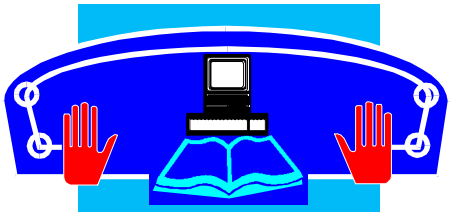

Sharing Power With Native Users: Co-management Regimes For Arctic Wildlife

Type of Study: Reference Material

Date of Report: 1988

Author: Canadian Arctic Resources Committee

Catalogue Number: 5-1-31

Sharing Power with Native Users: Co-Management Regimes for Arctic Wildlife

By Gail Osherenko

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In the late 1970s, biologists thought the Kaminuriak and Beverly herds had dropped to as low as a tenth and a third, respectively, of their previous populations. But, by 1984, new studies documented what Inuit hunters had claimed-that the populations of both herds are sizeable and that low numbers at the southern end of the range did not indicate precipitous declines in herd sizes.[22] The increased numbers reflect a combination of improved counting techniques brought shut through the caribou management regime and increasing herd sizes.

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What accounts for these successes? Above all, the agreement provides a significant role for indigenous users. Although the CMB's authority is technically advisory, its decisions, at least on wildlife conservation issues, are taken seriously by the relevant governments This may be due in part to fortunate political circumstances. One of the government parties to the regime, the GNWT, represents a predominantly native population holding a majority of seats in the Legislative Assembly. In recent years, natives have, at different times, held the posts of minister and deputy minister in the Department of Renewable Resources of the GNWT, the agency with authority to regulate caribou hunting. Today, much of the caribou research is conducted by the GNWT, and relations between GNWT researchers and user communities are good. Thus, in addition to the dominance of native-user representatives on the board and the user-oriented objectives of the regime, the political context in which the regime operates helps to ensure its success& creating a partnership between government and user groups.

Sharing Power with Native Users:

Co-Management Regimes for Native Wildlife

By Gail Osherenko

Canadian Arctic Resources Committee

111 Sparks Street, 4th Floor

Ottawa, Ontario

KIP 5B5

March 1988

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Canadian Cataloging in Publication Data

Osherenko, Gail
Sharing power with native users

(CARC policy paper; 5)
Includes bibliographical references.

ISBN 0-919996-36-1

1. Wildlife management--Arctic regions. 2. Native races. I. Canadian Arctic Resources Committee. II. Title. III. Series.

SK47 1.N6084 1988 333.95'097199 C88-090159-4

CARC 1988 Publishing Programme
Publications Manager: Alan Saunders
Production Manager: Anne Kneif

CARC would like to give special thanks to Pratt and Whitney Canada Inc. for their contribution towards this publication.

Printed and bound in Canada by Bonanza Press Limited, Ottawa

Cover photograph: George Calef

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Gail Osherenko teaches contemporary northern issues, natural resources, and Native American law at the Center for Northern Studies in Wolcott, Vermont. She holds a law degree from the University of California, Davis (1975). Before moving to Vermont in 1981, she worked as a natural resources lawyer for the U.S. Department of Justice, Division of Land and Natural Resources, for the President's Council on Environmental Quality, and for a U.S. Congressman.

Abstract

Two models of wildlife management operate throughout the North American Arctic, an indigenous system and a state system, but the former has limited application and the latter has never worked well. This article identities the problems associated with this dualism and argues that co-management arrangements involving public authorities and indigenous user groups offer the best approach for solving these problems in an ecologically sound, efficient, equitable, and enduring way. Examining three of the seven wildlife co-management arrangements now operating in Alaska and the Canadian North, the Beverly–Kaminuriak Caribou Management Plan in the central Canadian Arctic, the Northern Quebec Beluga Management Plan, and the Yukon–Kuskokwim Delta Goose Management Plan in Alaska, the paper seeks to determine the key ingredients of successful co-management.

Contents

Acknowledgements

This essay would not have been possible without the co-operation of government officials who are at the centre of the management regimes described. I wish to especially thank Barry Roberts, Mimi Breton, Robert Leedy, Richard Pospahala, and Lewis Pamplin, who provided essential information, carefully reviewed drafts, and took the time to discuss complex issues. I am grateful also to a number of other individuals who supplied useful information and helpful criticism at various junctures; Fikret Berkes, David Brackett, Lorraine Brook, Nick Flanders, David Gayer, Paul Gray, Libby Halpin, Terry Fenge, Bill Kemp, Larry Landry, Steve Matthews, Ed McKeon, Stas Olpinski, Felix Smith, Harold Sparck, Phillip Stenne, John Twiss, Peter Usher, Roy Vontobel, and George Wenzel. Three students at the Center for Northern Studies in the spring of 1987—Leo Kelly, Philip Kugzruk, and Dan Odess—not only put up with my obsession with co-management for a semester but contributed stimulating questions, firsthand information, and candid comments on early drafts. Above all, Oran Young provided insightful advice, criticism, and encouragement throughout. And finally, I wish to thank John Merritt, Ann Ray, and Alan Saunders at the Canadian Arctic Resources Committee for catching both large and small errors in the manuscript and dealing with the complexities of transforming the product of my word processor into a published manuscript.

1. Introduction

Two models of wildlife management operate throughout Alaska and the Canadian North, an indigenous system and a state system, but the former has limited application and the latter has never worked well.[1] This paper identifies the problems associated with this dualism and argues that co-management arrangements involving the relevant governmental entities and indigenous user groups offer the best prospect for solving these problems. The paper examines three existing wildlife co-management regimes: the Beverly-Kaminuriak Barren Ground Caribou Management Agreement in the central Canadian Arctic, the Northern Quebec Beluga Management Plan, and the Yukon-Kuskokwim Delta Goose Management Plan in Alaska.* For comparative purposes, the paper focuses on single species arrangements, though the trend in Canada today is to create broader wildlife co-management regimes through the comprehensive land claims negotiation process.[3]

The essay concludes with an account of lessons to be drawn from existing co-management regimes, together with a discussion of other areas where co-management may help to solve resource management problems. Above all, the paper explains why those participating in co-management regimes should ensure that no major decision is made without concurrence of each of the parties to the regime. Only by involving indigenous user groups in management decisions will co-management alleviate the problems associated with the clash of indigenous and state systems and meld the two into a single ecologically sound, efficient, equitable, and enduring system.

2. The Two Systems

In order to understand the current m we begin with brief characterizations of the two ideal types, the state system and the indigenous system.

The state system features written law, rules, and regulations made and administered by governments (state, provincial, territorial or federal) m g common property resources. As Usher puts it:

> The state manages for certain levels of abundance on a technical basis, and then allocates shares of this abundance to users on an economic and political basis. The system of knowledge is based on a scientific accumulation, organization, and interpretation of data, and management problems are resolved in a technical, a historical, and "value-free" framework. This system of management is bureaucratic, which is to say hierarchically organized and vertically compartmentalized. For example, managers are distinct from harvesters, authority is centralized and flows from the top down, and separate units are designated to manage individual components of the environment. Not least, the management of fish and wildlife resources is always functionally separate from the management of the lands and waters that sustain them.[4]

The state system arose from the needs of non-native cultures to maintain wildlife populations as well as to allocate wildlife resources among commercial and recreational users. The regulation of this system usually takes the form of licences and fees, harvest tickets and reports, open and closed seasons, bag limits, and gear restrictions. Game wardens enforce the rules by issuing citations and confiscating hunting equipment. Public authorities punish offenders by fines or imprisonment. In the Far North, agencies have found it difficult to apply the state system. In some cases, application of laws and regulations is relaxed, and authorities make few attempts to enforce the writ-

ten rules. The state system allows for consultation of user groups, but does not accord users a broader role in management.

The indigenous system of wildlife management is a collection of unwritten rules or social norms that govern native hunting, fishing, and trapping. The rules have been handed down by example and by word of mouth (often through stories) for generations. For the most part, compliance, based on cultural values, ethics, and even taboos, has been high. As one Alaska native noted:

If you cut your fish and hang it to dry and then go away for two weeks and don't tend it, there will be some mean eyes looking at you when you come back. When elders whom you 've known all your life quit talking to you, that's worse than jails

Because the system is seldom codified in native communities, much less incorporated into laws and regulations made by non-native society (the state system), wildlife managers sometimes conclude, erroneously, that native communities have no self-imposed rules to control human behaviour and ensure conservation of marine and terrestrial animals. Yet a recognition of human dependence on and respect for animals underlies the indigenous system. Whether people live in communities of 85or3000, they depend on wild animals for food.[6] Hunting not only provides preferred food, it is often a preferred occupation that confers respect and prestige in the community. Research, management, and harvesting are inseparable in the indigenous system. Knowledge, which comes from traveling, searching, hunting, butchering, and eating, is shared constantly within the household, the kinship group, and the community.[7] The indigenous system often makes use of conservation measures, including setting aside sanctuaries to allow certain animal populations time to recover from hunting or trapping pressure. Chukchi in Siberia, for example, traditionally banned hunting at several walrus hauling-out sites on the coast of Chukotka. Cree trappers regularly "let the land rest" in places where they perceive a need to allow beaver and other species to recover from trapping pressure.[8]

A key problem for the indigenous system arises when rules, once widely followed, are no longer passed down to the younger generation. Children learn values in school that conflict with values essential to their native culture-values that stress individuality and competition over community and co-operation. As well, new authority figures (school teachers, outside experts) begin to displace the elders, reducing the likelihood of compliance with previously held social norms. Additionally, students attending conventional schools have few opportunities to learn the skills of the land from their elders, and inadequate training has left a younger generation of hunters who often do not have the skill to maintain high rates of retrieval. Even so, most anthropologists working in the North confirm the continued vitality of native cultures and note that social norms and practices are changing or evolving rather than dying. We must not be too quick, therefore, to jump to the conclusion that customary law is no longer protecting wildlife in the Arctic.

3. Problems of Dualism

A number of problems arise from clashes between these two systems of wildlife management. The state system is fundamentally ill-suited to native communities. It often relies on cumbersome paperwork (licences, harvest tickets, reports), which is impractical in communities where many hunters are not fluent in the language in which the rules are printed. It is frequently based on individual bag limits rather that community needs. It relies on seasonal limits and gear restrictions that are often at odds with subsistence needs. Ultimately, it enforces by fine, forfeiture, seizure, and even personal confinement, rather than by social pressure to conform to community standards.[9] Understandably, compliance with governmental rules is low. For example, only 15 to 20 per cent of the active hunters in north-west Alaska obtain hunting licences.10 Public authorities, recognizing some of these problems with the state system, have adapted the system somewhat to meet indigenous needs. For example, regulators try to match seasonal restrictions with the users' seasonal needs, the Northwest Territories Department of Renewable Resources issues (annual) general hunting licences to natives (permitting them to hunt in any season for subsistence needs and to trap in accordance with seasonal restrictions), and agencies in northern Quebec do not impose regulations on native users except in cases of conservation need, and then only after consultation with the users. These adjustments solve some of the problems of dualism, but they fail to give indigenous users a sense of ownership in the decision-making process and do not address the difficult issues that arise when state managers fear overexploitation of a species.

In a few cases, the failure to develop a workable wildlife management system and a legal regime that melds indigenous and state systems has contributed to declines in populations of highly migratory species that both systems aim to protect. Two of the co-management regimes examined in this essay arose out of wildlife population crises.

Wildlife research as well as harvest data is essential to early detection of species' declines. However, information obtained when either system operates alone is incomplete and can lead to in-

accurate conclusions. (The Beverly–Kaminuriak caribou management regime, discussed later, developed when government authorities responded to false alarms regarding the health of two caribou herds.) The data on which to base sound management decisions cannot be collected without co-operation of user groups. Correspondingly, information obtained through western scientific research can be useful to native communities. In the traditional indigenous system, information might not pass through the entire range of a species. Thus, a particular user group might not observe a decline that would be apparent by compiling information from native and non-native users throughout the animals' range.

Where co-operation rather than confrontation occurs, by contrast, the frontiers of knowledge about wildlife can expand rapidly. University-trained researchers create excellent synchronic data sets covering wide geographic areas (well beyond the limits of knowledge likely to be available in remote native communities). For their part, natives provide remarkably accurate diachronic data for particular localities and specific stocks of animals about which knowledge has been transmitted orally for a hundred years or more. But the two sets of data must be integrated to produce a full picture of the wildlife population dynamics and to generate assessments credible to both communities. [11]

Finally, the costs of imposing the state system on communities that neither understand nor accept it are significant. Some regulations and procedures are so unenforceable that by policy (or individual discretion) public authorities ignore them, thereby undercutting the credibility of the entire system. On some occasions, when game wardens in Alaska have issued citations or confiscated hunting gear, natives have resorted to civil disobedience and litigation to demonstrate opposition to government regulations. [12] In September 1987, a federal crackdown on Cree goose hunting on the western shores of James Bay led to open defiance of RCMP efforts to enforce the federal Migratory Birds Convention Act and a threat to shoot down the helicopter carrying enforcement officers. [13] Most wildlife managers recognize that they have neither the financial nor the political capital to achieve compliance through conventional enforcement.

Direct native–game warden clashes over wildlife probably occur more frequently in Alaska than in the Canadian Arctic, due to significant differences in laws. In Alaska, state fish and game laws apply to natives and non-natives alike, with a provision guaranteeing preferential harvest rights to subsistence users, a category encompassing both native and non-native rural residents. The State Board of Game regulates subsistence hunting with the same management tools applied to sport hunters. In Canada under enabling statutes for the Yukon and Northwest Territories (N.W.T.), territorial governments may not restrict hunting by most natives for food unless a species is" in danger of extinction". 14 Many of the problems that arise in Alaska are thereby avoided. Furthermore, federal (and, in the case of northern Quebec, provincial) authorities have accorded natives priority and, in some cases, exclusive rights to hunt and trap many terrestrial species and some marine species through land claims agreements. In northern Quebec, beneficiaries of the land claims agreement do not need to obtain any permit or licence to harvest wildlife for their subsistence needs. Specific provisions of these settlements and of Indian treaties prohibit governmental restrictions on native subsistence harvesting unless the public authority concludes there is a need to regulate for conservation purposes. This approach reduces the potential for direct conflict between native users and government managers. But the same problems that occur in Alaska surface in the Canadian North when scientists or natives observe serious declines in a wildlife species or a particular population.

In short, the clash of systems of wildlife management in the Far North results in serious compliance problems, ecological crises, inadequate research data that can lead to inaccurate conclusions, and unnecessary political and financial costs.

4. The Conventional Response

A response that is attractive to many native groups as well as some wildlife managers is to establish zonal arrangements allowing the state system to operate on non-native lands and the indigenous system to operate on native lands. In this way, proponents argue, various governmental entities can preserve authority within their own jurisdictions. In Village Journey 15, for example, Berger recommends that tribal governments in Alaska have exclusive jurisdiction over fish and wildlife on native lands, including those owned by native corporations and tribal governments.[16] Presumably, zonal divisions would not affect federal jurisdiction over migratory birds, marine mammals, anadramous fish, and endangered species.

On state and federal lands, Berger suggests shared jurisdiction among tribal, state, and federal governments. However, states and provinces have long fought encroachments of federal jurisdiction over wildlife. They adamantly oppose enclaves of tribal jurisdiction further eroding their authority and are not likely to willingly share authority with tribal entities.

Efforts to assert exclusive tribal jurisdiction over wildlife anywhere in Alaska (except on the Metlakatla Reservation) will encounter legal obstacles and political resistance. Even if courts determine that tribal jurisdiction to manage fish and game may exist in Alaska, they may limit it to tribally owned village lands. At best, tribal jurisdiction might extend to municipally owned townsites, native allotments, native village corporation lands, and, possibly, native regional corporation lands.[17] However, much of the area crucial for subsistence is public land. Less than 12 per cent of Alaska is owned by native entities as compared with 60 per cent federal ownership and roughly 28 per cent state ownership.

In Canada, there is even less legal authority for the establishment of enclaves of tribal jurisdiction over wildlife management in the North, and the land area actually transferred to native ownership over which exclusive native jurisdiction might be asserted amounts, at best, to 20 per cent of

the lands originally used by native peoples, except as a bargaining tool, assertion of exclusive tribal jurisdiction over hunting and fishing will not prove an effective way to guarantee subsistence rights throughout the extensive hunting and fishing territories used by natives.

In addition to political problems of instituting a zonal system, divisions of jurisdiction would lead to illogical boundaries for managing species that regularly traverse political boundaries, making ecosystem management difficult if not impossible. Already, the jumble of jurisdictions between federal and state, provincial, and territorial governments produces confusion for user groups. Creating enclaves of tribal jurisdiction could lead to more costly and confusing results that fail to protect wildlife and wildlife habitat.

5. The Co-Management Solution

An alternative to a zonal system is co-management. A *co-management regime is an* institutional arrangement in which government agencies with jurisdiction over resources and user groups enter into an agreement covering a specific geographic region and spelling out: 1) a system of rights and obligations for those interested in the resource; 2) a collection of rules indicating actions that subjects are expected to take under various circumstances; and 3) procedures for making collective decisions affecting the interests of government actors, user organizations, and individual users.[19] Co-management does not require government agencies to relinquish or transfer any *legal* jurisdiction or authority; it does require public authorities to share decision-making power with user groups. Administrators often object to any suggestion that the arrangement implies an equal partnership between governmental agencies and user organizations. In each of the arrangements discussed here, however, public authorities have openly acknowledged that they cannot manage the relevant wildlife species without the co-operation of the user groups, and they have, therefore, accorded user groups a substantial role in management decisions, a role beyond that of "consultant" or "adviser". The role of the user group or joint government-user board created by the agreement may be termed "advisory", but if the user group does not concur in major management decisions regarding the relevant species, the co-management regime will fall apart, and the user group will no longer be obligated to participate or comply with regime rules.

Seven wildlife co-management regimes have been created in the North American Arctic to solve problems caused by clashes between indigenous and state systems of wildlife management, and several others are in various stages of conception. These vary substantially in the degree of power accorded the participating user groups. In addition to the three cases examined in this essay, the National Oceanic and Atmospheric Administration (NOAA) and the Alaska Eskimo Whaling Commission (AEWC) co-operate in a regime to manage bowhead whales, and the Inuvialuit Final Agreement of 1985 provides for a comprehensive hunting, fishing, and trapping regime among na-

tive users and governmental entities for the north-western N.W.T. In October 1986, government officials representing Yukon, Northwest Territories, and two federal agencies (the Department of Indian Affairs and Northern Development [DIAND] and the Department of the Environment [DOE]), as well as four native organizations (the Council for Yukon Indians, the Inuvialuit Game Council, the Dene Nation ,and the Métis Association of the N.W.T.) signed an agreement creating a co-management regime for the Porcupine caribou herd within Canada. And most recently (May 1987), the U.S. Fish and Wildlife Service (FWS), Alaska Department of Fish and Game (ADF&G), and the Eskimo Walrus Commission signed an agreement regarding research and management of the Pacific walrus in Alaska.[20] On the international front, the Agreement between the Government of Canada and the Government of the United States on the Conservation of the Porcupine Caribou Herd, signed by the Canadian Minister of the Environment and the U.S. Secretary of the Interior in Ottawa in July 1987, provides for an advisory International Porcupine Caribou Board composed of eight members, including a native user representative from each nation.

Three case studies of wildlife co-management regimes follow. They demonstrate that while co-management regimes between government agencies and indigenous users may employ varying organizational structures, *successful* co-management regimes always give the indigenous users a sense of ownership in the system.

6. Co-Management of Caribou in the Central Canadian Arctic

Five public officials (the federal minister of DIAND, the federal minister of Environment, the Manitoba minister of Natural Resources, the minister of Northern Saskatchewan, and the commissioner of the Northwest Territories)21 signed the Beverly–Karninuriak Barren Ground Caribou Management Agreement in 1982, in response to concern over apparent declines in the population of two large herds of caribou that calve in the Keewatin District of the N.W.T. and usually winter in or near the treeline in the N.W.T., northern Manitoba, and Saskatchewan (see Map 1).

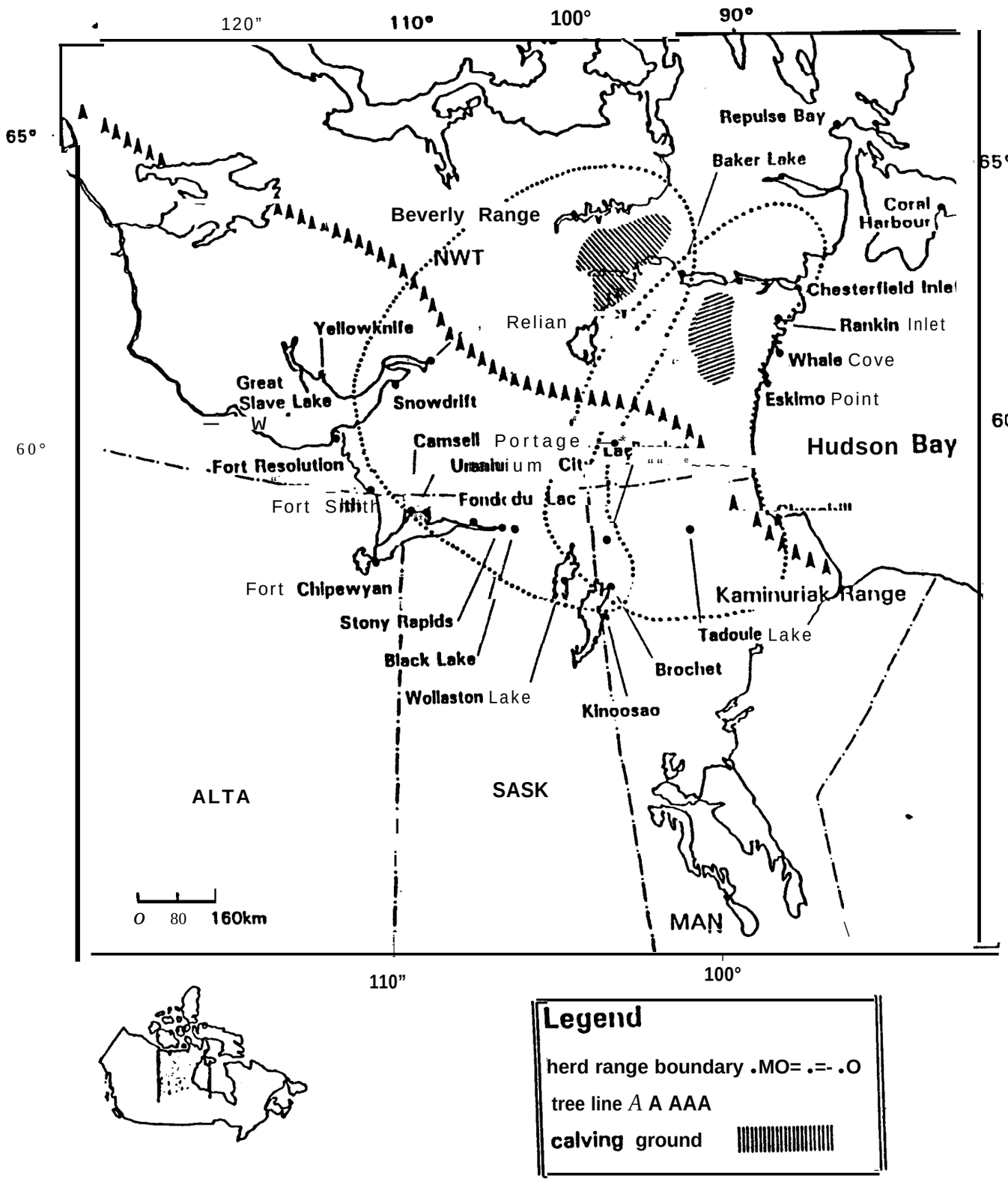
In the late 1970s, biologists thought the Kaminuriak and Beverly herds had dropped to as low as a tenth and a third, respectively, of their previous populations. But, by 1984, new studies documented what Inuit hunters had claimed-that the populations of both herds are sizeable and that low numbers at the southern end of the range did not indicate precipitous declines in herd sizes. [22] The increased numbers reflect a combination of improved counting techniques brought about through the caribou management regime and increasing herd sizes.

Keewatin, Chipewyan Dene, and Métis of border communities in Manitoba, Saskatchewan, and the South Slave region of the N.W.T., and some northern Cree. In 1981, representatives of these native groups proposed a users' caribou martagement board with government officials having only advisory status.23 In June 1982, the governments responded by agreeing to create a 13-member Caribou Management Board (CMB) composed of eight native-user representatives and five government officials. The board is the organizational vehicle for collective decision making regarding caribou management,

The agreement provides a theoretical basis for ecologically sound management. The board's members represent users throughout almost the entire ranges of the Beverly and Kaminuriak herds (with the exception of some territory to the north where the herds' ranges overlap with more northern herds). The CMB's geographic jurisdiction is not defined by political boundaries, but by ecological boundaries.

The board is unique in its user-oriented objectives as well as its user-dominated composition. The board is responsible for co-ordinating management of the herds "in the interest of traditional

Beverly -Kaminuriak Ranges and Caribou-using Communities



Map 1

users and their descendants, who are or may be residents on the range of the caribou, while recognizing the interest of all Canadians in the survival of this resource."[24] The agreement did not transfer jurisdiction or authority for wildlife management to the board, but assigned the board the responsibility "to develop and make recommendations to the appropriate governments and to groups of traditional caribou users for the conservation and management of the Beverly and Kaminuriak herds... and their habitat in order to restore the herds, as far as reasonably possible, to a size and quality which will sustain the requirements of traditional users."[25] Strictly speaking, the CMB is advisory. In reality, governments have, to date, followed the board's advice on matters of species management, although not on habitat protection. In addition to its advisory role, the board has responsibility for monitoring caribou habitat and conducting an information programme.

All five signatory government agencies share the base costs of operating the regime. The agreement requires each to provide $15000 (Canadian) annually, and $75000 in total, for board support. Each agency actually provides more, because it covers the travel costs of its own and user representatives and contributes through its own staff programmed to caribou research, education, and information activities recommended or reviewed by the board. The total budget for board expenses and caribou management programmed under the caribou management plan will be about $1.3 million (Canadian) in 1987, a reasonable expense in relation to a resource that produces two million pounds of meat with an estimated value of $15 million (Canadian) annually. This regime is more secure financially than either of the other co-management regimes examined in this essay, although the level of secure funding was fixed with no provision for inflation. Native members of the board did win a small increase in their per diem pay in 1986, but not without a fight with government.[26]

Now in its fifth year of operation, the CMB is often heralded as a model of successful co-management in the North. In order to evaluate whether it deserves this reputation, we must ask

whether the signatories have forged a partnership that avoids the usual problems of dualism and creates an ecologically sound, efficient, equitable, and enduring management system.

From the outset, the board questioned the population predictions of biologists and deferred discussion of hunting quotas. Instead, it emphasized harvest studies to be conducted by native communities with government funds. It initiated estimates of user needs (numbers of caribou required by hunters to support their families), and improved caribou population surveys employing aerial photography, studies of herd recruitment, distribution, overlap, and mixing. The board determined that the optimum herd size would be 300000 for each herd (or 330000 for the Beverly herd if it is to be used by the people of Fort Chipewyan) and that emergency action to protect the herds would only be necessary if either herd fell below 150000. While these decisions were being made, caribou populations showed signs of a substantial increase. Improved census-taking techniques documented the increase and made difficult allocation issues unnecessary, at least for the time being.

Freed from any immediate crisis, the CMB has been able to address problems of caribou habitat protection and predation as well as to plan for the future. Since users had long attributed decreased caribou numbers in northern Manitoba and Saskatchewan to habitat destruction caused by fires, the board initiated a study of the effects of fire on caribou and habitat and recommended that governments implement a short-term fire management strategy on the winter ranges. In the area of fire protection, native interests must compete with the interests of towns, as well as timber and industrial facilities, and government agencies have not yet changed their budgets or priorities for fire protection despite CMB recommendations. Similarly, the board's recommendations for permanent protection of the calving grounds have not yet produced results.27 But the board has achieved some influence over industrial activities. In response to the Baker Lake court injunction, the Government of the Northwest Territories (GNWT) and DIAND established Caribou Protection Areas and limited construction, mining, and other potentially damaging exploration activities in or near critical areas

during calving, immediate post-calving, and migration periods.[28] At its August 1987 meeting, the board finally approved its long-term management plan (subject to annual review).

The CMB has taken steps to avoid misuse of caribou and ecological problems as well as to reduce tensions between indigenous and state systems by ensuring that traditional knowledge of caribou is transmitted to younger generations along with relevant biological training. The board ordered the development of an innovative elementary and high school education programme that has been adapted for use in adult education, and the board has initiated programmed to reduce waste through used education.

The caribou management regime ended a "long period of claim and counterclaim [that had] fostered a climate of confrontation."[29] Now, government scientists and managers work co-operatively with native users through the mechanisms of the regime. Native knowledge regarding caribou health, numbers, migratory patterns, and behaviour over the last several centuries is now integrated with techniques of biologists for gathering current data. In the view of the executive secretary of the board, native members, who are all knowledgeable hunters, have provided remarkable expertise to governments from the first meeting. One small example is that of a native board member who also operates a commercial air charter service and flew one of the planes during an aerial caribou population survey. His years of experience as a hunter and flier in the region enhanced the research. Reporting on harvested numbers of caribou improved dramatically following creation of the board; the known harvest figures doubled for the 198 1–82 period over previous estimates.

Although tensions between government agencies and native users have largely subsided, non-native users, who are not directly represented on the CMB, have vocalized their discontent with the regime. In February 1987, the NWT Wildlife Federation called publicly for direct representation of non-native resident hunters on the board.[30] Until the "caribou crisis", non-native resident hunters were permitted (by the GNWT) to take five caribou a year. GNWT wildlife managers reduced the bag limits. In April 1987, the board recommended restoration of the prior five-caribou quota. The

level of harvest desired by non-native residents of the Keewatin is small (300 to 400 caribou as compared with a region-wide harvest of more than 19 000), Although the board defused the current controversy by recommending an increased quota for resident, non-native hunters, as the number of non-Native hunters increases, they may threaten the stability of the current regime. The board also approved two small, trial, commercial harvesting programmed that aim to provide fresh meat for local use (primarily by hospitals, the elderly, and those unable to hunt for themselves). Commercialization of caribou is a controversial issue throughout the Arctic, and the approval of these commercial quotas (for a total of 550 caribou) is a cautious entry into a new area. The board's ability to resolve issues surrounding non-native hunting and native commercial harvesting could affect the regime's continued viability.

The CMB has not been severely tested by the kind of controversy that would erupt should current caribou populations plunge. Nevertheless, the board's ability to avert a perceived ecological crisis and to move forward to long-range management planning is a testament to its success. Overall, the CMB has avoided problems of compliance with state-imposed hunting restrictions, reduced the possibility of future ecological crises, increased user–government co-operation, dramatically increased education and information to users of all kinds, improved the quality and content of research, and avoided unreasonable political and economic costs.

What accounts for these successes? Above all, the agreement provides a significant role for indigenous users. Although the CMB's authority is technically advisory, its decisions, at least on wildlife conservation issues, are taken seriously by the relevant governments. This may be due in part to fortunate political circumstances. One of the government parties to the regime, the GNWT, represents a predominantly native population holding a majority of seats in the Legislative Assembly. In recent years, natives have, at different times, held the posts of minister and deputy minister in the Department of Renewable Resources of the GNWT, the agency with authority to regulate caribou hunting. Today, much of the caribou research is conducted by the GNWT, and relations between GNWT researchers and user communities are good. Thus, in addition to the dominance of native-user representatives on the board and the user-oriented objectives of the regime, the political context in which the regime operates helps to ensure its success in creating a partnership between government and user groups.

of their greater familiarity with committee decision making machinery by co-ordinating with each

other in advance of meeting, then placing issues on the agenda and moving them through the process without adequate discussion and consideration. In some cases, the board makes the jobs of government officials easier by focusing criticism of unpopular decisions on the board.

Another reason for the board's success in creating "ownership" by the user groups is its extensive network of communication with local communities. Two of the board members (from Manitoba and Saskatchewan) are band chiefs, who must remain in touch with their communities to maintain their leadership positions. The Hunters and Trappers Associations (HTAs) in each of the Inuit communities are represented on the region-wide Keewatin Wildlife Federation (lONF), which maintains close ties with the two representatives it selects for board membership. 31 The long-term plan calls for a budget of $123000 (Canadian) annually for board liaison activities, including video and audio tapes, press releases, annual reports in English and native languages, community meetings, and visits to communities by individual board members. Every household in the region receives the bi-monthly newsletter, *Caribou News,* which has become a vehicle for discussion of important topics. Each issue contains some articles in native languages.

Another key component in this regime's success is continuity of member representation and staff, which has enabled the CMB to operate efficiently. The board elected the representative of the M&is Association of the N.W.T. as its first chairman. He has served at the board's pleasure wer since. Five of the eight original native members were still serving after four years, as were two of the five original government representatives (and one of the government alternates). One individual has filled the paid position of Executive Secretary from the outset. The board has demonstrated creativity and flexibility in responding quickly to changing economic and environmental conditions. When the board learned that aerial transport was leading to excessive and wasteful caribou hunts, it called for hunters to wait 12 hours after landing to begin hunting. When economic conditions changed, making the regulations not only unnecessary but also burdensome to subsistence hunters, the board rescinded its former ruling. The ability of the CMB to function effectively presents a

marked contrast to the Hunting, Fishing and Trapping Coordinating Committee created under the James Bay and Northern Québec Agreement (JBNQA) discussed briefly in the next case. The success of the CMB may be due to its more limited focus on a single species and the correspondingly smaller demand that board membership makes on the time and energy of native members, to the nature of the government participants, to differences in the non-native resident population, and to the historical context in which the regime arose. The question of the differences in performance of the CMB and the co-ordinating committee requires further study and is quite relevant to the question of whether new co-management regimes covering all wildlife in a particular geographic region can de designed effectively.

The Beverly–Kaminuriak caribou management regime appears likely to endure. Although caribou populations fluctuate dramatically under natural conditions, long-range management plans may help to stabilize populations and thereby avert allocation problems. Non-Native hunting and commercial harvesting issues will continue to test the ability of the board to deal with tough issues. Another threat may come from efforts to create another, potentially conflicting, co-management regime. The federal government and the Tungavik Federation of Nunavut (TFN), representing Inuit of the central and eastern Canadian Arctic in land claims negotiations for the region referred to as Nunavut, have signed a wildlife agreement in principle. This agreement calls for a wildlife regime covering all species in an area that overlaps geographically but is not identical with the domain of the CMB. If and when the Cabinet approves implementation of the wildlife agreement reached between TFN and the federal government (which TFN hopes will occur soon), TFN and the relevant government agencies will need to clarify the role of the CMB in relation to the Nunavut Wildlife Board.[32] Perhaps the CMB will simply add this new board to the list of government entities it advises, a solution that avoids controversy though it adds to the proliferation of duplicate institutions in a region already stretched for talent to fill all the posts.

The biggest threat to the regime comes from the apparent unwillingness of public authorities to act on the CMB's advice with regard to habitat protection. This undermines the good faith efforts of participants to the regime and raises questions concerning the commitment of government parties to the regime. As well, governments' failure to provide fire protection to the caribou range and to permanently protect regularly used calving grounds, as recommended by the board, may contribute to ecological crises in the future that the board is powerless to prevent. In another period of declining populations, users would be unlikely to accept harvest restrictions when declines may have been triggered by the unwillingness of governments to prevent habitat destruction.

None of these threats need undermine a regime that has removed many of the pre-existing problems associated with the operation of dual, and incompatible, caribou management systems. The caribou management agreement can be terminated easily by any of the government signatories (after six months' notice in writing to the other parties). For the present, the benefits that all parties to the regime have reaped are likely to impel them to reach consensus on difficult issues, to resolve possible jurisdictional conflicts with the Nunavut Wildlife Board, to push harder for habitat protection, and to renew the agreement before it expires.

7. Co-Management of Beluga Whales in Northern Quebec

After scientists documented a need to reduce hunting in northern Quebec to conserve beluga whales (white whales),[33] the government agency with jurisdiction to manage belugas in Canada, the Department of Fisheries and Oceans (DFO) encouraged and advised Anguvigaq, a native organization composed of hunters, to create and implement a beluga management plan. In August 1986, DFO adopted that plan as its own, thereby creating an informal co-management arrangement later formally approved by the Hunting, Fishing and Trapping Coordinating Committee for the region. This innovative arrangement between DFO and Anguvigaq supplements the formal regime instituted by the JBNQA and solves some of the problems associated with the co-ordinating committee.

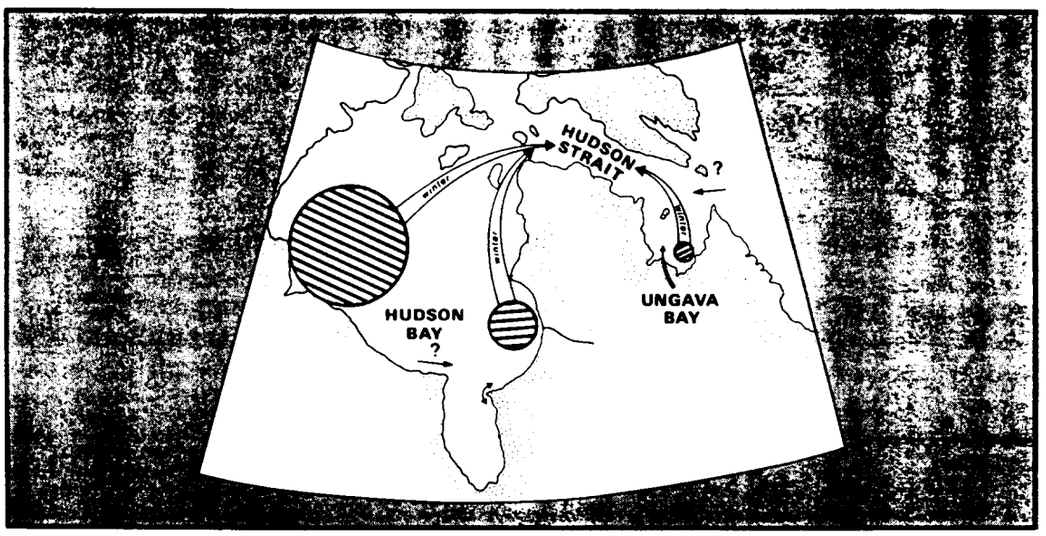
DFO has jurisdiction to manage marine resources throughout Canada, subject to a broad co-management regime for two-thirds of northern Quebec. That regime was created in 1975 as part of a comprehensive land claims agreement, the JBNQA, between the federal government, the provincial government, and native peoples (Inuit of northern Quebec and Cree of James Bay). The JBNQA, Section 24, spells out a system of rights and obligations of the parties as well as procedures for collective decision making. The agreement guarantees natives priority in harvesting all species for subsistence, in conformity with the principle of conservation, and exclusive rights to harvest certain species. In the case of beluga, hunting may not be opened to non-natives unless the beluga population can support an annual harvest of more than 476 whales (the level harvested by natives at the inception of the JBNQA). The agreement also prevents any federal or provincial regulation of native wildlife harvesting except when necessary for conservation purposes, interpreted by DFO to involve both ecological protection and maximum sustainable use.[34] General principles of the JBNQA state that regulation of native harvesting shall be minimal and less restrictive than regulation of non-native harvest activities.[35]

The agreement created a Hunting, Fishing and Trapping Coordinating Committee of 16 members—half government and half native representatives. The original composition of the committee

changed in 1978 when the Northeastern Québec Agreement added Naskapi representatives. The committee now has three Cree, three Inuit, two Naskapi, four provincial, and four federal representatives. The co-ordinating committee makes decisions by majority vote. In matters of primary interest to Inuit, the Inuit cast all eight native votes; likewise, on matters within federal jurisdiction, the federal representatives cast the eight government votes (Section 24.4.4).

All hunting, fishing, and trapping regulations relating to native people proposed by government agencies must be submitted to the co-ordinating committee for its advice before enactment.[36] Although the co-ordinating committee's recommendations are only advisory, they are intended to carry great weight with the responsible ministers. The co-ordinating committee holds lengthy meetings about four times a year, though it met 10 times in 1986. The committee has been hampered by the lack of a connecting link to the communities. Initially, the Inuit chose hunters from different regions to serve as representatives, but scheduling conflicts, language barriers, and the inability of most Inuit hunters to participate effectively in a non-native forum led to a change in representation. Now, Inuit who are full-time employees of the Makivik Corporation (the native corporation created under the JBNQA) fill the Inuit slots, accompanied by non-native advisers.[37] Federal government representatives have expressed disappointment that Inuit representatives are not the more experienced hunters who could provide first-hand knowledge of native practices and needs. The co-ordinating committee has not become a forum for relaxed communication and co-operation, but rather a political body in which many votes split evenly, the government on one side, the natives on the other. Additionally, both agendas for meeting and minutes are in English, creating obstacles to consistent Inuit participation. Some criticize the committee for dealing at length with details while seldom reaching closure on major issues. Both government and native representatives admit it is a cumbersome and inefficient group, which has suffered from low motivation and frequent turnover of membership.[38] It is in the context of the failure of this regime to solve the problems caused by the dual indigenous and state systems that the beluga management arrangement developed.

Inuit of northern Quebec harvest several hundred belugas annually; for them it is nutritionally and culturally an important harvest. However, research sponsored by the World Wildlife Fund (WWF) Canada, and DFO resulted in recommendations by DFO and WWF to close the Ungava Bay region to all beluga hunting and to reduce the harvest from eastern Hudson Bay and Hudson Strait[39] (see Map 2).



Beluga stocks, summer and main winter concentration areas.

Source: Breton, Smith, and Kemp, Studying and Managing Arctic Seals and Whales (DFO 1984) 29.

Map 2

In 1983, about the time that DFO expressed concern for beluga stocks, Makivik Corporation and the Kativik Regional Government (the regional government for Inuit communities chartered by the government of Quebec and created under the JBNQA) formed Anguvigaq Wildlife, Inc., a native organization devoted to wildlife management, composed of representatives of wildlife committees (created at the same time) in every community of northern Quebec. While presenting the co-ordinating committee with research showing a need for harvest restrictions on belugas, DFO'S senior adviser responsible for beluga management met directly with Makivik and Anguvigaq.[40] DFO welcomed Anguvigaq because it solved the problem of identifying appropriate individuals with whom to work at the community level.

DFO officials also contracted with Makivik Corporation for Anguvigaq to carry out harvest studies, and discussed research with the communities through the local wildlife committees. Initial exchanges of information among hunters, government researchers, and managers led to DFO to publish an information booklet on the biology and management of arctic seals and whales.[41] The book presents basic biological and harvesting information in English and Inuktitut (the first language of most Inuit in northern Quebec) in a format that is easy to follow and well illustrated. Hunters and managers discussed the research data and management options for beluga whales and agreed to work co-operatively toward their common goals-ensuring beluga conservation and long-term harvesting.

DFO chose to guide the users by providing information on the species and management techniques and encouraging the users to adopt management measures. DFO avoided imposition of regulations, contingency plans, or enforcement actions, options allowed as a last resort under Section 24.3.30 of the JBNQA. The local wildlife committees (Anguvigapiks) adopted rules protecting beluga females accompanied by calves and requiring hunters to harpoon before shooting to improve rates of retrieval. The latter rule, if followed, would entail a significant change in modem hunting practice. Two Ungava Bay communities established a beluga sanctuary within which "no

one may attempt to hunt, disturb or harass any whales . ...” In 1986, three years after the first meetings concerning beluga management, the wildlife committees and Anguvigaq established harvest quotas for each of three regions and for each community. These quotas limit the harvest to 200 belugas, a significant reduction from a mean annual catch of 310 between 1981 and 1985. Although DFO identified numerous management techniques for protecting belugas (including closed seasons and managing specific areas by selective closing), the hunters decided to use quotas to reduce the harvest in all regions, not only in Ungava Bay where the belugapopulation appears most depleted. In this way, hunters explained to DFO managers, Inuit would share management responsibility as they have always shared food. Although hunters had been uncomfortable about counting belugas early in the research phases (stating how many animals you expect to kill shows disrespect for the prey), they have adopted a management system dependent on counting yet hinged on an important Inuit value—sharing.

DFO published the Northern Quebec Beluga Management Plan for 1986-really a compilation of the specific local management plans and agreements adopted by each local wildlife committee and the executive members of Anguvigaq, as well as the few laws applying to belugas throughout Canada and, specifically, in northern Quebec. Regulations prohibit non-native hunting of beluga in northern Quebec, since the entire harvest is allocated to native people. The management plan, in effect, spells out the regime’s rules, as well as the rights and obligations of those interested in using the resource. DFO submitted this management plan to the co-ordinating committee for review. The coordinating committee passed a resolution commending DFO and Anguvigaq, supporting the plan, and encouraging continued co-operation and research. This resolution approved the approach taken by DFO and endorsed the participation of Anguvigaq. The management plan does not define procedures for making collective decisions affecting the interests of government actors, Anguvigaq, and individual users. But the informal procedure that led to the creation of the 1986 management plan could become a pattern for future collective decision making.

Although not formalized by an agreement, an innovative partnership has been forged by DFO with the user groups, which, hopefully, will avert problems of compliance, ecological crisis, inadequate or inaccurate harvest and research data, and unnecessary political and economic costs. The communities of northern Quebec have begun to reduce their harvest. In the most critical region, they have not terminated the harvest as recommended by biologists, but have set their own quotas and, in the first year, stayed within the overall harvest limit (although some communities exceeded their village quotas). Participating communities pressured the one community that most resisted restrictions the first year. Now, that community is more willing to co-operate. Since this is the first subsistence activity to be actively managed in the region, DFO believes that hunters, who at first did not respect the system, need time to adjust to it. Anguvigaq's actions to date have been praised by the WWF. Although some would prefer an approach that takes even greater precautions to protect the beluga stock of Ungava Bay, the current management plan has the advantage of support and involvement of the users.

The main stumbling block between DFO and Anguvigaq concerns regulations for harvesting belugas in Ungava Bay. Researchers believe that these belugas constitute a separate and very depleted stock which mingles with other beluga stocks in Hudson Strait. In 1986, Inuit from Ungava Bay communities took 42 belugas. The management plan permitted only 23 of those to be taken from Ungava Bay; the rest were to be taken from Hudson Strait. But DFO believes that hunters did not go the much longer distance to Hudson Strait, whereat least some of the whales harvested could have come from the less threatened stocks of Hudson Bay. Due to the continuing conflict over appropriate regulations for Ungava Bay, DFO and Anguvigaq had not, by June 1987, agreed on a management plan for the year. (Inuit hunt in Ungava Bay from July to early September.)

Information and education, rather than regulation and enforcement, are the main management tools of this regime. Personal communication between the managers and researchers and the users

plays a major role. Secondary schools throughout the region use the beluga pamphlet in an ecology class, and the regional school board plans to introduce it into adult education classes in the future.

The informal arrangement between DFO and Anguvigaq has proven more efficient and effective than the formal mechanism of the co-ordinating committee. It has reduced hostility and increased communication between government regulators and users, though it has not entirely removed tensions between the two, especially regarding research. Inuit do not distinguish between research and management, but DFO compartmentalizes research and management into separate divisions. Efforts of the managers (in the operations branch) to promote co-management do not necessarily carry over to the research branch of the department. DFO, Anguvigaq, and Makivik's research department have not yet agreed upon the appropriate role of Inuit in research. Nevertheless, Inuit are participating in some important aspects of research. Anguvigaq officials, for example, collected the harvest data from 1986.

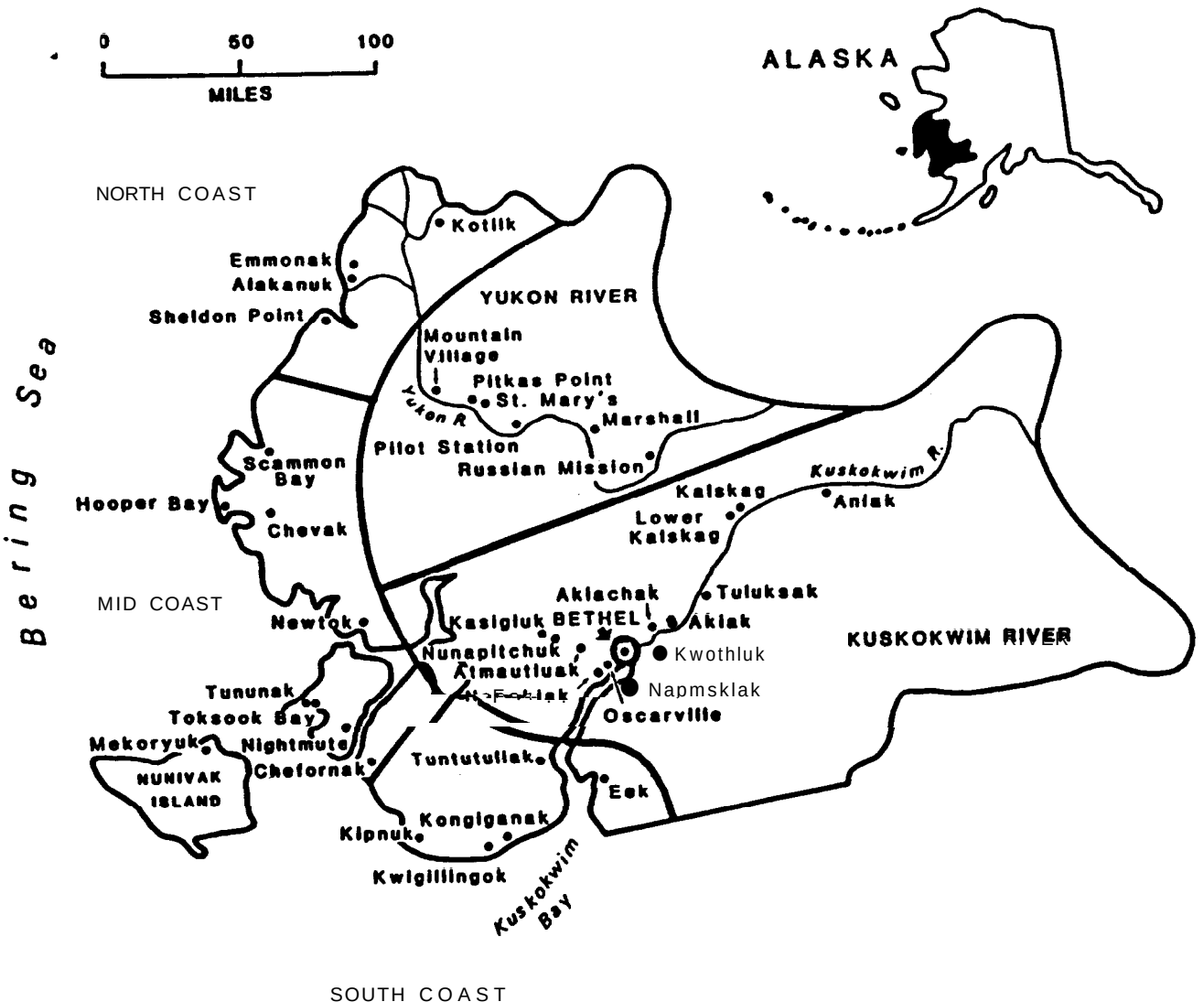
The arrangement for beluga management nested within the larger hunting, fishing, and trapping regime for northern Quebec has solved many of the problems of dualism, but Anguvigaq's participation in the regime is not entrenched, and its funding is not guaranteed. Anguvigaq is funded jointly by Makivik Corporation and the Kativik Regional Government (KRG) and has received substantial contracts, as well as contributions to expenses, from DFO. Since the KRG funds local governments (municipal corporations), some mayors and local officials may fear that support for Anguvigaq and local wildlife committees will reduce their revenues. Anguvigaq's leaders are well aware that they face power struggles with municipal corporations and, potentially, with the co-ordinating committee that could reduce their role in the decision-making process. Anguvigaq's participation in the regime also depends on the good will and understanding of individuals in DFO, since its participation is not specified in the JBNQA. Though the communication and co-operation already begun appear likely to continue, clear authority and secure funding for the Inuit organization most responsible for creating a management plan and reducing hunting pressure on beluga

8. Co-Management of Migratory Geese in Alaska's Yukon–Kuskokwim Delta

In 1984, the U.S. Fish and Wildlife Service (FWS), fish and game departments in Alaska and California, and organizations representing tribal governments in south-western Alaska formed a co-management regime to deal with declines in four species of migratory waterfowl along the Pacific flyway. The coastal plain of the Yukon–Kuskokwim Delta (Y-K Delta) in south-western Alaska is the nesting grounds for virtually all cackling Canada geese and Pacific flyway white-fronted geese, 75 percent of the emperor goose population, and 50 to 60 per cent of the black brant population.[42] The region is also the homeland and hunting grounds of approximately 18000 Yup'ik Eskimos of Alaska (see map 3). Since 1918, the Migratory Bird Treaty Act (MBTA) has banned taking any of these birds or their eggs between 10 March@& 1 September.[43] The closed season would virtually prohibit spring and summer native egging and hunting, as the relevant species arrive in the delta in mid to late April and fly south in late September or early October. However, geese are an important source of fresh meat and eggs for natives during the time between "sealing and salmon fishing. A sizeable hunt, as well as egg collection, has always occurred.[44]

The four species of geese have all suffered sharp declines in population over the last 20 years, declines attributed to harvesting in the Y–K Delta together with sport hunting along the flyway, loss of habitat, pollution, and natural predation.[45] Public authorities have not attempted to enforce the hunting ban since the early 1960s, when enforcement actions triggered hostility.[46]

Government managers eventually recognized the impossibility of protecting the geese without co-operation from native users. In 1982, FWS solicited co-operation from delta hunters in reducing harvests of white-fronted geese, and many hunters voluntarily co-operated.47 Beginning with the Hooper Bay Agreement in 1984, government agencies and native organizations created a co-management regime for the Y–K Delta, which, when modified in 1985, became known as the Yukon–KuskokwimDelta Goose Management Plan (YKDGMP).[48] This document, signed by FWS, the Alaska Department of Fish and Game (ADF&G), the California Department of Fish and Game



Communities and Strata, Yukon Delta National Wildlife Refuge

Source: John D. Copp and Brian J. McCaffery, Results of the 1986 Survey of Waterfowl Hunting on the Yukon-Kuskokwim Delta, Alaska (FWS, 10 June 1987) 14.

Map 3

(CDFG), the Association of Village Council Presidents (AVCP)—a native organization representing tribal governments in south-western Alaska—and its Waterfowl Conservation Committee (WCC), establishes the rights and obligations of the parties, rules regarding sport and subsistence hunting, and procedures for collective decision making.

Parties to the YKDGMP aim to restore and maintain the four species at "optimum population levels". The plan specifies population objectives for each species, population levels below which hunting should be halted, and mid-range levels at which hunting may resume. The parties agreed to stop harvesting Canadian cackling geese altogether, cease hunting the other-three species during nesting, rearing, and moulting, and ban all egg-gathering. The government parties agreed to reduce bag limits for sport hunting of these species in Alaska and along the flyway and to prohibit hunting of cacklers. The parties endorsed amendments to the plan for 1986 to terminate all hunting of emperor geese, in response to evidence that the emperor population had dropped below minimum levels.

In Alaska, the regime relies largely on voluntary compliance with hunting restrictions and depends on social control mechanisms of the indigenous communities. FWS, ADF&G, AVCP, and Nunam Kitlusisti, a Y–K Delta organization dedicated to protection of the environment and native hunting and fishing rights, formed the Information and Education Task Force to explain the need for and provisions of the YKDGMP and to encourage compliance with it.[49] The task force has produced materials for television, radio, newspapers, magazines, and school programmed. It arranges meetings in villages and schools, holds environmental education workshops for teachers, and (together with the National Audubon Society) has sponsored a poster contest.

FWS, ADF&G, AVCP, and WCC signed a supplemental agreement in March 1985 that deals with monitoring, verification, and enforcement of hunting restrictions. All suspected violations must be reported to the FWS refuge manager and AVCP. Representatives of the four signatories then meet jointly with the village government when an incident occurs. The arrangement reserves cita-

tions, confiscation of illegally taken birds and eggs, and judicial action for extreme cases, defined as recurring non-compliance, blatant violations, use of charter or private aircraft to assist in hunting, and requests by a local village government. To date, FWS has issued three citations (stemming from a single incident) with the unanimous consent of the village council. In 1985, a total of 17 incidents were reported, eight by the violators themselves.[50] In 1986, there were only three or four reported incidents, and to November 1987, only two (one in which the village does not want to meet, as called for by the plan). FWS officials believe that there is increasingly poor compliance in reporting violations.

The YKDGMP envisions habitat improvement along the flyway, including acquisition of additional winter habitat, designation of some wintering areas as sanctuaries from hunting, and improvements in water quality. Progress has been slow in addressing high levels of pesticides and selenium concentration in California wetlands and throughout the West from agricultural run-off that causes bird deformity and mortality.[51] Efforts by environmental organizations and the California Water Resources Board to improve water quality have met with strong opposition from agricultural interests. Some residents of the Y–K Delta believe that native hunters are being used to give the appearance that the federal government is responsive to migratory bird declines, when the more critical problems are not caused by native hunters but by habitat destruction and contamination of the wintering grounds, as well as by sport hunting in California.[52] Native organizations fought, unsuccessfully, to include Mexico in the regime, but extension of the plan is contingent upon FWS periodically supplying information on harvest levels of black brant in Mexico and all parties working for reductions in that harvest if it is "significant".

Government agencies are obligated to supply native parties with research data and to include AVCP and WCC in discussions of biological research and all phases of goose management. And the parties agreed to co-operate to develop a comprehensive plan to improve migratory bird scientific research.

State and federal public authorities question the term "co-management" in so far as it implies joint management authority. They prefer to refer to the YKDGMP as "co-operative management and improved communication". Although the agreement does not transfer management authority to Native organizations or even give them equal power, it does create obligations and expectations for all parties. If one party withdraws from the YKDGMP or fails to fulfil its obligations, presumably, the other parties are also freed from their obligations to co-operate. Thus, the definition of co-management employed here applies to the YKDGMP.

In addition to government's usual reluctance to relinquish any control, FWS has been careful to avoid any explicit delegation of authority to AVCP and WCC, given its uncertain legal authority to allow any hunting between 10 March and 1 September. This is especially understandable in light of litigation over the YKDGMP. Two Alaska sport hunting organizations challenged the plan in federal court as a violation of the MBTA and other statutes. FWS prevailed in the lower court when Judge von der Heydt held that the Alaska Game Law of 1925 (AGL), 53 which contains an exemption permitting Alaska natives, prospectors, and travelers to take migratory waterfowl and other wildlife whenever they are in need of food "and other sufficient food is not available", supersedes the MBTA for purposes of subsistence taking of birds in Alaska. However, in October 1987, the Ninth Circuit Court of Appeals disagreed and found that the AGL did not supersede the MBTA. The Ninth Circuit determined that subsistence hunting regulations must be in accord with the most restrictive of the four migratory bird treaties. Thus, the Secretary of the Interior cannot permit closed-season subsistence hunting. On the other hand, the appeals court said that the Secretary has absolute discretion regarding enforcement.[54] As of mid-November 1987, FWS was planning to develop a law-enforcement plan "in consultation with everyone" that would be in accordance with the appellate court decision.[55] While FWS cannot formally continue the YKDGMP, the agency may use its discretion in the area of enforcement to proceed with some aspects of the plan.

The YKDGMP has resolved many of the problems that existed prior to this regime. In four years, hunters have reduced their take of all four targeted species[56] and government/native communication and co-operation have improved markedly. The data suggests a direct link between native and sport hunter compliance with the ban on hunting cacklers and the rising cackler population. Harvest studies estimated a 56 per cent overall reduction from 1980 to 1985 in native harvests. (Native hunters took about 1500 cacklers in 1985, as compared with 6100 in 1980.)[57] Native harvesting of three species continued to decline (an average of 26 per cent) in 1986; however, natives shot 39 percent more cacklers in 1986 than in 1985.[58] Yup'ik hunters have reduced the number of goose eggs taken from more than 15000 in 1981 to about 1600 in 1986 (of which an estimated251 were from the four restricted species).59 This demonstrates a remarkable change in behaviour, attributable, in large measure, to the YKDGMP. Variations in the availability of 19 species of migratory birds taken in the Y–K Delta may account for some of the harvest reductions. However, reduced hunting of YKDGMP species appears to be linked to increased hunting of other migratory bird species, and compliance with the YKDGMP is a major reason for the overall reduction in harvests of restricted species in 1986.

The regime survived a major test in 1986 when AVCP and WCC agreed to a total ban on the harvesting of emperor geese. Researchers reported that emperor geese had dropped below the minimum population level specified in the YKDGMP, a level below which the plan prohibits hunting. Nevertheless, federal managers sought the approval of WCC and AVCP. WCC requested that FWS hold meetings in 13 of the communities most dependent on emperor geese. Following these meetings, the WCC made the difficult decision (through their usual consensus process) to approve a complete ban.[60] Rather than abandoning the regime or acting unilaterally, all parties concurred in this collective decision. Unfortunately, hunters in some communities never accepted the validity of FWS's figures and believed that the WCC was unfairly coerced into concurring. [61] If this view is widespread, it could result in reduced compliance and, ultimately, undermine the regime.

The main threats to the stability of the regime come from resistance by a powerful sport hunter lobby (and its recent success in court), reliance on insecure sources of funding for native participants, and continual tensions between research biologists working in the Y-D Delta and native users. Steady reductions in native harvesting of the four species covered by the plan and increasing geese populations are the best counters to the first threat. The sport hunter lobby is not monolithic, and the agreement enjoys the support of major national environmental organizations, such as the National Audubon Society, as well as waterfowl hunting organizations in California. FWS held hearings in early 1987 throughout Alaska in relation to the promulgations of new state-wide regulations for subsistence hunting of migratory birds. FWS used these hearings, in part, to dispel concerns about the YKDGMP. Despite these efforts, supporters of the regime must overcome strong opposition by the National Rifle Association and other organizations that have successfully opposed the YKDGMP in court and lobbied to stop Senate ratification of a protocol amending the Migratory Bird Convention with Canada to allow out-of-season subsistence hunting.

While FWS allocates substantial sums to YKDGMP programmed, native participants depend on the state legislature and government grants to cover many of their expenses. FWS funds the bulk of expenses for information and education activities, covers travel and expenses for Native participants at some meetings, and uses their own native participants at some meetings, and uses their own native employees to ensure that information materials are appropriate for a Yup'ik audience. . WCC, NK, and AVCP receive and comment on FWS materials and attend task force meetings but are unable to participate fully in the development of those materials due to limited staff. In 1987, the Alaska State Legislature appropriated $25000 for travel costs and per diem expenses of WCC members, but the ability of the state to continue funding in a period of seriously declining state oil revenues is questionable. In 1986, a federal Bureau of Indian Affairs grant provided small stipends for WCC members and partially funded AVCP'S natural resources co-ordinator, but this grant was not renewed for 1987. Steady and secure funding of native participants is necessary to ensure the continued partnership. Government parties should consider at least funding the information and

education task force in a manner similar to the funding arrangement for the Beverly-Kaminuriak Caribou Management Board.

Unfortunately, mutual respect for knowledge contributed by each party has been slow to develop in the Y-K Delta. Some natives believe the decline in geese is related to the arrival of biologists on the delta. In recent years, National Wildlife Refuge managers have reduced the number of research camps and researchers permitted in the delta during the summer, but many natives question whether the researchers comply with the agreement by all parties to refrain from unnecessarily disturbing the geese. Many elders, in particular, regard techniques such as capturing and tagging or writing on eggs as intrusive and believe that the researchers hamper the birds' reproductive success. Hiring native assistants has not healed the rift. Since the success of the YKDGMP depends on the acceptance by villagers of the biologists' data and willingness to accept hardships on account of that data, continued complaints about researchers maybe a bad omen.

A long history of mistrust of wildlife managers is not easily overcome in a few years. The difficulties encountered by researchers in gathering information for the 1986 harvest study (including the refusal of five communities to participate, high turnover of village survey workers, and ambivalence of those questioned with regard to responding to survey questions) demonstrate that mistrust continues.[62] Nevertheless, reduced harvests, remarkably high return rates for the 1986 harvest survey forms, and enthusiasm expressed by representatives of all parties to the regime indicate that the regime is working.

For the regime to endure in its current form, FWS must either manoeuvre around the substantial legal obstacles embodied in the recent court decision or remove those obstacles. The most direct way to achieve this, although not the easiest politically, would bring the U.S. migratory bird treaties with Canada and Mexico into line with the treaties with the Soviet Union and Japan, thereby allowing FWS to permit a regulated spring and summer subsistence hunt.

9. Lessons forthe Future

Neither the indigenous system nor the state system alone can protect northern wildlife and ecosystems, much less generate efficient and equitable wildlife management. Government agencies cannot implement and enforce their regulations without native co-operation, and natives cannot protect the resources or guarantee access to those resources without the co-operation of government agencies. By creating co-management regimes that meld the two systems, both groups gain.

The cases examined in this essay indicate that co-management in the North American Arctic has produced improved communication and understanding between native users and public authorities. In addition, the cases suggest that co-management has changed hunting practices in the interests of protecting declining species. In the Y-K Delta, users stopped collecting thousands of eggs and reduced harvests of migratory waterfowl covered by the regime. These changes contributed to an increase in the population of Canadian cackler geese in 1986, which reversed a long, serious decline in the species. Inuit in northern Quebec voluntarily cut their harvest of beluga whales by a third. These are impressive changes, especially in light of the history of non-co-operation between government agencies and user groups. The fundamental reason for co-operation is that both sides realize they need each other in order to protect resources they both value.

Since experience with wildlife co-management in the North American Arctic is brief, the conclusions we can draw are only half-time scores. Though the hunting, fishing, and trapping regime established under the JBNQA is 12 years old, the beluga management plan is just over a year old. The Yukon-Kuskokwim Delta goose management regime entered its fourth year in 1987, and the Beverly-Kaminuriak caribou management regime has operated for five years. Despite these short lifespans, the record does suggest one overriding conclusion. Co-management can help to overcome problems caused by conflicts between indigenous and state systems of wildlife management. To do so, however, government administrators and indigenous users must form a partnership in which the user groups gain a sense of ownership and responsibility for the system's success. To acquire a stake

in the success of the regime and a reason to comply with its rules, user groups must take part in a collective decision-making process in which all parties concur with major decisions.

The cases suggest that four ingredients are essential to creating such a sense of ownership:

(1) The regime must have strong support from and a link to the villages. Representation of users on a regional body alone is insufficient to ensure that the indigenous system is melded into the regime. The communities have, in some cases, adopted management tools characteristic of the state system, but they must be able to adapt these tools to their own circumstances as well as to employ the techniques of the indigenous system to make the regime work.

(2) Users must be granted a decision-making role in shaping and operating the regime from research design to enforcement. Participation by natives as research assistants is useful. But to obtain the benefits of co-operation, biologists must work with native users to design studies that integrate the indigenous **diachronic** database with their own **synchronic** studies. When it becomes necessary to reduce harvests, indigenous users emphasize information and education activities that establish new behavioral norms rather than the state system's usual enforcement tools. Although users may adoopt management techniques, such as quotas and bag limits, they are likely to adapt these to suit community lifeways.

(3) Governments must provide adequate funding for the operation of the regime. They must ensure support for participation of local hunter and trapper or wildlife organizations, as well as for the joint regional boards that administer the regime or regional native organizations that represent user communities.

(4) Cultural and linguistic barriers to native user participation in administrative arrangements must be removed. For example, meetings should take place in northern communities, interpreters should be provided, information should be transmitted in native languages, and indigenous ways of reaching collective decisions should be incorporated into the management system.

Bearing these lessons in mind, what can we say about the potential of co-management as a means to handle a variety of cases involving other wildlife species, resources, and geographic regions? Co-management arrangements already exist for specific wildlife populations (of caribou, belugas, migratory waterfowl, bowhead whales, and Pacific walrus).[63] Under the 1987 Agreement on the Conservation of the Porcupine Caribou Herd, Canada and the United States are in the process of setting up an international regime for managing the Porcupine caribou herd which includes representatives of native user groups. An international regime involving native users is also necessary for managing the Pacific walrus. And it is to be hoped that parties to the 1973 international Agreement on the Conservation of Polar Bears[64] will create a mechanism for the full participation of native user organizations in decisions regarding polar bear management. The broad hunting, fishing, and trapping regimes established under the JBNQA and the Inuvialuit Final Agreement have the potential to produce effective co-management of terrestrial and marine species, as does the Nunavut wildlife regime now awaiting implementation. Collaborative research between the Canadian Wildlife Service and Makivik's research department, for example, could lead to further co-operation in eider duck management under the broad outline of the JBNQA's hunting, fishing, and trapping regime.[65]

Co-management regimes involving native groups need not be limited to issues relating to wildlife. For example, fiie management in Alaska is co-ordinated by the Alaska Interagency Fife Management Council which is composed of federal and state agencies and regional native corporations, and area fire planning teams include native associations and villages as well.[66] Co-operative fire protection arrangements now cover 350 million acres in Alaska, at a savings of $2 million to $3 million annually. In the lower 48 states, tribal and state governments regularly enter into co-operative agreements to provide communities with policy and fire protection, as well as other services.

Through the Canadian comprehensive land claims process, both renewable and non-renewable resources on Crown lands throughout the N.W.T. may come under co-management arrangements.

TFN and federal negotiators have already agreed to provisions for co-management of lands and waters as well as co-operative environmental impacts assessments. Inuit negotiators seek to establish a joint government-native Nunavut Lands Authority (NLA) responsible for all development on federal Crown lands and oil and gas development under Inuit and municipal lands. The NLA would advise relevant authorities on administration, leasing, and licensing of development projects and deal with collection and sharing of revenues from development. TFN also seeks participation in decisions regarding development offshore.

Since mineral, hydrocarbon, timber, and hydrpower development can disturb wildlife and destroy wildlife habitat, we can expect parties to wildlife co-management regimes to seek a significant role in all renewable and non-renewable resource decisions either through existing arrangements or through new regimes that deal specifically with use of northern lands and waters for development.

Government officials often jealously guard their authority against encroachment by other agencies, and they are not in the habit of sharing power with those they have authority to regulate. Nevertheless, there is a growing awareness among those wildlife managers who spend time in native communities that involving native users in decision-making offers the only way to manage wildlife effectively.[67] The success of existing co-management arrangements has convinced many participants in such arrangements to consider handling other wildlife and resource management conflicts through co-management. The real question for the future, therefore, is not whether co-management regimes will increase in number and scope but whether the organizations created to implement them will work effectively. This essay should help those desiring to improve existing arrangements or to design new co-management regimes in the future.

Notes

1. Peter Usher coined the terms “indigenous system” and "state system” to contrast and compare two systems or ideal types of wildlife management in *The Devolution of Wildlife Management and the Prospects for Wildlife Conservation in the Northwest Territories,* (Ottawa: Canadian Arctic Resources Committee, July 1986), Policy Paper No. 3. Usher characterizes the two systems briefly (at pp. 2-4) and argues for integration of the indigenous system into the state system (see especially pp. 79–13 1). A capsule version of this paper appears in Usher, “Indigenous Management Systems and the Conservation of Wildlife in the Canadian North”, 15 *Alternatives (1987)* pp. 3-9.

2. The beluga case is part of a larger management regime covering hunting, fishing, and trapping created by The James Bay and Northern Quebec Agreement of 1975 (published by Éditeur officiel du Québec, 1976) [hereinafter cited as JBNQA].

3. For example, claims of one group of Inuit in the Northwest Territories (N. W. T.) resulted in the Inuvialuit Final Agreement of 1985, which, like the JBNQA, contains provisions for a co-management regime covering hunting, fishing, and trapping. See *The Western Arctic Claim* (Ottawa: Department of Indian Affairs and Northern Development, 1985).

4. Usher, (1986), pp. 2–3.

5. Philip Kugzruk, an Inupiat from Teller, made this comment in a class discussion regarding social norms in native communities.

6. Researchers estimate that smaller native communities depend on wild foods for upward of 50 per cent of caloric needs and often as much as 80 per cent of their protein, whereas larger communities (more than 1000 people) obtain at least 30 per cent of their caloric intake and half their protein from wild food. In addition to community size, road access, economic conditions, and other factors affect the level of dependence on wild food. Personal communication with G. Wenzel and P. Usher.

7. Usher (at p. 4) continues, "All members of the group are involved with management as well as with harvesting, but leadership and authority within the group are based on the greatest acquisition of knowledge and the demonstrated ability to use it effectively. "

8. Self-regulation is by no means limited to indigenous communities of the Far North. Many small-scale traditional or community-based fisheries and other natural-resource-based operations have demonstrated community self-regulation to avoid overexploitation of resources. For a discussion and references to some of these, see F. Berkes, "Fisheries and 'The Tragedy of the Commons'". 12 *Environmental Conservation 3 (1985)* pp. 199–206.

9. For a detailed discussion of these problems in the context of Alaska State hunting regulations, see P. Schaeffer, D. Barr, and G. Moore, ***Kotzebue*** *Fish and Game Advisory Committee Regulation Review: A Review of the Game Regulations Affecting Northwest Alaska* (Kotzebue: October 1986)

10. Ibid., p. 3.

11. The case study regarding eider duck research in northern Quebec contained in C.A. Drolet, A. Reed, M. Breton, F. Berkes, "Sharing Wildlife Management Responsibilities with Native Groups", forthcoming in *Trans. 52nd North American Wildlife and Natural Resources Conference (1987)* [hereinafter cited as Drolet], demonstrates the benefits of co-operative research design between biologists and native users.

12. The most noted case of outright hostility occurred in 1960. Two days after enforcement agents arrested a native representative to the state legislature for hunting ducks out of season, 138 other men shot ducks and showed up with them at the warden's doorstep. Robert D. Arnold, *Alaska Native Lund Claims* (Anchorage: Alaska Native Foundation, 1976) p. 54. This and other incidents are also reported in Steve Langdon, "Alaskan Native Subsistence: Current Regulatory Regimes and Issues" (paper prepared for Alaska Native Review Commission, October 1984), pp. 54, 55. Langdon (at p. 49) also chronicles the resistance of Inupiat whalers to quotas set for bowhead whales by the International Whaling Commission. After federal agents charged 20 people in five states in a "sting" on the illegal walrus ivory trade, the Alaska Eskimo Whaling Commission protested Fish and Wildlife Service's "cloak and dagger" tactics in dealing with the native community. *Tundra Times* (11 February 1981).

Recent court cases in which natives have challenged state and federal regulations and enforcement actions include *Bobby* v. *Alaska, No.* A84-544 (D. Ak. filed July 18, 1985); *State v. Eluska*, *698* P.2d 174 (CA Ak. 1985); Downey v. *Hodel* No. A86- 191 (pending D. Ak.); *John v. Alaska, No.* A85-698 (pending D. Ak.).

13. Mick Lowe, "Mounties ruffle many feathers in goose chase", *The Globe and Mail* (5 November 1987).

14. See the Yukon Act, section 17(3), and the Northwest Territories Act, section 14(3). Unfortunately, Métis and non-status Indians in the Yukon do not share the benefits of these provisions and must comply with the restrictions applied to non-native residents. The Department of Renewable Resources of the GNWT issues a general hunting licence (GHL) entitling the holder to unrestricted subsistence hunting for terrestrial species as well as participation in special programrnes to benefit native trappers. Four species have been declared "endangered" in the GNWT (polar bear, musk-oxen, wood bison, and barren-ground caribou), so some restrictions apply to native subsistence harvesting of these.

15. Thomas R. Berger, *Village Journey: The Report of the Alaska Native Review* Commission (New York: Hill and Wang, 1985), p. 171.

16. This type of exclusive jurisdiction occurs on some Indian reservations in the "Lower 48" and in Canada. See *Mescalero Apache Tribe v. New Mexico, 462* U.S. 324 (1983).

17. See Heather Noble, "Tribal Powers to Regulate Hunting in Alaska", *4 Alaska Law Review (1987),* pp. 223-275. The extent of tribal jurisdiction in Alaska hinges on the legal issue of which lands qualify as "Indian country" under the test for "dependent Indian communities". Ms Noble argues (at p. 252) that "ANCSA village corporation lands surrounding remote villages, which are used for sub-

sistence by Native village residents, should be considered to be dependent Indian communities." She does not discuss whether tribal jurisdiction might extend to ANCSA *regional* corporation lands. For other legal opinions on this issue, consult: T. Anderson and Larry A. Aschenbrenner, "Native GovernmentalJurisdiction" (unpublished paper, Native American Rights Fund, 31 December 1985); *Report of the Governor's Task Force on Federal–State–Tribal Relations* (Alaska Governor's Office, 27 March 1986); David S. Case, *Alaska Natives and American Laws* (Fairbanks: University of Alaska Press, 1984) chap. 10, pp. 435-511.

18. Under the Inuvialuit Final Agreement, Inuvialuit in the Northwest Territories received legal title (much of it with limited subsurface rights) to approximately 20 per cent of the area they traditionally used and occupied. This was a vast gain by comparison with the James Bay and Northern Québec Agreement of 1975 (JBNQA), under which Cree and Inuit of northern Quebec received ownership rights to the so-called Category I lands (only of the subsurface estate), amounting to less than 3 per cent of their traditional lands. JBNQA, section 24.5.

19. This definition draws heavily on the general definition of *regime* set forth in Oran R. Young, *Resource Management at the International Level: The Case of the North Pacific* (London and New York: Frances Pinter Ltd. and Nichols Publishing Co., 1977), pp. 44, 45 and Oran R. Young, *Resource Regimes: Natural Resources and Social Institutions* (Berkeley: University of California Press, 1982), pp. 15-18. The existing wildlife co-managed regimes do not specifically address the concerns of non-consumptive users. Rather, the government parties to these regimes must represent these interests. In some cases, the interests of environmental and recreational organizations as well

22. In 1980, scientific surveys estimated that the Kaminuriak herd had declined to between 33 000 and 45 000 animals. The 1982 visual survey, conducted in co-operation with users, showed a marked increase. In 1984, biologists using aerial photographic techniques as well as visual surveys estimated the Beverly herd size to be between 250 000 and 420 000; in 1985, they confirmed that between 260 000 and 380 000 caribou used the Kaminuriak range.

23. "Users' Caribou Management B ard Proposed", 1 *Caribou News* 3 (October 1981), p. ..

24. Beverly–Kaminuriak Barren Ground aribo Management Agreement, section B.1.(a), in *Executive Summary of the Long-term Ma m Plan for the Beverly and Kaminuriak Caribou Herds* 1986), pp. 37–40.

25. Ibid., sec. Cl.

26. "CMB Honoraria are Out of Line," 5 *Caribou News 5* (February 1986), p. 2. Native board members now receive $127 (Canadian) per day during meetings.

27. "The Department of Renewable Resources has identified the calving grounds of both herds as 'Wildlife Conservation Areas' and plans to pursue special management of these areas within the context of the N.W.T. Conservation Strategy and Land Use Planning." Paul A. Gray, Habitat Management Division, DRR, GNWT, in a letter to the author (21 August 1987).

28. Ibid. The measures are not designed to mitigate the long-term impacts of permanent or semi-permanent mines on the calving grounds. Rather, they address temporary exploration activities.

29. *Executive Summary,* p. 2.

30. See letter of Doug Barbe in 6 *Caribou News 5* (February 1987) p. 2. The federation withdrew this letter before the board met.

31. Despite the similarity in name, the Keewatin Wildlife Federation is not an affiliate of the Canadian Wildlife Federation (CWF); rather, KWF is a native organization representing native hunter and trapper interests.

32. For a discussion of the issues involved, see Michael Roberts, "NWT Land Claims and Caribou", 4 *Caribou News 4 (1984),* pp. 14-15.

33. For more information concerning distribution, population size, stock identity, and Inuit use of belugas in northern Quebec, see K.J. Finley, G.W. Miller, M. Allard, R.A. Davis, and C.R. Evans, "The Belugas (*Delphiapterus leucas*) of Northern Quebec" (Can. Tech. Fish. & Aquat. Sci. No. 1123, DFO, Winnipeg, November 1982)

34. The JBNQA, section 24.1.5, defines conservation as "the pursuit of the optimum natural productivity of all living resources and the protection of the ecological systems of the Territory so as to protect endangered species and to ensure primarily the continuance of the traditional pursuits of the Native people, and secondarily the satisfaction of the needs of non-Native people for sport hunting and fishing. "

35. JBNQA, section 24.3.30.

36. JBNQA, section 24.4.26. See also section 24.4.36.

37. Interview with Bill Kemp and Lorraine Brook, Makivik Research Department, February 1987.

38. For an evaluation of the Hunting, Fishing and Trapping Regime of the JBNQA written predominantly by government officials involved with it, see Drolet, "Sharing Wildlife Management".

39. World Wildlife Fund, *Whales Beneath the Ice* (Toronto, 1986) pp. 12, 29; *Northern Quebec Belugas Management Plan, 1986* (Quebec City: DFO, 1986) p. 34. Beluga stocks previously had been reduced by commercial harvesting operations of the Hudson's Bay Company in the 19th and early 20th centuries. Drolet, p. 9.

40. Other responsible officials within the Canadian Wildlife Service, DFO, and provincial agencies are also contacting Anguvigaq directly regarding wildlife and fisheries research and management.

41. M. Breton, T.G. Smith, and B. Kemp, *Studying and Managing Arctic Seals and Whales* (Quebec: DFO, 1984).

42. *Yukon Delta National Wildlife Refuge Draft Summary Comprehensive Conservation Plan, Environmental Impact Statement, Wilderness Review, and Wild River Plan* (FWS: 9 April 1987) W. Lewis Pamplin, "Cooperative Efforts to Halt Population Declines of Geese Nesting on Alaska's Yukon–Kuskokwim Delta," *Trans., 51st N.A. Wild/.&Nat. Res. Conf.* [hereinafter Pamplin] (1986)

p. 487, contains brief descriptions and figures on the decline of the four species as well as harvest statistics at pp. 489494. Pamplin chronicles the history of the Y–K Delta regime and assesses its performance through 1985.

43. The Migratory Bird Treaty Act of 1918, ch. 128,40 Stat. 755 (1918) codified as amended at 16 U.S.C. sections 703-712 (1982), implements the United States-Great Britain Convention for the Protection of Migratory Birds, August 161916,30 Stat. 1702, T.S. 628. This convention, a similar treaty with Mexico, and more recent bilateral migratory waterfowl treaties with Japan 1974) and the U.S.S.R. (1976) provide the basis of federal authority for regulating migratory birds; however, the newer treaties authorize FWS to grant exemptions for native subsistence harvesting. The State Department attempted to harmonize the 1916 convention and the Soviet treaty by signing a protocol patterned after the Soviet Treaty with Canadian negotiators in 1979. But the U.S. Senate has not ratified the protocol.

44. Although systematic, long-term harvest studies were not made on the Y–K Delta, researchers estimated that spring harvests of the four speciestotalled31 200 birds in 1980. Pamplin,1986 pp. 492-494.

45. In addition to loss of winter resting and feeding habitat, some important wetland areas in California (and elsewhere in the "Lower 48") now contain dangerously high levels of selenium (a naturally occurring trace element) which researchers have linked to a high incidence of reproductive failures, embryo and chick deformities and mortalities of waterfowl in the Kesterson Reservoir in Northern California), H. Ohlendorf, D.J. Hoffman, & T. Aldrich, "Recent Findings and Impacts on

Aquatic Birds at Kesterson Reservoir," (U.S. FWS, presented at Agricultural Waste Water Workshop, Univ. of Calif., Davis, 1984). The California State Water Resources Control Board ordered the Bureau of Land Management to clean up Kesterson by August 1988 (Order No. WQ 87-3), but improvements are not scheduled until spring of 1988. For a general discussion of winter waterfowl habitat problems in California, see M. Reisner, "California's Vanishing Wetlands," 9 *Amicus Journal* 1 (1987) pp. 8-15.

46. See footnote 12 above.

47. Interview with Harold Sparck, Chevak, Ak., 1 July 1987.

48. Pamplin, 1986 (at pp. 495-496) details negotiations leading to the Hooper Bay Agreement and describes its provisions.

49. The work of this task force is described in Kathleen Blanchard, "Strategies for the Conservation of Seabirds on Quebec's North Shore and Geese on Alaska's Yukon–Kuskokwim Delta, forthcoming in *Trans. 52nd N.A. Wildl. & Nat. Res. Conf., (1987)* and in Pamplin, pp. 499,500.

50. Pamplin, 1986, pp. 500,501.

51. The Central Valley of California provides winter habitat for sizeble numbers of waterfowl that nest in the Y–K Delta, including 89 per cent of Pacific whitefronted geese and 84 per cent of cackling Canada geese of the Pacific flyway. For an assessment of waterfowl habitat problems in these wintering grounds, see D.S. Gilmer, M.R. Miller, R.D. Bauer, J.R. Le Donne, "California's Central Valley Wintering Waterfowl," *Trans., 47th N.A. Wildl. & Nat. Res. Conf. (1982),* pp. 441452.

52. Sparck, 1987.

53.43 Stat. 739 (1925), as amended by the Act of October 1940,54 Stat. 1103.

54. *Alaska Fish and Wildlife Federation and Outdoor Council v. Jantzen, No.* CV84-013-V (D. Ak. unreported opin. Jan. 27, 1986), reversed in *Alaska Fish and Wildlife Conservation Fund v. Dunkle, No. 86-3657* (9th Cir. Oct. 9, 1987).

55. Phone interview with Richard S. Pospahala, FWS, Anchorage, 13 November 1987.

56. It is difficult to determine how much of the decrease is attributed to declines (i.e., unavailability) of certain species as opposed to voluntary compliance with the plan.

57. See Pamplin (at p. 499) for detailed figures and references to the harvest study reports.

58. John D. Copp and Brian J. McCaffery, *Results of the 1986 Survey of Waterfowl Hunting on the Yukon–Kuskokwim Delta, Ak.* (Anchorage: USF&WS, June 1987)p.31.

59. Ibid., pp. 32–33 and Pamplin.

60. As Larry Landry, AVCP'S Natural Resources Director, noted, this decision was reached "not without heartache" and with the knowledge that the dire emergency provision of FWS regulations provided a loophole for those who must hunt the species on occasion. Four delta villages strongly preferred bag limits to total curtailment of the harvest. Interview with Landry, 22 May 1987.

61. Sparck, 1987.

62. Copp, 1987, pp. 19–20, 26-28.

63. See the discussion *supra* at pp. 14-15.

64.13 I.L.M. 13, T.I.A.S. no. 8409,27 U.S.T. 3918.

65. See the case study by A. Reed in Drolet. For a review of the JBNQA as it related to fisheries management in Cree areas, see Fikret Berkes, "Co-management and the James Bay Agreement" (Draft paper prepared for Fisheries Co-management Conference, UBC, Vancouver, 8-10 May 1986.).

66. D. Taylor, F. Malotte, and D. Erskine, "Cooperative Fire Planning for Large Areas", *Proceedings of the Wilderness Fire Symposium* (held 15–18 November 1983, Missoula, Montana).

67. The prevailing mode of "involving" users in Alaska through 76 local advisory committees and 12 regional councils has proven insufficient in many parts of Alaska to solve the problems of dualism addressed here, and controversy over Alaska's subsistence statute has fueled the native sovereignty movement in many rural villages. For a brief discussion of local control overfish and game management and recommendations for improving local control, see *Report of the Governor's Task Force on Federal—State–Tribal Relations,* pp. 8–9, 15–18.