

**Alaska Native Perspectives on the Governance of  
Wildlife Subsistence and Conservation Resources in the Arctic**

Victoria Rose Buschman

A thesis submitted in partial fulfillment of the requirements for the degree of:  
Master of Science  
University of Washington  
2017

Reading Committee:  
Kristiina A. Vogt, Chair  
Craig W. Thomas  
Carolina Behe

Program Authorized to Offer Degree:  
School of Environmental and Forest Sciences

©Copyright 2017  
Victoria Rose Buschman

University of Washington

**ABSTRACT**

Alaska Native Perspectives on the Governance of  
Wildlife Subsistence and Conservation Resources in the Arctic

Victoria Rose Buschman

Chair of the Supervisory Committee:  
Professor Kristiina A. Vogt  
School of Environmental and Forest Sciences

Wildlife resource management in the Arctic is a collaborative effort across many governments, agencies, extractive industries, environmental organizations, and Indigenous communities. Many governments and environmental organizations recognize a need for wildlife conservation as the landscape undergoes rapid environmental change, but some conservation practices burden Indigenous communities that rely on access to wildlife as a means of subsistence and food security. Despite a collective desire for the continued proliferation of endemic species and sustainable population dynamics, many Indigenous Peoples continue to experience the failures of management efforts through inadequate consideration of their perspectives, needs, concerns, and strengths within the decision making process. Using several case studies and previous work done in collaboration with Alaska Native communities and other Indigenous Peoples, this study recognizes the widely-held perspectives of these groups in contrast with western environmentalism and typical natural resource management. Within the Alaska Native context, the five major challenges to the inclusive management of wildlife are, (1) cultural differences in definition and approach to natural resource issues, (2) disregard for the place of Indigenous knowledge alongside western science, (3) distribution of environmental impacts and the burden of conservation, (4) power imbalances, and (5) lack of trust and respect. Characterizing

differences between these groups' perspectives on environmentalism, decision making, and policy approach show clear evidence of a cultural divide and of shortcomings in current wildlife science and policy. In order to give Alaska Natives greater voice in wildlife decisions that impact their communities, management strategies must find a way to reconcile these differences and foster inclusive and engaging solutions that are both place-based and landscape-scale.

# TABLE OF CONTENTS

	Page
ABSTRACT.....	i
TABLE OF CONTENTS.....	iii
LIST OF FIGURES.....	iv
LIST OF TABLES.....	iv
KEY TERMS.....	v
INTRODUCTION.....	1
A Changing Landscape.....	1
Alaska Natives, Subsistence, and Conservation.....	2
Contemporary Natural Resource Governance.....	6
METHODS.....	9
Information Gathering.....	9
Conceptualizing.....	10
FIGURES.....	12
TABLES.....	14
WORKING TOWARDS INCLUSIVE MANAGEMENT.....	16
Identifying Challenges to Collaboration.....	16
Alaska Native Wildlife Use and Management.....	18
How Alaska Natives Define Natural Resource Issues.....	19
Western and Alaska Native Approaches to Management and Decision Making.....	22
Indigenous Knowledge in Environmental Decision Making.....	25
Baselines, Data Collection, and Ecological Monitoring.....	29
FURTHER WORK.....	32
REFERENCES.....	35

## **LIST OF FIGURES**

	Page
Figure 1. Components of Wildlife Use and Management for Subsistence and Conservation.....	11
Figure 2. Integrating Ways of Knowing in Wildlife Policy.....	12

## **LIST OF TABLES**

Table 1. Differing Perspectives on Environmentalism and Resource Management.....	13
Table 2. Differing Perspectives on Environmental Decision Making.....	14
Table 3. Differing Approaches to the Policy Process.....	14

## KEY TERMS

*Alaska Native* – Referring to the Indigenous Peoples of Alaska, recognizing individuals belonging to any of the 151 federally recognized tribes, 150 village corporations, and 12 regional corporations. Within the context of this study, Alaska Native also refers more specifically to people belonging to the communities indigenous to the Arctic Circle.

*Subsistence* – The use of natural resources for personal, familial, or community use by Indigenous peoples. This term refers both to the practices and the laws surrounding natural resource use. It is most often used to refer to the harvest of flora and fauna.

*Indigenous Food Security* – A complex concept that encompasses subsistence practices and laws but also includes measures of quality, abundance, and other characteristics of the natural resource. To avoid a lengthy discussion of the intricacies of this concept, this study aims to address subsistence practices rather than food security. A full report defining food security measures can be found with the Inuit Circumpolar Council Alaska (Inuit Circumpolar Council, 2015).

## INTRODUCTION

*As an Alaska Native myself, I am a participant observer and will therefore refer to the general collective beliefs of my people by using “we” and “our,” although I recognize that some statements may not represent the sentiments of all Alaska Natives.*

### ***A Changing Landscape***

Engagement and motivation around natural resource conservation in the Arctic is growing alongside the need to mitigate and adapt to ecological and anthropogenic impacts across the landscape (Arctic Council, 1998). Global interest in the state of the Arctic has compelled collaborative efforts to manage a variety of key natural resources including offshore oil (AOOGG, 2014), shipping waterways (AMSA, 2009), and wildlife (ABA, 2013). Wildlife pose a unique challenge to natural resource management. Many species are migratory, transcending ecological, jurisdictional, and political boundaries. They carry cultural, environmental, and economic significance that spur conflicts of interest in management decisions (AHDR, 2004). The question of who gets to make environmental decisions is also a source of contention within global efforts. Challenges for global and national policies and management strategies are only becoming more complex through shifting environmental realities brought on by climate change, environmental degradation, resource exploitation, among other impacts that seem to characterize the rapid loss of biodiversity in the 21st century.

The Arctic is undeniable warming. Records kept over a century indicate that the Arctic is warming twice as fast as the rest of the world – an estimated 3.5° C since the 1900s (Overland et

al. 2016). The temperature increase has catalyzed a slew of climatic issues including a significant decrease in minimum sea ice extent (Perovich et al. 2016) and lower spring snow cover extent (Derksen et al. 2016). These changes have adverse and uncertain implications for wildlife species. One of the key findings of the 2013 Arctic Biodiversity Assessment conducted by the Conservation of Arctic Flora and Fauna is that “*climate change is by far the most serious threat to Arctic biodiversity and exacerbates all other threats,*” (ABA, 2013). Dramatic changes to ecosystem dynamics affect species’ distributions, fecundity, and mortality, among other variables that contribute to survival.

An estimated four million people live in the Arctic (ABA, 2013). Certainly many communities both within and outside of the Arctic are concerned about these changes and their impacts to society. However, the general public perceives various governments, agencies, extractive industries, and environmental organizations as the major contributors to wildlife science and policy, but one key group of people is often forgotten: our Indigenous Peoples.

### ***Alaska Natives, Subsistence, and Conservation***

Alaska Natives represent one of many Indigenous Peoples from the colder, rugged landscapes of the far north. The reciprocal relationship between Indigenous Peoples and the landscape has persisted for time immemorial (AHDR, 2004). Ecosystem dynamics such as seasons and the lifecycles of wildlife have shaped every aspect of culture, from how people dress to how people eat – and these dynamics continue to shape Indigenous realities and ways of life today (ABA, 2013).

Indigenous peoples have a vested interest in environmental protections as their livelihoods depend directly on the health and provision of the ecosystems and landscapes (AHDR, 2004). Alaska Native culture is inextricably linked to wildlife as a source of food, continuity of language, spirituality, community, and wellbeing (Inuit Circumpolar Council, 2015). In many Arctic landscapes, the ability to subsist on a variety of plants and animals is the crux of Indigenous food security (AHDR, 2004). Subsistence in these environments is an important way of life that continues to support the world's Arctic communities (AHDR, 2004; ABA, 2013). Subsistence refers to the act of Indigenous peoples using certain species for personal, familial, or community use. Within the context of this study, I focus specifically on the subsistence of wildlife species and their management. Arctic Peoples practice some number of five forms of subsistence: hunting, fishing, gathering, herding, and farming. It is important to recognize the distinct histories that have led to the engagement in these practices and the different uses of these resources across cultures. Alaska Natives have traditionally practiced subsistence hunting, fishing, and gathering, and with the introduction of reindeer in some communities, subsistence herding as well.

The increase in natural and anthropogenic disasters across the landscape threatens subsistence and food security with new and dramatic losses to biodiversity and shifts in species dynamics (ABA, 2013). Many governments and environmental organizations acknowledge the role of natural resource conservation in mitigating environmental impacts but some conservation practices that focus on sanctions burden Indigenous communities (Inuit Circumpolar Council, 2015; Shackelford and Campbell, 2007). The fundamental issue that has pitted contemporary

wildlife conservation and subsistence practices against one another is the impossibility of both conserving and consuming a single unit of resource.

These days, much of wildlife management in the Arctic concerns the conservation of lands and species (ABA, 2013). Oftentimes environmentalists and decision makers neglect the importance and input of Indigenous Peoples such that conservation practices tend to have inequitable or detrimental effects on local communities (AHDR, 2004). Many Alaska Natives would consider unfair policies as representing “the burden of conservation,” (Inuit Circumpolar Council, 2015). This burden is often placed on communities while the drivers of climate change, environmental degradation, and resource exploitation occur elsewhere (AHDR, 2004). For instance, Indigenous communities are often expected to change their behavior to improve immediate environmental conditions while the greatest contributors of biodiversity loss and other impacts are not penalized. International law protects the fishing industry, but not an Indigenous community’s right to those fish as a source of food security. The disconnect between who is responsible for the problem and who has to suffer the consequences is a major source of tension (AHDR, 2004).

Alaska Native communities have a sovereign right to be a part of decision making and policy processes as they must live directly with wildlife management decisions. The 2007 United Nations Declaration on Indigenous Peoples gives Indigenous communities rights to their culture, language, identity, health, and environment, among other critical issues (UNDRIP, 2007). Articles 3,4, and 5, respectively, give them the right “to freely pursue their economic, social, and cultural development...”, “to autonomy or self-government in matters relating to their internal and local affairs...”, and “to maintain and strengthen their distinct political, legal, economic,

social, and cultural institutions,” (UNDRIP, 2007). The United Nations also declares “Indigenous Peoples have the right to the lands, territories, and resources which they have traditionally owned, occupied, or otherwise used or acquired,” (UNDRIP, 2007). Alaska Natives are interested in addressing this sovereignty:

*“We will continue to strive for recognition and protection of our basic human rights to food security and self-determination, and to maintain our own unique cultures – rights that are collectively recognized and codified in the International Covenant on Civil and Political Rights, the Universal Declaration of Human Rights, adopted by the United Nations in 1948, and the United Declaration on the Rights of Indigenous Peoples,”* (Alaska Federation of Natives, 2012).

These rights have been recognized in part because Alaska Natives and other Indigenous Peoples tend to approach environmentalism, decision making, and policy differently than the typical western model of natural resource management. Unique perspectives on the drivers, mechanisms, and systems of ecosystem dynamics also set Alaska Natives apart from western ideas of wildlife science and policy. This poses a major challenge to governing these resources, especially when governments, agencies, and environmental organizations are unwilling to accommodate these differences (MEMA, 2016). Despite all this, the general sentiment of Alaska Native communities is that they should play a larger role in the fate their homeland. As one Indigenous knowledge holder said...

*“All of the plants, all of the animals, the water, the air, the land is all of what we are... It is who we are. This is our understanding. People making decisions have a different understanding,”* (Inuit Circumpolar Council, 2015).

### ***Contemporary Natural Resource Governance***

In this day and age, the people deciding the fate of the Arctic tend to be people far removed from the landscape. Management decisions in the U.S. may be made as far as Washington D.C. or abroad at global summits. National and global approaches to wildlife policy are made necessary by the migratory nature of many species whose ranges may cross whole states, countries, or continents. Arctic ecosystems similarly stretch across large landscapes through national boundaries. Broader food systems transcend terrestrial, aquatic, and other ecosystem components. Indigenous Peoples themselves also span these boundaries such as the Saami of Scandinavia and the Inuit of North America. Wildlife management and conservation thus necessitates cooperation across many governments and agencies that may span multiple spatial scales.

Within the U.S. context, bureaucracies have historically managed wildlife and other natural resource uses (Andrews, 2006). These bureaucracies were born in the late 19<sup>th</sup> century as centralized public agencies that were supposedly removed from the corruption of industry and public interference. The environmental movement of the 1970s made bureaucracies less popular because the public perceived their interests to lie heavily in resource extraction rather than conservation (Andrews, 2006). Regardless, bureaucracies in the form of federal and state agencies still hold much of the power in natural resource management, especially in remote regions like the Arctic (AHDR, 2004).

Specific federal and state agencies are responsible for subsistence management and conservation planning for the species that fall under their jurisdiction. Take for instance how in Alaska the National Marine Fisheries Service is responsible for seals, sea lions, whales, and halibut, but the U.S. Fish and Wildlife Service is responsible for terrestrial mammals, sea otters, polar bears, and walrus. Each agency has its own planning and decision making process despite these animals all living across the same landscape. The distribution of responsibilities is arbitrary and an archaic remnant of past bureaucratic decisions. Management is broken into pieces rather than approached holistically, such that issues are simplified and distributed to the appropriate jurisdiction and entity. Western policy processes construct silos of policy and law that deal with only a fraction of the full problem. The complexity of interplay between jurisdictions, agencies, and forums makes bureaucratic management every boots-on-the-ground Native hunter's nightmare. This nightmare becomes a reality when subsistence users are forced to make decisions about obtaining food in violation of management regulations.

In considering the rapid ecosystem shifts imposed by rising global temperatures, decision making processes within bureaucracies are often slow (Andrews, 2006). This makes them ill suited to address evolving conservation and subsistence needs in rapidly shifting environments. In a time of unparalleled environmental change, new methods of engaging communities in natural resource policy are essential for developing more widely accepted conservation practices.

Within the Alaska context, the natural resource management strategy that is often cited is the co-management strategy. The 1980 Alaska National Interest Lands Conservation Act declares:

*“...an administrative structure be established for the purpose of enabling rural residents who have personal knowledge of local conditions and requirements to have a meaningful role in the management of fish and wildlife and of subsistence uses...” (ANILCA, 1980).*

ANILCA requires the federal and state governments to work with Alaska Native communities on natural resource management. There is little formalized structure in the co-management strategy; rather it refers to a general joint approach to natural resource management. In 2016, the Alaska Federation of Natives argued that climate change warrants tribal co-management of wildlife as Alaska Natives have a long history of sustainable resource management and continue to be the primary subsistence users (Blair et al. 2016). Other forums for collaborative governance have also emerged in the last several decades including intergovernmental organizations such as the Arctic Council and advisory groups such as the Western Arctic Caribou Herd Working Group. These forums support the participation of Indigenous Peoples in decision making and policy processes, however, some process dynamics and differences in perspectives challenge inclusive management. This thesis aims to identify and address these challenges.

## **METHODS**

### ***Information Gathering***

The methods for bringing together the information and recommendations provided here are twofold. First, I draw primarily from previous work done in collaboration with Alaska Native community members and interest groups such as the Inuit Circumpolar Council Alaska and the Alaska Federation of Natives (Inuit Circumpolar Council, 2015; Alaska Federation of Natives, 2016). These organizations have worked extensively to highlight the strengths of Alaska Native voices and Indigenous knowledge in public policy and decision making. Many of the claims here are informed by Indigenous knowledge that belongs to all Alaska Natives collectively and may not appear in academic literature beyond reports and summaries provided by governance organizations and agencies.

Second, some information here comes from my own experiences as an Alaska Native and a participant observer of Alaska Native communities. Details about Alaska Native community structure and organizing are absent from academic literature despite being easily characterized by those who live in those social systems. I draw some conclusions from projects that I consider exemplary case studies in which Alaska Natives have felt their true needs and perspectives addressed in science and decision making. I have included quotes from appropriate sources such as elders, Indigenous knowledge holders, and community members to help represent collective perspectives on the issues addressed in this thesis.

### *Conceptualizing*

In order to supplement the claims in this thesis, I have composed several diagrams and tables that aim to describe the relationships both between subsistence and conservation, and between Alaska Native environmental practices and western environmental practices.

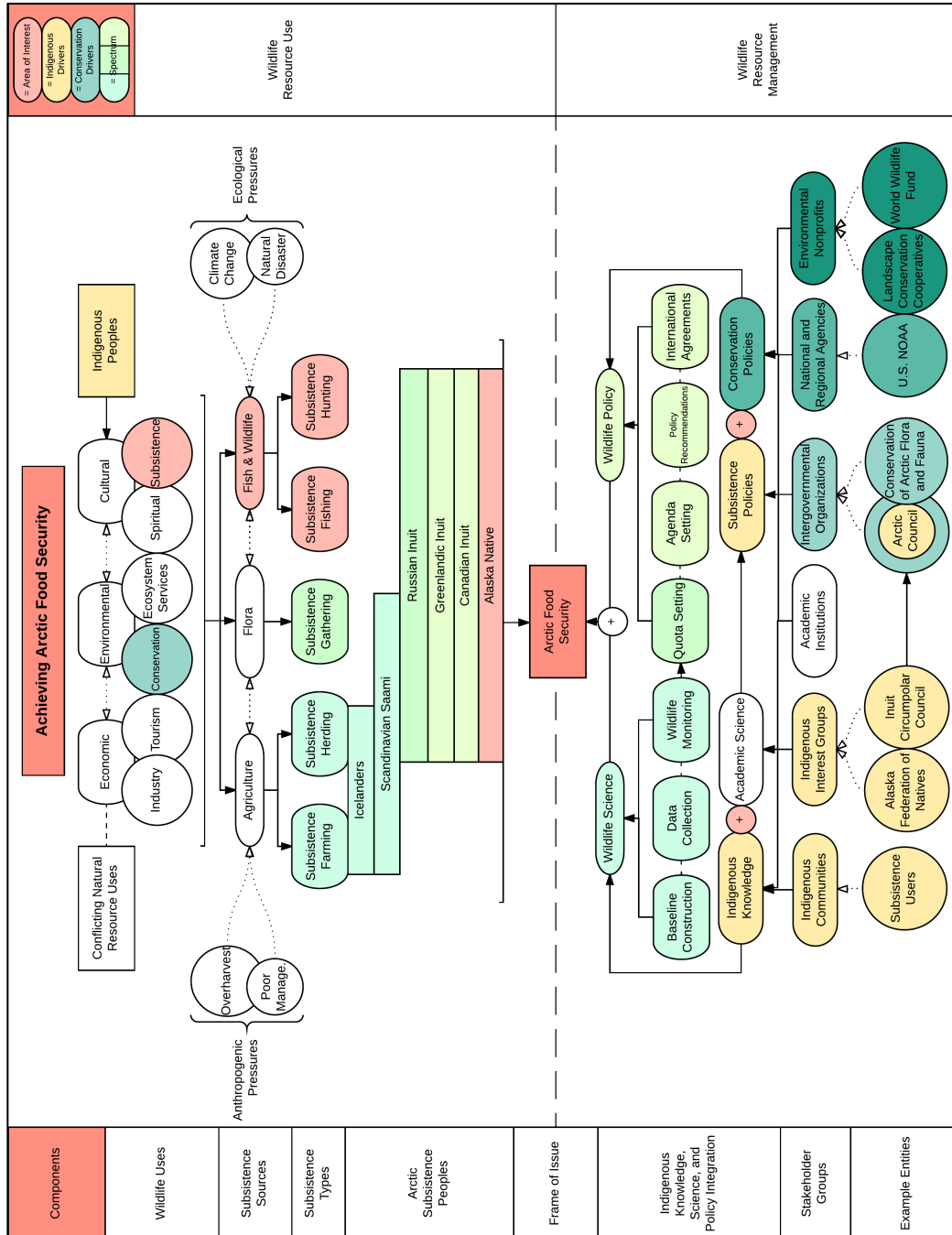
First, to illustrate the connections between wildlife resource use and wildlife resource management, I composed a diagram showing how the various stakeholders engage with the processes surrounding Arctic food security (Figure 1). I also focused on the integration of wildlife science and wildlife policy, which will appear as an important consideration in this thesis. I also highlight the current conflict in interest between conservation and subsistence management.

Second, to illustrate the value of partnering western science and Indigenous knowledge in the policy process, I highlight the contributions of each way of knowing, the information tools, knowledge contributions, and knowledge exchange that are beneficial to the decision making process (Figure 2). The recognition of Indigenous knowledge as a valid form of information is another major consideration of this thesis.

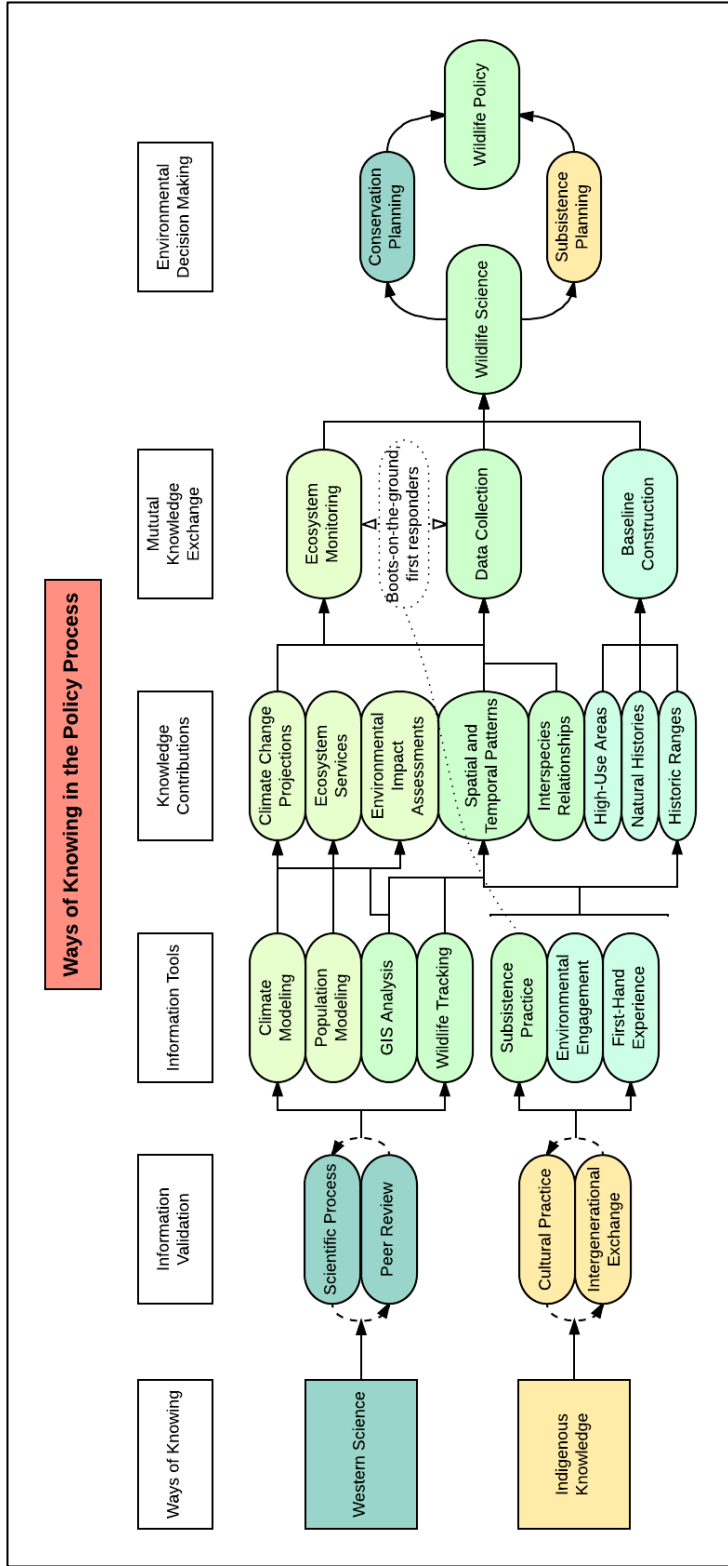
Third, I identified the common components, drivers, and characteristics of current collaborative processes and decision making efforts from both the western perspective and the Alaska Native perspective. To illustrate the challenges to the collaborative governance of wildlife for conservation and subsistence uses, I identify the differing perspectives on environmentalism (Table 1), the elements of decision making (Table 2), and the preferred or common approach to

the policy process (Table 3). I focused on conservation policies for the western perspective and subsistence policies for the Alaska Native perspective in order to focus the discussion on the common antagonism between conservation and subsistence in natural resource management. The characteristics listed in the tables summarize the perspectives generally self-described by Alaska Natives and western society. These characteristics should be considered generalizations of all group sentiments, systems, and mechanisms, as there are some exceptions to the information summarized here.

# FIGURES



**Figure 1.** Components of Wildlife Use and Management Related to Arctic Food Security. The author developed this figure from information obtained from numerous sources, notably those developed by the Arctic Council and its several working groups (SAMBR, 2017; ABA, 2013; Inuit Circumpolar Council, 2015).



**Figure 2. Integrating Ways of Knowing in Wildlife Policy.** The author developed this figure through information obtained from several reports and case studies (SAMBR, 2017; Northwest Arctic Borough, 2016; MEMA, 2016)

## TABLES

Characteristics of Environmentalism	Alaska Native Practice	Western Practice
Human Role in Environment	Part of ecosystem	Removed from ecosystem
Human Role in Management	Coexistence	Stewardship
Perceptions of Traditional Conservation Philosophies	Burden on communities <sup>1</sup>	Necessary for resource protection
Alternative Conservation Philosophies	Conservation through use <sup>2</sup>	Conservation science <sup>3</sup>
Historic Approach to Resource Use	Use many resource simultaneously and sustainably	Move to a new resource after exploiting a previous one
Approach to Scarcity	Management decisions adept at dealing with a scarcity of certainty and information	Management decisions adept at dealing with a scarcity of resources
Approach to Management	Management decisions adept at dealing with boom-bust cycles	Management decisions adept at dealing with overexploitation
Resource Ownership	Do not usually own the resource but may have legal rights to its use	Usually owns the resource and has responsibility to uphold legal use of it

**Table 1.** *Differing Perspectives on Environmentalism and Resource Management.* The author developed this table using participant observation of Alaska Native perspectives, Indigenous knowledge from sources such as the Inuit Circumpolar Council Alaska, and academic literature on natural resource management.

<sup>1</sup> (Inuit Circumpolar Council, 2015).

<sup>2</sup> (Inuit Circumpolar Council, [expected 2018]).

<sup>3</sup> (Kareiva and Marvier, 2012).

Characteristic of Natural Resource Decision Making	Alaska Native Practice	Western Practice
Primary Decision Making Entity	Local Community	Bureaucratic Agency
Trusted Authority	Elders and Indigenous knowledge holders	Environmental technocrats
Ways of Knowing	Indigenous knowledge	Western science
Common Direction of Decision Making	Bottom-up	Top-down
Responsiveness of Decision Making	Adaptive	Reactive
Information Needed	Best available information and knowledge	Scientific evidence, peer reviewed preferred
Primary Consideration in Analyzing Policy Alternatives	Impacts to sovereignty and culture	Economic impacts
Risk Aversion	Comparatively more risk averse	Comparatively less risk averse
Risk Mitigation	Convene a long time to reduce the risk of making a bad decision	Recognize risks and set aside mitigation funds

**Table 2.** *Differing Perspectives on Environmental Decision Making.* The author developed this table using participant observation of Alaska Native community structure and decision making processes and consultation of academic literature on bureaucracy (Andrews, 2006).

Characteristic of Policy Approach	Alaska Native Practice	Western Practice
Policy Process Entity	Local Community	Legislative Branch
Model for Policy Decisions	Place-based model	Generalized model
Regulatory Mechanism	Social regulation	Formal regulation

**Table 3.** *Differing Approaches to the Policy Process.* The author developed this table using participant observation and drawing conclusions from case study analysis (Northwest Arctic Borough, 2016).

## WORKING TOWARDS INCLUSIVE MANAGEMENT

### *Identifying Challenges to Inclusive Management*

We as Alaska Natives have been deeply connected to the landscape for millennia and our approach to conservation and natural resource governance will be integral in finding solutions for the future's most challenging Arctic issues. Alaska Native participation in governing institutions and venues has increased in part through a legislative fight for regional natural resource rights and in part through the increased international attention to Indigenous sovereignty, an examination of the ethics of climate change impacts, and the recognition of increasing stress on the ecosystems on which Indigenous communities depend for their livelihoods (ABA, 2013; UNDRIP, 2007; AHDR, 2004). Given the opportunity and inclusive policy processes, Alaska Natives are determined to be heard.

*"...We seek to maintain and bequeath to our children the knowledge and fruits of the land that have endured through the millennia. We find that in the face of welcoming others to our lands, we have been subjected to challenges that threaten our very physical and cultural survival. We have worked tirelessly to defend our relationship to the land and sea and our subsistence way of life,"* (Alaska Federation of Natives, 2012).

The inclusion of Alaska Natives in collaborative policy processes is a momentous shift that, albeit moving slowly, is backed by an increasingly powerful force of Native voices. The work of many Alaska Native interest groups has opened numerous venues for participation in decision making processes. However, inviting a group of people to the table is different from opening the

discussion to truly inclusive management (MEMA, 2016). Oftentimes, Indigenous participation is treated as a formality without respect for how inclusive and engaging that collaborative process is in reality. In building a framework for the management and governance of Arctic wildlife, western policy institutions must recognize their place in supporting diverse perspectives.

Fundamental differences in how Alaska Natives and western policy institutions define, approach, collaborate around, and solve natural resources issues complicates the working relationships of these groups and serve as barriers to the policy process. This challenge also poses an incredible opportunity to pool all of our collective resources and strategies to combat the impacts of climate change and work towards responsible and sustainable natural resource solutions in a tumultuous time.

Modern environmentalism tends to pit conservation and subsistence agendas against one another despite the mutual benefit of melding the two practices into cohesive and equitable management policies (AHDR, 2004). Alaska Natives and conservationists have many of the same end goals, namely the continued proliferation of healthy, endemic species population dynamics, a healthy environment, and climate change prevention and mitigation. Why, then, are Alaska Natives and many conservation agencies and organizations still at odds with one another despite desiring many of the same environmental outcomes? In consulting the literature, five key issues pose a challenge to inclusive management strategies:

*Challenge (1)* Differences in culture complicate how we define and approach natural resource issues, (AHDR, 2004).

- Challenge (2)* Current policy processes often fail to recognize Indigenous knowledge as a legitimate source of information to be used in partnership with western science to inform decision making, (MEMA, 2016; Inuit Circumpolar Council, 2015; Thornton and Scheer, 2012; Shackeroff and Campbell, 2007).
- Challenge (3)* The distribution of environmental impacts and the burden of conservation are unethical (Inuit Circumpolar Council, 2015).
- Challenge (4)* Institutional racism constructs a power imbalance within policy processes such that decision making is stacked against the marginalized, (MEMA, 2016).
- Challenge (5)* There is further room to foster mutual trust and respect of one another's perspectives and interests, (MEMA, 2016; Inuit Circumpolar Council 2015).

This thesis aims to provide a foundation on which to understand these five challenges and unpack how a difference in perspectives must be addressed within the policy process. A greater focus will be placed on *Challenge (1)* and *Challenge (2)*.

### ***Alaska Native Wildlife Use and Management***

There are always conflicts of interest in natural resource use and management. Before discussing the challenges to collaboration, it is important to determine who has a stake in the game and how decisions are made. Figure 1. illustrates how wildlife resource users and wildlife resource managers drive Arctic food security. The diagram focuses on how Indigenous drivers and conservation drivers play a central role in the process. These drivers may be groups of people, methods of analysis, or philosophies.

In considering resource use, wildlife provide food for Alaska Native communities and industry while tourism and conservation value wildlife alive (AHDR, 2004). The first challenge then becomes allocating some distribution of resources across users. This allocation is complicated by not only the spatial and temporal realities of wildlife population dynamics but, also by natural and anthropogenic pressures such as natural disaster and poor management strategies.

In considering western natural resource management, decisions are made through *wildlife science* and existing policy. Here I use wildlife science to encompass both western science and Indigenous knowledge. Many Alaska Natives recognize a lack of respect for Indigenous knowledge within wildlife science (MEMA, 2016), as do researchers (Thornton and Scheer, 2012; Shackeroff and Campbell, 2007). In short, wildlife science uses baseline data, data collection, and wildlife monitoring to inform wildlife policies that take the forms of subsistence quotas, institutional agendas, policy recommendations, and international agreements. Many interests are represented through different groups contributing to the accumulation of information and the decision making such as the Inuit Circumpolar Council, U.S. federal agencies and state departments, and environmental organizations such as the World Wildlife Fund. The integration of Indigenous knowledge, academic science, and policy is a major consideration of this study and will be discussed in detail in following sections.

### ***How Alaska Natives Define Natural Resource Issues***

As *Challenge (1)* states, the first key issue to address within a collaborative framework is differences in the cultural definitions and approaches to public policy and decision making. Studies on water management policies across countries show that our cultures and society

determine how we define and approach natural resource issues (Pahl-Wostle, C. et al. 2008). Table 1. characterizes how Alaska Natives and western society practice environmentalism and natural resource management. Obvious differences include perceptions of the human role in the environment and coexistence as opposed to stewardship. Acknowledging these cultural differences in perspectives is essential for developing culturally applicable management strategies.

Alaska Natives define natural resource issues differently than most environmentalists. Problems are generally framed from cultural or economic perspectives rather than from conservation perspectives, despite the overall desired environmental outcomes being healthy wildlife population dynamics. For instance, some Alaska Natives will use terms like cultural value rather than intrinsic value, and cite the economic burden of a decrease in subsistence sources (Inuit Circumpolar Council, 2015). Thus, some people may argue that Alaska Native communities fail to partake in environmental agendas because they tend to frame problems under different terms. This is surely not the case; rather the region has a complex history of conflict between Indigenous Peoples and early environmentalists that have shifted many Natives away from using similar vernacular and problem definitions. Many environmental organizations such as Greenpeace and Sea Shepherd have been, or still are, major opponents to the cultural harvest of important food species such as whales and other marine mammals. Other environmental groups have opposed rural economic development in a region in which western society is responsible for bringing economic development and also fails to supply viable alternatives. Others are intolerant of natural resource use in a region that outdated environmentalists feel should be “preserved,” rather than conserved (AHDR, 2004).

In fact, even how Alaska Natives and environmentalists define *conservation* differs in nuanced ways. For the western world, conservation in its simplest terms is the protection and restoration of the natural environment and its resources, made necessary through a concern over exploitation. For Alaska Natives, conservation is more a practice of *conservation through use* (Inuit Circumpolar Council, [expected 2018]). Traditional Indigenous economies in Alaska relied heavily on this sustainable use of resources such as wildlife species in a way that avoided exploitation (ABA, 2013). Conservation through use works in part through cultural norms as well as through the time constraints inherent to a seasonal climate with limited availability to store and process food. Families generally accepted the cycles of feast and famine and stored only what could keep in the months between plenty. Alaska Natives are adaptive and can make boots-on-the-ground decisions when wildlife populations unexpectedly fluctuate. This fluid movement between resources as ecological conditions change is how Alaska Natives have limited their impact on the environment to levels sustainable over the millennia. In contrast, western societies have a history of using a resource until it is depleted and then moving on to another. This is the scenario that gave birth to conservation practices in the early 20th century.

Alaska Natives obviously care greatly for the environment even if we don't frame natural resource issues the same way as western society. Environmental issues have been seen more frequently amongst Indigenous interest groups' priorities. In 2016, the Alaska Federation of Natives issued their annual priorities report which included the support of important policies such as funding and investment for climate change mitigation in Alaska Native communities, protections from toxic algal blooms, implementation of federal subsistence review, funding for

the Kuskokwim and Yukon Inter-Tribal Fish Commission, and disaster funds for subsistence fishery and wildlife population collapse (Alaska Federation of Natives, 2016).

Despite differences in framing natural resource issues, Alaska Natives and environmentalists are beginning to work together. Indigenous peoples are both resilient and adaptive and our presence at the table is more important now than ever. In recent years and under the threat of climate change, Alaska Natives and conservationists have begun reconciling and aiding one another through their collective resources and information (Shackeroff and Campbell, 2007). Collaboration on wildlife research and planning has been of particular interest to these groups (Thornton and Scheer, 2012; Shackeroff and Campbell, 2007).

### ***Western and Alaska Native Approaches to Management and Decision Making***

Historically, Alaska Natives have practiced a form of adaptive ecosystem management guided through cultural practice, Indigenous knowledge, and a reciprocal relationship with natural environmental cycles. Many Indigenous Peoples consider themselves to be a part of the ecosystem in which they live (AHDR, 2004) and the two have evolved together in the few thousand years that Native communities have occupied the landscape. During this time, we've formulated ideas about environmental systems and how best to make natural resource decisions.

*“As an Elder explains, the Arctic environment is like a puzzle, with all pieces having a place and all pieces necessary to make up the entire picture. These pieces include Inuit languages, retention of Indigenous knowledge, animal health, oceans and rivers, etc. This description of the environment helps explain how the Arctic ecosystem is made up of multiple parts. Scientists may*

*also understand this explanation in terms of systems. Each puzzle piece can be envisioned as a system that together makes up the entire ecosystem. The Inuit culture is a system within this larger ecosystem, just as the hydraulic system is part of the same ecosystem. And just as the Arctic ice system is interlinked within that system, so is the Inuit culture interconnected with all aspects of the larger ecosystem,” (Inuit Circumpolar Council, 2015)*

As stated before, one of the greatest cultural differences that affect how we conduct policy processes is how we approach problems and make decisions. The practice of conservation through use rather than a conservation of resources is one such example. Perhaps the cultural construction of conservation through use does not resemble a western management strategy in its formality, but it has been effective at supporting healthy ecosystem dynamics for generations (Inuit Circumpolar Council, [expected 2018]). As Table 2. illustrates, the Alaska Native approach to decision making is different than the typical western approach. For instance, ecosystem dynamics have relied heavily not only on our adaptive ecosystem management, but also our bottom-up decision making approach that is made on the ground by hunters, their families, and their communities. Under rural and remote circumstances, individuals must make decisions at the margin. They use their better judgment to determine whether the weather is good to dry fish without it molding or whether the time is right during the migration to hunt and prepare caribou. These communities’ resource extraction patterns shifted season-to-season and year to year depending on availability and the health of the animal and habitat, allowing for robust and biodiverse ecosystem dynamics through time.

Making decisions at the margin allows Alaska Natives to practice adaptive place-based management strategies that consider both spatial and temporal realities. Table 3. briefly reflects how Alaska Natives and western society build policy for management purposes. Rural communities in the Arctic are adept at using place-based models while also navigating landscape-scale environmental impacts. Western policies, especially those drafted by bureaucracies, rely heavily on generalized models. These generalized models are used when information is scarce and are constructed by considering aggregate variables. The goal is to optimize the model for combatting similar problems across many landscapes. These generalized models are likely not as effective as place-based models that are built on a greater understanding of the immediate environment.

Some mechanism must control adherence to decisions once they have been made. For Alaska Natives, natural resource use is traditionally culturally-constructed as social policy rather than dictated by formal public policy. This social mechanism has roots in the wellbeing of a wider community. We only take as much as we need and are sure to share with our elders and others that may be unable to provide food for themselves – there must be no waste and enough for all. In contrast, western society relies on rigid rules and laws born in part from the overexploitation of resources. These rigid policies make place-based management very difficult. Some of the resistance to stepping away from rigid policies is the western policy process' lack of recognition for the role of Indigenous knowledge in natural resource management.

### ***Indigenous Knowledge in Environmental Decision Making Processes***

As *Challenge (2)* recognizes, any conversation about collaborative governance between organizations and Indigenous communities must consider and accept the place Indigenous knowledge has in the decision making process. While science is validated through the scientific process and peer review, Indigenous knowledge is validated through our long-standing cultural practice and the intergenerational exchange of oral tradition (Inuit Circumpolar Council, 2015; Thornton and Scheer, 2012). While western science has been the dominant driver of science-based policy, Indigenous knowledge is slowly becoming accepted as an accredited source of natural resource knowledge (MEMA, 2016; Thornton and Scheer, 2012; Shackeroff and Campbell, 2007). It appears more frequently alongside western science in research findings and policy briefs across disciplines (SAMR, 2017; Northwest Arctic Borough, 2016; ABA, 2013).

The inclusion of Indigenous knowledge in policy processes has been driven by several limitations of western science. Researchers, scientists, and policy makers have limited time and money to dedicate to the many environmental problems across the world. In the case of the Arctic, resources are often poured into expensive and time consuming scientific research and monitoring programs such as those managed by the Arctic Council in collaboration with the eight Arctic nations. These projects have immense value to natural resource use and conservation efforts, but are limited by the western scientific process that stresses replication and the need for a robust number of observations. This makes time a limiting factor in the accumulation of acceptable data. The Arctic landscape is remote and seemingly inhospitable to those who have not lived there which further limits data collection efforts. For western conservation, time is of the essence, and as it is a crisis-based science, it relies on the use of the best available

information to make reactive decisions. There is not always time to gather more robust data and thus the use of western science alone struggles to support holistic conservation initiatives.

As many Indigenous Peoples have occupied the same landscapes for time immemorial, they have incredible reservoirs of place-based natural history knowledge that is passed on both by oral tradition and cultural practice. Archaeological records show that Alaska Natives have occupied some hunting grounds and settlements for millennia. A research project through the Barrow Arctic Science Consortium has shown some continuous use of a peninsula called Nuvuk as a settlement, graveyard, and important hunting ground for many wildlife species for over a thousand years (Jensen, 2009). Alaska Natives rely heavily on wildlife as a primary source of food and thus their knowledge base has inextricable value for wildlife conservation (Shackeroff and Campbell, 2007). The Arctic's Indigenous Peoples recognize that research should include as many perspectives as possible (MEMA, 2016). The question becomes how researchers and decision makers can bring western science and Indigenous knowledge together to collaboratively protect and manage these natural resources.

To illustrate a self-proclaimed successful case, consider the Northwest Arctic Borough Subsistence Mapping Project, "Documenting Our Way of Life through Maps," a 5-year project that brought together Indigenous knowledge holders in an effort to improve subsistence information for aid in land use decision making (Northwest Arctic Borough, 2016). The Mayor of the Northwest Arctic Borough wrote in the forward of the volume:

*“The purpose of the project was to use traditional knowledge to identify places people depend on for their traditional food resources and the current status and locations of important subsistence species. In some sections of this atlas, researchers incorporated data from other sources (for example, satellite whale tracking studies), but, even in those cases, the study results were reviewed by local experts who verified and augmented the findings. This project therefore breaks new ground in building a strong body of scientifically defensible evidence on a broad, solid foundation of local and traditional knowledge,”* (Richards, 2016).

The conclusive evidence provided by western science in the Arctic is lacking as many scientific papers will claim in their concluding remarks. There is a limited body of information on species’ distributions and migration patterns because the landscape is remote and challenging for conducting research. In the case of the mapping project, Indigenous knowledge supported the community’s ability to tell more intricate stories about species’ natural histories and dynamics than were available through academic literature and reports. Subsistence users in the region were able to map important geospatial realities for subsistence species such as high use feeding, spawning, birthing, rearing, and molting grounds as well as high density migration routes and other important dynamics that should be considered in landscape-scale conservation planning and land use decision making. This knowledge has been built over the generations of interactions between Alaska Natives and the plants and animals of the Arctic. Indigenous knowledge holders play an undervalued role in partnering with scientists in the production of mutual knowledge (MEMA, 2016; Thornton and Scheer, 2012).

The mapping project has immense conservation value and to reach its depth would have taken years of expensive scientific methods to replicate. This combination of Indigenous knowledge and western science was compiled into a landscape-scale ecosystem analysis of land and water important to subsistence species across seasons. While conservation efforts are not directly mentioned in the report, discussions around land use and wildlife protections may inherently lead to formalized conservation practices. Researching and monitoring ecosystems at this depth is not feasible through western scientific methods, but can be greatly informed through the inclusion of Indigenous Peoples and their knowledge of the landscape.

There are several ethical questions that conservationists should ask when attempting to benefit from Indigenous knowledge. One consideration is whether or not conservationists are exploiting this knowledge by using it to provide for protections that further marginalize those Indigenous knowledge holders (Shackeroff and Campbell, 2007). If researchers learn that a species of seal is appearing less and less at an important breeding ground, is it ethical to forbid subsistence hunters to continue hunting in that spot? It would be hypocritical if western society did not first attempt to remedy the problem on their side by examining the practices and the impacts they have on Arctic wildlife. If a species is under threat of local extinction, is it an agency's place to forbid a father from teaching his daughter how to have a meaningful cultural and spiritual relationship with that species through hunting? What happens when we sever the connections that Indigenous Peoples have to the land and the living? What happens when Indigenous knowledge and respect for the myriad dynamics of our ecosystems are suppressed and eliminated? We can only guess at the future impacts unfavorable laws would have on Alaska Natives and our culture but our communities are certainly feeling the strain (AHDR, 2004).

A major barrier to the inclusion of Indigenous knowledge in decision making is the western idea that data must be supported by a standardized scientific method and peer review. Many Alaska Natives do not think we should have to legitimize Indigenous knowledge because the teachings and practices that are built on this way of knowing have been in use for much longer than modern science (MEMA, 2016). In fact, many subsistence users think Alaska Natives should validate the findings of western science for accuracy (Northwest Arctic Borough, 2013). However, communicating the value of Indigenous knowledge to western scientists will undeniably require some standard of analysis until the western world is ready to accept Indigenous knowledge as a valid way of knowing (MEMA, 2016).

The question becomes how decision makers can integrate Indigenous knowledge into the western policy-making process. This is something that the Inuit Circumpolar Council has an invested interest in pushing into the environmental discourse through international forums such as the United Nations and the Arctic Council. Most Indigenous Peoples are in agreement that they need to be at the table more often and earlier in the process (MEMA, 2016). The collective gathering of information may be the optimal stage for beginning collaborative efforts because everyone will enter the decision making process with the same information.

### ***Baselines, Data Collection, and Ecological Monitoring***

Some academics and intergovernmental organizations have pushed for greater Alaska Native collaboration in research, particularly for baseline construction, data collection, and ecological monitoring (SAMBR, 2017). Constructing environmental baselines entails recreating historic environmental realities which allow scientists to quantitatively measure environmental changes

over time. Data collection entails the production and accumulation of information while ecological monitoring entails the observing, estimating, and forecasting of environmental trends. Each of these three activities is incredibly valuable to the creation of science-based wildlife policy, and each way of knowing brings its own strengths and capabilities.

Figure 2. illustrates how the different ways of knowing uniquely contribute to wildlife science and policy. Both western science and Indigenous knowledge are considered ways of knowing. Each has its own information tools and contributions that can be used in a mutual knowledge exchange to inform policy. Through a mutual knowledge exchange, scientists and communities can share their information ethically. Lacking mutual consent, Alaska Natives may consider some uses of Indigenous knowledge as an exploitation of information for scientific gain that may ultimately hurt the communities that provided it (Shackeroff and Campbell, 2007).

As for its contributions, Indigenous knowledge is unique in its ability to provide information on historic ecological baselines with which to compare anthropogenic impacts (Thornton and Scheer, 2012). Constructing baselines through modern science requires advanced archaeological work and there are few scientists dedicated to studying historic wildlife population dynamics. While neither archaeology nor Indigenous knowledge can provide the complete picture, the intergenerational nature of Indigenous knowledge allows scientists to track changes over the last few decades (Thornton and Scheer, 2012). If scientists invested more energy in engaging Alaska Native communities in constructing baselines, decision makers would have better estimates of the rate of change and could advocate for the appropriately stringent policies.

Engagement in subsistence practices support Alaska Native inclusion in data collection. Alaska Natives can help scientists better track the spatial and temporal patterns of key species by recording observations and other variables as they subsist. The previous example of the Northwest Arctic Borough Subsistence Mapping Project shows evidence of the complimentary role of subsistence with other technological information tools such as geographic information systems, modeling, and tracking (Northwest Arctic Borough, 2016). A combination of these tools is also important for ecological monitoring. Monitoring relies on information on spatial and temporal patterns, climate change projections, ecosystem services, and environmental impacts assessments, to determine the scale and rate of environmental change. These more technical tools and methods of assessing information are the strong suits of western science. Management strategies may be more successful in the long term by continuing to incorporate new information and knowledge about the environment into decision making.

## **FURTHER WORK**

Wildlife management strategies must address all environmental interests, including those held by Alaska Native communities and other Indigenous Peoples through an inclusive, engaging, and culturally applicable process. Reconciling the challenges and barriers to inclusive management strategies is becoming a priority for many governments, agencies, and organizations (SAMBR, 2017; MEMA, 2016; Alaska Federation of Natives, 2016; Inuit Circumpolar Council, 2015; ABA, 2013). Some challenges can be addressed “at the table,” while others will require the overhaul of existing policies and systems. To improve engagement in wildlife management and greater incorporate Alaska Native voices in decision-making processes, this analysis concludes with recommendations for further work:

- (1) Find ways to address the five challenges from this study using literature on governance theory, including the Advocacy Coalition Framework (Sabatier and Weible, 2007), adaptive governance (Brunner et al. 2005), and common pool resource theory.
- (2) In line with previous work (MEMA, 2016), determine which stage of the policy process Alaska Natives should participate to foster inclusive engagement in management strategies and conservation planning.
- (3) Determine how we can use Indigenous knowledge to first characterize the context of natural resource issues before the western problem definition has been set.

(4) Determine how we can develop culturally applicable conservation strategies that are place-based. Place-based governance is community-based, and may better represent a system of governance that existed before western policy processes were introduced, though it is still recognizable by our systems. Place-based collaborative governance may be a good alternative to bureaucratic governance because it is more consistent with traditional Indigenous decision-making processes. At the same time, we must have a system in place to allow for the landscape-scale exchange of Indigenous knowledge and western science so that we have the information necessary to make management decisions good for the region as a whole.

(5) Determine whether natural resource decision making can support place-based management within landscape-scale conservation planning. Determine whether decision makers and Indigenous communities could take advantage of an existing mechanism for incorporating place-based wildlife management within landscape-scale conservation planning to support the development of subsistence-friendly conservation strategies.

The work in this Masters thesis is a precursor to the Ph.D. dissertation. Further work is expected in subsequent publications. The dissertation will primary focus on addressing the challenges acknowledged here by adapting conservation practices to improve measures of Indigenous food security in the Arctic.

This thesis has been accepted for publication in a chapter of the following book:

2018. Marchand, M. et al. *The Medicine Wheel: Environmental decision-making processes of indigenous peoples*. Publishers: HEP (China), Michigan State University Press.

## REFERENCES

- ABA. 2013. *Arctic Biodiversity Assessment*. CAFF: Conservation of Arctic Flora and Fauna, Arctic Council.
- AHDR. 2004. *Arctic Human Development Report*. Stefansson Arctic Institute.
- Alaska Federation of Natives. 2012. “Subsistence Proclamation: To Achieve Subsistence Rights and Protection of Native Cultures.”
- Alaska Federation of Natives. 2016. *2016 Priorities*.
- AMSA. 2009. *Arctic Marine Shipping Assessment*. PAME: Protection of the Arctic Marine Environment. Arctic Council.
- ANILCA. 1980. *Alaska National Interest Lands Conservation Act* (Public Law 96-487, Statute 24 Title 8 Section 801).
- Andrews, R. 2006. “Progressivism: Conservation in the Public Interest” in *Managing the Environment, Managing Ourselves: A History of U.S. Environmental Policy*. Second Edition. Yale University Press.
- AOOGG. 2014. *Arctic Offshore Oil and Gas Guidelines. System Safety Management and Safety Culture. Avoiding Major Disasters in Arctic Offshore Oil and Gas Operations*. PAME: Protection of Arctic Marine Environments. Arctic Council.
- Arctic Council. 1998. *The Iqaluit Declaration*. The First Ministerial Meeting of the Arctic Council.
- Arctic Council. 2015. “Arctic Peoples.” Online, (<http://www.arctic-council.org/index.php/en/our-work/arctic-peoples>).
- Blair, M., N. Borrromeo, and A. Lehr. 2016. *Tribal Co-Management of Alaska’s Fish and Wildlife Resources for Subsistence Uses*. Alaska Federation of Natives.
- Brunner, R., T. Steelman, L. Coe-Juell, C. Cromley, C. Edwards, and D. Tucker. *Adaptive Governance: Integrating Science, Policy, and Decision Making*. Columbia University Press.
- Derksen, C., R. Brown, L. Mudryk, and K. Luoju. 2016. “Terrestrial Snow Cover,” in Arctic Report Card 2016. National Oceanic and Atmospheric Administration.
- Emerson, K. and T. Nabatchi. 2015. *Collaborative Governance Regimes*. Georgetown University Press.
- Inuit Circumpolar Council – Alaska. 2015. *Alaska Inuit Food Security Conceptual Framework: How to Assess the Arctic from an Inuit Perspective*. Technical Report.

Inuit Circumpolar Council – Alaska. Expected 2018. *Conservation through Use*.

Jensen, A. 2009. *Nuvuk, Point Barrow, Alaska: The Thule Cemetery and Ipiutak Occupation*. Dissertation. Bryn Mawr College.

Kareiva, P. and M. Marvier. 2012. “What is conservation science?” *BioScience*, 62(11): 962-969.

MEMA. 2016. *Meaningful Engagement of Indigenous Peoples and Communities in Marine Activities*. Workshop Report September 2016. PAME: Protection of the Arctic Marine Environment. Arctic Council.

Northwest Arctic Borough. 2016. *Inuunialiqput Ililugu Nunannuanun: Documenting Our Way of Life Through Maps*. Northwest Arctic Borough Subsistence Mapping Project. Volume 1. Northwest Arctic Borough.

Overland, J., E. Hanna, I. Hanssen-Bauer, S.J. Kim, J.E. Walsh, M. Wang, U.S. Bhatt, and R.L. Thoman. 2016. “Surface Air Temperature,” in Arctic Report Card 2016. National Oceanic and Atmospheric Administration.

Paul-Wostl, C., D. Tabara, R. Bouwen, M. Craps, A. Dewulf, E. Mostert, D. Ridder, and T. Taillieu. 2008. “The importance of social learning and culture for sustainable water management.” *Ecological Economics*, 64(3): 484-495.

Perovich, D., W. Meier, M. Tschudi, S. Farrell, S. Gerland, S. Hendricks, T. Krumpen, and C. Haas. 2016. “Sea Ice,” in Arctic Report Card 2016. National Oceanic and Atmospheric Administration.

Richards, C. Sr. 2016. Forward. *Inuunialiqput Ililugu Nunannuanun: Documenting Our Way of Life Through Maps*. Northwest Arctic Borough Subsistence Mapping Project. Volume 1. Northwest Arctic Borough.

Sabatier and Weible. 2007. “The advocacy coalition framework: innovations and clarifications,” in *Theories of the Policy Process*. Westview Press.

SAMBR. 2017. *State of the Arctic Marine Biodiversity Report*. CAFF: Conservation of Arctic Flora and Fauna. Arctic Council.

Shackeroff, J. and L. Campbell. 2007. “Traditional ecological knowledge in conservation research: problems and prospects for their constructive engagement.” *Conservation and Society*, 5(3): 343-360.

Thornton, T. and A. Scheer. 2012. “Collaborative engagement of local and traditional knowledge and science in marine environments: a review.” *Ecology and Society*, 17(3): 8.

UNDRIP. 2007. *United Nations Declaration on the rights of Indigenous Peoples*. Articles 3,4,5.  
United Nations.