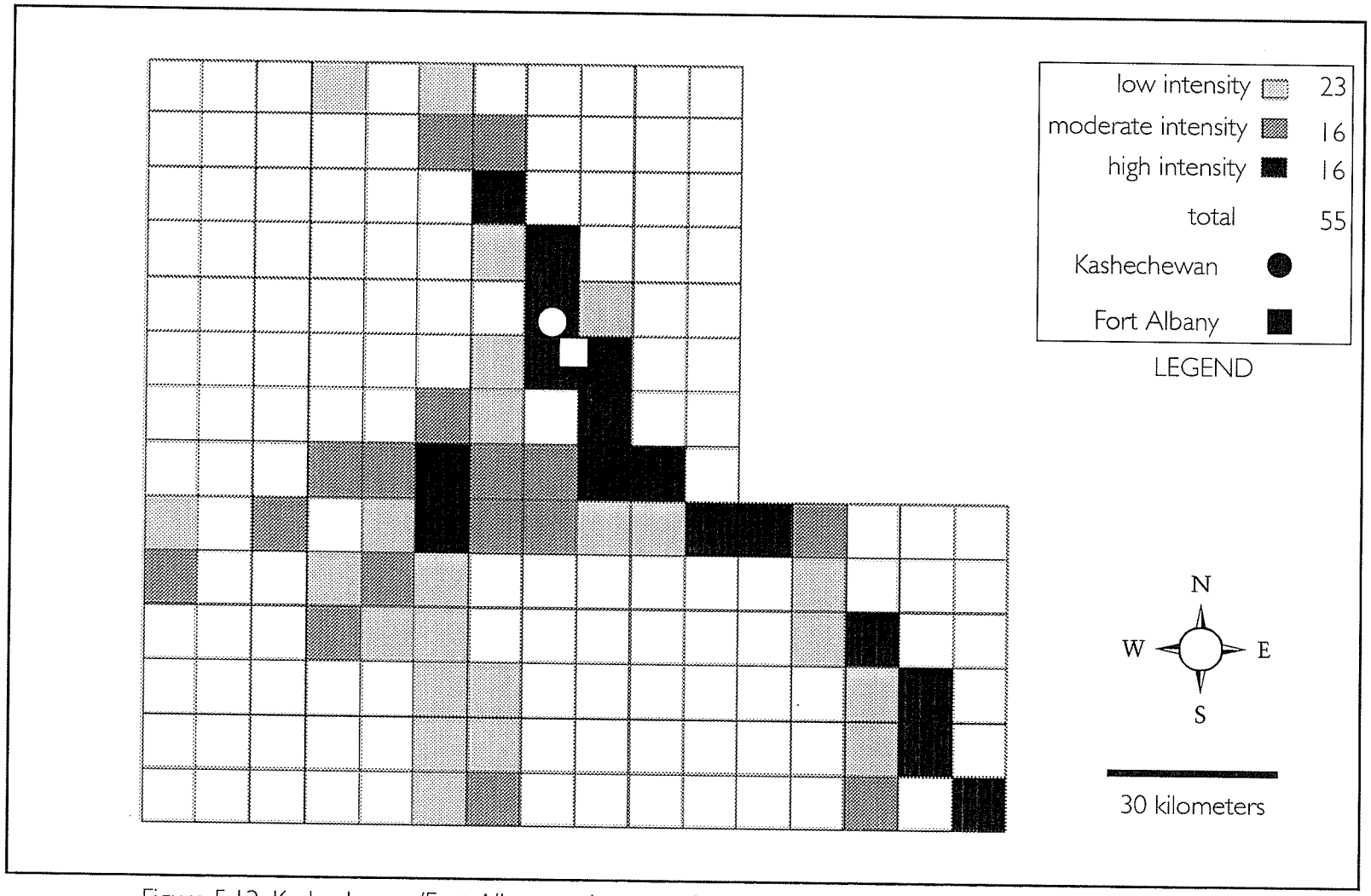

Figure 5.12: Kashechewan/Fort Albany spring waterfowl harvesting intensity by grid square for 1990.

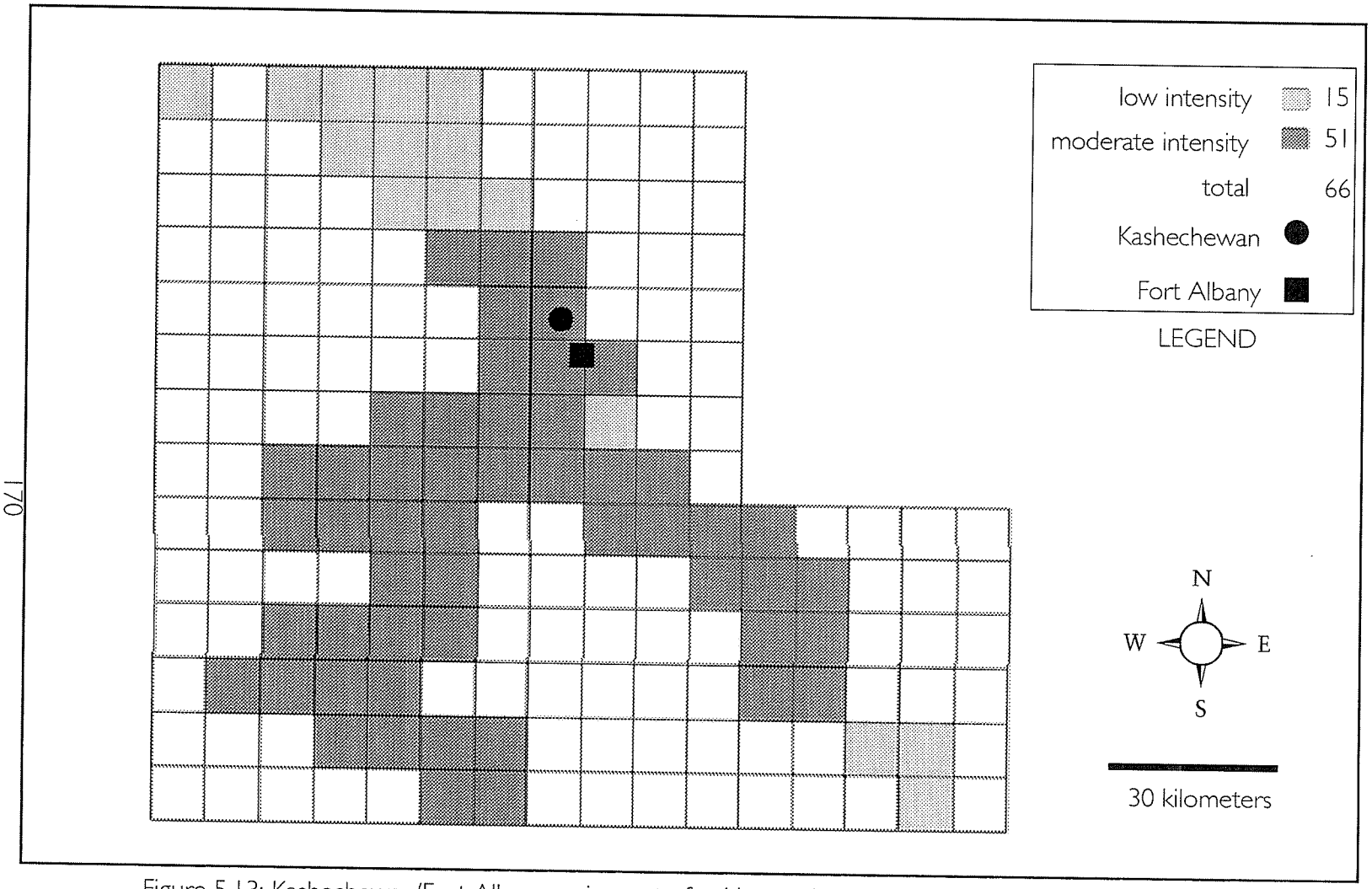

Figure 5.13: Kashechewan/Fort Albany spring waterfowl harvesting intensity by grid square for 1981/82.

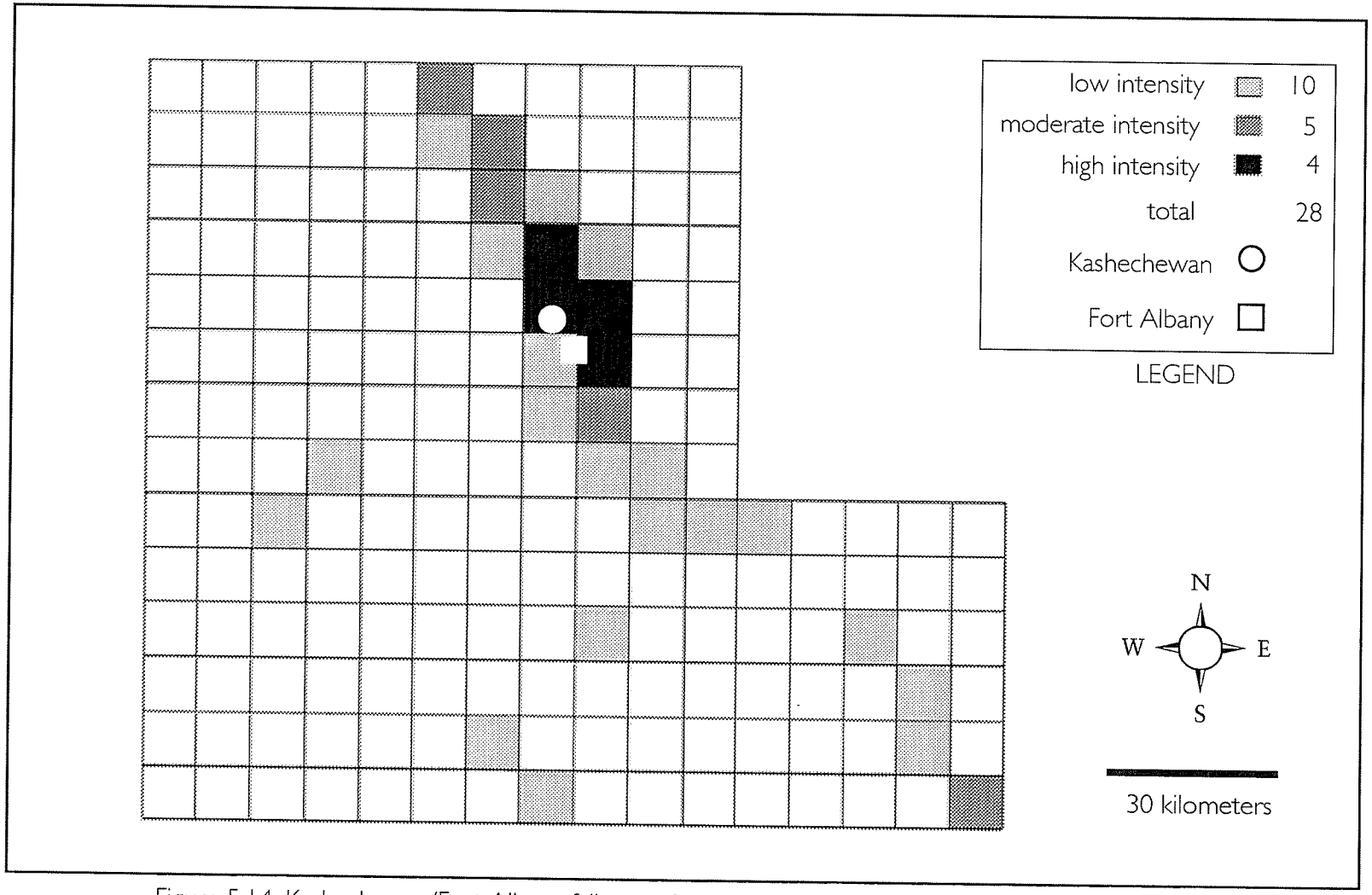

Figure 5.14: Kashechewan/Fort Albany fall waterfowl harvesting intensity by grid square for 1990.

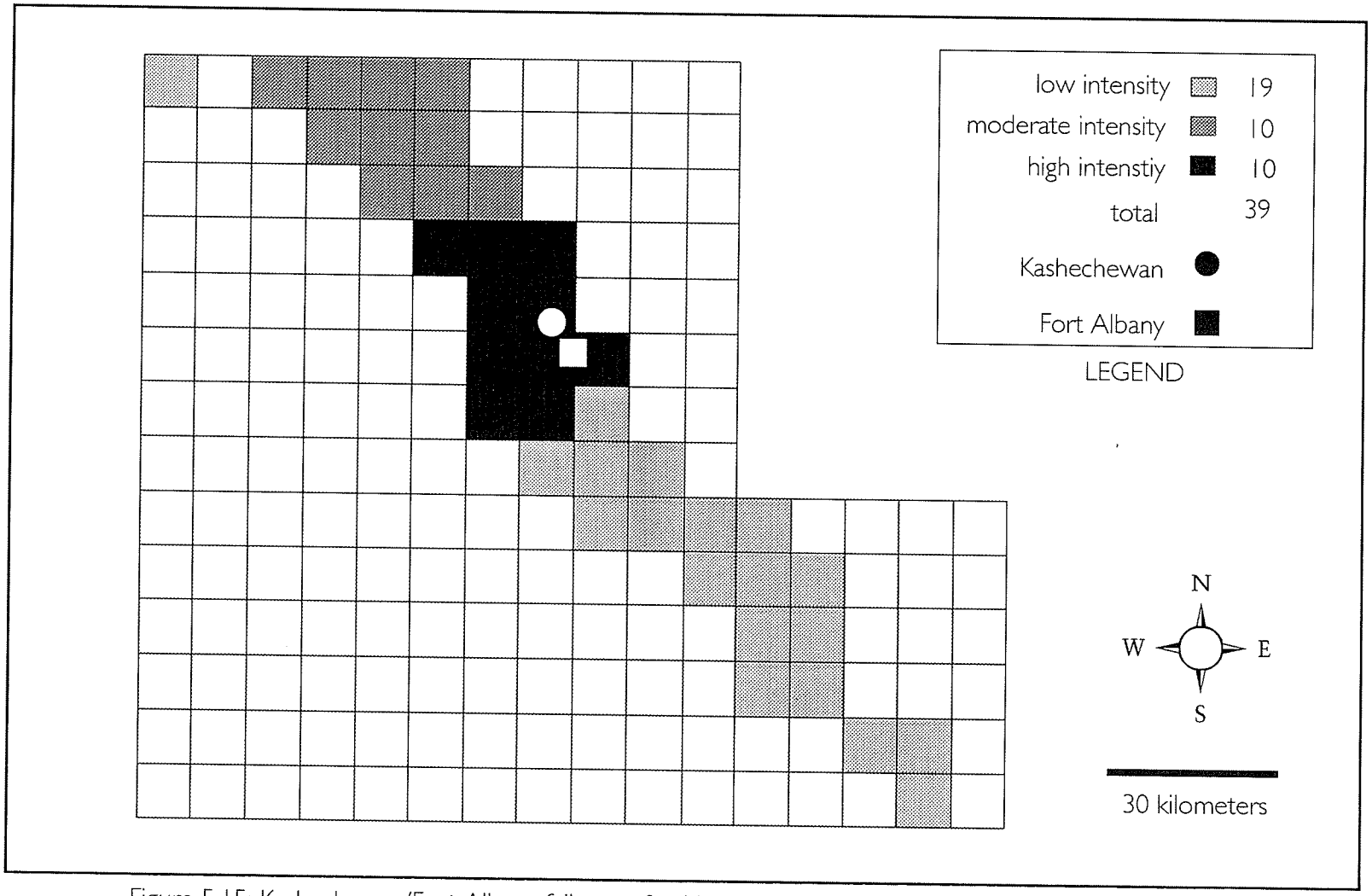

Figure 5.15: Kashechewan/Fort Albany fall waterfowl harvesting intensity by grid square for 1981/82.

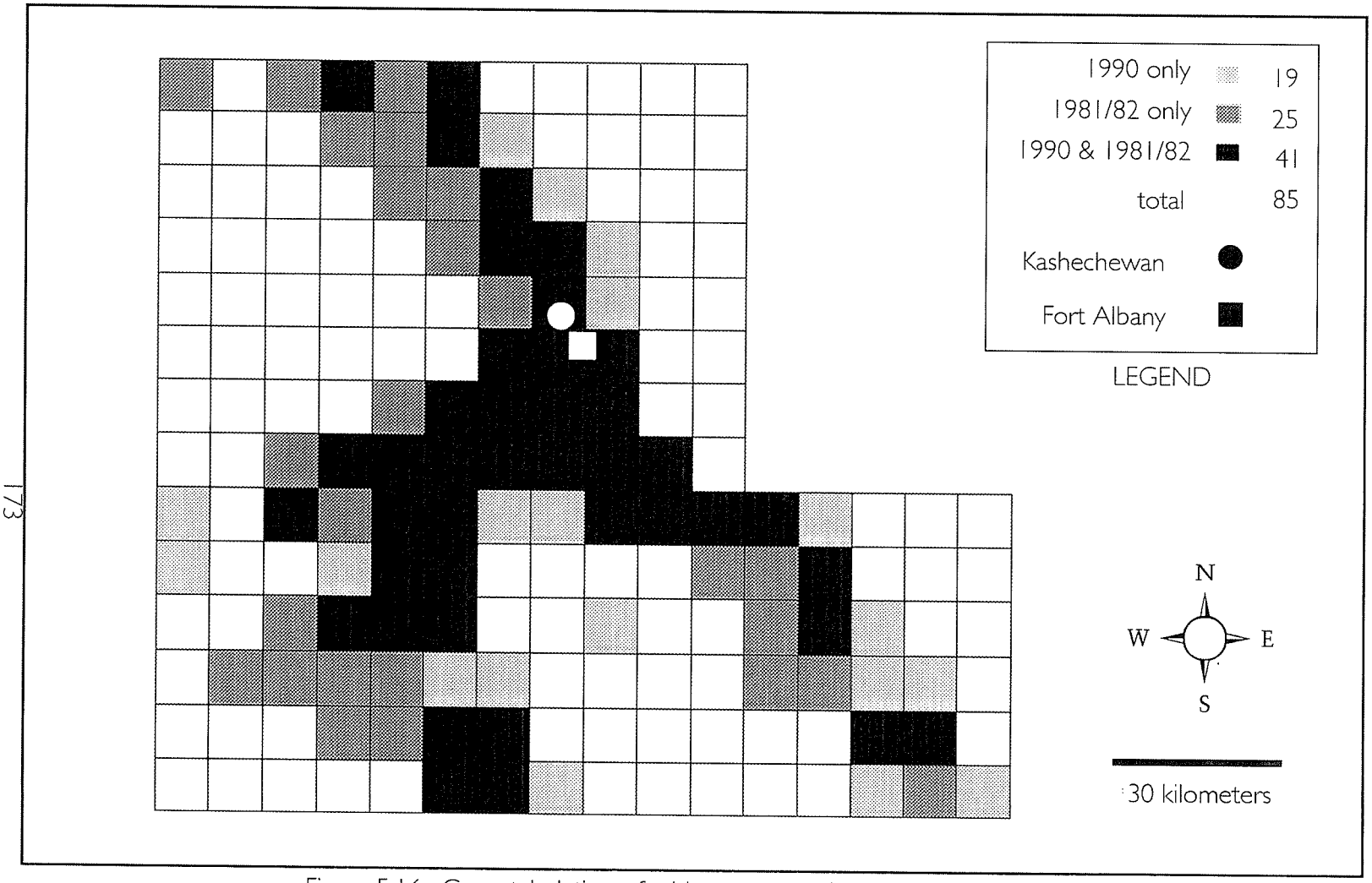

Figure 5.16: Cross tabulation of grid squares used for waterfowl harvesting in 1990 and 1981/82 by Kashechewan/Fort Albany hunters.

5.4.3 Waterfowl Harvests

Summary data on the extent and intensity of waterfowl harvesting activities in the two areas selected for analysis are provided in Tables 5.3 through 5.5. Table 5.3 indicates that there appears to be no significant difference from 1981 to 1990 in the number of grid squares in which waterfowl harvesting occurs. Table 5.4 suggests that the number of grid squares used for low intensity waterfowl harvesting activities are being maintained or increased, that the number of grid squares used for moderate harvesting activities and high intensity spring harvesting may be decreasing, but that the number of squares being used for high intensity harvests in the spring appear to be increasing There is simply not enough of a time trend to draw conclusions using this data, and the process of standardizing hunting intensities and areas may have distorted these outcomes. Similarly, the 1990 results are assumed to be understated because as noted earlier they reflect only goose harvests, as opposed to the waterfowl harvests depicted on the 1981/82 maps. A cross tabulation of the waterfowl harvesting areas used in common during both study periods is provided in Table 5.5 and shows correspondence of 32% in Moose Factory/Moosonee and 48% in Kashechewan/Fort Albany.

Table 5.3: Number of grid squares used for waterfowl harvesting activities.

Region	1990	1981/82	Total Area	% used
Moose Factory/ Moosonee	52	59	270	19 - 22
Kashechewan/Fort Albany	60	66	184	33 - 36

Table 5.4: Number of grid squares used for fall and spring waterfowl harvesting activities by level of intensity: Kashechewan/Fort Albany.

Region	1990	1981/82	Total Area	% used
Moose Factory/ Moosonee	52	59	270	19 - 22
Kashechewan/Fort Albany	60	66	184	33 - 36

Table 5.5: Cross tabulation of waterfowl harvesting areas used over time.

Time period	Kashechewan/Fort Albany	Moose Factory/ Moosonee
1990 only	19	25
1981/82 only	25	32
1990 & 1981/82	41	27
% used in common	48%	32%

There is reason to believe that preferred waterfowl harvesting sites would have similar vegetation—a marsh for example, but the scale at which the harvest data were gathered in these studies precluded correlating harvesting activities to habitat. Each of the 10 km. grid squares contains many vegetative species, and the preferred habitat in a given square cannot be assumed. When specific waterfowl harvesting sites are identified, however, it is possible to draw conclusions about preferred habitat. For example, a native harvester from Moose Factory, John Turner, provided ten specific seasonal waterfowl harvesting sites as shown in Figure 5.17. At this scale preferred harvesting sites can be predicted based on the vegetation, with preferred fall waterfowl harvesting sites being the saltwater marsh, an area comprising less than 1% of the land mass. Coastal marshes also provide preferred spring harvesting sites, with some hunting occurring further inland.

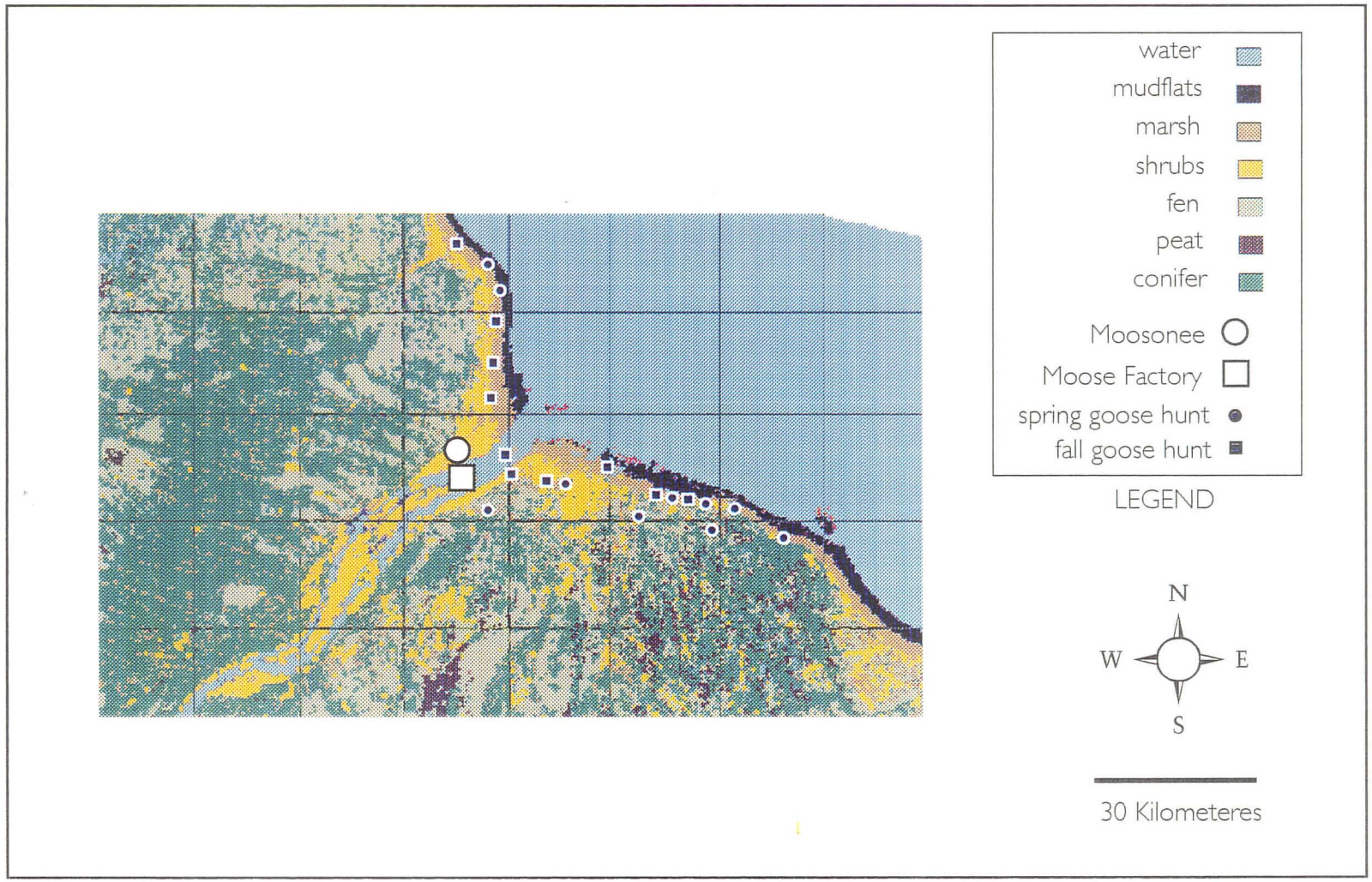

Figure 5.17: Specific goose harvesting spots in the Moosonee/Moose River area. Courtesy J. Turner.

Table 5.6 provides a comparison of the estimated waterfowl harvests for the two study periods relative to other harvesting activities. In the 1989 study, the total mean number of days spent harvesting waterfowl by waterfowl hunters averaged thirteen days in the spring and 15 days in the fall for a total of 15,316 days in 1981/82 and 14,576 days in 1982/83 (Thompson & Hutchison 1989, pp. 20, 68-69). In the 1990 study a total of 24,444 days of effort were reported spent on harvesting waterfowl (Berkes *et al.* 1994 p. 354).

In 1981/82, 107,000 geese were taken; in 1982/83, 91,000; and in 1990, 111,000. The number of geese taken per day of effort dropped from 7 in 1981/82 to 4.5 in 1990; the edible weight of waterfowl harvested per day averaged between 12 and 14 kg in the two earlier time periods, and 9 kg. per day in the 1990 study.

The estimated number of moose harvested more than tripled over the ten years, rising from 271 and 211 in 1981/82 and 1982/83 respectively, to 854 in 1990. The estimated number of caribou harvested also tripled, increasing from 461 and 559 in 1981/82 and 1982/83 respectively, to 1673 in 1990. Fish catches appeared to increase significantly as well, rising from an estimated catch of 40,310 in 1981/82 and 79,439 in 1982/83, to 135,983 in 1990. In this regard it should be noted, however, that the Thompson and Hutchison (1989) study did not include fish caught in commercial nets, and that this catch was in 1990 entirely eaten locally (Berkes *et al.* 1994, p. 357).

Total estimated edible weights of the waterfowl, large game and fish for the three years are provided in Table 5.6. During 1981/82 and 1982/83 a total estimated edible weight of 322,460 kg. and 316,705 kg. respectively were harvested, rising to 613,225 kg. in 1990.

Table 5.6: Comparison of estimated harvests for 1981-82, 1982-83, and 1990[1,2,3]

Harvest Species	Thompson & Hutchison 1989						Berkes *et al.* 1994b		
	1981/82			1982/83			1990		
	Number Harvested	Edible Weight (kg)	Effort (days)	Number Harvested	Edible Weight (kg)	Effort (days)	Number Harvested	Edible Weight (kg)	Effort (days)
Canada Geese	46,032	98,509		39,370	84,252		56,536	120,983	
Geese: Small Canada, Snow and Blue	61,061	97,087		51,783	82,335		55,076	87,587	
Ducks	14,893	11,468		14,625	11,261		21,766	16,760	
Brant, Loons and Swans	1,279	1,279		515	515		785	785	
Waterfowl	123,265[4]	208,343	15,316[5]	106,293	178,363	14,576[6]	134,163	226,115	24,444
Moose and Caribou	732	82,419	incom-plete	770	76,535	incom-plete	2,426	253,238	6,872
Fish	40,310	31,689	n/a	79,439	61,807	n/a	135,983	133,872	9,878
Total for all species		322,460			316,705			613,225	41,194

1. Based on Thompson & Hutchison 1989 & Berkes *et al.* 1994
2. Includes native hunters only unless otherwise noted.
3. Converted to edible weights as per Berkes *et al.* 1994 pp. 354-55.
4. As per species listed above.
5. Native and non-native hunters.

Waterfowl comprised 64% of the 1981/82 total; 56% of the 1982/83 total; and 36% of the1990 total. The proportions of edible weight harvested from big game were 26% in 1981/82; 24% in 1982/83 and 41% in 1990. Fish accounted for 10%, 20% and 21% of the harvests respectively. The per capita value of edible meat in the period 1981-83 was calculated by Berkes *et al.* (1994) to be 78 kg./capita/yr. or 214 g./capita/day, compared to 106 kg./capita/yr. or 290 g./capita/day in 1990 (p. 357). The average imputed value of the subsistence economy for households in this region was calculated to be $1,260.

5.5 Summary and Conclusions

Omushkego Cree harvesters continue to use their traditional hunting grounds of approximately 250,000 sq. km., an area which far exceeds the 900 sq. km. allocated to them as reserve land (Berkes *et al.* 1995c, p. 92). Consistent with this expansive land use is a continued reliance on the harvesting of wildlife and fish to provide a significant and culturally important portion of their diet. The analysis of the two studies presented in this chapter has confirmed the validity of the waterfowl harvesting land use maps in the 1981/83 study (Thompson & Hutchison 1989) and in the1990 study (Berkes *et al.*1994, 1995c). Despite the need to standardize data in the two studies and thereby cause a distortion of the results, this analysis indicates that subsistence harvesting of waterfowl continues to be an important activity in the lives of the Omushkego. It is therefore reasonable to conclude that the land use maps of other species are equally valid, since they were produced using the same methodology.

Similar findings have been reported by George & Preston (1987), George (1989), and George *et al.* (1995). While transfer payments and wage employment form the basis of

the monetary economy (George & Preston 1987; George 1989) George *et al.* (1995) in their analysis of aboriginal harvesting in the Moose River Basin (which included Moose Factory, New Post and Moosonee) observed that traditional characteristics of land use still prevail (p. 79-82). More than 90% of Cree respondents reported being active or intensive hunters, that is, participating regularly in one or more harvesting activities and spending more than a week-end at a time in the bush (Berkes *et al.* 1994, p. 352). Seventy per cent of respondents in Moose Factory reported that their wives participated in harvesting activities such as bush camp work. Almost 80% of the respondents reported eating bush food weekly, half eating bush food two or three times weekly, and most of the respondents reported that they shared the results of harvests with others (George *et al.* 1995, p. 79).

George *et al.* (1995) noted also that "high levels of activity in the bush appear to be compatible with relatively high rates of employment: fully 179, or 76%, of the Moose Factory respondents reported seasonal or casual, part-time year-round, or full-time year-round employment" (p. 81). Here is further evidence that 'modernization' has not led to the disappearance of traditional land use activities. New technologies such as snowmobiles and all-terrain vehicles have been adopted, reducing the amount of time spent hunting, and resulting in the formation of some "un-traditional" hunting groups, such as individuals or pairs of men instead of families, but the commitment to hunting as a way of life remains high.

The results of this analysis indicate that harvesting activities continue to be important to the financial, cultural and social well-being of the Omushkego Cree. Also based on this analysis it is reasonable to conclude that land use surveys are valid, if imperfect, tools for gathering information on the land use activities of band societies. When synthesized, the

over twenty land use studies conducted in the Hudson Bay bioregion document convincingly the importance of subsistence to aboriginal band societies across the bioregion.

Chapter 6

Subsistence and Evolving Resource Management Responsibilities: The Inuit of Nunavut

6.1 Introduction and Context

This chapter presents the last of three case studies of subsistence societies in the Hudson Bay bioregion. Its focus is the Inuit of Nunavut, a people whose ancestors lived undisturbed for centuries on the land and ice within the Arctic Circle (Hamilton, 1994, pp. 9, 11). Beginning with the Second World War, however, southern institutions, values and technologies have precipitated massive cultural changes on these people (Stenbaek 1987; Duffy1988). The changes began with the establishment of a number of northern air bases for strategic purposes. Following the war these bases were converted into commercial airports, and those who lived in the arctic began the process of adapting to southern cultural and political priorities. "Wartime experience in long-range flying brought the Arctic Islands suddenly within easy reach of southern Canada" (Greenaway & Dunbar 1981, p. 83).

The establishment under international agreement of the first high arctic weather stations at Resolute, Eureka, Mould Bay, Isachsen and Alert between 1947 and 1950 further advanced this trend since it led to the construction of a radio communications network to collect weather data which was transmitted to the south (Greenaway & Dunbar 1981, p. 84). The development of centralized communities in these regions was encouraged by government, and hastened by a famine in the Keewatin and Ungava Districts in the late 1940s and early 1950s. Centralized health, educational and social services were extended to residents of the growing settlements, and central administrative structures established. At

the same time, developers in the south became aware of the potential for extensive industrial development in the arctic, and began to exploit these opportunities.

A new chapter in the history of this people will be opened at the turn of the next century, when seventeen thousand Inuit are scheduled to regain political control over Nunavut, an area occupying 2,000,000 sq. km. of land and ice in the Eastern and Central Arctic. This chapter reviews the subsistence ethos and economics of this society over time, assesses the impacts precipitated by southern political, social and market forces during the twentieth century, and evaluates the relevance of subsistence in shaping the creation of Nunavut. The final section is based on the experience gained designing a harvest study for Nunavut. This experience is used to evaluate the compatibility between the modern resource management expertise/technologies which will be needed by the Inuit to run Nunavut, and subsistence ethos and economics.

6.2 Methods

This chapter is based on an analysis of harvest and land use studies; participation in the Hudson Bay Programme; and participation in the design of a harvest study for the Harvest Study Steering Committee of Nunavut Wildlife Management Board (Berkes *et al.* 1995a and 1995b). Design of the harvest study commenced in December of 1994 and concluded with delivery of the final report in June of 1995. During this time the researcher participated in two meetings with the Steering Committee—a two day meeting in Winnipeg on January 11 and 12, 1995, and a second two-day meeting in Iqaluit on March 29 and 30.

The Steering Committee had Inuit representatives from Pelly Bay, Kitikmeot Region; Arctic Bay, Baffin Region; and Chesterfield Inlet, Keewatin Region. Other membership

included representatives from Environment Canada's Canadian Wildlife Services, the Department of Fisheries and Oceans' Freshwater Institute, and the GNWT (Government of the Northwest Territories) Department of Renewable Resources. Designing the study was a collaborative and interactive process requiring knowledge in the areas of: data collection, processing, verification and interpretation methodologies; mapping technologies; and use of traditional ecological knowledge. Program planning required expertise in communications, hiring and training personnel, defining equipment requirements, budgeting (using *Microsoft Excel*, a spreadsheet with business graphics and database) and project management (using *Claris MacProject Pro*, a project management package to facilitate project planning, control and communication) for a vast and remote region.

Work leading to preparation of the final report involved extensive discussions with committee members; meetings with staff personnel and the Committee chairman; hiring three sub-contractors with expertise in fields needed to complement the knowledge of the three design team members; and consulting with fourteen other individuals on a variety of matters.

6.3 Background: The Federal Government Assumes Responsibility for Inuit

With the exception of lands owned by the Hudson Bay Company, Canada acquired "full beneficial rights over all land and resources" of Rupert's Land and the Northwestern Territories for 300,000 pounds, on June 23, 1870. Ten years later the northern extent of ownership was stipulated to include all the Arctic Islands. These lands were administered under the *1872 Dominion Lands Act*, an act designed to facilitate orderly settlement of the country's western regions. The Northwest Territories Act was passed in 1905, but did not

delineate the administration of Inuit affairs. The Federal Government remained unclear at that time as to whether the Inuit were, or were not, Indians. In 1924 the Indian Act was amended to include the Inuit, and two years later the Department created under the Indian Act extended medical services to the Eastern Arctic. Late in the 1930s the Inuit became the responsibility of the Department of Mines and Resources (Duffy 1988, pp. 10-11).

Instead of preparing the Inuit for the inevitable changes that southern forces would bring upon them through the provision of services such as education, for example, the federal government focused its attention and energies on the resource development potential of the arctic (Zaslow 1981, p. 78; Duffy1988, pp. 12-13). As early as 1927 RCMP officers had sent reports to Ottawa describing exploitation of the Inuit by the HBC traders, who, they said, forced the Inuit to trap where they could get desirable white fox pelts but little food. These reports of abuse had been disregarded, but during the Second World War the federal government's inaction on behalf of the Inuit drew the attention and criticism of international journalists and US military workers (Duffy 1988, pp. 14-17). The government was still without a plan for the Inuit, but began to recognize that inaction was causing severe problems. During the 1940s

> game resources, which provided both energy and materials, were declining, and the substitute store-bought foods were nutritionally inadequate. Day labour at the air bases proved not only less arduous than hunting and trapping but financially more rewarding. The more the Inuit were attracted to wage earning, the more strains and stresses appeared in the antique structure of traditional society. The unstoppable onrush of change in the Arctic alarmed and alerted the government in Ottawa (Duffy 1988, p. 17).

The actions finally taken by government in 1945 were to transfer responsibility for Inuit and Indian health to the Department of National Health and Welfare, to recognize Inuit as citi-

zens of the country, and to distribute family allowance cheques to them.

In 1950 the Territorial Lands Act was passed to replace the 1872 Dominion Lands Act. The new Act ensured that transfer of title would be controlled by the Government. In 1954 limited powers to administer surface rights to some of the land were transferred to the Territorial Government. These lands were typically the kind used to maintain highways, roadside parks and tourist campsites. Mineral and water rights to all land were retained by the Crown, and resource development projects were managed by the passage of federal government regulations and legislation such as the Canadian Mining Regulations, and the Northern Inland Waters Act (Doering 1983, pp. 3-9).

Prior to settlement of land claims in the NWT, all 3.4 million sq. km. of land were owned by the Crown. The Government of Canada ultimately recognized the existence of aboriginal title in areas where no treaties had been signed extinquishing title, and announced a policy to negotiate the settlement of outstanding land claims in exchange for land, money and other considerations. To that end it set up an Inter-departmental Committee on Claims in 1980/81. In 1982 the Federal Government announced that it would divide the Northwest Territories and create Nunavut, pending settlement of land claims (Doering 1983, pp. 1,2 &12).

6.4 Changing Land Use Patterns in the Twentieth Century

Prior to the arrival of European explorers in 1576, the Inuit depended primarily on whales, seals walruses, and to a lesser extent on caribou, for their survival (Purich 1992, p. 28). Seals were plentiful along the coast in the spring, and provided both food and skins. Inuit of each area had different seasonal routes, but a typical pattern might have involved several

moves per year. After the ice broke up on the rivers, the Inuit settled at the head of fiords and caught char swimming downstream. By July they had moved inland to hunt caribou. Summer also brought the return of walrus, seals and migratory birds, all of which were used for food. With the arrival of winter, Inuit families gathered in large groups or camps to hunt ringed seals at their breathing holes in the ice (Duffy 1988, pp. 19-20). They lived in skin tents in the summer, and in igloos, or sod, whalebone and stone houses in winter. Decision-making was by consensus, with older relatives having authority over their younger kin. Disputes were resolved variously, and including singing and wrestling competitions and gossip. Individuals who threatened the security of the group were ostracized (Jenness 1964, p. 162; Purich 1992, p. 28).

While early explorers had little impact on the Inuit, approximately 750 whaling ships sailed into the arctic between 1820 and 1830 and took away over 8,000 whales. These whalers introduced the Inuit to European trade goods, which they traded for furs. They also employed the Inuit to help with the whale hunts, in exchange for tea, tobacco, rifles, traps and utensils. They introduced alcohol and epidemics as well, with serious repercussions for the coastal communities they visited (Purich 1992, p. 30-31).

By the beginning of the twentieth century there were approximately 3,000 Inuit in the arctic. The whaling industry had declined, and was being replaced by the fur trade with its "powerful economic and acculturative forces". By 1910 a very favourable market had developed for white fox pelts, the only fur which could be trapped in quantity in the arctic (Zaslow 1981, p. 69). At the peak of the fur trade there were over one hundred trading posts in eighty arctic locations, and the Inuit were able to earn cash incomes. In the 1930s

the fur trade collapsed, and the value of pelts dropped from $40 to $10. By this time however, permanent changes had been wrought.

> The advance of the trade in white fox pelts during the boom years between 1910 and 1930 profoundly affected the largely self-sufficient bands in the remoter districts that still pursued their traditional life-style. Such bands came together near good sealing grounds every autumn to secure enough meat, oil and skins to enable the bands to survive the long, hard winters as successfully as possible. These winter seasons also afforded the main opportunities for participating in group social, cultural and religious activities. Trapping opposed this pattern by requiring the Inuit to disperse widely over the countryside during the winters to secure furs to exchange for the white man's goods. The credits they received to enable them to concentrate on trapping increased their dependence on the new-comers, while the goods traded—steel traps, staple foodstuffs, and especially rifles and ammunition to hunt game far more effectively—reduced their self-sufficiency...the rapid spread of rifles to the remotest districts reflected the expansion of the fur trade. Increased mobility in the wintertimes raised the total fish and meat needs by requiring larger numbers of sled dogs to be used. As the traders also were prepared to purchase the surplus caribou hides, the slaughter of caribou increased markedly, and their numbers declined visibly under the stepped-up hunts. As early as 1920 the first policemen stationed along the Arctic coast commented on the speed with which rifles had been distributed among the Inuit...also on the growing scarcity of caribou" (Zaslow 1981, pp. 70-71).

An increase in violent crimes, and rising tensions resulting from the growing number of white men in the country were also reported. As a consequence of the adoption by many Inuit of the foreign technologies and food supplies, the collapse of the fur market in the 1930s left the trappers in dire need of the trade goods to which they had become accustomed but which they could no longer afford, and 7,700 Inuit faced serious hardship (Purich 1992, p.p 34, 42). Winters at this time were unusually severe, and coupled with reduced game resources, the forced transition to greater self-reliance and less dependence on the fur trade was made even more difficult (Zaslow 1981, p. 72). Jenness (1964) concurred with this description: "by the early 1930's...the economy of the Eskimos in all

parts of the Arctic had gravely deteriorated, partly through the slump in fur prices, and partly through a diminution in the supply of game, particularly caribou" (1964, p. 53).

By the mid 1940s the price for white fox pelts had recovered to between $15 and $20, but by the end of that decade the price had dropped to less than $5 due to slow demand for the pelts, foreign exchange restrictions and competition with Russian white fox pelts. Hardships created by the drop in fur values were exacerbated by dramatic increases in the cost of essential goods, a 15% tax on rifles and ammunition levied nationally by the federal government in 1950, and very high freight rates. Hunting became more difficult as caribou and fox populations declined further. Hunters were forced into trapping less desirable areas, and consequently had to rely to a greater extent on traders with questionable ethics for food. There was evidence that many traders in the Western Arctic were taking advantage of Inuit trappers, encouraging them to make unnecessary purchases and extending credit in order to ensure trappers would be compelled to trade with them rather than elsewhere. The trappers' ability to provide for their families between harvests was of no concern to the trader (Jenness 1964, p. 79; Duffy 1988, pp. 135-6). Though it was Hudson Bay Company policy to ensure that all its Inuit traders were supplied with the essentials needed to live and to trap, this policy was not consistently followed. When fur prices dropped in the late 1940s the HBC elected to turn responsibility for trappers who brought in fewer than ten pelts a year, as well as for needy orphans, women and children, to the government (Duffy 1988, pp. 142-3). By 1950 many Inuit had come to depend on pensions and family allowances for some of their needs (Jenness 1964, pp. 80, 106).

In postwar years the market for sealskins began to expand. By the early 1960s seal-

skin clothing was becoming increasingly popular in Europe, as the result of new techniques used to prepare the pelts. For the first time, marketing ringed seals became profitable for Canadian Eskimos. In 1955 a young ringed seal pelt had sold for $4 in eastern Baffin Island. Eight years later the same pelt sold for $17.50. Total trade in sealskins in the NWT rose from 10,470 skins, valued at $48,689 in 1961/62, to 46,962 pelts valued at $691,707 in 1963/64. At Clyde River, in northern Baffin Island, a household's annual income from furs rose from an average of $111 in 1957, to $609 in 1964. Hunters used the income to outfit themselves in modern equipment. "In eastern Baffin Island, for example, most hunters used the gains of the early 1960s to buy canoes, flat-bottomed boats, outboard motors, snowmobiles, and low-calibre, high-powered rifles" (Foote 1967, pp. 267-268). Operating costs associated with hunting increased dramatically as a result, and by 1966 the average cost of bringing in one sealskin was estimated at $6.29 for the Eastern Baffin hunter in Cumberland Sound, and $4.46 in Clyde River (Foote 1967, p. 268).

The growth in construction and military developments initiated after the Second World War was over by the mid-sixties. Though sealskin and fur industries were becoming re-established, an extensive publicity campaign concerning the methods used to kill harp seal pups elsewhere in Canada by the Society for the Prevention of Cruelty to Animals effectively destroyed the ringed seal industry in the arctic. By 1965 the demand for sealskin had plummeted to five per cent of earlier levels in Switzerland, and to 50 per cent of former demand in West Germany. To avoid total collapse of the market the HBC bought pelts for $2.50 (Foote 1967, pp. 267-8).

The protest against killing seals dissipated, and by the end of the decade the market

for seal pelts had stabilized. From 1971 through 1974 pelts sold for an average of $14 at Clyde River, for example, but a second protest against the organized killing of newborn harp seals was launched in 1977. By August the price for ringed seal pelts had dropped to $10. By November the price in the Eastern Keewatin was less than $1. Similar declines were felt in Baffin and elsewhere in the arctic (Wenzel 1978, p. 4). When the ringed seal pelt market disappeared, many Inuit lost the income needed to support their hunting efforts. This lost income had serious implications for both the health and the subsistence economy of Inuit communities. Writing at the time, Wenzel (1978) observed that:

> This decline in prices poses a threat, not only to sealing by the Inuit but to all types of subsistence hunting by them as well. In most communities...the food provided by marine mammals—caribou, fish and birds—is vital for the nutritional health of the Inuit. (In any case, outside of the largest northern communities, such as Frobisher Bay and Inuvik, many southern substitute meats, which have lower protein and fat content, are not even available.) Purely subsistence activities often entail a greater expenditure on equipment and fuel than does sealing done mainly with the market in view. Thus, while the ringed seal supplies a food as well as a marketable commodity, it is as the latter that it supports other forms of Inuit subsistence activity. The hunting of certain animals, such as polar bear and narwhal, whose skins are marketable, is restricted by government quota. Members of Inuit communities may, as a result of these factors, have no other choice but to abandon hunting, despite the consequences for themselves and their families in terms of health and traditional culture (Wenzel 1978, p. 5).

6.5 The Post-War Wage Economy

In light of the Inuit's growing dependence on relief, a decision in 1954 to proceed with construction of the DEW Line[1] was regarded with optimism, raising expectations that the associated opportunities for employment might begin to ease their difficult financial situation (Duffy 1988, p. 155). The DEW Line project led to the construction of dozens of air

1. A product of the Cold War, the DEW Line project was part of an early warning system for the defence of the United States against Russian long range bombers.

fields in remote arctic locations, and the increased accessibility resulted in much greater exposure of Inuit communities to outsiders including teachers, bureaucrats, doctors, traders and missionaries. The lure of jobs and housing potentially available in close proximity to the project encouraged the Inuit to move off the land and into the settlements. During the peak of construction in 1956, 7,281 men were employed on the DEW Line, but Inuit hopes for employment were not met. The total number of Inuit hired reached only 101, and most of them were from the Western Arctic.

> There were not enough Inuit in the Eastern Arctic of the calibre the corporation [Federal Electric] required. The reason was easy to find. Decades of neglect of the eastern Inuit had left them grossly underqualified to accept employment when the opportunities came along....the outlook for sustained economic development in the Eastern Arctic offered little encouragement to those whose task was to find ways to stimulate it. Experience with the DEW Line had shown beyond doubt that modern economic development depended to a critical degree on education. The Inuit of the Eastern Arctic were singularly ill-equipped (Duffy 1988, pp. 158-161).

In addition to the DEW Line project, the federal government had also undertaken extensive housing and other construction projects following the Second World War, particularly in Frobisher Bay (now Iqaluit), and created some employment opportunities for aboriginal people. Wages were low, but nonetheless, the Inuit were eager to take these jobs. Those who got them, however, regretted the loss of freedom. Studying the effects of wage employment on the Inuit of Frobisher Bay in 1958-59, Yatsushiro (1962) learned that most of the approximately 100 Eskimos who had wage employment during that period were satisfied with their jobs, their treatment at work, the amount of pay they received and the length of their work day. A majority said they were living better at the time of the survey than they had been twenty years earlier, due to wage earnings and the purchasing power it gave them

for western goods, and due to government assistance in health, education, and housing. They also expressed a desire to spend less time working for wages and more time hunting. Only one-fifth of the respondents preferred working full-time for wages to hunting full-time; another one-fifth preferred hunting full-time; and another one-fifth preferred to pursue both equally. The remainder did not respond. Yatsushiro concluded that the desire for wage employment needed to purchase motor boats, guns and ammunition conflicted with the Inuit worker's *need* "as he views it" to hunt in order to provide food for his family (pp. 20-21).

Yatsushiro (1962) noted further that requirements of settlement life had proven difficult. Having to leash their dogs or have them shot by the R.C.M.P., shifting from a seasonal notion of time to one of hours on a clock, having to fill out income tax forms, send children to school, obey government laws and regulations, and losing the freedom to hunt at will, had taken a toll on the Inuit. Some of those who seemingly had adapted most easily to these changes expressed to Yatsushiro that they did not know how much longer they would be able to stay with wage employment. Socio-cultural problems had developed during this period of transition, and respondents expressed concern regarding the incidence of theft, marital difficulties, fighting, gambling, and drinking (pp. 22-5).

The advisory commission set up by Arthur Laing, then Minister responsible for the North, to look into the constitutional future of the NWT tabled its report in 1966. It was the Commissioners' recommendation that the NWT should not be divided "at this time", and that the seat of government should be moved from Ottawa to Yellowknife. This recommendation was adopted and on September 18, 1967 seventy-four civil servants and their

families, along with thirty tons of files, were delivered to Yellowknife by aircraft. Three years later the number of civil servants had increased to fifteen hundred. During the same time, oil and gas developments in Alaska began to have impacts on Canada. With billions of dollars at stake, American plans to build a pipeline across Alaska to Valdez were delayed by a court injunction pending settlement of native land claims. The US Congress acted quickly to pass the Native Claims Act in 1971, giving "forty million acres to the Eskimos, Indians, and Aleuts, plus a billion dollars over twenty years, partly from oil royalties" (Hamilton 1994, p. 128). The pipeline in Alaska drew attention to the oil and gas reserves in the Beaufort Sea, the High Arctic and the Mackenzie Delta. These reserves could potentially be transported by pipeline across Alaska, through Canada and to the United States, or alternatively up the Mackenzie River Valley to the Beaufort Sea (Hamilton 1994, pp. 100, 128-129).

The federal government was convinced that a pipeline would be good for Canada, but thought it politically prudent to conduct an inquiry prior to proceeding with such a development. Prior to the establishment of the Mackenzie Valley Pipeline Inquiry in 1974, the government had not consulted residents, white or native, concerning its intentions (Hamilton 1994, p. 174). Mr. Justice Thomas Berger was appointed by then DIAND (Department of Indian and Northern Affairs) Minister Jean Chrétien to head the Inquiry. "His mandate was to build a pipeline—not to stop a pipeline" (Chrétien cited in Hamilton 1994, p. 180)., but stop it he did. The order-in-council setting up the Commission had been sufficiently vague to give Berger considerable latitude in conducting the Inquiry. He consulted with executives, lawyers, experts and consultants, but, of more significance, he also sought the participation of public interest groups and aboriginal people in their own

communities and in their own language. He used modern communications technology to advantage with the CBC, spending $500,000 to send a staff of translators to every settlement and ensuring full media coverage. The Commission's Report—titled *Northern Frontier Northern Homeland: The Report of the Mackenzie Valley Pipeline Inquiry*—was submitted in 1977. The Report ruled out building a pipeline along the shore of the Arctic Ocean, but did support the idea of a pipeline route along the Alaska Highway, across the Yukon to British Columbia and Alberta, specifying a ten-year delay and prior settlement of native land claims (Hamilton 1994, pp.180-187, 194).

The impact of Berger's work went beyond the technical aspects of building a pipeline:

> Berger started most of his chapters with brilliantly written essays providing overviews of whatever subject he was considering. He went far beyond pipeline questions: his vision encompassed the future of Canada as a whole. Often he was analytical; sometimes he was argumentative; once in a while he was didactic. The report thus became a tour de force dealing not only with the use of natural and manufactured resources, but also with the motivation behind approaches to human and economic rights (Hamilton 1994, p. 194).

Included in the Report are long commentaries on native claims, which he justified on the basis that the Inquiry had been instructed "to consider the social, economic and environmental impact "[sic] of the construction of a pipeline". This instruction, he argued, necessitated study of the issues surrounding native claims. In retrospect, Hamilton concluded that the Commission's most important achievement had been making the Dene, Metis, and Inuvialuit in remote communities finally aware of the forces of the larger society which were closing in on them (1994, p. 105 & 199).

During the same time that Berger was producing his report, thirty Inuit communities

under the umbrella of the Inuit Tapirisat of Canada (ITC) sought a settlement of Inuit claims. Subsequently 2,500 Inuvialuit in the Beaufort Sea/Mackenzie Delta settlements broke away from the ITC leaving three regions: the Baffin and Keewatin Regions of the Eastern Arctic and the Kitikmeot Region of the Central Arctic. The first proposal for a Nunavut Territory was issued in 1976. It requested that the Inuit be given political control over an area two million sq. km. in size, and hunting and fishing rights in an area 650,000 sq. km. in size. No sub-surface rights were requested. This proposal was withdrawn in 1977 and replaced with one that stipulated sub-surface mineral rights (Hamilton 1994, p. 244).

In the years that followed, various units were set up under the ITC to deal with specific functions: the Nunasi Corporation was set up to deal with capital investments in Inuit businesses; the Tungavik Federation of Nunavut (TFN) to negotiate a land settlement; and the Nunavut Constitutional Forum (NCF) to determine how the Territories would be divided and what shape the government of Nunavut would take (Hamilton 1994, pp. 245-246).

Also in the same year that Berger submitted his report, then Prime Minister Trudeau appointed Charles Drury to a one-man commission mandated to study constitutional development for the North. Drury observed that non-elected, non-native bureaucrats and administrators were making all the decisions concerning the land, resources and finances in the North, and he advocated that decision making be shifted to the local level. His report was released in 1980 and recommended that (1) the government be made accountable to the people; (2) institutions should reflect the values and concerns of all northerners, including native and white; (3) any changes made should be accepted by a majority of north-

erners through a process of constant consultation and negotiation (Hamilton 1994, p. 223).

Drury's report was put on hold by John Munroe, then Minister of DIAND, who said the issue of native participation in government would be addressed in constitutional negotiations. The impact of this report might have been greater than it initially appeared Hamilton (1994) observed, for "some of its recommendations seemed to seep into the constantly evolving GNWT" (p. 237).

Robinson *et al.* (1989) reported in a background paper for the Legislative Assembly's Special Committee on the Northern Economy that government attempts to offer northerners services comparable to those in the south had resulted in per capita expenditures of $15,000 by 1989, and observed that no private sector capacity existed to support this level of support (p. 100). The Background Study went on to argue that claim settlements should be used to develop an economic base in the private sector which would lessen dependence on government. "Developing that economic base should then provide them [the Inuit] with choice—a choice of lifestyles, traditional, modern or a combination of the two" (Robinson *et al.* 1989, p. 100). The authors urged that the first objective in any settlement be fostering Inuit control over their own lives.

The following year an agreement-in-principle was signed giving the Inuit $580 million (1992 dollars), title to 350,000 sq. km., and subsurface mineral rights to 36,257 sq. km. Two land classes were identified in the final agreement. Class A lands, being those "held by the claimants in fee simple without mines and minerals; and class B lands held in fee simple including mines and minerals" (Hamilton 1994, p. 3; Robinson *et al.* 1989, p. 63; Riewe 1992, p. 1) Provisions were also made for wildlife and environmental controls (Hamilton 1994, p.

3). The final Nunavut Agreement (*Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada*) was signed in 1993.

The Nunavut Settlement Area was created from the Central and Eastern parts of the Northwest Territories, an area with a population of approximately twenty-one thousand people, of whom approximately 17,500 were of Inuit origin. Nunavut encompasses all of the former NWT north of the tree line, and covers approximately one-fifth of Canada. It is comprised of three regions, Baffin, Keewatin and Kitikmeot, and there are approximately thirty communities in the Settlement Area. The largest is Iqaluit (formerly Frobisher Bay) with a population of about 3,500. The second largest community is Rankin Inlet, with a population of about 1,500 (Purich 1992, pp. 9-10).

When Nunavut comes into being in 1999, it will occupy more than 2,000,000 square kilometres, or one-fifth of Canada's land mass. Before that can happen, however, a new government structure must be put into place, and a bureaucracy trained (Hamilton 1994, pp. 3-4). As part of the process of achieving competence in these new responsibilities, Designated Inuit Organization (DIO) status is being granted to Inuit organizations as they demonstrate capacity and expertise in specific areas. Still heavily dependent on the expertise and leadership of "whites", Nunavut leaders must move quickly to have their own doctors, nurses, lawyers, administrators, teachers, and other professional and technically skilled employees trained. The vast regions to be administered, coupled with the forbidding climate would severely challenge the most astute administrators, and add significantly to the human and financial costs needed to undertake even simple operations.

Other steps are also being taken to prepare for the responsibilities of governing and

managing Nunavut. One such step has been the design of a harvest study to document levels of Inuit use of wildlife, in order to establish allowable harvest levels in future years. Under the Nunavut Agreement the NWMB (Nunavut Wildlife Management Board) was established and instructed to set up a Steering Committee mandated to implement a harvest study.

> The purpose of the [harvest] study shall be to furnish data, to establish current harvesting levels, to assist the NWMB in establishing levels of total allowable harvest and, in general, to contribute to the sound management and rational utilization of wildlife resources in the Nunavut Settlement area. To this end, the study shall: a) document levels and patterns of Inuit use of wildlife resources for the purpose of determining the basic needs level; and b) gather, review and analyze existing biological, ecological and harvest data pertinent to the management of wildlife in the Nunavut Settlement area (Indian & Northern Affairs 1993, Paragraph 5.4.5).

The long-term benefits of such a study, if well designed, could be much more far-reaching than achievement of the study's stated objectives; the expertise and knowledge acquired in designing, implementing, running and evaluating the study are very transferable and will be in great demand for the foreseeable future. Participation by the researcher in the design of the Nunavut Wildlife Harvest Study served to elucidate in a very practical way some of the challenges facing this society as it moves to assume responsibility for governing and managing its ancestral lands.

6.6 Subsistence Societies Assume Leadership Roles: Designing the Nunavut Wildlife Harvest Study

The Eastern and Central Arctic have been the subject of numerous land use and harvest studies since the 1970s. Three large regional studies conducted in the 1980s in the Nunavut area are depicted in Figure 6.1, and key features of these studies are summarized in

Table 6.1. In the Baffin Region, harvest studies were carried out between 1980 and 1984, and again between 1987 and 1990; in the Keewatin Region, they were carried out from 1982 to 1985 and from 1987 to 1990; and in the Kitikmeot Region, studies were carried out between 1983 and 1989. In all instances the studies were conducted cooperatively between Inuit regional agencies and government departments. All three studies were multiple-year studies, modeled after the James Bay and Northern Quebec (JB&NQA) study. Two community-based studies were undertaken in Arviat (McEachern 1978) and Resolute-Kuvinaluk (Kemp *et al.* 1977).

The NWMB, established under provisions for wildlife controls in the Nunavut Agreement (Indian & Northern Affairs 1993, p. 28) has "sole authority to establish, modify or remove, from time to time and as circumstances require, levels of total allowable harvest or harvesting in the Nunavut Settlement Area" (Indian & Northern Affairs 1993, p. 41). One of the major tasks of this "institution of public government" was to appoint a Harvest Study Steering Committee which would design, implement and oversee a five-year wildlife harvest study in each of the three regions, in order to establish allowable harvest levels. Basic needs levels will have first demand on the total allowable harvesting, determined either on the basis of:

> (a) the aggregate of the greatest amount harvested in any one year during the Study, and the average annual amount harvested over the five years of the Study, which aggregate is then divided by two; or (b) the amount harvested in any year during the Study that is nominated by an HTO [Hunters' and Trappers' Organization] at the conclusion of the Study, and the nominated year shall apply to all species subject to a total allowable harvest at the commencement of the Study (Indian & Northern Affairs 1993, p. 41).

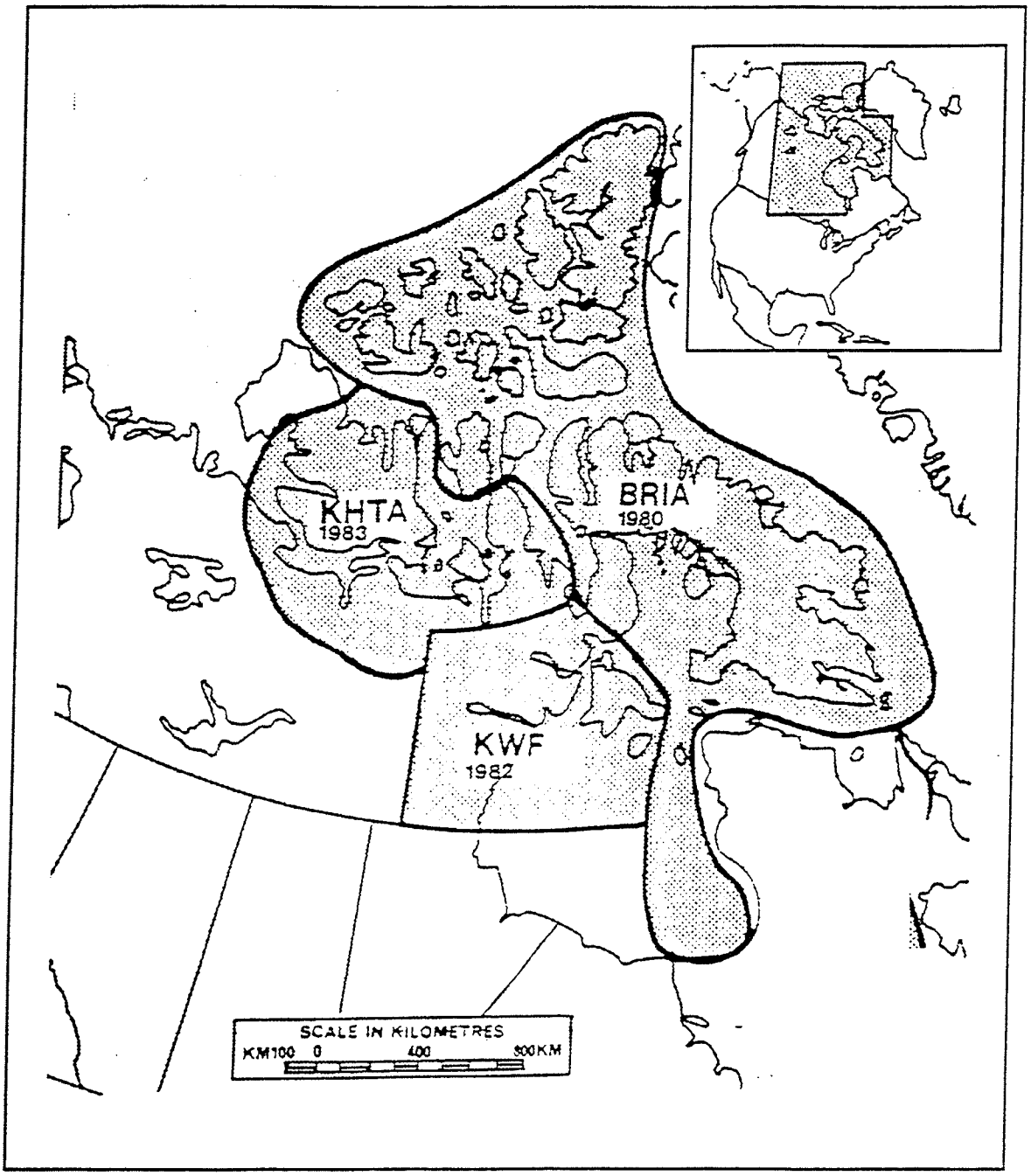

Figure 6.1: Nunavut areas covered by harvest surveys. After Usher *et al.* 1985.

Table 6.1: Summary of NWT Nunavut Region harvesting studies, as compiled by Berkes *et al.* 1995b. (continued).

Description	Baffin Region	Keewatin Region	Kitikmeot Region
Sponsor	undertaken by the Baffin Region Inuit Association, funded by: Federal Departments of Indian and Northern Affairs, Environment, Fisheries and Oceans; NWT Department of Renewable Resources; Dome Petroleum, Consolidex	undertaken by the Keewatin Wildlife Federation, funded by: Federal Departments of Environment, Fisheries and Oceans, Indian Affairs and Northern Development; NWT Department of Renewable Resources	undertaken by Kitikmeot Hunters and Trappers Organization. Funded by NWT Department of Renewable Resources
Duration: Years of Survey Year Report Released	1980, 1981, 1982, 1983, 1984 1983, 1984, 1985	1982, 1983, 1984, 1985 1984, 1984, 1987, 1987	1983, 1984 1984, 1986
Data Collection	calendar/diary; monthly, by field workers	calendar/diary; initially bi-weekly later monthly, by field workers	calendar/diary, monthly, by field workers
Communities Covered	fifteen communities of the Baffin Region: Apex, Arctic Bay, Broughton Island, Cape Dorset, Clyde River, Frobisher Bay, Grise Fiord, Hall Beach, Igloolik, Lake Harbour, Nanisivik, Pangnirtung, Pond Inlet, Resolute Bay, Sanikiluaq	seven communities of the Keewatin Region: Baker Lake, Chesterfield Inlet, Coral Harbour, Eskimo Point, Rankin Inlet, Repulse Bay, Whale Cove	seven communities of Kitikmeot Region: Coppermine, Cambridge Bay, Bathurst Inlet/Umingmaktok (Bay Chimo), Gjoa Haven, Taloyoak, Pelly Bay, Holman
Definition of Harvester	males and females over 18 years of age who hunt at least once a year	males and females over 16 years of age who hunt; youths under 16 who hunt regularly	GHL holder who hunts at least once a year
Total No. of Harvesters	1,358 (1981), 1,514 (1982), 1,450 (1984)	1,331 (1982), 1,470 (1983), 1,445 (1984)	623 (1983), 668 (1984)
Percent Coverage	72% (1981); 79% (1982); 81% (1984)	Not given	74% (1983), 88% (1984)

Table 6.1: Summary of NWT Nunavut Region harvesting studies, as compiled by Berkes *et al.* 1995b. (concluded).

Description	Baffin Region	Keewatin Region	Kitikmeot Region
No. of species or Categories	25	56	17
Harvest Areas	by community only, harvest location data collected between Jan.-March 1985 only	ringed seal, common eider and caribou by blocks (one degree longitude by half degree latitude) other species by community	caribou and muskox by GNWT game management zone; other species by community only
Cost	$800,000 total, or about $200,000 per year	$289,000 for the first two years; $165,000 in 1985	$21,000 plus funds for salary housing, travel costs and data processing from GNWT Wildlife Service budget
Stage of Completion and Availability of Results	complete; available as data reports, Donaldson (1983), Donaldson (1984), Pattimore (1985); continued by GNWT, July 1987 to June 1990; reports not available	complete; available as published technical reports, Gamble (1984), Gamble (1987a), Gamble (1987b); continued by GNWT, July 1987 to June 1990; reports not available	ongoing; 1983 available as data report, Jingfors (1984); 1984 in Gunn *et al.* (1986); continued by GNWT to June 1989; recent years not available

The Study Design Team was selected in late 1994, and work began in December of that year; the five years of data collection will commence in January of 1996. Both the NWMB and the Steering Committee have Inuit and government representatives. The latter has four government representatives, including the Chairman, and three Inuit members serving as regional representatives. Completion of this study is an important part of the process that will create "a whole new government framework....In the case of Nunavut, the six years between proclamation and implementation of the act must be used to train Inuit to take over the bureaucracy on several levels" (Hamilton 1994, p. 4).

The design team was expected to lead the Committee through all aspects of the design of the harvest study, data collection, processing, and verification. As well, detailed advice was sought concerning the development of a communications plan, determining the personnel, training and equipment requirements for the study, and also concerning the collection of traditional ecological knowledge. Development of the project's budget and timeline were used as rigorous planning exercises which the Committee used to priorize activities, define emphases, and allocate resources. The entire process was very participative and iterative in nature, and was likely indicative of the type of support that will be required for the foreseeable future. Specific aspects of the design process and implications for the future management of Nunavut are provided in the following sections.

6.6.1 Designing the Harvest Study

The first stage of the study design process involved defining succinctly the harvest study requirements and objectives. The second stage required designing a study that would achieve these objectives within the time frame, budget and other resources available to

conduct the work. The harvest study design was required to anticipate and document all aspects of the study from implementation to preparation of the final report. This process included 1) a literature review of relevant studies undertaken to date; 2) design of an appropriate data collection, processing, verification and interpretation methodology; 3) design of a suitable mapping methodology; 4) development of a communications plan; 7) elaboration of personnel requirements and a training plan; 8) identification of equipment and other resource requirements needed to conduct the study; 9) development of a study budget, and finally, 10) a study implementation plan.

In addition to achieving the usual principal objective of harvest studies— determining harvest levels—modern land use/harvest studies are expected to aid in the resolution of increasingly complex issues. Scientists, for example, are seeking more precise data than that which has previously been collected in harvest studies. Knowing that an estimated number of char were caught in a10 sq. km. area, for example, is less useful to a fish biologist than knowing in which river or stream these fish were caught. A move to greater precision in reporting data has significant implications for the complexity and size of a study, however, and also raises the question of appropriate levels of confidentiality in reporting. On the other hand, recognizing the risk that traditional ecological knowledge (TEK) will otherwise soon be lost, aboriginal people seek the integration of qualitative TEK with the hard data demanded by scientists. Both requirements have important implications for study design and costs. Other possible study objectives include gathering data to facilitate nutritional evaluations; data for economic evaluations of harvest; data for socioeconomic profiling of employment and income; data to assess commercial harvesting opportunities; and data to assess

potential impacts of development projects. For purposes of this study, objectives were prioritized and limited in number. A shared reading of the study's objectives specified in the Agreement by no means ensured a common understanding of what the study would be designed to accomplish. The direction to gather "existing biological, ecological and harvest data pertinent to the management of wildlife in the Nunavut Settlement area" for example, required extensive discussion and refinement before the committee and design team members were in agreement.

The methods to be used to achieve the study objectives were delineated next. Harvest study data is typically collected using either questionnaires or calendar/diaries on which harvesters record their harvests and subsequently report them to the researcher. Care had to be taken to ensure that the data collected would be technically adequate to achieve the study's objectives, and yet tailored to the various regions. The species for which harvest data were to be collected, for example, had to be specified by region. Finally, procedures were designed for pre-testing the data collection method chosen, and for ensuring the validity of the data as they were collected and processed.

Throughout the process discussion returned again and again to the challenge of ensuring that the study was genuinely supported by the harvesters whose data would form the basis of the results, but who would be the only study participants to receive no remuneration for their efforts.

6.6.2 Collecting, Manipulating, Analyzing and Portraying the Data

Recommendations made concerning the equipment and software to be used for the collection, manipulation, analysis and portrayal of harvest data were based on the recogni-

tion that the reliability, robustness and user friendliness of the computer systems used would be critical to the success of the study, particularly given the isolated nature of the study communities. Only industry-standard, commercially available hardware and software were recommended for word processing, database development and desktop mapping. Staff were advised to purchase digitized base maps at a scale consistent with those used by other parts of the study, and were cautioned to ensure consistency between the digital file formats and media types with the data purchased and the study mapping program in order that the data could be readily moved from one format and media to the other.

Common options for collecting harvest data include: a) identifying in which pre-defined "blocks" an animal, fish, or bird was harvested; and b) identifying the specific place or point where an animal, fish or bird was harvested (see Table 6.2). The block in which an animal, fish, or bird was harvested can be any area considered appropriate for purposes of the study. Ten kilometer square blocks have been considered sufficiently accurate for use in some wildlife harvest studies (Berkes *et al.* 1995c). The Keewatin study used larger blocks, comparable to a 100 km. by 100 km. UTM grid. The Inuvialuit Harvest Study has been using 1:250 000 scale maps, with the exception of the Mackenzie Delta area where 1:25 000 scale maps are being used (Norman Snow, Inuvialuit Study Feb. 1995, pers. comm.).

Table 6.2: Comparison of area and point harvest data collection methods.
After D. R. Mosscrop Jan. 1995, pers. comm. (continued).

Harvest Data Collection	Description	Method	Advantages	Disadvantages
Block	identifies the general area where an animal, fish or bird was harvested; size of the "general area" is determined based on what is appropriate to the study, for example a (a) 10 km. x 10 km. block, or a (b) 100 km. x 100 km. block, or (c) some other size	• the analyst has a 1:250 000 digitized basemap in his/her computer; field workers have the paper maps needed to show the harvesting areas in their communities.; a mylar (clear plastic) grid delineating squares of the appropriate "block" size is laid over the paper maps, and each square is given a unique identifying number • the field workers ask harvesters to point to the specific blocks in which they harvested an animal/bird/fish • the field workers note the name or other identifier of the harvester, the number of the square identified, and the species harvested, on his list for each reported kill • completed lists are sent to a central office • in the central office a data entry clerk types the data from all the field workers into the computer and creates a master file or database containing all the harvesting data and forwards the file to the analyst on a diskette • the analyst transfers the data, which can be in either raster or vector format, to his/her computer where he/she links the harvest data to the digitized map; this linkage can be done manually in a graphics program or a desk-top mapping program, or electronically in a GIS program	• the data is relatively easy to collect • the amount of data collected is minimized and so costs are less • confidentiality can be readily preserved • harvest data can be saved in "layers" by species, season, etc. and a variety of maps showing patterns can be produced	• less analysis can be done on block data than on point data and the larger the block the less analysis that can be done on it • the data cannot later be converted to point data

Table 6.2: Comparison of area and point harvest data collection methods.
After D. R. Mosscrop Jan. 1995, pers. comm. (continued).

Harvest Data Collection	Description	Method	Advantages	Disadvantages
Point	identifies the specific place where an animal, fish or bird was harvested	• the analyst has a 1:250 000 digitized basemap in his/her computer; field workers have the paper maps needed to show the harvesting areas in their communities • the field workers place a sheet of mylar over the paper maps, and georeference the mylar transparencies to the paper maps; they ask the harvesters to point to the specific spot where they harvested an animal/bird/fish and mark it on the mylar with a dot, and an identifying number; the field workers then record the name, or some other identifier, of the harvester, the species harvested and the number identifying the dot on their lists of harvest data • the lists and mylar "maps" prepared by the field workers are sent to a central office • at the central office a data entry clerk types the fieldworkers' data recorded on the lists into the computer and creates a master file or database with the harvest data; this file is forwarded to the analyst on a diskette, along with the mylar transparencies • the analyst receives the harvest databases and transfers the data to his/her computer, then he/she georeferences the information on the mylar transparencies by calculating the longitude/latitude of each dot; this information on georeferences is added to the database and linked to a digitized map by the identifying number recorded initially by the field workers; this linking can be done manually in a graphics program, or electronically in a desk-top mapping program or in a GIS program; vector systems are designed to handle point data	• links harvest to specific sites which provides more information and allows for more complex analysis including the integration of remotely sensed data, vegetation, waterbodies and other environmental data • harvest data can be saved in "layers" by species, season, etc. and a variety of maps showing patterns can be produced • point data can be converted to a block system at a later date if desired	• the increased level of specificity of this method requires the collection, storage and analysis of more data, and increases the resources needed to conduct the study • vector systems are more complex than raster systems and so are more difficult to learn and use

Table 6.2: Comparison of area and point harvest data collection methods.
After D. R. Mosscrop Jan. 1995, pers. comm. (concluded).

Harvest Data Collection	Description	Method	Advantages	Disadvantages
Both block and point	collects the level of harvest data appropriate to each species	see above descriptions of data collection methods for block and point	• see above • allows the study team to collect the level of harvest data appropriate to each species	• using two systems is more complex than using one • requires the use and understanding of two methods

The trade-offs between more accurate versus more general data, the most appropriate scale of data collection for each species and the additional complexity required of more detailed data were weighed, evaluated and resolved. It was determined that map scales of 1: 250 000 would be appropriate for this study. Specific harvesting sites could also be recorded when the generalization which occurs using the block method was not adequate to meet the study's objectives. Using a combination of data collection methods was proposed as an alternative to choosing either the block or point method to record the harvests of all species. If this option were chosen a desk-top mapping package could be used to collect both block and point data. Table 6.3 presents a summary analysis of three options for producing cartographic representations of the harvest data which was used to focus discussion at the meetings; graphics program; desk-top mapping programs; and geographic information systems.

The use of graphics programs was not recommended for the study because these programs could not be linked with a relational database, and maps produced using graphics programs could not easily be integrated into more advanced geographic information systems (GISs). Many desk-top mapping programs, however, have this capability, and once data describing the harvester, the species harvested etc. was stored in a relational database it could be used to produce maps in either of these programs, and it could be accessed through other statistical analysis programs to produce summary statistics. These results could be produced in either hard copy and/or electronic format. Since highly skilled staff were not available to operate large GIS systems, personal computer-based desk-top mapping packages were recommended to be used to produce the maps.

Table 6.3: Options for geographic portrayal of harvests.
After D. R. Mosscrop Jan. 1995, pers. comm.

Options	Advantages	Disadvantages
Graphics Programs	• produce attractive, cartographically correct maps • conceptually not difficult • easily integrated into reports using desk-top publishing capabilities	• lack analysis capabilities • lack georeferencing • lack capabilities of a relational database
Desk-Top Mapping Programs	• produce attractive, cartographically correct maps • can have overlay function • data is georeferenced • conceptually not difficult relative to GIS • less expensive than GIS • could be extended to GIS in future • easily integrated into reports using desk-top publishing capabilities • can be linked with biophysical data • can be linked with satellite data • can be operated on personal computers	• lack advanced analysis capabilities
Geographic Information Systems	• can mange large and extensive databases • data is georeferenced • extensive analysis is possible • can be linked with biophysical data • can be linked with satellite data	• conceptually difficult • large systems are costly • require trained technicians • require special advanced hardware which is costly, and trained systems operators • map production is more complex than for the other options

The Steering Committee was advised to ensure that results would be not only accurate, but also meaningful to the researchers and the communities whose data was being portrayed. It was suggested that community and regional maps of a preliminary nature could be faxed to the various regions and communities, but that the skills of a trained cartographer should be employed to design and produce larger full colour final map products.

Ultimately, the Steering Committee chose to restrict the type of maps to be produced to those required for the final report. This decision was based on two factors: the need to try to bring proposed expenditures more in line with the budget allocated, and the difficulty members had visualizing what the maps would depict and how they would be used. Part of this difficulty reflected a lack of experience in using maps, and particularly GIS databases to conduct analyses and produce informative output. The budgetary problem might have been alleviated had the Resource Centre been further developed. As it was, the costs of working with that unit could not be estimated, and the costs of training a GIS analyst at the NWMB office finally proved prohibitive.

It is anticipated that the absence of maps will make communicating study results more difficult. Particularly for oral cultures, pictures are a more appropriate medium than is text. The absence of maps will likely reduce the effectiveness of the study because harvesters and others will have less knowledge of what is being accomplished. On the other hand, the data will still be collected in such a way as to facilitate the production of maps at a later time should funding become available, or should priorities shift to require the production of maps.

6.6.3 Preserving Traditional Ecological Knowledge

The desire to collect and document TEK has become a matter of growing concern, not only for aboriginals, but for academics, and scientists as well. For example, a major objective of CARC's Hudson Bay Programme was to bring aboriginal people and their traditional ecological knowledge of the environment together with members from the scientific community in order to share and exchange knowledge and build a more complete understanding of the environmental changes occurring around the Hudson Bay. Despite the efforts being made to preserve TEK, its collection and application remain problematic. Part of the difficulty in determining how this knowledge can best be collected and used lies in the term's ambiguity (Kemp 1992), and other terms such as *Indigenous Knowledge* (IK) and *Indigenous ecological knowledge* (IEK) are sometimes used in an attempt to more accurately portray what is being described. Nonetheless, though Inuit members of the Harvest Study Steering Committee were convinced that the collection of their *Inuit Ecological Knowledge* must be integral to the study, they were unable to come to grips with how this could be accomplished, or what form it should take. Considerable discussion was devoted to this matter, but it proved so difficult that members finally agreed simply to include a line item in the budget called *Inuit Ecological Knowledge* without specifying how the money would be used. The amount allocated for this purpose was three percent of the overall budget.

Ironically, the collection and documentation of TEK is becoming increasingly easier, given modern multi-media computer production capabilities which are ideally suited to recording the knowledge and experiences of oral cultures. Interviews of elders in their native languages, for example, can be readily combined with color, sound and movement to

bring the "traditional knowledge" to life. This material can then be recorded on a compact disc (CD), which can hold tremendous volumes of information. Costs of production are very low, and many copies can distributed across great distances for viewing either in schools or on local television channels (Mosscrop Jan. 1995, pers. comm.).

As another example of how TEK could be adapted to multi-media technologies, the information contained in the Nunavut Atlas (Riewe 1992) could be re-produced in an electronic format, allowing for much wider distribution and greater ease of use at less cost than is possible with the oversized, $150 to $200, 4.5 kg. hard-copy version. Additional information could readily be included along with the maps, and various options are possible. One option would be simply to have the maps scanned, saved as graphic images to a CD ROM and to convert the text to electronic format using optical character recognition software such as *omniPAGE DIRECT*. A second option would be to produce a multi-media CD ROM version of the Atlas. This version could be produced in an educational format suitable for displaying and querying of information by school children as well as adults. Interviews with elders, using full color, sound and movement could be included to supplement the land use and wildlife information already in the Atlas. *Hypertext Markup Language* (HTML) capabilities could be used to mark the contents with informational tags, and viewers could choose to click on items of interest to learn more about a particular subject. For example, the map of Eskimo Point could be viewed showing the land use information, or it could be viewed showing the wildlife overlay. If a viewer wished to know more about the travel patterns and other habits of the caribou in the region, she or he would simply click the mouse on a *click-able* caribou. Another page of information would be brought to the foreground with the

desired information. Alternatively, pictures of elders could be formatted as *clickable* items, and the voice, stories and pictures of that individual would appear on-screen in the form of a recorded interview. In this way, viewers could become familiar with the history, lands and people of all of Nunavut (Mosscrop Jan. 1995, pers. comm.).

Similarly, the contents of the Nunavut Atlas when produced as a CD ROM version could be made compatible with electronic mapping and image processing capabilities. This version would facilitate the use of indigenous knowledge for resource management purposes. For example, the land use and wildlife overlays in the Atlas could be produced in a format that could be imported into a GIS. This could be achieved by having the data digitized and saved in a common exchange format such as *DXF* (*Data Exchange Format*). Sites would be digitized in point form; travel routes would be digitized as lines; and areas of land use would be digitized using polygons. Ideally the information would by supported by a digitized basemap at a similar scale. This database could be further developed as additional information was accumulated, through wildlife harvest studies, remotely sensed data, scientific observations, and indigenous knowledge. This information system would allow manipulation of the data, and could be used for resource management purposes (Mosscrop Jan. 1995, pers. comm.).

6.6.4 Integrating Subsistence Ethos and Resource Management Decisions Using Geographic Information Systems

Developing expertise in the design and application of Geographic Information Systems would be a logical and appropriate next step. These systems are powerful tools with application for understanding and resolving complex resource management problems. Of

particular significance is the potential these systems have for integrating both biophysical and socio-cultural information. More comprehensive and meaningful evaluations of proposed development projects are possible when social goals and cultural values are integrated into community-based resource management decision-making. One of the challenges for resource managers in any community today is to use GISs to move toward the reintegration of people and the non-human environment. Subsistence societies such as those described in this study have the potential for being on the cutting edge of integrating the values of subsistence with modern computing technologies and information systems in order to make better resource management and development decisions.

While GIS has been used extensively to inform decision makers in urban regions, it has great unrealized potential in the area of process modeling, that is, simulating the spatial results of a given decision. For example, it is technologically possible to simulate the physical effects that will result from the hydro-electric development of the Birthday and Gull sites upstream from York Landing. Similarly, GIS can be used to simulate the effects of mineral exploration on beluga calving grounds in the arctic. The level of confidence with which the results can be interpreted will depend on the validity of the data used to define the variables for such a situation. The indigenous knowledge of aboriginals who live in the area no doubt includes an extensive knowledge of the likely quantitative and qualitative impacts of disturbance on beluga behavior, and this knowledge can be used to design a more accurate model of process outcomes than would otherwise be possible. Examples of this indigenous knowledge include defining the types and extent of buffer zones needed to ensure important calving grounds are not affected by drilling derricks, storage tanks and pipeline facilities; esti-

mating wildlife populations; and so on.

GISs are well suited to the task of integrating qualitative information into the modeling process. Recently, the capacity to resolve conflicting resource management priorities co-operatively has been developed in the Idrisi GIS package (Eastman, 1993). This function can be used to evaluate multi-objective/multi-criteria problems. For example, once the people of Nunavut commence mineral exploration in areas for which they have been granted sub-surface mineral rights, they may encounter opposition from others who wish to use the area for alternative purposes. Development may necessitate much higher traffic levels, which may not be desired by subsistence hunters. GIS capabilities for resolution of resource management conflicts could potentially be used help to resolve this type of resource management conflict.

In order to develop the level of technical and management expertise needed to take advantage of these capabilities it will be necessary to train individuals to become familiar with computers, and then to develop the specialized knowledge needed to design and implement applications as desirable, and to ensure that these individuals also have the requisite analytical skills to interpret their results. In addition, management staff would need to be trained to understand the process, be able to oversee the gathering and interpretation of the qualitative information to be used in the decision making process, be able to respond appropriately to the information generated, and finally be able to communicate the results to political decision makers and communities.

Steps are being taken to initiate the first stage of this requirement. A Resource Centre Steering Committee was set up in 1994 with the objective of "develop[ing] priorities

and policies to guide the development of a Nunavut Resource Centre and to design a Geographic Information System capable of serving the needs of all institutions of public government in Nunavut". This Centre is presently located in Ottawa, and staff are grappling with very basic but important issues such as the development of 1: 250 000 digitized basemaps for all of Nunavut; determining what the subscription price for these maps will be to various potential users; deciding what GIS system should be adopted, what the capacities of the Centre will be, and how the Centre will relate to various DIOs (Peter Wilson, Pers. comm. March 1995; Minutes of the Resource Centre Steering Committee, January 5, 1995).

While the Centre has a vital role to play in the development of GIS capabilities for Nunavut, it does not have an administrative or management function, and does not obviate the need for skilled technicians and capable managers at the local level. Ideally, its location should be moved to Nunavut where it would be in a stronger position to identify the needs of its various constituents, consolidate the collection of data and even train Inuit students to become skilled GIS technicians.

6.6.5 Determining Personnel Requirements and Planning a Training Schedule

The Study Steering Committee required guidance on the development of a personnel plan for the study. This included identifying the number of individuals required, the qualifications needed to implement and complete the study, and a process for training staff to achieve the qualifications needed. Personnel finally required for this study included a harvest study coordinator, three regional coordinators, 28 field workers and three data entry clerks. It was apparent that all staff, including the study coordinator, would require training in a variety of areas as skill levels were generally low.

The functions of the study coordinator were identified as including administrative, budgetary, supervisory, reporting, liaising, and training responsibilities. This individual would oversee implementation of the study, ensure budget allocations were not exceeded, and manage the day-to-day operation of the central office, including directing and supervising staff, and liaising with regional coordinators. Her/his reporting requirements would be primarily to the steering committee, but there was also an expectation that she/he would oversee the regular flow of information back to the three regions. As well, she/he would be assigned responsibility for training regional coordinators and for ensuring that they would be able to competently represent the harvest study and be able to train the harvest study field workers in their region. It was anticipated that five days annually would be devoted to training regional coordinators at a central location. The study coordinator would likely require assistance in this capacity during the first year, and it was suggested that a harvest study expert could be hired to work with her/him to ensure all aspects of the training process were covered. The coordinator was also responsible for developing a field manual used to guide field workers through the interview process and to answer the most frequently asked questions.

Regional coordinators would be required to be knowledgeable about the goals and objectives of the harvest study. They would also be required to train field workers, and coordinate their collection of data and traditional knowledge. It was anticipated that each regional coordinator would spend approximately five days annually training field workers in a regional centre. Assistance in this function would be required in the first year, and could be provided by the study coordinator, possibly with the help of a harvest study expert. As well,

they would be expected to supervise the data input clerk for their region, and to ensure that data was entered accurately and forwarded regularly to the central study office. This meant that they would need to be trained in data entry and verification. Once harvest study information was returned to them in the form of reports and summaries from the central office, regional coordinators would have responsibility for ensuring that the information was made available to the individual communities as appropriate. A very important part of this job would be communicating and liaising with others, and this ability would also have to be honed on the job.

It was recommended that data entry clerks be hired at the regional level, and work under the supervision of the regional coordinator for that region. These clerks would require basic computer training on how their computer operates, and additional training on entering harvest study data into the spreadsheet chosen for data collection. This training should ideally take place on site, with actual raw data, and could be performed by the regional coordinators. It was also necessary that these clerks have some basic training in office procedures as they would most likely become involved in such activities as answering the phone and filing reports.

Field workers were required to be highly regarded in their communities, and to have a good understanding of the local harvesting activities. As well, they required good organizational skills and had to be methodical in the conduct of their work in order to ensure that all the necessary information was gathered and accurately recorded. In addition, these individuals would have to be able to work independently, as they would for the most part be isolated from other field workers and from their regional coordinators. They should meet at

the regional level for training, as necessary, and in order to develop a better sense of the overall study process. To the extent possible, they would be expected to develop a high profile in their community for study participants, and to develop and maintain enthusiasm for the project.

The staff needed to run the harvest study totalled 35, before turnover. While the coordinator was non-aboriginal, all others, it was assumed, would be Inuit. The various skills required included computer, supervisory, training, communications, management, administrative, clerical, and organizational. All would be required to function independently. The expectations, then, were very high. A process for developing the training and knowledge required of the employees over the life of the project was developed, recognizing that several years would be needed for all members to acquire the necessary skill levels to perform competently. The cost of training, which included travel, was estimated at $750,000, or 10% of the total study budget.

A Nunavut Implementation Training Committee (NITI) has been set up in Rankin Inlet, in response to Section 37.5 of the Nunavut Land Claims Agreement. This is an independent organization charged with identifying "the training the Inuit will need to implement the Claim....and to put the required training systems in place" (Nunavut Implementation Training Committee Brochure). Though not a training deliverer, "it does provide the funding required for implementation training with the D.I.O.'s...and [has] also established a scholarship program to help beneficiaries further their studies in the areas related to the implementation and management of the Claim". Areas approved for this funding include: accounting; financial management; organizational development; public administration; and land manage-

ment; resource management.

The logistics of working with this body are not easy. The amount of funding available for training is not large and the capacity to train 35 people was clearly beyond the realm of what could be undertaken (Bill Logan Mar. 1995, pers. comm.). The training trust set up under this Committee was intended to provide for training needs not met by existing government programs, and it was assumed that the NWMB would have training funds in its budget. Staff at the NITI were very interested in working with the NWMB to develop appropriate training, but the difficulties of routinely meeting with the Board, some 1200 kilometres away as the crow flies, are almost insurmountable.

Training is also provided by Arctic College, which has campuses at Iqaluit, Rankin Inlet, Cambridge Bay and elsewhere. This College offers an Inuit Resource Management Certificate, specializing in three areas: administration; field inspection; and technical aspects of resource management. The certificate is designed for the working population, and is offered in three week modules. The NITI is sometimes able to arrange to cover the costs of room and board, and possibly travel, but has no funding for honoraria.

The skills and training which will be acquired by study staff over the next five years will obviously be of great long term value in their communities. For example, a data input clerk in Kitikmeot can presumably be called on to teach others in the community how to use a computer. Regional coordinators will acquire extensive administrative, financial management, communication, and training, as well as some computer training. Obviously they will be well prepared for leadership roles in the years that follow. The harvest study workers will have developed inter-personal skills, as well as organizational abilities. They too

will be in a position to serve their communities more capably following their training and experience with the Harvest Study. Training staff to the level needed to enable them to implement Inuit obligations under the Claim will be a major challenge. What the NITI will be able to achieve is very limited by geography and funding constraints. The importance of using wisely other resources and opportunities such as those provided by the NWMB Harvest Study can probably not be overestimated.

6.6.6 Developing the Communications Plan

A critical aspect of the Nunavut Wildlife Harvest Study design was ensuring that all communities were informed of the study in advance, and that they are kept informed throughout the process. Without full community support and involvement the study will fail. The challenges of designing a communications plan for such a study had to address the realities of thirty far-flung communities. Ways had to be identified to ensure that the data analyzed and the traditional knowledge collected would be returned to the communities in a timely and useful way. The first stage of this involvement was to solicit the participation of community representatives in decision-making for the study, and to include local priorities in setting the study objectives. This was accomplished by having regional representation on the Steering Committee.

The DIOs who would ultimately be given contracts to implement various aspects of the study were also identified as critical to a successful communication strategy, and it was recommended that a DIO with communications expertise be hired to oversee various aspects of this process, including the timely development, production and distribution of the annual harvest study calendars, news releases, posters, radio spots and television videos. At

the time of making this recommendation, however, no such DIO was yet in place. Special communication blitzes were suggested for key periods in the study such as prior to and during the annual calendar distribution. Other critical periods which needed to be highlighted in the communication process included feedback, such as the annual and final presentation of harvest data and traditional knowledge to the community.

Staff in the Policy and Programs Section of Arctic College expressed interest in helping coordinate some of the communications activities of the study. It was suggested that with enough lead time TV North Canada (TVNC), a public television network consortium including educators, government and private businesses could provide a live interactive delivery of information on the study. For example, a harvest study representative could be live on-camera in one community, and viewers from across the region could phone in and have a conversation with that person which could be heard by all viewers. TVNC is said to be a very popular television channel which presents most programs in Inuktitut. The cost per hour could be expected to range from $1,000 to $1,200 (Ian Rose Mar. 1995, pers. comm.).

This method of communicating across Nunavut appeared to be a viable means of exchanging information in the Inuit language, at relatively little cost. It could no doubt be used to good advantage by the NWMB harvest study staff, given some help. It is to be hoped that DIOs with expertise in communications will be established fairly soon to ensure that the potential use of this medium is maximized.

The Steering Committee ultimately reduced to a bare minimum the number of "feedback sessions" that are to be held in the communities to validate the information collected, and to sustain interest in the progress of the study. It is anticipated that maintaining

momentum and interest in the study will be made more difficult by this reduction, implemented due to anticipated budget shortfalls over the life of the study.

6.6.7 Developing a Budget

A detailed budget for all years of the study was prepared as part of the design process. A review of the costs of previous harvest studies indicated that the six million dollar budget for the six-year Nunavut Harvest Study would prove to be a severe constraint. The cost of the 1980/83 Baffin study was about $200,000 per year or $800,000 in total. The Keewatin study cost $289,000 for the first two years of study (1982, 1983). Comparable cost estimates were not available for the Kitikmeot study, also covering seven communities, because most of the expenditures were from the budget of GNWT Wildlife Service. It appeared that the overall annual cost of the three studies was about $500,000 (in 1982 dollars) or about $780,000 (in 1994 dollars). Given the increase in the region's population, the Nunavut Wildlife Harvest Study budget was about the same or somewhat less than the budgets of the earlier harvest studies, and would have to be used very carefully. The budget finally drafted for the study was over budget by $1.3 million, despite the reductions in costs and activities already described.

The largest single budget item was field worker salaries, which accounted for approximately one-third of the total budget. This amount allowed for only a modest $200 monthly base pay plus $10 per interview for fieldworkers. The Committee recognized that continuity in the cadre of fieldworkers would play a key role in the success of the study. Members also realized the rates of pay being offered were inadequate, but had very little flexibility to change this level because of the impact even a small increase would have on

other budget items. The Committee was not prepared to reduce the interval between interviews from one month to bi-monthly, being convinced that the data collected would be less consistent and less reliable should they move to fewer interviews. Neither was it prepared to reduce the number of years over which the study was to be conducted, arguing that five years of data were necessary to provide an adequate base for determining allowable harvest levels.

In the budget finally drafted, major budget items included administrative salaries and benefits totalling 23% of the preliminary budget. Communications and training each accounted for 10% of the total budget. The balance was allocated to the collection of Inuit ecological knowledge, office costs including hardware and software, a pilot of the study methods, contingency and administrative cost allowance for DIOs.

Numerous iterations were required to achieve the final budget, and this process proved an invaluable planning tool. Priorities were defined and re-defined as the Committee attempted to design a viable study with the resources allocated for the task. In so doing future problems were anticipated, compromises made and the conclusion reached that funding levels would prove inadequate by 23 percent. As a result, steps could be taken very early in the process to ensure some accommodation could be achieved well before the shortfall occurred. In addition, the detailed annual budgets prepared as part of the budgeting process have established a sound planning tool for each of the study years.

Developing expertise in financial management is a priority of the NITI, and the process of designing this study while trying to limit expenditures to a pre-determined budget served to underline its importance. As the Committee struggled to balance priori-

ties, objectives and funding, it became clear that the amount budgeted had been totally arbitrary. This realization proved frustrating but also instructive. As Inuit are trained to assume management responsibilities, more and better planning will have improved results. The bottom line, however, is that there will not be enough money to provide the optimum amount of training, the optimum communications strategy, or even, most likely, good salaries for everyone, based on the fieldworkers' experience, and the fact that there is no funding to compensate the harvesters who provide the data on which the study depends.

6.6.8 Scheduling the Study

The final stage of the study design process involved developing a flow-chart for the life of the study, depicting the specific timing of all the various activities which would need to occur, and identifying the individual(s) with primary responsibility for each of the activities. This process too, necessitated a number of iterations, and required that all aspects of the study's implementation and delivery be anticipated to the extent possible. The process of working through the myriad details using this visual tool proved very useful. It helped to break down the isolation of a committee member who spoke no English, and it highlighted potential problems for specific discussion. For example the timing of various aspects of the communication strategy were better coordinated once the Steering Committee had an opportunity to study a visual representation of how the time selected for a media blitz could be used to optimize publicizing the distribution of annual calendars. The opportunity to review which individuals had been assigned primary responsibility for each of the activities also served to ensure all Committee members concurred with the assignments and activities scheduled. It also served to illustrate that a great deal was being demanded of the staff.

It is anticipated that this flow-chart will be a useful and practical guide to staff as implementation of the study progresses, and will serve as a benchmark for evaluating progress to date throughout the life of the study.

6.7 Summary and Conclusions

The Inuit welcomed whalers to the arctic in the nineteenth century and subsequently accepted the presence and rule of a foreign government. After the whale trade ended, they turned to trapping white foxes for the European traders, in exchange for guns and supplies. They adapted quickly to European goods and technology, but at the very high price of becoming dependent on a money economy, an economy in which they were at a severe disadvantage. Within several decades they had fallen victim to erratic national and international fur trade markets, and faced severe hardship. At the close of the twentieth century the Inuit continue to be at a severe disadvantage relative to Canadians from the larger society, often living in poverty and largely dependent on imported foods for survival.

Over the last twenty years however, the Inuit have been taking steps to regain control of their traditional lands and resources. By implication they are taking steps to regain to some extent the subsistence life-style and values of their ancestors. The Berger Report was released in 1977. Berger had spent the three years leading to that report raising awareness in Inuit communities of the interests of southerners in exploiting arctic resources. That same year marked the founding conference of the Inuit Circumpolar Conference, where the Mayor of the North Slope Borough (Alaska) Eben Hopson described the Inuit as "one people under four flags"—Canada, Denmark, the former Soviet Union and the United States, with common goals: "They want to maintain their close interrelationship with the

land; they want to protect the fragile arctic environment; and they want to preserve and affirm their special Inuit way of life, culture and language. They want non-Inuit who come into the Arctic to deal with them on their premises in a spirit of cooperation, not confrontation" (cited in Stenbaek 1987, p. 309).

Since that founding meeting the Inuit of the Kitikmeot, Baffin Island and Keewatin Regions have united and successfully negotiated new resource management institutions for an area that covers one-fifth of Canada. The dedication of purpose and strength of will required to achieve this new stature is strong evidence in support of Freeman's (1981) thesis concerning the persistence of Inuit culture, despite the forces of change, acculturation and evolution.

> I see or hear no pertinent evidence that after a century of contact Inuit society or culture is about to disappear from Arctic Canada. What I do hear is heightened consciousness—on all sides—about Inuit culture. In particular, sensible concern is voiced in the north about safeguarding Inuit cultural identity because of the weakening of traditional modes of *transmitting* the culture as a result of alien processes of education, also growing concern to rationalize the use of the language, and to safeguard the land/sea-based resources—all of which are among the most important means of ensuring the persistence of the Inuit community in the face of progressive encroachment by powerful non-Inuit social, cultural, economic and political forces (Freeman 1981, p. 266).

The Inuit have lost some of the survival skills traditionally held by their forefathers, but their use of their ancestral land continues to be extensive and figure prominently in their daily lives.

Though Inuit societies have adopted behaviors and values of the larger society, they have not relinquished their cultural identity, particularly as it is reflected in their relationship with the land, both symbolically and in practice. To a large extent the collection of data on

the numbers of various animals harvested was an anathema to Inuit members of the Steering Committee. In the first place, it is not considered proper behavior in Inuit culture to approach a hunter directly and ask how many animals he/she has killed while out hunting. If the hunter has not been successful, he/she will not wish to discuss this "failure". If he/she has been successful, such a direct question may well offend the hunter's sensibilities for he/she will have developed a personal relationship with the animals killed. Fieldworkers will have to approach hunters with respect, deference and proper timing if they hope to have their questions answered, and it was suggested that young fieldworkers would simply lack the discretion needed for this work.

A second problem with the collection of this data is that it has little relevance to the Inuit hunter's view of the world, and his/her hunting activities. Instead of counting kills, he/she focuses his/her powers of observation on overall patterns, trends and other environmental changes he/she notices over time during the course of his/her travels. These he/she shares with fellow hunters. Combined, this information forms the basis for a complex body of indigenous knowledge of the environment, knowledge which is more meaningful and of more practical use to them than a list documenting the numbers of animals killed. The considerable disappointment expressed by Inuit NWMB Steering Committee members when the collection of "traditional knowledge" could not readily be incorporated into the harvest study was a result of this dichotomy, and may have led to the third problem Inuit members had with their harvest study.

The third problem was the study's name. The word harvest, they argued, is southern terminology, more appropriate to agricultural practices. It does not begin to describe the

subtle and complex relations typical of Inuit hunting practices. There seemed to be no one Inuit word or phrase that described the study's purpose, perhaps because the study's purpose was in fact a "foreign" idea, but to accommodate the need for more appropriate terminology the word harvesting was replaced with the word *Anguyanik*.

Those accepting responsibility for the management and development of Nunavut's resources are assuming a moral obligation to ensure that these activities "allow for and facilitate the spiritual, social, and cultural development" of the people of Nunavut (after a 1992 position paper produced by the Inuit Circumpolar Conference cited in Chance 1992). They will be required to blend traditional values and techniques with values and technologies of the larger society. Compromises will be inevitable. There appears, however, to be a strong desire among the Inuit to ensure that their move to self-government be rooted in the subsistence culture of their ancestors, even as they adopt and benefit from some of the modern technologies which can help them manage their resource base more effectively.

The Inuit face a tremendous challenge in acquiring the skills and competencies needed to govern Nunavut. A second and even larger challenge will be retaining the ethos of a subsistence society. The larger society can help them in the first instance. The second challenge they must meet alone.

Chapter 7

The Nature of Subsistence Societies in the Hudson Bay Bioregion

7.1 Introduction and Context

The preceding chapters of this thesis have illustrated that subsistence societies in the Hudson Bay bioregion at the end of the twentieth century have an enduring relationship with the land generally, and with their traditional hunting grounds in particular. This affinity has persisted through centuries of acculturation to the larger society's market economy, values and institutions. Ironically, it has persisted when the traditional land base has been severely altered, and even when there has been no land base. It has persisted though the costs of hunting and travelling in order to conduct the hunt sometimes exceed the imputed value of the bush food garnered from these hunting efforts, i.e., when hunting makes no sense on a strictly economic basis.

The resoluteness and apparent incongruity of this attachment cannot be understood from the context of the larger society, for it represents a worldview based on a different ethos, namely that of a subsistence society. Subsistence has a depth and richness of complexity and subtlety not readily apparent to those with a Euro-Canadian worldview. Developing an appreciation for this other worldview is of some importance to the larger society, however, for its ethos and economics have produced quite different outcomes from those of the larger society, outcomes which are more characteristic of the nature of sustainability.

The worldview of Western industrialized societies is premised on a short term, linear, temporal perspective. Success is measured in relation to progress, and progress in

turn is equated with growth (Ophuls 1992; Goulet 1990; Rolston III 1990). Natural resources are exploited for purposes of maximizing profits, and the ethos inherent in this worldview are instrumental. They are also a product of the prevailing social view regarding appropriate relationships among humans, and between humans and their environment. As members of the larger society continue to search for paths to sustainability, predicts Milbrath (1995), they too will begin to value life over consumption and wealth; they also will emphasize love for friends, family and future generations; they will prefer partnerships to domination by a few. In a sustainable society work will not be equated with employment, and self-esteem will be rooted in one's "skill, artistry, effort, and integrity" (p. 613). If Milbrath is right, the larger society can learn much about the ethos of a sustainable society from subsistence societies.

This study concludes that (1) land use studies are replicable and are an appropriate methodology for establishing land sue over time; (2) analyses of subsistence economies premised on the commoditisation of land and labor are inadequate; (3) there is no inherent incompatibility between the application of modern technological resource management strategies and subsistence ethos; (4) a fundamental distinction between subsistence ethos and the ethos of the larger society is that the former does not allow for the commoditisation of human labor and land; and (5) subsistence ethos will be severely challenged in the transition to self-government.

7.2 Subsistence Ethos and Economics

It is a construct of the "industrialized" mind that a society's ethos can be separated from its economics. It is a construct created during the Industrial Revolution, when the

market economy emerged and personal financial profit became the motive for action. The use of high volume production equipment transformed human labor into a commodity. "The transformation [implied] a change in the motive of action on the part of the members of society: for the motive of subsistence that of gain [had to] be substituted. All transactions [were] turned into money transaction, and these in turn require[d] that a medium of exchange be introduced into every articulation of industrial life" (Polanyi 1944, p. 41). For the first time in history, human behavior was being justified on the basis of "gain" or profit. This section examines the relationship between subsistence ethos and economics, and compares it to the nature of relations and economics in the larger society.

7.2.1 Subsistence Ethos: A Mirror Image of the Subsistence Economy

The shift in emphasis to profit represented a fundamental transformation in society's ethos, and ultimately put human relations with one another and with the land at risk. This argument is developed by White (1959). In his study of the evolution of culture, White was able to identify only two basic types of economic systems: either property relations were subordinated to human social relations, or, alternatively, human social relations were subordinated to property relations. The former characterized band/subsistence societies: "the system which subordinates property relationships to human social relationships is the only kind that exists *within* primitive societies based upon kinship" (White 1959, p. 329). The latter type of economic system in turn characterized "all civil societies". These he wrote, were "nonethical", and responsible for "all the suffering, indignities, and degradation that come from slavery, serfdom, prostitution, usury, dependence upon wages, unemployment, wars of conquest and expropriation. Colonial rule, and exploitation are inherent in the

economic systems of civil society....There is no crime however heinous that men will not commit in obedience to their economic systems" (White 1959, p. 330).

Within a given subsistence society the obligations to help one another, and to share food with one another reduced the potential for inequality, or for the success of one individual at the expense of another. A competitive monetary society, however, was in fact designed to enable the strong to dominate the weak to their own advantage. "It goes without saying, of course, that such a system must have the endorsement of the government and be enforced, in the last analysis, by physical force. But a socio-cultural system that has made moneylending possible almost always provides adequate safeguards to the lender" (White 1959, p. 300).

To work efficiently the new self-regulating market economy required the subordination of the rest of society to its needs, so labor and land began to be treated as commodities which could be manipulated for gain. The absurdity of this distortion was expressed by Polanyi: "Labor is only another name for a human activity which goes with life itself, which in its turn is not produced for sale but for entirely different reasons, nor can that activity be detached from the rest of life, be stored or mobilized; land is only another name for nature, which is not produced by man". However absurd, this "economic" view of "reality" took hold, and facilitated the widespread acceptance of a mental distinction between human beings and their labor. Human labor had become a commodity to be bought and sold, without regard for the person who produced it. Land and its resources were similarly commoditised.

This process of commoditisation signalled a transformation in the larger society's

ethos, for it subordinated human social relations to property relations. The only type of society which could evolve under these circumstances was one based on the individual. Obligations of kinship and community were hindrances to the functioning of the new market-place. The social practices of sharing and reciprocity typical of subsistence societies defied the goals of the market economy because they kept members of the group independent from the market. Subsistence societies did not fit into the new mold and would have to be re-shaped. "The natives are to be forced to make a living by selling their labor. To this end their traditional institutions must be destroyed, and prevented from re-forming, since, as a rule, the individual in a primitive society is not threatened by starvation unless the community as a whole is in a like predicament" (Polanyi 1944, p. 164). As Brody (1981) put it, "Would-be civilizers concluded that hunters never had, or had lost, the means to achieve a decent way of life; should welcome the benefits of trade, wage employment, and proper religion; should allow their lands to be differently used; and must accept whatever changes are brought to them, however the changes are brought. This is the death sentence" (p. x-xii).

Brody (1981) went on to observe, however, "that the condemned have somehow repeatedly escaped their execution" (p. xii). Subsistence societies have in some fundamental way refused to adopt the underlying premise of the market economy, even though they have been required to participate in it. The attachment many members of contemporary subsistence societies in the Hudson Bay bioregion feel to the land has persisted despite centuries of interaction with global markets. To a large extent they have refused to become "objects" of the market economy as demanded by the larger society, even though they need cash to live and to support their subsistence activities. They have not been absorbed by the

larger society's ethos.

Contemporary subsistence societies continue to nurture and value relations between humans, animals and the land. One hundred years ago this attachment could be readily understood because it was necessary to physical survival. That is no longer the case, but the attachment continues. It continues because relations have a significance greater than physical survival: relations give life meaning and establish an individual's sense of place in the world (Champagne 1970 p. 10).

How one sees the world and understands relations is a product of one's *Gestalt*, or essence, which is in turn a cumulation of one's roots, surroundings, and identity (Naess 1989, pp. 60-69). Gestalt relations are fundamentally important in giving life meaning, and disturbing them has serious implications for how one relates to the world, and so for one's sense of self. Freeman (1985b) echoed these thoughts in describing the importance of harvesting activities for the Inuit:

> To give up hunting, to abandon the activity that supported one's forebears during the past millenium [*sic*], is to deny in one essential way the living connection with one's ancestral roots: it is, in short, to deny one's Inuit identity. To fail to hunt, share and consume real meat is to deny an important emblematic identification with essential resources that assure one's very being as a living extension of the past. Lastly, to attenutate the social ties, which so distinctively and effectively structure Inuit society, by failing to re-emphasize the importance of the institutions and values upon which Inuit society is founded, all of which are inextricably linked to hunting, would again constitute a denial of full membership in that society (Freeman 1985b, p. 254).

The subsistence economy is subtle and complex. The hunter cannot be separated from the hunt, from the animal he kills for food, from the land on which he hunts, or from the community with which he shares the rewards of his efforts. Naess's (1989) description

of a 'relational field' well describes the complex reality of the subsistence hunter's existence. "A human being", he writes, "is not a thing in an environment, but a juncture in a relational system without determined boundaries in time and space" (p. 79). Interactions do not occur between organisms. Rather, since organisms and their milieu are in fact not severed but one entity, organisms *are* interaction (p. 56). The subsistence economy can not be understood apart from its ethos and the relations described by those ethos.

An individual's identity is shaped by his milieu and his interaction with it. To distance oneself from that milieu is to renounce that part of one's essence or self. One's understanding of the environment is prescribed by one's understanding of reality. If one's worldview is premised on the commoditisation of labor and land, then one will perceive labor and land as commodities. This view in turn will shape one's sense of self and be the basis for a search for meaning. If one expands one's awareness by stepping outside of this paradigm, and questioning the reasonableness of commoditisation one's understanding of reality will expand. This broader knowledge, writes Evernden (1985), will alter the nature of the relationship between humans and their environment, which will shift back from I-it to I-Thou, from subject-object to mutual participation (p. 106).

The experiences and behaviors of communities in the study region are largely consistent with this analysis of subsistence societies. As long as they refuse to be treated as commodities, and insist on retaining in some form their kinship relations with one another and with the land, they will retain their traditional capacity for experiencing meaning. The larger society has nothing to offer in its place.

7.2.2 Valuing the Subsistence Economy

The larger society has difficulty appreciating the "worth" of a subsistence economy, because the tools it uses for economic analysis are based on the commoditisation of land and labor, and soon lead to the conclusion that subsistence hunting activities are not cost effective. The value of bush harvests have been estimated in this study, not by commoditising the value of the inputs, i.e., labor and cash costs, but by calculating the imputed values of the meat harvested, and calculating the relative importance of the bush sector in the overall economy. The results of these analyses indicated that the subsistence economy continues to make an important contribution to the overall northern economy, and reduces the amount of cash needed to purchase food. Though bush food is no longer the only source of the aboriginal diet, it continues to provide a significant portion of northern people's food requirements, and the limited opportunities for earning a cash income in these communities coupled with the higher prices charged for meat in northern stores would preclude harvesters being able to buy a comparable quantity of protein from the store. As Usher (1976, p. 119) wrote, "the North may well be the only place where a poor man's table is laden with meat".

Attempts to carry the analysis further are not fruitful. Realities of life in the north are such that other opportunities for gainful activity are most often not available in these communities, and the time invested in hunting cannot necessarily be put to other productive use. An economic analysis, premised on the fiction that human labor can be commoditised, would erroneously conclude that this labor has little or no value.

Another reason that a further economic analysis would not be useful is that the scale

of activity appropriate in areas with widely dispersed, sparse food resources is different from the scale of activity appropriate in richer, more productive resource areas. Small production units, such as those based on the household, may well be the most effective means of utilizing resources in the arctic and subarctic regions, since centralized, highly structured organizations would be an extremely inefficient means of harvesting these resources (Usher 1981, p. 58). The results of an economic analysis, premised on the assumption that the "bottom line" dictates how viable an activity is, would conclude that the activity is not cost effective, and would recommend relocation to more productive areas. But there *are* no "more productive areas" to which to turn.

On the other hand, an analysis of harvesting activity premised on the primacy of relations, and not on the commoditisation of labor and land, would first consider the role harvesting continues to play in the social and cultural life of aboriginal communities. The skills required and the food returned to the community, wrote Usher (1981) are "important and even essential to their [members of subsistence societies] long-term security, their cultural identity, their socio-economic status and their general well-being" (p. 60). These non-economic needs, observed Freeman (1993) "can only be met by either engaging in subsistence or being enabled to consume the products of subsistence", and this direct correlation between subsistence and a "multi-dimensionally satisfying way of life and identity" is likely to persist in future (p. 248).

The hunting efforts of subsistence societies in the Hudson Bay bioregion cannot be commoditised. Neither can the land on which the hunter travels be commoditised, or the meat he/she brings home. The nature of relations between the hunter and the land are once

again too complex for this oversimplification (Freeman 1979, p. 348), and the relationship between the hunter and the hunted

> is not simply a question of economics (i.e., having enough material and food coming in) but importantly it is part of a comprehensive systemic relationship that relates the individual to family and community, to a system of values and beliefs encompassing the sacred as well as the secular, that involves emotional and psychological, as well as physical/material needs and satisfactions, and that ensures reinforced attachment to a worthwhile past, as well as to an uncertain present and future (Freeman 1985a, p. 276).

The activity of hunting ultimately serves to establish the hunter's place in the world, for his/her identity is symbolized by hunting (Freeman 1988, pp. 165-166). The food brought home is shared with others in the community, as is the hunter's knowledge of the land acquired as he/she travelled across it in search of food. As members of the community share their food and knowledge with one another they also establish a sense of place, and as they eat bush food they reinforce their connections with the land and the animals they eat (Freeman 1988, pp. 165-166) and give meaning to their lives.

Intrusions of the larger society into subsistence societies in the Hudson Bay bioregion over the last hundred years have required their adaptation to a market economy. This accommodation to the larger society, however, did not and could not displace the subsistence ethos on which these societies premised their existence. This observation has also been made by Peterson & Matsuyama (1991) who wrote that "if economic activity is socially constituted...then it is possible that as well as being transformed by these external influences [cash and commoditisation] foragers may assimilate some, many or all of the intrusions and linkages with the dominant economy to their own internal social purposes and in so doing reproduce distinctive sets of economic and social relations" (p. 2). Had these societies

agreed to the commoditisation of their labor and land they would have been left with nothing, for their labor and land would most often have had no "productive" value under terms of the market economy.

The myth of the market economy has allowed perpetuation of the delusion that a society's ethos and economics are discrete. This study of subsistence societies has demonstrated how impossible such a distinction is, for a society's ethos is not separable from its economics, and ultimately one's economic system must be ethically justifiable. It has been observed that "our present... economic arrangements [the market economy] are only retained because they are perceived to be legitimate, and their legitimacy rests ultimately on the perception that they are ethically justified" (Engel 1990, p. 5). It is these same economic relations, presumed by the larger society to be legitimate, which perpetuate the inequalities between those who have access to the privileges of wealth, and those who do not. This same economic system has allowed Canada's banks to enjoy all-time record profits for 1995, the same year in which record numbers of people are relying on food banks for some portion of their food, and welfare and unemployment allowances are being reduced (Galloway 1996, p. B1). The larger society can apparently no longer afford to support its indigent members. Budget deficits must be cut at any cost, and those who are not employed are increasingly regarded as lazy, unproductive and unworthy of status in the society.

It is this same economic system that has failed to value the world's natural resources until they are harvested, and has, for example, allowed development of hydro-electric potentials on the Nelson River system without consideration for the people who would be harmed by that development. Any potential offence to nature resulting from these develop-

ments has been even less of an issue to the developers and their political masters who encouraged their activities. Clearly, however, a system which perpetuates the consumption/ pollution of natural resources must inevitably become exhausted. The larger society would do well to re-examine the constructs it has created to permit the flowering of its market economy. Its tools are inadequate for measuring the value of life in any society.

7.3 The Extent and Persistence of Subsistence Land Use

The sixteen land use studies depicted in Chapter 3 provide convincing evidence that subsistence land use continues to be practiced across the Hudson Bay bioregion. In northern Manitoba, an area extensively altered through hydro-electric developments, extensive subsistence harvesting is still practiced. Residents of South Indian Lake, a Cree community in northern Manitoba, occupied by Cree-culture peoples for at least 1000 years, suffered impoundment of their lake in 1976. Despite the severe disruptions to wildlife and habitat caused by this project, the community continues to practice both commercial and subsistence harvesting over an area greater than 35,000 sq km., and "the bush life in both commercial and subsistence forms has continuing vitality for the community [of South Indian Lake] and retains strong personal, cultural, and economic significance" (Hrenchuk 1991).

Members of Fox Lake FN in North Eastern Manitoba, also heavily impacted by modern industrial development, are not as heavily involved in hunting, trapping, fishing and gathering as was formerly the case, but "these activities have not...lost their importance to the present-day Fox Lake Cree....Patterns of land use and occupancy may change in response to a changing environment, but given that many Fox Lake Cree maintain strong ties to the land and an intimate knowledge of it, it is unlikely that their traditional land use activi-

ties will ever be abandoned" (Hill 1993, pp. 110-111).

The Denesuline west of Hudson Bay traditionally migrated seasonally with the caribou herds from the transitional forest in winter and northward to the tundra in summer. In more recent times they have established permanent settlements at the southern end of their traditional hunting grounds, and use summer camps in the tundra to a lesser extent. Nonetheless, the fall camps are unchanged, still determined by the migration routes of the caribou as they were in the 18th century (MKO 1993, pp. 44-45).

Members of York Factory First Nation continue to hunt, trap and fish, despite their relocation from the coast, despite the despoilation of the land and waterways around them, despite the fact that their harvesting activities were severely constrained by the loss of a land base with the move to York Landing. They continue to hunt to the extent possible around York Landing, and travel to the area around York Factory by plane in the spring, fall and winter to hunt geese, ducks and large game. They have even devised a strategy which allows them to travel up the Nelson River by boat, using the dam tide created by the daily release of water from Long Spruce in time to catch incoming tides from the Hudson Bay to carry them to the coast. They continue to fish on Split Lake, and to use the trapline to which they were given access by Split Lake FN. In December, 1995, they were granted 19,000 acres in their traditional hunting/trapping area, and were negotiating a comparable piece of land as part of their treaty land entitlement.

The approximately 3,000 Cree people of Cross Lake, also in North Central Manitoba and also covered under Treaty 5, had their lake level lowered substantially by diversion of water flow from the Churchill River to the Nelson River. With that de-watering, a major

means of transportation was lost to the community, and fishing, trapping and hunting practices were dramatically affected. These impacts were exacerbated by extensive fires and forestry development in the same area. Nonetheless, McDonald (1995) writes that "the subsistence economy [in Cross Lake] continues to provide resources for domestic use, defines, in part, the culture and history of the people, and provides evidence of historical and contemporary use and occupancy of the Cross Lake region" (p. 86).

The 6500 Omushkego Cree who live in the Mushkegowuk region of Ontario continue to use the full extent of their traditional hunting grounds which cover 250,000 sq. km., of which only 900 sq. km. is Indian Reserve land (Berkes 1995, p. 92). Authors of the Kayahna Region Land Utilization and Occupancy Study (1985) in Northern Ontario concluded that the creation of new settlements had not had a major impact on their land use, and "although some changes in land-use patterns and occupancy occurred, these were in the nature of adaptations which did not greatly affect the traditional patterns over a longer period of time, from the 1920's to the present" (p. 22). These findings were consistent with those reported in the Thompson & Hutchison study (1989).

Riewe (1992) reported that though the 17,500 Inuit of Nunavut will own approximately 348,000 sq. km. "they actually use approximately 1.5 million square miles [3.8 million sq. km.] of land and ocean in Nunavut for hunting, fishing, and trapping" (p.1). The land use practices of the Inuit and Cree of northern Quebec were documented in two studies conducted by the JB&NQNHRC (1982 and1988). The Hudson Bay Programme gathered copious volumes of information, both qualitative and quantitative, on the traditional and present land use of subsistence societies around the Hudson Bay, and showed the feasibility

of using local expertise and observation to monitor environmental change (McDonald *et al.* in press).

Contemporary land use practices of subsistence societies in arctic and subarctic zones of the Hudson Bay bioregion have been painstakingly documented in one map biography after another, in one study after another. The results show that members of these societies continue to practice subsistence harvesting extensively, and in many instances do so in their traditional hunting grounds.

7.4 The Future of Subsistence Societies

Whether subsistence societies will survive in the long term is not clear. Major factors influencing their survival are whether the youth in these societies choose to continue to live in these societies; whether their leaders can develop effective working relationships with the larger society; and whether these leaders will be able to develop the financial and resource management capabilities needed to support their continuance.

Subsistence societies in the Hudson Bay bioregion are well advanced in the process of re-establishing a resource base. They are also negotiating substantial cash settlements for surrendered lands and damages suffered. The larger society is watching with considerable interest and even skepticism to see how well they will manage these resources. The challenges are enormous. Assuming responsibility for self-government before the concept itself has even been defined is but the first. Designing, establishing and effectively running the infrastructure needed to manage these resources wisely and for the long-term benefit of subsistence societies themselves is a second. Both are made hugely more difficult because members of subsistence societies are for the most part ill-equipped to assume these

responsibilities, and to hold their own against powerful bureaucracies of the larger society which have dominated them for so long, and which continue to provide considerable guidance in the period of transition. Low levels of formal education in the areas of resource and financial planning leave them vulnerable to misuse and abuse by those on whom they must rely for advice and training.

As leaders of subsistence societies cope with their new responsibilities, they will also have to kindle an interest in their youth to commit to becoming part of the emerging nation-states being created, and to ensure that they acquire the skills and expertise needed to participate in the further evolution of self-determination and cultural revitalization. "Societies maintain themselves because they are able to transmit their principles and values from one generation to the next. The moment they feel unable to hand anything down, or no longer know what to transmit...they are sick" (Lévi-Strauss 1991, p. 160). With wise leadership and sound planning, there is reason to believe that many young members of these societies will be eager to make this commitment. It will be the first time that this generation will have had the opportunity to participate fully in any society.

Members of York Factory First Nation are beginning to establish both a financial and a resource base. They are beginning to take an active role in designing school teaching materials for their children, including "classes" with elders and hunters on the land, and producing curriculum materials which describe their Band's history and values. They are moving to train their own teachers. The Omushkego of northern Ontario have been dealing with issues of acculturation since the 1930s, and over time have developed a core of professionals with the demonstrated capacity to undertake independent research and participate fully in arenas

such as the *Royal Commission on Aboriginal Peoples.* The Inuit of Nunavut are struggling to retain and strengthen their culture's traditional values. Symbolized for them by their "traditional knowledge", the difficulties of incorporating this knowledge into a study on harvest data is representative of the dichotomy they face.

Despite the obstacles facing subsistence societies, the desire for self-determination is very strong. The alternative of assimilation offers little promise in any event, for though some of their number have adapted well to the larger society, many more have not, and it is becoming obvious that behaviors of the larger society are leading to an environmental, cultural and moral impasse with little promise for anyone.

7.5 Conclusions

Societies are characterized by their ethos and economic systems, and one is a reflection of the other. Traditionally the subsistence lifestyle has offered little in the way of material wealth or comfort, and members of subsistence societies have instead depended on relations with one another and with the land for survival to define life's meaning.

In latter years traditional subsistence societies have become "mixed" subsistence societies. They have moved to settlements, live in bungalows, use bullets, guns, rifles, snowmobiles, outboard motors and even chartered aircraft to hunt. They require a cash income which is obtained in the form of social assistance or employment income to survive. In many cases their resource base has been destroyed or in some way diminished by forces of the larger society. Despite the damages suffered, and the extent of assimilation which has occurred, subsistence societies continue to be guided to a large extent by the ethos of traditional subsistence societies.

The period of transition to self-government and land ownership will inevitably challenge this ethos. This challenge will not emerge from the adoption of sophisticated technological and financial resource management strategies, but rather from the opportunities for personal gain which will occur. To the extent that members of these societies faced with such opportunities are able to continue to place the community's well-being ahead of their own personal gain, they will be able to retain their subsistence ethos. The primary criteria for decision-making can as well be a project's impact on people and/or the environment as it can be a project's impact on the bottom line. If members of subsistence societies in the future continue to place less importance on the ornamental trappings of civilization than they do on their relations, then subsistence ethos will continue to guide them.

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Rose, Ian. Acting Director of Policy & Programs, Arctic College Iqaluit Campus. Telephone call on March 13, 1995.

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Saunders, Horace (Jr.). Interview conducted in York Landing on November 18, 1993. Born in 1959 in York Landing. Son of Horace Saunders (Sr.).

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Wastesicoot, Obediah. Interview conducted in York Landing on November 19, 1993 and recorded interview conducted by Donald Saunders in July, 1992. Born 1940 in York Factory.

Wilson, Peter. Nunavut Planning Commission. Telephone conversation on March 1995.

Appendix I
Cree Technical Words & Species Names[1]

English	Cree
place of the great house - York Factory	*Kihciwaskahikanihk*
local chief or group leader	*okimah*
Cree people of the Hudson Bay lowland; muskeg people	*Mushkego*
wilderness	*tuski*
Coasters	*Winipeg Athinuwick*
Inlanders	*Muchiskewuck Athinuwick*
river	*sepee*
powdered caribou or other meat, with grease	*pemican*
caribou	*attik*
moose	*moos*
Canada goose (large)	*nis'ku (niskuk - plural)*
Canada goose (small variety)	*apichiskis*
lesser snow goose	*wawao*
brant goose	*ayowa'poowao*
duck	*sese'p*
mallard duck	*e'yinesip sese'p*
snow bunting	*wapanukoses*
swans (trumpeter, whistling or tundra)	*wa'pisew*
ptarmigan	*wa'piuao*
sharp-tailed grouse	*a'kisko*

1. The English orthography of Cree words is taken from two sources. The first is based on Rev. E.A. Watkins 1865 *Dictionary of the Cree Language as spoken by the Indians in the Province of Quebec, Ontario, Manitoba, Saskatchewan and Alberta*, using the Swampy Cree dialect spoken in Northern Manitoba when possible. The second source is Fred Beardy (Aug. 3, 1994, pers. comm.). Note that spelling varies with the author.

English	Cree
ruffed grouse	*puspuskew*
bald eagle	*mickesew*
white sucker	*numa'pin*
sturgeon	*numa'o*
pike	*kino'sao*
lake whitefish	*uti'kumak*
beluga whale	*wa'pumak*
large whale	*mistumak*
seal	*a'kik*
redcurrants	*aye'kimin (smooth red)* *meyechemin (rough red)*
blackcurrants	*kusketamin, muntomin*
juniperberries	*aha'seminu*
yellowberries	*osa'wominu*
strawberries	*otahimin*
gooseberries	*sap'oomin*
raspberries	*uyoo'skan*
cranberries	*wesukemin*
wild rice	*muskose'minu*
beaver	*u' misk*
otter	*nikik*
marten	*wa'pistan*
mink	*sa'kwasew*
wolverine	*kwekwuhakao*
lynx	*pi'sew*
red fox	*muka'sew*
white (arctic) fox	*wapu'kasew*
silver fox	*soniyawu'kasew*
skunk	*sika'kk*
porcupine	*kak or kakwu*

English	Cree
black bear	*mu'skwa*
polar bear	*wwa'pusk*
snowshoe hare	*wa'poos*
fisher	*ochak*
groundhog	*we'nusk*
wolf	*muhe'kun*