

CONDITIONS LEADING TO GRASSROOTS INITIATIVES
FOR THE CO-MANAGEMENT OF SUBSISTENCE
USES OF WILDLIFE IN ALASKA

by

JAMES ARTHUR SCHWARBER

B.A., University of Hawaii at Hilo, 1990

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

in

THE FACULTY OF GRADUATE STUDIES
School of Community and Regional Planning

We accept this thesis as conforming
to the required standard



THE UNIVERSITY OF BRITISH COLUMBIA

December 1992

© James Arthur Schwarber, 1992

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

(Signature)

Department of School of Community & Regional Planning

The University of British Columbia
Vancouver, Canada

Date December 23, 1992

ABSTRACT

Between 1985 and 1991, grassroots co-management initiatives for subsistence uses of wildlife emerged from three of Alaska's six subsistence resource regions. Initiatives from the northwest Arctic, Interior, and Western regions ranged from requests for the delegation of management authority from the State Board of Game and federal government to village governments, to proposals for the contracting of federal subsistence management responsibilities to tribal groups.

This thesis considers regional variations in six factors as possible explanations of the emergence of terrestrial wildlife co-management initiatives in certain regions: 1) magnitude and type of subsistence resource utilization; 2) degree of cultural homogeneity and Native percentage of population; 3) strength of leadership towards subsistence; 4) degree of congruity between state wildlife regulations and traditional subsistence activities; 5) differences in perception of state regulatory system; and 6) federal jurisdiction over land and Native affairs.

Interviews, subsistence literature, and records relating to the state's regulatory system provided research material. Analysis involved comparing the presence and relative strength of each of the six factors in regions where co-management proposals emerged and those where they did not.

Four factors were found to be most important for the emergence of co-management initiatives in certain regions: long-term leadership commitment towards subsistence issues; a high degree of per capita subsistence resource use, regardless of resource type; cultural homogeneity in association with a predominantly Native population; and the presence of extensive federal lands. Taken together, these four

factors make a sufficient set of conditions for co-management to emerge. Where leadership was lacking, and the other three predictors were present, co-management did not emerge. Thus, strength of leadership commitment to the protection of Native subsistence activities proved to be the key characteristic separating the three regions first to initiate co-management proposals, and the other regions following their lead. Incongruities between state regulations and subsistence uses, and negative perceptions of the state system by subsistence users were also found to have contributed to co-management initiatives, but they were less important factors.

Subsistence management has been characterized by interjurisdictional and user-group conflicts, which co-management may help to resolve. The implications of the findings for improving wildlife and subsistence management through co-management are that policies may be developed that usefully reinforce subsistence leadership capabilities and integrate other predictors into management efforts.

TABLE OF CONTENTS

	Page
ABSTRACT	ii
LIST OF TABLES	vi
LIST OF FIGURES	vii
ABBREVIATIONS	viii
ACKNOWLEDGEMENTS	ix
CHAPTER 1 INTRODUCTION	
Purpose and Problem	1
Scope	5
Six Factors Considered to Help Explain Initiatives	8
Definition of Key Terms	13
The Relevance of Co-Management	15
Subsistence as a Socioeconomic System	18
Institutional and Regulatory Setting	22
Research Design and Methods	31
Organization of Thesis	33
CHAPTER 2 COMMON PROPERTY THEORY AND EMERGING CO-MANAGEMENT THEORY	
Introduction	34
Common Property Defined	34
The Need for Differentiating Between Resource Regimes	38
Common Property Resource Management Systems	42
Co-management as a Subset of Common Property Theory	45
Co-Management Defined	46
Citizen Participation	48
Levels of Co-Management	48
History of Co-Management Regimes	53
Benefits of Co-Management	55
Barriers to Co-Management	58
Summary of Common Property Theory	61
Conclusion	64

CHAPTER 3 FINDINGS	Page
Introduction	65
Findings From the Kotzebue Sound Subregion of the Arctic Region	66
Findings From the Western Region	85
Findings From the Interior Region	95
Findings From the Southeast Region	101
Findings From the Southwest Region	110
Findings From the Southcentral Region	118
 CHAPTER 4 ANALYSIS	
Introduction	123
1. Magnitude of Subsistence Resource Utilization	125
2. Cultural Unity	130
3. Strength of Leadership	132
4. Congruity of State Regulations with Subsistence Uses	135
5. Perception of the State Regulatory System	136
6. Federal Jurisdiction Over Land and Native Affairs	137
New Factors Considered	139
Conclusion	140
 CHAPTER 5 CONCLUSION AND POLICY IMPLICATIONS	
Conclusion	142
Policy Implications	144
 BIBLIOGRAPHY	148
 GLOSSARY	157

LIST OF TABLES

TABLE	Page
I. Three Basic Types of Resource Property Institution	35
II. Levels of Co-Management	50
III. Predictors of Grassroots Subsistence Co-management Initiatives	124
IV. Subsistence Harvest Categories and Totals for each Region	126

LIST OF FIGURES

FIGURE	Page
1. Map of Alaska's Subsistence Resource Regions (State Regional Advisory Council boundaries in 1991)	3
2. Map of Alaskan Native Cultural and Language Areas	131
3. Map of Twelve Alaska Native Regional Corporations	134

ABBREVIATIONS

The most frequently used abbreviations are underlined.

<u>ADF&G</u>	Alaska Department of Fish and Game
<u>ANCSA</u>	Alaska Native Claims Settlement Act of 1971
<u>ANILCA</u>	Alaska National Interest Lands Conservation Act
<u>AVCP</u>	Association of Village Council Presidents
<u>BOG</u>	Board of Game
<u>FWS</u>	United States Fish and Wildlife Service
KAC	Kotzebue Fish and Game Advisory Committee
MMPA	Marine Mammal Protection Act of 1972
NAB	Northwest Arctic Borough
<u>NANA</u>	NANA Regional Corporation (Northwest Alaska Native Association)
RurAL CAP	Rural Alaska Community Action Program, Inc.
<u>TCC</u>	Tanana Chiefs Conference, Inc.

ACKNOWLEDGEMENTS

I would like to acknowledge the assistance provided by my research advisor, Evelyn Pinkerton, and extend my thanks. I would also like to indicate my gratitude to the people of rural Alaska who assisted me in gaining a better understanding of the new directions for community roles in wildlife management and community development. And thanks to Bill Caldwell and Terry Haynes for their review of the draft of this thesis.

This research was supported with financial assistance from the Harry S. Truman Scholarship Foundation and the University of British Columbia Graduate Fellowship program.

One of the best teachers is the land itself, and I dedicate this work to rural Alaska in acknowledgement of the lessons and values I could have not learned elsewhere.

The support of my wonderful wife, Gail, and our family has made it all possible. Thanks.

CHAPTER 1

INTRODUCTION

Purpose and Problem

Between 1985 and 1991, three rural areas within the State of Alaska began pursuing initiatives for increasing their role in the management of their subsistence uses of wildlife, while in other rural regions no proposals were forthcoming. This thesis seeks to identify the most important conditions associated with the development of grassroots proposals for increasing community influence in the management of local subsistence uses of terrestrial wildlife.

Involving local users in the management of wildlife with the state or federal agency having jurisdiction over the resource is known as co-management or cooperative wildlife management. Both terms are often used interchangeably when discussing the involvement of resource users in management activities. In government resource agencies in Alaska, cooperative management is sometimes differentiated from co-management, with the former describing the involvement of resource users in certain management tasks, and the latter implying a government to Native¹ government agreement. In this thesis, cooperative management is considered one of the variations of co-management.

Co-management regimes are an adaptation of centralized government regulatory regimes for common property resources such as wildlife. The sharing of decision-making responsibilities between resource users and managing agencies

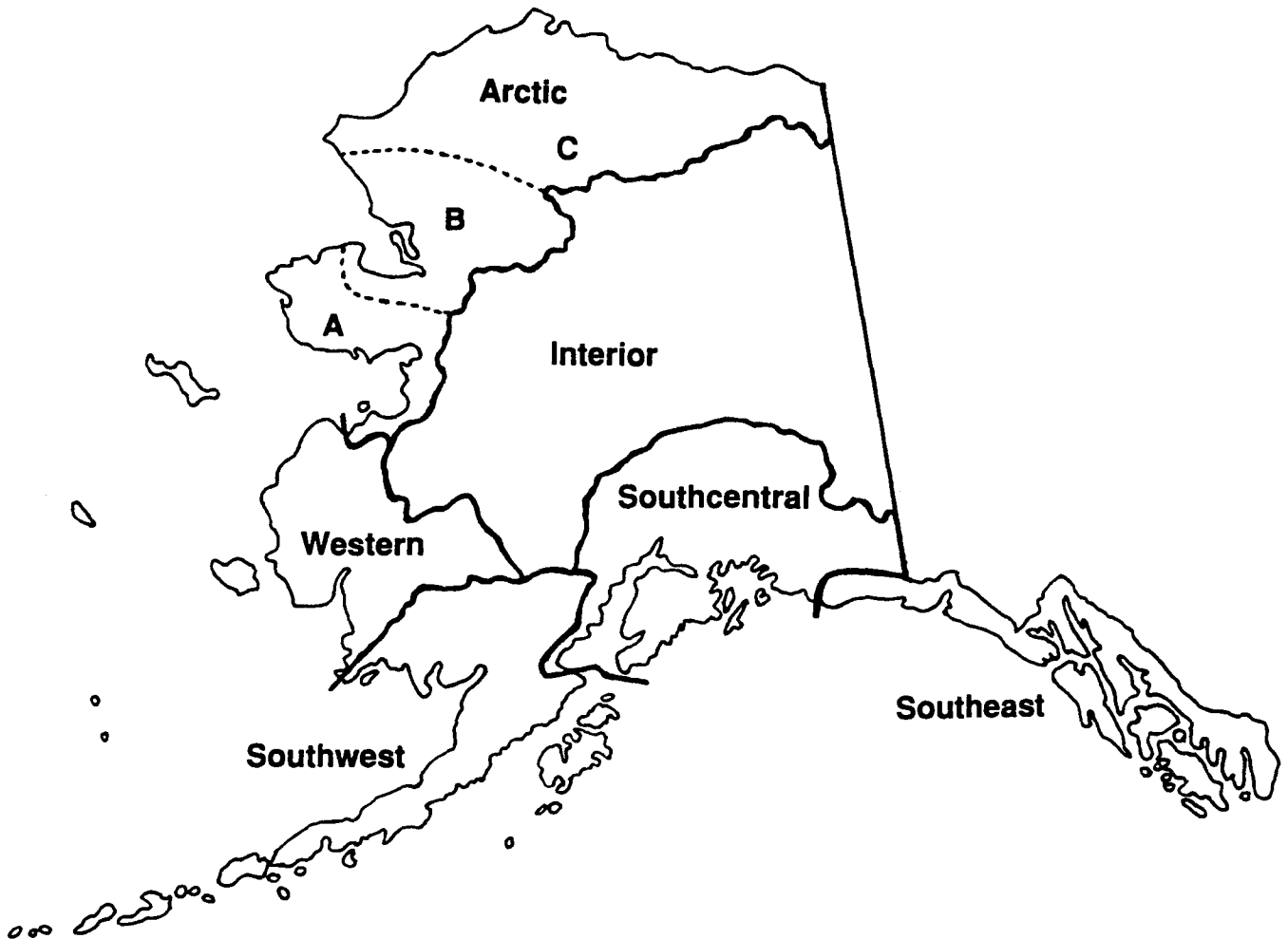
¹ When capitalized, Native refers to the indigenous people of Alaska, including the Aleut, Indian, and Eskimo peoples.

potentially contributes to a more comprehensive approach to wildlife conservation by including cultural and socioeconomic concerns with conventional biological considerations during the management process (Berkes et al. 1991; Pinkerton 1989; Usher 1986).

Subsistence management in Alaska has been characterized by high levels of conflict for at least the past ten years. Prior problems continue to be unresolved, and future conflicts are likely, especially as the state's population grows and pressure on natural resources increases. Incongruities continue to exist between state and federal subsistence management policies, and between government regulations and rural subsistence uses. Cross-cultural communication difficulties between rural Native residents and different levels of government contributes to the continuation of these problems. Unresolved interjurisdictional and user-group conflict diminishes efforts to effectively manage wildlife resources and to implement existing laws requiring the protection of rural subsistence activities.

Co-management agreements have a record of being able to address these kinds of problems in other places, and improving resource management in situations with a history of conflict. To take advantage of co-management possibilities, rural and government leaders in Alaska need a clear analysis of what mix of conditions give rise to co-management. This work is intended to further our understanding of what combination of conditions are associated with grassroots co-management initiatives. Policy implications for improving wildlife management and subsistence protection through the support of conditions leading to co-management will be discussed in the concluding chapter.

FIGURE 1. Map of Alaska's Subsistence Resource Regions
(State Regional Advisory Council boundaries in 1991)



Arctic Subregions

A - Bering Strait/Norton Sound

B - Kotzebue Sound

C - North Slope

SCALE

0 200

Miles

0 300

Kilometers

↑
N

While Alaska's participation program for obtaining public input during the decision-making process for wildlife regulations is perhaps the nation's most comprehensive, rural users continue to pursue other ways to increase their influence over subsistence management decisions. The state's fish and game advisory committees and six regional councils provide for public input into the regulatory process. The State Board of Game, which exercises regulatory authority over wildlife, also takes public testimony during its two meetings a year. Notwithstanding the state's existing efforts to provide for public input, local rural interests are pursuing initiatives to increase community influence and roles in subsistence management through various grassroots co-management proposals.

Subsistence co-management proposals arose from three of the six subsistence resource regions established for administering the state's fish and game regional advisory council system. The regions roughly conform to Alaska's six major geographic areas (Figure 1, page 3). Co-management proposals emerged from the Kotzebue Sound subregion of the Arctic subsistence resource region, the Interior region, and the Western region.

Co-management theory, as an emerging subset of common property theory, will be used as an analytical framework for examining the existing government² wildlife regulatory regimes in Alaska and the grassroots initiatives proposing a greater community role in subsistence management. This framework was chosen because wildlife is normally regarded as a common property resource, and the array of possible management regimes for wildlife are encompassed by common property and co-

² The term government will be used when either state or federal levels of jurisdiction apply, or when both levels are involved.

management theory. The interdisciplinary nature of this work incorporates general sociological theory as well. A growing empirical record describes the characteristics associated with successful co-management regimes (Pinkerton 1989). The identification of conditions leading to co-management initiatives may contribute to an increased awareness of the potential for improving subsistence wildlife management in Alaska through the application of co-management.

Scope

The co-management initiatives to be investigated are restricted to those emerging between 1985 and 1991 which are related to the subsistence harvest of terrestrial wildlife located on state, federal, Native corporation, or other private lands in rural Alaska. During this period, initiatives originated from the Kotzebue Sound Fish and Game Advisory Committee (KAC) and Arctic Regional Council (ARC) in the Arctic subsistence resource region; the Association of Village Council Presidents (AVCP) in the Western region; and the Tanana Chiefs Conference (TCC) in the Interior region. An element common to all the initiatives was the intent to increase the roles of local users in subsistence management.

The northwest Arctic and Southeast subsistence resource regions will be examined in detail to provide a comparison between a region with a history of wildlife co-management initiatives and one without. The other four regions will be reviewed in less detail, but with adequate information presented to allow comparisons to be made among all the regions. This allows the use of a multiple case research design (Yin 1989).

The scope is further limited to determining the conditions which help to explain the emergence of terrestrial wildlife co-management proposals. The proposals themselves, and steps necessary for achieving changes in the existing regulatory structure to accommodate the proposals will not be addressed in detail. To date, few terrestrial wildlife co-management proposals have appeared in Alaska, compared to activities involving many of the marine mammal species of Alaska's long coastal region, such as the bowhead whale, beluga whale, Pacific walrus, and sea otter.³ The Kuskokwim River Salmon Working Group, which manages fisheries in a cooperative manner, and the Yukon-Kuskokwim Delta Goose Management Plan provide the only two non-marine mammal examples of co-management regimes involving subsistence users in Alaska.⁴ There are no formal co-management agreements between Native subsistence users and the government for the sharing of decision-making for the management of the subsistence harvest and use of terrestrial wildlife in Alaska (Huntington 1991; Langdon 1989).⁵

³ The Alaska Eskimo Whaling Commission and National Oceanic and Atmospheric Administration created a bowhead whale co-management regime in 1981, and the Eskimo Walrus Commission, Alaska Department of Fish and Game, and the U.S. Fish and Wildlife Service signed an agreement for walrus in 1987 (Osherenko 1988). Other more recent marine mammal management efforts include the Alaska Sea Otter Commission, Marine Mammal Coalition, Alaska and Inuvialuit Beluga Whale Committee, and the Inuvialuit Game Council-North Slope Borough polar bear agreement.

⁴ Osherenko (1988) describes a number of Canadian Arctic wildlife co-management regimes, along with the Yukon-Kuskokwim Delta Goose Management Plan. Albrecht (1990) presents a detailed description of a fisheries co-management regime involving rural subsistence and commercial fishers and State fisheries biologists on the Kuskokwim River in Western Alaska.

⁵ The Kilbuck Caribou Herd Management Plan in Western Alaska involves local subsistence users in planning and some other management activities for this herd. Decisions over resource harvesting regulations, however, continue to be made by the

State roles in marine mammal management are presently minimal due to provisions of the Marine Mammal Protection Act of 1972 (MMPA) granting management jurisdiction to the federal government. Alaskan marine mammal co-management regimes are addressed by others (Freeman 1989a; Huntington 1991; Langdon 1989; Osherenko 1988).⁶ Management authority for migratory waterfowl, an important subsistence resource in Western Alaska and other regions, is also held by the federal government. This research examines the period when the state retained management authority over rural subsistence wildlife uses on both federal and non-federal lands, and the subsequent period when the federal government reasserted management authority over subsistence uses on federal lands.⁷

Subsistence users in rural Alaska include both Alaska Natives and non-Natives. This research recognizes the important cultural and socioeconomic role subsistence plays in Native culture, and acknowledges the presence of many non-Native subsistence users throughout rural Alaska. The wildlife co-management initiatives under review, however, emerged from Native organizations and advisory groups in regions where Native subsistence users are a majority of the population. Therefore, this research will focus more on Alaskan Native subsistence users than non-Native.

State Board of Game and the Federal Subsistence Board for those periods when the herd is located on state and federal lands, respectively.

⁶ There is also Pinkerton and Langdon (1987), explaining the regional emergence of the co-management of salmon enhancement aquaculture associations in Alaska, using a similar framework.

⁷ Federal management of subsistence wildlife uses on federal public lands by rural residents in Alaska resumed on July 1, 1990 (see pages 21-30).

Interest in co-management applications is increasing throughout Alaska and new proposals are emerging. This research will be restricted to examining grassroots initiatives taking place prior to 1992. To summarize, the scope of this work is limited to determining the conditions associated with the emergence of co-management proposals for subsistence wildlife management from three rural areas in Alaska.

Six Factors Considered to Help Explain Initiatives

Based in part upon my nearly twenty years of personal experience as a rural subsistence user in the Brooks Range of northern Alaska, and four years of involvement with the implementation of the subsistence title of Alaska National Interest Lands Conservation Act of 1980 (ANILCA),⁸ the following six factors were identified as helping to explain the emergence of grassroots initiatives from specific rural regions for the co-management of subsistence uses of terrestrial wildlife. These selected predictors for the emergence of co-management are consistent with general sociological theory, and build upon propositions in the co-management literature predicting which preconditions are favorable to developing co-management (Pinkerton 1989, 26-30).

⁸ ANILCA, Title VIII, Section 808 established a subsistence resource commission for each national park where subsistence uses by local rural residents were recognized by Congress and allowed to continue. For two years I served as chair and coordinated the development of a draft subsistence hunting program by the Subsistence Resource Commission for Gates of the Arctic National Park. This experience highlighted the dynamics present when government agencies utilize conventional wildlife management tools appropriate for sports users and attempt to apply them without modification to rural Native subsistence activities. Agency reluctance to accept subsistence management recommendations from local groups established for that purpose was also experienced.

1. Magnitude and type of subsistence resource utilization;
2. Degree of cultural unity and Native percentage of population;
3. Strength of leadership around subsistence issues;
4. Degree of congruity between state wildlife regulations and customary and traditional subsistence activities;
5. Differences in perception of the state regulatory system; and
6. Federal jurisdiction over land and Native affairs.

This study will compare variations in the presence and strength of these factors in Alaska's six subsistence resource regions. The state's subsistence resource regional boundaries shown in Figure 1 (page 3) will be used to define the areas where co-management proposals emerged. Each of the six factors will be described next.

1. Subsistence Resource Utilization

The first factor relates to variations in the magnitude and type of subsistence resource use by the people of a region. Both the amount of subsistence harvesting and the presence of terrestrial wildlife in the subsistence diet is expected to be greater in the regions pursuing wildlife co-management. Regions with the highest per capita utilization of subsistence wildlife resources are expected to have the most interest in increasing their influence over subsistence management. Extensive information about the magnitude and type of subsistence harvests in each region is available from Alaska Department of Fish and Game, Division of Subsistence technical reports.

2. Cultural Unity and Native Percentage of Population

Variations in a region's cultural composition, and the predominance of Natives in the population, will be analyzed. Co-management regimes require the presence of a distinct user group to share management responsibilities with the government. Many, though not all, co-management regimes in Canada and the United States involve Native Americans. Native people engaging in subsistence live throughout Alaska, yet only three regions pursued co-management between 1985 and 1991. An Alaska Department of Labor report summarizing the 1990 census provides adequate information for making comparisons among the regions regarding their cultural unity or homogeneity, percentage of Native inhabitants, and the number of Native regional corporations (1991).

3. Strength of Leadership

Variations in the strength and long-term commitment of regional leadership and organizations to the protection of local subsistence activities may be related to the emergence of co-management initiatives. Different regions may have different political and social agendas or priorities. After examining the history of regional leadership efforts to protect subsistence activities, a subjective ranking of the six subsistence resource regions will be made.

4. Degree of Congruity

Variations in the degree of congruity between the state regulatory system and local customary and traditional subsistence activities may play a role in a region's interest in co-management. The more that state wildlife regulations conflict with local subsistence activities, the more likely interest in changing the existing system will be expressed. There might be less local interest in co-managing subsistence wildlife uses if government regulations are consistent with customary and traditional subsistence practices.

5. Perception of the State Regulatory System

Variations in perception of the state regulatory regime by regional residents is expected to be related to the co-management initiatives. Local or Native perceptions of the state regulatory system are important to consider because the existing system is designed to provide substantial user input to the State Board of Game. Attempts to change locally inappropriate wildlife regulations through proposals and recommendations from local advisory committees and regional councils, however, are often unsuccessful. When local efforts to influence regulatory decisions consistently fail or take an unreasonably long time to accomplish, frustrations with the state regulatory system may result. Dissatisfaction with the existing state wildlife regulatory system and its public participation program may help explain the emergence of co-management proposals from certain regions. A 1989 survey by the Rural Alaska Community Action Program (RurAL CAP) of fish and game advisory committee

members located throughout rural Alaska provided useful material for making subjective rankings of the regions for factors 4 and 5.

6. Federal Jurisdiction Over Land and Native Affairs

Variations in the extent of a regions' land under federal jurisdiction may be a factor because federal protection for rural subsistence activities only applies on federally managed lands (ANILCA, Title VIII). Regions with a greater proportion of their lands under federal management could be expected to be more interested in seeing improved implementation of the legal priority for rural subsistence uses of wildlife. In addition, judicially recognized federal trust responsibilities for Alaska Native subsistence activities may preempt state attempts to regulate subsistence.⁹ This enables the federal government to address and protect the cultural concerns of Alaskan Natives relating to subsistence in ways the state is less able constitutionally, or less willing politically, to accomplish. Alaska Native status and the presence of federal lands are expected to combine to foster co-management opportunities.

A combination of the factors of subsistence resource utilization, cultural unity, subsistence leadership, lack of congruity between state regulations and local resource use, local perceptions of the state regulatory system, and federal jurisdiction over land and Native affairs is proposed to partially account for why a region initiates efforts to increase local influence over the management of their subsistence uses of wildlife.

⁹ In *People of Togiak v. U.S.* (1979), the court concluded that the long history of Alaska Native exemptions in federal treaties and statutes established a federal trust responsibility to preserve Native subsistence values (Case 1984, 293).

Findings from the state's six subsistence resource regions will be analyzed to determine the significance of the proposed factors in the emergence of grassroots wildlife co-management initiatives.

Definition of Key Terms

The key terms requiring definition are by their very nature broad concepts. The lack of generally agreed upon, or specific meanings for co-management and subsistence contributes to continuing confusion and misunderstandings in public policy debates over subsistence management. Co-management has a broad range of meanings because of the variety of forms it may take in application. Chapter Two will more fully explore the theory behind and the range of meanings and applications for co-management. Other major terms, such as Native, customary and traditional, government, rural, and wildlife management are defined in footnotes or the glossary following the references.

Co-management

The shared decision-making process, formal or informal, between a government authority and a user group for managing a species of fish or wildlife, or other resource. This process will be situated on a scale describing eight 'levels of co-management,' ranging from less to more sharing of power (see Table II, page 50).

Co-management regime

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 (Osherenko 1988, 13).

Subsistence is another term that defies simple definition, nor is there a consensus on its meaning. Before giving my personal definition, I will first quote the federal definition provided in the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) and then Justice Thomas R. Berger's description of subsistence in Village Journey (1985).

Subsistence uses are:

The customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade (ANILCA, Title VIII, Sec. 803; emphasis added).

Berger writes, "For Alaskan Natives, however, subsistence is a way of life," and:

The traditional economy [of Native villages] is based on subsistence activities that require special skills and a complex understanding of the local environment that enables the people to live directly from the land. It also involves cultural values and attitudes; mutual respect, sharing, resourcefulness, and an understanding that is both conscious and mystical of the intricate interrelationships that link humans, animals, and the environment. To this array of activities and deeply embedded values, we attach the word "subsistence," recognizing that no one word can adequately encompass all these related concepts (Berger 1985, 51).

For this thesis, subsistence is defined as the foundation of the mixed subsistence and cash economy whereby the values and relationship of the Native people with each other, with their culture, and with the renewable natural resources

upon which they depend is expressed and continually revitalized. This foundation integrates the personal, family, community, cultural, spiritual, economic, and nutritional components associated with the harvesting and non-commercial use of wild resources.

Ethnographic literature and Alaska Department of Fish and Game (ADF&G), Division of Subsistence Technical Reports provide a wealth of descriptive information about the variety of subsistence activities taking place in rural Alaska.

The Relevance of Co-Management

The identification and improved understanding of the conditions related to grassroots requests for co-management may contribute to public policy changes leading to a greater community role in subsistence management. Co-management may improve communication between government managers and rural subsistence users, leading to more effective wildlife management. The potential benefits associated with increasing local community empowerment in the area of subsistence management transcend wildlife issues to include a range of community concerns.

It now appears certain that a strong, local community is essential to psychological well-being, personal growth, social order, and a sense of political efficacy. These conclusions are emerging at the center of every social science discipline (Schwarz 1982, 264).

Rothschild and Whitt (1986) and Pinkerton (1991) discuss the contribution co-management regimes may make towards strengthening community and social values through direct participation in resource management activities.

Co-management regimes may promote sustainable community development through the centering of wildlife management administration and activities within a region, thereby providing culturally appropriate and much needed employment opportunities in rural communities. Rural subsistence activities may be more effectively protected through co-management's ability to use traditional ecological knowledge and incorporate it into a unified, consistent management framework for accommodating subsistence uses (Berkes et al. 1991; Usher 1986, 1987).

Understanding the dynamics and conditions associated with the initiation of efforts to increase local influence over resource management is important as a means of facilitating such changes when they appear to be in the best interests of both the communities and the resources. The world-wide concern over achieving 'sustainable development' is recognizing the important role communities may play in the stewardship of regional resources. 'Agenda 21,' adopted at the United Nations Commission on Environment and Development 1992 Earth Summit in Rio de Janeiro, includes a policy to promote community empowerment over local resources. Other sustainable development literature highlights the relationship between a strong community and personal well-being (Daly and Cobb 1989).

Co-management regimes may also benefit wildlife management by enhancing mutual understanding and communication between resource users and the government agencies responsible for the resource. Enhanced legitimacy of the management regime generally contributes to the conservation of wildlife resources important to the community and the public interest through improved voluntary compliance with rules and enhanced resource data collection.

The interest in increasing local involvement in subsistence management of

wildlife follows the trend in rural Alaska of increasing local management over other components fundamental to a community's well-being, such as health care, education, employment centers, and land-use planning (Case 1984, 389-405). Many community services are now provided by Native non-profit organizations through contracts funded under the Indian Self-Determination and Education Act of 1975 (P.L. 93-638).¹⁰

A growing empirical record of successful co-management regimes in a variety of situations indicates the potential for co-management to contribute to improved fish and wildlife management and resource conservation, along with reducing resource conflicts. Since implementation of the Yukon-Kuskokwim Delta Goose Management Plan began in 1984, population declines of target species have been turned around, and total populations of four species increased 25 percent. An enhanced clarity about the applications and implications of grassroots co-management initiatives may help to inform policy-makers how co-management can contribute to improved wildlife management, the protection of subsistence, cultural revitalization, and sustainable community development.

Rural Alaskan communities, long aware of their dependence upon access to healthy wildlife populations, appear ready to assume a more active role in the stewardship and management of those resources so vital to community well-being. Improved public policy actions towards the protection of subsistence activities and resources may be facilitated through improving understanding about the dynamics of grassroots co-management initiatives.

¹⁰ Among the Alaskan Native non-profit groups contracting services from the federal government under provisions of P.L. 93-638 are the Association of Village Council Presidents, Bristol Bay Native Association, Maniilaq Association, Tanana Chiefs Conference, and the Tlingit and Haida Central Council.

Subsistence as a Socioeconomic System

The following summary describes how subsistence activities function as a central part of the socioeconomic system in much of rural Alaska. It is intended to show that co-management proposals for subsistence involve more than biological or allocation concerns with wildlife.

Subsistence harvests of wild, renewable resources provided for the needs of Alaska's Native people for thousands of years, and continue to make substantial contributions to rural communities today (Burch 1984). Subsistence refers to the long-term, customary and traditional uses by rural Alaska residents of wild, renewable resources for personal, family, and community consumption as food, shelter, fuel, clothing, tools, or transportation, and for the making and selling of handicraft articles. It is useful to view subsistence activities as the foundation of an economic system of production which supports the family, community, and cultural values of rural Native villages, and supports similar social values in the more integrated or non-Native rural communities (Schroeder et al. 1987). Even though there is tremendous variety in subsistence activities and among the cultures of rural Native people, subsistence consistently plays an important socioeconomic and cultural role nearly everywhere.

During the past two decades, social science research and work by the ADF&G's Division of Subsistence has documented the continuing existence and viability of what is sometimes referred to as a 'mixed subsistence and cash' economy in rural Alaska (Langdon 1986; Schroeder et al. 1987; Wolfe and Walker 1987). Native village economies are a blend of traditional subsistence harvesting activities of local renewable resources supported by generally modest cash input. Subsistence

production provides fresh and healthy food resources on a scale greater than the existing rural cash economy could replace, if subsistence resources were no longer available or accessible.

The subsistence harvesting of fish and wildlife and the sharing of the harvest among extended family and community elders plays an immensely important cultural role in rural Native communities. It is significant that in many of Alaska's approximately 200 villages, there are few local employment opportunities, and the cost of imported food is the highest in the nation. The contribution to community well-being from subsistence harvests varies from place to place, but in most rural areas subsistence is considered an essential element, culturally as well as nutritionally (Berger 1985).

Extensive research by the Division of Subsistence identified the following eight characteristics of mixed subsistence and cash economies present in many rural areas:

1. Community-wide seasonal round of fishing and hunting activities for subsistence use: harvest and use varies seasonally with the distribution and abundance of species.
2. A large proportion of available food species are harvested.
3. High overall harvest and use level: harvested resources make a significant contribution to the support of households and community as a whole. Fish and wildlife supply most of the meat, fish, and fowl used in the community.
4. Noncommercial distribution and exchange networks: harvested resources are distributed between households and communities.
5. Traditional systems of land tenure and use rights: customary law defines access to resource harvest areas and sites, such as traplines, fish camp sites, and community hunting areas, and regulates the resource harvest activities by members of the social group.
6. A significant amount of time is spent harvesting and processing subsistence resources.

7. Complementary cash and subsistence activities: cash income is used to purchase supplies needed for subsistence hunting and fishing. Subsistence may compensate for uncertain cash income and difficulties in importing food.
8. The organization of subsistence production is primarily around extended kinship groups and alliances, which differs markedly from the organization of production for a market (Schroeder et al. 1987, citations omitted).

Division of Subsistence research shows that subsistence harvests of fish and wildlife resources provide the entire protein needs for many rural families. Regional per person annual harvests of wild resources range from an average of 212 pounds in the Southeast region to 610 pounds in the Arctic region (Alaska Department of Fish and Game 1989). In thirteen of the more than one hundred communities surveyed, per capita yearly harvests of wild resources exceeded 800 pounds. These harvests, depending on the community, region, and year, may be dominated by fish, marine mammals, or land mammal species (Table IV, page 126). Of Alaska's total commercial, sport, and subsistence harvest of fish and wildlife, less than four percent is taken by subsistence users (*ibid.*). Therefore, subsistence activities contribute to community well-being without constituting a significant drain on wild resources.

Subsistence harvests are characterized by a seasonal round of customary and traditional activity utilizing many different species. Each region and community has its own pattern of resource use, depending on the resources available and the culture of the people residing there. Due to the seasonal and yearly variations in availability of many northern wild resources, subsistence harvest patterns may vary widely from year to year in the same community or between communities in the same region.

Opportunistic harvesting of a variety of wild resources is characteristic of successful

subsistence production for community use. The sharing of subsistence harvests among extended family members, with elders, and with others in the community or nearby communities is a strongly valued custom and is another characteristic of this mode of production.

Subsistence activities are not limited to contributing to the nutritional needs of a community. Timber resources are used for building and heating homes and for building boats and sleds for transportation. Animal skins and furs are used for mittens, footwear, hats, parkas, and sleeping pads, and may be sold for cash to help support subsistence production.

Customary trade in crafts made from wild resources and trapping are sources for cash income needed to maintain the cash-dependent elements of contemporary subsistence living. Cash is needed for purchasing river boats, outboard motors, chain saws, snowmachines,¹¹ fuel, fishing nets, firearms, and ammunition. The need for cash to purchase equipment for subsistence requires some participation in the wage or cash economy. The cash value of the annual subsistence harvest of 40 million pounds of wild resources, let alone the important cultural values, could not be easily replaced, if at all, by the cash sector of the existing economic system in rural Alaska (ibid.). Subsistence fishing and hunting contributes a major portion of the food used in rural Native and some non-Native communities and is expected to continue to do so.

¹¹ In Alaska, the term 'snowmachine' is commonly used in place of 'snowmobile.'

Institutional and Regulatory Setting

Wildlife management in Alaska falls under either federal or state jurisdiction, and sometimes both, depending upon the land ownership of the locality, the type of animal, and the category of use intended by the hunter.¹² 'Cooperative federalism' is a common regulatory practice in the United States, with governmental powers allocated between the state and federal governments in a variety of complex ways, depending on the resource and enabling legislation (Huffman and Coggins 1986). When Alaska acquired statehood in 1959, the federal government transferred primary management authority for terrestrial wildlife resources to the new state.¹³ Jurisdiction over migratory waterfowl and marine mammals continues in federal hands.

The Alaska Constitution allows the State Legislature to establish the management structures for fish and wildlife resources. State legislation created a joint Board of Fisheries and Game, which was later divided into separate Boards. Each Board has seven citizen members appointed by the governor. The legislature delegated authority to the Boards to establish regulations governing the harvesting and conservation of fish and wildlife. The Alaska Department of Fish and Game (ADF&G) is responsible for managing resident fish and wildlife, and provides support to the Board of Game (BOG).

The BOG meets twice a year, usually in Anchorage or Fairbanks, to review and

¹² The two categories for regulating consumptive wildlife uses are 'subsistence' and 'general hunting.' The general hunting regulations apply to recreational, sport, and commercial guiding activities, and sometimes apply to subsistence users.

¹³ Huntington (1991) reviews the history of wildlife management in Alaska from early territorial days to the present.

adopt hunting regulations. Meetings last for about three weeks. Biological and human harvest data are provided to the BOG by the ADF&G. About 80 fish and game local advisory committees and six regional advisory councils provide public input to the BOG. Public testimony is also taken during BOG meetings, or may be submitted in writing. State wildlife management historically has been oriented to sport hunting, and "until 1975 game laws and regulations in Alaska were primarily applications and extensions of existing laws from outside the state" (Huntington 1991, 31).

Beginning in 1975, the State Legislature adopted a bill directing the Board of Game (BOG) to adopt separate regulations for subsistence uses of wildlife. The BOG, unlike the Board of Fisheries, did not adopt separate regulations for subsistence until the *State of Alaska v. Eluska* court decision in 1986 required the Board of Game to do so. Differences in the characteristics, purposes, and legal standing between subsistence and sport hunting needed to be reflected in the regulations.

In 1978, partly in anticipation of the impending passage of the Alaska National Interest Lands Conservation Act (ANILCA), the state adopted its first 'subsistence' law granting a priority to subsistence uses of fish and wildlife over other consumptive uses. The subsistence law created a Division of Subsistence within the Alaska Department of Fish and Game to study subsistence activities from an anthropological and social perspective, and to provide information about subsistence uses to the Boards. Despite these policy steps towards subsistence protection, the state faced several legal, political, and economic issues that impeded implementation of a subsistence priority for local subsistence uses (Case 1984, 295).

Alaska is constrained by its constitution from taking wildlife management actions to protect only Native subsistence users. Until at least 1983, the ADF&G and the

Boards of Fish and Game were dominated by non-Native urban, sports, and commercial hunting and fishing interests (Case 1984, 296). Rural subsistence management issues were not well understood nor supported in this political climate. And economically, until the passage of ANILCA in 1980, funding for the Alaska Department of Fish and Game came mostly from federal grant programs such as the Pittman-Robertson, which redistributed funds collected from the sale of hunting licenses and taxes on hunting equipment purchased mainly by sport hunters. The combined affect of this situation was limited implementation of the policy of protection for subsistence activities during the 1970s.

Title VIII, the subsistence section in the Alaska National Interest Lands Conservation Act of 1980 (ANILCA), is intended to fulfill the unkept promises made almost ten years earlier by the United States Congress to protect Alaskan Native subsistence culture and related activities. While Section 4(b) the Alaska Native Claims Settlement Act of 1971 (ANCSA) extinguishes "any aboriginal hunting or fishing rights which may exist," the accompanying Conference Committee report to ANCSA clearly required both the federal and state governments to protect Native subsistence activities. Case (1984) quotes from the report:

The Conference Committee after careful consideration believes that *all Native interests in subsistence resource land can and will be protected* by the Secretary through the exercise of his existing withdrawal authority. The Secretary could ... protect Native subsistence needs and requirements by closing appropriate lands to entry by *nonresidents* when subsistence resources for these lands are in short supply or otherwise threatened. *The Conference Committee expects both the Secretary and the State to take any action necessary to protect the subsistence needs of the Native* (Senate Report 1971, 37; emphasis added by Case).

Title VIII of ANILCA addresses the joint government responsibility towards subsistence protection pledged in the Conference Committee report nine years earlier. In recognition of the problems the state was experiencing in implementing a workable subsistence program, Title VIII adopted a comprehensive program for the legal protection of subsistence uses by both Native and non-Native local rural residents. In response to pressure from the state, eligibility for subsistence protection in ANILCA was extended to include "rural residents," instead of being limited to Alaskan Natives.

Title VIII, Sections 804 and 805 provide for a subsistence priority and require a system of local advisory committees and at least six regional advisory councils be established to provide input and make recommendations for subsistence management and regulations. The regional councils were intended to provide a meaningful role in subsistence management to local subsistence users and were designed and empowered to counter-balance the urban sport hunter bias present in the state regulatory system. Federal funding for up to fifty percent of the cost of state administration of the advisory committee and council system is provided by ANILCA.

Title VIII provides for the continued state management of subsistence uses of fish and wildlife on federal lands only if Alaska "enacts and implements laws of general applicability" consistent with ANILCA's federal subsistence definition, preference, and participation specified in sections 803, 804, and 805. If the state fails to adopt a legal and administrative structure applicable statewide and consistent with ANILCA, the Secretary of the Interior is required by law to assume management authority over subsistence uses by rural residents on all federal lands in Alaska. The state subsistence program was certified as being in compliance with federal requirements from 1982 until 1989. During this period the rural subsistence priority

applied state-wide, and the state exercised jurisdiction over subsistence management.

The role intended by Congress for the regional advisory councils has been interpreted in a number of ways. ANILCA states the purpose of the regional councils is to provide a meaningful role in subsistence management for "rural residents who have personal knowledge of local conditions and requirements." State implementation of the regional councils, however, allowed them to address issues for all user groups, not just those related to subsistence. This compromised the ability of some regional councils to adequately represent subsistence concerns to the Board of Game (Marshall and Peterson 1991).

Another area of concern between local subsistence interests and the state was the degree of management authority vested in the regional councils. ANILCA requires the adoption of regional council subsistence recommendations unless the recommendation "is not supported by substantial evidence, violates recognized principles of fish and wildlife conservation, or would be detrimental to the satisfaction of subsistence needs" (Case 1984, 304; ANILCA, Title VIII, Sec. 805(c)). If not adopted, the Secretary must explain the reason for the decision. Many local people felt this requirement for the government to adopt recommendations provided councils with more than an 'advisory' role.

The state and federal government, however, interpreted the councils' role as being advisory, not regulatory. Lack of positive or sometimes any response from the Board of Game to regional council recommendations contributed to a sense of frustration among local people who tried influencing subsistence management decisions (Sealaska 1989; RurAL CAP 1989). A 1991 federal review of the adequacy of the state's regional advisory council system found it generally not fulfilling the

intended forum for input from rural subsistence users as required by provisions of Title VIII of ANILCA (Marshall and Peterson 1991).

In December 1989, the Alaska Supreme Court ruled in *McDowell v. State of Alaska* that the Alaska Constitution did not allow the state to provide for a rural preference in the state subsistence law, because this discriminated against urban subsistence users.¹⁴ The rural provisions of the state subsistence law were therefore unconstitutional. The removal of the rural preference from the subsistence law placed Alaska out of compliance with Title VIII of ANILCA.

With Alaska unable to provide a legal preference for rural subsistence users because of the *McDowell* ruling, the federal government was required to assume responsibility for implementing Title VIII. Since July 1, 1990, management of subsistence on federal lands in Alaska, or about 65 percent of the state, has been under the control of a Federal Subsistence Board composed of the directors of the major federal land managing agencies in Alaska, and the Bureau of Indian Affairs.¹⁵

Alaska continues to manage subsistence uses of fish and wildlife on the remaining state and private lands, which include Native corporation lands. Alaska also continues to manage sport and commercial uses of wildlife on all public lands, subject to certain restrictions in National Parks. Of considerable concern to rural subsistence users is the state's continuing jurisdiction over subsistence fishing in all navigable

¹⁴ Another Alaska Supreme Court ruling on July 10, 1992, extended *McDowell* by finding all Alaskans eligible for subsistence, even those with no history of subsistence use (*State of Alaska v. Morry*).

¹⁵ The heads of the following agencies, or their designees, are voting members of the Federal Subsistence Board: U.S. Fish and Wildlife Service, National Park Service, U.S. Forest Service, Bureau of Land Management, and Bureau of Indian Affairs. In addition, a chair is appointed by the Secretary of the Interior.

waters, since title to all submerged lands under navigable waters belongs to the state, even for those waters located within federal lands. This concern centers on the major role fish play in the subsistence economy of many villages, and the belief that Congress intended subsistence rights be protected as fully as possible.¹⁶

A crucial difference between state and federal management authority is evident when the issue of Native hunting and rural subsistence rights is examined. Article I, Section 3 of the Alaska Constitution is construed by the state to prohibit the recognition of any special status for Natives when managing wildlife, and more recently from distinguishing between urban and rural residency when defining eligibility for subsistence (*McDowell v. State of Alaska* 1989). Under federal law, however, Alaska Natives may be legally exempted from regulations such as the general hunting ban established by the Marine Mammal Protection Act, based on their political relationship with the federal government. The long history of Alaska Native exemptions in federal treaties and statutes is responsible for the emergence of a "judicially recognized, federal 'trust responsibility' to protect Alaska Native subsistence culture" (Case 1984, 293; *People of Togiak v. U.S.* 1979). The federal government will continue to provide the principal legal protection for rural Native and non-Native subsistence activities, unless either Alaska's Constitution is amended to provide for a 'rural' preference for subsistence, or ANILCA is amended to remove the 'rural' requirement. Neither action appears imminent.

¹⁶ This concern is being litigated in *John v. U.S.* through the Federal District Court. John argues that the federal government, not the State, must manage subsistence fisheries in all navigable waters.

Implementation of the 'rural subsistence priority' is embroiled in continuing controversy, fueled by urban residents and sport hunters who feel they are not being treated equally, and the continuing conflict between ANILCA's requirement for a "rural" priority, and the Alaska Constitution's prohibition of such a priority. The complexity of this controversy goes beyond the scope of this thesis, and is not directly relevant to the research question. In addition, the controversy continues to be volatile, with actions by the Alaska State Legislature, along with state and federal court proceedings all potentially affecting the unsettled situation (Caldwell 1992). Meanwhile, a dual management system for subsistence exists in Alaska, one for federal lands, and one for state and private areas.

Fundamental differences between the regulatory tools of the existing sports user-based state wildlife management system - and perhaps the newly established federal subsistence management structure - and rural Native subsistence uses are problematic for two reasons. First, without the cooperation and support of rural subsistence users, harvest and other data essential for managing wildlife resources is often unavailable to state or federal managers, and compliance with existing harvest regulations is often low. For example, Division of Subsistence research indicates that during a ten year period only three percent of the local subsistence harvest of brown bear in northwest Alaska was reported to the state (Loon and Georgette 1989). Alaska's tremendous expanse and rural, roadless character render external enforcement efforts relating to policing wildlife regulations ineffective unless there is local support for the management regime. As a result, government protection of the health of the wildlife resources is compromised, and this places the economic and cultural well-being of subsistence dependent rural communities directly at risk.

Second, the lack of a local or shared decision-making role in wildlife management weakens the socioeconomic foundation of Native communities and culture through the resulting lack of assured resource availability and influence on conditions of access to subsistence resources. Legally recognized allocations and access to subsistence resources are vital to the mixed subsistence and cash economies of nearly all of Alaska's rural villages (Schroeder et al. 1987; Wolfe et al. 1986). One response by Native village and regional corporations to protect local subsistence uses is to control or prohibit access to their lands for hunting by non-shareholders. Threats to the continuation of subsistence way of life in rural Alaska include competition for scarce wildlife resources by non-rural residents, diminished abundance of subsistence resources through ineffective management or changes in habitat, and wildlife regulations which unnecessarily interfere with or prevent customary and traditional subsistence activities. A strong local voice in management decisions may be required to minimize external or institutional threats to subsistence.

Wildlife co-management initiatives in Alaska are important because they offer a possible means to reduce the historical conflict and lack of congruity between customary and traditional subsistence uses of wild resources and the state's wildlife regulatory system. The present conflict between the state and federal governments over which should exercise management authority over subsistence uses of wildlife further highlights the uncertainty of both governments' commitment to and the implementation of protection for subsistence uses by rural Native and non-Native residents. This uncertainty also highlights the lack of influence rural communities exercise over the management of resources they utilize as the foundation of their physical, socioeconomic, and cultural existence. Grassroots co-management

initiatives may provide a route for rural Native Alaskans to foster the exercise of self-determination within their own communities over resource issues crucial to community and cultural well-being.

Research Design and Methods

A qualitative as well as quantitative approach is used because the research question requires comparisons among a number of regional histories. Alaska's six subsistence resource regions - Arctic, Interior, Western, Southcentral, Southeast, and Southwest - are used as units of analysis for identifying and comparing conditions associated with grassroots co-management proposals (Figure 1, page 3). Division of Subsistence technical reports contain a wealth of information documenting subsistence activities and their role in the culture and economies of rural Alaskan communities. This information provides the basis for making quantitative comparisons among regions regarding the magnitude and type of subsistence harvests of wild resources.

Additional information to help explain the emergence of co-management initiatives was gathered using the 'key informant' approach (Yin 1989). This qualitative approach to interviewing key informants was chosen for two reasons. First, there are practical financial and time constraints in covering multiple, large geographic areas in Alaska for the purpose of numerous interviews. Second, a literature review and personal knowledge of the developing rural interest in subsistence wildlife management indicated that much of the information sought was held by key people involved with wildlife management policy issues. It was possible to identify through written reports and membership lists those who would be most valuable to interview.

Key informants were interviewed either face-to-face or by telephone. At the beginning of each interview, complete confidentiality was assured and the general purpose for the interview explained to the informant. When possible, a brief letter of introduction served as the initial contact with an informant. An open-ended interview format was used, along with questions directed to elicit information related to the research question. More than forty individuals were interviewed, including federal and state personnel involved in resource management, people associated with regional organizations representing rural interests, and rural residents directly involved in the generation of proposals for the devolution of wildlife management functions from the government level to the regional or local level.

Three months were spent gathering material and talking with people in Alaska during the late spring and summer of 1991. During a second trip to Alaska in the early spring of 1992, several people attending the statewide Native conference on subsistence and the spring Board of Game meeting in Anchorage were interviewed in person. Because of the qualitative nature of the information, and the use of key informants, a quantitative presentation of the interview results will not be undertaken.

The Kotzebue Sound subregion of the Arctic subsistence resource region and the Southeast region will be examined in detail. These two regions were chosen to provide a comparison between a region with a history of wildlife co-management initiatives and one without such a history. The other four regions are examined to obtain sufficient information to generate a comparative analysis among the six subsistence resource regions used by the state for its regional council system.

Common property theory is used to evaluate the existing government regulatory regimes and the co-management proposals, using a scale depicting eight 'levels of co-

management' (Table II, page 50). The findings from this research will be situated within the emerging subset of common property theory known as co-management theory (Berkes 1989; Berkes et al. 1991; Pinkerton 1989; Usher 1986). Arnstein's well-known description of the varieties of public participation, and a modification of Berkes' adaptation of Arnstein's 'ladder' to different 'levels of co-management' will be used to describe and compare the initiatives for co-management with the existing government regulatory systems (Arnstein 1969; Berkes et al. 1991).

Organization of Thesis

Chapter One provides an overview of the institutional context from which the co-management initiatives emerged. Chapter Two will describe common property theory and the associated resource management regimes, and then explain the emerging subset of common property theory known as co-management theory. Chapter Three will present the research findings from the six subsistence resource regions. Chapter Four will analyze the findings and make cross-case conclusions about the most important conditions helping to explain the emergence of grassroots co-management proposals from the northwest Arctic, Interior, and Western subsistence resource regions. Chapter Five summarizes the research results and discusses their specific policy implications for improving subsistence and wildlife management in Alaska. A glossary follows the bibliography.

CHAPTER 2

COMMON PROPERTY THEORY AND EMERGING CO-MANAGEMENT THEORY

Introduction

This chapter provides a review of common property theory and the emerging subset of co-management theory. This review is intended to serve as a framework for discussing Alaskan grassroots wildlife co-management initiatives and the existing government wildlife regulatory systems. The common property framework will be used because Alaskan wildlife is considered a public resource to be managed by the State "for the maximum benefit of its people" and is "reserved to the people for common use."¹⁷ The range of institutions which may be applied to the management of wildlife is integral to the question of how common property resources may be managed in a sustainable and culturally appropriate manner. Both common property and co-management literature address this management issue, and provide an appropriate context for exploring the emergence of grassroots wildlife co-management initiatives from rural Alaska.

Common Property Defined

In a broad definition, a common property resource is any resource shared by many people or social groups (Berkes 1989, vii). Wildlife, fisheries, and forests are often considered common property resources. Different property rights regimes may

¹⁷ Alaska State Constitution, Article VIII, Sections 2 and 3.

be applied to these resources, however, and the type of regime affects the common property nature of the resource. Berkes and Farvar (1989) define common property resources as those resources for which it is difficult to exclude outsiders, and where each user is capable of subtracting from the welfare of others.

Table I. Three Basic Types of Resource Property Institution

	1	2		3
	PRIVATE PROPERTY	COMMON PROPERTY		OPEN ACCESS
		COMMUNITY PROPERTY REGIME	STATE PROPERTY REGIME	
GROUP LIMITATION	ONE PERSON	MEMBERS ONLY	MEMBERS OR OPEN TO ALL	OPEN TO ALL
HARVEST LIMITATION	HARVEST LIMITED BY INDIVIDUAL DECISION	HARVEST LIMITED BY RULES	HARVEST LIMITED BY RULES	HARVEST UNLIMITED

(Adapted from Stevenson 1991, 58)

Resource 'property' may be managed by one of three basic resource institutions or regimes. A resource may be treated as private property, common property, or 'open access,' as presented above in Table I. 'Group Limitation' relates to the issue of exclusion of potential users of a resource, and 'Harvest Limitation' relates to the potential for users to over-harvest a resource, and therefore subtract from the interests of others.

In the case of private property, access and use rights to the resource and its ownership are held by an individual. In common property regimes, resources may be managed by either a community or state property regime, with access usually limited to members of a specific, defined group. Also present in common property regimes are implicit or explicit rules which function to maintain resource sustainability by governing and limiting uses of the shared resource. In the third basic type of resource property institution, 'open access' resources belong to no one and are freely available for anyone to use without limitation. One distinguishing condition between a common property resource and an 'open access' resource is that a management regime is applied to the former. It is the management regime in many cases which determines the property nature of the resource, instead of the reverse. In practice, resources are sometimes managed by regimes which combine elements of the above three basic forms of property resource regime (Berkes and Farvar 1989, 9).¹⁸

The two main issues present when managing common property resources are difficulties in controlling access, and the ability of each user to subtract from the welfare of others by their harvest activities (Feeney et al. 1990). Garret Hardin popularized the model that the unrestricted use of any resource held in common inevitably leads to a 'tragedy of the commons' (1968). The 'tragedy' takes place as the resource is overused by individuals pursuing their unrestrained self-interest.

¹⁸ The location of a fugitive resource, how it is caught, and by whom is critical in determining the property nature of a resource. For example, a salmon in the high seas belongs to no one, and is considered an 'open access' resource. The same salmon in a Scottish lord's salmon stream, even before it is caught, is considered private property. In United States' waters, the salmon is managed as state property. Within a fisheries area under Native American tribal jurisdiction, the salmon becomes community property (example from Buck (Cox) 1989, 127-28).

Hardin suggested only two solutions existed to prevent the 'tragedy of the commons.' These were the privatization of the resource or the imposition of a strong centralized government authority to manage uses of the resource. The 'tragedy of the commons' metaphor, suitable only for certain, rarely occurring 'open access' resource situations, is often applied to resources which are viewed as being potentially 'open access' in character. This is a misuse of the metaphor, because the variables of restricted access to and group control over resource use are normally associated with community-based and state-controlled resource regimes.

True 'open access' resource situations rarely exist today. International agreements, such as the Law of the Sea, further reduce the existence of potentially tragic 'open access' resource situations. The prescription or retention of resource management regimes based upon this metaphor of inevitable resource destruction may contribute to less than optimal management results (Ostrom 1990). One documented example occurred when Nepalese forests, formerly under village stewardship as community property, were nationalized in 1957 in order to 'protect' the forest and promote its development through government management. Nationalization led to the villagers treating the forest as an 'open access' resource, because their traditional stewardship obligations no longer assured any community benefit. This breakdown in the exercise of community responsibility contributed to the further degradation of the forest, because the nation was unable to monitor and protect the nation's remote forest areas. Recognition by the government of the important conservation role community stewardship can play in protecting remote resources led in the 1970s to a national initiative to build upon traditional community-based forest management through a program supporting local management of forest resources

(Arnold and Campbell 1986). Partnership between the government and community in forest management is contributing to healthier forests in Nepal.

Nearly 5,000 cases of sustainable community-based resource regimes have been identified world-wide (Ostrom 1990). The growing empirical record of long-term community-based resource regimes that depend neither on privatization nor state control for their success indicates that Hardin (1968) overlooked the role of community property regimes as a third solution for avoiding the 'tragedy of the commons.'

When all the conditions of an 'open access' resource do occur, as happened in the past with high seas commercial whaling, a 'tragedy of the commons' may take place. In other cases, when resources are managed under a community-based property regime, with limitations on both users and their harvests, the 'tragedy' rarely takes place. Pressure on resources frequently leads to the establishment of a management framework, displacing former 'open access' situations with community-based or state common property regimes. Sustainable resource use characterizes the end result of many community-based common property resource regimes studied to date (Berkes 1989; Feeney et al. 1990; Ostrom 1990).

The Need for Differentiating Between Resource Regimes

By differentiating between 'open access' natural resource situations and common property or community-based resource regimes, the application of appropriate resource management prescriptions is more likely to take place. Many community-based resource regimes are not recognized by government resource agencies who tend to view all non-private, or common property 'state' resources as

having 'open access' characteristics. To help distinguish between common property and other resource regimes, Stevenson defines "common property as a form of resource ownership with the following characteristics:"¹⁹

1. The resource unit has bounds that are well defined by physical, biological, and social parameters.
2. There is a well-defined group of users, who are distinct from persons excluded from resource use.
3. Multiple included users participate in resource extraction.
4. Explicit or implicit well-understood rules exist among users regarding their rights and their duties to one another about resource extraction.
5. Users share joint, nonexclusive entitlement to the *in situ* or fugitive resource prior to its capture or use.
6. Users compete for the resource, and thereby impose negative externalities on one another.
7. A well-defined group of rights holders exists, which may or may not coincide with the group of users (1991, 40).

All seven characteristics are considered necessary for a resource to be managed as common property. The other two basic resource regimes, private property and 'open access,' do not meet all seven of these conditions. The term common property, as used by Stevenson, refers to a social institution or resource regime applied to a resource. Stevenson restates his definition that common property

is a form of resource management in which a well-delineated group of competing users participates in extraction or use of a jointly held, fugitive resource according to explicitly or implicitly understood rules about who may take how much of a resource (Stevenson 1991, 46).

¹⁹ Stevenson acknowledges that this distinction between 'open access' and common property regimes was made earlier by Ciriacy-Wantrup (1971) and Ciriacy-Wantrup and Bishop (1975).

Stevenson's definition will be used in this thesis to help differentiate common property from 'open access' and private property resource regimes.

Over-exploitation of a resource is predicted to take place where resource use is not restricted, there are many users present, and there is an excess of demand beyond what the resource may sustain (ibid.). It is these characteristics associated with 'open access' resource regimes which create the need to find solutions to the dilemma of the commons. The physical nature of some resources, such as the mobility of wildlife, contributes to their being viewed as having 'open access' characteristics, even though community resource regimes may be present.

The solution [to the 'open access' problem] that is often given is to "vest property rights" in the resource in certain users. Vesting property rights means defining who may participate in resource extraction and to what degree, and designating who makes the management decisions regarding the resource. But it is important to note: Common property performs these tasks within the framework of group control, even as private property accomplishes them under individual control. Common property also possesses a set of property rights relationships designed to eliminate open access exploitation. The number of users is limited, each user understands how much of the resource he or she may extract, and decisions about resource allocation are made by some group process (ibid., 5; emphasis added).

Privatization or state control are frequently the only two options proposed by resource managers and economists for protecting common property resources from degradation. Even these two options have a mixed record of success in preventing resource degradation, though each approach has its advocates (Larkin 1977). Ostrom argues against there being a single institutional solution to the problem of the commons. Instead, "many solutions exist to cope with many different problems" in common property resource management (1990, 14). Expecting government

authorities to develop resource management institutions and impose them on resource users is overly simplistic, and ignores other possibilities for achieving resource protection. Ostrom points out that

"getting the institutions right" is a difficult, time-consuming, conflict-invoking process. It is a process that requires reliable information about time and place variables as well as a broad repertoire of culturally acceptable rules. New institutional arrangements do not work in the field as they do in abstract models unless the models are well specified and empirically valid and the participants in a field setting understand how to make the new rules work (Ostrom 1990, 14; emphasis added).

Government responses to grassroots co-management proposals need to consider the validity of alternatives to centralized state control over wildlife resource management.

The belief that "freedom in the commons brings ruin to all," and that Hardin's two solutions are the only options to prevent this tragedy, pervades resource-management, economics, and the conventional wisdom of many resource managers (Berkes and Farvar 1989, 9; Feeney et al. 1990, 2; McCay and Acheson 1987, 2).

The importance of natural resources to human endeavors requires resource management policies and actions to be built upon as strong and legitimate a foundation as possible. Common property theory is challenging the validity of the assumptions used to justify the use of centralized state control of resources.

This clarification of the limitations to Hardin's model sets the stage for presenting a review of common property resource regimes that are based upon neither private property nor state control. Increased understanding of the range of proven policy prescriptions for managing common property resources, as differentiated from 'open access' resources, will lessen the likelihood inappropriate resource management choices will be made in the future.

Common Property Resource Management Systems

A new theory of common-property resources has to be able to account for sustainable resource management under communal-property regimes. Alternative models based on more complete theory, rather than the misleading 'tragedy of the commons' model, could provide the basis for the sustainable use of common-property resources for the future (Berkes and Farvar 1989, 15).

As described earlier and presented in Table I (page 35), common property regimes, as differentiated from private property and 'open access' types, may take two main forms, either state property (*res publica*) or community property (*res communes*).²⁰ In the first form, the government exercises ownership and management control of the resource as public property. Government administration of common property resources may take a variety of forms. State property regimes may be viewed as fitting Hardin's prescription for centralized control over 'open access' resources in order to avoid the 'tragedy of the commons'(1968). When this is the case, government control can become an end in itself. Resource management benefits associated with community property regimes may also be overlooked.

Community-based resource management systems are a second form of common property regime (Table I, page 35). Use-rights in this regime are held by a definable group, with rules "concerning who may use the resource, who is excluded, and how the resource should be used" determined by the user-group itself (Berkes and Farvar 1989, 10). The resources are not privately held, nor are they managed or controlled by the government. Berkes and Farvar list five critical roles community-

²⁰ Ciriacy-Wantrup (1971) used the terms *res communes* and *res nullius* to describe community property and 'open access' resources which are unowned.

based resource systems play in local communities.

1. Community-based management guarantees access rights to a vital resource and is a principal means of ensuring livelihood security. Elaborate rules exist for sharing food among the group.
2. Local, mutually agreed upon rules reduce conflict in resource use and provide for equitable access.
3. Mode of production for community is often at the household or sub-village level, with the resource being the foundation of this system. Community members share a common culture, knowledge of the resource and its use rules, including 'you must live in this community to use this resource.'
4. The resource system provides for conservative utilization of resources, based on need, with an aim at local self-sufficiency. There are social sanctions against excessive individual gain and the accumulation of a surplus.
5. Common-property systems have remained productive through generations and contribute to ecological sustainability (1989, 11-13, citations omitted).

The mixed subsistence and cash-based economies in rural Alaskan communities exhibit similar characteristics.²¹

Community-based resource regimes do not share with 'open access' resource regimes the problems associated with the unrestricted entry to and use of resources, at least when there are no external pressures or incursions disrupting an existing system. Rights to use the resource are limited to a specific group, and resource uses are constrained by internally consistent and agreed upon rules. Community-based resource regimes located throughout the world are very diverse, yet adhere to the basic theme of controlling access and use with some form of locally-based resource management institution (Berkes 1989, 75). The large number and resilience of

²¹ See pages 18 and 19 for a description of the eight characteristics of mixed subsistence and cash economies.

community-based resource systems over time indicate they are capable of managing resources in a sustainable and culturally compatible manner.

It is argued by some that impacts from modern hunting technology and a growing local population will lead to the over-harvesting of wildlife in the Arctic by Natives if the state does not exercise strong management control over wildlife resources. The implicit assumption behind these concerns for the health of the resource is that northern hunting cultures and communities either never had or no longer have the capability of managing their uses of the resource in the long-term interest of either the resource or their own community well-being. Research on the northern Cree Indians of Canada indicates the argument foretelling negative resource impacts has no empirical basis. Cree populations have doubled in the past twenty years, modern harvesting technology is available and used, and the government has a minimal harvest quota or enforcement program for wildlife. Populations of wildlife in the Cree region remain healthy, or are growing, and overall resource harvesting has not increased to the degree predicted (Freeman 1989b; Berkes et al. 1991, 27). Unilateral state control over Native subsistence uses of wildlife is shown to be unnecessary for resource protection.

Combinations of State and Community-Based Property Regimes

Central governments are often granted or assume authority over public resources such as fish and wildlife even when local community-based resource regimes may already be in existence. When this occurs, it is not unusual for conflicts to develop between the indigenous, or community-based resource system, and the

externally imposed governmental system. Conflicts may arise when state enforcement actions are taken against local resource users who are following traditional rules which happen to be inconsistent with externally developed, state imposed rules. Several Alaskan court cases resulted from conflicts between customary and traditional subsistence uses and state wildlife regulations (*Frank v. State of Alaska*, *Bobby v. State of Alaska*).

Responses to conflicts between state and community-based resource regimes vary. Community renewable resource regimes may be modified or even abandoned in favor of the imposed governmental one. In other cases, the community resource system may continue functioning informally. What generally takes place is something between these two extremes. One fruitful direction this interaction between state and community property regimes may take is towards co-management.

Co-Management as a Subset of Common Property Theory

The interaction or overlap between state and community resource regimes may lead to the transformation of both systems into a third form of common property resource regime known as co-management or cooperative management. Co-management, or the practice of the joint administration of natural resources, is emerging as a subset of common property theory (Berkes et al. 1991; Pinkerton 1987 and 1989). Occasionally cooperative management may evolve between a non-community-based user-group and the state. For example, salmon aquaculture associations in southeast Alaska are the product of a user-group defined by their common commercial interests in the salmon resource, who cooperate with the State in

the operation of non-profit fish hatcheries (Pinkerton and Langdon 1987). Whether community-based or user-based, co-management regimes involve users directly with the government in resource management activities and decision-making.

Co-Management Defined

Co-management refers to the process of sharing power and responsibility between the government and a local user-group or community for managing fish, wildlife, or other resources (Berkes et al. 1991, 6). The degree of user-group authority present in a particular co-management regime varies widely and may be ranked on a scale ranging from less to more sharing of power (Table II, page 50). Co-management, as another type of common property regime, is based upon the integration of government authority with specific roles for the local users of a resource.

A co-management regime may be formal or informal, with formal regimes fitting the following definition.

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 the government, user organizations, and individual users (Osherenko 1988, 13).

Two critical characteristics distinguish formal co-management regimes from government-imposed structures which may include user participation. First, the regime itself is designed, negotiated, and jointly agreed upon by the affected user-group and the government. In most state-controlled common property resource regimes, the government unilaterally establishes and imposes the resource-management regime on resource user-groups, though some state regimes include provisions for public participation in setting regulations. The second distinguishing characteristic of a formal co-management regime is the explicit sharing of decision-making power between a user-group and the government. Government regulatory structures may provide for public participation, but without the sharing of decision-making power, even a strong public participation program may rank relatively low according to the eight levels of co-management displayed in Table II (page 50).

Many co-management situations are informal. They function as a result of initiatives by key government agency personnel, usually field biologists, who have established a working relationship with local user-groups. Informal situations lack the degree of institutionalization present in formal co-management regimes, i.e., they may change or stop functioning when key personnel leave. Generally, informal situations use consensus and shared information for making management adjustments during the harvest period for a resource, such as a commercial fishery. Power remains in the hands of the state or federal agency, but the decision-making process is more localized, and when consensus-based, may include full and equal participation by the affected user-groups. The Kuskokwim River Salmon Management Working Group is an example of an informal fisheries co-management agreement in Alaska's Western subsistence resource region (Albrecht 1990).

Citizen Participation

Citizen participation is a fundamental component of a democratic society. How this participation is defined and provided for is less clear. Citizens interested in public participation generally intend to be able to exert enough power so the government agency or institution involved with an issue will be responsive to their views and needs. Arnstein differentiates between the 'empty ritual' of public participation and having the real power to affect the outcome (1969). Public participation in situations where citizens exercise no power tends to result in the status quo remaining unchanged. In addressing the question of what form citizen participation may take, Arnstein developed a typology in the form of an eight rung ladder to illustrate the range of citizen power (ibid., 217).

Levels of Co-Management

Berkes adapted Arnstein's (1969) "ladder of citizen participation" to describe eight 'levels of co-management' (Berkes et al. 1991). Like the case of citizen participation, the amount of influence or power which users exercise or share in a wildlife co-management regime or state property regime may vary widely. Using this approach, wildlife management regimes and co-management proposals can be placed on a continuum for a comparative analysis. Berkes' 'levels of co-management' is further adapted and presented below in Table II (page 50).

The first and lowest 'level of co-management' is called informing, and normally involves one-way communication from government agencies to the users about rules

and regulations affecting resource use. Technical jargon may be used, and some input may be sought from local users, but complete control and management of the resource is centered within a government agency. The resource managing agency may perceive local users as being incapable of contributing to management efforts.

Level 2, consultation, involves explicit efforts by the managing agency to acquire input from users of the resource. Changes in hunting regulations or research findings may be discussed face-to-face with the community. Research agendas, however, continue to be set according to the government program. While an opportunity is provided for local people to share their concerns with managers, there is no assurance local concerns will be understood or heeded.

The third level, communication, involves two-way communication leading to the potential inclusion of community concerns into research agendas and resource management decisions. Decision-making power continues to reside with the government, but local concerns begin to be treated fairly, and local knowledge may be used to address community concerns instead of only externally defined research needs. Joint management actions may take place without there being joint jurisdiction over a resource. The Kilbuck Caribou Herd Management Plan process in Western Alaska could be placed on this level and on level 5, cooperation (Alaska Department of Fish and Game 1992).

Advisory committees or regional councils are the next level of co-management, and are often formally established through legislation. Effective partnership in decision-making may start at this level, but advisory committees and councils often

TABLE II. Levels of Co-Management

8 COMMUNITY CONTROL	When resources are manageable locally, power is delegated to community; self-regulation
7 PARTNERSHIP	Partnership of equals between state and users; joint decision-making institutionalized
6 MANAGEMENT BOARDS	Community is involved in policy and decision-making about some objectives; decisions binding
5 COOPERATION	Use of local knowledge and Native research assistants; some management activities contracted to local groups
4 REGIONAL COUNCILS ADVISORY COMMITTEES	Partnership in decision-making may start; common objectives sought; advisory only, though government may be required to respond to recommendations
3 COMMUNICATION	Two-way communication begins; research plans begin to include local concerns
2 CONSULTATION	Community consulted on projects; feedback from research
1 INFORMING	Users are informed about regulations; communication is one-way

(Adapted from Berkes et al. 1991, 36)

have advisory powers only and are limited to making non-binding recommendations. The government may be required to respond to recommendations, but this does not assure the adoption of advice. Often this level represents a government agency's effort to provide for public participation, and there is no intent for the committees or councils to actually share in decision-making about the resource. The federal government calls this "including rural Alaska residents in the decisionmaking process," while explaining there are no "mechanisms for including rural Alaska residents beyond the scope of the advisory system" (Federal Register 1992, 22944). Arnstein points out, however, that "participation without redistribution of power is an empty and frustrating process" for the public (1969, 216). Both the state and federal fish and game advisory committee and regional council systems in Alaska fit squarely in the middle of this level.

Cooperation marks the transition from merely talking together to beginning to work together on resource management activities. Native research assistants may be used, and local environmental knowledge begins to be incorporated into research. Cooperation provides a means to begin overcoming mistrust between parties and for gaining a better understanding of each others' perspective of the resource. Local groups may begin to contract for management activities with the government through cooperative agreements. The grassroots co-management proposals from the Association of Village Council Presidents in Western Alaska, and the Tanana Chiefs Conference in the Interior region could be placed high within this level.

Management boards are the sixth level, and represent the first co-management level where local input plays more than an advisory role in decision-making for the resource. Some management boards include an equal number of government and

user-group members, and represent a mechanism for the actual sharing of decision-making authority. Board decisions are usually binding, though the government typically retains ultimate jurisdiction over the resource. At this level, co-management begins to fully involve the users in decision-making as decision-makers, instead of merely advisors or makers of recommendations.

Partnership at the seventh level occurs when joint decision-making becomes fully institutionalized. Formal agreements often spell out the roles and responsibilities of each party in managing a resource. Policy-making and decision-making are joint undertakings, with the health of the resource serving as common ground between both local users and the government.

Community control is the highest level of co-management. At this level most or all management power is formally delegated to the community for those local resources which generally are not migratory, such as beaver. In the case of migratory species, local users may share equally with the government the decision-making for the resource. A working co-management regime applied to several species of wildlife might include provisions related to both the partnership and community control levels on this scale. Some Canadian land claims provide for exclusive rights and management responsibilities over wildlife resources. In such cases community management roles would involve self-management of the resource (Berkes 1989). Co-management proposals from the Kotzebue Sound Fish and Game Advisory Committee and the Arctic Regional Council to enable qualifying villages to manage their own subsistence uses of wildlife would fit on this level. Management efforts by the Alaska Eskimo Whaling Commission could be placed on levels 7 and 8.

History of Co-Management Regimes

Documented co-management agreements involving wildlife in North America date back only as far as the James Bay and Northern Quebec hunting, fishing and trapping regime created in 1975 in Canada. Numerous other formal regimes began functioning in the 1980s, and new ones continue to be developed (Osherenko 1988; Berkes et al. 1991). These examples provide a basis for a theoretical framework.

The most common factor initiating the establishment of early co-management regimes was a perceived or real crisis in the health of a fish or wildlife resource (Pinkerton 1989). Government managers responded to a resource crisis by considering new ways to involve local users in efforts to protect a seriously threatened resource. Native land claims negotiations in Canada are another source of co-management regimes.²²

Cooperative wildlife management seeks to unite government wildlife management systems with regional or local indigenous systems to form a third management paradigm consisting of elements of both. It involves the joint development and implementation of management frameworks which bring wildlife agencies and user groups together in an effort to ensure the long-term viability of wildlife resources while addressing the resource needs of user groups (Swerdfager 1990, 155-56).

Most co-management regimes for arctic wildlife were established in the mid-1980s and are located in Canada. Alaskan examples of co-management center around marine mammals, migratory waterfowl, and fisheries (Albrecht 1990; Langdon

²² Co-management regimes between treaty tribes and states developed out of *U.S. v. Washington* in Washington state (Cohen 1986), and the *State v. Gurnoe* case in Wisconsin (Busiahn 1989). In both cases the courts upheld treaty-guaranteed Indian fishing rights on ceded lands.

1984 and 1989; Wheeler 1988). The oldest and most successful Alaska regime involves co-management of the traditional subsistence harvest of the bowhead whale by the Alaska Eskimo Whaling Commission (Huntington 1991). Cooperative agreements or contracts between the federal government and Native tribal groups for the gathering of subsistence harvest information are under negotiation, and one was signed in 1991 with the Tanana Chiefs Conference. Co-management activities related to terrestrial wildlife species in Alaska are just beginning, and there are no institutionalized terrestrial wildlife co-management regimes where local involvement exceeds the limited advisory roles of level 4 on Table II (page 50).

The evolving Kilbuck Caribou Herd Management Plan in Western Alaska is the product of an on-going cooperative planning effort for the Kilbuck Caribou herd which began in 1990 following litigation by local village leaders.²³ The involved parties were brought together by the Alaska Department of Fish and Game (ADF&G), and include the U.S. Fish and Wildlife Service (FWS), and the Association of Village Council Presidents (AVCP), and other community and subsistence user representatives. Village members are involved in the development of the plan, and occasionally assist in caribou research with state or federal biologists. Actual management and regulatory decisions, however, continue to be made by the Board of Game and Federal Subsistence Board. The cooperative planning process facilitates the submission of mutually agreed upon regulatory proposals to both boards, increasing the influence from local input in the existing regulatory framework.

²³ *Kwethluk IRA Council v. State of Alaska* was filed in the Federal District Court in March 1990. Kwethluk requested the Board of Game's ban on hunting of the Kilbuck caribou herd be lifted to allow a limited local subsistence hunt by villagers.

Benefits of Co-Management

There are many benefits associated with co-management regimes beyond those providing for public participation and improved resource management. A co-management regime involving resource users as equal partners (Table II, levels 5-7, page 50) potentially enhances the following cultural and socioeconomic aspects of rural community life, along with improving the prospects for resource conservation.

Improved resource management may translate into better conservation of renewable resources. Co-management may improve wildlife management by increasing communication between users and the government, improving data gathering and the monitoring of harvests, potentially lowering costs, increasing user respect for the management system, and contributing to greater compliance with conservation regulations. These specific management benefits are related to the degree of legitimacy a regulatory regime has in the eyes of local users. Legitimacy is fostered when local users develop a sense of ownership and responsibility for a regime from sharing in its development and the decision-making for the resource with the government (page 62 describes ways to foster legitimacy)(Osherenko 1988).

Co-management can minimize conflicts between the government and local users by fostering the integration of customary and traditional subsistence activities into the management system. Both the resource management system and the community may be strengthened by minimizing unnecessary conflicts between resource regulations and traditional subsistence activities.

Enhancing local roles in subsistence management can contribute to the strengthening of community confidence, leadership, and cultural identity through the

exercise of greater local influence over this fundamental element of rural community and Native cultural existence. Dependency on outside levels of government is reduced by the centering of management for important cultural activities, such as subsistence, within the community. Cultural revitalization is enhanced by building positive associations and structures for local roles in the management of subsistence. The removal of legal proscriptions to certain customary and traditional subsistence practices will allow hunters to contribute to the community well-being without fear of legal prosecution and enhance the legitimacy of the management regime.

Few formal economic opportunities exist in Alaska's villages. Wage-earning opportunities connected to subsistence management can strengthen the existing informal mixed cash and subsistence economy of rural communities. Local employment opportunities resulting from wildlife management activities associated with co-management regimes will assist community economic development in rural areas where few jobs are available. Village or tribal government experience in administering contracts for wildlife management activities will expand their capability to administer other resource-based economic development projects, further contributing to sustainable development actions potentially consistent with wildlife habitat protection.

The benefits of improved subsistence management and conservation of wildlife resources are adequate to explain and justify consideration of the co-management option. When the potential cultural and socioeconomic benefits of co-management are considered from the perspectives of rural Native and non-Native communities, the increasing grassroots interest in developing subsistence co-management regimes is easier to understand. Co-management not only provides a means for integrating local subsistence concerns into wildlife management, it potentially reinforces the informal

mixed cash and subsistence economy of rural Alaskan communities while providing a boost to Native cultural revitalization.

Co-management regimes may overcome the biological and political limitations of wildlife management by integrating the socio-cultural elements of the rural Native subsistence way of life into a more appropriate structure for assuring the protection of both wildlife and subsistence activities. Berkes points out that co-management

is also important to the social and economic health of many native communities. Because of the continuing importance of living resources, the economic development of native communities is linked to their ability to manage their own resources. This, in turn, is linked to larger questions of self-government (Berkes et al. 1991, 2).

Wildlife management has historically functioned to accomplish two interrelated goals: 1) protection of the biological health of a resource, and 2) maximization of the recreational use of certain species. Managers scientifically act to increase or sustain the populations of an animal species, while using a system of controls appropriate for equitably limiting the harvest by sport hunters. These controls consist of licenses, harvest tags or permits, open and closed seasons, individual bag limits, and restrictions on methods and means to maintain elements of 'fair chase' to hunting and further restrict individual sport harvests. While often being portrayed as objective, general hunting regulations in Alaska reflect a strong sports' user bias, and sometimes fail to recognize or provide for differences associated with Native subsistence harvest activities (*Bobby v. State of Alaska*, 1989; Schaeffer, Barr, and Moore 1986). Co-management regimes incorporate through their design a process which helps to bridge the differences between conventional wildlife management regimes and the community-based nature of rural Native subsistence activities.

Barriers to Co-Management

Attempts to develop co-management regimes may be stymied by lack of understanding on the part of government agencies about the motivation, purposes, and goals behind grassroots requests from community-based resource users for developing subsistence co-management regimes. For example, during planning for the federal subsistence management program in Alaska, public requests for co-management, for the delegation of subsistence management authority to local governmental entities, and for subsistence user participation on the Federal Subsistence Board and its staff committee were submitted to the U.S. Fish and Wildlife Service. The federal response to these requests was "the primary avenue for involving rural Alaska residents in subsistence management will be through the Regional Councils and Federal Advisory Committees" (Federal Register 1992, 22945). The federal regulations adopted for subsistence management on federal lands further explain that "The Regional Councils shall provide for public participation in the Federal regulatory process" (ibid., 22954).

The federal government appears to have responded to the above requests for co-management as if they were only pleas for public participation. In response to a request for delegation of management responsibility to local entities, the federal government explained such a delegation was beyond their authority. Public participation is provided for through the regional councils, and the responsibility for wildlife resources and subsistence protection rests with the federal government. The option of the government sharing management responsibilities while retaining ultimate authority appears not to have been considered. Therefore, no actions were taken in

response to public requests for a greater local role in subsistence management other than to provide the advisory role mandated by the Alaska National Interest Lands Conservation Act.

Co-management regimes as defined in this paper range from various forms of public participation, to the total devolution or delegation of resource management authority to the local level. In its mid-range applications (Table II, levels 3-7, page 50), co-management may provide for the integration of local user-groups into the management process as partners, with the government retaining full or final authority over the resource.

Local interests in co-management apparently were unable to communicate the possibility of developing middle-range co-management regimes that go beyond simple public participation (Table II, levels 2-4, page 50), but fall short of the total devolution of management authority to local levels (Table II, level 8). Within co-management a wide range of possibilities exist which could provide for a greater degree of local influence in management while also allowing the federal government to maintain their responsibilities for subsistence activities on federal lands (Table II, levels 5-7). These possibilities have apparently not been understood nor investigated in the planning process for the federal subsistence management program adopted in 1992 (Federal Register 1992).

Centrally-run government natural resource management systems are often rationalized as necessary to prevent the over-exploitation of wildlife resources or 'the tragedy of the commons' predicted by Hardin's theoretical model (1968). Some professional biologists go further and say that the devolution of centralized government wildlife management towards locally or regionally-based management

"would be a disaster for the resource" (interview 1991). These beliefs appear to be based on the assumption that rural population increases, combined with modern technology, will lead to uncontrolled and excessive harvesting of wildlife in the absence of state-imposed controls. There is also the implication that local or regional bodies are incapable of successfully managing wildlife resources, or that government authority over the resources would not be retained.

The evidence from northern Canada, however, where Native populations recently doubled, modern hunting technology exists, and there are few state-imposed harvest quotas or enforcement activities, indicates no such 'disaster' has taken place. In fact, caribou populations continue to expand in the north, even in proximity to Cree hunting communities (Berkes et al. 1991, 27; Freeman 1989b).

What is not always apparent to non-local professional biologists is the existence of culturally-based norms and rules regarding traditional resource use which serve to protect wildlife resources from over-exploitation by community members. Subsistence is sometimes referred to as a self-regulating system because of the internal checks and balances which function to direct hunting pressure to a wide range of renewable resources, based upon their relative seasonal abundance (Berkes 1989; Wolfe and Walker 1987). Harvesting based upon the needs of a specific local population is limited by that need, and access to the resource from non-local residents for subsistence purposes has been traditionally limited or excluded. It is these two characteristics of common property regimes, the existence of a defined user-group, and mechanisms for limiting harvests, that contribute to sustainable resource use, instead of leading to the 'tragedy of the commons.' When harvesting behavior must be changed to protect a resource, rural community members are capable of learning

and then acting in the best interests of the resource and the community. Subsistence users participating in the Yukon-Delta Goose Management Plan and Alaska Eskimo Whaling Commission demonstrate the potential for the self-regulation of harvest activities to effectively protect and conserve limited resources.

Adherence to Hardin's (1968) model of resource degradation, which is suitable only for certain 'open access' resource situations, impedes efforts to devolve subsistence management towards co-management regimes that potentially reinforce local community-based resource systems. Possibilities exist for the emergence of new forms of wildlife management incorporating the strengths of each system. There is a strong potential for new wildlife management systems to better meet the cultural, socioeconomic, biological, and institutional requirements relating to subsistence activities in rural Alaska. State-dominated forms of control over renewable resources, even when combined with an active public advisory system, have been shown to be unable to adequately fulfill the federal mandate to meaningfully incorporate local perspectives into an administrative structure for subsistence management (Marshall and Peterson 1991). Co-management regimes offer an alternative model of resource management capable of bridging the gap between customary and traditional indigenous resource systems and practices, and government wildlife regimes.

Summary of Common Property Theory

Common property resources shared by many users may be managed according to three basic property rights institutions. These are private property, common property, and 'open access' regimes. Private property belongs to an individual, who

also controls and decides how a resource will be used. Common property is usually managed either by a state property or community-based property regime. 'Open access' resources are not controlled or owned by anyone nor any state, and are freely open to all to use without restriction (Table I, page 35).

A third form of common property management regime, known as co-management, has recently appeared. Co-management or cooperative management is based upon the integration of a government management system with either an existing community-based property regime or another definable user-group of the resource. This integration of two systems may take a variety of forms, ranging from a government-dominated structure, to a management situation supervised by the local users of the resource. Table II (page 50) provides a scale defining eight 'levels of co-management' which may be useful in analyzing a resource regime according to the degree of power exercised by local users in resource management.

When common property resources are managed by regimes limiting access to a defined group of users and with rules governing how the resource is used, resource sustainability is generally assured according to a growing empirical base of findings (Feeney et al. 1990). Common property regimes, characterized by a limited user-group practicing cooperation and controlled harvests, are not predisposed to contribute to resource degradation or Hardin's 'tragedy of the commons' (1968). Resource sustainability is shown to be a principle characteristic of community-based and user-group property regimes.

Co-management regimes are emerging as an alternative framework to conventional centralized state wildlife management, especially in situations of conflict between community-based and state systems, or during a crisis involving the

population of an important species (Pinkerton 1989). This new framework provides a means for overcoming conflict, while both protecting or enhancing the health of a wild resource and enabling Native and non-Native users to continue with their customary and traditional subsistence activities. Improved communication and understanding between government agencies and Native users resulting from working together in co-management regimes has contributed to the realization of the goals of more effective wildlife protection and accommodation of Native subsistence uses of these same resources. The Alaska Eskimo Whaling Commission demonstrates the potential for co-management to accommodate cultural resource uses with biological conservation.

Osherenko (1988) makes tentative conclusions about key ingredients for successful cooperation between indigenous users and the government based on the brief history of arctic wildlife co-management regimes. One key ingredient is the establishment of a sense of ownership and responsibility in the regime by indigenous users. The development of this sense of local ownership depends on several factors.

- 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.
- 2) Users must be granted a decision-making role in shaping and operating the regime from research design to enforcement. Management techniques used need to be consistent with community lifeways and cultural norms.
- 3) Adequate funding for the regime must be provided by the government.
- 4) Cultural and linguistic barriers to Native user participation in the regime must be removed. Meetings should take place in affected communities, using Native languages or interpreters with indigenous decision-making processes made part of the management system (Osherenko 1988, 42; emphasis added).

Conclusion

Co-management or cooperative management generally involves a combination of community-level and government-level resource management systems, and may take a variety of forms (Berkes et al. 1991, 4). Resource regimes may be compared and analyzed by placing them on a scale depicting levels of co-management (Table II, page 50). Co-management regimes may be derived from aboriginal rights or land claims negotiations, though they are not dependent upon a recognition of aboriginal rights for their existence. For example, "The Nunavut resource management boards [in the Northwest Territories of Canada] ... are ... not institutions of Aboriginal self-government per se, but institutions of public government" (Merritt and Fenge 1990, 274). Co-management regimes provide a potential means for incorporating customary and traditional subsistence activities into government regulatory regimes.

In nearly all formal co-management regimes, decision-making is shared according to specific guidelines between local users and government wildlife authorities. And in most cases, ultimate jurisdiction over the resource is retained by the government.²⁴ This protects the public interest, while at the same time actively involving local users and their traditional ecological knowledge in the management of the resource. Successful co-management regimes may provide valuable cultural and socioeconomic benefits to communities. Improved wildlife management resulting from co-management regimes may contribute further to the protection of subsistence uses by helping to maintain healthy wildlife populations.

²⁴ Exceptions generally occur as a result of Native land claims or court interpretations of existing Indian treaty rights.

CHAPTER 3

FINDINGS

Introduction

This chapter presents the findings related to the research question. Each subsistence resource region will be examined separately, with findings presented for each of the six factors believed to be related to the emergence of grassroots wildlife co-management proposals. During the period under study, initiatives for subsistence wildlife management emerged from the Arctic, Interior, and Western regions, while none emerged from the Southcentral, Southeast, or Southwest regions. More extensive findings from the Kotzebue Sound subregion in the Arctic region and the Southeast region will be provided to help draw out the differences between regions where wildlife co-management initiatives emerged and those where they did not, respectively. Findings from the other four subsistence resource regions will be presented in less detail.

Evidence was obtained by reviewing the written records and literature sources related to subsistence management, and by interviewing key informants. Ethnographic literature (Burch 1984, Clark 1974) and the many technical reports published by the Alaska Department of Fish and Game (ADF&G), Division of Subsistence, provided information for making demographic and cultural comparisons among the Arctic, Interior, Southcentral, Southeast, Southwest, and Western subsistence resource regions (Figure 1, page 3). The examination of regions not expressing interest in initiatives for establishing co-management regimes for subsistence uses of wildlife allowed for a multiple case study approach and

comparative analysis among regions. The multiple case study method provides for an increased credibility of the findings than is possible with a single case.

The published literature makes little mention of initiatives for wildlife co-management (Rogers 1991), though several works describe existing co-management regimes and the history of their establishment (Berkes 1989; Pinkerton 1989; Usher 1986; Wheeler 1988). This research is directed at determining the conditions which may help to explain the emergence of wildlife co-management initiatives from certain subsistence resource regions in rural Alaska.

Findings From the Kotzebue Sound Subregion of the Arctic Region

In 1988 and 1990, the Arctic Fish and Game Regional Council (ARC) submitted formal recommendations originating from the Kotzebue Sound Advisory Committee to the State Board of Game (BOG) and Federal Subsistence Board (FSB), respectively, to establish a process for exempting communities from state and federal wildlife regulations.²⁵ To qualify for an exemption, a designated community would first have to adopt a local ordinance prohibiting the wasteful uses of wildlife. The purpose of this proposal was to enable an exempt community to practice self-regulation of its residents' subsistence uses of wildlife. On the scale of eight possible levels of co-management, the ARC proposal could be placed near the top, between levels seven and eight, which represent the most user power (Table II, page 50). The existing state regional advisory council system, in comparison, fits on level 4, which represents much less subsistence user influence on management decisions by the government.

²⁵ Proposal #26 was submitted to the Board of Game in 1988.

The Arctic subsistence resource region includes the entire area of Alaska north of the Yukon River drainage and may be divided into the North Slope, Bering Strait/Norton Sound, and Kotzebue Sound subregions (Figure 1, page 3). The North Slope geographic area coincides with the boundaries of the Arctic Slope Regional Corporation established by Alaska Native Claims Settlement Act (ANCSA) in 1971, and has a land area of 88,000 square miles. The Bering Strait/Norton Sound subregion of 26,000 square miles includes Saint Lawrence Island, and falls within the Bering Straits Native Corporation boundaries. The Kotzebue Sound subregional area of 36,000 square miles closely corresponds to the boundaries of the Northwest Arctic Native Association (NANA) Regional Corporation (Figure 3, page 134).

The Kotzebue Sound subregion includes the watersheds of rivers flowing into the Sound, with the Noatak, Kobuk, and Selawik Rivers being the largest. Cape Thompson marks the northern boundary of the Sound, and Cape Espenberg the southern. Land cover is mostly arctic tundra, with stands of boreal northern forest of spruce and birch found in many of the river valleys. Access to the subregion from other parts of Alaska is by way of commercial airline service mainly to the regional center of Kotzebue, and limited summer barge service. No roads or railroads link this subregion with the state highway system.

Magnitude and Type of Subsistence Resource Utilization

The magnitude and type of subsistence resource utilization is the first of six factors proposed to help explain the emergence of wildlife co-management proposals from certain regions in Alaska. Comparisons will be made among the six regions

according to the amount and type of subsistence resource harvest taking place in each region.

Subsistence harvesting by local residents takes place throughout the Kotzebue Sound subregion, including marine mammal hunting ranging far offshore. The major rivers and their tributaries provide transportation and habitat for intensive local subsistence use of fisheries and wildlife. A wide variety of fish, wildlife, and plant resources are utilized, including at least 24 species of land mammals, 33 of fish, 9 of sea mammals, and 67 bird species (Schroeder et al. 1989). The more important subsistence food species include walrus, beluga, seal, caribou, moose, sheep, bear, and fish. Extreme variability in the availability of specific subsistence resources from year to year contributes to yearly variability in the harvest amount of each species.

The economies of the Kotzebue Sound subregion's eleven communities are primarily subsistence-based. Subsistence harvesting takes place year round and is the most consistent economic activity within the subregion for most of the residents. Subsistence harvests of local fish and wildlife resources provide most of the protein and fat in the diets of the region's residents (ibid.). A subsistence harvest survey in 1972 found that Kotzebue Sound communities harvested nearly four million pounds of mammals, fish, birds, and plants for human food. Of this total, about 2.7 million pounds was from mammals (mainly caribou), and one million pounds was fish. Considering the region's 1970 population was 4,048, the annual per capita subsistence harvest equals 667 pounds (Alaska Department of Labor 1991). More recent subsistence harvest surveys indicate these high harvest amounts continue today with little change in overall magnitude (Schroeder et al. 1987).

The Arctic subsistence resource region's annual average subsistence harvest of

610 pounds per person is the second highest among the six regions, and compares to the state-wide average of 250 pounds. Kivalina, a coastal village along Kotzebue Sound, harvests 820 pounds of subsistence food per person each year (Alaska Department of Fish and Game 1989). Research over the past twenty years indicates a consistent pattern of overall use of subsistence foods in Kivalina, though there is a considerable variation in the quantity of caribou, walrus, and beluga harvested from year to year. Subsistence harvesting continues to play a vital and leading role in the subregion's mixed cash and subsistence economy.

Degree of Cultural Unity and Native Percentage of Population

The entire Arctic subsistence resource region, except for Saint Lawrence Island, is inhabited by Iñupiat Eskimo peoples. The people of Saint Lawrence Island are Siberian Yup'ik Eskimo. The boundaries of the three Native regional corporations in the Arctic region reflect language dialect and social organization boundaries (Figures 2 and 3, pages 131 and 134). The total 1990 population of the North Slope subregion is 5,979, of which 72 percent are Alaska Native, and the population of Bering Straits/Norton Sound subregion is 8,288, with 74 percent Native.²⁶ The Kotzebue Sound subregion will be examined in detail because of the wildlife co-management initiatives which consistently emerged from this area of the Arctic region.

Eighty-five percent of the Kotzebue Sound subregion's 6,113 residents are Iñupiat Eskimo who reside in ten villages and the regional center of Kotzebue. A

²⁶ All population and cultural data are from the Alaska Population Overview: 1990 Census and Estimates, Alaska Department of Labor, 1991.

common cultural heritage ties the people of this area together. This cultural homogeneity is related to the geographic unity of the Kotzebue basin. The confluence of the basin's major rivers near Shesalik enabled people from different communities or 'societies' to travel downriver and gather each summer for an annual fair (Burch 1984, 305). The present strong cultural unity of the region is derived from hundreds of years of close contact among the ten traditional societies of Iñupiat speaking people who reside in the Kotzebue Sound basin. The lack of surface transportation connection to the rest of Alaska, and minimal commercial and industrial activity help to explain the presence of relatively few non-Native settlers in the Kotzebue Sound subregion.

The community of Kotzebue serves as the regional administrative and supply center for the subregion's ten smaller villages, and is centrally located in the vicinity of Shesalik. The 2,751 Kotzebue residents are 75 percent Native. The other villages have much lower total populations, but much higher percentages of Native residents. For example, Kivilina's 317 people are 97 percent Native, Noorvik's 531 residents are 93 percent Native, and Noatak's 333 inhabitants are 96 percent Native.

Overall, the Kotzebue Sound subregion is marked by extremely strong cultural ties and a very high percentage of Native residents in all eleven communities. The lack of road access and remoteness from the rest of Alaska, and the historical absence of major industrial intrusions or commercial enterprises in the subregion help to explain the continuing existence of a strong subsistence-based economy.²⁷

²⁷ The recently opened Red Dog lead and zinc mine is located in the northern portion of the Kotzebue Sound subregion, and employs about 400 people, many of whom are residents of the region. There is also a small scale and brief commercial fishing season based in Kotzebue.

Strength of Leadership Around Subsistence Issues

The third factor, strength of leadership, is used to measure the commitment of regional leaders and organizations to the protection of the subsistence activities of local residents. A brief review of each region's history may allow conclusions to be drawn about the relative importance given to subsistence. A more extensive review of the history of regional leadership activities directed towards subsistence will be provided for the Kotzebue Sound subregion and Southeast than for the other regions.

The first Native organization in northwest Alaska was established in the early 1960s in response to the Project Chariot proposal by the United States Atomic Energy Commission. Project Chariot intended to use five nuclear explosive devices to blast a harbor near Cape Thompson at the northern boundary of Kotzebue Sound (Burch 1984). Local opposition was centered on the impacts from the released radiation on the subsistence marine and land resources which residents depended upon for their local economy and well-being. After cancellation of the proposed harbor project, general Native rights and land claims issues were pursued by the local leadership. The initial concern for the protection of local subsistence activities continues as a theme throughout the history of leadership and organizations in this subregion.

The Northwest Alaska Native Association (NANA) was organized in 1963 by members earlier involved with the Iñupiat Paitot association, a group formed in 1961 to address subsistence and land issues (Case 1984, 396). NANA later incorporated as a non-profit corporation in 1967 to pursue land claims for the Iñupiat of the Kotzebue Sound area. When Native claims were settled by Alaska Native Claims Settlement Act (ANCSA) in 1971, the new for-profit Native regional corporation for this

area adopted the NANA name. To avoid confusion, the older non-profit association adopted the name Mauneluk, which was later changed to Maniilaq in 1981.

The Maniilaq Association serves as Kotzebue Sound's non-profit Native association and administers grants and contracts under the Indian Self-Determination and Education Act (P.L. 93-638). Maniilaq is organized to promote the economic, social, educational, and personal well-being of the people of northwestern Alaska, and functioned as a regional government until the establishment of the Northwest Arctic Borough (NAB) in 1986. Programs and services provided by Maniilaq include the hosting of an annual Elder's Conference, operating community health clinics, and providing a variety of social services.

Subsistence issues are also central to Maniilaq's activities. In 1983, Maniilaq published a bibliography of recent subsistence publications which included a review of the state fish and game advisory system (Maniilaq 1983). The region's Iñupiat Iilitqusiit (Eskimo Spirit) program promotes Iñupiat cultural values as a means of strengthening individual self-esteem to counter destructive social behavior. The program includes field camps where traditional subsistence activities are taught.

The NANA Regional Corporation was established as the for-profit organization to administer the cash benefits and land title associated with ANCSA. John Schaeffer, President of the NANA Regional Corporation, called the maintenance of subsistence "the single most important need of all the people" (Arnold 1978, 286). Prior to 1976, the maintenance of subsistence resources was adopted as a goal by NANA.

Another provision of ANCSA established a village corporation for each recognized Native community. In the NANA region, all village corporations except Kotzebue's merged with the NANA Regional Corporation. The ten villages which

merged were assisted by Maniilaq to form Indian Reorganization Act (IRA) governments, and NANA designated the IRA governments to exercise village consent rights for subsurface development of village lands (Case 1984, 398). Few village corporations in other regions have merged with their regional corporation or formed multi-village associations. No other region appears as unified as the Kotzebue Sound subregion in respect to the merging of village and regional corporations.

Planning is a major new process in northwest Alaska and throughout Alaska (Gallagher 1988; Gallagher and Todd 1991). Since the mid-1970s, literally hundreds of separate planning efforts have taken place in Alaska. Each federal agency is mandated by federal law to develop comprehensive plans for each of the designated regions or conservation units it administers. The State develops regional plans for state lands and borough governments develop comprehensive land use plans. The multitude of planning efforts provide another means for reviewing leadership actions on the behalf of subsistence.

Numerous planning efforts by different agencies have been centered in the Kotzebue Sound subregion. A characteristic common to these planning efforts is the attention demanded by local participants to protecting local subsistence activities. Research generated during planning for proposed national parks in northwest Alaska focussed on identifying the subsistence uses and needs of northwest residents prior to the passage of ANILCA in 1980.²⁸ Major planning efforts involving protection of local

²⁸ Research by Anderson et al. (1977) in northwest Alaska documented local residents' heavy dependence upon subsistence resources in proposed national park areas. In recognition of the critical importance to local rural residents of continued access into these proposed national parks for subsistence purposes, when Congress established new park units they provided an exemption for local rural subsistence users to the general ban on hunting in national parks (ANILCA).

subsistence activities in the Kotzebue Sound subregion include the NANA Regional Strategy in 1978; Coastal Management Program in 1977; Northwest Areas National Park, Monument, and Preserve General Management Plans in 1986; Northwest Area Plan for state lands in 1988; Selawik National Wildlife Refuge Comprehensive Plan in 1987; and the Northwest Arctic Borough Comprehensive Plan.

Local subsistence users and their leaders became increasingly familiar with planning and other political arenas potentially affecting the local subsistence culture and economy. This experience demonstrated to local leaders what worked and did not work when the protection of local subsistence activities is a high priority. During planning for the Northwest Area Plan for State lands, a cooperative planning team included leaders from the Kotzebue Sound subregion. Efforts by the local members to eliminate proposed state land sales in the region, and to classify state lands for subsistence use met with limited success. Land sales were opposed locally because of the potential impact on subsistence resources by additional residents in the area.

Meanwhile, joint planning and development of the Red Dog Mine by the NANA Regional Corporation and Cominco included provisions to minimize impacts on the local subsistence culture and habitat. Frustration with the state land planning process, the source of a potential revenue base from the Red Dog Mine, and the desire to exercise more control over development actions on the area's lands led to the establishment of Northwest Arctic Borough (NAB) in 1986. The boundary of the NAB coincides with the NANA Regional Corporation boundary.

One of the first consequences of the establishment of the NAB was the inclusion of language in the Northwest Area Plan that defers state land sales within the Borough for five years, or until the Borough's comprehensive land use plan is

complete, whichever comes first. The NAB is also entitled to select a portion of state lands, and may exercise that right by selecting the land the state previously identified to sell. This action by the NAB could effectively preclude the state land sales objected to by the Borough and NANA Regional Corporation because of their potential adverse impacts on subsistence. This is a very sophisticated use by local leadership of municipal land entitlements to further the protection of local subsistence activities.

A more recent example of local leadership using existing institutions in innovative ways to provide protection for local subsistence activities took place in early 1992. In this case a non-local fisheries guide applied to the state for a commercial lease of a parcel of state land about twenty miles upriver from the village of Noatak. Local subsistence users and their representatives strongly opposed the lease for the commercial guiding operation because of its location and potential negative impact on local subsistence resources. The State indicated they had a mandate to develop state lands, and intended to approve the lease. In March 1992 the Northwest Arctic Borough (NAB) issued emergency regulations for implementing zoning powers, pending approval of the Borough's comprehensive plan. According to the borough planner, the new ordinance gives the borough the power to zone specific areas for subsistence priority use and deny any land-use permit applications, even those on state lands, that might be a threat to subsistence activities (Werle 1992, 3). This may be the first time a borough's zoning powers have been directed towards protecting traditional subsistence activities.

Another area where regional leadership has been exercised on behalf of local subsistence concerns is at the state legislative level. On at least three occasions state legislators from the Kotzebue area took actions to directly assist local

subsistence users with their efforts to make changes in state wildlife regulations affecting local subsistence uses. In 1984 and 1988, State Senator Ferguson of Kotzebue submitted legislation to transfer funding from the Alaska Department of Fish and Game (ADF&G) to local governments to allow subcontracting for the management of fish and wildlife to take place (Langdon 1984, 90). These legislative actions were taken because of the lack of response by the State Board of Game (BOG) to regulatory proposals from the Kotzebue Fish and Game Advisory Committee and the Arctic Regional Council. The threat of loss of funding and management authority apparently did not fall on deaf ears at ADF&G. In 1988, the BOG did adopt a controlled use area proposal to protect local subsistence users by limiting the area on the Noatak River where non-subsistence hunters could use aircraft. This was the third submission of the proposal to the Board of Game (Wolfe 1989).

Following a recommendation in 1988 by the Arctic Regional Council (ARC) to the Board of Game (BOG) to establish a process to exempt local villages from state wildlife regulations, a meeting was held in Kotzebue between local subsistence leaders, members of the ARC, the Commissioner of Fish and Game and ADF&G staff, four members of the BOG, and an ex-State legislator (Magdanz 1988; Wolfe 1989). At this meeting ARC decided to pursue the exemption proposal with the BOG and to submit proposals for regulatory changes through the existing state process.

Other local leadership actions directed at subsistence protection took place at a more local or subregional level. Subsistence interests assumed control of the Kotzebue Fish and Game Advisory Committee (KAC) in 1985 from guiding interests who had dominated the committee up to that time. In 1986, the KAC completed a review of state wildlife regulations. KAC described the presence of a sport users' bias

within the regulations and how many state regulations were inconsistent with local customary and traditional subsistence practices (Schaeffer, Barr, and Moore 1986).

With support of the Arctic Fish and Game Regional Council (ARC), KAC submitted the regulation review to the Board of Game (BOG). The purpose of the review was to identify where regulations needed to be changed, and to communicate these proposed changes to the BOG for action. The existence of incongruity between local customary and traditional subsistence practices and state wildlife regulations, along with the difficulties experienced in trying to change regulations with local input, will be discussed under the next two factors.

Leadership in subsistence matters took place within the subregion when the issue was local. Two cases of local informal self-regulation in response to changes in subsistence harvest participants were noted. In the first example, upper Kobuk River elders adopted rules governing the fall caribou hunt at Onion Portage. These rules were developed in response to greater numbers of down-river hunters traveling by boat to participate at this traditional caribou hunting location. The rules were publicized in the form of a poster, and served to inform hunters of the proper place to camp, animal waste disposal methods, and other hunting procedures for minimizing conflicts with traditional subsistence patterns.

In the second example, self-management efforts by senior beluga whale hunters addressed the new participation by Kotzebue area residents in the beluga whale hunting area of Eschscholtz Bay, traditionally used solely by Buckland and Deering village residents. Different beluga harvesting methods between Buckland and hunters from six other villages was leading to conflict and interfering with the subsistence harvest. Hunters met and agreed to procedures to avoid local conflicts on

the beluga hunting grounds (Feldman 1986; Langdon 1984, 58-59). It is significant that neither state nor federal government involvement was sought during efforts to resolve these two situations.

In summary, there is a high degree of integration of regional leadership and organizational commitment to the protection of local residents' subsistence activities in the Kotzebue Sound subregion. Elders, beluga hunters, local IRA councils, the Kotzebue Fish and Game Advisory Committee, the Arctic Regional Council, the Cape Krusenstern and Kobuk Valley Subsistence Resource Commissions, Maniilaq Association, NANA Regional Corporation, the Northwest Arctic Borough, and the region's State legislators are actively committed to enhancing protection for local subsistence users, their culture, and the subsistence resources upon which they depend. The high degree of cultural unity in the Kotzebue Sound subregion may explain the presence of long-term, unified, and complementary leadership actions supporting subsistence.

Strong communication links exist with the Iñupiat and Yup'ik people of other regions who are involved in marine mammal co-management and the Yukon-Kuskokwim Delta Goose Management Plan. Knowledge of the benefits from the application of co-management to subsistence resources in other regions, states, and countries is likely to influence the leaders in the Kotzebue Sound subregion.

Degree of Congruity Between State Wildlife Regulations and Customary and Traditional Subsistence Activities

This factor identifies the degree of correspondence between state wildlife regulations and a specific region's customary and traditional subsistence practices.

Subsistence use patterns and practices vary widely around the state, and sometimes within a single region. State regulations are often applied state-wide, resulting in regulations that may be consistent with local practices in one region, but are inconsistent with local practices in another. Prior to 1985, the Board of Game, unlike the Board of Fisheries, did not have separate regulations for subsistence uses.²⁹ The state-wide application of 'general hunting' regulations to rural subsistence uses contributed to inconsistencies between regulations and local subsistence activities.

In 1986, the Kotzebue Sound Advisory Committee (KAC) completed a review of all state hunting regulations that applied within the region (Schaeffer, Barr, and Moore 1986). The purpose of that review was to identify existing state wildlife regulations not appropriate to local conditions, and begin the process of developing a "single, culturally appropriate regulatory package for the Arctic Region" (ibid., 26).

The regulation review identified specific problems in several sections of the regulations and concluded there were many fundamental problems with the state's regulatory system. Among the problems discussed were licensing; a complex and locally unworkable harvest reporting system; bag limits and seasons designed for individual sport use that conflict with the extensive sharing of subsistence harvests in communities; methods and means restrictions that make several common local harvesting practices illegal; and possession and transportation regulations that interfere with the sharing of harvests and do not accommodate the traditional cultural practice of storing meat ("Sigluaq") in the field. The scope of the regulation review

²⁹ *State of Alaska v. Eluska* (1985) directed the Board of Game to adopt subsistence bag limits and seasons for each species in regions where subsistence took place. The initial set of 'subsistence regulations' adopted by the BOG, with few exceptions, were identical to existing general or sport regulations (Magdanz 1988).

suggests there is a need for more than a liberalization of bag limits and seasons to adequately provide for local subsistence uses. Some of the problems identified were beyond the authority of the Board of Game to alleviate, such as changes in licensing.

Inconsistencies between state regulations and traditional subsistence activities contribute to a lack of harvest reporting by subsistence hunters because local hunters are "reluctant to report their harvest when they ... conflict with regulatory seasons and bag limits" (Loon and Georgette 1991, 32). If a hunter reports a harvest which took place outside of the state-imposed season or bag limit, he or she risks legal prosecution, fines, possible jail time, hunting license suspension, and loss of the meat and hunting equipment, such as rifles, boats, or snowmachines. When faced with the choice of participating in traditional subsistence activities important to local community needs, but not allowed by regulations, or abiding by regulations that effectively limit or prevent customary practices, local subsistence hunters in the Kotzebue Sound subregion appear to often choose to follow the local cultural norms.

Enforcement actions against local hunters practicing customary and traditional subsistence activities highlighted incongruities between state regulations and local cultural norms associated with subsistence activities. The Clement Downey case is part of the folklore of the Kotzebue Sound subregion. Downey, a respected elder and active subsistence hunter from Kotzebue, was cited for being in possession of Dall sheep without a permit while hunting in the Noatak River area in the mid-1980s. The charges were later dropped, and his confiscated rifle and snowmachine returned. Subsequent to this case, enforcement efforts by federal agencies appear to be more sensitive to local concerns and cultural realities, with customary and traditional hunting practices being allowed to continue without enforcement pressure.

Differences in Perception of the State Regulatory System

In the early 1980s, Kotzebue Sound leaders recognized the potential for working within the established state regulatory structure to effect changes in regulations affecting subsistence. As mentioned earlier, subsistence interests achieved control of the Kotzebue Sound Fish and Game Advisory Committee (KAC) in 1985, and began a comprehensive review of wildlife regulations. The regulation review was submitted to the Board of Game (BOG) in 1986 with the expectation that it would facilitate changes in regulations which were inconsistent with local subsistence practices.

Changes were slow in coming. One significant change made by the BOG was to allow the traditional hunting of swimming caribou on the Kobuk River with the use of rim-fire weapons. This traditional subsistence practice was illegal under the state's general hunting regulations which forbid the hunting of swimming wildlife or the use of rim-fire weapons for hunting large animals. However, many other fundamental problems continued. Resistance to further regulatory change rested within the BOG and ADF&G, who argued the general (or sport) hunting regulations adequately accommodated subsistence uses (Magdanz 1988). On the other hand, KAC argued that regional, cultural, and economic differences could not be accommodated by regulations with state-wide application. Instead, KAC favored the development of regulations specific to only the local subsistence users of a region. Conflict between these two views of state-wide versus regional regulation contributed to an impasse, and growing frustration by fish and game advisory committee members.

Frustration also arose locally from the lack of staffing for the Arctic Regional

Council's Regulatory Program Assistant position and inadequate funding support for advisory committee and regional council meetings. Board of Game meetings are normally held in Anchorage or Fairbanks, making local rural participation difficult, while favoring urban interests with better access to the board process (ibid.).

The system currently used by the Alaska Board of Game and the Alaska Department of Fish and Game effectively precludes Native participation in the design, implementation and enforcement of state game regulations. While there is the appearance of participation in the form of advisory committees, competing statewide sport-hunting and commercial-hunting interests seem always to outweigh Alaskan Native testimony in front of the Board of Game (Schaeffer, Barr, and Moore 1986, 25).

In 1988, frustration with the state regulatory system led the Arctic Regional Council to recommend Proposal #26 to the Board of Game. This proposal, if adopted, would have exempted qualifying villages from the state's general hunting regulations. To qualify, a community would first adopt a local ordinance prohibiting wasteful harvesting of wildlife, and then petition the BOG for the exemption. Frustrations with the inability to adequately influence the State's regulatory process as it affected local subsistence activities contributed to the attempt to return management of subsistence to the community level.

This proposal for community management of local subsistence wildlife uses could be placed on level seven or eight of the co-management scale in Table II (page 50). The State Attorney General's office advised the BOG that the transfer of wildlife management authority from the BOG to a local level would require legislative action; it was beyond the authority of the BOG to delegate its authority.

The proposal prompted a meeting in June 1988 between the Arctic Regional Council (ARC), the Commissioner of Fish and Game, four BOG members, ADF&G

staff, and representatives of several northwest organizations. There was a decision by ARC to pursue both the exemption proposal and to submit new proposals for regulatory changes through the existing administrative channels of the advisory committees, regional council, and Board of Game (Magdanz 1988).

Regulations continue to be inconsistent in significant ways with local subsistence practices after BOG actions take place in response to proposals. Even when liberal bag limits and seasons are applied, inconsistencies may continue to exist between local practices and revised regulations. For example, sheep seasons, horn size, and bag limit are not consistent with traditional subsistence practices in the Kotzebue subregion, even though the bag limit and season are fairly liberal, according to sport hunting standards (Georgette and Loon 1991). Inconsistencies between state regulations and subsistence uses of wildlife are almost inevitable when management tools designed for sport hunting are applied to traditional Native subsistence hunting.

Federal Jurisdiction over Land and Native Affairs

The people and leaders of the Kotzebue Sound subregion of the Arctic region are familiar with the legal protection for subsistence mandated by ANILCA, and similar provisions within the Marine Mammal Protection Act which exempt Native subsistence users from the general ban on marine mammal hunting.³⁰ These provisions include a priority for subsistence uses over other consumptive uses, and set up an

³⁰ See *People of Togiak v. United States* (1979, 423) for a discussion of federal "duties so to regulate as to protect subsistence resources of Indian communities and to preserve such communities as distinct cultural entities against interference by the states."

administrative structure to help insure local subsistence concerns are incorporated into the management of wildlife (Title VIII, Sec. 805). Actions by the Kotzebue Advisory Committee and Arctic Regional Council (ARC) demonstrate a desire to use these structures to protect and accommodate local subsistence uses of wildlife. When ARC received no response from the federal government to their formal recommendations, ARC filed suit in 1990.³¹ The mixed success of these efforts is discussed above.

Another important aspect of this factor, especially since the federal government assumed subsistence management on federal lands on July 1, 1990, is the amount of land within a region under federal jurisdiction. In the Kotzebue Sound subregion of the Arctic region, a large majority of the land is within federal conservation units or under other federal control. Only about 25 percent of the subregions's lands are privately owned or under state jurisdiction, leaving the federal 'rural subsistence priority' intact for three-fourths of this subregion. Of the other five subsistence resource regions, only the Southeast and Western regions have a larger percentage of their area in federal lands (Table III, page 124).

It is relevant that within the Kotzebue Sound subregion are two national park areas and one national monument where only local rural residents are allowed to engage in subsistence activities. Since 1980, these parks and monuments have been closed to all consumptive uses of wildlife except for subsistence uses by local residents.³² The history of federal actions to protect local rural subsistence activities,

³¹ Litigation in this case began after the federal government did not respond to ARC's recommendation to adopt a proposal similar to #26 (page 82).

³² Kobuk Valley National Park, Cape Krusenstern National Monument, and the Gates of the Arctic National Park restrict access for hunting purposes to local residents engaging in subsistence activities (ANILCA, Title II, Section 201).

and the legal responsibility to do so, encourages local leadership to pursue improved implementation of rural subsistence protection.

Summary of conditions

The most important conditions associated with co-management initiatives from the Kotzebue Sound subregion are: 1) the important role of wildlife and overall magnitude of the subsistence harvests in the local mixed subsistence and cash-based economy; 2) the predominantly Native population in a culturally unified region; and 3) the long-term involvement of the region's leadership and organizations in efforts to protect the subsistence uses of local people.

Other conditions, not particularly unique to this region, but identified as related to the initiatives are: 1) a centralized state regulatory structure and regulations incongruent with local customary and traditional subsistence activities; 2) a regulatory system unresponsive or slowly responsive to subsistence values, needs, and concerns; and 3) history of federal legal protection for subsistence activities on federal lands comprising most of the region.

Findings From the Western Region

In 1990, the Association of Village Council Presidents (AVCP) developed a draft proposal to contract with the U.S. Fish and Wildlife Service for certain federal subsistence management activities on public lands in the AVCP region in Alaska. AVCP is a tribal organization representing 56 Native villages in the Yukon-Kuskokwim

Delta area of the Western subsistence resource region. This proposal by AVCP for an Indian Self-Determination and Education Act (P.L. 93-638) contract continues to be under negotiation. The initial federal response to the proposed contract was to suggest using the provisions for cooperative agreements in ANILCA, Title VIII, Sec. 809, instead of P.L. 93-638. The Western subsistence resource region is one of three regions pursuing wildlife co-management initiatives.

AVCP proposed to provide the following four services:

1. The research and collection of scientific data necessary to insure healthy populations of fish and game and to determine customary and traditional subsistence uses;
2. A coordinator in the AVCP region for the Federal Subsistence Board;
3. Personnel [hired by AVCP] for enforcement of subsistence regulations;
4. The staff and services required by the federal Western Regional Council (Association of Village Council Presidents 1990, 5).

The Western subsistence resource region includes the broad deltas of the Yukon and Kuskokwim Rivers, inland mountains, and the coastal area between the Southwest and Arctic regions (Figure 1, page 3). The river system serves as the principal transportation system in the region in the summer. After freeze-up, travel is possible across the lakes and tundra with few limitations. Bethel and Aniak serve as regional centers, and 56 villages are located along the coast and main rivers. Transportation between the Western region and the rest of the state is limited to commercial airline and seasonal barge service.

Magnitude and Type of Subsistence Resource Utilization

The Western regional economy is a mix of subsistence and cash-related economic activities. There are few wage-earning activities available, and the cost of living is very high (Schroeder et al. 1987). Local subsistence activities are a very important sector of the local economy, and are primarily oriented to fisheries. Fish accounts for 58 to 85 percent of reported subsistence harvest by weight among eight villages surveyed (ibid.). However, this seeming dependence on fish belies the value of being able to add bear, moose, and caribou to the subsistence diet. Wildlife plays an important subsistence role before and after the summer fishing season, especially the fall and spring hunting of brown bears. Fall hunters also seek moose and caribou, trap squirrels, fish, and gather berries (Coffing and Pete 1992).

Annual harvests of subsistence resources in surveyed Western communities range from 500 pounds to about 1,400 pounds per person (Schroeder et al. 1987). Stebbins' residents annually harvest about 975 pounds of subsistence resources per person, Quinhagak harvests 740 pounds per person, and Russian Mission 590 pounds (Alaska Department of Fish and Game 1989). Communities harvesting large quantities of marine mammals usually do not harvest similar amounts of land mammals. Fish accounts for most of the subsistence harvest by weight in this region, though a few communities harvest a large amount of wildlife (Schroeder et al. 1987). The estimated average annual per capita subsistence harvest for the Western region is 793 pounds, the highest average among the six regions.

Degree of Cultural Unity and Native Percentage of Population

The Western subsistence resource region has the highest percentage of Native population among the six regions, with 86 percent (figures from Alaska Department of Labor 1991). Most of the residents are Yup'ik Eskimo, and many continue to use their Native language. About ten percent of the Bethel census area's 13,656 residents live in eleven villages on the middle Kuskokwim River inhabited by mostly Athabaskan Indian people. Outside of Bethel, the region's largest town, most of the smaller communities have populations greater than 90 percent Native. The Kotlik population is 96 percent Native, the Russian Mission population is 94 percent Native, and the population of Quinhagak is 93 percent Native.

The Western region's boundaries roughly coincide with the Calista Corporation borders (Figure 3, page 134). Calista is the for-profit Native regional corporation representing shareholders in the Western region, and the Association of Village Council Presidents is the main non-profit organization for the villages. Cultural unity and proportion of Native inhabitants in the Western region is comparable to that found in the Kotzebue Sound subregion, though the Western region is much larger in size and population, and has many more communities.

Strength of Leadership Around Subsistence Issues

The Western region, like the Kotzebue Sound subregion, has a lengthy history of leadership and organizational commitment towards subsistence issues. Both the Association of Village Council Presidents (AVCP) and Nunam Kitlutsisti are involved

with protecting local subsistence activities and resources. Leadership was demonstrated by the joint development in the early 1980s of the initial Hooper Bay Agreement and the subsequent Yukon-Kuskokwim Delta Goose Management Plan between AVCP and the Fish and Wildlife Service (FWS), ADF&G, and California Department of Fish and Game. The Goose Management Plan addresses conservation concerns related to the subsistence and sport harvesting of certain species of migratory waterfowl. The Plan is considered to be functioning successfully, with increases in the populations of targeted species.

State legislative involvement with subsistence issues included efforts by Bethel's Representative Tony Vaska in the early 1980s, and by other legislators from the Western region. Other local leaders who are "Members [of the state's Western Regional Fish and Game Council] are very busy with subsistence activities, community, IRA (Indian Reorganization Act), and Corporation business" (interview 1992). The importance of subsistence resources to local residents is reflected in the attention given subsistence by the local leadership.

Other examples of leadership involvement in subsistence issues include participation with planning for the region's Yukon Delta National Wildlife Refuge, and recent cooperative planning between AVCP, FWS, and ADF&G for managing the subsistence uses of the Kilbuck caribou herd (Alaska Department of Fish and Game 1992). The Eskimo Walrus Commission, which includes members from the Western region, is developing a management plan for the subsistence uses of walrus. Evidence supports the conclusion that there is a long-term and well-integrated leadership commitment to subsistence issues in the Western region.

Degree of Congruity Between State Wildlife Regulations and Customary and Traditional Subsistence Activities

A review of subsistence litigation is another means of determining the degree of consistency between state wildlife regulations and customary and traditional subsistence practices. *Bobby v. State of Alaska* is a precedent setting case from the Lime Village area of the Western region. Attorneys for Lime Village submitted a proposal to the Board of Game (BOG) in March 1985 to eliminate the closed season and individual bag limit for both moose and caribou harvested by the residents of the village. The purpose of the proposal was to ensure the traditional subsistence uses of the villagers, who heavily depended on these resources, be provided for under the state's subsistence wildlife harvest regulations.

The existing closed seasons and bag limits in the state regulations interfered with and restricted traditional practices, and resulted in under-reporting of subsistence harvests. Kari's Land Use and Economy of Lime Village, a 1983 Division of Subsistence technical report, documented the year round subsistence hunting practices of Lime Village residents. The BOG response to Lime village's proposal was to increase the individual bag limit on caribou from 3 to 5, and to lengthen the season.

However, the moose season continued to be closed for almost six months each year, and the caribou hunting season was closed for over four months. In 1989, the U.S. District Court ruled that:

the BOG regulations on subsistence hunting seasons for moose and caribou were arbitrary, and thus invalid, as they failed to accommodate what Board determined to be the customary and traditional use of moose and caribou for subsistence purposes without first eliminating other consumptive uses (*Bobby v. Alaska* 1989, 765).

The court further found that:

If bag limits and seasons are imposed by the Alaska Board of Game on subsistence hunting, there must be substantial evidence in record that such restrictions are not inconsistent with customary and traditional uses of game in question, as regards to both quantity or volume of use and duration of use (ibid., 765).

This seven year-long case highlights the difficulties faced by rural subsistence interests in trying to effect changes in the state wildlife regulations to make them consistent with traditional subsistence hunting practices.

Another example where state wildlife regulations differ from documented customary and traditional subsistence practices is in the area of brown bear regulation. The Western region shares with the northwest Arctic region similar conflicts between state regulations and traditional subsistence practices relating to brown bear hunting and use. Traditional practice is for local hunters to leave brown and black bear skulls in the field, often buried facing east, or otherwise covered to keep other animals from disturbing it. To do otherwise is considered disrespectful to the bear, and to local traditional practices and cultural beliefs (Coffing and Pete 1992, 4). Bears are harvested for their meat and fat, with nearly all of the animal, except its head, being used. Where bear hunting continues as an important part of a communities' subsistence activities, people believe bear meat should be salvaged and used for food.

Hunters also are taught not to talk of their intentions to kill brown bear, or to boast of their ability or success. Doing so may bring bad luck or even harm to the hunter. It is a traditional belief that bears can hear what hunters are saying. A few hunters harvest bear each year, sometimes harvesting more than one. The meat is shared in the community, with the elders receiving the best parts.

Recent state regulations for harvesting brown bears conflicted until 1992 with the above described customary and traditional subsistence practices in the following ways: 1) the open hunting season for brown bears is less than the traditional and present hunting period of local hunters; 2) the bag limit of one bear every four regulatory years does not accommodate those hunters who generally harvest each year; 3) the state requirement to purchase a \$25 bear tag prior to hunting conflicts with traditional proscription against speaking of one's intentions to hunt a bear; and 4) the requirement to bring in the skull and hide for sealing conflicts with local practice of respecting the bear by burying the head in the field. Newly adopted regulations by the Board of Game still require a subsistence hunter to obtain a registration permit prior to hunting brown bear, though the \$25 fee has been eliminated for subsistence hunters. Other conflicts between customary subsistence bear hunting practices and the state regulations were either reduced or eliminated.

These conflicts may help explain why few subsistence hunters in Western Alaska purchase the brown bear tag or report their harvest. Coffing and Pete (1992, 8) suggest these regulations have "little or no effect on current subsistence bear hunting practices other than to discourage hunters from reporting their catch."

Differences in Perception of the State Regulatory System

Responses from the Western region to the 1989 Rural Alaska Community Action Program survey of rural members of fish and game advisory committees indicate that 44 percent felt the state's implementation of the committee system was poor or very poor, while 31 percent felt implementation was excellent or good.

Members from Western Alaska responded similarly to members from the Arctic, Southwest, and Southeast regions. Only from Southcentral did a majority of the respondents indicate they felt that the state's implementation of the fish and game advisory committee system was excellent or good.

Another important court case centered in the Western region is the *Kwethluk IRA Council v. State of Alaska*. After the Board of Game declined to authorize any subsistence hunting of the Kilbuck caribou herd by Kwethluk village residents, the federal district judge issued the village a preliminary injunction allowing a limited subsistence harvest by villagers to proceed.

Dissatisfaction with state subsistence hunting regulations in the Western region has resulted in successful federal court actions upholding the position of local residents. One person familiar with Western regional perspectives said there is local dissatisfaction with all three areas of state involvement with subsistence wildlife management: the state regulatory process; the legislative process; and the state courts, because, "All three show extreme hostility towards subsistence." Whether or not state actions are hostile, some rural residents perceive them that way.

Federal Jurisdiction over Land and Native Affairs

The federal government is the principal land owner in the Western subsistence resource region. An estimated 80 percent of the land area is under federal management, with the Yukon Delta National Wildlife Refuge comprising most of region. The Southeast region has a slightly higher percentage of lands in federal ownership, and the Kotzebue Sound subregion has slightly less of its lands in federal

hands than does the Western region.

Provisions of the Marine Mammal Protection Act exempting Native subsistence uses of marine mammals from the general ban on hunting, and the federal trust responsibility for Native American affairs are a combination likely to facilitate progress towards increased local influence in subsistence management. The Western region is well situated to benefit from the federal jurisdiction over rural subsistence uses taking place on federal lands or involving marine mammals.

Summary of Conditions Associated with Initiatives

The important conditions associated with co-management initiatives in the Western region are a heavy dependence upon subsistence resources, strong cultural unity and a high percentage of Native inhabitants, and a local leadership active in subsistence issues. The large extent of federal lands in the Western region, along with incongruities between state regulations and traditional subsistence wildlife uses, further contributed to grassroots co-management initiatives. The successful Yukon-Kuskokwim Goose Management Plan provided experience to AVCP in working cooperatively with state and federal agencies, and demonstrated the ability of local village residents to contribute to the management of their own subsistence uses of migratory waterfowl. Other local experience with the community administration of schools and contracting under the Indian Self-Determination Act for providing other social services contributes to the desire to increase local influence over subsistence management.

Findings From the Interior Region

The Interior is the third subsistence resource region to initiate wildlife co-management proposals between 1985 and 1991. The other two, the Kotzebue Sound subregion of the Arctic region and the Western region, are discussed above. Discussion of the three regions without initiatives will follow the findings for this region.

In July of 1990, Tanana Chiefs Conference, Inc. (TCC) submitted a comprehensive proposal under provisions of the Indian Self-Determination Act (P.L. 93-638) to the Secretary of the U.S. Department of the Interior to "assume all functions of the Secretary of the Interior under Title VIII of ANILCA" in relation to subsistence management (Tanana Chiefs Conference 1990). Tanana Chiefs Conference is a non-profit agency representing 43 Native villages in the Interior region, and provides a variety of social services to an area greater than one-third the size of Alaska. The TCC proposal included a detailed budget for establishing a subsistence management program with four components. The four were administration and operations, research and habitat, enforcement, and a regional court.

In July of 1991, TCC and the U.S. Fish and Wildlife Service (FWS) signed a cooperative agreement under provisions of Section 809 of ANILCA. This cooperative agreement provided for a substantially less comprehensive role for TCC than proposed in 1990. The two principal tasks TCC contracted were: 1) document the contemporary patterns of subsistence uses of fish and wildlife in four villages; and 2) monitor and report the subsistence harvests of caribou in three villages. A third task, to be produced at no cost, was to provide recommendations to "assist the Federal

Subsistence Board in improving the acceptability of Federal subsistence regulations by rural residents within the TCC region."

The Interior subsistence resource region consists of the central area of Alaska north of the Alaska Range, south of the Brooks Range, and stretching from the lower Yukon River to the Canadian border on the east (Figure 1, page 3). The Yukon River, its large tributaries, and the upper Kuskokwim River are the major river drainages of this region. Fairbanks, the state's second largest city, is linked by road with Anchorage, Canada, and the Prudhoe Bay oil fields on the North Slope. The Alaska Railroad has its terminus in Fairbanks. The majority of rural communities in the vast Interior region, however, are reachable only by commercial air service or summer barge service.

Magnitude and Type of Subsistence Resource Utilization

Subsistence uses in the Interior region, like other regions, are primarily oriented to subsistence fisheries, though there is also a high utilization of land mammals in some areas. Salmon are harvested by many households and are an important food source in most communities (Schroeder et al. 1987). Whitefish are another valuable subsistence food source. Moose, and then caribou, are the two most important subsistence wildlife species harvested. Brown bear, black bear, and Dall sheep are also harvested for subsistence purposes. Hunting of waterfowl and small game, along with the gathering of plants, are other local subsistence activities.

The overall annual subsistence harvest of fish, wildlife, and birds in the Interior region averages 377 pounds per person. This is less than residents of the Arctic and

Western regions use, but more than is used by residents in the other three subsistence resource regions (Table III, page 124). The annual per capita subsistence resource use in the village of Huslia is 1,082 pounds, in Nikolai 785 pounds, in Tetlin 424 pounds, and in Beaver 723 pounds (Wolfe and Walker 1987). Harvest data has been collected from more than 100 communities in Alaska. Among the eight surveyed communities with the highest per capita subsistence resource use, five are located in the Interior region. Subsistence harvests play as important a role in rural Interior communities as anywhere in Alaska.

Degree of Cultural Unity and Native Percentage of Population

The Native inhabitants of the extensive Interior region are northern Athabaskan Indians. Within the Interior, nine linguistic sub-groups of northern Athabaskans have been identified by Krauss (1982)(Figure 2, page 131). Doyon Limited is the sole for-profit Native regional corporation representing the Natives of this region. When the urban and road connected population of the Fairbanks North Star Borough is excluded, the remainder of the Interior's residents are 52 percent Alaskan Native.

The populations of many Interior villages are predominantly Native. The Yukon-Koyukuk Census Area includes most of the Interior region, except for the organized Fairbanks borough and Southeast Fairbanks. Living within the Yukon-Koyukuk area are 8,478 people, of which 4,726, or 56 percent, are Alaskan Native (Alaska Department of Labor 1991). The population of Arctic Village is 94 percent Native, Fort Yukon is 85 percent Native, Huslia is 91 percent Native, and Nenana is 48 percent Native. Of these four communities, only Nenana is connected to the road system.

The Interior region is characterized by a single Native cultural group, represented by one Native regional corporation, with many rural communities inhabited by a high proportion of Athabaskan Indian people.

Strength of Leadership Around Subsistence Issues

The Interior region is similar to the Arctic and Western regions in the degree of dedication by leadership towards the protection of rural subsistence uses of fish and wildlife by local residents. Doyon Limited, the Native regional corporation for the Interior, actively supported efforts to uphold the state subsistence law in 1982 against a repeal effort led by urban sports hunters. Doyon continues to be involved in political efforts related to the protection of rural subsistence activities.

Tanana Chiefs Conference, Inc. (TCC) is the non-profit Native organization representing over 40 Alaska Native villages in the Interior region. The Wildlife and Parks Department within TCC dedicates its attention to subsistence issues. In the 1980s, Wildlife and Parks produced a video for training rural residents how to participate effectively in the state's fish and game advisory committee and regional council system. The presence of full-time staff dedicated to subsistence matters demonstrates the commitment to subsistence protection by Native leadership and organizations in the Interior.

Degree of Congruity Between State Wildlife Regulations and Customary and Traditional Subsistence Activities

One well-known court case involving Native cultural uses of wildlife is *Frank v. State of Alaska* (1979). Frank, an Interior Native, harvested a moose for a traditional funeral 'potlatch' ceremony during a period when moose hunting was not allowed by the state hunting regulations. He was charged with illegally killing the moose. The court ruled in Frank's favor, finding that the taking of a moose for religious purposes is valid, and must be provided for by the regulations. A permit system was subsequently adopted by the state to accommodate harvests for funeral 'potlatch' ceremonies.

In the Rural Alaska Community Action Program (RurAL CAP) survey of Interior fish and game advisory committee members in 1989, 38 percent responded that state wildlife regulations reflected local conditions and uses, compared to 62 percent saying the regulations did not or only somewhat reflected local uses. A 1991 study by Tanana Chiefs Conference found few problems with existing subsistence regulations, though some changes were recommended to bring regulations more into agreement with local customary and traditional practices. The Interior region may be subjectively ranked in the middle, compared to the other six subsistence resource regions, in the degree of congruity between state regulations and local subsistence uses.

Differences in Perception of the State Regulatory System

When commenting on the draft federal subsistence management program, the director for Wildlife and Parks at the Tanana Chiefs Conference characterized the state fish and game local advisory committee system as:

a defective system which has been politically balanced against subsistence interests and is thus suspect in its' [sic] ability to make just and sound decisions for subsistence. ... Its' [sic] no wonder those people with subsistence concerns have little respect and tremendous distrust for the advisory committee system (Fish and Wildlife Service 1992b, V-156).

Opinions towards the state advisory system are mixed, though Rural Alaska Community Action Program (RurAL CAP) found a greater degree of dissatisfaction among subsistence users than sport or commercial interests (1989).

Federal Jurisdiction over Land and Native Affairs

Land ownership in the vast Interior region is a complex mix of state, federal, and private holdings. The state holds title to a majority of the land south of the Yukon River. In other parts of the Interior, the federal government holds title to a majority of the land. Overall, about 50 percent of the Interior's lands are under federal jurisdiction, placing it third after Southcentral and Southwest in having the least amount of land in federal hands. This moderate presence of federal lands limits the opportunity for the protection of rural subsistence activities by the federal government, compared to the three regions with 75 to 85 percent of their lands under federal jurisdiction (Table III, page 124).

The rural areas of the Interior subsistence resource region share with the Kotzebue Sound subregion and Western region a high level of per capita subsistence resource use, the presence of a single Native cultural group and Native regional corporation, and a history of strong leadership towards the protection of subsistence. The Interior's proportion of Native inhabitants is lower than in the two regions pursuing co-management initiatives, but higher than in the three regions without initiatives.

Findings From the Southeast Region

The Southeast region is often referred to as the 'Alaskan panhandle' and consists of a relatively narrow, mountainous strip of land, islands, and complex fiord environment bordered by Canada on the east and the Pacific Ocean on the west (Figure 1, page 3). The 'panhandle' stretches for 560 miles in a southeast direction from the community of Yakutat to the Dixon Entrance just south of Ketchikan and Metlakatla. The coastal rainforest habitat supports deer, bear, abundant fisheries, and a major timber industry. Commercial fishing is another major economic enterprise of this region. Scheduled airlines and a state ferry service called the Alaska Marine Highway provide the only commercial transportation links between most communities. Roads connect Haines and Skagway to British Columbia, Canada. Of the three regions not pursuing wildlife co-management initiatives between 1985 and 1991, the Southeast will be examined in the most detail.

Magnitude and Type of Subsistence Resource Utilization

Southeast Alaska subsistence orientation is predominantly based on five species of salmon and other fish and marine resources. Patterns of subsistence use vary from community to community and from year to year, as is the case throughout the state. In 1987, deer provided 21 percent of the weight of subsistence resources harvested by Southeast's rural residents. Other land mammals contributed about four percent to the total subsistence harvest. Marine resources therefore account for about 75 percent of the subsistence harvest. In the village of Angoon, deer comprised

nearly all of the land mammal use, with 250 pounds harvested annually per household. Fish were Angoon's other primary subsistence resource (Fish and Wildlife Service 1992b).

The Southeast region's annual subsistence harvest of 212 lbs per person is the second lowest after Southcentrals', and is less than the state average of 250 pounds (Alaska Department of Fish and Game 1989). Annual community subsistence harvests from Sitka averaged 145 pounds per person, while Angoon and Yakutak residents averaged 240 and 380 pounds, respectively (ibid.). Fish and marine resources are the most important for subsistence, though land animals contribute to the diet, in some places providing all the meat in the winter diet.

The comparatively low figure for overall subsistence harvesting in Southeast is probably related to the following conditions. Beginning in the late 1870s, economic development in the form of fish canneries and mining greatly impacted Native subsistence practices by reducing Native access to prime subsistence harvesting locations. Settlement by non-Natives, and the concentration of Natives into larger settlements further reduced access to traditional subsistence resources. In some areas the Native economy became heavily involved in the commercial fisheries, fish canneries, and mining. The seasonality and wages associated with the fishing industry allowed a mixed cash and subsistence economy to develop in some areas which continues today (Case 1984, 338). The presence of a major commercial fishery, and later the timber and mining industry, affected the traditional subsistence economy by displacing it in some cases, providing an alternative economy in others, and in a few cases integrating the formal economic opportunities with subsistence production to form a mixed cash and subsistence economy.

Overall, some Southeast communities continue to maintain a strong relationship with local renewable resources through a mixed subsistence and cash economy. Involvement with commercial fisheries, mining, and the timber industry dominates the regional economy. An exception is Juneau, the state's capital, where government-based employment and tourism are strong economic sectors.

Degree of Cultural Unity and Native Percentage of Population

The Southeast subsistence resource region covers the same area administered by the Sealaska Corporation for its Native stockholders.³³ About 19 percent of the region's 68,989 residents are Tlingit, Haida, and Tsimshian Natives (Figure 2, page 131). The Tlingit Indians are the most widespread and numerous group, accounting for 85 percent of Southeast's Native population (Alaska Department of Labor 1991). The other 15 percent are either Haida or Tsimshian Indians. In the late 1700s, a group of Haida Indians moved from the Queen Charlotte Islands in Canada to southern Prince of Wales Island, and in 1887, the Tsimshian people moved from British Columbia to Annette Island in Southeast Alaska and settled New Metlakatla (Case 1984, 334). Sealaska Corporation represents the Tlingit and Haida Indians, while the Tsimshians of the Annette Island Reservation administer their own affairs.

The populations of smaller Southeast communities range from nearly 90 percent Native, to others with Native populations of less than five percent. Larger towns had lower percentages of Native populations. Petersburg's population of 3,207

³³ Sealaska Corporation is one of thirteen Native regional corporations established under provisions of the Alaska Native Claims Settlement Act (ANCSA).

is ten percent Native, and 21 percent of Sitka's 8,588 residents are Native. Among smaller communities, 82 percent of the 638 residents of Angoon are Native, 89 percent of the 384 residents of Hydaburg are Native, and Yakutat's 534 residents are 55 percent Native (Alaska Department of Labor 1991).

The overall cultural unity of Southeast, defined as 19 percent of the total population being Native, ranks second lowest among the six subsistence resource regions (Table III, page 124). Division of Subsistence research shows there is generally a much higher per capita utilization of subsistence resources in communities with higher percentages of Native residents. Southeast data confirms this trend.

Strength of Leadership Around Subsistence Issues

As mentioned earlier, in the late nineteenth century the commercial development of the region's fisheries, timber, and mineral resources began to heavily impact traditional Tlingit subsistence areas and economy. In response to these forces of change affecting Native peoples, the "Alaska Native Brotherhood (ANB) was established in 1912, with nine Tlingit and one Tsimshian member" (Case 1984, 339; Drucker 1965, 189-222). The ANB assumed a major political and social role in Native affairs, with nearly all Tlingit and Haida men becoming members. An Alaska Native Sisterhood was established soon after ANB began. Early emphasis of the ANB was on education and the abolition of aboriginal customs.

Later, as land claims were pursued in the 1930s, the Tlingit and Haida Central Council was established to be the "general and supreme governing body of the [Tlingit and Haida] Tribes" (Case 1984, 378). The Central Council is recognized as a tribal

government, and has contracted social programs with the Bureau of Indian Affairs under the Indian Self-Determination Act (P.L. 93-638). Activities of the Central Council include the administration of grant programs providing a variety of services, such as housing, education and training, and a Fisheries Development Corporation to establish fish hatcheries in Tlingit and Haida communities (*ibid.*, 383). The Alaska Native Brotherhood and the Tlingit and Haida Central Council continue to be active region-wide organizations in Southeast Alaska.

With the passage of the Alaska Native Claims Settlement Act (ANCSA) by Congress in 1971, the Sealaska Corporation was established to administer the claims settlement for Southeast Natives. Although Sealaska is a profit-making corporation, it also recognizes it "has a strong moral commitment and obligation to the well-being of its shareholders" and that "The subsistence lifestyle is vital to that well-being" (Sealaska Corporation 1989, 2).

In 1989, the Natural Resources Department of Sealaska analyzed the state's subsistence regulatory system, including the Southeast Regional Council and local fish and game advisory committees, and published a report concluding, among other things, "that the state advisory/regional council system [and the Board of Fisheries] is out of compliance with ANILCA" (*ibid.*, 23). Sealaska's conclusion was based on the record of the State Board of Fisheries making decisions, with few exceptions, contrary to recommendations from the Southeast Regional Council, and failing to provide reasons for rejecting Council recommendations.

Additionally, the state requirement that local fish and game advisory committees be representative of all user groups in an area creates tensions with ANILCA's Section 805 requirement for regional councils to represent local and regional subsistence

concerns to the Boards of Fisheries and Game. In areas where strong sport or commercial interests became involved with the advisory system, local or regional subsistence concerns tended to be jeopardized or minimized.

An example of this tension between commercial and subsistence fisheries interests in Southeast took place at a Southeast Regional Council meeting on January 21, 1989. A Petersburg Advisory Committee member stated on the record that:

The Petersburg Advisory Committee voted down almost every subsistence proposal in the subsistence section of the book. And generally speaking, it was unanimous. We feel this is a cash flow economy that is to a large extent generated by the commercial fisher and that it would be improper to have a very loose interpretation of the subsistence laws so that a majority of the people living in Southeast have subsistence rights with the potential of shutting down the commercial fisheries (quoted in Sealaska Corporation 1989).

Divergent perspectives between commercial interests and subsistence users over the management of subsistence uses have further compromised the effectiveness of the state regulatory system in addressing subsistence issues.

The Sealaska report's conclusion that the state was not adequately administering or responding to regional councils led to the establishment of the Southeast Native Subsistence Commission (SNSC) in 1989 (interview 1992). SNSC is under the 'umbrella' of the Tlingit and Haida Central Council, though functions as a separate body. Each of the 20 member communities has an elected representative; the Alaska Native Brotherhood and Sisterhood, and Sealaska Corporation are also members. Each commissioner represents the village corporation or Indian Reorganization Act (IRA) council of their community.

The Southeast Native Subsistence Commission represents a major regional effort to address subsistence concerns in a unified fashion. SNSC was established as

a result of a growing awareness of the role of subsistence in the cultural life of Southeast Natives, coupled with frustration over state fisheries management favoring commercial interests while down-playing subsistence. Native leadership in Southeast is beginning to take actions to fulfill their commitment towards protecting the subsistence activities and needs of local Native residents.

Degree of Congruity Between State Wildlife Regulations and Customary and Traditional Subsistence Activities

Fisheries dominates both the subsistence and commercial economies of Southeast. Wildlife accounts for about 25 percent of the annual subsistence harvest of Angoon, and probably plays a similar role in other small communities. During the period under study, harvest regulations for deer were relatively liberal, and deer populations were generally healthy. There tend to be fewer problems between traditional subsistence activities and state regulations when the subsistence resources are healthy, competition from non-subsistence users is minimal, and regulations allow adequate access to the amount of resource generally used for subsistence purposes. This appears to be the situation in Southeast for the subsistence uses of wildlife. There appears to be more conflict between the subsistence uses of fisheries and state regulatory efforts.

Rural Alaska Community Action Program (RurAL CAP 1989) surveyed rural members of local fish and game advisory committees and asked them whether wildlife regulations reflect local conditions and uses. The sixty-two responses from Southeast were divided between 38 yes, 15 somewhat, and 9 no; 85 percent reported they believed the game regulations reflected local conditions and uses somewhat or

entirely. RurAL CAP points out in their report that Southeast has more commercial users than subsistence users involved on the advisory committees, and commercial and sport interests are generally more satisfied with the regulatory system than subsistence users.

Differences in Perception of the State Regulatory System

Sealaska Corporation's "Southeast Regional Council White Paper" (1989) concludes that from the perspective of local Native subsistence users and the regional council, the state regulatory system has failed to be responsive to local subsistence input. On the other hand, RurAL CAP found that 32 percent of local fish and game advisory committee members in Southeast who responded to their survey believed the state's implementation of ANILCA was good to excellent, 23 percent felt it was fair, and 45 percent believed implementation was poor to very poor (1989). This range of opinion is partly explained by commercial interests being more satisfied with the regulatory system than subsistence interests, as mentioned above.

Since Southeast is dominated by commercial fisheries interests, it is difficult to separate out opinions about subsistence because of the different attitudes subsistence and commercial users have towards state management. The situation is further complicated because many Native subsistence users also participate in the commercial fisheries. There is a growing sense of frustration among subsistence users with the state regulatory system in Southeast because of its reluctance to include traditional ecological knowledge or recognize traditional methods of conservative resource use (interview 1992).

Federal Jurisdiction over Land and Native Affairs

An overwhelming majority of the land area of the Southeast region is under federal management. The Tongass National Forest accounts for most of the federal lands. Misty Fjords National Monument, Glacier Bay National Park, and the southeast portion of Wrangell-Saint Elias National Park account for most of the remaining federal land area. At an estimated 85 percent, the proportion of Southeast land under federal jurisdiction is greater than in any other region (State of Alaska 1987).

Subsistence concerns in Southeast revolve around fisheries and habitat issues related to the impacts from timberland clear-cutting practices located mainly within the Tongass National Forest. Impacts from timber harvesting and associated road building range from reduced deer populations, to adverse affects upon salmon stream habitat. Section 810 of ANILCA provides procedural steps to review the potential impacts upon subsistence prior to any major actions on federal lands, such as logging, and to propose mitigation measures. There is no parallel state law for reviewing impacts from major projects on subsistence on state lands.

Extensive federal land holdings, combined with federal responsibilities for Native affairs, make Southeast a fertile setting for improving rural subsistence protection. In contrast, subsistence activities are not allowed in Glacier Bay National Park, and timber harvesting in the Tongass National Forest is potentially damaging to the habitat of important subsistence wildlife and fishery resources. Important Southeast subsistence fisheries and marine resources continue to be managed under state authority, thereby minimizing opportunities for federal actions to improve the protection of rural subsistence activities. Opportunities for improving the influence of local rural

residents in subsistence management may be achieved through increasing cooperation among subsistence users and the state and federal government.

In summary, the main similarities between Southeast and the three regions pursuing co-management initiatives are: 1) the large extent of lands under federal jurisdiction; 2) perception of the state regulatory system as not being responsive to local subsistence input; and 3) a single ANCSA Native regional corporation representing primarily one Native cultural group. There is also the presence of a mixed cash and subsistence economy in some rural Southeast communities.

Differences between Southeast and regions initially pursuing co-management include: 1) a substantially lower per capita annual subsistence harvest; 2) a much lower percentage of Native inhabitants; and 3) the lengthy presence of major commercial fisheries and timber industries, and other acculturative influences.

Findings From the Southwest Region

The Southwest Subsistence Resource Region includes the Aleutian and Pribilof Islands, Kodiak and Afognak Islands, the Alaska Peninsula, and the Bristol Bay coastal area and inland areas located south of the Kuskokwim River and north of the Alaska Peninsula (Figure 1, page 3). The Division of Subsistence divides the Southwest into nine subregions for research purposes (Schroeder et al. 1987, 500). Transportation links to the rest of the state are limited to commercial airline service and ocean barge service. During the period under study, no co-management initiatives emerged from this region.

Magnitude and Type of Subsistence Resource Utilization

The economies of most communities in the Southwest subsistence resource region are based upon a mix of cash and subsistence activities (*ibid.*). Exceptions include the military bases at Adak, King Salmon, and Shemya, which have an external economy. Some Southwest communities have mixed economies dominated by commercial fishing, though subsistence harvests continue to play an important role in social organization and the diet.

Southwest Alaska subsistence orientation is predominantly based on the five species of salmon, and other fish and marine resources. Overall annual subsistence resource use of fish, land and marine mammals, birds, other wild resources for the Southwest region averages 378 pounds per person (Table IV, page 126). This compares to the state-wide average of 250 pounds (all figures from Alaska Department of Fish and Game 1989). In the communities of New Stuyahok and Nondalton, average per capita subsistence harvests of fish and wildlife approach or exceed 900 pounds per person, and are among the highest in the state. Fisheries are the largest component of the subsistence resources harvested, though subsistence harvests of land and marine animals make important contributions to the diet. The magnitude of the subsistence resource use for the region is slightly less than occurs in the Interior region, but much higher than occurs in either the Southcentral or Southeast regions.

Degree of Cultural Unity and Native Percentage of Population

Native Alaskans of the Southwest region belong to three cultural groups represented by three Alaska Native regional corporations. The Aleut, Bristol Bay, and Koniag Native Corporations represent the Aleut, Central Yup'ik Eskimo, and Sugpiag Yup'ik Eskimo people, respectively (Figures 2 and 3, pages 131 and 134). The presence of different cultural groups reflects the breadth of geographical areas included within the Southwest subsistence resource region. The Aleut Corporation represents Alaska Natives living on the western end of the Alaska Peninsula, and the Aleutian and Pribilof Islands. The Bristol Bay Native Corporation represents Natives living around Bristol Bay and the northern inland areas of the region. Kodiak and Afognak Islands, and a section of the eastern Alaska Peninsula are represented by Koniag, Inc. Among the six subsistence resource regions, Southcentral and Southwest have the greatest Alaska Native cultural plurality.

The total population of Alaska's Southwest region is 32,279 (Alaska Department of Labor 1991). Of this total, 28 percent, or 8,883 of the region's residents are Alaska Native. The population of the Bristol Bay Native Corporation area is 66 percent Native, while the population of the other two regional corporation areas located within the Southwest region ranges from 16 to 18 percent Native. Several communities have Native populations ranging from 75 to 96 percent. Only the Southcentral and Southeast subsistence resource regions have lower percentages of Native inhabitants than Southwest. In general, the Southwest region encompasses an area with a diverse Native and non-Native population, with Alaskan Natives accounting for 28 percent of the residents.

Strength of Leadership Around Subsistence Issues

Prior to 1990, leadership in the Bristol Bay section of the Southwest region was politically dominated by commercial fishing interests (interview 1992). As a result, the subsistence concerns of smaller villages generally went unheeded. Since 1990, more attention by regional leadership, particularly within the Bristol Bay Native Association (BBNA), has been directed towards subsistence and other natural resource issues. The impetus for this attention to subsistence is pressure from the smaller villages.

BBNA is a non-profit corporation serving Alaska Natives of the Bristol Bay region. Like both Tanana Chiefs Conference and Maniilaq non-profit corporations, BBNA administers a number of social service programs funded by the state and federal governments, and appears to qualify as an Indian organization for the purposes of contracting with the federal government under provisions of the Indian Self-Determination Act (P.L. 93-638)(Case 1984, 403). BBNA provides services ranging from health and public safety, to educational and employment assistance.

Leadership in subsistence issues by the state's fish and game regional advisory council has been hampered by differing perspectives present on the council. Council members from the northern section of the Southwest region are more interested in subsistence issues relating to wildlife, while members from southern communities represent commercial fishery interests. The divergence of opinions between different subregions represented on the Southwest Regional Council has led to an impasse by the Council in addressing subsistence issues (interview 1992).

The Bristol Bay Native Association is responding to village subsistence concerns by becoming more active in subsistence issues. The Southwest region is

much larger than the area represented by BBNA, and it is unclear to what degree leadership in the Aleut and Koniag Native Corporation regions is addressing subsistence concerns. The community-based, local nature of most subsistence activities is not conducive to gaining leadership consensus and action towards subsistence issues among the several different cultural groups and organizations located within the broad boundaries of the Southwest subsistence resource region.

Degree of Congruity Between State Wildlife Regulations and Customary and Traditional Subsistence Activities

There is limited information available for making a qualitative judgement regarding the consistency of wildlife regulations and customary and traditional subsistence harvest activities in this region. A Rural Alaska Community Action Program (RurAL CAP) survey in 1989 asked members of the state's fish and game advisory committees whether game regulations reflected local conditions and uses of wildlife.³⁴ Of the 40 responses from the Southwest region to this question, 45 percent said the regulations do reflect local conditions, 30 percent said they do to some extent, and 25 percent said they do not. Respondents representing sport and commercial users were more satisfied with the regulations than were the subsistence users. State regulations appear to be inconsistent with the local subsistence uses of wildlife by a significant proportion of the region's population.

³⁴ The RurAL CAP survey acknowledges a number of important limitations to take into consideration when reviewing its results. Few responses were submitted from the Arctic and Western regions, and statistical validity is influenced by who chose to respond. Cultural factors may have skewed responses to the mailed questionnaire format. It is likely the results over-represent sport and commercial users.

Interview information from three sources, however, suggested minimal problems between state regulations and local uses. One person said, "generally, people have learned to live with game regulations ... and have adapted to the system" (interview 1992). Another said there are "no big problems with Board of Game regulations. ADF&G staff visits villages to discuss regulations. Villages accept [the] regulations" (interview 1992). Both of these comments suggest some wildlife regulations may not be consistent with traditional subsistence uses, and local users are modifying, or adapting their wildlife uses to fit the regulations.

The most important subsistence resources in this region are the abundant fisheries. This abundance minimizes the potential for allocation conflicts between subsistence and commercial or sport users, and facilitates the adoption by the Board of Fisheries of regulations consistent with local subsistence needs and traditional uses. Caribou are not abundant, however, and conflicts between local subsistence needs and other consumptive uses may arise when wildlife harvest regulations are adopted by the Board of Game to accommodate both user groups.

Differences in Perception of the State Regulatory System

The local fish and game advisory committees and six regional councils located throughout rural Alaska provide a means for local subsistence interests to comment on and propose changes in wildlife regulations, and contribute to the expectation that local input will influence decisions by the Board of Game. Local efforts to affect changes in regulations by the Board of Game are often unsuccessful, however, and this contributes to a sense of frustration among rural users towards the state wildlife

regulatory system. Inadequate state funding and staff support for advisory committees and regional councils further frustrates local efforts to participate in the state wildlife regulatory system (Marshall and Peterson 1991).

The above mentioned RurAL CAP (1989) survey of advisory committee members also evaluated the effectiveness of the committee system. In the Southwest region, 45 percent responded that state implementation of the advisory committee system was poor or very poor, compared to 24 percent who said it was good or excellent. Implementation was fair, according to 31 percent. The overall effectiveness of the committee system was rated 'very' by 22 percent, 'somewhat' by 51 percent, and 'not very' to 'very poorly' by 27 percent. Over half said the committees do not meet often enough. Based upon the RurAL CAP survey data, the Southwest region's dissatisfaction with the overall effectiveness and state implementation of the advisory committee system was similar to levels indicated by the Arctic, Western, and Southeast regions. Southcentral was most satisfied, and the Interior region fell in the middle range, with 46 percent saying the state's implementation was fair.

Federal Jurisdiction over Land and Native Affairs

Since July 1, 1990, when the federal government assumed management authority over subsistence activities on federal lands in Alaska, land status became a critical factor in the application of legal protection for subsistence uses by rural residents. In the Southwest subsistence resource region, an estimated 40 percent of the lands are state managed, 40 percent are federally managed, and the remaining 20 percent are in private or Native corporation ownership (State of Alaska 1987).

This mix of land ownership, along with continued state management of fisheries in navigable waters on federal lands, places the state in the position of primary subsistence resource manager in the Southwest region. Several national wildlife refuges and one national park and preserve encompass most of this region's federal land holdings. One of the explicit purposes for the establishment of the national wildlife refuges is to provide "the opportunity for continued subsistence uses by local residents" (ANILCA, Sec. 303, (6)(B)(iii)). The presence of extensive state and private lands near many communities minimizes federal roles in subsistence management.

Just as federal protection of subsistence activities of local rural residents is limited to federal lands, federal oversight for Native affairs is restricted to Native Americans. In the Southwest region, 28 percent of the residents are Alaskan Native, and this relatively low percentage reduces the potential for federal actions to protect Native subsistence activities. The Bristol Bay subregion, with 66 percent of its residents Native, is in a stronger position than the other subregions to benefit from possible federal actions designed to protect rural Native subsistence activities. An example of federal protection is found within the Marine Mammal Protection Act (MMPA), which exempts coastal Natives from the general ban on marine mammal hunting. The MMPA allows continued non-wasteful subsistence uses of marine mammals by Alaska Natives as long as the resource population remains healthy.

Findings From the Southcentral Region

The Southcentral region of Alaska includes the land area south of the Alaska Range stretching between the Canadian border on the east and the Southwest region on the west (Figure 1, page 3). The extensive coastal area of Southcentral borders the Gulf of Alaska, Prince William Sound, and Cook Inlet. This region is dominated by urban Anchorage, where over half of the state's population lives. The most extensive road system in Alaska connects nearly all of the region's communities. The Alaska Railroad, Anchorage International Airport, Alaska Marine Highway, and Trans-Alaska Pipeline are other major transportation elements located or terminating in this region. Southcentral is one of three regions not pursuing wildlife co-management initiatives.

Magnitude and Type of Subsistence Resource Utilization

Subsistence resources play a much larger role in the overall economy of the more remote communities than in the more urban and road-connected areas of the Southcentral region. Anchorage residents annually harvest about 10 pounds of subsistence resources per person, while the state's predominantly urban organized boroughs, average 48 pounds (Alaska Department of Fish and Game 1989). Residents of Port Graham and English Bay on the Kenai Peninsula have a more intensive pattern of subsistence resource use than do other Peninsula communities, with annual subsistence harvests of about 150 pounds per person (Schroeder et al. 1987). In Tyonek, an isolated Native community on the west side of Cook Inlet, the annual subsistence harvest averages 260 pounds per person. The annual

subsistence harvest in 20 Southcentral rural communities ranges from Glennallen's 50 pounds to Chenega's 370 pounds per person (Alaska Department of Fish and Game 1989). Excluding the urban population of Southcentral, a rough estimate of the region's annual per capita rural subsistence harvest would be 180 pounds (*ibid.*). This is the lowest subsistence harvest among the six subsistence resource regions.

Salmon, moose, and caribou are important subsistence resources in Southcentral, though in the most active subsistence communities a wide variety of resources are harvested. Coastal villages harvest a range of marine resources. Salmon comprise over 50 percent of the subsistence harvest in communities with access to fisheries. In communities further from fisheries resources, wildlife accounts for a larger proportion of the subsistence harvest (Schroeder et al. 1987).

Degree of Cultural Unity and Native Percentage of Population

Native Alaskans of the Southcentral region belong to either the Athabaskan or Eskimo cultural group, and are represented by three Native regional corporations. Tanaina and Ahtna Athabaskan Indians are represented by the Cook Inlet and Ahtna Native regional corporations, and the Sugpiaq Yup'ik Eskimos in the Prince William Sound are represented by the Chugach Alaska Corporation (Figures 2 and 3, pages 131 and 134).

Six percent of the Cook Inlet region's 302,473 people are Alaska Native (all data Alaska Department of Labor 1991). The Ahtna region's 3,089 people are 19 percent Native, while about 14 percent of the Chugach region's 11,450 residents are Native. Region-wide, less than seven percent of the residents are Alaska Native.

This is the lowest percentage of Native residents among the six subsistence resource regions (Table III, page 124). The presence of two Native cultural groups who are vastly outnumbered by urban and rural non-Native residents reduces the degree of cultural unity in the Southcentral region.

Strength of Leadership Around Subsistence Issues

Direct leadership response to subsistence issues is minimal. One person pointed out that the region's outnumbered rural subsistence users are "fragmented geographically and culturally" and "each group has its own battles, such as AIDS in English Bay or fighting for rural status in the Kenaitze case" (interview 1992). The political agenda of rural Native leadership appears to be driven by outside influences. It appears that efforts to increase local influence over subsistence management are being postponed until other more pressing local issues are addressed.

Degree of Congruity Between State Wildlife Regulations and Customary and Traditional Subsistence Activities

"Subsistence people are very dissatisfied with regulations," according to one informant knowledgeable of Southcentral's subsistence perspectives (interview 1992). RurAL CAP found over half of the Southcentral advisory committee members who responded to the question of whether wildlife regulations reflect local conditions indicated yes, while 48 percent said somewhat or no (Rural Alaska Community Action Program 1989). This breakdown may reflect the tendency for sport and commercial users to be more comfortable than subsistence users with wildlife regulations.

Conflicts between urban sport users and rural subsistence users have resulted in litigation and court battles over wildlife regulations believed to be too restrictive by subsistence users, especially for hunting of the Nelchina caribou herd.

Differences in Perception of the State Regulatory System

The 1989 RurAL CAP survey of advisory committee members found a majority of respondents from Southcentral satisfied with the overall effectiveness and implementation of the state's advisory committee system. About two-thirds of the respondents indicated they represented sport or commercial users instead of subsistence users.³⁵ Analysis of the survey suggested a greater level of satisfaction with the state regulatory system among sport and commercial users, compared to subsistence users. Communication difficulties and lack of understanding between the Board of Game and Native rural subsistence users contributed to the withdrawal of rural Natives from participation in the local advisory system (interview 1992). Competition for scarce resources is heightened by the presence of a large urban population with easy road access to rural areas. Dissatisfaction by local subsistence users with Board of Game regulations has led to the courtroom. Subsistence users in the Ahtna region are dissatisfied and frustrated with the state's regulatory system.

³⁵ Some respondents indicated they represented more than one user group.

Federal Jurisdiction over Land and Native Affairs

The Southcentral region has the lowest proportion of its lands in federal jurisdiction among the six regions, with an estimated 35 percent under federal management (State of Alaska 1987). Much of the more accessible areas are state-owned, and management of subsistence fisheries continues in state hands in the navigable waterways located on federal lands. The low percentage of Native inhabitants in Southcentral further reduces opportunities for federal efforts to provide improved rural subsistence protection. The conditions present in Southcentral are most unlike those of the three regions pursuing co-management. In four of the six factors developed to help explain the emergence of grassroots co-management initiatives for subsistence wildlife uses, Southcentral ranks lowest among the six subsistence resource regions (Table III, page 124).

The findings from the six subsistence resource regions will be analyzed in Chapter Four to identify predictors for co-management initiatives.

CHAPTER 4

ANALYSIS

Introduction

This chapter analyzes the findings for each of the six factors developed to help explain the emergence of grassroots co-management initiatives for terrestrial wildlife. Co-management initiatives were proposed by groups representing subsistence users within the Arctic, Interior, and Western subsistence resource regions (Figure 1, page 3). Information gathered from Alaska's six subsistence resource regions will allow a comparative analysis to be made between regions pursuing co-management between 1985 and 1991, and those which did not. The Kotzebue Sound subregion of the Arctic region and the Southeast region are examined in more detail than the other four to help draw out the differences between regions.

The comparative analysis will facilitate the identification of those factors most important in leading to the grassroots co-management proposals. By determining variations in the presence and strength of particular factors in each region, it will be possible to make tentative conclusions about why some regions have pursued co-management initiatives earlier and more consistently than others. A rank ordering of each region by its degree of correspondence with each factor, and an overall score for each regions' correlation to the original six factors is presented in Table III (page 124).

TABLE III. Predictors of Grassroots Subsistence Co-management Initiatives

PREDICTORS	Arctic	Western	Interior	South-East	South-West	South-Central
Strength of Leadership ¹	6	5	4	3	2	1
Magnitude of Subsistence Resource Use ²	5 (610)	6 (793)	4 (377)	2 (212)	3 (350)	1 (50)
Degree of Cultural Homogeneity ³	5 (85%)	6 (86%)	4 (52%)	2 (19%)	3 (28%)	1 (7%)
Region's lands Under Federal Jurisdiction ⁴	4 (75%)	5 (80%)	3 (50%)	6 (85%)	2 (40%)	1 (35%)
Incongruity of Regulations ⁵	6	5	4	1	3	2
Negative Perception of Regulatory System ⁶	6	5	4	2	1	3
TOTAL	32	32	23	16	14	9

The regions are ranked from 1 to 6, with 6 indicating the highest correspondence with a predictor, according to criteria in each note below. Factors are ranked from top to bottom, with most important predictors at the top. The totals at the bottom provide an overall indication of the extent each region relates to the predictors.

¹ Ranked by leadership strength and long-term organizational support for subsistence.

² Ranked according to region's annual per capita subsistence harvest in pounds.

³ Ranked by the Native percentage of region's population (Alaska Department of Labor 1991). The Interior, excluding the Fairbanks North Star Borough, is 52 percent Native. The Arctic figure is based on the Kotzebue Sound subregion's population.

⁴ Ranked by the estimated percentage of a region's lands being under federal control.

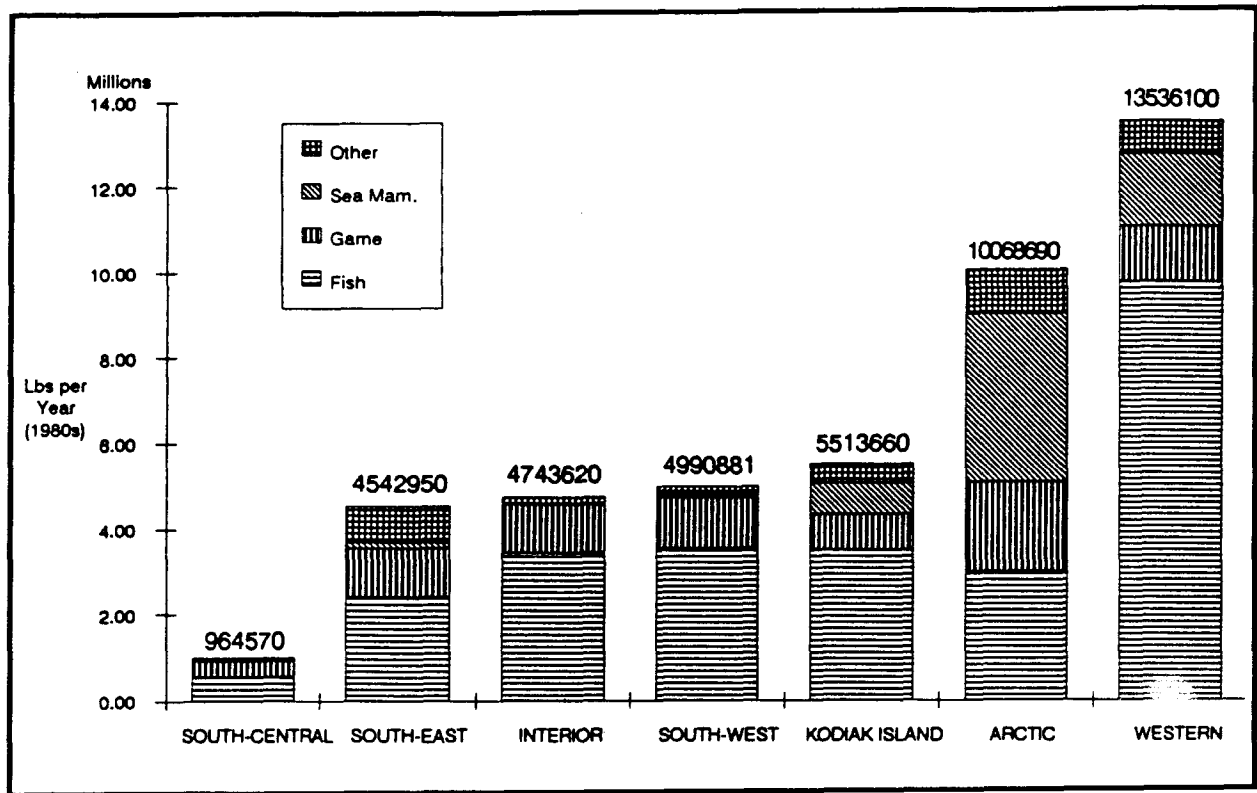
⁵ Subjective ranking of impact of incongruent wildlife regulations on subsistence uses.

⁶ Subjective ranking, considering rural perception of state regulations.

1. Magnitude of Subsistence Resource Utilization

The first factor examines the magnitude and type of subsistence resource utilization taking place in each region. Researchers working for the Alaska Department of Fish and Game (ADF&G), Division of Subsistence have approached the complexity of describing subsistence practices by doing household harvest surveys in rural communities located throughout Alaska. Their reports describe subsistence activities as characterized by the opportunistic harvesting of a variety of species in varying amounts each year. The species composition of annual harvests may vary, but total harvest amounts are stable. This information includes harvest data by resource species and category, and may be summarized variously as the average annual subsistence harvest in pounds per person, per household, or by community or region. Table IV (page 126) will present the subsistence harvest in pounds per year by subsistence resource region, along with the composition of the harvest divided into the categories of fish, game, sea mammals, and other resources, such as birds and plants. Table III (page 124) presents regional harvests in pounds per person.

Using the annual subsistence harvest in pounds per person as an indicator allows comparisons to be made between communities and regions according to their relative degree of participation in subsistence activities. Drawing qualitative comparisons among regions based on this quantitative data must be done with caution, because the cultural and socioeconomic values associated with subsistence activities are not entirely dependent upon the quantity of the subsistence harvest. It is reasonable to infer that regions with the highest per capita use of subsistence resources are nutritionally and culturally benefitting more from subsistence harvesting.

TABLE IV. Subsistence Harvest Categories and Totals for each Region

(Kodiak Island is part of the Southwest region)

(Wolfe and Walker 1987)

Community per capita average harvests will be reviewed because subsistence activities generally take place in a rural community context. The median annual per capita subsistence harvest for the 122 Alaska communities surveyed by the Division of Subsistence is about 250 pounds. The 25 surveyed communities with the largest per capita harvests are located in four of the state's six subsistence resource regions, and had annual harvests of wild resources ranging from 600 pounds per person to more than 1400 pounds.³⁶ Of the six communities with per capita harvests exceeding

³⁶ The four regions with surveyed villages annually harvesting more than 600 pounds of subsistence foods per capita are the Interior, with 8 villages; the Western, with 9 villages; the Southwest, with 6; and the Arctic, with 2.

1,000 pounds, four were from the Interior region, and one each were from the Western and Arctic regions. These are the same three regions first to pursue wildlife co-management initiatives. In contrast, Southcentral's Anchorage, the state's largest urban center, had an annual average subsistence harvest of ten pounds per person (Alaska Department of Fish and Game 1989, 14-15; Wolfe and Walker 1987).

Existing region-wide harvest information is consistent with community harvest information from the three regions pursuing co-management. Annual average subsistence harvests in the Western region are highest, at 793 pounds per person,³⁷ the Arctic region is next highest, at 610 pounds per person, and the Interior averages 377 pounds per person. Regions without initiatives had the lowest per capita subsistence harvests. The Southwest region's per capita subsistence harvest level, however, is similar to the Interiors'. Some communities in the Southwest region have high per capita subsistence resource harvests, though others that are more dominated by commercial fishing activities may have lower harvest levels. Southeast per capita subsistence levels, at 212 pounds, are the second lowest. The lowest average subsistence harvests are found in the Southcentral region, which has an industrial-based economic system, an extensive road system, and the lowest proportion of Native inhabitants.

The three regions first to propose co-management - the Arctic, Interior, and Western - have the highest average per capita subsistence harvests. Division of Subsistence research shows that subsistence productivity is highest in rural

³⁷ Amount derived by averaging per capita harvests from 10 communities surveyed using ADF&G Division of Subsistence methodologies (Schroeder et al. 1987, Figures 53-62). This amount does not include harvests from the regional center of Bethel.

communities with the lowest percentage of non-Native residents. Most communities in these regions have a higher dependency on subsistence fish resources than they do on wildlife. However, this does not diminish the value of wildlife, and may enhance it, as it is a welcome addition to a diet based upon fish. It is not possible to separate out one component of a subsistence diet and suggest it is less important nutritionally and culturally simply because other resources are harvested in greater amounts.

At the beginning of this research, it was thought that a greater utilization of wildlife species in the subsistence diet, instead of fish or marine mammals, might explain the appearance of wildlife co-management proposals in the northwest Arctic, Interior, and Western regions. The extent of wildlife in the subsistence diet was found to vary from community to community, from region to region, and from year to year. In the case of Western Alaska, wildlife plays a modest role in overall harvest amounts in most communities, with fish being the major subsistence resource. Fish is also a primary subsistence resource in the Arctic and Interior regions, and marine mammal harvests are important in many coastal villages from the Southwest to the Arctic regions. Caribou are a major wildlife subsistence resource in the northwest Arctic, and play a relatively important role in some Interior villages. The emergence of co-management initiatives appears to be correlated more with the magnitude of overall subsistence resource use within a region than with the specific role of wildlife in the composition of the subsistence diet of a regions' people.

The economy of a region is another important aspect of this factor. The rural villages throughout the Western, northwest Arctic, and vast non-urban areas of the Interior region have mixed subsistence and cash-based economies (see pages 18-19). The magnitude of the subsistence production component of this mixed economy

makes a major contribution to community welfare. Wage and other cash-generating opportunities within these three regions are very limited and the cost of living is extremely high, with village prices for imported food running about 200 percent of Anchorage prices (Schroeder et al. 1987). Subsistence activities are a central productive component of rural economies unlikely to be replaced by cash sector opportunities in the near future. Growing regional awareness of the major contribution subsistence production makes to local economies may help to explain the efforts to increase local influence in wildlife management.

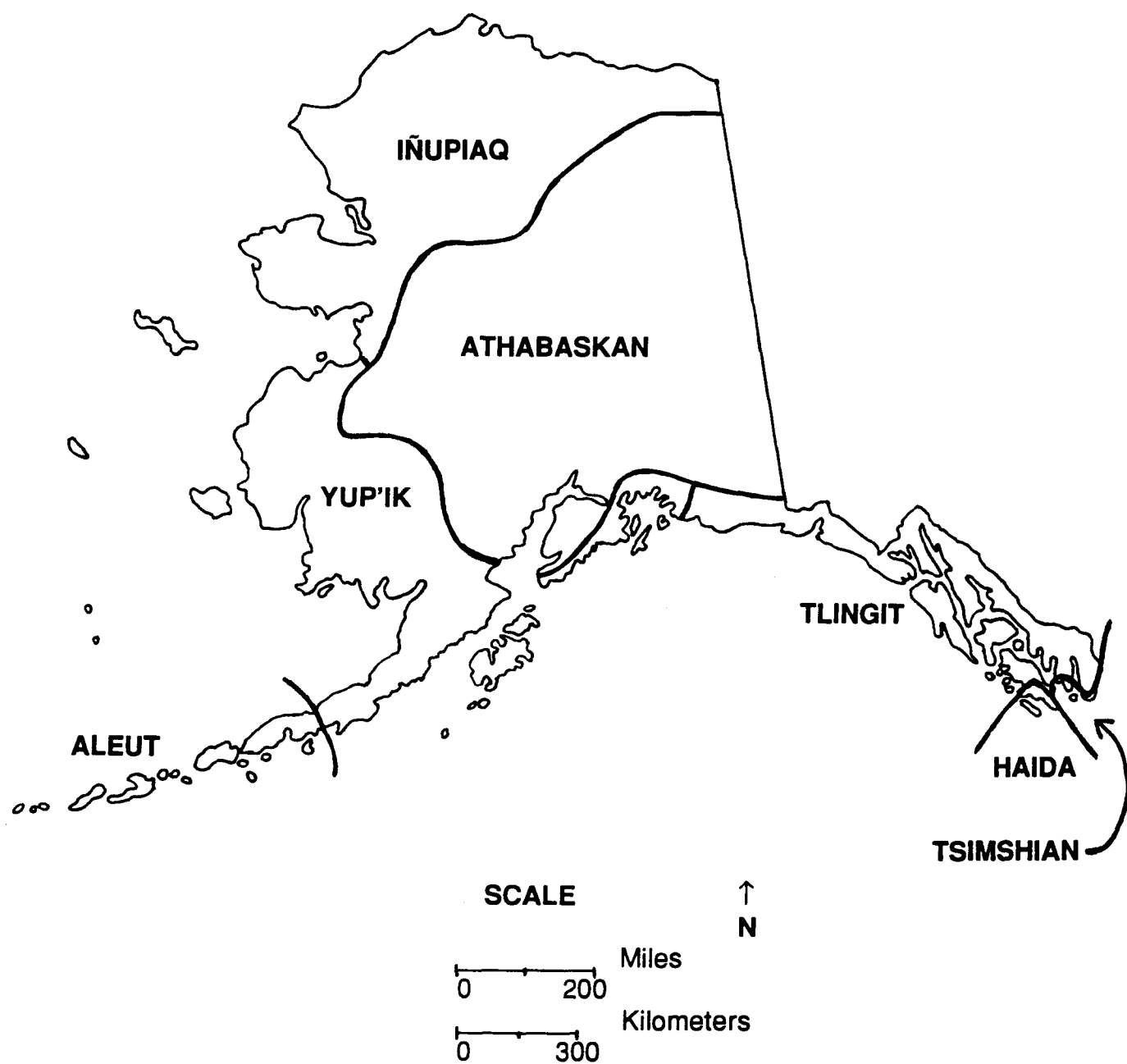
Also relevant is the minor role the commercialization of fisheries plays in the economies of those regions first to pursue co-management. Commercial fishery activities dominate the economies of Southwest and Southeast Alaska, and are a major user of Southcentral fishery resources. In addition, the Southeast region is home to a major timber industry. Southcentral has a large sport fishing industry, and resource allocation conflicts among commercial, sport, and subsistence fishers are centered mainly in this region. The Southcentral region is dominated by the urban presence of more than one-half of the state's population, many roads provide access throughout the region, and the economy is based on non-renewable resources. Subsistence activities, on the other hand, are the dominant economic characteristic of nearly the entire regions of Arctic, Interior (excluding Fairbanks), and Western Alaska. Rural subsistence communities exist in other regions, but their presence is overshadowed by other regional economic activities. Regions without major commercial enterprises based on renewable resources were first to pursue co-management initiatives.

2. Cultural Unity

The findings for Factor 2, the degree of cultural unity or homogeneity and the Native percentage of a subsistence resource regions' population, are closely associated with the findings for Factor 1. Division of Subsistence research shows that communities with fewer non-Native settlers harvest higher amounts of subsistence resources on a per capita basis. The three wildlife co-management initiatives emerged from regions or subregions inhabited by a single cultural group of Alaskan Natives. The Arctic region is home to Iñupiaq Eskimos, the Western region is inhabited by Yup'ik Eskimos, and the Interior region is home for Athabaskan Indians (Figures 1 and 2, pages 3 and 131). In contrast, the other three subsistence resource regions include multiple Native cultural groups and generally have a much lower percentage of Native residents.

In the Southwest region, 28 percent of the population belongs to either the Yup'ik or Aleut Native cultural group, and are members of three Native (ANCSA) regional corporations. In the Southeast region, 19 percent of the population is primarily Tlingit Indian who are represented by one Native regional corporation. The Southcentral region is only seven percent Native, and includes Tanaina and Ahtna Athabaskan Indians, and Sugpiaq Yup'ik Eskimos belonging to three different Native regional corporations (Alaska Department of Labor 1991).

FIGURE 2. Map of Alaskan Native Cultural and Language Areas



(Based on Krauss 1982)

Unlike the above three regions, the inhabitants of the three regions where co-management proposals were first to emerge are predominantly Native. The population of the Western region is 86 percent Native, the Kotzebue Sound subregion of the Arctic region is 85 percent Native, and the Interior region, excluding the urban Fairbanks North Star Borough, is 52 percent Native (*ibid.*). Many of the small villages in these three regions are inhabited by populations that are from 80 to 95 percent Alaskan Native. Findings for this factor document the presence of a defined population of subsistence resource users, which is one of the essential elements for defining a common property regime and distinguishing it from an 'open access' situation (Stevenson 1991; Table I, page 35).

These figures suggest a strong association between the factor of cultural unity, combined with a predominantly Native population, and the emergence of co-management initiatives. This combination may contribute to grassroots co-management proposals by facilitating a consensus for making subsistence protection an important item on the regional political agenda.

3. Strength of Leadership

Strength of leadership towards subsistence issues appears to be the most important and necessary characteristic contributing to the co-management proposals. In the three regions with co-management proposals, there is a long history of leadership and organizational commitment, dating back at least to the early 1960s, to protecting the subsistence culture of the regions' people. The non-profit Native organizations for the three regions have consistently coordinated efforts to protect

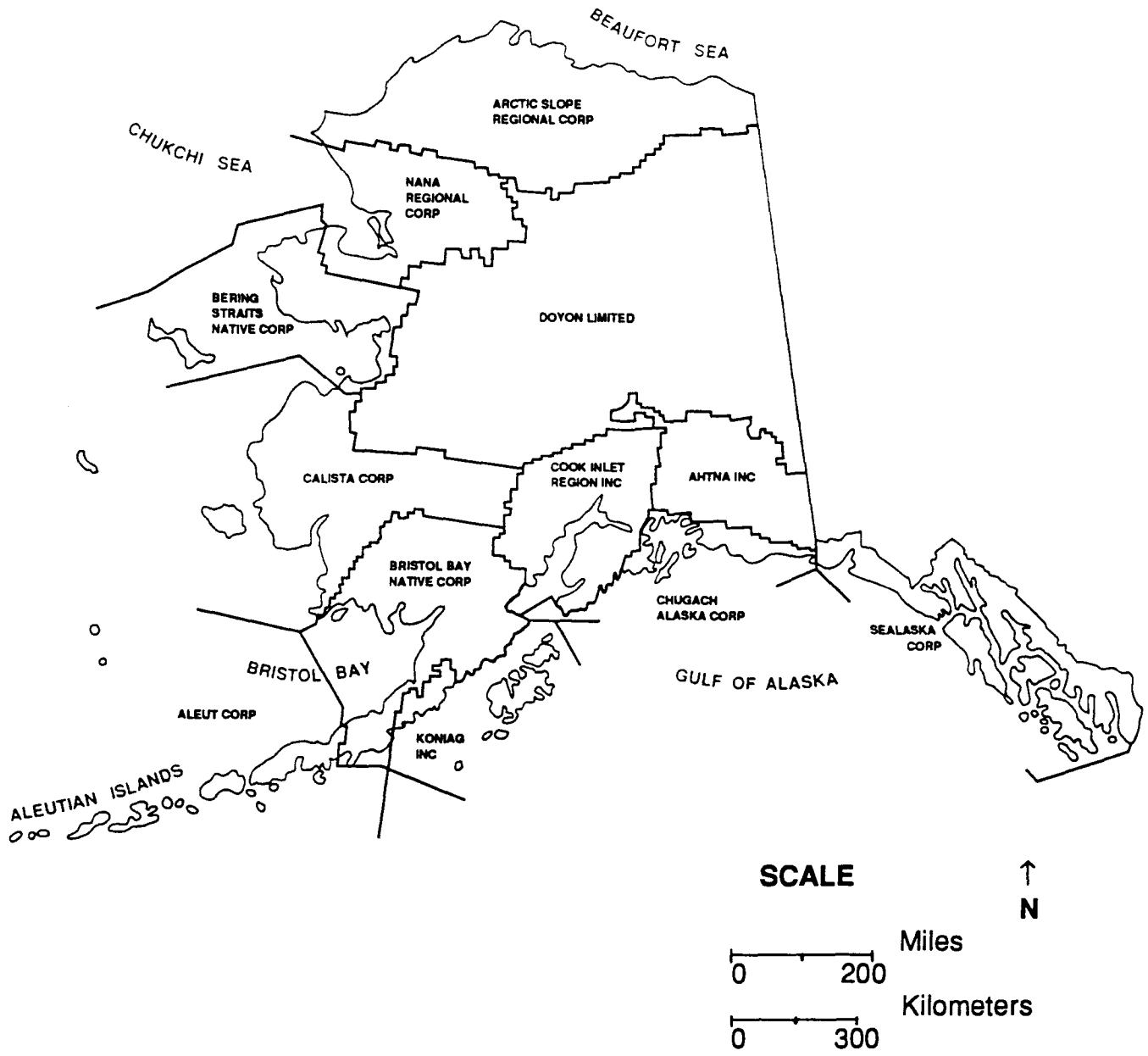
subsistence, ranging from providing training material to local fish and game advisory committee members, to assisting the region's legislative leaders on subsistence issues.³⁸

Within the three regions not pursuing co-management between 1985 and 1991, leadership efforts were not as directed towards subsistence issues. The presence of multiple cultural groups, three Native regional corporations, a large non-Native population, and a large commercial fishery in both the Southwest and Southcentral regions combined to minimize the opportunity for rural leadership to develop a consensus to protect subsistence interests. In Southeast, commercial and sport fishing interests dominate fish and wildlife management efforts by the state.

In 1989, the Southeast Native Subsistence Commission was established to serve as a single body to represent the subsistence concerns of the Southeast region's Native communities. Considering the large proportion of federal land in the Southeast region (85 percent), the 19 percent Native population, and the existence of a Native organization dedicated to representing subsistence interests for the entire region, co-management initiatives may soon be emerging from this region.

³⁸ The three principal non-profit Native organizations are the Tanana Chiefs Conference (TCC) for the Interior Native villages; Maniilaq Association for the Arctic communities of the Kotzebue Sound subregion; and the Association of Village Council Presidents (AVCP) for the Western villages.

FIGURE 3. Map of Twelve Alaska Native Regional Corporations



(Gallagher and Todd 1991)

4. Congruity of State Regulations with Subsistence Uses

The first review of the effect of state hunting regulations on local Native people was done by the Kotzebue Fish and Game Advisory Committee (KAC) in 1986 (Schaeffer, Barr, and Moore 1986). KAC found that the

regulations seek to manage village subsistence hunters with the same set of principles and values used to manage urban sport hunters, and it does not work (ibid., 8).

Examples given by KAC include the lack of meaning and relevance of bag limits and hunting seasons to Native hunters responsible for providing for an extended family, an unrealistic harvest tag and reporting system, and methods and means restrictions which unnecessarily prohibit local hunting techniques. The Kotzebue Sound subregion is not the only area to identify or experience conflicts between government wildlife regulations and customary and traditional subsistence practices.

Some of the conflicts between state regulations and local subsistence practices identified by KAC's regulation review, such as the use of bag limits, apply to Native hunters in many regions. The Arctic and Western regions appear most aware of the lack of congruity between regulations and traditional subsistence practices, and may benefit the most by reducing or eliminating culturally inconsistent or biologically unnecessary regulations. The Interior region is subjectively ranked third in degree of incongruity of regulations with local subsistence uses. Southeast, with a healthy deer population during the period under study, also had a correspondingly high bag limit. Subsistence needs for deer in Southeast were able to be met without conflicting with state hunting regulations.

The three regions pursuing co-management initiatives were ranked as being

most impacted by incongruent regulations because of enforcement actions, litigation, and the magnitude of the subsistence harvest potentially affected by inappropriate regulations.

5. Perception of the State Regulatory System

Factors 4 and 5 are closely related. The presence of state or federal wildlife regulations which are incongruent with the customary and traditional subsistence practices in a region often led to local efforts to change regulations through the state fish and game local advisory committee and regional council system. Incongruities potentially lead to enforcement actions and litigation, further affecting local perceptions of the government regulatory system. Factors 4 and 5 also apply statewide, though there is evidence indicating the Arctic, Interior, and Western regions were potentially more affected by incongruities with the regulatory system than were other regions. The effect of incongruities is potentially more pronounced in the regions with the greatest magnitude of subsistence harvest.

For example, some international migratory bird treaties prohibit spring harvests of ducks and geese by Natives. Ducks and geese are an important traditional source of fresh meat to Western Alaska's Yup'ik people each spring. State and federal efforts to enforce a ban on spring waterfowl hunting met with strong local resistance, and little success. These efforts to enforce culturally inconsistent regulations on Native subsistence hunters contributed to local resentment and dislike of the imposed management regimes.

Local efforts to change other regulations through proposals to the Board of

Game met with limited success. Difficulties encountered when trying to bring about changes in regulations to better accommodate local customary and traditional uses and harvest periods for subsistence resources contributed to a sense of frustration among rural users towards the state's regulatory system. The presence of fish and game local advisory committees and regional councils, and the opportunity to provide input directly to the Board of Game generated the expectation that local input would lead to better subsistence regulations. The frustration and dissatisfaction of rural residents with the existing government regulatory systems for subsistence resources clearly identifies this factor as one of the pre-conditions leading to grassroots co-management initiatives.

The other three regions were generally less affected by Factors 4 and 5 because they have a lower proportion of rural Native inhabitants, and their regional economies are centered more on commercial fisheries resources than on the subsistence uses of fish and wildlife. A statewide survey conducted in 1989 by RurAL CAP found that there was less dissatisfaction with the state's regulations as they affected local uses in the three regions not pursuing co-management (1989).

6. Federal Jurisdiction Over Land and Native Affairs

Both the political status of Natives, and federal legislation protecting rural subsistence uses were related to the emergence of the co-management proposals. Factor 6 applied to all six subsistence resource regions, though it is argued that regions with a greater proportion of federal lands and predominantly Native populations benefit most from federal protection for rural subsistence activities.

The three co-management proposals involved village Indian Reorganization Act (IRA) Councils or non-profit Native organizations recognized as having the authority to contract with the government as a tribal entity under provisions of the Indian Self-Determination Act (P.L. 93-638). Grassroots wildlife co-management proposals between 1985 and 1991 are the product of Native actions to protect legally recognized Native rural subsistence interests. No initiatives for the co-management of sport or commercial uses of wildlife were noted during the period under study.

Since 1990, the federal legal protection for rural subsistence use applies only to federal lands, which account for about two-thirds of the land area of Alaska. Land ownership patterns vary by region, and some regions include a much higher percentage of federal lands than others. There is a close association between the presence of a high proportion of federal lands in the Western and northwest Arctic regions and the co-management initiatives. Proposals from the northwest Arctic, however, predate the period of dual state and federal subsistence management. The presence of federal national park lands, where only local subsistence users may hunt, is an important consideration in the northwest Arctic region. Both the Western and Interior wildlife co-management proposals were submitted to the federal government following the federal resumption of subsistence management responsibilities in 1990. The Southeast region has the highest proportion of federal lands, but did not become active in subsistence issues prior to 1989. The presence of significantly large federal areas within a region cannot by itself be considered more than a pre-condition leading to the emergence of co-management proposals.

New Factors Considered

A number of other factors were mentioned during interviews as being related to the emergence of the co-management initiatives, though none appeared consistently. Impacts upon local subsistence activities and resources from non-local users was mentioned as a concern. This point may fit under factor 5, assuming an unresponsive regulatory structure takes inadequate action to protect local subsistence uses guaranteed a priority by law. One person described public participation training received by ADF&G staff as an important factor contributing to the emergence of the Kilbuck Caribou Herd Management Plan (interview 1992). Training of agency personnel is acknowledged as important, but it does not appear to have played a role in the initiation of the grassroots proposals studied in this thesis.

Examples of existing marine mammal co-management regimes were mentioned several times as contributing to the wildlife proposals, but like factors 4, 5, and 6, the influence of examples would be spread evenly among all six regions. It is likely, however, that the experience of people in Western and coastal Alaska with Native marine mammal commissions and the Yukon-Kuskokwim Delta Goose Management Plan facilitated local interest in applying similar co-management concepts to subsistence wildlife management. If this is the case, then past co-management experience or knowledge may be placed within factor 3, leadership, as another indication of a long-term commitment towards innovative actions for protecting local subsistence activities.

Difficulties in communicating the local subsistence perspective and related local knowledge to ADF&G staff and the Board of Game was mentioned as being related to

the grassroots interest in co-management. Communication difficulties, and the frustrations associated with them, fall under factor 5, local perceptions of the regulatory system. Communication problems contributed to local perceptions of the state regulatory system as being insensitive or unresponsive to local input.

The validity of the six factors developed to help identify the conditions leading to co-management initiatives was confirmed by the research findings. The factors appeared broad enough to include the majority of the information gathered from written and interview sources, and no new major factors were discovered.

Conclusion

A high degree of subsistence resource use, the presence of cultural homogeneity, strong leadership dedication towards the protection of subsistence activities, and a large extent of lands under federal jurisdiction helps to explain why grassroots wildlife co-management initiatives were first to emerge from the Arctic, Interior, and Western subsistence resource regions. These first four factors conclusively distinguished between the three regions proposing wildlife co-management and the three regions without initiatives.

The magnitude of subsistence resource utilization is quantitatively much greater and probably qualitatively stronger in the Arctic, Interior, and Western regions, than in the other three regions. Annual per capita subsistence harvests of wild resources exceed 1,000 pounds in some communities, and regional per capita average harvests are highest among the three regions pursuing co-management. The fundamental role subsistence activities play in the daily lives of most rural Alaskan Native communities

is the driving force behind recent grassroots efforts to provide more effective protection of these activities through the development of co-management regimes.

The three regions pursuing co-management have populations from 52 percent to 86 percent Native, and include one cultural group and Native organization per region or subregion under study. The other three subsistence resource regions are more fragmented in terms of the cultural composition of the population, and have a much lower percentage of Native inhabitants.

The extent of lands under federal jurisdiction was greater, with one exception, in regions pursuing co-management. Considering the historical oversight role by the federal government over Native American affairs, and legislative protection for rural subsistence activities on federal lands, the factor is easy to explain.

The Southeast and Southwest regions ranked lower in most of the six factors than the regions pursuing co-management. Subsistence activities play a significant role in the rural areas of these two regions and in a few more isolated areas of the Southcentral region. Interest in co-management opportunities is increasing throughout rural Alaska, and this research concludes that conditions exist within certain areas or subregions of all regions which may lead to further grassroots co-management initiatives for increasing local influence and roles in subsistence management.

Strong regionally-integrated leadership combined with a long-term commitment to protecting local subsistence culture is the key characteristic present in subsistence resource regions first to propose co-management, but missing from other regions. Grassroots co-management initiatives may be considered a further expression of leadership commitment to the protection of subsistence wildlife resources and the Native cultures dependent upon them.

CHAPTER 5

CONCLUSION AND POLICY IMPLICATIONS

Conclusion

This research sought to determine the conditions associated with several grassroots initiatives for the co-management of subsistence uses of wildlife in rural Alaska. Six factors were explored to help explain why grassroots initiatives for increasing local influence in subsistence wildlife management arose in three of Alaska's six subsistence resource regions (Figure 1, page 3). Research results suggested that all six factors were predictors of wildlife co-management initiatives, although four factors were most important (Table III, page 124).

The six factors hypothesized as helping to explain the emergence of co-management proposals from three of Alaska's six subsistence resource regions are:

- 1) Magnitude and type of subsistence resource utilization;
- 2) Degree of cultural unity and Native percentage of population;
- 3) Strength of leadership around subsistence issues;
- 4) Degree of congruity between state wildlife regulations and local customary and traditional subsistence activities;
- 5) Differences in perception of the state regulatory system; and
- 6) Federal jurisdiction over land and Native affairs.

The four conditions found to be most strongly associated with the regions pursuing co-management are: a high level of subsistence resource harvest; a high

degree of cultural unity and a predominantly Native population; strong leadership directed at subsistence issues; and a large extent of land under federal jurisdiction. It had been anticipated that the proportion of wildlife in the diet of a region's people would help explain the interest in wildlife co-management. This turned out not to be the case, since fisheries or marine resources, instead of wildlife, dominate the subsistence diet in most areas. However, the magnitude of per capita fish and wildlife subsistence harvest was substantial, and highest in the three regions pursuing co-management initiatives.

Strength of leadership around subsistence issues was the key condition among the six factors for separating regions first to pursue wildlife co-management initiatives from regions where initiatives did not come forth. The importance of the role of leadership was highlighted by comparisons between the Interior and Southwest subsistence resource regions. Both regions have similar amounts of per capita subsistence resource use, moderate cultural homogeneity, and a similar percentage of lands under federal jurisdiction, but only the Interior region has a history of pursuing co-management. These two regions are also geographically isolated from the urban and road-connected areas of the state. Leadership in the Southwest appears historically to be more concerned with issues associated with Bristol Bay's large commercial fishery. The much lower degree of organizational and leadership commitment to wildlife subsistence issues in the Southwest region may help to explain why no co-management initiatives appeared from this region between 1985 and 1991. Unlike Southwest, the Interior region has a long history of leadership commitment and action towards protecting subsistence.

Policy Implications

The consistent and growing interest by rural leaders in subsistence co-management applications suggests that current, conventional government subsistence management efforts are not meeting rural needs. Improved understanding of the regional, cultural, and institutional contexts associated with co-management proposals may facilitate the development of a more enlightened public policy response to future grassroots co-management initiatives. The community-based nature of customary and traditional subsistence activities makes it appropriate to also consider ways for incorporating community roles into future cooperative wildlife management agreements between Native groups and government.

Given that the goals of improved wildlife conservation, subsistence protection, and public participation in subsistence management may be facilitated by the implementation of co-management regimes for the subsistence uses of wildlife, the thesis findings suggest several areas where policy responses by government and local organizations may promote these goals. An integrated policy response consistent with the identified co-management predictors may be an effective beginning to resolving many of the problems plaguing subsistence management in Alaska today.

In consideration of scarce staff and limited financial resources, initial government actions towards developing co-management with local subsistence groups could be directed to rural areas having the best prospects for success. The research findings suggest regions, subregions, or smaller rural areas having a high level of subsistence resource use, a high degree of cultural homogeneity, and extensive federal land holdings may be appropriate places for the initial commitment of scarce

resources for improving subsistence management.

The Arctic and Western regions, and the rural, roadless areas of the Interior region appear well-suited for initial efforts directed at the development of wildlife co-management regimes. These regions' predominantly Native populations have a significant dependence on subsistence resources, and their leadership is experienced in subsistence issues. The presence of extensive federal land holdings in all three regions suggests the federal government may be a key player in future co-management efforts.

Leadership was shown by this research to be the single most important factor contributing to grassroots co-management initiatives. The Alaska State Legislature and Executive Branch, the Alaska Department of Fish and Game, and state and federal resource agencies could take steps to recognize and support the most organized and consistent rural leadership efforts towards improving subsistence management. Present leadership in rural Alaska may also take actions to assure strong leadership capabilities are developed among young community members. Regional leadership could be effectively supported by government policies directed at increasing the involvement of local leaders in all phases of resource management. The consent, cooperation, and support of rural leadership is likely to be a key factor in achieving improved subsistence management, just as it was for initiating co-management proposals.

There are also policy implications for the communities involved in these issues. It is important for rural leadership, with the support of their communities, to work consistently towards opportunities for improving subsistence management through co-management. The potential for local conflicts in other issues to be an obstacle to

cooperation can be recognized, and guarded against, by placing a high priority on developing co-management.

Other specific actions could be taken to improve communication and understanding between government resource agencies and rural subsistence users, such as training and culturally appropriate meeting formats. Specific actions by the government in support of rural traditional subsistence activities could demonstrate to local users that government is capable and serious about improving wildlife and subsistence management. Rural attitudes and perceptions are more likely to change in response to specific actions by government.

Government and rural leadership efforts towards improving wildlife and subsistence management are more likely to be effective if an integrated approach consistent with the findings of thesis is undertaken. The involvement of all major parties during the development of co-management regimes will contribute to a more robust and comprehensive approach to subsistence management, than is the case today. The present system of multiple, independent jurisdictions applied at times to the same subsistence communities unnecessarily complicates management efforts and leads to confusion and frustration among rural users towards government regulatory regimes. ANILCA's Section 809 provides for cooperative agreements between the federal and state government, and other entities, such as Native groups or village councils, for implementing federal subsistence management policies. In regions where the federal government is the principal land owner, it may be appropriate for federal resource agencies to take the lead in efforts to improve subsistence management through supporting co-management processes. Initial efforts are more likely to succeed by proceeding slowly, step by step, in a region with

few major land owners and interest holders. Contracting between Native tribal organizations and the federal government for subsistence management responsibilities may also be possible under provisions of the Indian Education and Self-Determination Act (P.L. 93-638).

In sum, the results from this thesis may be used in establishing guidelines for where best to apply scarce government resources for improving wildlife management and subsistence protection. By approaching co-management opportunities for subsistence management in an informed and integrated fashion, government and rural efforts to improve wildlife and subsistence management are more likely to be effective.

BIBLIOGRAPHY

- Alaska Department of Fish and Game (ADF&G). 1989. "Alaskans' Per Capita Harvests of Wild Food." *Alaska Fish & Game* 21 6: 14-15.
- _____. 1992. Kilbuck Caribou Herd Management Plan (Interim Draft). April 17, 1992.
- Alaska Department of Labor (ADL). 1991. Alaska Population Overview: 1990 Census and Estimates. Juneau, AK: ADL, Research and Analysis.
- Alaska Department of Natural Resources (DNR), Division of Land and Water. 1988. Northwest Area Plan: Subsistence Resource Report. Fairbanks, AK: DNR.
- Albrecht, Daniel E. 1990. Co-Management as Transaction: The Kuskokwim River Salmon Management Working Group. Master's thesis, McGill University, Montreal.
- Anderson, Douglas D., Ray Bane, Richard Nelson, Wanni W. Anderson, and Nita Sheldon. 1977. Kuuvangmiut Subsistence: Traditional Eskimo Life in the Latter Twentieth Century. Washington, DC: National Park Service.
- Arnold, J.E.M., and J. Gabriel Campbell. 1986. "Collective Management of Hill Forests in Nepal: The Community Forestry Development Project." Proceedings of the Conference on Common Property Resource Management. Washington, DC: National Academy Press, 425-454.
- Arnold, Robert D. 1978. Alaska Native Land Claims. Anchorage, AK: Alaska Native Foundation.
- Arnstein, Sherry R. 1969. "A Ladder of Citizen Participation." *AIP Journal* 35 (July): 216-224.
- Association of Village Council Presidents (AVCP). 1990. "Draft Proposal for a Self-Determination Contract to Administer the Management of Federal Subsistence Activities on Public Lands in the AVCP Region of Alaska." Bethel, AK: AVCP.
- Bailey, James A. 1984. Principles of Wildlife Management. New York: John Wiley & Sons.
- Benke, Steven R., and Terry L. Haynes. 1986. "Local and Native Hire in Renewable Resource Management: An Alaskan Case." Native People and Renewable Resource Management: the 1986 Symposium of the Alberta Society of Professional Biologists. Edmonton, Alberta: Alberta Society of Professional Biologists, 142-149.

- Berger, Thomas R. 1985. Village Journey: The Report of the Alaska Native Review Commission. New York: Hill and Wang.
- Berkes, Fikret, ed. 1989. Common Property Resources: Ecology and Community-Based Sustainable Development. London: Belhaven Press.
- Berkes, Fikret, and M. Taghi Farvar. 1989. "Introduction and Overview." Common Property Resources, ed. Berkes, 1-17.
- Berkes, Fikret, Peter George, and Richard Preston. 1991. Co-Management: The Evolution of the Theory and Practice of Joint Administration of Living Resources. TASSO Research Report, Second Series, No. 1. Hamilton, ON: McMaster University.
- Bobby v. State of Alaska. 1989. 718 F.Supp. 764 (D. Alaska 1989).
- Buck (Cox), Susan J. 1989. "Multi-Jurisdictional Resources: Testing a Typology for Problem-Structuring." Common Property Resources, ed. Berkes, 127-148.
- Burch, Earnest S., Jr. 1984. "Kotzebue Sound Eskimo." Indians of North America, Arctic. Washington, DC: Smithsonian, Volume 5: 303-319.
- Busiahn, Thomas R. 1989. "The Development of State/Tribal Co-Management of Wisconsin Fisheries." Co-Operative Management of Local Fisheries, ed. Pinkerton, 170-185.
- Caldwell, William. 1992. "Protecting the Hunting and Fishing Rights of Alaska Natives: An Unworkable System Producing Much Litigation and Little Negotiation." Paper delivered to Federal Bar Association, 17th Annual Indian Law Conference, Albuquerque, NM, April 2-3, 1992.
- Case, David S. 1984. Alaska Natives and American Laws. Fairbanks, AK: University of Alaska Press.
- Ciriacy-Wantrup, S.V. 1971. "The Economics of Environmental Policy." *Land Economics* 47 1 (Feb): 36-45.
- Ciriacy-Wantrup, S.V., and Richard C. Bishop. 1975. "'Common Property' as a Concept in Natural Resources Policy." *Natural Resources Journal* 15 4 (Oct): 713-727.
- Clark, Annette McFadyen. 1974. Koyukuk River Culture. Ottawa: National Museums of Canada.

- Coffing, Michael W. 1991. Kwethluk Subsistence: Contemporary Land Use Patterns, Wild Resource Harvest and Use, and the Subsistence Economy of a Lower Kuskokwim River Area Community. Technical Paper No. 157. Juneau, AK: ADF&G, Div. of Subsistence.
- Coffing, Michael, and Mary Pete. 1992. "Subsistence Use of Brown Bear in Western Alaska." A report to the Board of Game, March 30, 1992. Juneau, AK: ADF&G, Div. of Subsistence.
- Cohen, Fay G. 1986. Treaties on Trial: The Continuing Controversy over Northwest Indian Fishing Rights. Seattle: University of Washington Press.
- Cook, Gregory F. 1986. "Alaska Waterfowl Management and the Law." Transactions of the Fifty-first North American Wildlife and Natural Resources Conference, 1986. Reno, NV. 51: 516-526.
- Cormack, Jerry. 1992. Comments made at British Columbia Round Table on the Environment and Economy workshop, July 4, 1992, Vancouver, BC.
- Cournoyea, Nellie J., and Robert G. Bromley. 1986. "The Role of Native People in Waterfowl Management in Canada." Transactions of the Fifty-first North American Wildlife and Natural Resources Conference, 1986. Reno, NV. 51: 507-510.
- Daly, Herman E., and John B. Cobb, Jr. 1989. For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future. Boston: Beacon Press.
- Drolet, Charles A. 1986. "Land Claim Settlements and the Management of Migratory Birds, A Case History: The James Bay and Northern Quebec Agreement." Transactions of the Fifty-first North American Wildlife and Natural Resources Conference, 1986. Reno, NV. 51: 511-515.
- Drucker, Philip. 1965. Cultures of the North Pacific Coast. San Francisco: Chandler Publishing Co.
- Federal Register. 1991. 56 FR 236, 1991.
- _____. 1992. Vol. 57, No. 104 May 29, 1992.
- Feeney, D., F. Berkes, B.J. McCay, and J.M. Acheson. 1990. "The Tragedy of the Commons: Twentytwo Years Later." *Human Ecology* 18 1: 1-19.
- Feit, Harvey A. 1988. "Self-management and State Management: Forms of Knowing and Managing Northern Wildlife." In Traditional Knowledge and Renewable Resource Management in Northern Regions, ed. Freeman and Carbyn, 72-91. Edmonton: Boreal Institute for Northern Studies.

- Feldman, Kerry D. 1986. "Subsistence Beluga Whale Hunting in Alaska: A View from Eschscholtz Bay." In: Langdon 1986, Contemporary Alaskan Native Economies. 153-171.
- Fish and Wildlife Service (FWS). 1988. "Final Federal Agency Guidelines for Receiving and Responding to Regional Advisory Council Annual Reports." Letter to regional councils. Anchorage, AK: FWS.
- _____. 1989. ANILCA Section 806 Subsistence Monitoring Report - 1989. Anchorage, AK: FWS, Div. of Technical Support.
- _____. 1992a. Record of Decision. Anchorage, AK: FWS, Federal Subsistence Board.
- _____. 1992b. Subsistence Management for Federal Lands in Alaska, Volume I: Final Environmental Impact Statement. Anchorage, AK: FWS, Federal Subsistence Board.
- Frank v. State of Alaska. 1979. 604 P.2d 1068 (AK 1979).
- Freeman, Milton M.R. 1989a. "The Alaska Eskimo Whaling Commission: Successful Co-Management under Extreme Conditions." In Co-Operative Management of Local Fisheries, ed. Pinkerton, 137-153.
- _____. 1989b. "Graphs and Gaffs: A Cautionary Tale in the Common-Property Debate." In Common Property Resources, ed. Berkes, 92-109.
- Freeman, Milton M.R., and Ludwig N. Carbyn, eds. 1988. Traditional Knowledge and Renewable Resource Management in Northern Regions. Edmonton: Boreal Institute for Northern Studies.
- Gallagher, Thomas J. 1988. "Native Participation in Land Management Planning in Alaska." *Arctic* 41 2: 91-98.
- Gallagher, Thomas J., and Susan Todd. 1991. Who's Planning Alaska: The Alaska Planning Directory 1991. Fairbanks, AK: Cooperative Extension Service, University of Alaska Fairbanks.
- Georgette, Susan, and Hannah Loon. 1991. Subsistence Hunting of Dall Sheep in Northwest Alaska. Technical Paper No. 208. Juneau, AK: ADF&G, Div. of Subsistence.
- Glaser, Barney G., and Anselm L. Strauss. 1967. The Discovery of Grounded Theory: Strategies for Qualitative Research. Chicago: Aldine Publishing Co.
- Hardin, Garret. 1968. "The Tragedy of the Commons." *Science* 162: 1243-1248.

- Huffman, J.L., and G.C. Coggins. 1986. "The Federal Role in Natural Resource Management in the United States." In Managing Natural Resources in a Federal State, ed. Saunders, 52-72. Toronto: Carswell.
- Huntington, Henry P. 1991. Management and Regulation of Local Subsistence Hunting in North Alaska. Ph.D. diss., University of Cambridge.
- Institute for Participatory Management and Planning. 1990. Citizen Participation Handbook for Public Officials and Other Professionals Serving the Public. 6th Ed. Monterey, CA: The Institute.
- Kari, Priscilla Russell. 1983. Land Use and Economy of Lime Village. Technical Paper No. 80. Juneau, AK: ADF&G, Div. of Subsistence.
- Kelso, Dennis D. 1981. Technical Overview of the State's Subsistence Program. Technical Report No. 64. Juneau, AK: ADF&G, Div. of Subsistence.
- _____. 1982. "Subsistence Use of Fish and Game Resources in Alaska: Considerations in Formulating Effective Management Policies." Transactions of the North American Wildlife and Natural Resources Conference. 47: 630-640.
- Kiss, Agnes, ed. 1990. Living with Wildlife: Wildlife Resource Management with Local Participation in Africa. World Bank Technical Paper Number 130. Washington, DC: The World Bank.
- Krauss, Michael E. 1982. Native Peoples and Languages of Alaska. Fairbanks, AK: Alaska Native Language Center, University of Alaska Fairbanks.
- Kwethluk IRA Council v. State of Alaska. 1990. 740 F.Supp. 765 (D.AK 1990).
- Langdon, Steve J. 1984. "Alaskan Native Subsistence: Current Regulatory Regimes and Issues." Paper prepared for the Alaskan Native Review Commission Hearings on Subsistence, October 10-13, 1984, Anchorage, AK.
- _____, ed. 1986. Contemporary Alaskan Native Economies. New York: University Press of America.
- _____. 1987. The Native People of Alaska. Anchorage, AK: Greatland Graphics.
- _____. 1989. "Prospects for Co-Management of Marine Mammals in Alaska." In Co-Operative Management of Local Fisheries, ed. Pinkerton, 154-169.
- Larkin, P.A. 1977. "An Epitaph for the Concept of Maximum Sustained Yield." Transactions of the American Fisheries Society. 106: 1-11.
- Leopold, Aldo. 1933. Game Management. New York: Charles Scribner's Sons.

- Lonner, Thomas D. 1980. Subsistence as an Economic System in Alaska: Theoretical and Policy Implications. Technical Paper No. 67. Juneau, AK: ADF&G, Div. of Subsistence.
- _____. 1981. Perceptions of Subsistence and Public Policy Formation in Alaska. Technical Paper No. 68. Juneau, AK: ADF&G, Div. of Subsistence.
- Loon, Hannah, and Susan Georgette. 1989. Contemporary Brown Bear Use in Northwest Alaska. Technical Paper No. 163. Kotzebue, AK: ADF&G, Div. of Subsistence.
- Magdanz, Jim. 1988. "Northwest Alaska Game Review: A Discussion Paper." Unpublished paper. Kotzebue, AK: ADF&G records.
- Maniilaq Association, Inc. 1983. Subsistence in Northwest Alaska: A Collection of Recent Publications. Kotzebue, AK: Maniilaq Assn.
- Marshall, Richard, and Larry Peterson. 1991. A Review of the Existing Alaska Department of Fish and Game Advisory System and a Determination of its Adequacy in Fulfilling the Secretary of the Interior's and the Secretary of Agriculture's Alaska National Interest Lands Conservation Act Title VIII Responsibilities. Anchorage, AK: U.S. Fish and Wildlife Service.
- Martin, Fenton. 1989. Common Pool Resources and Collective Action: A Bibliography. Bloomington, IN: Indiana University.
- McCay, Bonnie J., and James M. Acheson. 1987. The Question of the Commons: The Culture and Ecology of Communal Resources. Tucson: University of Arizona Press.
- McDowell v. Alaska. 1989. 785 P.2d 1 (AK 1989).
- Merritt, John, and Terry Fenge. 1990. "The Nunavut Land Claims Settlement: Emerging Issues in Law and Public Administration." *Queen's Law Journal* 15: 255-277.
- Mitchell, Donald C. 1986. "Native Subsistence Hunting of Migratory Waterfowl in Alaska: A Case Study Demonstrating Why Politics and Wildlife Management Don't Mix." Transactions of the Fifty-first North American Wildlife and Natural Resources Conference. Reno, NV. 51: 527-534.
- Noble, Heather. 1987. "Tribal Powers to Regulate Hunting in Alaska." *Alaska Law Review* 4: 223-275.
- Osherenko, Gail. 1988. Sharing Power with Native Users: Co-Management Regimes for Native Wildlife. CARC Policy Paper 5, Ottawa: Canadian Arctic Resources Committee.

- Ostrom, Elinor. 1990. Governing the Commons: The Evolution of Institutions for Collective Action. Cambridge: Cambridge University Press.
- Pamplin, W. Lewis, Jr. 1986. "Cooperative Efforts to Halt Population Declines of Geese Nesting on Alaska's Yukon-Kuskokwim Delta." Transactions of the Fifty-first North American Wildlife and Natural Resources Conference. Reno, NV. 51: 487-506.
- People of Togiak v. U.S. 1979. 470 F.Supp 423 (D.C.D.C. 1979).
- Pinkerton, Evelyn. 1987. "Intercepting the State: Dramatic Processes in the Assertion of Local Comanagement Rights." In The Question of the Commons, ed. McCay and Acheson, 344-369.
- _____, ed. 1989. Co-Operative Management of Local Fisheries: New Directions for Improved Management and Community Development. Vancouver: University of British Columbia Press.
- _____. 1991. "Locally Based Water Quality Planning: Contributions to Fish Habitat Protection." *Canadian Journal of Fisheries and Aquatic Sciences* 48: 1326-1333.
- Pinkerton, Evelyn, and Steve Langdon. 1987. "Regional Aquaculture Associations in Alaska: An Overview." Phase I: Final Report, Launching a Fisheries Co-Management Pilot Project: Learning from the Experience of Alaska and Washington State. Ottawa: Department of Fisheries and Oceans.
- Raveling, D.G. 1983. "Geese and Hunters of Alaska's Yukon Delta: Management Problems and Political Dilemmas." Transactions of the Forty-fifth North American Wildlife and Natural Resources Conference. 45: 555-575.
- Rees, Judith. 1985. Natural Resources. London: Methuen.
- Rogers, Randall R. 1991. An Analysis of Eligibility for Subsistence Hunting in the Wrangell-St. Elias National Park, Alaska. M.S. thesis, University of Alaska Fairbanks.
- Ross, David P., and Peter J. Usher. 1986. From the Roots Up: Economic Development as if Community Mattered. Croton-on-Hudson, NY: Bootstrap Press.
- Rothschild, Joyce, and J. Allen Whitt. 1986. The Cooperative Workplace. Cambridge: Cambridge University Press.

- Rural Alaska Community Action Program (RurAL CAP). 1989. Results of a Survey: Implementation of ANILCA'S Subsistence Priority and Advisory Committee System by the State of Alaska. Anchorage, AK: RurAL CAP.
- Schaeffer, Pete, D. Barr, and G. Moore. 1986. "Kotzebue Fish and Game Advisory Committee Regulation Review: A Review of the Game Regulations Affecting Northwest Alaska." Unpublished report. Kotzebue, AK.
- Schroeder, Robert F., David B. Anderson, Rob Bosworth, Judith M. Morris, and John M. Wright. 1987. Subsistence in Alaska: Arctic, Interior, Southcentral, Southwest, and Western Regional Summaries. Technical Paper No. 150. Juneau, AK: ADF&G, Div. of Subsistence.
- Schwarz, Edward. 1982. "Economic Development as If Neighborhoods Mattered." In Community and Capital in Conflict: Plant Closing and Job Loss, ed. Raines, Benson, and Gracie. Philadelphia: Temple University Press.
- Scollon, Ronald, and Suzanne Scollon. 1980. Interethnic Communication. Fairbanks: University of Alaska, Alaska Native Language Center.
- Sealaska Corporation. 1989. "Southeast Regional Council White Paper." Juneau, AK: Sealaska Corporation, Natural Resources Department.
- Senate Report. 1971. U.S. Senate Report 92-581, 92nd Congress; 1st Session, December 14, 1971.
- Sherwood, Morgan B. 1981. Big Game in Alaska: A History of Wildlife and People. New Haven: Yale University Press.
- Smith, Eric, and Mary Kancewick. 1990. "The Tribal Status of Alaska Natives." *University of Colorado Law Review* 61 3: 445-516.
- State of Alaska. 1987. Alaska Land Status Map.
- State of Alaska v. Eluska. 1986. 724 P.2d 514 (Alaska 1986).
- Stevenson, Glenn G. 1991. Common Property Economics: A General Theory and Land Use Applications. Cambridge: Cambridge University Press.
- Swerdfager, Trevor M. 1990. "Cooperative Wildlife Management: Implications for Wildlife Management Professionals." Transactions of the Fifty-fifth North American Wildlife and Natural Resources Conference. 55: 154-163.

- Tanana Chiefs Conference, Inc. (TCC). 1990. "Proposal for the Assumption of the Duties of the Secretary of the Interior under Title VIII of the Alaska National Interest Lands Conservation Act [P.L.96-487; 94 STAT.2371] For the Interior of Alaska Within the Tanana Chief's Region under Provisions of the the [sic] Indian Self-Determination Act [P.L. 93-638 As amended by P.L. 100-202, P.L. 100-446, P.L. 100-472 & P.L. 100-581]." July 24, 1990. Fairbanks, AK: TCC.
- Tober, James A. 1981. Who Owns the Wildlife?: The Political Economy of Conservation in Nineteenth-Century America. Westport, CT: Greenwood Press.
- Usher, Peter J. 1986. The Devolution of Wildlife Management and the Prospects for Wildlife Conservation in the Northwest Territories. CARC Policy Paper 3. Ottawa: Canadian Arctic Resources Committee.
- _____. 1987. "Indigenous Management Systems and the Conservation of Wildlife in the Canadian North." *Alternatives* 15: 3-9.
- Van Ballenberghe, Victor. 1986. "Legislation, Litigation and Allocation: A Case History of Subsistence Hunting in Alaska." Transactions of the Fifty-first North American Wildlife and Natural Resources Conference. Reno, NV. 51: 107-115.
- Werle, Steve. 1992. Subsistence to be Protected Under New Land Ordinance. Kotzebue (Alaska) Arctic Sounder, 1 May, 3.
- Wheeler, Polly. 1988. "State and Indigenous Fisheries Management: The Alaska Context." In Traditional Knowledge and Renewable Resource Management, ed. Freeman and Carbyn, 38-47.
- Wolfe, Robert J. 1989. "Territorial Control by Contemporary Hunter-Gatherer Groups in Alaska: Case Examples of Subsistence and Recreation Conflicts." Paper presented at the Society for Applied Anthropology Annual Meeting, Santa Fe, NM, April 5-9, 1989.
- Wolfe, Robert J., James A. Fall, Virginia Fay, Susan Georgette, James Magdanz, Sverre Pedersen, Mary Pete, and Janet Schichnes. 1986. The Role of Fish and Wildlife in the Economies of Barrow, Bethel, Dillingham, Kotzebue, and Nome. Technical Paper No. 154. Juneau, AK: ADF&G, Div. of Subsistence.
- Wolfe, Robert J., and Robert J. Walker. 1987. "Subsistence Economies in Alaska: Productivity, Geography, and Development Impacts." *Arctic Anthropology* 24 2: 56-81.
- Worl, Rosita. 1981. "Cultural Norms, Laws, and Modern Resource Management Requirements." *Arctic Coastal Zone Management Newsletter* 34: 15-17.
- Yin, Robert K. 1989. Case Study Research: Design and Methods. Applied Social Research Methods Series, Volume 5. Newbury Park, CA: Sage Publications.

GLOSSARY

Customary and Traditional Use

A consistent pattern of, and reliance for subsistence purposes upon fish or wildlife or other wild, renewable resources near or reasonably accessible from the user's place of residence (Fish and Wildlife Service 1992b).

Eskimo

The term Eskimo embraces the Yup'ik, Siberian Yup'ik, and Iñupiaq peoples generally living along Alaska's coastal areas. In Alaska, this term is used freely without the negative connotation it has in Canada.

Rural

All communities with less than 2500 in population; those places with populations between 2500 and 7000 with a rural subsistence character, such as Barrow, Bethel, Dillingham, Kotzebue, and Nome. Sitka, with a population slightly greater than 7000, is still considered rural due to its maintaining a substantial subsistence character³⁹.

Urban

Generally those communities with a population greater than 7000 people, or communities adjacent to or within Anchorage, Fairbanks, or Juneau's urbanized, road-connected areas.

Wildlife Management

The art and science of overseeing wildlife resources to provide for their maximum use, historically, by recreational users. Aldo Leopold, recognized as the father of wildlife management, wrote that "Game management is the art of making land produce sustained annual crops of wild game for recreational use" (1933, 3).

³⁹ The Alaska National Interest Lands Conservation Act of 1980 (ANILCA) provides a federal priority only for 'rural' subsistence users, making the determination of a communities' or areas' urban or rural status a critical and sometimes contentious affair sometimes leading to the courts. Both the state and federal governments make formal findings about the rural status of each community. Eligibility for subsistence use is based on residence in communities declared 'rural' by the state or federal government. See discussion on page 22 about incompatibilities between ANILCA's 'rural' eligibility requirement and Alaska's Constitution, highlighted by the Alaska Supreme Court *McDowell* ruling in 1989.