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CANADA - UNITED STATES ARCTIC TRANSBOUNDARY ENVIRONMENTAL
RELATIONS: THE IMPLICATIONS TO THE PORCUPINE CARIBOU HERD
FROM THE PROPOSED HYDROCARBON LEASING PROGRAM IN
THE ARCTIC NATIONAL WILDLIFE REFUGE.

by

PETER LORNE MURPHY, B.A.

the Faculty of Graduate Studies and Research

in partial fulfillment of

the requirements for the degree of

Master of Arts

Department of Geography

Carleton University

Ottawa, Ontario

January 4, 1991

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submitted by

Peter Lorne Murphy

B.A. Carleton University

in partial fulfillment of the requirements for
the degree of Master of Arts.

THESIS SUPERVISOR

CHAIRMAN, DEPARTMENT OF GEOGRAPHY

Carleton University

May 1991

ABSTRACT

The dispute between Canada and the U.S. over the proposed hydrocarbon leasing activities in the 1002 area of the Arctic National Wildlife Refuge (ANWR) is the latest in a series of transboundary environmental conflicts between these two countries. Since the early 1960's vast areas on the arctic north slope adjacent to the Beaufort Sea have been designated as protected areas. Preservation of the habitat of valued wildlife has been a determining factor in the selection of areas for protection from industrial activity. The Porcupine Caribou Herd (PCH) and its habitat have been, and remain, an important focus for governments, native subsistence users, and environmentalists. The hydrocarbon development activities have raised concerns in regards to the PCH its habitat, and protected areas. The current transboundary dispute involves two sovereign states, development and conservation interests, and native groups. This conflict exemplifies the problems commonly associated with shared resources and the clash between states when they value those shared resources differently. This study assesses the recent historical events, reviews the current proposals and public policy positions of the major governmental and native actors, and assesses the impact the 1002 area development proposal has on Canada - U.S. transboundary environmental relations in the Arctic.

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Special thanks to go to Julie. Finally, this thesis is dedicated to the memory of Dr. Patrick Murphy, M.D. F.R.C.S.(c).

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LIST OF ABBREVIATIONS

AIWR	Arctic International Wildlife Range
ANILCA	Alaska National Interests Lands Conservation Act
ANS	Alaska North Slope
ANWR	Arctic National Wildlife Refuge
APS	Alyeska Pipeline System
ASRC	Arctic Slope Region Corporation, Alaska
BEARP	Beaufort Sea Assessment and Review Panel
CAGP	Canadian Arctic Gas Project
CAH	Central Arctic Herd
COE	U.S. Army Corps of Engineers
COGLA	Canadian Oil and Gas Lands Administration
CPCMB	Canadian Porcupine Caribou Management Board
DIAND	Department of Indian and Northern Development
EA	Department of External Affairs, Canada
EIRB	Environmental Impact Review Board, Inuvialuit
EEC	Exclusive Economic Zone
EPA	U.S. Environmental Protection Agency
FEARO	Federal Environmental Assessment Review Office
GNWT	Government of the Northwest Territories
ICJ	International Court of Justice
IFA	Inuvialuit Final Agreement
IJC	International Joint Commission
IPMB	International Porcupine Management Board
KIC	Kaktovik Inupiat Corporation
MMC	Marine Mammal Commission
MMS	U.S. Mineral Management Service
NPRA	National Petroleum Reserve - Alaska
NPS	U.S. National Park Service
NYNP	Northern Yukon National Park
NSB	North Slope Borough
NYNP	Northern Yukon National Park
OCS	Outer Continental Shelf
PCH	Porcupine caribou herd
TAPS	Trans-Alaska Pipeline System
U.S. DOI	United States Department of the Interior
WMAD-NS	Wildlife Management Advisory Council-North Slope
YTG	Yukon Territorial Government

CHAPTER ONE

INTRODUCTION

The modern history and current status of Canada-United States (US) relations in the Arctic can be defined in many ways, from many perspectives, and within many contexts.¹ Despite the range of issues and disciplinary perspectives, common elements exist which attract interest, concern and study.

A short list of so-called "common elements" that constitute the modern history and current status of the relationship between Canada and the United States in the Arctic region include strategic and sovereignty matters (Kirton, 1987: 7-19), the economic development of non-renewable natural resources (Westermeyer and Shusterich, 1984; Dosman, 1976; Page, 1986), and environmental concerns (Lloyd, 1970; Canadian Arctic Resources Committee, 1980-90). Each of these so-called elements can be examined from either a global or a regional

¹ The term "modern history" in this context is meant to describe the period after the Second World War to present.

perspective; none can be analyzed exclusively from the others.

Environmental issues within the context of Canada-US relations in the Arctic are intimately linked to, *inter alia*, northern native demands for self-determination (Berger, 1977; Dacks, 1981; Denhez, 1982; Cummings, 1985; Davies, 1985; Berger, 1985), strategic and sovereignty matters, and the industrial development of onshore and offshore non-renewable resource extraction. Since the 1968 discovery and industrial development of a super-giant oil deposit at Prudhoe Bay in Alaska, the political, social, and environmental pressures from oil and gas production and exploratory activity have increased in the North American arctic (Tussing, 1975; Morehouse, 1984: 1-12). Other hypothetical development proposals and exploratory hydrocarbon activities in northwestern Alaska, northern Yukon, northwestern Northwest Territories, and the adjacent offshore areas of the Beaufort sea (herein referred to as the North American Western Arctic) have continued to focus concern on the protection of the environment.

Many hydrocarbon development proposals in the North American Western Arctic have had transboundary environmental implications. The Mackenzie Valley Pipeline Enquiry (1977) reviewed the potential environmental impacts of the development proposal by the Arctic Gas Consortium (Berger: 1977, vol. 1; Scott and Pearse, 1974: 1-32; Smith, 1982: 561-572). A decade later, in April, 1987, the U.S. Secretary of the Interior submitted a Legislative Environmental Impact Statement (LEIS)¹ to the U.S. Congress concerning the future management of a part of the Alaskan Arctic coastal plain.² In both cases transboundary environmental impacts were recognized. The former case set standards

¹ The Legislative Environmental Impact Statement is hereinafter referred to as the Report.

² US Department of Interior's policy position on the future of the 1002 area is described in: Clough N.K, Patton P.C., and Christiansen, A.C. (eds.), 1987, Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment: Report and Recommendation to the Congress of the United States and Final Legislative Environmental Impact Statement. United States Department of Interior, U.S. Fish and Wildlife Service, U.S. Geological Service, volume 1, 208 p.; volume 2, 998 p.

for the conduct of environmental reviews and continues to influence the political development of the Canadian North. The latter case remains unresolved and brings into question the nature and status of Canada-US environmental relations in the Arctic.

The Secretary's Report recommended a full leasing program (called Alternative A in the Report) in the 1.55 million acre portion of the coastal plain of the 19 million acre Alaska National Wildlife Refuge (ANWR). The coastal plain was set aside for future management consideration under the Alaska National Interest Lands Conservation Act (ANILCA) U.S. Public Law 96-487. The aforementioned coastal plain is commonly referred to as the '1002 area'. Its name is taken from the clause number in ANILCA that describes the affected area. The 1002 area was set aside for assessment of its industrial development potential by the United States Department of the Interior (U.S. DOI); hence the 1002 area was not given 'wilderness' status as defined under ANILCA. ANWR was established in its present form under the ANILCA

Figure 1. The Arctic National Wildlife Refuge, the Northern Yukon National Park, and the limit of the Porcupine Caribou Herd (Source: PCMB, 1987:21)

in 1980.¹ Under ANILCA eight (8) million acres were set aside in order to protect it from any kind of development by designating it a 'wilderness' as defined under ANILCA. This area is distinct from the area designated under clause 1002. The 1.55 million acre 1002 area is situated in the northern part of the 19 million acre Alaska National Wildlife Refuge. The Refuge was originally created in 1960 by President Eisenhower and was called the Arctic National Wildlife Range. Under ANILCA the Range was enlarged in 1980 and renamed a Refuge. Since the Secretary's submission of the Report, committees in both Houses of Congress have been deliberating on the issue of whether to make the 1002 area available for oil leasing and development.

This thesis examines the implications of hydrocarbon exploration activity in the coastal plain of the Arctic National Wildlife Refuge (ANWR) for Canada-US transboundary relations in the Arctic. The transboundary environmental issue reviewed in the following chapters is the potential impact(s) of the

¹ See chapter two for a fuller review of the history of conservation in northwestern Alaska.

proposed hydrocarbon leasing program in the 1002 area of the Alaska National Wildlife Refuge (ANWR) on the Porcupine Caribou Herd (PCH).

The PCH's habitat (winter range, migration routes, and calving areas) transcends the Yukon-Alaska international boundary. The normal life cycle of the herd includes the migration of the herd across the Alaska-Yukon international boundary twice a year. The 1002 area coincides with the PCH's traditional calving, predator avoidance and insect relief habitats. The importance of the herd can be assessed in two ways. The primary users, in this case native subsistence hunters on both sides of the international boundary, rely on the herd (Jacobsen and Wentworth, 1982, Pedersen, Coffing, and Thomson 1985, and Leblond, 1979). According to archaeological evidence caribou were harvested up to 27,000 years ago in the vicinity of Old Crow, Yukon (Irving and Harrington, 1973). Caulfield (1983) estimates that as much as 90 percent of subsistence foodstuffs are obtained through hunting. In the past,

Figure 2. The 1002 area (Source: Clough, 1987: 21)

reliance on the herd has resulted in starvation among native communities due to fluctuations in the timing and appearance of the herd (Stefansson, 1914 referenced in Urquart, 1986: 50). Annual native harvest estimates range from 100 to 1000 animals among Alaskan natives and 700 to 2,900 animals among Canadian natives (Coffing and Pederson, 1985 and Clough et. al. 1987: 41). Population estimates of the herd have ranged from 30,000 animals in 1955 (Munro, 1953 referenced in Urquart, 1986: 65) to 180,000 animals in 1986 (Clough et. al., 1987). Urquart (1986: 64-68) stresses that data prior to 1972 "are highly questionable" and that "the herd has either remained relatively stable since 1972 or increased slightly." Currently three native communities rely heavily on the PCH; the Inupiat community of Kaktovik, Alaska, and the Gwi'chin Athapaskan communities of Arctic Village in Alaska, and Old Crow in the Yukon.

The importance of the PCH can also be judged by the number of initiatives that have been proposed to protect the herd and its habitat. Beginning in the early 1920's awareness of the PCH and its habitat as an important

component in the ecology in the North was recognized (see Leblond's (1979) description of Olaus Murie's field work in the early 1920's and subsequent activism on behalf of the PCH). In the late 1950's non-governmental organizations (notably the Sierra Club of America) promoted the idea of establishing a protected area in northwestern Alaska. Between 1960 and 1990 a National Wildlife Refuge was created on the U.S. side of the border and a National Park on the Canadian side. Recently, an international treaty on PCH management was agreed to by Canada and the U.S and national and international PCH management boards were created. As a transboundary environmental issue the potential negative environmental impacts on the PCH, and the status of the ANWR as a 'wildlife' area, is unique with respect to other current issues in Canada-US transboundary relations. The issue is centered on an exclusively northern wildlife species and its habitat.

The thesis focuses on the likely impact of the proposed 1002 Area leasing program on the status of Canada - US transboundary environmental relations in the Arctic. Its emphasis will be on the fundamental schism

between the U.S. and Canadian positions. Canadian opposition, as the potential injured party in a transboundary environmental conflict, to the proposed 1002 Area drilling program stems from a perceived threat to the continued health of the PCH and its transboundary habitat. The various Canadian positions can be described as ones which seeks to minimize damage to the PCH and its habitat in the 1002 area. The Canadian positions consist of public policy responses to the release of the Secretary of the Department of the Interior's Report and recommendations to Congress. Canadian responses include the following organized interests: the federal government, the Yukon and Northwest territorial governments, the Inuvialuit regional government, the Porcupine Caribou Management Board (Canada), and the Council of Yukon Indians. The positions of Canadian and American environmental groups and industry lobbyists are not analyzed in this thesis since the positions they take are self evident. Industry lobbyists represent oil and construction interests while environmental groups promote conservation and preservation. This should not be interpreted as meaning

these groups are not important. These groups do exert pressure on the decision makers and public opinion. Both groups have made Congress their main target and their submissions to the various committees reflect this strategy as well as their views.

Unlike the Canadian positions, U.S. interests are highly fractured. Elements of the U.S. federal government either definitively oppose 1002 development (such as the National Park Service), or they have couched their approval with highly stringent conditions (notably the Army Corps of Engineers). Indeed, the Report issued by the U.S. DOI (examined in detail in later chapters) and authored by DOI staff clearly states that unavoidable negative impacts will occur to the herd and its habitat. The Secretary and the recommendations in the Report appear to disregard the evidence and expert opinion contained in the Report by recommending full leasing in the 1002 area.¹ The recommendations by both the Secretary and the editors of the Report appear to be less than objective and contradictory relative to the

¹ See Clough et. al. 1987.

information collected and described in the Report. The editors, two geologists and one wildlife biologist, as employees of the U.S. DOI accepted their Secretary's recommendations since they failed to state otherwise; this raises an important question as to the legitimacy of their analysis and leads to the conclusion that they were co-opted by the system they serve. The Secretary explicitly states the position of the U.S. DOI:

"In 1986, U.S. domestic oil production dropped to 9 to 10 percent; production is predicted to drop an additional 4 to 5 percent in 1987, if prices do not drop this year. At the same time, U.S. oil consumption, which has exceeded domestic production since the 1960's, is expected to increase. Our oil imports are expected to exceed 50 percent of consumption in the 1990's. America's growing reliance on imported oil for the rest of the century could have potentially serious ramifications for our national security...(b)ased on the analyses conducted, public comment on the draft report, the national need for domestic sources of oil and gas, and the Nation's ability to develop such resources in an environmentally sensitive manner as demonstrated by two decades of success at Prudhoe Bay and elsewhere, I have selected as my preferred alternative, making available for consideration the entire Arctic

coastal Plain for oil and gas leasing."
(Clough et. al., 1987: 1).

In Chapter 8 of the Report, entitled "The Secretary's Recommendation", the Secretary states that:

"The only potential "major" effects are attendant to oil production and are limited to the Porcupine caribou herd and the reintroduced muskox herd. "Major biological effects," for purposes of the analysis, were defined as: "widespread, long-term change in habitat availability or quality which would likely modify natural abundance or distribution of species. Modification will persist at least as long as modifying influences exist" (Clough et. al., 1987: 187).

At the writing of this thesis both Houses of Congress are in the midst of debating the Secretary's recommendations. Members in each House with an interest in the issue appear to be polarized and therefore the committees with jurisdiction have proposed and debated different bills (see Chapter Three).

The State of Alaska, through the Office of the Governor, has consistently backed the full leasing option

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the inland Gwi'chin Athapaskans communities have stated their opposition to 1002 area hydrocarbon development.

Given the negative responses by Canadian interests to the current U.S Department of the Interior (U.S. DOI) initiative it is noteworthy that the U.S. Congress has, in the past, explicitly acknowledged the importance of transboundary environmental impacts from hydrocarbon development activities in the ANWR on the PCH. Under ANILCA a number of issues were addressed including an increase in the size of ANWR, hydrocarbon leasing in the Refuge, and the importance of informing Canada about any development proposals for the 1002 that could affect the PCH. Section 1005 of ANILCA the Secretary of the Interior:

"... Shall work closely with the State of Alaska and Native Village and Regional Corporations in evaluating the impact of oil and gas exploration, development, production, and transportation and other human activities on the arctic wildlife resources of these lands, including impacts on the Arctic and Porcupine caribou herds, polar bear, muskox, grizzly bear, wolf, wolverine, seabirds, shore birds, and migratory waterfowl. In addition the Secretary shall consult with the appropriate agencies of the Government of

Canada in evaluating such impacts particularly with respect to the Porcupine caribou herd."
(emphasis added)

No Canadian government or agency, federal or territorial, was consulted as evidenced by the reaction to the Draft Report.¹ The Yukon government stated this omission clearly in a statement to the U.S. DOI:

"no Canadian governments, agencies, native groups, environmental groups or other interest groups were officially consulted about the 1002 report." (Yukon Territorial Government, 1987: 6)

The Federal government also explicitly criticized the lack of consultation:

"There was no consultation with the Government of Canada prior to the release of the draft EIS... (h)ad consultation taken place prior to the release of the draft EIS it is to be hoped that the document would have dealt with the serious Canadian concerns... (i)n particular, Canada would seek further consultations with the United States before the EIS is finalized particularly if the Secretary of the Interior's final recommendation to Congress is to propose any of those options which will have negative impact on Canada and Canadians... (t)he Government of Canada, following careful analysis of the EIS, has concluded that

¹ The Draft Report was release in 1986, one year prior to the publication of the final Report.

the risks of oil and gas development far outweigh the benefits. Canadian native people are working to develop local economies sustained by renewable resources. Canada regrets the general lack of appreciation of the immense value of Porcupine Caribou to northern native cultures. Canada urges the United States Government to recognize the serious implications for Canada of development of the 1002 lands, and to adopt Option E - Wilderness Designation. Canada further proposes that both our governments mark the regional and international importance of this area by considering a twinning of protected areas on both sides of our border" (Canada, 1987: 6 and 8)

In the final report (referred to in this thesis as the Report) no mention was made of the Canadian government's rejection of the full leasing option or its preference for a wilderness designation of the 1002 area. Further, no mention was made of the objections to the lack of consultation with Canadian governments and agencies. The Report did describe a 1985 Canada - U.S. caribou biologist technical workshop in which scenarios were discussed among other issues before the release of the draft and the final reports - and more importantly the recommendations made by the Secretary and those made in

the reports to Congress to open the 1002 area to full leasing.

Transboundary environmental conflicts between Canada and the US have centered upon such issues as the apportionment and quality of Great Lakes water, east coast fisheries resources, acid precipitation, transboundary environmental problems aside from acid precipitation, and environmental issues associated with the Arctic region. Canada and the US have addressed transboundary environmental disputes through a range of mechanisms from ad hoc to highly institutionalized processes (see generally Carroll, 1983: 34).

It is proposed that within this bilateral context the most successful examples of transboundary environmental cooperation have been achieved through formal bi-national institutional mechanisms (Carroll, 1981; Carroll and Curtis, 1983). Furthermore, since there is no binding mechanism for transboundary environmental dispute resolution at the international level (comparable to domestic legal mechanisms) it is important to study the existing Canada-US transboundary

relationship. Transboundary conflicts between Canada and the U.S. have largely centered on the transmission of pollutants across shared media (e.g., water or air) and the management of shared resources (e.g., fisheries). Until the recent signing of the Canada - U.S. acid rain treaty, the problem of acid rain would have been characterized as ad hoc since no mechanism for formal/institutional dispute resolution for airborne pollutants existed prior to the treaty. The effectiveness of this new treaty and the mechanisms that are created under its articles remains to be seen.

The 1909 Boundary Waters Treaty remains an important cornerstone in transboundary relations between Canada and the U.S. The factors that led to the Treaty were based on the unique problems posed at the time (Lemarquand, 1985: 16). Apportionment of water resources (flooding in the Great Lakes region and water shortages in the West) and navigational rights dominated the late nineteenth and early twentieth century and created the necessary impetus for cooperation (55 percent of the 90 largest rivers flow from Canada to the U.S. thereby making Canada the upper riparian in many situations- see Bruce and Quinn, 1979:

5). The International Joint Commission (IJC) was created under the Boundary Waters Treaty in 1911 in order to address issues and complaints. The IJC is regarded by many scholars as the 'best' example of Canada - U.S. environmental cooperation and a "key actor playing a central role in the countries' relationship" (Carroll 1986: 211). Since 1911 the role of the IJC has expanded and now addresses water quality and water pollution questions stemming from the 1972 and 1978 Great Lakes Water Quality Agreements and includes over 50 boards (Lemarquand, 28-29).¹ Nevertheless Article II of the Treaty and U.S. transboundary water policy have been, from time to time, characterized as reflections of the Harmon Doctrine.² In practice the IJC has mediated solutions, albeit with limited success in some situations, in several transboundary cases. Carroll (1986: 207) states the overarching reason for the initial

1 Johnson (1985) notes that the IJC played an important role in the negotiations of the two Water Quality Agreements.

2 The Harmon Doctrine asserts the right of the upstream state to use its water as though no downstream user had legitimate claims (Cohen, 1977).

and continued cooperation in boundary waters affairs:

"Geography, physical and human, thus ensures the existence of bilateral water management challenges and opportunities for both countries and the constant presence of this subject, therefore, on the bilateral diplomatic agenda." Arguably, this line of reasoning leads to the observation that common policy objectives with a defined spatial and resource/environmental framework are preconditions to cooperation that lead to formal management arrangements - similar to the Boundary Waters Treaty and the IJC.

The Georges Bank boundary and fisheries resource conflicts involved both fisheries management mechanisms (in the form of treaties - some signed others nearly agreed upon, and still others rejected outright) and recourse to the International Court of Justice (ICJ) in order to resolve the maritime boundary dispute. The latter action has given the Georges Bank boundary dispute a unique status among Canada - U.S. disputes in general. Rarely does the U.S. submit itself to third party adjudication. According to Legault (1985) the modern Georges Bank dispute began with advent of the continental

shelf doctrine in 1945 and extension of other maritime boundary limits (such the territorial sea limit) and the adoption of functional ocean exploitation zones such as the 200 nautical mile exclusive economic zone ¹. Prior to the Second World War disputes had erupted over the fishery. However, in 1964 Canada began to issue offshore oil exploration permits for the Georges Bank and thus the boundary dispute was kindled between Canada and the U.S. Once the boundary was in dispute the fisheries resource jurisdiction came into question; extrapolating Gottman's (1973) territorial 'security-opportunity' concept to maritime boundary disputes the resulting change in the status quo in the offshore area of the Georges Bank created significant uncertainty over the spatial extent of each state's legal jurisdiction. In 1979 the two countries reached a tentative agreement on fisheries management and to refer the boundary dispute to the ICJ. In 1981 the fisheries agreement was withdrawn from the

¹ Legault's article provided the basic information on the discussion of the Georges Bank dispute briefly described above. The author was a legal advisor to the Department of External Affairs at the time his article was published.

Senate. In 1984 the ICJ delivered its ruling on the Georges Bank boundary. While the basic arguments each state presented before the ICJ are beyond the scope of this thesis, the court used a complicated three part proportional geometrical technique based primarily on shoreline length with minor exceptions for islands. Both states accepted the decision and negotiations on cooperative fisheries management regimes resumed. The settlement of the boundary dispute enabled each side to relinquish any doubts concerning the boundary thereby creating the opportunity to resume negotiations on the cooperative fisheries management.

The transboundary conflict studied here shares some of traits with each of the case and type resolutions described above. However, unlike the above cases the dispute over the PCH and its habitat are unique. The 'shared' resources, namely the PCH and its habitat, are in direct conflict with one state's desire to pursue a policy of non-renewable resource extraction, in this case oil production, inside it's territory. Therefore the U.S. DOI is promoting a policy that calls for the extraction of a non-renewable resource without regard to

the effects this activity may have on other environmental components. In this case among other threats are those to shared transboundary resources and the different values other interests attach to these resources; this situation creates the conditions for a transboundary conflict. Moreover, this kind of behaviour exposes the fundamental schism in conflicts over the environment.

The transboundary nature of the conflict studied here compounds the conflict since the spatial and juridical-administrative structures of the international system promotes state sovereignty. The normative approach in Canada - U.S. transboundary environmental relations is based on the acceptance of the other state's right to recourse, always within a non-binding framework, in which formal institutional mechanisms with relatively broad mandates exist to manage conflicts as they arise. However, no formal institutional mechanism exists that could address a range of northern Canadian - U.S. environmental conflicts; oil and gas exploration in the 1002 area is a U.S. federal matter with no restraints from an international energy development/environment treaty. It is argued here that the newly created

international Porcupine management board could fulfill this function only if its mandate is greatly expanded.

O'Riordon (1974) observes that the definition of resources is variable through space and time since values attached to them tend to change. The conflicts in this case study neatly fit his observation. The value of the PCH to native subsistence users defies conventional or neoclassical quantitative measurement given the cultural and spiritual values attached to the herd. The value of the PCH's habitat in a 'wilderness' state also defies conventional or neoclassical quantitative measurement given the cultural and spiritual values attached to it by various interests. The following chapters discuss the policy positions of the various governmental and native interests; the variation in how and in what way these different interests value hydrocarbon development, the PCH and its habitat explain much of the underlying reasons why there is conflict in the first place. Geographers have attempted to categorize resource types: flow or depletable/degradable resources; stock or non-renewable resources; and continuous or undepletable resources (after O'Riordan, 1976). Based upon the

1976). Based upon the aforementioned definitions the conflict studied here involves the clash between interests which value the PCH and it's habitat (flow or depletable / degradable resources' versus interests which value oil production (stock or non-renewable resources). Given the policy positions of the interests on both sides of this conflict one resource type cannot be utilized or protected without eroding or denying the opposing interest.

Each new transboundary environmental conflict is more than a test of the general nature of Canada-US bilateral relations. The factors that lead to a dispute, sustain it, and lead to either a prolonged status quo of uncertainty and inaction or equitable resolution are worthy of consideration because of a greater awareness of the need for global environmental and transboundary resources management cooperation between states.

The following chapters discuss those aspects that relate directly to the study, namely, a discussion of the PCH and the likely impacts to it from the proposed hydrocarbon activity, a review of the Secretary's full

leasing proposal, a review of the hydrocarbon and conservation initiatives in the wider transboundary context, and an analysis of the stated positions of the government agencies and native organizations involved. The thesis concludes with an assessment of the impact the US proposal has on Canada-US transboundary environmental relations in the Arctic.

CHAPTER TWO

DEVELOPMENT AND CONSERVATION IN THE NORTH SLOPE REGION

This chapter describes the historical context of hydrocarbon development and conservation in the study area northeastern Alaska and the Yukon north slope region (hereinafter referred to as the north slope region).

The focus on development and conservation in the northeastern north slope region is meant to provide a general context from which to review and assess the case study. Furthermore, this chapter can be viewed within a higher context; namely a 'Northern', circumpolar, or a global context.

The existence of two adjacent nation-states, having a common international boundary, different regulatory regimes, regional political development, and a myriad of other conditions has contributed to this conflict. Nowhere in the North American arctic is there a comparably high concentration of interest in hydrocarbon development and, arguably, concern over the future state

of the environment. Equally evident is the level of disagreement between these competing interests.

The north slope region includes one of North America's largest continuous park and designated wilderness areas separated by an international boundary. The Northern Yukon National Park, in the Yukon Territory, and the adjacent Arctic National Wildlife Refuge, in Alaska, are located in the north slope region. The combined total surface area of the two protected areas total 22.5 million acres. The north slope region (including Beaufort Sea) also contains proven and estimated unproven hydrocarbon reserves that have elicited serious oil and gas industry interest since the late 1960's.

The Alaska North Slope (ANS) contains the closest oil fields in production to the 1002 area and the PCH's habitat. The Prudhoe Bay production complex is described as "the most productive oil field in U.S. history" (Gould, Karpas, and Douglas, 1990: 45). The

entire 'Alaskan hydrocarbon complex' consisting of the former, the 800 mile Alyeska Pipeline System (APS) and the large storage and terminus facilities at the Port of Valdez in the south of the state have no comparable northern 'Canadian' counterpart.¹

In comparison, the adjacent Yukon north slope/upper Mackenzie Delta region has been the subject of several hydrocarbon development proposals since the early 1970's. None, except at Norman Wells, have advanced beyond the exploration phase.

Rather than list and describe all of the hydrocarbon development proposals for the North American arctic, the following chapter focuses on selected hydrocarbon development proposals and significant transboundary environmental implications that involve the PCH and its habitat. The goal is to establish the 1002 area dispute as one more development

¹ The Alyeska Pipeline System was formerly known as the Trans-Alaska Pipeline System (TAPS).

initiative in a series of hydrocarbon proposals that have been on going since the late 1960's.

Oil and Gas Activities:

The earliest interest in oil and gas in the North American Western Arctic dates back to the late nineteenth century. At that time a Canadian Senate report stated, with apparent enthusiasm, that the Mackenzie Valley contained "the most extensive petroleum field in America, if not in the world".¹ In 1920 oil was discovered at Norman Wells. Until World War II the Norman Wells field served local fuel needs. During the War the Canol pipeline was built, primarily to supply U.S. demand in Alaska, to carry oil from Norman Wells to the newly completed Alaska highway in the Yukon. The pipeline was used for one year and

¹ Quoted in Page (1986: 10) quoting Senate of Canada, Report of the Select Committee Appointed to Inquire into the Resources of the Great Mackenzie Basin, Ottawa, 1888, pages 10 to 15. The reference to "America" is assumed here, however obliging I am to the long gone authors of this Senate report, to mean the North American continent.

subsequently abandoned (Page, 1986: 17; Armstrong, Rogers, and Rowley, 1978: 303). In 1923, preliminary exploration activities on northeastern Alaska culminated in the creation of the Naval Petroleum Reserve number 4 (NPRA-4). Detailed geological surveys of the NPRA-4 did not begin until the late 1960's (Kresge, Morehouse, and Rogers, 1977: 72). Significant and recoverable hydrocarbon deposits have yet to be found in the NPRA-4

In the post War period the first significant development of hydrocarbon activities anywhere in the North American Arctic and in particular the Western Arctic began in 1968. In that year the Sohio Company announced the discovery of what was termed a 'supergiant' oil field at Prudhoe Bay on the North Slope of Alaska located approximately 150 miles west of the 1002 area (Dryzek, 1983: 2). The Prudhoe Bay discovery and subsequent development of the oil field complex and the Alyeska Pipeline System (APS) proved to

be a significant catalyst for later oil and gas exploration and development proposals.

Concurrent with these development proposals were concerns about the predicted impacts to the environment. Among the significant environmental issues identified at that time were habitat degradation arising from hydrocarbon exploration activities, site construction and operations and hydrocarbon transportation (pipelines and/or tankers).¹ These concerns have persisted and were definitively demonstrated by the Exxon-Valdez oil tanker spill in Prince William Sound, Alaska.

Canadian oil and gas activities:

Hydrocarbon development activity in the Canadian Western Arctic can be characterized as a series of hydrocarbon development proposals and reviews of these

¹ For a brief overview of the issues since the late 1960's and 1970's see back issues of the Canadian Arctic Resources Committee's (CARC) newsletter Northern Perspectives .

proposals. Few of the proposals in the past have gone on to completion. The notable exception is the Norman Wells complex and pipeline. Hydrocarbon activities beyond the proposal planning stage have concentrated on offshore or onshore exploration activities.

An important facet of hydrocarbon activity in the Canadian North is the importance of public and regulatory reviews. A long and complex chronology of industry and governmental initiatives have been evaluated by a myriad of regulatory and environmental reviews. The Berger Inquiry, the National Energy Board's 1977 inquiry into Arctic gas pipelines, the Beaufort Sea Environmental Assessment Review Panel (BEARP), the latest reviews by the Inuvialuit Environmental Review Board (EIRB) and the industry proposals reviewed therein, generally exemplify the kind of proposed and offshore and onshore activities since the early 1970's.

The following section briefly discusses each of these reviews in order to describe the history of

hydrocarbon development in the Canadian Western Arctic. It is argued here that the above reviews contributed, directly and indirectly, to the degree of hydrocarbon activity and its state in the Canadian North in general and in the Yukon north slope in particular. Further, all of the proposals and reviews considered the potential impact to the environment from the proposals reviewed. Some, like the Berger Inquiry and NEB's 1977 review, specifically addressed the likely impact(s) to the PCH.

Following the discovery at Prudhoe Bay the oil and gas industry, both in Canada and the U.S., expanded exploration activities and initiated several transportation infrastructure scenarios. Initially the focus in the Canadian North was on natural gas since the initial discoveries were made in the Mackenzie Delta. (Scott and Pearse, 1974; and generally Pearse, 1974) Together with the Prudhoe Bay oil discovery, which included significant natural gas

discoveries, industry and governments turned to the question of natural gas transportation requirements.

By the early 1970's two gas pipeline routes were proposed; 1- the Mackenzie River route south from the Mackenzie Delta through to Alberta and southern markets (two variants of this route were proposed by two industry consortiums); and, 2- the Alaska highway route which called for a gas pipeline from Prudhoe Bay south through Alaska across the Yukon - Alaska boundary to Whitehorse and through northern British Columbia and subsequently to southern markets.¹ Each of these routes and the proposals forwarded by their proponents were scrutinized by public reviews. Each of these reviews produced written recommendations and influenced northern hydrocarbon development at that time. Both

¹ The proponents of the Mackenzie Delta route were Canada Arctic Gas, a consortium of Canadian and multinational corporations, and Foothills Ltd., a smaller Canadian consortium. The Arctic Gas proposal would have linked Prudhoe Bay and Mackenzie Delta gas while the Foothills Ltd. proposal only considered a pipeline for Mackenzie Delta reserves.

explicitly addressed the relationships between the proposals and the likely impact(s) to the PCH.

The hearings and written final reports produced by the Berger Inquiry and the National Energy Board's (NEB) 1977 inquiry on the natural gas pipelines routes proposed by Canada Arctic Gas Project (CAGP) and Foothills Limited (FL) addressed the impact to the Porcupine Caribou Herd from pipeline siting, construction and operation (Berger, 1977; NEB, 1977).

As stated in the introductory chapter, the Berger Inquiry set standards and goals that before its completion did not exist in the Canadian context, and due to the circumstances at the time have not been repeated since; indeed, very few academic research essays, dissertations, and monographs on environmental issues, native rights, and hydrocarbon development in the western arctic do not include at least a passing reference to the Berger Report. The Berger Report and the CAGP and FL proposals are milestones in the history of, *inter alia*, oil and gas development in the Arctic,

and they had important influences on the development of northern hydrocarbon and environmental policy.

Of particular importance here are the two main recommendations in the Berger Report. In the first volume of the final report Justice Berger recommended that pipelines not be built on the North Slope of the Yukon and that a ten year moratorium be imposed on pipeline construction in the adjacent Mackenzie Valley. The latter recommendation is noteworthy since it effectively halted private and public sector support for the proposals. The former recommendation is of significance since it was based on the prediction that a pipeline system in the north slope of the Yukon would negatively impact, among other environmental components the calving areas of the Porcupine caribou herd in northern Yukon (Berger, 1977: vol. 1 at xi).

The NEB's 1977 final report concluded that the Alaska Highway route was the only acceptable proposal and rejected the proposed Mackenzie Delta route (NEB, 1977). The Board placed several strict conditions on

the Alaska Highway route proposal before granting any final approval. Foothills Ltd. was required to conduct additional environmental and social impact studies and to reapply to the NEB for approval of the proposed 'Dempster' lateral route. (NEB, 1977: 153) The NEB rejected the Mackenzie Delta route based on, among other conclusions, predicted negative impacts to the Porcupine caribou herd (NEB, 1977: 153). Pipelines down the Mackenzie Valley from the Delta and along the Alaska Highway into the Yukon were not built. Subsequently, there have been proposals to build them.

Beaufort Sea development, beginning in the early 1970's with shallow offshore drilling, consisted of several exploratory drilling programmes initiated by Esso, Gulf, Dome and other exploration companies. By the late 1970's concern about the environmental and social impacts from accelerated Beaufort Sea development caused the Department of Indian and Northern Development (DIAND) to refer the issue to the Federal Environmental Assessment Review Office (FEARO)

for a formal environmental impact assessment. The review report, conducted through the Beaufort Environmental and Review Process (BEARP), was made public in 1984 (FEARO, 1984). In the final report the Panel proposed 83 recommendations including a phased approach to development in the Beaufort Sea. Of significance here was the recommendation (from BEARP) that a small diameter pipeline could be built down through the Mackenzie Valley. Unlike, and in contradiction to the Berger Inquiry, BEARP did not directly address land claims issues and failed to assess the major onshore environmental impacts completely (Fenge, 1984; Department of Fisheries and Oceans, 1984). In doing so it did not explicitly accept or reject the earlier reviews regarding, among other factors, the likely impact(s) to the PCH. Exploration activity in the Beaufort Sea has continued since the release of the BEARP report (Wilkinson, 1989: 74-77).

Recent environmental impact reviews of proposed offshore Beaufort Sea hydrocarbon activities have been undertaken by the Inuvialuit Environmental Impact Review Board (EIRB) under the Inuvialuit Final Agreement (IFA) enacted 1984. The IFA and its enactment under enabling legislation created environmental screening and review mechanisms under the control of the Inuvialuit of the settlement region. According to the Inuvialuit Environmental Impact Review Board (EIRB) the IFA has "preferred status over all other federal and territorial laws within the defined Inuvialuit Settlement Region in the Western Arctic" (EIRB, 1989: 1). The governmental agencies affected by this evolution (evolution in the sense of change) in the regulatory regime include the Federal departments of Indian and Northern Development, Environment, Fisheries and Oceans, and the Canadian Oil and Gas Lands Administration (COGLA). The governments of the Yukon and Northwest Territories have also been affected. Sections 11 and 13 of the IFA describe the

rights and responsibilities accorded to the Inuvialuit.¹

Two Inuvialuit reviews to date have assessed two offshore exploration drilling programmes proposed by Esso et al and Gulf respectively. The 'Esso, Chevron et al ISSERK I-15' application was accepted with the inclusion of 10 strict conditions (EIRB, 1989: 30-31). The proposal consisted of a single winter season well drilled in the land-fast ice zone approximately 25 kilometers off the Tuktoyaktuk Peninsula. Esso's own "worst case" scenario predicted that if a drilling system blowout should occur, 3,000 barrels of oil per day would be emitted into the environment until containment at the end of 75 days; 225,000 barrels of oil in total would be emitted (EIRB, 1989: 9). The EIRB commented that Esso's scenario was a "best case" scenario with regard to the duration of a spill and that

¹ For a description of the settlement region and the sections pertaining to the screening and review processes see Appendix A and the appropriate sections in the Inuvialuit Final Agreement, 1984.

the volume of oil spilled would be greater than Esso's prediction:

"The Board felt that the size of the program and logistical commitment and planning required to effect the clean up was underestimated, while program efficiencies and effectiveness were unduly optimistic." (EIRB, 1989: 20)

The review of the Gulf Kulluk drilling programme was initiated in the spring of 1990 (EIRB, 1990). Gulf's proposal consisted of a three-year eastern Beaufort Sea exploration drilling programme (including vessels and five onshore port in the vicinity of the Amauligak field). The Amauligak field is the largest offshore proven reserve in the Canadian Beaufort Sea (EIRB, 1990: 4 and 6). The EIRB concluded that it could not recommend approval of Gulf's drilling program. The "worst case" scenarios provided by Gulf and an outside consultant produced a range of predicted total oil spill estimates. Gulf's lowest estimate predicted that the total oil spilled would be 10,000 barrels while a consultant retained by the board estimated that 1.45

million barrels of oil could be emitted into the environment. (EIRB, 1990: 24 and 25) The EIRB's explanation for withholding approval provides a concise insight into the problems and lacunae encountered by regulatory agencies that review offshore exploration proposals:

"Firstly, it is the conclusion of the Board, based on all the evidence and information it has heard and received, that there is a startling lack of preparedness evident on the part of government and on the part of Gulf to deal effectively with a major oil well blowout in the Beaufort Sea during the open water season.

Secondly, nothing that the Board has heard enables it to make any sensible recommendation dealing substantively with Gulf's potential liability in the event of a worst case blowout, ... That such a situation exists after years of drilling in the Beaufort Sea is a sad reflection of a complacency which seems to have developed on the part of Gulf and the government authorities, driven by the ultimate belief that a blowout is so unlikely to occur that preparing to meet it is largely an academic exercise. That complacency has led to a failure to amass information, a failure to develop essential planning, and a failure to test, in realistic conditions, equipment and responses. All of these would be necessary and vital, if a

major blowout did occur, in order to lessen the environmental impacts" (EIRB, 1990: 16 and 17)

The EIRB criticized the Gulf proposal for its lack of detail on shoreline cleanup planning and the lack of governmental foresight in this area:

"What is particularly difficult for the Board to accept is the fact that Gulf has operated in the Beaufort Sea since 1983 with its \$600 million Beaufort Sea Drilling System and has not yet put a shoreline cleanup manual in place. Even more astounding is the fact that COGLA¹ has not requested that this be done." (EIRB, 1990: 18)

"...based on the information available to the Board, is the unavoidable conclusion that an adequate level of preparedness in this regard does not appear to be demanded of the Proponent by governmental regulatory agencies, who are themselves unprepared for an event of this nature". (EIRB, 1990: 30)

The EIRB's review ultimately discusses concerns about the transboundary environmental implications by acknowledging the likelihood that a major blowout would

¹ COGLA is the (Canadian Oil and Gas Lands Administration)

adversely affect the Alaskan Beaufort Sea and coastal areas. Further, the EIRB reiterated the Inuvialuit Game Council's (IGC) submission to the Board concerning the impact on their relationship with the Inupiat of Alaska. Similarly, the written submission by the Wildlife Management Advisory Council-North Slope (WMAD-NS) reaffirmed the importance of the recognition of transboundary impacts. The WMAD-NS stated their views on the proposal and on transboundary environmental relationship in a wider context:

"We would suggest that, given, the migratory nature of a potential spill and the wildlife species that such a spill could affect, careful consideration be given to recognizing the Alaskan interest. Canada and the territorial governments have made clear their interest and expectations regarding consultation on transboundary impacts. If Canada's ANWR [Alaska National Wildlife Range (sic)] position is to be credible, Canadians must surely stand by these same standards and act on the basis of some principle of equality and reciprocity in dealing with Alaskan interests"¹

¹ Quoted from the Transcripts, volume 1 page 147 in Environmental Impact Review Board, at page 54, Public

To date there is no Canadian Beaufort Sea production system due in part to cyclical and/or depressed oil prices, the relative high cost of oil extraction in the Beaufort Sea, weak tax incentives to continue exhaustive exploratory drilling and increased concern over the environmental impacts from hydrocarbon activities in the Arctic in general.

Hydrocarbon development in the Canadian western arctic can be viewed as a series of offshore and onshore proposals, and reviews of these proposals. Yet after a quarter of a century of activity the major hydrocarbon undertakings have been centered on exploration, and regulatory and environmental reviews. The reviews described either included stringent environmental preconditions attached to the proposals and therefore conditionally approved the activities reviewed, the NEB inquiry (1977), BEARP (1984), and the Isserk I-15 review

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Review of the Gulf Canada Resources Limited Kulluk Drilling Program 1990 - 1992, June 1990, 68 p. with appendices

(1989), or they rejected the proposals reviewed, notably the Berger Inquiry (1977) and the Gulf-Kulluk Inuvialuit review. Early reviews of onshore hydrocarbon proposals, in this case natural gas pipelines, recognized the importance of the PCH and its habitat in the North Slope of the Yukon. In both cases the pipeline proposals received negative recommendations. Both the Berger Inquiry and the Gulf-Kulluk Inuvialuit (1990) review, notably the first and latest northern hydrocarbon environmental reviews, recognized the transboundary impacts of the proposals they reviewed. Thus, predicted transboundary impacts contributed to the decisions reached in these reviews. These early reviews recognized that the PCH and its habitat, among other environmental components, were valuable relative to the proposed hydrocarbon activities. Conversely, the Beaufort Environmental Assessment and Review Panel's report illustrates a relative lack of concern for these previously valued resources.

In contrast, the level of hydrocarbon activity on the U.S. side of the boundary is more advanced relative to the situation on the Canadian side; the Alaskan North Slope has four operational oil fields (e.g., Prudhoe Bay) and a complete transportation system in place.. Furthermore, hydrocarbon development beyond the exploration stage has not occurred in the vicinity of the PCH's habitat; exploration, approximately 80 exploratory wells drilled, in the Yukon north slope occurred before the Northern Yukon National Park was created.

Regardless of the influence these reviews may have had on development in the past the future remains uncertain. In regards to pipeline construction, a 'boom' in hydrocarbon exploration, and new oil and gas initiatives cannot be ruled out as improbable at least not the creation of development proposals on paper. Governments remain committed to hydrocarbon development in the North. In 1989 Nellie Cournoyea, the Minister of

Energy Mines and Resources for the Northwest

Territories, stated that:

"We feel confident that full-scale development of oil and gas resources of the Mackenzie Delta and the Beaufort Sea will occur in the 1990s. With pipelines in place, we can look forward to continued, long term activity. However, we must turn our attention to being prepared for the impacts and opportunities such development will bring to the North, and the new responsibilities our government will assume." (Cournoyea, 1989: 61).

Factors such as higher and more stable prices for oil and gas and a more conducive hydrocarbon regulatory framework in the Canadian Western Arctic may lead to increased oil and gas activity.

The Alaskan oil and gas activities:

As stated earlier the discovery of oil at Prudhoe Bay in 1968 is a significant milestone in the history of oil and gas development in the North American Arctic. The impact of this discovery on Arctic policy in both Canada, primarily indirectly, and the U.S. cannot be underestimated (Kresge et al, 1977; Berger,

1977; Dryzek, 1983). Prudhoe Bay is significant because it has directly and indirectly precipitated a series of developments in Alaska, and to varying degrees in the Canadian Western Arctic.

This section focuses on the existing Alaskan North Slope (ANS) oil production system and leasing programs. In 1990 1.8 million barrels oil per day were transported through the Alyeska Pipeline System (APS) to U.S. domestic markets and accounts for 20 percent of the U.S. domestic oil production (England-Joseph, 1990). In 1988 the State of Alaska became the largest domestic energy producer in the U.S. (England-Joseph, 1990: 3). These two factors alone create an impetus for continued exploration and pressure to maintain the expensive APS.

Several significant and antecedent factors contributed to the current North Slope hydrocarbon production system. They were the settlement of native land claims, the legal dispute over the Secretary of Interior's right to award pipeline right-of-way permits

and the Congressional amendments to exiting legislation and the creation of new legislation in order to permit pipeline construction, and the completion of the Alyeska Pipeline System itself in 1977.

For the native peoples of Alaska the passage of the Alaska Native Claims Settlement Act (ANCSA) in 1971 marked the settlement of their land claims against the U.S. Federal government. The settlement they received included 900 million dollars in cash, title to nearly 44 millions acres, and the creation of 13 Native Corporations in exchange for any future claims (Kresge, 1977: 76). According to early observers ANCSA created the legal environment in which planning and construction of the APS could begin (Berry, 1975). Thus the U.S. government and oil industry interests avoided the threat of delays from protracted land claims negotiations and disputes. Construction of the APS began in 1974. Recent reviews of ANCSA within a wider framework have questioned the purported benefits that the Native Corporations and Native Alaskans

themselves acquired since its enactment (Berger, 1985; Jull, 1985: 11-12).

The second antecedent consisted of a major legal dispute over the APS and subsequent legislative action which facilitated the construction of the APS.¹ Following the settlement of the Alaskan native land claims a coalition of environmentalists sued the Secretary of the Interior. The court's decision barred the Secretary of the Interior from issuing the required pipeline right-of-way permits; it was determined that the pipeline proposal did not meet the necessary right-of-way requirements of the Mineral Leasing Act (MLA), 1920.² Subsequent congressional action amended the MLA

¹ The substantive information contained in this paragraph was taken from Kresge et al, pages 81 to 86. These three pages contain a concise description of the issues relating to the court and legislative action preceding the construction of the APS.

² Kresge et al at page 85. The court case, *Wilderness Society v. Morton* (1973), barred the issuance of pipeline permits under the Mineral Leasing Act (1920) based on a maximum 25 foot right-of-way on either side of a pipeline, as prescribed in the Act, and the

in order to accommodate the requirements for a larger pipeline right-of-way. Congress also enacted the Trans-Alaska Pipeline Authorization Act (TAPAA), 1973. This Act exempted the APS from "procedural" reviews under the relatively new National Environmental Protection Act (1969) (Kresge et al, 1977: 86).

Given the political and economic context of the times, the 1973 Arab oil embargo and subsequent price increases, the stated aim of the Trans-Alaska Pipeline Authorization Act was clear: "the early development and delivery of oil and gas from Alaska's North Slope to domestic markets is in the national interest because of growing domestic shortages and increasing dependence upon insecure foreign sources". (Kresge et al , 1977: 86) Combined with the aforementioned antecedents, the political and economic climate at the time and increased industry and government interest in ANS development created the necessary impetus to commence

footnote continued _____

pipelines proposed minimum right-of-way of 100 feet each side.

and complete the minimum components of a production system.

Currently oil activities on the ANS range from proposed exploration, such as in the 1002 area, to operational and productive oil fields located onshore and the near offshore. The current status of hydrocarbon activity in the ANS in and adjacent to ANWR include the following leasing activities in State owned onshore and offshore areas in the ANS, leasing activities in the offshore Federal Outer Continental Shelf (OCS) zone, production in and around Prudhoe Bay (onshore and offshore), the native corporation leasing activity at Kaktovik, and finally the proposed leasing programme in the Arctic National Wildlife Refuge (ANWR)

Between 1959 and 1989 the State of Alaska leased approximately 11.8 million acres (onshore and offshore); 1.6 million acres remained leased as of

1989.¹ Total revenues from these lease sales were no less than 1.7 billion dollars as of 1988.² The total amount of revenues, direct and indirect, that went into the State economy from hydrocarbon activities in the ANS is 23 billion dollars (Bakiel, 1989: 79). The total acreage leased in the ANS was 6.6 million acres; or approximately 56 percent of the total leases sold by the State. Since the Exxon-Valdez disaster the State

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- ¹ This data was compiled using three sources: State of Alaska, Department of Natural Resources, 1988, Five Year oil and Gas Leasing Program, 93 pp.; State of Alaska, Department of Natural Resources, February 4, 1988 Preliminary Finding of the Director and Preliminary ACMP Consistency Analysis Regarding Proposed Oil and Gas Lease Sale 55, Demarcation Point, Division of Oil and Gas, Anchorage Alaska, 105 pp.; and, Gregory J. Gould, Robert M. Karpas, and Douglas L. Slitor, 1990, Alaska Update: September 1988-January 1990, U.S. Department of the Interior, Minerals Management Service, OCS Information Program, 81 pp.
- ² This figure was calculated from page 60, State of Alaska, Department of Natural Resources, 1988, Five Year oil and Gas Leasing Program, 93 pp. It should be noted that royalties and bonuses from producing fields were not calculated into this estimate.

has suspended its proposed 5-year leasing program until late 1990 (Gould, Karpas, and Slitor, 1990: 32).

Federal OCS lease sales in Alaska began in 1976 and continue to date. Approximately 8.2 million acres have been leased and 6.2 billion dollars collected (Gould et al , 1990: 18). As of 1988, 20 OCS Beaufort Sea exploratory drilling programmes have been completed by industry. (Gould et al , 1990: 28) No development of producing fields has occurred in the OCS in the Beaufort Sea.

Currently, there are five operational oil fields in the ANS. All are linked to the APS and only one is considered to be a truly offshore oil field - the only producing offshore oil field in the Beaufort Sea. Four of the five are on lands owed by the State while the fifth, the offshore Duck Island/Endicott field, was leased under a joint agreement between the Federal and State governments.

A third area of oil activity in the ANS adjacent to the 1002 area is on the land owned by the Kaktovik

Inupiat Corporation (KIC) and Arctic Slope Regional Corporation (ASRC). KIC owns the subsurface rights to 92,000 acres in the coastal area immediately north of the 1002 area. ASRC owns the surface to the same area and both groups have cooperated on joint management and lately joint leasing to Chevron. The importance of industrial activities on the KIC/ASRC land is based on the potential royalties and taxes raised from such activity. As stated earlier, and in chapter two, the KIC/ASRC cannot expect to promote extensive hydrocarbon development unless 1002 area leasing occurs - if ever.

Conservation on the Alaskan and Yukon north slope:

The first calls for a wilderness reserve in the North American Western Arctic were made nearly seventy years ago. During the 1920's biologists Olaus and Mardy Murie began their field studies on the Porcupine Caribou Herd which culminated in their efforts to have a reserve created (Leblond, 1982:11).

In the mid 1950s the Muries and other researchers renewed their field studies in the area (Leblond,

1982:11; Leonard, 1978: 5). As a result of their activities the northeastern Alaska and northern Yukon became the focus of the 1957 Sierra Club Wilderness Conference (Collins, 1970: 9).

In 1958 the U.S. Fish and Wildlife Service proposed to withdraw 6.4 million acres in order to create a wildlife range in the ANS in the coastal region adjacent to the Alaska - Yukon boundary (Bakiel et al , 1988: 12). This interest culminated in the creation of the Arctic National Wildlife Range, the precursor to the larger Arctic National Wildlife Refuge (ANWR). (Findley; 1970) In 1960, shortly after Alaska acquired Statehood in 1959, the Secretary of the Interior, Fred A. Seaton, created the 8.9 million acre Arctic National Wildlife Range under Public Land Order 2214 (Leonard, 1978: 5; Alaska Coalition, 1988: 3). The original ANWR was expanded in 1980 under ANILCA. Ten million acres were added, the Range became a Refuge in name and in function, and clause 1002 of ANILCA set aside 1.55

million acres in the coastal area in order to assess the oil and gas potential.

Leblond (1982: 12) notes that Canadian and U.S. wildlife officials met in order to discuss the creation of a similar range in northern Yukon. The Department of Northern Affairs and Natural Resources submitted this initiative to the Yukon Territorial Council which in turn rejected it due to the Council's concerns over provincial status. Despite internal planning and research the Department of Northern Affairs and Natural Resources discarded the project. (Leblond, 1982: 12)

The discovery at Prudhoe Bay precipitated concern for the PCH and its habitat and subsequently renewed interest in creating a protected area in northern Yukon. The creation of the Arctic International Wildlife Range through the establishment of a Canadian park in the northern Yukon was proposed at the Arctic International Wildlife Conference (1970) (Collins, 1970: 8-11). In 1972 the IUCN passed a resolution endorsing the proposal for an international Porcupine

caribou range. (Leblond, 1982: 13) A subsequent federal initiative, during 1973, to withdraw a portion of the northern Yukon was abandoned after pressure from the Yukon's Commissioner, mining interests, and land claims, which caused the Minister of DIAND to freeze all land dispositions (Thompson referenced in Leblond, 1982: 13)

In his final report Justice Berger proposed the creation of a wilderness park north of the Porcupine River in order to protect the habitat of the PCH, and to "mirror" the 9 million acre ANWR (Range). (Berger, 1977: vol.1 30 - 31)

Until the creation of the Northern Yukon National Park (NYNP) in 1984 (under the enactment of the Inuvialuit Final Agreement - 1984), variations similar to the original Arctic International Wildlife Range (AIWR) were proposed by various federal departments and the Inuvialuit (Livingston, 1986: 6). The distinguishing feature between the earlier proposals and the NYNP is size. The NYNP is much smaller in area

than earlier proposals. The NYNP's southern boundary is the Babbage River as opposed to the Porcupine River (in the case of the AIWR), and the coastal boundary for NYNP extends just west of Kay Point while the proposed AIWR's boundary included the entire Yukon coast.

Although the creation of the NYNP is a milestone in the conservation history of Northern Canada it fell short of earlier proposals.

Although hydrocarbon activity permeates the North American Western Arctic large areas of land have been designated as either wildlife refuges, parks, and sanctuaries and are generally expected to be protected from industrial activity.¹ The habitat of the PCH is nearly covered by two adjacent protected areas and therefore a normal assumption would be that it would be protected by virtue of its existence inside these designated areas, the Northern Yukon National Park (NYNP), in the Yukon Territory, and the Arctic National Wildlife Refuge (ANWR) in the State of Alaska.

Yet, in the 1002 area dispute, there are two factors which threaten not only the anthropocentric notion that protected areas 'protect' the ecosystems inside these designated areas, but that the PCH and its habitat are at risk as well. Firstly, activities outside protected areas can and do have impacts on the environment inside these areas. An example would be the existence of a large industrial complex near a protected area.¹ In this case environmental degradation rarely restricts itself to the outer edge of the protected area boundary. Secondly, activities inside protected areas can cause damage as well. Overuse by tourists to permitted mineral leasing degrade and damage the environment to the point where the original purposes of protected area are violated and are effectively lost. The '1002 area' dispute has

¹ The Cabin Creek dispute between British Colombia (B.C.) and Montana is one example of this kind of conflict. The coal mine development proposal at Cabin Creek, B.C. has caused concern in Montana for the Flathead River (a river designated a National Wild and Scenic River). See generally Carroll (1983: 162-172)

both elements. Moreover, the PCH and its habitat exist in a frontier region (international boundary region) and therefore become transboundary international natural resources.

Summary:

While environmental and regulatory reviews reject onshore hydrocarbon activities in the Yukon north slope based, partly on the expected negative impacts on the PCH and its calving areas in the 1002 area, offshore hydrocarbon activity in the Canadian Beaufort Sea continues; the latter occurring without specific regard to the transportation requirements if production occurs. Generally, hydrocarbon activity in the Canadian Western Arctic remains at the exploration phase. As the inventory of hydrocarbon reserves increases (albeit slowly) the critical questions concerning the necessary transportation infrastructure will become increasingly important.

In the Alaska North Slope (ANS) the situation is entirely different. A developed industrial hydrocarbon

system is in place and government and industry interest remain high as evidenced by the amount of earnings derived by the Federal and State governments, industry interest in obtaining leases, and the importance of hydrocarbon activities to the economy of Alaska. Seventy percent of the Alaskan economy is based on hydrocarbon activities. (Dryzek, 1983, 2-3)

Clearly, the impulse and momentum for hydrocarbon development is strongest in the ANS. Yet, tentative proposals on the Canadian side indicate industry willingness to promote initiative after initiative. Transboundary environmental concerns on both sides of the border are based on actual or proposed onshore and offshore hydrocarbon activities. Coincident with these hydrocarbon activities is the existence of wilderness and park areas that are adjacent to one another along the Yukon-Alaska border. That industrial activities of the nature of hydrocarbon development should occur adjacent to, and in the case of the 1002 area inside protected areas, raises broad questions on the coherence

of hydrocarbon and protected areas policies in both Canada and the U.S., once again creating transboundary environmental concerns.

CHAPTER THREE

THE RECOMMENDATIONS BEFORE CONGRESS

In April 1987 the Secretary of the U.S. Department of the Interior (USDOI), Donald P. Hodel, submitted to the U.S. Congress a set of recommendations and a two volume report entitled Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment: Report and Final Recommendation to the Congress of the United States and Final Legislative Environmental Impact Statement¹ (hereinafter referred to as the Report). This report, required under the Alaska National Interest Lands Conservation Act (ANILCA)², instructed

¹ Hereinafter called the Report. See Clough, N. K., Patten, P. C., and Christiansen, A. C., editors, 1987, Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment: Report and Final Recommendation to the Congress of the United States and Final Legislative Environmental Impact Statement, Washington, D. C., U.S. Fish and Wildlife Service, U. S. Geological Survey, and Bureau of Land Management, volume 1 (Report) 208 pages, volume 2 (Appendix-- Public comments and responses) 998 pages.

² Alaska National Interest Lands Conservation Act (ANILCA) Public Law 96-487.

the Secretary of the Interior to complete a legislative environmental impact statement and report to Congress on, *inter alia*, the potential options for oil and gas exploration and eventual development in the 1.5 million acre coastal plain of the Arctic National Wildlife Refuge (ANWR).¹ Section 1002(i) of ANILCA specifically withdrew all of the land referred to as the '1002 area' while section 1003 prohibits any hydrocarbon activities until Congress enacts legislation permitting it. The Secretary recommended the following to Congress:

"Based on the analyses conducted, public comment on the draft report, the national need for domestic sources of oil and gas, and the Nation's ability to develop such resources in an environmentally sensitive manner as demonstrated by two decades of success at Prudhoe Bay and elsewhere, I have selected as my preferred alternative, making available for consideration the

¹ In this thesis the "coastal plain" of the Arctic National Wildlife Refuge is defined as the area designated under section 1002 of ANILCA - hence the term "1002 area" (commonly pronounced "10-0-2").

entire Arctic Refuge coastal plain for oil and gas leasing." (Clough et al , 1987: 1)

The Secretary recommended to Congress that it enact the necessary legislation that would allow the United States Department of Interior (US DOI) to :

"...conduct an orderly oil and gas leasing program for the 1002 area at such pace and in such circumstances as he determines will avoid unnecessary adverse effect on the environment" (Clough et al , 1987: vii)

The Secretary considered five alternatives:

Alternative A: full leasing

Alternative B: limited leasing

Alternative C: further exploration

Alternative D: no action

Alternative E: wilderness designation.

Clough et al , 1987: 97).

The Secretary recommended Alternative A, the full leasing option. He justified this choice by stating the following:

"The 1002 area is the Nation's best single opportunity to increase significantly domestic oil production. It is rated by geologists as the most outstanding

petroleum exploration target in the onshore United States. Data from nearby wells in the Prudhoe Bay area and in the Canadian Beaufort Sea and Mackenzie Delta, combined with promising seismic data gathered on the 1002 area, indicate extensions of producing trends and other geologic conditions exceptionally favorable for discovery of one or more supergiant fields (larger than 500 million barrels).

There is a 19 percent chance that economically recoverable oil occurs on the 1002 area. The average of all estimates of conditional economically recoverable oil resources (the "mean") is 3.2 billion barrels. Based on this estimate, 1002 area production by the year 2005 could provide 4 percent of total US demand; provide 8 percent of U.S. production (about 660,000 barrels/day); and reduce imports by nearly 9 percent. This production could provide net national economic benefits of \$79.4 billion, including Federal revenues of \$38.0 billion. (Clough et al , 1987: 1)

The Secretary's decision to recommend a full leasing alternative is but one proposal in the history of industrial development in the North American arctic that affect the fate and the future of the coastal plain, the Arctic Refuge, and the North American

Western Arctic and Beaufort Sea region, and of particular interest here the range of the Porcupine caribou herd and Canada-US transboundary environmental relations in the arctic.

It is the spatial concentration of industrial development proposals and conservation initiatives (or counter proposals), and industrial installations and conservation areas that has created many situations of 'industrial development versus conservation' conflicts within the Canadian western arctic and American northeastern arctic and in some cases, such as the one under study here, between the two nation-states.

Alternative A: full leasing:

The 'full leasing' alternative would allow the US DOI to lease all U.S. Federal land (subsurface ownership) in the 1002 area. In addition to permitting oil and gas development in the 1002 the Secretary also recommended that Congress enact the necessary legislation to permit hydrocarbon development on lands owned by the Kaktovik Inupiat Corporation (KIC)/Arctic

Slope Regional Corporation (ASRC) (Clough et al , 1987: 189). Under ANILCA the KIC/ASRC can acquire the subsurface ownership to the land it owns the surface rights to if Congress first permits hydrocarbon activity in the 1002 area. In 1983 an agreement was concluded, entitled the Chandler Lake Agreement, between the ASRC and the US DOI allowing the Corporation to conduct limited hydrocarbon exploration. As a result of this agreement the ASRC leased land to the Chevron Corporation for exploratory drilling. In 1988 the American Association of Petroleum Geologists named Chevron Corporation's KIC Jago River wildcat the 'Well of the Year'. (Shirley, 1988: 6-7) Since this exploratory well is the only one ever sunk on the onshore area of ANWR the importance of the data collected is critical given the current situation. Chevron has consistently reserved the right to withhold reporting its findings to the US DOI and the public.¹

¹ The Chevron-KIC well is considered a 'tight well' since Chevron refuses to disclose its data (Shirley, 1986).

By recommending the above, the Secretary has created a situation in which the entire 1002 area and the adjacent KIC/ASRC lands open to hydrocarbon development.

Full Leasing Assumptions:

The Secretary lists the following assumptions for full leasing in the Report to Congress:

- "i. Although both oil and gas will be leased, initially only oil will be developed and transported to market. Associated gas will be reinjected and/or used for field operations in a manner similar to other North Slope fields, until gas production becomes economical and adequate markets are identified.
- ii. Development would be sequential in the area, and oil production will start about the year 2000.
- iii. Development will be unitized within the 1002 area and on privately owned subsurface resources.

Figure 3. Full leasing scenario under Alternative A
(Source: Clough et al, 1987: 98)

- iv. A single trunk oil pipeline will transport oil from Federal leases and from any private lands in the 1002 area to Pump Station 1 of the Trans-Alaska Pipeline System (TAPS).
- v. Development, production, and transportation of oil from the 1002 area are considered to be independent of any offshore production; however, production infrastructure could be shared.
- vi. The State of Alaska will allow a trunk oil pipeline to cross the State lands between the western boundary of the 1002 area and TAPS Pump Station 1 at Prudhoe Bay (a distance of about 50 miles).
- vii. Once the Congress approves leasing, but prior to lease sales, industry will be allowed to conduct additional geophysical and surface geological exploration work." (Clough et al, 1987: 97)

Alternative B: limited leasing

Under this alternative no lands in the 1002 area that constitute the 'concentrated' calving area would be available for leasing. According to the Report:

"The exact size of this area would be equal to the area used for concentrated calving in approximately 50 percent of the of the years

for which calving data are available, at the time legislation passed." (Clough et al , 1987: 100)

This alternative uses the same assumptions as the full leasing alternative including leasing activities on KIC/ASRC lands. It is estimated that 2.4 billion barrels of oil are available under this alternative.¹ According to the Report no leasing would be permitted in the southeastern part of the 1002 area.

Alternative C: further exploration:

This alternative would permit further exploration and exploratory drilling in the 1002 area by the US DOI and industry. Under ANILCA exploratory drilling is expressly prohibited until permission, via legislation, from Congress is granted. Current data was obtained from seismic surveys collected over two winter field seasons by private industry and surveys conducted by the Bureau of Land Management and the Geological Survey. (Clough et al, 1987: 101)

¹ This is 800 million barrels less than the estimate for full leasing.

The Report describes the 1002 area as a "very complex geological terrane". Given the restriction prohibiting exploratory drilling in the 1002 area until Congressional action the Report understates the uncertainty on the existence of economically recoverable reserves of oil:

"The location and size of geologic structures have been generally defined. However, the nature of the rocks present remains virtually unknown owing to a lack of deep stratigraphic, paleontological, and geochemical data specific to the 1002 area. Therefore, only indirect inferences based on surface and near-surface geological data and on well data from outside the 1002 area can be made as to the nature of source and reservoir rocks and the type of hydrocarbon present. A program to drill off-structure test wells would provide subsurface geological information on the 1002 area and eliminate some of the uncertainties in the oil and gas assessment such as the probability of the occurrence of adequate source and reservoir rocks, also the probable mix of hydrocarbons." (Clough et al , 1987: 101).

Under full or limited leasing the first step private industry will likely take would be to conduct

further seismic surveys and commence exploratory drilling.

Alternative D: no action:

This alternative would permit the 1002 lands to be added to the Arctic National Refuge under Section 304(g) of ANILCA and requires no act of Congress; all other alternatives considered by the Secretary require an act of Congress. This alternative would require that all activities be regulated under existing Federal and North Slope statutes and regulations. The Secretary's own assessment of this alternative recognizes that by virtue of sections 1002 and 1003 of ANILCA hydrocarbon activity would not be permissible in the 1002 area.

✱

Under section 304(g) all of the 16 Refuges in Alaska are assessed by the Arctic Refuge comprehensive conservation plan (CCP). The CCP has been implemented through the environmental impact assessment (EIS) process by the US Fish and Wildlife Service. The

recommendations in the EIS would form the planning guidelines. Section 304(g) requires that the plan accomplish the following:

"(1) designate areas within the refuge according to their respective resources and values;

(2) specify the programs proposed for conserving fish and wildlife and maintaining the values for which the refuge was established;

(3) specify uses which may be compatible with the major purposes of the refuge" (Clough et al , 1987: 102).

Alternative E: wilderness designation:

The 'wilderness designation' alternative would require an act of Congress that would be consistent with the Wilderness Act¹ (Clough et al , 1987: 103).
Wilderness designation for the 1002 area and the entire

¹ Wilderness Act (1964) Public Law 88-577.

Refuge were among the key elements debated in Congress prior to the enactment of ANILCA. While the House of Representatives favoured wilderness designation the Senate proposed further assessment; section 1002 of ANILCA resulted from this debate (Eastin, 1984).

As stated in chapter one the comments and observations made in the Report on the likely impacts to the PCH and the habitat are at odds with the Secretary's recommendations to Congress. There is a strong contradiction between the recommendations and the findings in the Report given the following acknowledgement:

"The only potential "major" effects are attendant to oil production and are limited to the Porcupine caribou herd and the reintroduced muskox herd. "Major biological effects," for purposes of the analysis, were defined as: "widespread, long-term change in habitat availability or quality which would likely modify natural abundance or distribution of species. Modification will

persist at least as long as modifying influences exist" (Clough et. al., 1987: 187).

CHAPTER FOUR

THE PORCUPINE CARIBOU HERD AND THE 1002 AREA IMPACTS

The Porcupine Caribou Herd (PCH) is one of the largest caribou herds in existence and the sixth largest in North America (Whitten, 1987: 21; Jakimchuk, 1978: 3).¹ The PCH is a transboundary international natural resource, since its habitat covers approximately 250,000 km² in northern Yukon, parts of the Northwest Territories, and northwestern Alaska (Mair and Cowan, 1978). This point has been reiterated since the 1920's in several landmark environmental reviews of hydrocarbon development proposals since the mid 1970's (Berger, 1977) The most recent U.S. policy affirmation of the PCH as an international resource is stated in the Secretary

¹ The authors of the Secretary's Report are Clough N.K, Patton P.C., and Christiansen, A.C. (eds.), 1967, Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment: Report and Recommendation to the Congress of the United States and Final Legislative Environmental Impact Statement. United States Department of Interior, U.S. Fish and Wildlife Service, U.S. Geological Service, volume 1, 208 p.; volume 2, 998 p.

of Interior's Report to Congress (Clough et al, 1987: 21).

This chapter discusses the PCH's range, migratory routes, population characteristics, and the likely impact on the herd from the proposed full leasing alternative in the 1002 area of the Arctic National Wildlife Refuge (ANWR). The so-called 1002 area is located within the PCH's range and coincides with the area that is widely recognized as the PCH's historic calving grounds.

The PCH as a herd:

The accepted definition of a caribou herd is a group of animals that calves in a traditional area different from areas used by other groups (Thomas, 1969). Following this definition the group of caribou found in northern Yukon, portions of the Northwest Territories and northwestern Alaska that calves in the arctic coastal plain between the Blow River in the Yukon to the Canning River in Alaska constitutes a herd--the Porcupine caribou herd (PCH).

The most recent photocensus indicated that the PCH numbered 135,000 animals in 1983 (Whitten, 1987).

Urquart (1986: 68) characterizes the population size variations of the herd as "stable since 1972 or increased slightly".

Life cycle, ranges and migratory routes:

The annual cycle of the PCH can be divided into seven phases (Skoog, 1968; Calef, 1974):

- 1) winter ranges
- 2) spring migration;
- 3) calving;
- 4) post-calving;
- 5) late summer dispersal;
- 6) fall migration;
- 7) rut.

Winter Ranges:

The winter ranges of the PCH have remained relatively constant since at least 1828 (Leblond, 1982, 42). Caribou biologists have found two distinct winter ranges.

One winter range consists of approximately 80,000 square kilometers in the Ogilvie - Peel River region in Canada (Jakimchuk, 1979: 57). The second winter range extends "over 25,000 square kilometers in northeastern Alaska, including most of the Chandalar River drainage, the mid and upper reaches of the Skeenjek River drainage, the upper Christian River and portions of the Dall, Hodzana and Hadweenzic river headwaters" (Jakimchuk, 1979: 57). Approximately ninety percent of the herd winters in the Ogilvie-Peel region. According to Surrendi and Debock, the amount of snow cover determines caribou use within a given area and

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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

contributes to the annual variability of the winter ranges (Surrendi and Debock, 1976; 25-33).

Spring migration:

Spring migration normally begins with small groups of animals moving northward in mid-March (Leblond, 1982: 35). The collecting together of large groups of caribou, numbering in the thousands, does not occur until late March or early April (Roseneau and Curatolo, 1976). Snow, weather conditions, so-called "favourable geographic and physiographic features", and the stimulus of advanced pregnancy of the adult females have been suggested as possible determinants in initiating migration (Surrendi and DeBock, 1976: 27; Garner and Reynolds, 1984: 17-21).

Three spring migration routes have been observed (Jakimchuk and McCourt, 1975; Jakimchuk, 1980).

- 1- the Richardson route;
- 2- the Old Crow route;

3- the Brooks range route.

The Richardson route follows the axis of the Richardson Mountains and is travelled by animals that have used winter ranges in the Richardson Mountains and Peel River Basin in the Yukon and the Northwest Territories. From the Trevor Range-Bonnet Plume area, and the Wind, Snake, and Arctic Red Rivers, caribou cross the Peel River up the east slope of the Richardson Mountains. Some groups move west across the mountains and follow the west slope. The groups mass at the Fish Creek-Rapid Creek-Blow River area and continue northwest along the Barn and British Mountains to the Alaska-Yukon border (Calef, 1974; Roseneau and Curatolo, 1976; R.D. Jakimchuk et al., 1974).

The Old Crow route is travelled by Caribou wintering in the Ogilvie Mountains and central Yukon areas. Both groups join near the western edge of the Barn Mountains and move to the Firth River (Roseneau and Curatolo, 1976).

According to Kevan, the migration patterns of the PCH have been consistent since 1950.¹ Archaeological records support this observation with evidence that suggests northern Yukon natives have hunted Caribou at traditional crossing points for at least 27,000 to 30,000 years (Morlan, 1978: 78-95). Evidence from archaeological sites near Old Crow suggest that a subsistence economy centered on the interception of caribou during the fall and spring migrations existed 1,500 years ago (Clough et al, 1987, 40).

Calving:

Calving occurs on the coastal plains and in the foothills up to 1,100 meters above sea-level. Calving grounds extend from the Blow River in the Yukon to the Canning River in Alaska, and from the arctic coast south to the Brooks Mountains and Old Crow Flats. (Roseneau, Curatolo and G. Moore, 1975: chapter 3) Annual calving

¹ Unpublished report by P.G. Kevan "The caribou of the northern Yukon Territory: a history of man's interest in them with special reference to wildlife biology" Canadian Wildlife Service, 1970, quoted in Leblond, 1981; 39.

Figure 5. Selected yearly concentrated and total calving areas for the PCH (source: Clough et al, 1987: 23)

grounds vary depending on the chronology of migration and use of wintering areas. It has been observed that the earlier a migration takes place the more likely calving will occur further west along the Alaskan Beaufort Sea coast (Surrendi and DeBock, 1976: 40-41); therefore, the more likely it will occur in the 1002 Area. Habitats of wet sedge meadows to dry ridges are used, with preference for dry uplands.

Cows arrive on the calving grounds in late May. Calving usually occurs between 31 May and 15 June, and can vary by up to ten days (Calef, 1974; Roseneau, Curatolo and G. Moore, 1975). Most of the calving occurs within a 3 week period. (Clough et al, 1987, 25) Peak calving occurs between June 4 and 8. Recent studies estimate the percentage of parturient¹ cow use of the entire 1002 Area ranges between 38 and 82 percent (Clough et al. 1986: 28). In the Report to Congress Clough et al. describe caribou calves as:

¹ Parturient means those females ready to calve.

"...precocious, able to stand and nurse within 1 hour following birth. They are capable of travel with adults within a week. The first 24 hours of life is critical, when a behavioral bond is formed between the calf and its mother." (Clough et al, 1987: 25).

The following sentence appeared after the last above quoted sentence in the Draft Report, but was deleted in the Final Report:

"Disturbance of cow-calf groups on the calving grounds may interfere with bond formation and can increase calf mortality." (Clough et al, 1987: 29)

Post Calving:

In the post-calving period cows and calves initially form small groups which eventually join the rest of the herd in concentrations of between 25,000 and 80,000 caribou (Roseneau and Curatolo, 1976; Clough et al, 1987: 25). By early July, the group which calved in Alaska begins to re-enter the Yukon and joins the Yukon segment on their way eastward. The majority cross the Malcolm River, sometimes pausing to congregate on the Firth River. They continue their movement in loosely

aggregated groups through the foothills of the Barn and British Mountains, then southeast to the Richardson Mountains (Surrendi and Debock, 1976; Roseneau, Curatolo and Moore, 1975).

Late Summer Dispersal:

By early August the concentrations disperse rapidly westwards from the Driftwood River area, crossing the Old Crow Flats and Alaska-Yukon boundary, reaching the Arctic Village-Sheenjkjek River area by mid to late August. The east fork of the Chandalar River appears to form the western boundary of their dispersal (Surrendi and Debock, 1976; Calef, 1974).

Fall Migration:

Fall migration begins with small groups drifting southeastwards back towards Old Crow Flats in early September. By late September larger groups begin to move more rapidly to the Yukon. Most groups cross at the confluence of the Driftwood and Porcupine rivers and

the Alaska-Yukon boundary. One group, numbering up to 40,000+ animals, moves south through the Nahoni Range and Ogilvie Mountains towards the Ogilvie and Tatonduk winter ranges. Another group crosses the Coleen river east through the Barns and British Mountains towards Eagle Plains and Richardson Mountains ranges. A third group, numbering 10,000 to 15,000 animals, travels southwest into the Chandalar drainage area to winter (Surrendi and Debock, 1976; Roseneau, Curatolo and G. Moore, 1975).

Rut:

Rut takes place during the fall migration in October and therefore is not associated with any area in particular due to the variability of the fall migration (Calef, 1974: 106).

Full leasing in the 1002 area and the Porcupine Caribou

Herd:

The impact to the PCH from hydrocarbon development activity in the 1002 Lands is itself a point of

contention between industry, U.S. Federal and State government interests and interests opposed to development. The following section reviews the comments and conclusions of two published reports on the potential impact to the PCH from the proposed full leasing hydrocarbon activity in the 1002 area: the Secretary of the Interior's own report and a report of a caribou impact analysis workshop that addressed the impact to the PCH from hydrocarbon activity in the 1002 area exclusively. Extensive research on caribou and the PCH exists. The above reports both synthesize and review the existing literature up to 1986, particularly the Secretary's Report, and reflect the professional opinion, notably the caribou impact analysis workshop, of caribou biologists.

In his report the Secretary of the Interior commented on the likely impacts to the herd from the preferred alternative (Alternative A - full leasing).

The Secretary describes two types of impacts: exploration and development impacts. Exploration

impacts are described as nil since most exploration activity would be confined to the winter months when the PCH is absent in the 1002 area and negligible from "summer scattered surface geology exploration" (Clough et al, 1987: 118).

Development impacts from a full leasing alternative are described as "direct habitat modification, displacement, obstructions to movements which would reduce access to important habitats, and disturbance and harassment" and that "calving and insect relief were considered important functions which could be disrupted by activity in the 1002 area" (Clough et al, 1987: 118-119).

Habitat modification, under the full leasing alternative, is expected to directly and indirectly affect an estimated 5,650 and 7,000 acres respectively in the 1002 area resulting in the loss of "calving, insect-relief, foraging, and predator-avoidance habitats". (Clough et al, 1987: 119)

The likelihood of displacement and other disturbances is acknowledged in the Secretary's Report. Oil activity related displacement from calving grounds in the 1002 area is expected. If oil related activities occur it will be the first time any significant year-round industrial activity takes place in the 1002 area. According to the Report twenty seven percent of the PCH core calving grounds, based on a sixteen year average, are located inside the 1002 area (Clough et al, 1987: 118).¹ Displacement of parturient and postpartum females and calves from calving grounds is best understood relative to the importance accorded to these areas by caribou biologists:

"The possible consequences of displacing female caribou from preferred calving areas have been the subject of considerable debate and speculation. Although there is no precedent involving industrial activity on calving grounds, various concerns regarding increased neonatal mortality have a firm basis

¹ This estimate is based on a sixteen year (1972-86) average of the annual concentrated calving areas. Little data exists prior to 1972 on the extent of the calving range of the PCH.

in evolutionary theory. From a natural selection point of view, it is illogical that female caribou in relatively poor condition would undertake early spring migration to such areas if no net advantage were to be realized. Early snow melt, advanced emergence of new vegetation, scarcity of predators, and/or proximity to insect relief habitat have been cited as advantages related to the selection and repeated use of specific calving areas (Lent, 1964, 1966b; Kelsall, 1968; Skoog, 1968). The calving grounds of all four arctic herds are each characterized by at least two of these attributes.

Under some circumstances, the calving environment may be crucial to calf production and/or subsequent survival. Thus, if caribou attain maximum fat stores by fall and encounter ideal winter conditions, use of suboptimal calving habitat may be little more than an inconvenience. However, given nutrient deficiencies in summer or during a winter of heavy snowfall, surviving female *Rangifer* enter the spring season in poor condition (Cameron and Luick, 1972; Dauphiné, 1976), yet are faced with the stresses of late pregnancy, parturition, and lactation. Loss of access to favorable calving areas might then be catastrophic to calving caribou, their offspring (Miller, 1974a), and, ultimately, to the herd itself. Displacement to an area of abundant predators would have more direct, and severe, consequences. Considering the fundamental importance of the calving process

itself and the distinctive physical characteristics of traditional calving grounds, free access of parturient caribou to these areas should be maintained to the greatest extent possible" (Dau and Cameron, 1986: 95-96)

The Report describes the Central Arctic Herd (CAH) and its reaction to the construction and operation of the Milne Point oil field road through a CAH concentrated calving area. Biologists observed a significant decrease in habitat use, not total avoidance, within three kilometers on each side of the road. The term used in the Report to describe the area of impact is the "3-Km sphere of influence" (Clough et al, 1987: 120). The study spanned six years; four years pre-construction and two years post-construction. They observed the following:

- a reduction in the number of adults (particularly maternal females) and calves within a 3 kilometers zone around the road in the post-construction period;

- an increase in the expected number of calves and adults in the 3-6 kilometers area on either side of the road (therefore an increase in density);
- a fifty percent decrease in habitat use in the 3 kilometer area in the post-construction period by caribou (mostly maternal cows and calves) compared to the pre-construction period (Clough et al, 1987: 120).

Using the 3-Km sphere of influence concept observed in the CAH-Milne Point case study and assumptions under the full leasing alternative, a total of 303,000 acres of core calving habitat inside the 1002 area could to affected, i.e., thirty seven percent of the total core calving area inside the 1002 area (Clough et al, 1987: 120). While noting that total avoidance is unlikely, the Report failed to explain the impacts to the surrounding habitat and the caribou given displacement of caribou (cows and calves) to the 3-6 Km zone. Given the above predicted alteration of caribou calving area in the 1002 area the authors of the Report note:

"...that the Milne Point field is the smallest development area on the North Slope. Activity levels were low (fewer than 10 vehicle trips per day) and there was one active drill rig during 2 of the 4 years of post-construction study. Under full leasing, most roads in the 1002 area would be expected to have much greater traffic. There would be more drill rigs and other facilities in many areas. Thus, predicted results in the 1002 area, using the Milne Point study as a basis, are likely to be conservative" (Clough et al, 1987: 120)

The Report addressed the question of comparability between the observed CAH-Prudhoe Bay complex experience and the expected impacts to the PCH from 1002 area development. Perhaps the most striking observation is the increase in population of the CAH since 1978; estimated at 6000 in 1978 it increased to 15,000 members in 1985 (Shideler, 1986 referenced in Clough et al, 1987: 121). The authors of the Report refer to sources that claim that the Prudhoe Bay complex area was never, since observations have been recorded, a CAH concentrated calving area. (Shideler, 1986 referenced in Clough et al, 1987: 121). Further, they refer to studies that state calving was absent in the coastal

areas near Prudhoe Bay due, reportedly, to hydrocarbon activity (Whitten and Cameron, 1985). The same authors (Whitten and Cameron) described the conditions that contributed to the CAH population increase since development and displacement occurred as:

"(1) suitable alternative high-quality habitat appears available; (2) the CAH has been displaced from only a part of its calving grounds to areas already used for calving; and (3) overall density of CAH caribou on their calving grounds (even after displacement) is much lower than the density of other Alaskan Arctic herds." (Clough et al, 1987: 121)

The Report described several factors that suggest CAH population increase and productivity are attributable to low calving density in current calving areas, displacement (some would argue that displacement was minimal to begin with) into favorable habitats, and exposure to low predation due to a reduction in the wolf population in the area from illegal hunting (Clough et al, 1987: 121).

Insect relief is another important element of the calving habitat in the 1002 area. Insect harassment due

to peak activity and abundance of mosquitoes, skin warbles, and nasal bot flies coincide geographically and chronologically with the availability of high quality forage and with the postcalving caribou's need to forage in order to satisfy the immediate demands of nursing females, and energy requirements for winter survival. High quality forage exists inland from the coast. PCH postcalving aggregations (at times numbering 80,000 as opposed to 1,000 in the CAH) normally move towards the coast for insect-relief. Of importance is the possible impact an oil field-pipeline complex would have on PCH postcalving aggregations seeking insect-relief. The Report notes that:

"If caribou are delayed or prevented from free access to insect-relief habitat, the result may be deterioration in body condition with consequences of decreased growth, increased winter mortality, and lowered herd productivity (Dau, 1986)

Reduced access to important insect-relief, forage, and predator-avoidance habitats could result from development in the 1002 area. Postcalving aggregations could be inhibited from moving between inland feeding areas and coastal or mountainous insect-relief habitats

within and to the south of the 1002 area as a result of development.

Several investigators have described inhibited passage of caribou through developed areas due to linear oil-development facilities and associated activities (Curatolo and others, 1982; Smith and Cameron, 1985a, b; Klein, 1980). This is of concern in the 1002 area because the probable main pipeline/haul road route would bisect the area, rather than run parallel to caribou movements as it does in the Prudhoe Bay development. The probability of avoidance, though unknown, is anticipated to be low for bachelor bulls and high for maternal cows and calves (Elison and Others, 1986)" (Clough et al, 1987: 122).

Given the nature of the likely development scenario under Alternative A on the 1002 area, notably east-west pipeline structures and oil related facilities interspersed throughout, postcalving aggregate groups could experience significant exclusion from the coast.¹ Estimates of reduction in the use of insect-relief habitat north of the proposed 1002 development area

¹ This suggestion is made in the Report and referenced to Smith and Cameron (1985) "Reactions of large groups of caribou to a pipeline corridor on the Arctic coastal plain" in Arctic, vol. 38, no. 1, p. 53-57.

range from eighteen to fifty two percent (approximately eighty percent of the total coastal area). Displacement of postcalving aggregations could result in migration to less favourable insect-relief areas, notably the foothills to the south, and exposure to increased predation (Clough et al, 1987: 123).

The Report concludes that even with the proposed array of mitigative measures "[m]ajor effects on the PCH could result if the entire area were leased and all oil prospects contained economically recoverable oil." and "...if significant adverse effects coincide with a population low in natural fluctuations, their effects would be greater than at a population high" (Clough et al, 1987: 123).

The Secretary concludes that:

"Reductions in calving habitat values, reduced access to insect-relief areas, obstacles to free movement required for foraging and predator avoidance, increased energy expenditure as a result of disturbance, higher levels of stress, and other factors could cumulatively affect caribou physiology.

A change in distribution of the PCH could reasonably be expected. The potential for occurrence of a population decline resulting from loss of habitat and reduction in habitat values cannot be predicted nor the size of the decline estimated. Nevertheless, there is a risk that a decline could occur. However, no appreciable population decline is expected as a result of oil development" (Clough et al, 1987: 123).

Given the above review of Secretary's position on the likely impacts to the PCH the last sentence seems arbitrary relative to the overall impression left by the preceding observations and statements. Since there is no significant hydrocarbon activity in any part of the PCH's range the predictions offered in the Report are based on the judgements of experts who themselves cannot predict with absolute certainty; the latter is acknowledged in the text of the Report. Hence, the last quoted statement and the Secretary's full leasing recommendation are at odds with the observations and views stated throughout the Report itself.

The caribou impact analysis workshop¹, held in 1985, preceded the release of the Secretary's 1002 area recommendation and Report. The scenario presented to the participants necessarily differed, although only slightly, from the Secretary's hypothesized full leasing scenario. Both presented a pipeline/haul road that bisected the 1002 area parallel to the coast across the Canning river westward to a location on the coast east of Anjun Point. Each scenario had a second pipeline/haul road descending southward from the east-west pipeline/haul. The workshop discussed and assessed the likely impacts to the PCH from 1002 area development.

The participants agreed that 1002 area development would negatively affect the PCH. They acknowledged that "the displacement from the historic core calving area is a major issue".(Elison et al, 1986: 9) Further, they

¹ G.W. Elison, Rappoport A., and Reid G.M., 19 Report of the caribou impact analysis workshop, Arctic National Wildlife Refuge, November 19-20, 1985, Fairbanks: U.S. Fish and Wildlife Service, 39 p.

noted that the sensitive calving period and calving area coincided with the likely location of hydrocarbon facilities. Displacement was linked to reduced caribou production citing the following factors:

- increased predation;
- less nutritious forage;
- later snow melt;
- related factors in the areas of displacement.

Displacement caused by disturbance was cited as another major concern. Factors associated with disturbance to the PCH included:

- hunting near development;
- traffic;
- general activity associated with petroleum development.

Elison et al, 1986: 10)

The participants did not quantitatively assess the impact displacement on the caribou and would not

speculate on the likely areas to which the PCH would be displaced. Eight points of consensus were reached at the workshop:

- 1- that there be a two-tier approach to impact evaluation; one set for animals that use the 1002 area and another for the entire population;
- 2- a 5-8 kilometers wide non-development zone adjacent to the coast in order to improve caribou insect-relief movements to and from the coastal area;
- 3- calving females and cow-calf aggregations segments of the PCH population are the most sensitive to industrial activity and the most likely to encounter it in the 1002 area;
- 4- based on experience in Canada and from TAPS restricted roads would become open;
- 5- the 1002 area would experience increased public use;
- 6- disturbance from surface traffic would be greater than air traffic;

- 7- accidental deaths to caribou would occur but should not significantly affect the population;
- 8- the cumulative effect of oil activity outside the 1002 area should complicate the assessment of 1002 area activity generally. (Rappoport et al, 1986: 18 and 20)

Summary:

Since no significant, large scale development has occurred in the PCH's calving habitat in the 1002 area, few predictions on the impact from development should be considered as completely accurate and definitive. However, the proposed full leasing alternative would lead to the bisecting of the core calving area of the PCH. The core calving area is widely acknowledged as a special and vital part of the PCH's range. Further, if oil related activities occur, they will likely displace and disturb calving females, cow-calf aggregations, and significantly inhibit insect-relief movements. Each of these components are important elements of caribou

behaviour and survival. As with most environmental disputes there is little agreement between opposing interests over the likely impact(s).

CHAPTER FIVE

POSITIONS OF THE FEDERAL GOVERNMENTS, THE NORTHERN GOVERNMENTS AND THE NATIVE ORGANIZATIONS

Since the enactment of ANILCA (1980) uncertainty has persisted over the fate of the area defined by clause 1002. The array of the possible future uses range from full hydrocarbon leasing activities to wilderness designation. Indeed, the uncertainty created under ANILCA may persist if Congress decides to postpone legislative action indefinitely. The current transboundary environmental dispute is a direct result of the legislative framework that instructed the US DOI to assess the 1002 area and which subsequently gave the Secretary of the Interior an opportunity to recommend a so-called preferred alternative to Congress: a full hydrocarbon leasing alternative that could lead to oil production in the coastal plain. It is the different positions taken on the 1002 area debate by the various levels of government and native organizations in both countries that has created the dispute. The focus is on

the differences between the Canadian and U.S. policy positions on the full leasing proposal for the 1002 area.

The following chapter describes the responses to the Draft Report and the Secretary's recommendation to Congress from the various governmental agencies (federal, state, and territorial), the Canadian and International Porcupine Caribou Management Boards, and native organizations (Corporations, Boroughs, Villages, and land claims groups). Since the US DOI was directed to produce a report on the resource potential and future management of the coastal plain under clause 1002 of ANILCA, responses from the principal governments and organization are contained in the Report. Subsequent hearings in the various congressional committees and subcommittees include near identical reiterations from the aforementioned governmental agencies (strictly U.S. agencies and governing bodies) and native organizations. As of December 31, 1990 the ANWR issue is stalled in the committees concerned with the 1002 area, therefore no bill has been debated and voted upon in Congress.

Policy positions contained in the Report:

The second volume of the Secretary's Report to Congress (entitled 'Appendix') contains policy statements by governments and affiliated agencies (federal, state/territorial, and local), and substantive remarks of organizations, industry and individuals in response to the publication of the Draft Report (1986) to Congress on the future on the 1002 area.

The Secretary received 11,361 written responses to the Draft Report between the November, 1986 and February, 1987 (the release date of the Draft Report and the closing date for the submission of comments on the Draft Report respectively). The final Report, the two volume report submitted to Congress by the Secretary, was made public in April, 1987. According to the Secretary's own analysis of the submissions not included in volume two of the Report, forty-six responses did not state any clear position on hydrocarbon leasing in ANWR, "7,491 favored leasing and 3,707 favored wilderness designation"; a full sixty-six percent of the respondents favored leasing in

the 1002 area (Report, volume two, 1987; 1). The overwhelming majority of responses, 10,423, were from private individuals.¹ Responses were received from all fifty states and Canada; as many as 1,718 and 1,256 from Alaska and Texas alone, as few as 20 from the District of Columbia, and six from Canada. This chapter focuses on the responses contained in the Report from the government agencies and native organizations in both countries directly concerned with the 1002 area conflict.

The Canadian responses:

The Canadian response to the Secretary's recommendation of Alternative A includes responses from the Government of Canada, the Northwest Territories and Yukon Territory governments, and the Council of Yukon Indians (CYI) to the Draft Report.² All of the above

¹ Volume two of the Secretary's Report, consisting of 1000-plus pages, contains 117 written comments from individuals, organizations, industry, and governing bodies.

² All four written submissions are included in the volume two of the Secretary's Report.

entities responded negatively to the Draft Report and the Secretary's full leasing (Alternative A) recommendation. Cooperation between these interests occurred primarily at the bureaucratic levels. Scientists from the Yukon Government and federal government collaborated on an in-depth review of the Draft Report which was subsequently provided to the Department of External Affairs (Jingfors, 1988). Both the Yukon Territorial Government and the Federal government included technical critiques of the Draft Reports in their respective responses.

The federal government, through the Department of External Affairs (EA), submitted the longest and most detailed Canadian governmental critique of the Draft Report and the Secretary's recommendation to Congress. The federal government explicitly states its preference for a wilderness designation (Alternative E) for the 1002 area based on an interpretation of the text of ANILCA: "to preserve for the benefit, use, education, and inspiration of present and future generations certain lands and waters in the State of Alaska that contain

nationally significant natural, scenic, historic, archaeological, geological, scientific, wilderness, cultural, recreational, and wildlife values...." (quoted in EA's submission to the Draft Report (See Government of Canada, 1987a: 2). Additionally, the federal government proposed a 'twinning' of ANWR and the NYNP in an unspecified manner in order to "mark the international and regional significance of the area..." (Government of Canada, 1987a: 2).

The main thrust of EA's submission centres on the threats to the shared wildlife species that use parts of the 1002 area and the native communities in Canada that rely on them, the uncertainties concerning the likely hydrocarbon resources in the 1002 area, the lack acknowledgement of the cumulative impacts from other development initiatives, and the failure of the U.S. government to consult with the Government of Canada, as specified under ANILCA, before the Draft Report was released to the public.

The federal government's submission states that the shared wildlife resources and their habitats (also shared) are "important resources which are shared by Canada and the United States. The draft EIS, however, does not address the fact that the most heavily affected species are shared resources. A significant reduction in shared wildlife migratory resources such as caribou, Lesser Snow Geese, Polar Bears, fish or marine mammals, occasioned by developments envisaged in the 1002 area, would entail unacceptable damage to Canada" (Government of Canada, 1987a: 2).

The Canadian federal government's concerns for the native communities is based primarily on their reliance on the PCH. The communities that will likely be affected by 1002 development are Dawson, Mayo, Old Crow, Fort McPherson, Arctic Red River, Aklavik, Inuvik, and Tuktoyaktuk. Accordingly, the federal submission reiterates a prediction contained in the Draft Report of a 'major' population decline and significant change in

the distribution (twenty to forty percent)¹ of the PCH in order to accent the concerns over the potential impact to the subsistence economies in each of these communities (Government of Canada, 1987a: 3). A further criticism of the Draft Report is the lack of recognition of the importance of the herd to Canadian subsistence users. Since subsistence harvesters in Canada account for eighty percent of the total subsistence harvest of the PCH, up to 5,000 caribou annually, any change to the population size and distribution of the PCH could lead to severe difficulty in the subsistence economies in each of the affected communities in Canada. In comparison, hunters from Kaktovik, the village closest to and north of the 1002 area, harvested 102 caribou in 1983-84 (Pedersen and Coffing, 1985: 21).

The federal submission also criticizes the Draft Report for the "optimistic assessment of the oil and gas

¹ This figure is taken from the Draft Report at page 112.

potential of the area" (Government of Canada, 1987a: 3).

The criticisms address the assumptions used to predict the hydrocarbon potential of the 1002 area. The primary critique focuses on the comparisons made with geology in the Prudhoe bay area:

"The primary reservoir unit at Prudhoe Bay has been assumed to underlie a portion of the area. Since a significant fraction of the oil potential is ascribed to this reservoir section, the risk of its absence is critical. Further, most of the potential in the unit is assumed to be contained in a few very large structures. However, the seismic data indicate that these features are internally structured, leading to a greater uncertainty in the identification of the key seismic reflectors and the possibility that each feature could consist in fact of smaller pools rather than one large feature. This observation of complex structuring also applies to other plays in the assessment. Finally, the pool size distribution predicts four large pools, each roughly one-third of the size of Prudhoe Bay. While the possibility of large pools in the range exist, the likelihood of several in this size is remote" (Government of Canada, 1987a: 3)

From the Government of Canada's perspective the Secretary's recommendation for Alternative A is based, in

part, on an overly optimistic prediction on the potential existence of large and recoverable hydrocarbon deposits underneath the 1002 area.

The final criticism made by the federal government concerned the lack of consultation with Canada. Under section 1005 of ANILCA the US DOI was mandated to consult with the Government of Canada in order to assess "such impacts particularly with respect to the Porcupine Caribou Herd" (Government of Canada, 1987a: 6). EA noted that no consultation conforming to the intent of ANILCA occurred before the release of the Draft Report.

The federal government's reaction to the final Report maintained its rejection of the full leasing alternative proposed by the Secretary (Government of Canada, 1987b). The position of the federal government, contained in a document entitled Comments by Canada, on the content of the Report include comments on the revisions made to the Draft Report; topics discussed include the revision of the core calving grounds concept, comparison with CAH, the hazing of Alternatives A and B,

and the continued downplaying of the cumulative effects of other hydrocarbon initiatives in the region (Government of Canada, 1987b). The position paper also includes a description of the treaty obligations the federal government expects the U.S. to honour. Four treaties are listed:

- the Migratory Bird Convention (1916);
- the Agreement on the Conservation of Polar Bears (1976);
- the North American Waterfowl Management Plan (1986);
- the Agreement on the Conservation of the Porcupine Caribou Herd (1987).

Each of the above treaties contains provisions that call for the protection of a species and its habitat in both countries. In the opinion of the federal government 1002 area leasing possible hydrocarbon development "could put the U.S. in violation of these four international accords" (Government of Canada, 1987b: 12).

The federal government concludes its assessment of the Report and secretary's recommendation to Congress by

addressing the subsistence use of transboundary wildlife resources:

"Canada is concerned with the expected effect of the 1002 development on the transboundary resources which will in turn impact the traditional harvest. In many instances there is no suitable alternative source of food. Page 140 of the Report refers to the reduced subsistence harvest that could result from development, but impacts of that loss are never assessed or discussed especially as they relate to Canada. Canada expects the United States will not take actions affecting the shared resources and in particular put in jeopardy the way of life of Canada's northern citizens" (Government of Canada, 1987b: 13)

The Yukon Territorial Government's (YTG) position on ANWR mirrors the federal governments position. The YTG calls for "increased and enhanced protection of 1002 lands" (YTG, 1987: 5). The YTG identifies three 'omissions': failure to address the transboundary impacts (on wildlife and the native communities that harvest them), failure to fully evaluate the cumulative effects of other development initiatives, and the lack of consultation.

The YTG describes as 'mildly ironic' the reversal between the current state of the regulatory and

conservation framework in northern Yukon, and the state of the regulatory and conservation framework in northwestern Alaska prior to and after 1984. Prior to 1984, under the provisions of ANILCA and an earlier law (1960), a large area of northwestern Alaska was set aside for conservation purposes. Indeed, the impetus to set aside this region in Alaska for conservation purposes dates back to the 1920s. In contrast, the adjacent region in the Yukon has only recently been designated a protected area (in 1984). In describing the current framework in the YTG acknowledges that "[s]uch protection was sorely lacking until 1984: we lagged behind the progressive steps taken by our government when you establish ANWR" (YTG, 1987: 5). The YTG continues its statement by noting the following:

"It will be indeed ironic if the historical circumstances are reversed as a result of this draft EIS, leaving Canada with a more complete system of protection for the international north slope resources" (YTG, 1987: 5-6)

The Government of the Northwest Territories' (GNWT) statement explicitly accepts and essentially restates the YTG's criticisms of the Draft Report (GNWT, 1987: 2). On the issue of the impact to the PCH the GNWT severely criticizes the Secretary's recommendation in view of the predicted population decline and change in distribution: "This is an intolerable figure based on the International Porcupine Caribou Management Agreement initialed in December 1986 by both the Government of the Northwest Territories and federal government of Canada, as well as as your Department" (GNWT, 1987: 2).

The statement by the Council for Yukon Indians (CYI), contained in the Report, is the first public statement regarding ANWR and the release of the Draft Report from any Canadian native organization. It contains the basic arguments against development in the 1002 area that have been forwarded by the CYI and other native interests since 1986.

The basic tenet of the CYI's opposition to 1002 area development stems from the importance of the

transboundary wildlife resources to the subsistence economy of northern natives. The importance of viable wildlife resources was stated clearly by CYI's representative:

"..our harvest of wildlife resources is an on-going, legitimate economic activity. Translated into hard cash - (if we must put a price tag on it) - the worth of the annual subsistence economy to the Yukon amounts to millions of dollars. While its social value cannot be put into monetary terms, our subsistence economy has remained central to the Yukon Indian way of life.

One of the key elements to the successful settlement of the Yukon Indian land claim is my people's guaranteed access to wildlife, both in terms of harvest and management rights. The governments of Canada and Yukon recognize this fact.

To the communities in the northern Yukon, but first and foremost to Old Crow, the survival of the 150,000 - strong Porcupine caribou herd is, of course, just as critical." (CYI, 1987: 3-4)

The CYI's position on the PCH is emphatic: "[f]or Old Crow in the northern Yukon, caribou is and has been, since thousands of years, my people's livelihood. For

Yukon Indians any disturbance to the Porcupine caribou is therefore unacceptable." (CYI, 1987: 9-10).

Since its creation the Porcupine Caribou Management Board (PCMB) in Canada, with a membership from the federal and territorial governments, the CYI, the Inuvialuit Game Council, the Déné Nation and the Métis Association of the NWT, has consistently maintained the position that the 1002 area should be designated wilderness (PCMB, 1987: 21). In 1988 the PCMB undertook an aggressive posture on the 1002 issue by funding the production of a video on the importance of the PCH to Canadian native users, and funding and coordinating delegations (made up of representatives from three native signatory groups to the PCMB) to Washington, D.C. in order to testify before Congress (PCMB, 1988: 22-24). Testifying on February 17, 1988 before the Senate Subcommittee on Environmental Protection the Inuvialuit Game Council member on the PCMB, Roy Moses, reiterated the same concerns voiced by the CYI submission in 1987. Moses stated that: "[f]or us the caribou provide food,

recreation, a cultural heritage and beyond all that an identification with our surroundings that is fulfilling beyond description" (Moses, 1988: 3).

The signing of the Agreement on the Conservation of the Porcupine Caribou Herd (1987) between Canada and the U.S. brought into existence a wildlife management board solely devoted to the PCH. Created after the Secretary's submission of the Report to Congress, although the negotiations leading to the agreement span a decade, the International Board did not submit an official statement on behalf of its members. As such its influence over the Secretary was nil. However the wording of the agreement suggests that the International Board would likely follow the lead of the PCMB (Canada) and native communities in Canada. Part 2a. of the Agreement states that the objectives of the two signatories are "[t]o conserve the Porcupine Caribou Herd and its habitat through international cooperation so that the risk of irreversible damage of long-term adverse effects as a result of use of caribou or their habitat is minimized"

(PCMB, 1988: 41). The influence of the International Board, and the rest of the Canadian interests, has yet to be seen.

The U.S. Positions:

The positions held by the various governmental agencies and native organizations in the U.S. differ from those held by their Canadian counterparts in two significant ways. Firstly, the lead agency with jurisdictional authority over the 1002 area, the U.S. DOI, favours a full leasing program. Secondly, there is no unanimity among the various interests on the 1002 area debate. Divisions within the U.S. Federal government and among native organizations range between pro and anti 1002 area development positions.

The position of the Secretary of the Interior on the 1002 area debate is contained in the two volume Report submitted to Congress and described earlier in this thesis. The Secretary's position is clear: full hydrocarbon leasing should take place in the 1002 area. Five other U.S. federal agencies submitted positions and

critiques of the Secretary's Report and recommendations to Congress. Both the U.S. Army Corps of Engineers (COE) and Minerals Management Service (MMS) agreed with Secretary's recommendation. Each agency generally accepted the contents of the Draft Report with some suggested changes to specific analyses and paragraphs (U.S. Army Corps of Engineers, 1987; and, Minerals Management Service 1987)

The Environmental Protection Agency (EPA), the Marine Mammals Commission (MMC), and the National Parks Service (NPS) each submitted reserved statements on the Draft Report.

The EPA was the only agency to explicitly reject Alternative A (indeed, the EPA rejected Alternative B). The EPA based its rejection of Alternative A on the grounds that several impacts were not fully discussed. Some of concerns raised by the EIA included:

- lack of acknowledgement of the cumulative impacts of the regional development initiative in state owned lands and the Beaufort Sea (U.S. and Canadian);

- lack of a complete analysis on the effect 1002 hydrocarbon leasing and development may have on communities which use the PCH; and,
- the lack of discussion on air quality (Environmental Protection Agency, 1987).

The NPS and the MMC provided concise critiques. The MMC focused on the marine concerns while the NPS stressed the importance of preliminary site selections for inclusion in the National Natural Landmarks system (National Park Service, 1987; and Marine Mammals Commission, 1987). The NPS and MMC did not explicitly reject or confirm the Secretary's recommendation to Congress. Rather, they suggested that major revisions be carried out on the Draft Report before the Secretary issued a final report.

The State of Alaska unequivocally supported the Secretary's recommendation to Congress. The statement from the Governor's office included the following concluding remarks:

"Recognizing the important renewable resources values found in ANWR, the state fully supports the opening of the coastal plain to oil and gas leasing subject to appropriate and effective mitigation based on our firm belief that exploration, development, and production can occur in a manner consistent with the established purposes of ANWR" (State of Alaska, 1987a: 9)

The Native Alaskan reactions to the Draft Report and Secretary's recommendation include statements from three villages, two inside ANWR and one on the coast, and the North Slope Borough (NSB). Unlike the Native Canadian position, Native Alaskan reactions are not unanimous.

The NSB and the Village of Kaktovik, the former an Inupiat dominated municipality and the latter an Inupiat village, favour hydrocarbon leasing in the 1002 area. Kaktovik favours Alternative B (the limited leasing alternative) and entirely rejects Alternative E (wilderness) in order to permit hydrocarbon development on its own lands immediately north of the 1002 area (Ahiers, 1987: 1-2). The Village's reluctance to endorse Alternative A is based on the proposed manner in

which leasing would occur. Alternative A does not include public participation in the leasing process. Further, the Village disputes the necessity of a 5 mile no hunting/no firearms discharge zone around development infrastructure for "local subsistence uses", and raises concerns over the lack of discussion in the Draft Report of the potential impacts to marine resources harvested by the residents of Kaktovik (Ahiers, 1987: 1). The NSB, the largest (geographically) native dominated municipality in the U.S., favours full hydrocarbon leasing in the 1002 area (Ahmaogak, 1987: 1). The NSB reiterated the Village of Kaktovik's concerns regarding the proposed limits on hunting and firearm discharges, and the lack of adequate discussion on the potential impact on the marine resources. Moreover, the NSB clearly considered its future tax base and the financing of public works projects before issuing its position on

ANWR:

*Based upon tax revenues on property in Prudhoe Bay, Kuparuk River, and other oil fields, the Borough has in the past decade built a comprehensive network of schools,

roads, housing and facilities and services of many kinds in all of its villages. A strong, secure tax base is necessary to support these facilities in the future, including during that time when production at Prudhoe Bay begins to wind down. Oil exploration and development within the ANWR Coastal Plain would provide a significant portion of that tax base." (North Slope Borough, 1987, 1)

The Venetie and Arctic Village Councils rejected the Secretary's recommendation based on their fear that hydrocarbon activity in the 1002 area would negatively affect the PCH and subsequently their village economies. The Arctic Village submission focuses on the PCH:

"After the caribou have their young, they migrate to the Arctic Village area and sometimes stay all winter. Since there's no trapping, the people of Arctic Village depend more on anything on Porcupine herds. We don't have trapping which brings monies for our survivability; we have caribou to survive...

Drilling would keep caribou away from their calving ground (How would you like it if you were in labor in a delivery room and someone was drilling in the same room?)...

Don't do to the caribou what your ancestors did to the buffalo." (Arctic Village Council, 1987: 1-2)

The Venetie Village submission emphasizes the importance of the PCH and criticizes the Draft Report for not considering the effects on Venetie and Arctic Village from a reduced caribou harvest. The Venetie submission also criticized the Secretary for not holding preliminary hearings in the Venetie and Arctic Village: "If you had come here, you would have heard people tell you about how vital caribou are to our people here. They would have asked you whether 20 days worth of oil is worth the destruction of our culture" (Venetie Village Council, 1987: 1).

The 1002 area debate before Congress:

Under ANILCA hydrocarbon leasing in the 1002 area cannot proceed until Congress enacts an act that affirms it. Since the Secretary's submission of the Report and recommendations to Congress several committees have been

attempting to propose bills for consideration by the full Houses of Congress. Two Senate and three House Committees have had hearings and have considered billings in the 1002 issue. The House committees are:

- Committee on Interior and Insular Affairs;
- Committee on Merchant Marine and Fisheries;
- Committee on Energy and Commerce.

The Senate Committees are:

- Committee on Environment and Public Works;
- Committee on Energy and Natural Resources.

The proposed bills, and the testimony presented, fall into three groups; pro-wilderness; a deferred decision; and, pro-development (Stewart, 1988). Since the summer of 1987 numerous hearings have been held in each of the committees listed above.¹ Without exception

¹ An exhaustive review of the congressional action to date was not undertaken in this thesis. Until a decision has rendered by Congress the best analysis of what decision will be taken would be only a guess given

each has considered bills that fall into one of the three stances outlined. As with most other issues before congressional committees, the 1002 area debate has come under pressure from a variety of interest groups. The dynamics of the interplay between these interests and the bills proposed by committee members is complex (and, beyond the scope of this thesis). Yet, the final outcome will affect the nature of Canada - U.S. transboundary relations in the arctic profoundly. Supporters of a pro-wilderness decision by Congress view the 1002 area an important part of the arctic ecosystem; a view shared by Canadian interests. Supporters of a pro-development decision view the 1002 area an addition to and eventual supplement to the existing Prudhoe Bay production complex. Moreover, pro-development arguments based on 'national security' and 'balance of trade' were initially proposed in the Secretary's Report to Congress (Clough et footnote continued _____

the complexity of congressional politics. The author would like to point out that seventeen hearings had taken place on issues relating to the 1002 area as of the end of 1989, producing 10,000+ pages of committee transcripts and attachments.

al, 1987: 185-86 and 203-204). The importance of the former arguments is difficult to assess, but a factor nonetheless given the decision Congress will have to make. Advocates of this position include the Secretary of the Interior, the State of Alaska, and at least two Alaskan native organizations. Supporters of a delayed decision argue that there is too much uncertainty surrounding the debate; uncertainty over the hydrocarbon resources under the 1002 area, or uncertainty over the kind and magnitude of potential environmental impacts from hydrocarbon activity. A deferred decision would delay development or wilderness designation. None of the bills proposed in the committees had been sent to either House as of December, 1989. The following is a list of the Bills proposed in the Senate and House Committees between January 6 and November 3, 1987¹:

¹ Bills proposed since 1988 have been variations of the ones proposed in the 1987. The bill that is ultimately voted upon by Congress may not yet have been proposed.

Proposed House Bills¹:

H.R. 39: wilderness;
 H.R. 1082: pro-development;
 H.R. 3601: wilderness (special habitat protection
 based on species use - somewhat of a
 compromise);
 H.R. 3928: pro-development.

Senate bill proposals:

S. 1217: pro-development;
 S. 1804: wilderness.
 (U.S. Library of Congress, 1988: 1-15)

The Senate and the House have yet to vote on the 1002 area in either House as of the writing of this thesis. The importance of congressional action is paramount to the 1002 area conflict Canada - U.S. transboundary relations. It is Congress that will decide on the future of the 1002 area.

Analysis and summary:

The Canadian positions on the Secretary's recommendation for full leasing in the 1002 area centre

¹ 'H.R.' and 'S.' are the accepted abbreviations that denote the origin of bills in Congress.

upon three concerns; the potential changes to the PCH's size and distribution (particularly the winter ranges and migration patterns, the effect the former may have on the subsistence economies of native communities that rely on the PCH, and the integrity of the 22.5 million acre protected area across the Yukon - Alaska boundary (ANWR and the NYNP).

The federal government's jurisdiction as defined under the Constitution Act (1982) and related enabling federal legislation determine its stand on the 1002 area debate - unqualified opposition to the Secretary's recommendation and a critical stance on the report that the US DOI produced. The negative responses from the territorial governments to the Secretary's report and recommendations to Congress are significant and important given the continuing devolution of powers to the Territories (such as wildlife management). Native involvement, through the CYI and the PCMB, also revolve around the three concern listed above. As subsistence

users of the PCH northerns natives have an unmistakable interest in maintaining the herd at renewable levels.

The U.S. positions on the 1002 area debate range from total support for the Secretary's recommendation to total opposition to it. Between U.S. agencies no clear consensus prevails. Of the agencies that support the full leasing alternative the U.S. DOI remains the most significant proponent given its mandate under ANILCA. The State of Alaska's position in favour of 1002 development is based on the state's overwhelming economic reliance on hydrocarbon activities. Native support for the Secretary's position is split between the pro-development coastal community of Kaktovik and the NSB, and the pro-wilderness interior villages of Venetie and Arctic Village. The latter division is indicative of the fundamental schism between pro-development and pro-wilderness proponents in the 1002 area debate. Those who propose development of the 1002 area discount the impact to wildlife and its habitat, while others see the cost of

1002 development outweighing its benefits in view of the potential impact to valued wildlife and wilderness.

CHAPTER SIX

CONCLUSION

Canada - U.S. transboundary environmental relations in the arctic are once again at a crossroad. The proposed 1002 area full leasing recommendation from the Secretary of the Interior has precipitated the transboundary environmental conflict studied in this thesis. The PCH is a transboundary renewable resource valued by the Canadian federal, territorial governments and native subsistence users. It is the latter group which has the most at risk from any activities that decreases the herd population and distribution.

Within the conservation framework in the Alaska - Yukon region the existence of the ANWR and the NYNP are the result of conservation policies and measures that have taken decades to create. Hydrocarbon activity in the 1002 area threatens the integrity of the combined ANWR-NYNP region; proposed pipeline construction, port facilities, and offshore activities can be grouped with

the latter since the cumulative effects of all of these kinds of hydrocarbon activities pose serious problems for the environment in the region and therefore on the transboundary relationship. The U.S. was the first to acknowledge the importance of the north slope in terms of its ecology and wildlife values. The establishment of the Arctic National Wildlife Range (1960) marks an important date in the history of conservation in the region, and in the arctic. The NYNP was established twenty four years later. The Secretary's Report and recommendations to Congress are milestones of another sort. Habitat and wildlife protection tend to be a deliberate effort on the part of the governments that designate areas as protected, while hydrocarbon development by its very nature is opportunistic. In the 1002 case the U.S. altered the status of an area in order to permit exploration with the intention of encouraging development if recoverable resources are found (section 1002 of ANILCA). To date the opportunity to explore for hydrocarbon resources throughout the 1002 area is one vote away from becoming a fact. The U.S. Congress is, as

of this writing, still unable to render a decision on the 1002 area. Thus, the seeds of this situation were sown in 1980 with the passage of ANILCA and section 1002 of that law.

The implications of full leasing in the 1002 on Canada - U.S. transboundary environmental relations in the arctic are twofold. Firstly, uncertainty has prevailed over the future of the 1002 lands since 1986 (for some it goes back to 1980). The Secretary's full leasing recommendation has created a conflict between the neighbouring countries. If a pro-development or a deferred decision were adopted by Congress the aforementioned conflict would continue. It would be an understatement to describe the interests affecting Congress as complicated. Until a decision is rendered it is impossible to ascertain if Congress will take into account the unanimous Canadian positions. National and economic security, and other pro-development forces cannot be discounted. Secondly, a decision to develop the 1002 area would call into question the nature of

transboundary relations between two sovereign and adjacent states in which one state clearly views itself as the injured party (in this case Canada). In an era of heightened public and governmental awareness of environmental problems at the global scale, the long-standing bilateral relationship between Canada and the U.S. would seem to offer some guidance.

In the 1002 area conflict treaties and agreements, such as the Agreement on the Conservation of Polar Bears, (1976), the North American Waterfowl Management Plan (1986), and the International Porcupine Management Agreement (1987) contain sections specifying consultation with and consideration of the neighbouring state. In the 1002 conflict these treaties and agreements appeared to be augmented by legislative instruments that appear to complement the aforementioned bilateral agreements. Section 1005 of ANILCA is one such legislative device. The Secretary of the Interior was mandated to consult with the Government of Canada, and to consider the impact(s) to the PCH specifically. The failure of this device stems from the basic assumption that the Secretary

would be willing to consult Canadian interests; this is not an assumption that an observer of Canada - U.S. relations would believe to be necessarily true. The problem therefore lies in the lack of an established cooperative framework to deal with transboundary resource conflicts in this region. The notion here is that such a framework would at the very least facilitate the flow of information - ideally mediation would follow. It is doubtful that the U.S. would submit itself to third party adjudication as in the case of the Georges Bank boundary dispute. Therefore the only viable and tested method of addressing transboundary resource management is through a formal institutionalized mechanism underpinned by a broad enough bi-national treaty. This normative approach could include the expansion of the existing international PCH management agreement; perhaps, a newer agreement could be negotiated since the international PCH agreement is still new and relatively untested. Specifically, the mandate of any new agreement would have to include the two main functions, similar to those of the IJC:

APPENDIX 1
EXCEPTS FROM ANILCA

ARCTIC NATIONAL WILDLIFE REFUGE COASTAL PLAIN REOSURCE
ASSESSMENT

Sec. 1002. (a) Purpose._The purpose of this section is to provide for a comprehensive and continuing inventory and assessment of the fish and wildlife resources of the coastal plain of the Arctic National Wildlife Refuge; an analysis of the impacts of oil and gas exploration, development, and production, and to authorize exploratory activity within the coastal plain in a manner that avoids significant adverse effects on the fish and wildlife and other resources.

(h) Report to Congress.-Not earlier than five years after the enactment date of this Act and not later than five years and nine months after such date, the Secretary shall prepare and submit to Congress a report containing-

- (1) the identification by means other than drilling of exploratory wells of the areas within the coastal plain that have oil and gas potential and estimate of the volume of the oil and gas concerned;
- (2) the description of the fish and wildlife, their habitats, and other resources that are within the areas identified under paragraph (1);
- (3) an evaluation of the adverse effects that the carrying out of further exploration for, and the development and the production of oil and gas within such areas will have on the resources referred to in paragraph (2);

avoidance or for other reasons) would quickly become a problem in itself since these very same disputes have dominated Canada - U.S. transboundary relations for decades; the 1002 area is now on the current list of Canada - U.S. transboundary disputes in the arctic..

In the case of an arctic transboundary dispute resolution mechanism, native participation both as members of emerging political movements and as advisors on technical matters would have to be a precondition given that the most serious effects of industrial development and managed growth would affect the changing nature of the articulation between their subsistence economies and the cash economy. The success of the IJC is largely attributable to the above functions; arguably any arctic transboundary environmental dispute mechanism would need to perform the same functions in order to be able manage conflicts as they arise. This model, as it has been formulated in this thesis, is based upon an approach that calls for the coordination of the existing regulatory regimes (as in the adoption of water quality standards proposed by the IJC and adopted by the Great Lakes states and province) and cooperative policy

formulation within an institutionalized framework (as in the creation and continued operation of the various IJC boards). The caveats of this kind of normative approach are stated by House (1983):

"To relate the contribution of social science to policy-making and its analysis the first step is to look at the process of policy formulation and implementation before considering the modest achievements of social scientists in that field to date. ...In considering the process it is important to distinguish what actually happens in the real world from what ideally should or could be the case. The operational stance of the policy-maker is inevitably in contrast to that of any academic analyst, who may wish to inhabit a more perfect world and usually hopes to contribute to an improvement in the ways in which effective policies are made, without perhaps sufficiently appreciating the multitudinous political impediments along the road." (House, 1983: 4-6).

What of the relationship elsewhere on the North American continent? Is the conditional failure, given that Congress has not made a decision, of the transboundary environmental relationship in 1002 area a lesson? Given the Canadian responses the answer to the above question would have to be that transboundary environmental relationship in the arctic has failed. In

this case state sovereignty appears to be acting as a negative force on the informal diplomatic bilateral mechanisms and newly created IPMB. Moreover, the concept of sovereignty is at the centre of this and many other transboundary environmental / resources disputes.

Disputes over international boundaries (typified in modern times by ocean boundaries) and/or ownership of shared resources have created many international conflicts. Under international law and practice each state has the right to exploit resources within its boundaries. However, if this exploitation impinges on another sovereign state, the questions over exploitation and sovereignty become ambiguous. Depending on the decision made in Congress, the fate of the PCH and the stability of the subsistence economies in the native communities that depend on it remain uncertain. Thus, the opposing positions held by the governments and organizations described in this thesis will continue to strain the transboundary environmental relationship in the arctic between Canada and the U.S. Even if the 1002 area is not developed in the short to medium term, other

industrial development proposals may emerge (e.g., the offshore and a pipeline down the Mackenzie Valley) to test the fragile status quo. Predictably the outcome would likely be the same if one state unilaterally pursues these kinds of efforts. Without a broadly based institutionalized transboundary management mechanism the chances of pro-active cooperation would be less than the current series of reactive ad hoc responses. When a transboundary environmental relationship falters, the valued transboundary resources become more important and disputes arise.

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- (3) an evaluation of the adverse effects that the carrying out of further exploration for, and the development and the production of oil and gas within such areas will have on the resources referred to in paragraph (2);

- (4) a description of how such oil and gas, if produced within such area, may be transported to processing facilities;
- (5) an evaluation of how such oil and gas relates to the national need for additional domestic sources of oil and gas; and
- (6) the recommendations of the Secretary with respect to whether further exploration for, and the development and production of, oil and gas within the coastal plain should be permitted and, if so, what additional legal authority is necessary to ensure that the adverse effects of such activities on fish and wildlife, their habitats, and other resources are avoided or minimized.

APPENDIX 2

CHRONOLOGY OF SELECTED EVENTS RELATING TO THE ANWR
CONFLICT.

- 1920's: Olaus and Mardy Murie begin
 their field studies in the
 Alaskan North Slope.
- the Naval Petroleum Reserve is
 delimited in the western Alaskan
 North Slope
- 1958: the U.S. Fish and Wildlife
 Service propose a land
 withdrawal in order to create a
 wildlife range.
- 1959: Alaska gains statehood.
- 1960: The Arctic National Wildlife
 Range is created.
- 1968: A 'super giant' oil field is
 discovered in Prudhoe Bay in
 Alaska.
- 1970: A proposal to create an
 International Wildlife Range
 made at a conference in
 Whitehorse. The proposal was
 submitted to the Government of
 Canada.

- 1971: The Alaska Native Claims Settlement Act (ANCSA) is enacted.
- 1974: Gas pipeline proposals to construct a pipeline from Prudhoe Bay south are made.
- Thomas Berger begins the Mackenzie Valley Pipeline Inquiry.
- 1977: Thomas Berger submits his review. He proposes a ban on the construction of a pipeline in the northern part of the Yukon, and recommends that a park adjacent to the Arctic National Wildlife Range be established in the Yukon.
- The National Energy Board releases its review of the Canadian Arctic Gas Pipeline Ltd. proposals to construct a pipeline from Prudhoe Bay to southern markets. two routes were proposed: the Mackenzie Valley route, and the Alaska Highway route. The NEB rejected both.
- The Trans Alaska Pipeline System (TAPS) becomes operational.

- 1978: DIAND withdraws 9.5 million acres of northern Yukon in order to assess its conservation values.
- Parks Canada proposes the first in a series of National Parks in northern Yukon.
- 1978: The Yukon Territorial Government (YTG) proposes a national park for northern Yukon (Zone - A of the Northern Yukon Resource Management Model.
- 1980: The Alaska National Interest Lands Conservation Act (ANILCA) becomes law in the U.S. The existing Range is enlarged, renamed the Arctic National Wildlife Refuge (ANWR), and given wilderness status. Section 1002 of ANILCA sets aside 1.55 million acres of the coastal plain for future assessment of the hydrocarbon potential.
- 1984: The Inuvialuit of the western arctic settle their land claims with the federal government. Under the Inuvialuit Final Agreement the Northern Yukon National Park is official designated.

The Beaufort Assessment
Environmental Review Panel
(BEARP) releases its review.
The Panel found that a small
diameter pipeline be built down
the Mackenzie Valley.

1985: Porcupine Management Agreement
(Canada) is signed.

1986: Canada and the United States
sign a draft agreement on the
international management of the
Porcupine caribou herd.

1987 (June): The Secretary of State releases
the Draft Report on the future
management of the 1002 area.
Full leasing of hydrocarbon
exploration is the main
recommendation.

The governments of Canada, the
Yukon, and the Northwest
Territories respond to the Draft
Report issued by the Secretary
of the Interior

The Secretary of State releases
the two volume Final Report to
both Houses of Congress
recommending a full leasing
alternative for the 1002 area of
ANWR.

The International Porcupine Management Agreement is signed by the Secretary of the Interior and the Minister of Environment.

1987 to Sept., 1990: Different bills are proposed in the two Houses of Congress. No vote has occurred on the 1002 area issue before the full Houses of Congress.

1989: The Exxon-Valdez spills 11 million gallons of crude oil in Prince William Sound, Alaska. The U.S. Federal Government spends \$125.2 million dollars in the first six months alone on the spill.

APPENDIX 3

SELECTED TREATIES BETWEEN CANADA AND THE US AFFECTING
TRANSBOUNDARY ENVIRONMENTAL RELATIONS

Boundary Waters Treaty, 1909.

Migratory Bird Convention, 1916.

International Convention for the Regulation of
Whaling, Whaling Convention Act, 1949.

Agreement on the Conservation of Polar Bears, 1976.

North American Waterfowl Management Plan, 1986.

The International Porcupine Management Agreement,
1987.

APPENDIX 4

THE STATUS OF THE OPERATIONAL OIL FIELD AT PRUDHOE BAY

Field	Operator	Leasor	Reserves	Status as of Dec. 1989
Endicott	BP /Exxon	State/Fed.	1000MBO	100,000bpd
Kuparuk	ARCO	State	4400MBO	280,000bpd 35% depleted
Lisburne	ARCO	State	3000MBO	30-40,000bpd
Milne Point	Conoco	State	60MBO	32,000bpd
Prudhoe Bay	ARCO/BP	State	23.5BBO	1.5 million bpd Decreased production expected throughout the nineties.

APPENDIX 5

SUMMARY OF UNAVOIDABLE IMPACTS, ALTERNATIVE A
(source: Clough et al, 1987: 144-145)

Translocation of gravel from natural sites to oil activity areas resulting in local changes in topography.

Use of limited natural fresh water source for industrial uses.

Some thermokarsting, erosion, and melting of permafrost.

Compaction, destruction and delayed growth of vegetation in areas of further geophysical exploration (green and brown trails)

Direct loss of approximately 5,650 acres of coastal plain habitat to road and pad construction and gravel borrow sites.

Modification of about 7,000 additional acres of coastal plain habitat due to secondary effects of gravel spray, dust deposition, and altered snowmelt and erosion patterns.

Increased noise and other disturbance factors.

An unknown number (possibly hundreds) of minor spills (diesel fuel, oil, antifreeze, etc.) resulting from vehicle and equipment operation, causing some

destruction of vegetation, contamination of waters, and mortality of small food organisms.

Reduced use by caribou of up to thirty seven percent (303,000) of concentrated calving areas.

Possible reduced use through avoidance of approximately 72,000 acres of insect-relief habitat for caribou.

Direct loss of approximately 2,700 acres of muskoxen habitat due to placement of facilities and pipelines.

Disturbance and possible avoidance by muskoxen of seventy one percent of their high-use, year-round habitats, resulting in a change in distribution, population decline, or limitation on expansion of the 1002 area population.

Direct loss of approximately 140 acres of moose habitat.

Moderate decline in the wolf population due to cumulative increase in mortality and decrease in production or survival resulting from reduced prey availability.

Displacement and increased harvest of wolverines.

Direct loss of 3,500 acres of brown bear high- and moderate-use habitats.

Probable loss of approximately one brown bear per year from accidents or from being shot in defense of life or property.

Direct and indirect small mammal loss due to habitat destruction, road kills, etc.

Probable loss of the eastern part of the 1002 area as denning habitat for polar bears, if a marine/port facility is located.

Direct loss of 2,000 acres of snow goose preferred staging habitat.

Decreased habitat values on 162,000 to 236,000 acres of snow goose preferred staging habitat.

Direct mortality of an unquantifiable number of birds due to collisions with towers, antennas, wires, and other structures.

Minor decline or change in distribution of golden eagles as a result of decreased caribou prey.

Moderate loss of arctic grayling habitat in Block A due to stream alterations.

Accelerated rate of change in traditional Native culture and probably some cultural disorientation.

Loss of subsistence hunting opportunities throughout approximately one-half the 1002 area and possible reduction in subsistence opportunities to communities outside the 1002 area that are dependent on harvest of migratory fish and

wildlife populations that spend part of their time on the 1002 area.

Unquantifiable loss of wilderness values throughout the entire 1002 area.

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