KNOWLEDGE IN THE NETWORK: AN ETHNOGRAPHY OF WWF'S GLOBAL ARCTIC PROGRAM

by

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(Under the Direction of J. Peter Brosius)

ABSTRACT

This dissertation describes a multi-sited, institutional ethnography of the WWF Global Arctic Programme (GAP) investigating the interplay of networks, organizational culture, and institutional structures. Research at the 2009 UNFCCC CoP15, the 2010 CBD CoP10, and in WWF offices spanned continents, staff changes, and program shifts, and was accompanied by archival research, targeted interviews, egocentric network data collection, and participation in ongoing virtual meetings and discussions. Within WWF's GAP, multinational groups operating within dual local and network contexts carry out the development of policy. The broad WWF Arctic network is not homogeneous. Rather, it is composed of several discreet clusters, two of which correspond roughly to US and Russian offices. Many collaborations within the organization are bilateral or trilateral, involving subsets of the larger Arctic network. 40% of the members of the extended WWF Arctic network are individuals who do not work for WWF: funders, members of findigenous communities, other conservationists, and political officials.

As WWF staff develop new conservation initiatives, they enroll and deploy new network members in the service of knowledge development and transformation. The

resulting program development glosses over internal complexities and gives the impression of a unified voice for conservation. WWF's offices are organized through a system of network governance, with the GAP working to facilitate collaboration and sharing of information and resources. Individual projects are similarly nonhierarchical, with coordination accomplished through both formal and informal communication.

WWF has a long history of work within the Arctic. Key staff within the extended GAP network have years of experience both within WWF and within the field of conservation practice. Those staff are able to serve as mentors for new staff and as links—both among WWF offices and between WWF and external contacts. The presence of staff members with accurate understandings of their own network structure is particularly salient for the Arctic, where institutional complexities and trans-boundary conservation needs are high. In such an environment, achieving credibility and legitimacy across multiple knowledge domains presents a special challenge: one that WWF attempts to address through the mobilization of networked resources.

INDEX WORDS: knowledge, epistemology, social networks, egocentric networks, Actor-Network Theory, network governance, biodiversity conservation, anthropology of science and technology, anthropology of organizations, multi-sited ethnography, Arctic conservation

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DEDICATION

> ...It reminds me very much of Bilbo in the last years, before he went away. He used often to say there was only one Road; that it was like a great river: its springs were at every doorstep, and every path was its tributary. "It's a dangerous business, Frodo, going out of your door," he used to say, "You step into the Road, and if you don't keep your feet, there is no knowing where you might be swept off to" (Tolkien 1994,72).

This dissertation is dedicated to Ellie Maclin, whose company along the road has been a support and a comfort, even in the Dark Lands.

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CHAPTER 1

INTRODUCTION: WWF AND THE RISE OF CIRCUMPOLAR CONSERVATION

> Because you have seen something doesn't mean you can explain it. Differing interpretations will always abound, even when good minds come to bear. The kernel of indisputable information is a dot in space; interpretations grow out of the desire to make this point a line, to give it direction. The directions in which it can be sent, the uses to which it can be put by a culturally, professionally, and geographically diverse society are almost without limit. The possibilities make good scientists chary. — *Arctic Dreams* (Lopez 1986,127)

In the spring of 2011, I left the Jail Hostel in Ottawa, Ontario for the short walk through downtown to WWF[1] headquarters. I had allowed myself plenty of time, and I veered from my course to stroll through the Byward Market with its shops full of cheese, candies, and local fare. I had a goal in mind, based on my time in other large cities, and I soon found myself at the entrance to Le Boulanger Français. Already the morning crowd had gathered. I waited my turn and ordered a coffee and a pain au chocolat. The chocolate was still warm, and the bread flaky and crumbly. Coffee and snack in hand, I wandered toward WWF in a crowd of other morning commuters: a diverse and active group moving to start the city's business machinery.

WWF's offices in Ottawa are just down the street from Parliament, surrounded by banks, trade offices, and downtown shopping. The building is easy to find: marked by the familiar Panda logo. Just inside the foyer, I took the elevator up to the heart of WWF's

1 WWF is one of the world's largest conservation organizations. The initials originally stood for "World Wildlife Fund," and later for "World Wide Fund for Nature." Since 2001, the WWF network uses the WWF acronym as its one global name (WWF 2015b).

Global Arctic Programme. The office fills half of the floor: individual offices along the periphery with windows looking outward, and cubicles and interior meeting rooms in the center of the space. The first thing I noticed on entering was a room with a large glass window presenting a view of a conference room, complete with a large screen, video projector, camera, and speakerphone. This is the conference center where WWF staff can meet virtually with other WWF staff across the network. The conference room in Ottawa is similar to rooms in Moscow, Oslo, Anchorage, and other WWF offices.

Within this space, two interlinked programs operate: the WWF Global Arctic Program (GAP) and the WWF Canada Arctic Program. While both of these programs focus on Arctic work, their relationship is non-hierarchical. The staff is in a perpetual state of motion: internal meetings, conference calls, business emails, visitors from other organizations, staff travelling away from the office, and other staff returning to brief their peers on their travels.

On this particular day, staff members were moving between offices working on several different projects, including developing press releases and planning for the kickoff of the Last Ice Area project. I put my bag down at the cubicle where I had been given space to work—just outside the GAP Director's office. Pulling out my computer and notebook, I walked to one of the unoccupied meeting rooms, plugged in my laptop, opened my notebook, and prepared for my morning meeting: a conference call with WWF staff in Vancouver, Toronto, Oslo, and Moscow to discuss the developing RACER project.

Looked at one way, I had travelled over a thousand miles to sit in a room alone and participate in a conference call, something I could have done (and often did) from the

porch of my family farmhouse. Looked at in another way, this experience—which was echoed in my visits to Moscow, Toronto, and Anchorage—says something about the way that WWF staff work, how the network is structured, what is considered "local," and how technical advances have changed the scope and process of Arctic Conservation.

Background

This dissertation is the product of a multi-sited ethnographic research project within the WWF Global Arctic Programme (GAP). *The objective of this research is to understand the social and cultural processes that influence Arctic conservation in the context of the GAP.* This project answers calls for organizational ethnographies of conservation from social scientists (Brechin, Wilshusen, and Benjamin 2003; Brosius and Russell 2003; Brosius 1999a). Nader (1972) describes the study of powerful organizations as "studying up," versus studies of conventional ethnographic subjects. In the Arctic, and in other regions, large conservation organizations like WWF are involved in both the negotiation of international conservation policy and the development of local conservation practices. As an official observer within both the Arctic Council and the United Nations Framework Convention on Climate Change (UNFCCC), WWF is positioned to influence the details of international agreements governing greenhouse gas emissions, resource extraction, ocean transport, fishing, and other key Arctic issues. Meanwhile, WWF programs work directly with communities throughout the Arctic to collect scientific data and promote conservation activities. WWF's Arctic efforts are coordinated within the GAP, comprising program offices in the US, Denmark, Norway, Canada, and Russia.

The position of WWF's GAP as a bridge between policy and practice creates international social networks that coevolve through time with WWF's institutional structures. David Mosse (2004) has argued that policy often contradicts the local practices of actors, whose actions are shaped by networks of relationships, institutional structures, and organizational culture. Rather than seeing formal institutions as a conflict with actual work, I argue that work and institutions co-create one another in a continuous process. During recent years, WWF has shifted their governance model toward a focus on decentralized decision-making and large-scale projects—making the negotiation of both policy and practice explicitly reliant on networked relations. In the chapters that follow, I analyze the networks, knowledge, history, and ongoing work of WWF in the Arctic to show that WWF's networks, programs, and conservation knowledge continually reinforce and entwine with one another.

Collaborative Beginnings

The idea for this research came about during a meeting in 2007, while I was working as a Research Assistant in the Center for Integrative Conservation Research (CICR) at the University of Georgia (UGA). The focus of my assistantship was the Advancing Conservation in a Social Context[2] (ACSC) project—a MacArthur Foundation funded initiative involving conservationists and researchers in the US, Peru, Vietnam, and Tanzania. The ACSC project was initiated when MacArthur Foundation staff became concerned about the number of proposals promising win-win outcomes: successes for conservation with simultaneous development improvements. As ACSC moved ahead, it

2 *Advancing Conservation in a Social Context* (ACSC) was a four-year interdisciplinary research initiative designed to generate knowledge about, and promote potential solutions to, the trade-offs surrounding ongoing conservation projects. The project was funded by the John D. and Catherine T. MacArthur Foundation.

became clear that win-win outcomes in conservation and development projects are rare at best, and that most if not all conservation projects involve trade-offs in which not all ends can be simultaneously achieved (McShane et al. 2011).

One of the early recommendations that emerged from the ACSC project was an increasing focus on institutional ethnography[3], particularly looking at how institutions are developed within conservation programs and organizations. During an ACSC meeting, a WWF staff member made an off-hand comment that it would be interesting to do a study of WWF. After talking to my WWF contact and to my Committee Chair, Dr. Peter Brosius, we decided to explore the idea further. My WWF contact took the idea back to WWF-International in Gland. I was committed to an explicit sort of negotiated collaboration, and this was the first step in such a process.

It took a while for the concept to move ahead. An early lesson learned was that patience would be essential. At the time I never felt that I was being ignored or put off—only that staff at WWF were busy, and that thinking through my concept was more than they had time to do. By mid-2008, though, we (my committee chair, my WWF contact, and myself) had come to the conclusion that research within WWF was, at least provisionally, possible. My WWF contact returned to me with a set of questions from within WWF in Gland related to the behavior of WWF's network:

3 "Institutional ethnography" and "organizational ethnography" are used interchangeably by many social scientists studying conservation. I distinguish organizations from institutions (Following North 1990; Brechin, Wilshusen, and Benjamin 2003; Scott 2007 and others). North (1990) notes in particular that organizations arise as a consequence of institutional opportunities, and in working toward their missions act as agents of institutional change. Organizations may include corporations, non-government organizations, social movements, and various types of publics. What they have in common is an ability to exercise group action, so that the entire organization becomes an actor (itself composed of other actors, sensu Latour 2007). When discussing Dorothy Smith's variant of Institutional Ethnography (Smith 2005; Smith 2006) I will use initial capital letters.

- How can the culture of the WWF Network best be described?
- How is the Network perceived (internally) and how does it behave? (Are there rules, are they obeyed, are they needed, etc.)
- What works to strengthen (or not) positive behavior and help us realize our vision and desired outcomes? (examples from within[4])(WWF 2008, email communication)

These questions reflected the interests of the WWF administration in understanding their array of newly implemented Network Initiatives (NIs). The hope in WWF-International was that this would be a time of "transformational change" in organizational culture (Hails 2012) and that a new series of NIs would be key in achieving global conservation goals. WWF's Director General had spearheaded the formation of several NIs as a way of encouraging decentralization and resource sharing among National Offices (NOs). Some of the NIs were topical: focusing on climate change or the "China Shift." Others were geographically focused: the Coral Triangle, Himalayas, or the Arctic. The NIs in general were appropriate in scope for a PhD dissertation, and any of them would enable the type of multi-sited study that I was seeking. The Arctic NI[5], though, was an immediate draw for me for several reasons. First, my travel would take me through the core of the Global North: the US, Canada, and Europe. Since reading Laura Nader's classic anthropological treatise on "studying up" (Nader 1972), I had been interested in working within the highly developed capitalist

4 The "Examples from within" clarification in parentheses was part of the original set of questions from WWF.

5 The WWF Arctic NI was built upon the foundation of the earlier WWF Arctic Programme, headquartered in Oslo. The Network Initiatives are now known as Global Initiatives, and the Arctic NI is now named the WWF Global Arctic Program (GAP).

economies that seemed so familiar and, at the same time, so foreign to my own values. Second, the issues affecting the Arctic were important to me on a personal level: climate change, bio-accumulation, threats from resource extraction, and overexploitation of ecosystems to name a few. Third, on a practical level, I have always fared better in the cold than in the heat.

By the spring of 2009, I had arranged to meet the head of the Arctic NI at WWF-US headquarters in Washington, DC. He was a climate expert who had been tapped to head the fledgling NI from an office within WWF-Norway. He was passing through the US for a series of meetings, and had set aside time to talk with me. We spoke for just over an hour, covering possibilities for research (many), what I would want to see (some mixture of WWF policy work and on-the-ground conservation activities), and where I would want to go (Norway—the main office, as well as Alaska, Canada, and possibly Greenland). I left the office that day feeling that I had made the best possible plan for moving ahead.

In the fall of 2009, I had received preliminary research funding from ACSC to travel to Oslo (then the main office of the Arctic NI), interview staff, and conduct participant observation. In October, following a series of emails from me to WWF that were not returned, I heard through the grapevine that the former Director—my only contact in the Arctic Program—had left the organization. With no contacts in Oslo, I quickly changed plans to travel to Copenhagen, where the WWF Arctic NI was setting up a large tent with a slate of speakers, performers, and special guests to raise awareness of Arctic issues during the meeting of the Conference of the Parties (CoP) to the United Nations Framework Convention on Climate Change (UNFCCC). I arrived in Copenhagen

in December, and was able to spend valuable time interviewing WWF-Arctic staff and observing their work as a public program outside the UN negotiations.

During the Fall of 2010 I received a Doctoral Dissertation Improvement Grant through the Arctic Social Sciences Program of the National Science Foundation. When I met the new Director of the Global Arctic Program in October 2010 it was at the Conference of the Parties to the UN Convention on Biological Diversity (CBD CoP10) in Nagoya, Japan. In many ways, I felt that I was starting over at square one. The full details of my earlier conversations had not made it through the network.

When I first began the current project, I had planned to work in a fully and explicitly collaborative way with WWF staff members (Lassiter 2001, 2008). My research would emerge through discussions with both program leaders and front-line office staff. Parts of my research would be co-authored to draw upon the para-ethnographic strengths of people within WWF—the processes they already use for understanding their own organizational culture (D. R. Holmes and Marcus 2006; Marcus 2013). My goals were to complete a dissertation research project for myself while helping WWF to achieve more effective Arctic conservation with fewer unintended consequences. While I was able to meet some of those initial goals, I had discovered that collaboration would not always be easy, and that my own research framings were not entirely in line with those anticipated by WWF.

Research Questions

The initial questions that emerged from my contacts within WWF dealt with organizational culture, formal and informal "rules" or institutions, and the effects and behavior of WWF's network. Anthropology includes multiple theoretical frameworks for

addressing each of these facets (see Chapter 2). WWF staff also expressed an interest in the ways that social and cultural processes influence program development and outcomes—but were clear in early discussions that they were not looking for a program evaluation.

I reframed these questions into a set of three research questions, focusing on three aspects of conservation work within the WWF GAP: organizational culture, institutional relations, and social networks.

Q1: What is the role of organizational culture in the WWF GAP?
Q2: What institutional arrangements most strongly influence conservation outcomes in the WWF GAP?
Q3: How do social networks (both within and outside of the core WWF staff) influence processes within the GAP?

These questions all have in common awareness that the Global Arctic Program is explicitly a networked structure. Changes in governance at WWF since the 1960s, coupled with changes in conservation focus (Hails 2012), have resulted in a complex mosaic of institutions and network connections. For example, the WWF Climate Witness program was designed to collect personal testimonials of the effects of climate change on the lives of individuals around the world—including the Arctic. The program is officially no longer active or supported, though staff continue to collect stories and the program has a strong presence on the Web. It exists as an institutional vestige of a previous initiative

(WWF staff—personal communication, 2009). The texts, programs, and staff of WWF continually intertwine.

Research Context

In this section, I review the overlapping contexts of Arctic conservation. The geographic, ecological, and human contexts of the Arctic are important for the work that WWF does on an ongoing basis. I begin with a discussion of how the Arctic is bounded as a region, effects of climate change on the Arctic, and the biological and ecological diversity of the Arctic. I address some of the complicated human history of the Arctic, including historic attempts at Arctic exploration by sub-Arctic countries, as well as changes in Arctic resource use resulting from climate change. I then review the current state of transnational conservation within the Arctic. Finally, I look more closely at the organizational context of WWF itself, including WWF in general and its specific history within the Arctic.

Defining the Arctic

Depending on context, the Arctic is bounded by one of several different metrics: the northern extent of the tree line (Koivurova and Molenaar 2009), the line at which average July temperature is ~10°C (Woods Hole Oceanographic Institution 2006), ranges of various Arctic species, sociopolitical boundaries, or the Arctic circle (66.56° north latitude). For example, in some of its work WWF relies on the Circum-Arctic Vegetation Map (CAVM) produced by the Arctic Council working group in Conservation of Arctic Flora and Fauna (CAFF) (CAVM Team 2003; D. A. Walker et al. 2005). This map follows the northern extent of the circumpolar treeline. In other work, WWF follows boundaries used by the Arctic Monitoring Assessment Program (AMAP)—another Arctic

Council working group—or other boundaries. Figure 1 shows the location of Arctic boundaries as set by four different Arctic Council working groups.

The Arctic is sometimes also divided into three circumpolar regions based on dominant plant communities: the High Arctic, Low Arctic, and subarctic (F. S. I. Chapin et al. 1991). The High Arctic includes areas of permanent ice as well as arid and semi-arid polar deserts dominated by cryptogams and low herbs. The low arctic consists of tundra areas featuring low shrubs, sedges, and cold mires. The subarctic includes the extreme northern forests and extends into the taiga to the south.

The land of the Arctic is controlled by eight different states: The United States, Russia, Canada, Norway, Sweden, Finland, Iceland, and Denmark. The marine areas in the Arctic include international waters, national waters, and contested areas such as the recently-thawed Northwest Passage (from the Atlantic to the Pacific across the north of Canada), which Canada claims as territorial waters although other nations define it as an international strait. Marine areas up to 200 nautical miles off state coastlines where states may exercise exclusive rights to resources are listed as Exclusive Economic Zones (VLIZ 2014), though the North Pole and the oceans surrounding it are considered international waters.

Figure 1.1: Arctic boundaries, as defined by four Arctic Council Working Groups. There is no absolute agreement on what constitutes "The Arctic" (GRID-Arendal 2013).

Broadly defined, the Arctic covers over 40 million km^2 of land and sea (Young and Einarsson 2004). Marine areas including the Arctic Ocean and the Nordic, Bering, and Labrador seas comprise approximately two-thirds of the total Arctic. Marine Arctic areas are important ecosystems, and also contribute to deepwater formation that drives global ocean currents and large-scale climate conditions (ACIA 2005).

The Changing Arctic Climate

Despite recent warming, the climate in the Arctic remains harsh. Annual mean temperatures range from as high as 4°C at Reykjavik to as low as -29.4°C on the edge of

the Greenland Ice Sheet (ACIA 2005). Annual precipitation ranges from below 100mm to over 1000mm (Serreze and Hurst 2000).

Climate in the Arctic is influenced by many factors aside from latitude including altitude, warm ocean currents, southward movement of cold air masses, and cyclic ocean features. The North Atlantic Oscillation and the Pacific Decadal Oscillation together influence weather patterns over a large portion of the Northern Hemisphere (ACIA 2005). Feedbacks from ice and vegetation albedo and sea ice insulation also influence the Arctic climate over both long and short terms (Miller et al. 2010).

One of the largest concerns in the Arctic among scientists is the rapid decline in sea ice thickness and coverage. Sea ice in the Arctic varies seasonally, but has been decreasing for the past several decades. Arctic sea ice has declined at a rate of roughly 4% per decade from 1979 to 2011, with the rate of decline increasing from 1996 to 2010. Perennial ice has declined by 14% per decade from 1979 to 2012, while the thickest component of perennial ice (known as multiyear ice) has declined at a rate of 19% per decade over the same period (Comiso 2012).

Sea ice is important socially, ecologically, and economically (ACIA 2005). Melting ice is having complicated effects on the lives of Inuit in northern Canada: changing fish ranges, decreasing the narwhal harvest, and increasing tensions over polar bear hunts (Struzik 2012). Hooded seals, polar bears, and narwhal all show sensitivity to decreasing sea ice due to specialized feeding strategies and habitat needs (Laidre et al. 2008). Melting ice makes transportation difficult as long-used ice routes become impassable (Laidler et al. 2009). At the same time, melting ice opens shipping lanes, providing new economic opportunities. Many computer models exist for predicting future

declines in sea ice due to anthropogenic climate change, but as of now the largest point of agreement is that summer ice will continue to decline; future refinements in model constraints should improve their predictive capacities (Massonnet et al. 2012).

Land ice is important for many of the same reasons as sea ice. In addition, melting land ice directly raises sea level (sea ice is largely floating, and so is already displacing its mass in water). At current rates of decline, summer sea ice could be entirely gone as early as 2040. Melting of the Greenland ice sheet has accelerated in the last few years; there is enough water in the Greenland ice sheet to raise sea levels globally by nearly seven meters (NRDC 2014).

Arctic Species and Ecosystems: Why Conserve the Arctic?

Despite the harsh climatic conditions of the Arctic, circumpolar land masses are home to a diverse flora, from low-growing cryptogamic tundra to shrubs and wetland plants. These include over 2800 species of vascular plants, 900 mosses, and 1600 lichens (D. A. Walker and Raynolds 2011). 96 species of vascular plants around the Arctic are regarded as rare endemics (CAFF 2001; Talbot et al. 1999). Bearing this diversity in mind, the Arctic Council has proposed an international Red List of Arctic plants.

Ecological heterogeneity is caused by numerous factors including temperature differences, north-south oriented mountain ranges, and coastal inlets, all of which break the circumpolar regions into sections. Yurtsev (1994) identified six regional floral provinces and 20 sub-provinces. More recently, the Pan-Arctic Flora (PAF) Project (Elvebakk et al. 1999) built on Yurtsev's work to develop a system of five floral groups—a system also followed in the international development of the Circum-Arctic

Vegetation Map (CAVM) (CAVM Team 2003). In total, the Arctic includes approximately 3% of known plant and animal species (ACIA 2005).

Table 1.1: Selected Arctic species groups and some of their characteristics, from the Arctic Biodiversity Assessment (CAFF 2013:71).

Group	Species occurring in the Arctic	Ratio of worldwide total	Mainly Arctic species	IUCN Endangered, Vulnerable, or Near Threatened	Extinct in modern times
Terrestrial mammals	67	1%	18	1	0
Marine mammals	35	27%	11	13	1
Terrestrial and freshwater birds	154[a]	2%	81[a]	17	0
Marine birds	45[a]	15%	24[a]	3	0
Amphibians/reptiles	6	< 1%	0	0	0
Freshwater and diadromous fishes	128	1%	19		
Marine fishes	c. 250[b]	1%	63	4[c]	
Terrestrial and freshwater invertebrates	> 4,750				
Marine invertebrates	c. 5,000				
Vascular plants	2,218	< 1%	106[d]	0	0
Bryophytes	c. 900	6%			
Terrestrial and freshwater algae	> 1,700				
Marine algae	> 2,300				
Non-lichenized fungi	c. 2,030	4%	< 2%		
Lichens	c. 1,750	10%	c. 350		
Lichenocolous fungi	373	> 20%			

[a] Includes only birds that breed in the Arctic. [b] Excludes the sub-Arctic Bering, Barents and Norwegian Seas. [c] Most marine fish species have not been assessed by IUCN. [d] Includes Arctic endemics only.

Table 1.1 (above) shows several categories of Arctic species, their numbers in the Arctic, and their relative level of vulnerability. Of 430 breeding bird species in the Arctic, approximately 30% are migratory waterbirds (Zöckler 1998). While 162 species of all birds have more than half of their breeding ranges within the terrestrial or marine Arctic, the low Arctic contains more than double the avian species richness of the High Arctic. Most species of Arctic birds are migratory, breeding within the Arctic but moving as far south as the southern tips of South America and Africa or even Antarctica during non-breeding seasons. Because of this, Arctic bird populations are heavily influenced by non-Arctic factors, and their conservation often relies on international cooperation (CAFF 2013).

Mammals in the Arctic make up 2% of global mammalian diversity. Approximately 67 species of land mammals and 35 species of marine mammals are found in the Arctic, either year-round or seasonally (CAFF 2013). Of terrestrial mammals, 18 have distributions almost entirely within the Arctic while 12 additional species have links to Arctic refugia during the Last Glacial Maximum (12-18,000 years ago) and present ranges extending well into the sub-Arctic. Many of these species are lemmings, shrews, and other small mammals (CAFF 2013). In terms of mammalian species conservation campaigns, WWF tends to focus on larger land fauna such as caribou (*Rangifer tarandus*) and Arctic fox (*Vulpes lagopus*).

Of the 35 species of Arctic marine mammals, only 11 are full-time Arctic residents. The others migrate in and out of the Arctic. Consequentially, the highest marine mammal species richness is found in the low Arctic of the Atlantic and Pacific oceans (CAFF 2013). The polar bear (*Ursus maritimis*) has iconic status as a symbol of the Arctic, and receives special attention as a target of conservation initiatives (Laidre et al. 2008) (see Chapter 5). Many other marine mammals including pinnipeds and cetaceans are also threatened globally (CAFF 2013; Kovacs et al. 2012). Marine mammals in the Arctic are ecologically dependent on sea ice for feeding and/or reproduction. Most Arctic marine mammals are also important among indigenous populations culturally and sometimes for subsistence (CAFF 2013).

The Arctic Ocean and adjacent seas include over 600 known marine species. The gateway seas (Barents, Norwegian, and Baltic) have very well known faunal assemblages, since these areas represent some of the most important global fisheries.

Relative to the High Arctic, these areas also have high species richness. They are also of particular concern due to ongoing fishing pressures and climate change (CAFF 2013).

Not Just Ice and Bears: People in the Arctic

The Arctic is home to nearly four million people, half of whom live in the Russian Federation. Approximately 10% of the people living in the Arctic may be identified as "indigenous" although all nations do not keep census records of indigenous categorizations and many individuals claim multiple heritages (Young and Einarsson 2004:29). There are over 40 indigenous languages spoken throughout the Arctic, though many of them are endangered (Young and Einarsson 2004,58). Indigenous and local peoples within the Arctic are represented by numerous organizations including the Inuit Circumpolar Council (ICC), the Arctic Athabaskan Council (AAC), Gwich'in Council International (GCI) and the Russian Association of Indigenous Peoples of the North (RAIPON).

Human habitation of the Arctic stretches back to before the end of the last Ice Age. The earliest discovered human occupation in the Arctic was as early as 36,000 yr BP in what is now the European portion of the Russian Arctic (Pavlov et al. 2001). Stone points, ivory shafts, and zooarchaeological evidence of hunting Wooly Mammoths, *Mammuthus primigenius* have been found at the Yana Site in Northern Siberia dating from 27,000 to 29,000 years BP (32,000 to 34,000 yr BP) (Nikolskiy and Pitulko 2013). The oldest sites in Berengia, along the Kamchatka coast, date to ca. 13,000 yr BP (Goebel et al. 2010). Archaeologists in Alaska have discovered more than 30 sites dated to between 10,000 and 14,000 yr BP (Saleeby 2010). Figure 1.2, below, shows the

indigenous and non-indigenous population levels of several Arctic countries as of 2004 (Young and Einarsson 2004,19).

Cold Colonialism: Arctic Exploration and Exploitation

Sub-Arctic politics have and continue to govern many Arctic issues, including trade, resource extraction, and biodiversity conservation (Young and Einarsson 2004). Early exploration of the Arctic by people of Europe, Russia, Canada, and the USA can be grouped into three overlapping categories: searches for the North Pole, attempts at finding new trade routes (either northwest or northeast passages), and geographic exploration and mapping (Karpoff 2001; J. B. Scott 1909).

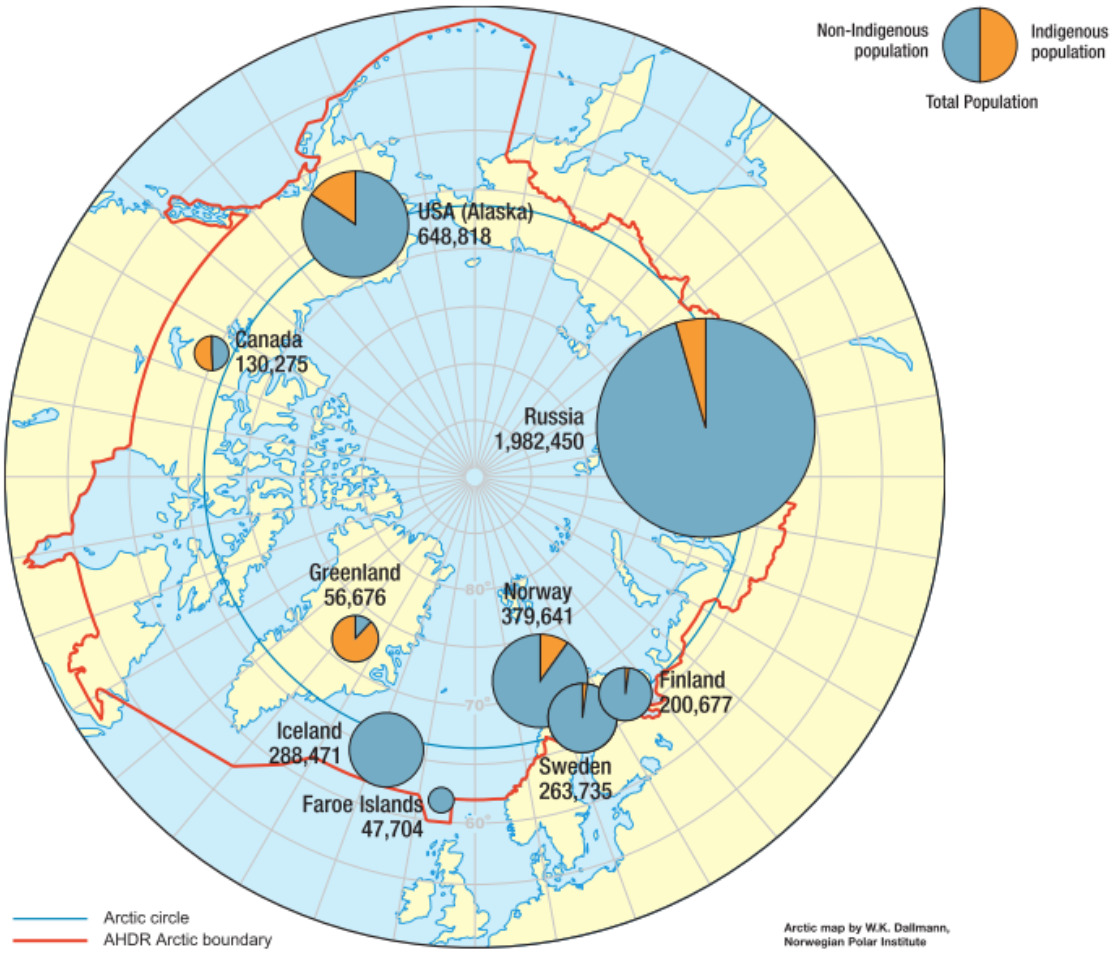

Figure 1.2: Indigenous and non-indigenous populations of the Arctic, by region (Young and Einarsson 2004,19).

From 1818 to 1909, over 92 expeditions from the USA, Great Britain, and Continental Europe were mounted using both government and private funds (Karpoff 2001). Many of these trips—by land, sea, and balloon—ended in tragedy as explorers were not prepared for the harsh environmental conditions they would face (Karpoff 2001); the same is true for Soviet-era expeditions during the Stalin years (McCannon 1998).

The North Pole offered a stage on which nations could perform the act of imperial power. The United States, Britain, and the Soviet Union each took advantage of this stage during the late nineteenth and early twentieth centuries:

> It literalized the colonial fantasy of a tabula rasa where people, history, and culture vanish. The absence of land, peoples, or wildlife to conquer gave polar exploration an aesthetic dimension that allowed discovery of the North Pole to appear above political and commercial concerns. Thus, paradoxically, it was the lack of material gain from such an exploit that transformed polar exploration into a new kind of political theatre with all its colonial and scientific trappings (Bloom 1993,2-3).

Early Arctic exploration often relied on the participation of indigenous peoples, albeit invisibly, as their participation was often not included in official narratives. When Arctic native peoples were mentioned, they were often referenced as being either primitive or pure (Bloom 1993).

Some of this representation built on Greek and later conceptions of Ultima Thule, the last frontier in the far North that was said to be warm and habitable. In literary representations, this northern land was sometimes the entrance to a Hollow Earth filled with imagined wonders (Bakshi 1968; D. Jones 2010; Verne 2002).

The Northwest Passage was a target of European exploration as early as the 16th century, in hopes of opening new, faster trade routes between Europe and Asia. Roald Amundsen was the first known explorer to transit the Northwest Passage along the northern coast of Canada entirely by boat in 1903-1906. Amundsen's route was at the time commercially not viable due to the long transit time and areas of very shallow water.

During the 20th century, there was a push for Arctic exploration within the Soviet Union, building an "Arctic Myth" of heroism based on the coupling of technological advancement with the conquering of the great Northern frontier (McCannon 1998). In addition to the myth-building aspect of explorations under the Stalin regime, these voyages also focused on finding and opening a *Sevmorput* or northern sea route along the northern coast of Russia, which would greatly increase the efficiency of shipping from

the east to Northern Europe and back (McCannon 1998). The exploration of the Arctic as a colonial project was neither confined to the Soviet Union nor to the 20th century (Bloom 1993; McGhee 2005).

As ice has continued to decrease over the past decade, Arctic shipping has become both a possibility and a threat to Arctic species. The first commercial cargo ship to navigate the Northwest Passage was the MS Nordic Orion, a Danish ship carrying 73,500 tons of coking coal in 2013. Shipping from Vancouver to Finland via the Northwest Passage saves roughly 1000 nautical miles and about $200,000, as well as enabling ships to carry more cargo than the shallow Panama Canal would allow (McGarrity and Gloystein 2013).

The Northeast Passage, also known as the Northern Sea Route, has been a goal of exploration by Russians and Europeans since the 1500s. Similar to the Northwest Passage, melting ice combined with the development of improved icebreakers has opened this route to commercial traffic only within the last few years. The first commercial crossing was in 2009 (Kramer 2013). In November of 2012 Gazprom made the first shipment of liquefied natural gas through the Northeast Passage (McGarrity and Gloystein 2013). A total of 46 ships made the transit in 2012. In 2013, the total number of ships crossing the Northern Sea Route neared 400, and the Russian military announced plans for increased patrols of the now open waterway (Kramer 2013). The opening of the Northeast Passage has raised environmental concerns, including concerns over the transport of nuclear waste through the route (Sawhill and Ragner 2009).

Transnational Conservation in the Arctic

In conservation circles, the Arctic is presented as a unique set of ecosystems with species often found nowhere else on Earth. Because many terrestrial and marine ecosystems cut across or fall entirely outside national boundaries, many conservation efforts are transnational in scope. Some of these initiatives, such as the Ramsar Convention on wetland conservation, are global in scope but with a strong component in the Arctic. Others are bi-national agreements on conservation of particular regions in the Arctic. A full description of every international conservation initiative that falls within the Arctic is far beyond the scope of this dissertation. In this section, I provide a summary of some of the key organizations and protocols for Arctic biodiversity conservation.

The most important organization for international governance of the Arctic is the Arctic Council. The Arctic Council is composed of:

- The eight Arctic nations (Canada, Denmark, Iceland, Finland, Norway, Sweden, Russia, and the USA);
- Six indigenous Permanent Participant groups (the Aleut International Association, Arctic Athabaskan Council, Gwich'in Council International, Inuit Circumpolar Council (ICC), Russian Association of Indigenous Peoples of the North (RAIPON), and the Saami Council);
- Twelve non-Arctic observer states;
- Nine intergovernmental observers including the International Union for Conservation of Nature (IUCN), the International Red Cross Federation, the Nordic Council, the Northern Forum, United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP);

- Eleven non-governmental observers including the Association of World Reindeer Herders, the University of the Arctic, and the WWF Arctic Programme (Arctic Council 2014).

The chairmanship of the Arctic Council rotates from country to country within the eight member states once every two years.

The Arctic Council maintains a number of international Working Groups that work directly on issues related to Arctic conservation. These include the Arctic Contaminants Action Program (ACAP), Arctic Monitoring and Assessment Programme (AMAP), Conservation of Arctic Flora and Fauna (CAFF), and Protection of the Arctic Marine Environment (PAME).

On a global level, biodiversity conservation is governed by the UN Convention on Biological Diversity (CBD). As part of my research, I attended the 10th Conference of the Parties to the CBD in 2010 (CBD Cop10) where WWF Arctic Programme representatives were giving presentations and participating in negotiations. I also attended the 2011 CBD SBSTTA (Subsidiary Body on Scientific, Technical, and Technological Advice) meeting in Montreal, where it was agreed that the Arctic Council (largely through CAFF) would continue as the main intergovernmental body for Arctic conservation, and that the CBD and Arctic Council would cooperate where possible.

In addition to intergovernmental efforts, a number of biodiversity conservation non-governmental organizations (NGOs) work within the Arctic. These include:

- Wildlife Conservation Society (WCS) has conservation projects in the areas around the Bering Sea focusing largely on marine conservation, with staff in Vladivostok and Fairbanks (WCS 2014).

- The Wilderness Society works in communities and lobbies congress to protect areas within the Alaskan Arctic (The Wilderness Society 2014).
- Birdlife International works on protection of many migratory species that nest in the Arctic, often in cooperation with other organizations.
- The Nature Conservancy (TNC) works globally in the Arctic, including in the Alaskan Marine Arctic (TNC 2014).
- Greenpeace works frequently in the Arctic, as evidenced by their ship, *Arctic Sunrise*. In September of 2013, the *Arctic Sunrise* was boarded and the crew arrested by Russian Coast Guard officials, following a Greenpeace demonstration at a Gazprom drilling platform to protest against offshore drilling and climate change. The ship was towed to Murmansk, and eventually the crew (the "Arctic 30") were released (Vidal 2014).

Why WWF? A History of Change

WWF was founded in 1961 as an international organization for conservation fundraising. During its early years, WWF worked closely with the International Union for the Conservation of Nature (IUCN) in determining the distribution of conservation funds. In 1970, WWF initiated a $10 million trust fund to cover organizational expenses, so that donations could go directly to conservation. The focus at WWF during the 60s and 70s remained on charismatic species and their habitats (Hails 2012). During the 1980s WWF continued to grow: the organization worked with IUCN and the United Nations Environment Programme (UNEP) to publish the World Conservation Strategy, which emphasized the idea of sustainable development, and worked with governments to negotiate debt-for-nature swaps.

In the 1990s, WWF revised their mission to focus on biodiversity conservation, sustainable resource use, and pollution reduction. They also revised their operational strategy to emphasize decentralized decision making in the organization. Following the 1992 Earth Summit, WWF also increased partnerships with companies in the private sector (Hails 2012).

Since 2000, the focus of WWF has shifted from local conservation priorities toward a global approach, with a two-pronged strategy of local action combined with lobbying at national and international scales (WWF 2009). The shift at WWF has been from individual projects toward larger programs—a shift echoed in other transnational conservation and aid organizations. WWF's development of Network Initiatives (NIs) in the first decade of the 2000s was organized around both geographic areas and key conservation themes. The development of NIs is part of a larger move within WWF toward a network governance model, echoing the 1990 move toward decentralized decision making.

WWF differs from other conservation organizations not only in its history but also in its structure. WWF consists of a head office in Gland, Switzerland that one long-time staff member described as being "like a secretariat" (field notes). The overall structure is non-hierarchical, with National Offices (NOs) in each country directing their own affairs. Funding for programs comes from a combination of in-country donors, corporate donors, and WWF donor offices such as WWF-UK or WWF-Netherlands. As I will discuss in Chapter 4, the network structure of WWF's offices is not homogenous, and collaborations between NOs can sometimes be strained. Into this mixture, the WWF GAP works to facilitate collaboration, communication, and resource sharing on Arctic issues.

WWF in the Arctic

WWF has worked in the Arctic since well before the 1996 formation of the Arctic Council. As with other Arctic conservation, much of the work that WWF does crosses national borders. WWF's work in the Arctic includes community engagement, lobbying, in-house and sponsored research on individual species, research on climate change, development of recommendations and guidelines for conservation, work to raise the public profile of Arctic environmental issues, and participation in international policy fora.

Prior to 1991, WWF worked in many places within the Arctic as part of the individual programs of WWF national offices. In 1991, the eight Arctic states came together to sign the Arctic Environmental Protection Strategy (AEPS). The AEPS was a precursor to the Arctic Council and the first circumpolar environmental agreement (CARC 1993). The AEPS grew out of nearly two years of meetings that were also important for the founding of the WWF Arctic Programme.

In 1992, WWF formed the Arctic Programme (AP) as a formal initiative, based in Oslo, and designed to facilitate collaboration on Arctic issues and to support and extend the work of the proposed Arctic Council. In 1996, the AP identified climate change as a "gap" in Arctic conservation. In 1997, the AP worked toward identifying an official WWF position on climate change for the Kyoto Protocol. In 1999, the WWF Climate Change Initiative turned to the AP to provide evidence for climate change. A 2001 strategic plan was developed by the AP leadership team calling for development of CO_2 targets and strategies for climate change adaptation. Meanwhile, national strategies in

each of WWF's National Offices in the Arctic continued to be developed (based on data from WWF AP archives).

The 2007 move to develop the Arctic Program into a Network Initiative, still headquartered in Oslo, was an attempt to promote greater cooperation between national offices and coordination of global Arctic conservation activities. While the network was headquartered in Oslo and then in Ottawa, it remained a decentralized group, with individual national offices exercising autonomy and the central Arctic office serving as a facilitator, helping to bridge gaps. At the same time, the Arctic Programme office did institute programs of its own with support from one more of the national offices. By 2010, the Network Initiative was going by the new moniker WWF Global Arctic Programme (GAP).

During the period of this research, the GAP was working on several specific initiatives that will be discussed in detail in later chapters. These include:

- The RACER (Rapid Assessment of Circum-Arctic Ecosystem Resilience) project. RACER uses computer models, satellite data, and geographic information systems to project which areas will, in the future, be most important for ensuring resilience—so that those areas can be protected now.

- The Last Ice Area project. This project uses projections of summer sea ice under climate change and proposes a locally-managed "home" for polar bears in the area where ice will melt last. The project is a collaboration with Coca-Cola, for whom the polar bear is a brand icon.

- Development of the *Atlas of Marine and Coastal Biological Diversity of the Russian Arctic* (Spiradonov et al. 2011).

All of these programs rely on the WWF Arctic network in some form. National Offices continue to work both on their own Arctic issues and in bilateral collaboration with other NOs—for example, WWF-US in Anchorage and WWF-Russia in Kamchatka coordinate their efforts on conservation of the Bering Sea area, just as WWF-Norway and WWF-Russia coordinate on the Barents Sea. Even programs that seem to be locally focused (The *Atlas of Marine and Coastal Biological Diversity of the Russian Arctic* for example) draw on the wider resources of the network (in the case of the Atlas, funding from WWF-Netherlands). The GAP works consistently to maintain and enhance its own networks. This includes both internal networks within and among WWF offices and external networks of stakeholders and audiences. That work may be incidental—the product of daily contacts between offices as they work on projects—or intentional, such as yearly network meetings or workshops that bring together experts around specific Arctic issues.

Mixed Methods

This study included frequent travel, varying levels of access, changing perceptions of the research (and researcher) over time within WWF, and more general shifts in the subject position of the researcher. In contrast to some other studies of conservation and development organizations (e.g. Corson 2008; Rhee 2006), WWF's Global Arctic Program is in many ways as much a virtual community as a physical one—a collective where connections are often episodic and partial (Burrell 2009). To overcome this fragmentation I relied on a mixed-methods approach (Markowitz 2001). This combination included online participation, personal participant observation, structured and informal interviews, text analysis, and network analysis.

Participant observation

As a project in studying up (Conti and O'Neil 2007; Gusterson 1997; Nader 1972), periods of participant observation were supplemented in this study with a mixed methods approach. Participant observation was crucial for understanding office dynamics, and for the teachable moments that arose in meetings, discussions, and introductions when WWF took time to explain their work to me. While this participatory element was important, it was also inherently problematic due to the decentralized and multi-sited nature of WWF's Arctic work. Rather than a full story of life in a particular office or the development of a single project, I was left with fragments: half of a conversation, one perspective on a meeting, two weeks of activity before staff dispersed from the office in opposite directions. Here I draw on the ethnographic work of Anna Tsing:

> My project stretches and changes the practice of ethnography. As I reach to describe global connections, my ethnography necessarily diverges from the holism of more familiar models, in which each anecdote or custom forms a scrap in a larger, unified pattern. Instead, following the example of subaltern studies by historians who retrieve forgotten pasts plowed over by national histories, I endorse the fragment. In this project, I have used ethnographic fragments to interrupt stories of a unified and successful regime of global self-management (Tsing 2005,271).

At the same time, changing technology in the workplace has simultaneously reconfigured social relations. During the 1990s, meetings of multinational Arctic staff occurred yearly, and communication between offices was often via phone or fax. With the rising ubiquity of office computers, an increasing share of communications have moved to email and Skype, even for intra-office communication. Meetings in WWF offices routinely reference digital communications, shared files, or ongoing computer-based work. A side effect of this shift is that, for the ethnographer doing participant

observation in the office, the physical and verbal components of daily work are often limited to keystrokes and overheard snippets of conversations while staff sit in front of computers. As Sarah Hunt has noted in her multi-sited ethnographic work (Hunt 2010,47-48), the computerization of work yields diminishing returns in terms of observational data collection. As with other fragmentation, I do not see this as a problem to be solved by using technological tricks to capture more data: rather, it is an opportunity to experience the disjunction of work that staff themselves face in daily practice.

The focus on divergence between text and practice points to informal effects on program outcomes. I draw on a politics of knowledge perspective to study ways that knowledge is produced, contested, and reworked and the multiple significances that terms may carry (Lewis et al. 2003,546). Attention to activities, conjunctions, and conflicts within the GAP highlight the degree to which there is a unified organizational culture across offices in different regions or countries—and under what conditions cultural configurations may change (Lewis et al. 2003; Martin 1992).

Document analysis

While travelling through WWF offices, I collected over 2 million words of text (4000 pages of documents), including Arctic Program newsletters, meeting minutes, internal memoranda, planning documents, and program outlines. Changing technology since the establishment of the Arctic Programme in 1992 is reflected in the state of archival records. Archival records from the 1990s exist largely as paper documents in binders, located in specific physical spaces (mostly in Anchorage and Oslo), while records from the early 2000s onward exist increasingly in digital formats. While at first glance it may seem that digital archives would be easier to access and analyze because of

the possibilities of remote access and searchability, these records are in many cases actually difficult or impossible to retrieve. Since WWF's recent digital files include active personnel information, budgets, and other potentially sensitive information, my access to these files was limited. Older paper records, on the other hand, were abundantly available and accessible—though they reflect a bias on the part of WWF staff in what was saved versus what was not.

These sorts of documents yield a wealth of information. They show the rise and fall of program initiatives, the introduction of new influences (climate change as a problem, for example), and the formation of current partnerships. They also show consistencies—elements of institutional culture that remain in place over decades. Meeting minutes and planning documents in particular highlight institutional structures including reporting requirements, meeting processes, and the "how" formalities of network formation. Texts can also be analyzed as semantic networks, showing relationships between concepts, knowledges, people, places, resources, and organizations (Diesner and Carley 2005).

As with other research methods, the collection and analysis of texts has a reflexive component. Staff within WWF were initially curious about the kinds of documents I would be collecting and the way that I would be doing analysis. In conversations with staff, they frequently employed an espionage analogy to describe this part of my research, and the prospect of analyzing texts seemed to raise a small level of trepidation. At the same time, the collection, sharing, and analysis of archival documents is something that WWF staff generally do not have time to do. While long-time staff are familiar with the contents of their own local archives, they are not necessarily aware of or

familiar with other sets of documents in other offices. This is true for both paper and digital files—since different national offices tend to use different computer systems for maintaining their own archives. Some staff expressed a genuine curiosity about what I would find in the archives; for example, the first mention I have found of climate change in the Arctic Program meeting minutes is a reference from 1997, and the first sign that climate change was shaping programs was not until after 2000.

Network Analysis

WWF places a great deal of emphasis on the networked aspect of the GAP. I focused on the network structure of the GAP using combined egocentric data to widen the circle of contacts noted for each individual (Brandes, Lubbers, and Mccarty 2009; Reagans and McEvily 2003). Egocentric data collection is most likely to elicit strong ties, though increasing the sample size for egocentric networks can encourage the inclusion of more weak ties in the data (McCarty 2002). This is particularly important since weak ties may contribute significantly to innovative capacity and social support (Granovetter 1973, 1983).

Of all the methods I employed in the field, network analysis drew the most attention from WWF staff. I used a mixture of network analysis techniques in a semi-quantitative process. Through this, my attention has been on networks in several senses. I used a combination of egocentric and sociometric social network analysis (McCarty 2002; McCarty et al. 2007; Reagans and McEvily 2003). And I frame these approaches within an Actor-Network Theory framework. Part of my own attention to networks is a result of WWF's explicit internal structure, which has shifted in the last ten years toward a form of network governance (Grabher 2006).

In WWF offices in Oslo, Ottawa, Moscow, and Anchorage, I conducted a series of egocentric network interviews with key Arctic conservationists within WWF using EgoNet software (McCarty 2011). In these interviews, I asked network members to free-list fifty of their associates and to evaluate the connection or lack of connection between each pair. The idea of asking for fifty names is to increase the number of "weak ties" (Granovetter 1973; Granovetter 1983) included in the process (McCarty 2002). An advantage of the EgoNet software package is that it can display a visualization of an individual's egocentric network immediately following the interview. These network visualizations then serve as an additional point of conversation about the interviewee's own perceptions of network structure, changes in the network, and the reasons why associations appear as they do.

EgoNet also provides a utility for joining together egocentric networks to form a proxy of the larger organizational network. I supplemented EgoNet with Gephi (Bastian, Heymann, and Jacomy 2009), an open-source network analysis program, to generate maps of the larger sociometric network with nodes sized according to eigenvector centrality and colored according to WWF office location. These larger maps were also valuable as discussion generators, and I presented them in both staff meetings and at the International Polar Year conference in Montreal in 2012, where a large contingent of WWF Arctic staff were present. The conversations that resulted from these network maps allowed staff to object to, agree with, or provide justifications for what they were seeing in the visualization.

Network mapping and visualization techniques are not typically employed for the heterogeneous networks of Actor-Network Theory. Nevertheless, I attempted to generate

visualizations of these networks, showing that biological species, technological resources, and other organizations are important in structuring the work in WWF offices. These purely qualitative visualizations based on interviews, observations, and text analysis also served as points of discussion.

Open-source technology and research methods

Early in my research, I made a decision to use open-source software where available for writing and analysis. I made the decision both out of practicality (cost in dollars) and out of a philosophical commitment to open-source. My operating system is Ubuntu Linux. For word processing, I use LibreOffice. For social network research, I use a combination of EgoNet (Mccarty 2011) for collecting egocentric network data and Gephi for producing graphs (Bastian, Heymann, and Jacomy 2009) and analyzing network metrics. I use AutoMap (Carley and Diesner 2005) and Ngram Statistics Package (NSP) (Banerjee and Pedersen 2003) for document analysis.

Outline

Chapter 2 focuses on three interrelated bodies of theory: the politics of knowledge; networks and networked governance; and the political ecology of conservation. The politics of knowledge includes both epistemology and ontology, and questions of why people know what they know; what people believe, what they can believe, and how they believe it. It is rooted in the Sociology of Scientific Knowledge (SSK) and Actor-Network Theory (ANT). WWF explicitly trades in, constructs, and modifies knowledge as part of an ongoing political project of conservation. How staff work to assemble knowledge and how that knowledge is translated across space and time are core questions both for this research and for the organization itself.

Since WWF's work in the Arctic is self-described as a network, and the organization has moved toward a form of networked governance (C. Jones, Hesterly, and Borgatti 2009), a network analysis methodology was employed during the research. Also in Chapter 2, I review literature on networks: networked governance, network structure, and the production of Actor-Networks. Much of the day-to-day work of WWF in the Arctic involves defining, creating, and reinforcing networks of staff, stakeholders, and would-be-stakeholders. Networks and power reiterate old but still relevant anthropological questions of structure and agency (Layder 1985).

As WWF works in the Arctic, power is distributed heterogeneously. The study of political ecology combines the political economy's interest in power and distribution with the relational approach of ecology (Greenberg and Park 1994). In this section, I explore the relevant political ecology literature focusing on the political ecology of transnational conservation, conservation in the Arctic, and international environmental agreements. In the words of Arturo Escobar (Escobar 2007,107):

> the focus is on the objective, albeit historical, processes of assembly through which a wide range of social entities, from persons to nation-states, come into being. The main objects of study are 'assemblages', defined as wholes whose properties emerge from the interactions between parts; they can be any entity: interpersonal networks, cities, markets, nation-states, etc.

There are sets of ecological relations here involving species, treaties, humans, and machines—technologies of conservation within and around WWF's network.

In Chapter 3, I draw from archival data, including official archives from Oslo and Anchorage and over 20 years of WWF Arctic Program publications. I also draw on numerous interviews with both long-time WWF employees and former WWF staff. Combining these sources, I focus on changes in conservation practice within the GAP

from 1992 to the present, and concomitant epistemological changes within the organization. Based on ethnographic study in WWF's offices in Canada, Russia, Norway, and the USA along with text analysis of WWF archives, I examine shifts in what is considered appropriate ecological knowledge for conservation. As ideas about ecology and conservation have changed, some conservation practices remain the same—with climate change presented as renewed justification for both existing practices and innovative programs.

Chapter 4 is a view of WWF's network from inside and out. In this chapter, I draw on dozens of interviews with current and former WWF staff and their collaborators, meeting notes, formal Ego-Centric Network interviews, and documents produced by WWF. First, I focus on internal and external perceptions of the WWF network, compared with my analysis of the "actual" network; secondly, I look deeper at the ways that the WWF staff works explicitly to extend and maintain their network ties, and the tension in talking about the network: that the network is both historically rooted (and therefore stable) and unstable (and therefore in need of continual defense and fortification). The question of actual versus perceived network structure is one that was posed by WWF staff early in the research development process.

Chapter 5 explores the relationship between the production and maintenance of knowledge and the production and maintenance of WWF's network itself. Drawing on the work of Agrawal (1995), Bateson and Bateson (1987), Berkes and Berkes (2009), Latour (2007a, 2007b), Nonaka 1994), and Whitehead (1929), I examine the convolution of knowledge and network within WWF to show that these two concepts are, in fact, identical processes united through the process of translation (Callon 1986).

I explore reconfigurations of scale and development of knowledge in two WWF Arctic conservation projects. In each case, action occurs through networks of individuals, organizations, species, maps, texts, and tools. The broad strokes of conservation project development here follow Callon's four moments of translation. In both projects, enrollment is complicated by WWF desire to maintain control over the resulting Actor-Network. Taking a view based on political ecology allows for an examination of the development of power and knowledge in the conservation process. The resulting picture fits more easily into a flattened anthropology without scale (Marston et al. 2005).

In the final chapter, Chapter 6, I draw together overarching conclusions and present a summary of recommendations: both for WWF and for other researchers attempting global ethnographies. The first section of this chapter looks at the research process including limitations, successes, and lessons learned. The second section covers some key theoretical points arising from this research. The final section is a listing of takeaway points for consideration of conservationists and environmentalists in general and WWF in particular.

What began as a collaborative project, with negotiation of my research questions (broadly focused on institutions, network structure, and organizational culture) and research sites (key Arctic network offices), was challenging to operationalize—at least in part due to the non-hierarchical structure of the larger WWF network. As an anthropologist "insinuating myself" (Holmes and Marcus 2008) into a loose non-hierarchical organization, the opportunities for deep collaboration were limited and fragmentary. Working within this transnational network through time and across

continents led me away from traditionally imagined fieldwork and toward an episodic anthropology—one that echoed the episodic connections within the organization itself.

However, as actors responded to my research efforts in ways that insinuated their own understandings and meanings, the research process became more collaborative in a para-ethnographic sense (Holmes and Marcus 2006; Holmes and Marcus 2008; Holmes and Marcus 2012). Entering into research, the anthropologist becomes part of the network, and in the process stories are created by, for, and with the ethnographer. All of these narratives produce potential reflections that reveal the logic of associations and justifications for action within WWF.

CHAPTER 2

EMBEDDED KNOWLEDGE, EMBEDDED CULTURE

> …domestic research has never been valued very highly in our discipline, nor has the application of anthropology to the solution of real world problems. I am advocating the relocation of both engaged and domestic research from anthropology's periphery toward its center… . To move engaged domestic research toward the center of the discipline may be, ipso facto, to move anthropology as a whole toward a more central position in our society's attempts to reflect upon and to deal with its own vexations and agonies-to anthropologize, so to speak, public discourse (Rappaport 1993,295).

In this chapter, I describe the theoretical context around my approach to research within WWF. I begin with reflections on collaboration, and on the nature of organizations and institutions. I then turn to a discussion of three interrelated bodies of theory: the politics of knowledge; networks and networked governance; and the political ecology of conservation. As WWF works across the Arctic, they engage in the development, transmission, and transformation of specialized knowledge across their conservation network. Those knowledge processes operate in service of WWF's political goals in the Arctic, which are centered on the conservation of Arctic species and ecosystems.

The politics of knowledge includes both epistemology and ontology, and questions of why people know what they know. The study of the politics of knowledge is rooted in the Sociology of Scientific Knowledge (SSK) and Actor-Network Theory (ANT). How staff work to assemble knowledge and how that knowledge is translated across space and time through the WWF network are core questions both for this research and for the organization itself.

WWF explicitly identifies its own operation as a network. In terms of network theory, I address network governance—the flat, minimally-hierarchical management structure found within WWF (C. Jones, Hesterly, and Borgatti 2009). I also address key tenets of both social network analysis and Actor-Network Theory, each of which I employ in later chapters.

Lastly, I discuss the political ecology of conservation. As WWF works in the Arctic, power is distributed heterogeneously. The study of political ecology combines the political economy's interest in power and distribution with the relational approach of ecology (Greenberg and Park 1994). In this section, I explore the relevant political ecology literature focusing on the political ecology of climate change, transnational conservation, and international environmental agreements.

Collaborative Process

As I discussed in Chapter 1, my approach to this research began with a commitment to collaborative principles. At the same time, there were challenges to this collaborative approach—in terms of access, in my own understanding of WWF staff expectations, and also in that the questions developed within WWF international were not necessarily the same ones that WWF Arctic staff would have asked.

Rather than a formal and explicit collaboration, what emerged was a more nuanced and tentative approach resembling what has recently been termed *para-ethnography* (D. R. Holmes and Marcus 2005, 2006, 2012; Marcus 2013). Para-ethnography describes research in multi-sited settings that privileges the knowledge of "the professional, the expert, and the mundanely powerful" (Marcus 2013,208) by recognizing and working with their own conceptual frameworks. Para-ethnography also

leads to novel fieldwork designs to address the challenge of working in globalized, technological settings (Marcus 2013). WWF has an internal culture that values non-hierarchical interactions between offices, but also relies on internal reporting and program evaluations—information gathering that resembles some anthropological modes of data collection. WWF holds meetings instead of focus groups, uses phone calls and emails in place of interviews, and produces minutes and reports instead of field notes. They have personal and institutional preparations in place to interpret and describe the complex world in which they work. The subjects of my research, then, are on a parallel journey to mine as an ethnographer. Tapping into the analytic capabilities of WWF staff moves the research away from the imagined lone researcher conducting ethnography toward a more collaborative para-ethnography (Holmes and Marcus 2008; Holmes and Marcus 2006; Marcus 2007a).

The use of collaborative methods has been described as an ethical imperative (Lassiter 2001, 2005). The negotiation and renegotiation of research ethics, expectations, and procedures takes place within relational spaces when the focus of the research turns inward toward the research itself (Gustavson and Cytrynbaum 2003; Stening and Skubik 2007). Navigating this changing terrain while continuing to fit within the institutional guidelines of academia is an increasingly important challenge for researchers (Niks 2004). The micro-politics of authority come into play here (as in power differences between interviewer and interviewee), as does the recognition of counter-expertise—both within the organization and between organizational actors and the researcher (Fortun and Cherkasky 1998; Fortun 1998). Collaboration becomes the recognition of epistemological pluralism as a resource rather than a problem (Fortun and Cherkasky 1998,146).

Collaboration within non-traditional research contexts (studying up, multi-sited ethnography, global ethnography) calls for a turn away from traditional ideas of rapport toward a complicity that recognizes the researcher as an outsider (Marcus 1997). Complicity may be productive, in the sense that experts are complicit in the development of the research project (Marcus 1997). New reflections on collaboration and complicity follow directly from new research contexts, critical reflection on the positioning of researchers, and new approaches to writing ethnography (Clifford and Marcus 1986; Marcus 1997, 2007). Anthropologists and their collaborators are mutually complicit in a process of culture-making (Myers 2006). A research process that begins collaboratively may also help to open access for later researchers (Sridhar 2005).

Studies of Institutions and Organizations

"Institutional ethnography" and "organizational ethnography" are used interchangeably by many social scientists. I distinguish organizations from institutions (Following Brechin, Wilshusen, and Benjamin 2003; North 1990; W. R. Scott 2007). Organizations may include corporations, non-government organizations, social movements, and various types of publics. What they have in common is an ability to exercise group action, so that the entire organization becomes an actor (itself composed of other actors, *sensu* Latour 2005). Institutions, on the other hand, are the rules—both formal and informal—that govern everyday activities in society. Dorothy Smith[6] describes institutions as the "ruling relations" that cut off work-selves from bodily lives as mothers, spouses, and other identities (D. E. Smith 1989, 2005, 2006). North (1990)

6 When discussing Dorothy Smith's variant of Institutional Ethnography (Smith 2005; Smith 2006) I will use initial capital letters.

notes in particular that organizations arise as a consequence of institutional opportunities, and in working toward their missions act as agents of institutional change.

Studying Up

Both institutional and organizational ethnography may be considered as forms of "studying up" (Nader 1972). Nader coined the term "studying up" to describe studies of bureaucracy, upper classes, and businesses: looking "up" instead of "down." Traditionally, anthropology has focused on studies of subaltern peoples and local populations. Studying up would serve a democratic function by providing information about institutions that constrain the lives of citizens while bringing a balance to anthropology encouraging the study of all people—not just those with less power.

Within anthropology, several factors have limited the full realization of studying up. The institutional culture of the discipline still valorizes the study of remote others, though the environment has shifted (Gusterson 1997; Rappaport 1993). The academy also tends to avoid study in areas of conflict (Nader et al. 1997). These may be conflicts in sense of war or in a sense similar to Rappaport's (1993) "Anthropology of Trouble." Rappaport is talking about a non-neutral anthropology addressing and correcting a broad array of domestic social and ecological problems. Meanwhile Nader addresses the ways that structural power in the discipline of anthropology keeps studying up from being realized (Nader et al. 1997).

The relative power of upper classes, leaders, and businesses also limits access for the would-be researcher, as does the non-residential setting, which is very different from the ethnography of the Malinowskian imaginary. Within this context, participant engagement remains problematic, and Gusterson (1997) suggests replacing it in expert

and professional contexts with "polymorphous engagement" or mixed methods: combining aspects of interviewing, text analysis, participant observation, and other techniques across multiple sites, including telephone and email interviews.

Studying up requires anthropologists to realize that our research subjects—our interlocutors—are literate participants who will read what is written about them, making the development of an ongoing dialogue important. As anthropologists have deepened their social ties with those they study, the writing of ethnography has become increasingly problematic (Mosse 2006). Earlier ethnographic writing has given way to dialog, then to collaboration. This collaboration is especially problematic in cases where anthropologists are studying powerful organizations or states—where they may face "public and formal reprimands, or even the threat of defamation proceedings, for their ethnographic accounts" (Mosse 2006,938). Mosse describes this type of ethnography as anti-social because it cuts social ties and breaks relationships.

Mosse refers to his work as the ethnography of objection—a term that echoes the Burawoy's (1998) take on the extended case method and Smith's institutional ethnography, as well as Latour's idea of objectivity as allowing subjects "to object" (Latour 2000,115). Mosse suggests that objections arise within organizations when powerful actors seek to maintain their projects as "systems of representations" against competing representations—including ethnographic ones (Mosse 2006,942). As with Nader and Gusterson, Mosse does not see these difficulties as reasons to avoid studying up. Rather, they are key cultural structures that must be included within the scope of research.

Institutions

In contrast to human organizations, institutions are those formal and informal mechanisms or rules developed by humans for structuring human behavior (Agrawal 2001, 2008; North 1990; Ostrom 1990). Institutions are important in the ways that different organizations assemble, perform, and interact. These rules arise based on historical contingency, tradition, and social interactions—sometimes as a direct result of the work of organizations (North 1990). Dorothy Smith (1989, 2005, 2006) refers to her Institutional Ethnography as the study of the ruling relations—and the study of institutional relationships is acutely important for the project of studying up.

These ruling relations can also result in tension when institutions vary between organizations or when human institutions and ecological realities do not align (K. Brown 2003b). As Ken MacDonald has written in his call for institutional ethnography:

> ...localized human-environment relations have become the object of knowledge and action for international development and conservation organizations, which explicitly strive to alter localized human/environment relations in particularized ways that satisfy institutional agendas (MacDonald 2002).

Those human-environment relations are governed by institutions, and changing those institutions has become a priority for conservation organizations.

Ostrom (2008) has written about the analysis of changing institutions, noting (based on Nepalese irrigation systems) that while institutions continually evolve the development of new institutions is dependent on participation, openness, and adaptability. The engineering of new institutions has become a topic of interest within the field of conservation and sustainable development, as seen in the 2003 World Bank report on Sustainable Development in a Dynamic World (World Bank 2003).

Institutions as conceptualized by the World Bank (2003), Ostrom (2008) and many others are the agreed-upon constraints that govern individual behavior: multiscalar and interacting, possibly conflicting (1999). These approaches and others such as the Institutional Analysis and Development (IAD) framework proposed by Elinor Ostrom and others (Ostrom 2011) differ substantially from the Institutional Ethnography approach proposed by Smith (D. E. Smith 1989, 2001, 2005, 2006). Considering the interplay of institutions at different levels (local, national, international, etc.) Smith's Institutional Ethnography (IE) focuses in particular on texts as mediators of behavior in the lived experiences of people.

Textual institutions may include internal both organizational documents (Lewis et al. 2003) and policy texts. Once a relation is set within an official text, it may become both fixed and portable; what Latour would call an immutable mobile (Latour 2007b). These texts are additive—once a phrase is in place, it can serve as script for a range of political projects and become both difficult to dislodge and easy to repeat from document to document. For example, 2008 IUCN negotiations on biofuels policy energy framed biofuels in terms of energy for sustainable development—language that descended directly from text that was developed years earlier (Maclin and Bello 2010).

Organizations

One question that arose early in the study of organizations is how they form: how does a group come to behave as a singular actor? How does a set of "micro-actors" develop into a "macro-actor"? This question is addressed at length by Callon and Latour (Callon and Latour 1981), who take the question back even further to Hobbes and the idea of the social contract. Callon and Latour argue that the Hobbesian social contract is a

particular type of a more general phenomenon of "translation," through which an actor enrolls other actors into a project. In the process, the knowledge and actions of individual actors are translated into support of the Actor-Network. I discuss this phenomenon further later in this chapter in the section on Actor-Network Theory (ANT).

As individuals come together within organizations, the rules for formal work may differ substantially from the ways that people actually work. The actual work of people depends highly upon their embeddedness in communities of practice and material networks (J. S. Brown and Duguid 1991). Those internal networks are important in the development of organizational knowledge, as are external networks of other organizations and communities (J. S. Brown and Duguid 2001).

Benson (1975) views interorganizational networks as a specialized type of political economy, based on his work in a series of human service organizations. In this view, decision makers within organizations, particularly large and complex organizations, are concerned with maintaining the flow of two core resources: money and legitimacy, which organizations will defend and seek to expand when possible.

Studying projects involving multiple organizations requires attention to context, practice, and power. Research by Lewis, et al. (Lewis et al. 2003), conducted in World Bank development projects in Bangladesh, Burkina Faso, and Peru, suggests that an understanding of divergent or convergent organizational cultures is important for understanding outcomes when multiple organizations interface around a single project or issue. Attention to culture among collaborating organizations is important here for two reasons. WWF partners with other organizations in order to achieve conservation goals. At the same time, WWF itself is composed of multiple, interacting, and largely

independent sub-units—meaning that WWF is on its own a type of inter-organizational collaboration.

Politics of Knowledge

Much of WWF's work involves collecting, transmitting, sharing, and transforming knowledge. Organizations for which knowledge is a key asset or product are *knowledge-intensive firms*, also called *knowledge organizations* (Alvesson 1993; Blackler 1995; Starbuck 1992; Styhre 2002; Swart and Kinnie 2003). The staff of these organizations are experts, knowledge workers, or what Robert Reich calls symbolic analysts (D. R. Holmes and Marcus 2006; Reich 1991). Alvesson (1993) notes five roles of knowledge within organizations beyond the functional aspect of knowledge in doing work:

> Knowledge plays other roles such as (a) a means for creating community and social identity through offering organizational members a shared language and promoting their self esteem; (b) a resource for persuasion in, for example, PR work and interactions with customers; (c) providing the company with a profile (an intended image targeted at the market); (d) creating legitimacy and good faith regarding actions and outcomes, and (e) obscuring uncertainty and counteracting reflection. This last point indicates that 'knowledge' and 'knowledge work' may lead to the reverse of what it claims, that is, to ignorance and uncritical attitudes (Alvesson 1993,1011).

As a knowledge organization, WWF's work often involves internal discussion of what actually constitutes appropriate knowledge for publication, branding, and promotion of conservation. In the next sections, I review three threads of knowledge studies that are relevant to this dissertation: studies of science and scientific knowledge, knowledge and power, and the subject of ignorance.

Scientific Knowledge

Social scientists have approached the understanding of scientific knowledge from several perspectives. Within the social sciences, these approaches fall largely under the umbrella of what is now called Science and Technology Studies[7] (STS). Within this umbrella, STS has produced two main intellectual threads: the Sociology of Scientific Knowledge (SSK) and Actor-Network Theory (ANT) (Law 2011).

SSK has emphasized the social construction of knowledge with the perspective that our knowledge could have been otherwise. SSK deals with scientific epistemology—how scientists come to know what they know. It is rooted in works on the history and philosophy of science including those by Michael Polanyi (1950, 1952, 1966) and Thomas Kuhn (1962). Jacobs (2003) has argued that Polanyi's idea of the "logical gap" (Polanyi 1958,151 in Jacobs 2003), which later influenced Kuhn and Feyerabend's ideas of incommensurability of scientific paradigms, was in turn influenced by St. Augustine's writings on conversion and Evans-Pritchard's studies of alternate logical systems among Azande (Evans-Pritchard 1937).

SSK places research within laboratories, offices, and field sites where scientists work, and outside the lab where science is read, performed, used, praised, or denied. By recognizing that scientific and technological knowledge are socially created, they also connect science directly to politics. Viewing scientific knowledge as constructed and ideological rather than inevitable and ethically neutral may also open space for innovation and creation of new social/material relations (Harvey 1974). Looking more deeply into the sociology and history of science allows for untold stories—hidden

7 STS is also sometimes rendered as Science, Technology, and Society.

agencies—to come to light and has the potential to contribute to the democratization of science (Jasanoff 2000).

Partially in response to Harding's (1986) calls for a "successor science," Haraway (1988) brings together feminist critique with constructivism, suggesting that knowledge is situated within particular subject positions. This situated knowledge attempts to avoid the "god trick" of "seeing everything from nowhere" (Haraway 1988,581) by stressing the perspective of the viewer.

Tsoukas (1997,827) points out that modern society tends to conceive of knowledge as information: "objectified, commodified, abstract, decontextualized representations." A politics of knowledge approach recontextualizes and subjectifies knowledge. While social network analysis is useful for studying the spread of information, the study of knowledge requires a different approach, one that aligns more comfortably with Actor-Network Theory (ANT).

With ANT, scientists have suggested a symmetrical redefinition of both science and society as a way of resolving problems within the STS program (Latour 2000, 2007b). Latour considers "social" as an adjective describing heterogeneous associations—between people, groups, objects, theories, and documents. The creation of the "social" becomes the thing to be explained. Central to understanding ANT are the definitions of "social" and "science" put forward by Latour, referenced above. By relying on a symmetrical and agnostic view—not considering categories of phenomena to exist a priori without a transaction of some type—ANT seeks to find the "missing masses" (Latour 1992b) within sociology, showing the interrelatedness of humans, nature, and technology.

Law (2007) describes the idea that all things are effects of the web of relations in which they are located as a "material-semiotic" approach. The non-human "things" that work within this system are sometimes described as "actants" (Latour 1992). Whether actors or actants, "if non-humans are actants [actors], then we need a way of determining their power. This is the business of scientists and technologists" (Collins and Yearley 1992,322). The ANT perspective is both ontological and epistemological: it concerns what social scientists see as existing within their realm of study, as well as how they produce their own knowledges.

ANT argues that while the expertise of knowledge workers is dependent on heterogeneous networks of actors/materials/technologies, that complexity is glossed over or "black boxed" until such time as it is called into question (Latour 1987, 2007a; Law 2007). Similarly, an ANT perspective on knowledge development and transformation relies on the concept of heterogeneous networks—a process of translation that I will discuss further in the section on networks.

Knowledge and Power

Although power is certainly addressed in some types of SSK and STS (Callon 1986; Castree 2002; Latour 2004; Murdoch 1997, 1998), focusing on the power-knowledge nexus only from within a sociology of knowledge framework misses key parts of the literature. One of the insights of Michel Foucault is that power and knowledge are two sides of a coin: "there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations" (Foucault 1995,28). Power determines, in this sense, both epistemology and ontology. This does not mean that power lies behind knowledge (or

other activities) but that the process of undertaking activities is power (Latour 2005,86). In Foucault's (1995) description of the Panopticon, complete vision serves to create and strengthen the imbalance of power/knowledge between the all-seeing guards and the non-seeing (but observed) prisoner. The metaphor here is important; the link of vision to knowledge and power calls to mind Haraway's (1988) situated knowledges, Scott's (1998) legibility, and Geertz's (1973) ideas of reading culture, as well as other visual metaphors for understanding knowledge as topology (Law 1999).

In *Seeing Like a State* (1998), Scott looks at technologies of legibility and simplification as key reasons for the failure of some social schemes. States in their quest for modernization seek to render their population legible—easily classified and understood. As they go through this process, they engage in simplification. From a Foucaultian standpoint, the process of simplification is no different from the creation of knowledge about citizens. What is concealed in this process is the presence of other knowledges—local and specific knowledges relating to work, the environment, and other aspects of culture. Scott (1998) also relates legibility to Foucault's idea of Governmentality (Foucault 2007): knowledge of how to govern and be governed (Foucault et al. 1991,7).

Foucault's governmentality is not an idea restricted to governments. Ferguson (1994) sees governmentality as a key issue in the "anti-politics" of development in Lesotho—in that development organizations expect governments to govern in certain ways. In this sense, development organizations have their own governmentality, and also act to increase legibility through processes of simplification. In the process of instituting development while misunderstanding government, politics is performed silently: hidden

by “the anti-politics machine” (Ferguson 1994). What Ferguson, Foucault, and Scott share is a concept of power/knowledge articulated across domains. Luke (1995) takes the idea of governmentality and transposes it onto environment as “environmentality,” an environmental rationality that constitutes knowledge about how to think about and manage space and nature.

Closely related to legibility are questions of legitimacy. When is knowledge considered to be legitimate? Knowledges not fitting within the simplifications of states (Scott 1998) and organizations (Luke 1995), that escape visibility (Strathern 2000), or that directly challenge power (Foucault 1982, 1995) may be seen as illegitimate. Legitimacy of scientific knowledge is a key question, for example in the case of climate change, where an article appearing to question scientific legitimacy on the basis of social construction (Boehmer-Christiansen 2003) has contributed to online debate. Benson (1975) links legitimacy to authority, specifically authority to make claims within professional knowledge domains.

In the face of public discourse, scientists increasingly participate in activities such as press conferences designed to “shore up” their legitimacy (Epstein 1996,16). Epstein looks at the role of lay experts in the development of AIDS treatments, showing the development of credibility and legitimacy within discourse as well as the permeability of science’s borders. The discursive development of legitimacy can also be seen in a popular example presented by Lynch (1998): the double murder trial of O.J. Simpson. Lynch reviews the Simpson case to show how credibility and legitimacy are alternately built and destroyed through testimony, particularly focusing on the science of DNA evidence. An individual’s political views also contribute to the legitimacy of knowledge. Dan Kahan

and his associates (Kahan 2006, Kahan et al 2011), in a wide-ranging set of experiments, show that individuals accept or reject "facts" based on whether they strengthen or weaken ties to other community members, rather than basing fact acceptance on scientific authority or reasoning.

Knowledge systems within organizations may gain (or lose) legitimacy based on perceptions that they reflect the values and beliefs of stakeholders (Jackson 2007), again showing the importance of context to legitimacy. Jackson (2007) shows that transparency and participation do not consistently increase legitimacy of the knowledge system within the Global Environmental Facility (GEF), and may instead be perceived as an attempt to extend the organization's influence. Perceived legitimacy is important for supporting effective organizational decision-making (Jackson 2007).

Ignorance

Rather than a simple absence of knowledge, social scientists have shown that ignorance is constructed both as a by-product of knowledge and as a political strategy. Alvesson (1993) suggested that knowledge organizations may actually create ignorance by downplaying simplifications and minimizing reflection. Turning back to the metaphor of vision, Strathern (2000) asks the provocative question: "what does visibility conceal" (Strathern 2000,310)? She argues that institutionalized transparency (more visibility) conceals processes in two ways; first, as a result of relying on formal institutional structures (such as reports on recent publications) organizations become blinded to other ways that people work. Secondly, since institutional forms do not always match with the actual temporality of social processes, an entire type of reality falls into shadow. Mathews (2005) makes similar points in his institutional ethnography of SEMARNAP in

Mexico, when he argues that governmentality includes not only power/knowledge but also power/ignorance, and that the blind spots of government are important links across power that may be both officially and unofficially sustained. Dove (1983) similarly shows how a continuing political economy of ignorance—in this case government ignorance of how swidden agriculture actually functions—enables the development of authoritative and intrusive institutions. This political economy resembles Harding's (2006,20) idea of "systematic interested ignorance," in which the dominance of bourgeois interests results in ongoing ignorance of women and the global South.

Smithson (1985) draws from SSK to form a social theory of ignorance, emphasizing that ignorance is socially constructed and should not be thought of as merely the lack of or opposite of knowledge. Smithson points out that ignorance may variously increase or decrease social standing, and that ignorance may be used as a form of legitimation (for additional research, for example). Following along these lines, Townley (2006) argues that ignorance may serve instrumental purposes—as an epistemological aid for increasing knowledge or as a necessary element in building trust.

Networks and Networking

There are several varieties of social network research that, to various degrees, overlap, support one another, or exist in relative independence. Network governance describes an approach to management that relies on a embeddedness coupled with a flat (non-hierarchical) organizational structure. Social network analysis provides a strong quantitative framework (some would say overly deterministic) for describing roles, linkages, and positioning within networks. Actor-Network Theory is separated from other

forms of network research by an ontological gap regarding the rhizomatic nature of existence.

Network Governance

Granovetter's (1985) conception of "embeddedness" changed the focus of social network research from one of structure and position to one of institutional context, while shifting methodology from quantitative sociometrics to qualitative case studies (Grabher 2006,164). This embeddedness is horizontal—reflecting an interpenetration of cultural domains—rather than a vertical or hierarchical embeddedness, as of the local within the global (Schweizer 1997). Granovetter's introduction of embeddedness was a reaction to both the undersocialization of individuals by economists and Hobbesian social scientists and the ensuing reactionary oversocialization of individuals by sociologists such as Talcott Parsons. Granovetter suggested that behavior (particularly economic behavior, in this case, but generalizable to most behavior) is embedded in networks of interpersonal relations (Granovetter 1985). Structural embeddedness increases individual constraints within the network (Hudson 2004). As opposed to transaction cost economics, embeddedness and the network governance view do not see economic performance as the primary driver of exchange behavior.

Prior to the development of a network governance perspective rooted in embeddedness, management structures were seen as being either market-driven (a marketplace of ideas in which competition determined success) or hierarchical (top-down structures where strong leadership was key to success). Granovetter's embeddedness had particular resonance within economic sociology and economic geography, where it provided not only an alternative to the pre-existing hierarchy – market dichotomy but

also a conception of networks as specific governance structures. This network governance is decentralized and horizontal, presenting an alternative to hierarchical top-down or bottom-up governance structures.

Network governance has been envisioned as a rethinking of democratic theory (Sørensen and Kakihara 2002), as a connection to Benson's (1975) work on interorganizational networks, particularly provider and policy networks (Hudson 2004), and as a key tenet in understanding the politics of urban sustainability (Bulkeley and Betsill 2005). In network governance it is the social and institutional embeddedness of actors that largely determines behavior. Much of the research on network governance has remained within the economic realm, though there has been a recent trend of its use in management and organizational studies (Borgatti and Foster 2003). The network governance perspective has been criticized for underplaying the role of authoritative governments (Kemp et al. 2005). The network governance approach not only stands in contrast to hierarchy—market governance, but also to new forms of bazaar governance (Demil and Lecocq 2005) in which anonymity precludes reciprocity, open membership prevents member selection, and open access to resources eschews private ownership.

Social Network Analysis

Social network analysis focuses attention on quantitative descriptions of network interactions and positioning within networks. Social network analysis follows an anticategorical imperative (Emirbayer and Goodwin 2004), meaning that it rejects categorical attributes of individuals as determinants of behavior, relying instead on relational attributes. Network analysis tends to describe social structure in terms of

relations between nodes and positioning of nodes within the network, with centrally positioned actors holding relatively more power (Emirbayer et al. 2007; Yeung 2005,45).

While structural network analysis has succeeded in operationalizing the interpersonal networks in which individuals are embedded, some argue that is has done so in an overly structural way at the expense of process and agency (Emirbayer and Goodwin 2004). Table 2.1 presents a listing of key terms in social network analysis and brief descriptions of each.

Table 2.1: Key ideas in network theory.

Concept	Description
Heterogeneity	*Material heterogeneity.* It is the patterning of heterogeneous networks that creates the social; in fact "all phenomena are the effect or the product of heterogeneous networks" (Law 1992,5). Heterogeneous networks become temporarily stable, or punctualized—and it is these punctualizations that Actor-Network Theory studies. The materially heterogeneous nature of networks is what allows them to reproduce themselves. *Relational heterogeneity.* Heterogeneous relational geometries in social network analysis are reflective of heterogeneous power relations. Moreover, heterogeneous relational geometries produce power as an emergent effect that is greater than the sums of individual nodes (Yeung 2005).
Centrality	This is a key factor in the exertion of social influence, problem solving capacity, and organizational development. Centrality is related to betweenness (the number of other points that a node lies between), closeness (the distance to other nodes), and degree (the number of nodes connected to a particular node), and has been detailed by Freeman (1978). Centrality is linked to positions of power within network structure.
Social Cognition	The ways in which individuals see their own network (and their place within it) have an impact on the structure of the network (Borgatti and Foster 2003). Moreover, an ability to accurately cognize informal network structure is related to positions of power within that network; either because accurately identifying network structure is itself empowering (Krackhardt 1990) or because positions of power allow for the accurate estimation (or control) of network structure.

Small worlds	Small world networks are heterogeneous networks with low reachability, which is to say that information requires few steps to move throughout the network. Milgram (1967) conducted the first large-scale small world experiment, in which he directed individuals to pass a package through their personal network toward a target person in another part of the country. Milgram and subsequent researchers developed the now-popular concept of "six degrees of separation," meaning that in small world networks any individual is generally separated from any other individual by six or fewer links. Information within small worlds diffuses in three stages, first through cliques, then between cliques, and lastly to individuals who are disconnected from the larger network (Granovetter 1973; White and Houseman 2002).
Cognitive Maximum	Researchers have postulated a cognitive maximum for social network size of around 150 individuals based on the size of the human neocortex (Dunbar 1993), sometimes referred to as Dunbar's Law. If there is a cognitive maximum on immediate network contacts, this has an implication for the creation of large-scale networks that may need to be subdivided into clusters for maximum effectiveness.
Tie Strength	Granovetter (1973, 1983) argued that the degree of overlap of individual's personal networks is proportional to the strength of their connection. Friends tend to cluster, and a network with only strong connections would be small and insular. Weak connections are structurally important for extending the reach of networks and promoting the large-scale diffusion of innovation and influence. Weak connections may function by bridging structural holes (Burt 1992)—gaps between smaller networks of connected nodes. Weaker bridging ties are important for reaching a diverse pool of resources and enhancing resilience, whereas networks of only strong links are rigid and constraining (Newman 2005). Within institutional contexts, weak ties are important for the transfer of knowledge between subunits, though weak ties may slow projects where the knowledge to be transferred is complex—since complex knowledge moves more readily along strong ties (Hansen 1999).
Scale	ANT networks are free of scale (not 'scale-free') because of the ANT rejection of hierarchy and the local/global dichotomy and the symmetrical positioning of actors within the network. Although networks may have a geographic component they operate not only through prescribed space (which may be temporarily fixed) but also through non-physical spaces of negotiation (Murdoch 1998), making descriptions of network scale problematic.

Actor Network Theory

A very different take on networks is found in Actor-Network Theory, a view that grew out of STS (Latour 1992b; Law 1999, 2011). The network, seen through the lens of social network analysis, is suggestive of a dichotomy of the individual vs. the social—a dichotomy which Actor-Network Theory (ANT) specifically seeks to transcend (Castree 2002). Not that dichotomies do not exist, but that they have no a priori reason to exist—they come about as effects of networked processes (Law 1999). Whereas in other forms of social network research, "the central argument of network research is that actors are embedded in networks of interconnected social relationships that offer opportunities for and constraints on behavior" (Brass 2004,795), while in ANT "the social is nothing other than patterned networks of heterogeneous materials" (Law 2003,2) including humans but also networks, money, buildings, machines and other non-human entities. Networks are seen not only as constrains upon individual agency but as actors in and of themselves. Moreover, The non-scalar nature of networks—networks being all that there is to study—removes from discussion such concepts as top-down vs. bottom-up and large-scale vs. small scale (Latour 1999, 2007b) and implies that all actors, regardless of apparent hierarchical rank, should be studied in essentially the same way.

ANT, also referred to as the sociology of *translation*, is rooted in three key principles: impartiality between actors, symmetry in explanation of conflicting viewpoints, and an abandonment of the nature/society dichotomy (Callon 1986). Translation is a continuous and reversible process including "negotiations, intrigues, calculations, acts of persuasion and violence" (Callon and Latour 1981,279). Callon (1986) goes on to identify four moments of translation: problematization (problem

definition), interessement (assigning and accepting roles), enrollment (strengthening links between diverse actors) and mobilization (the network taking action through key spokespersons). Each of these is a set of processes, and the entire translation process may occur simultaneously, and may fail. Micro-actors become macro-actors by enrolling others and by accumulating durable materials and institutions—placing those relations into "black boxes" where they no longer need to be considered (Callon and Latour 1981,284).

Actor-Network Theory has been criticized for, among other things, being as totalizing as any other system of network studies (S. D. Brown and Capdevila 1999). Miettinen (1999) has presented three specific problems with the generalized symmetry of ANT: that it makes the structuring of analysis difficult, particularly in heterogeneous networks; that the presence of silent actors causes ANT to exaggerate asymmetry; and that ANT underestimates the importance of human intentionality and learning—particularly in the context of innovation. I attempt to address these criticisms in my own research by combining the use of an ANT framework with other perspectives (text analysis and social network analysis for example) and a mixed-methods approach (Gusterson 1997) to research within WWF's Global Arctic Program.

Teams and Communities

Within a single network, the distributed nature of knowledge leads to the need for transactive memory: actors need to know who knows what in order to access and utilize information (Borgatti and Foster 2003). Knowing-who-knows is a feature of personal or egocentric networks. Although workplaces, even those relying on computer supported cooperative work, often plan on the creation of teams and consider these to be the

primary work unit, it is often personal workplace networks that act as main worker resources (Nardi et al. 2002). Within institutions, social networks not only operate at the level of the individual but also between and within subgroups or blocks that may be identified mathematically/graphically and ethnographically (Frank 1996). These communities of practice (Borgatti and Foster 2003) are epistemic communities where knowledge is produced and shared and serve as the loci for innovation within the workplace (J. S. Brown and Duguid 1991).

Epistemic communities within and between institutions are places of shared beliefs and values, with new community members adopting those beliefs and values through situated learning and legitimate peripheral participation (Edwards 2001). Subgroups within organizations—teams dedicated to specific projects—may be composed in ways that foster divides or that tie together disparate groups, making the network effect of team composition an important managerial consideration (Katz and Lazer 2003). The divide between institutional and local networks is an artificial one. Not only are there links between community and institutional networks, but studies of decision making among experts (Laumann, Marsden, and Galaskiewicz 2007) have shown that regular communication patterns may become institutionalized within some communities.

While decision-making focuses on choices between several alternatives, problem solving is a creative process in which new alternatives are visualized. Problem solving is an important engine for the evolution of networks, particularly in co-management schemes (Carlsson and Berkes 2005). This innovative aspect of social networks has been linked to endogenous resilience within socioecological systems (Carpenter et al. 2001).

The complexity of these co-management networks, particularly their cross-scalar nature, has also been linked to problem solving capacity (Cash et al. 2006).

Diffusion of Knowledge

Within knowledge organizations, sharing knowledge is an important prerequisite for working effectively (Starbuck 1992; Sveiby and Lloyd 1987; Swart and Kinnie 2003). Social network structure affects the rate at which potential adopters find out about new innovations (Abrahamson 1997). New innovations may spread first through strongly linked networks of experts (Albrecht and Hall 1991), who manage their strong ties in a way that perpetuates their elite status. Prestige effects within social networks have also been shown to influence the likelihood and extent of information transfer (Cho et al. 2002).

A network perspective is useful not only in studying the spread of innovations, but also in identifying the loci of ideation. Powell et al. (1996) have suggested that in rapidly developing technological fields innovations will be developed within interorganizational networks rather than localized within individual firms. The implication for conservation organizations is that single-organization projects may be affected by interorganizational connections, and that the study and assessment of such projects should avoid organizational myopia. Since WWF is, in a sense, an ongoing collaboration of independent National Organizations, a network approach is particularly useful in identifying sites of innovation.

Institutional collaborations

Increasingly, coalitions of NGOs have developed complex formal and informal linkages (W. F. Fisher 1997; Soeftestad and Kashwan 2004; Soeftestad 2002; Soeftestad

et al. 2004), and a network perspective may be a fruitful way of investigating interorganizational dynamics. Within and between individual organizations, communication using new technologies allows for wider networks with restricted dimensionality compared to face-to-face communication. Within interorganizational networks, individuals may also have differing political opportunities and oppositions, regardless of their network position (Stevenson 2000).

Complex international networks of NGOs, governments, and individuals become necessary when problems are conceptualized as highly complex and global (see for example Westley and Vredenburg 1997). A social network approach has been used in studying scientific collaborations (Barabási et al. 2002), in studying the establishment of trust in interagency collaborations (Bardach 1994) and in studies of board interlocks, joint ventures, and inter-firm alliances (Borgatti and Foster 2003). Intra-institutional networks in globalized corporations (Baba 2002) follow similar models.

Particularly within biodiversity conservation, administrators may be tied to the epistemic community of ecologists and more open to explicit programs of interorganizational collaboration and interconnection (Thomas 1997). Networks arise in co-management, which can be viewed as a process of deliberation, negotiation, and learning across heterogeneous state/community networks, evolving through time through continuous problem solving (Carlsson and Berkes 2005). A similar process may occur within WWF, where continuous processes of negotiation and deliberation between offices reinforce the explicitly networked organizational structure.

Networking technologies

New forms of technology from cell phones to the Internet are creating new public spaces (Sheller 2004) and facilitating new network possibilities while transforming existing organizational structures. New tools using email and the Web are attempting to technologically facilitate user collaboration by working adaptively with user feedback (Gaspari et al. 2002). Networking technologies such as the World Wide Web, company intranets, and email not only facilitate collaboration: they reinforce complimentary ideas and put pressure against competing non-network concepts, further promoting the network society (Hartzog 2004). Technological network effects have ripple effects extending offline into organizational structure, product development, and individual expectations (Neff and Stark 2003).

Network Ethnography

Howard (2002) has suggested network ethnography, using social network analysis to lay a framework for ethnographic study. A network ethnography approach is particularly useful in cases where staff interactions are in large part virtual—which limits the range of data that ethnographers can collect through participant observation. It is important to consider the distributed nature of knowledge and social network effects when identifying local experts in studies of local environmental knowledge, since expertise may not be as localized as snowball sampling and institutional perceptions would indicate (Davis and Wagner 2003). In institutional contexts, social network analysis has been used in the localization of experts as in the SELaKT (Sustainable Expert Localization and Knowledge Transfer) system (Mueller-Prothmann and Finke

2004), which helps organizations to retain specialized knowledge, analyze knowledge communities, and track the flow of knowledge within their staff.

Political Ecology of Conservation

For the past several decades, WWF has remained one of the world's leading conservation organizations. WWF sits at the nexus of policy and environment, and as such the current study draws on recent literature on political ecology. Political ecology, as an approach combining political economy and ecology, has long roots within the discipline of anthropology, building on earlier cultural ecology (Steward 1955) and ecological anthropology (Rappaport 1968; Vayda and Rappaport 1968). Along the way, political ecologists working in anthropology and geography have struggled to keep up with changes in the field of ecology (Zimmerer 1994) while maintaining a balance of the ecological and the political (Vayda and Walters 1999; P. A. Walker 2005). From these early roots, political ecology has become a wide-ranging field of study encompassing parts of environmental anthropology and human geography.

Over the past two decades, political ecology has increasingly focused on the practice of biodiversity conservation, as conservation itself has become more socially significant (Vaccaro, Beltran, and Paquet 2013). Political ecology has focused on the ties between conservation and development (K. Brown 1998, 2003a; MacDonald 2010b; West 2006); links between community, participation, and conservation (Berkes 2004; Brosius, Tsing, and Zerner 1998; Orlove and Brush 1996); the role of multiple knowledges in conservation practice (Escobar 1998); indigenous cosmologies in conservation activities (Velásquez Runk 2009); and the practice of conservation in a globalized world (Goldman 2001; Igoe 2005; Zimmerer 2006). Political ecologists have

studied the development of conservation policy (Adger et al. 2001; Adger, Brown, et al. 2003; K. Brown 1998) including collaborative studies of large-scale policy meetings such as the World Conservation Congress (Brosius and Campbell 2010; MacDonald 2010a; Maclin and Bello 2010), and the UN Convention on Biological Diversity (CBD) (C. Corson and MacDonald 2012; Hagerman et al. 2012; MacDonald and Corson 2012; D. Scott et al. 2014). There is also an emerging body of literature on the practices of conservation organizations, focusing on studies from within those organizations themselves (Gatt 2011; Rhee 2006).

While political ecology research has taken place within the Arctic (Ford et al. 2006; Nadasdy 1999, 2003; Richmond et al. 2005), political ecology literature on "the Arctic" as a whole is lacking. I suggest that there are two reasons for this; first, while anthropology has moved toward multi-sited research (Marcus 1995) the "ecology" portion of political ecology remains largely rooted in restricted localities. Second, it may be that unless the Arctic is considered from the external perspective of a transnational organization the entirety of the circumpolar Arctic is difficult to consider as a single "place." Environmental pressure, resource extraction, climate change, and economic growth work together as place-making narratives to create the Arctic as a unified object of exploitation, and as a site in need of rescue (Dalby 2003).

Attempts at protecting the circumpolar Arctic have focused on international conventions such as the Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC) where enforcement is problematic, and attempts at establishing a network of country-based protected areas (Pagnan 2000). According to WWF, neither of these approaches has been effective at

addressing extra-Arctic drivers of Arctic degradation (WWF 2008). Where WWF has perceived some success is within the work of the Arctic Council, which remains simultaneously a key partner of the WWF Global Arctic Program (GAP) and a target of the GAP's ongoing policy work. In the remainder of this section, I focus on recent threads in political ecology that are relevant to this research: climate change, transnational conservation, and environmental policy.

Climate Change

Within the Arctic, climate change has become the key driver behind much of WWF's ongoing conservation work. The contention that local ecological problems may be the ultimate result of extra-local political economy poses difficulties for conservation organizations, both in the categorization of problems and in the complex political issues that ensue (Doane 2007). Much as reflections on categorizations of "nature" (Escobar 1996) and "wilderness" (Cronon 1995) as the products of specific Western discourses have led to a rethinking of conservation, the rise of climate change as a key driver has resulted in both a shift in conservation strategy (as seen in WWF) and an embrace of "carbon logic" (Hagerman et al. 2012) in which climate change becomes a renewed justification for reinforcement of existing practices such as the creation of protected areas and carbon becomes categorized as both a threat (in terms of CO_2) and a resource (in terms of carbon storage).

Within the Arctic and elsewhere globally, political ecology research has focused on local climate adaptation (Adger 2003; Adger, Huq, et al. 2003; Reuveny 2007; Shearer 2012) more heavily than on climate change mitigation (see though Bäckstrand and Lövbrand 2006). Where it has focused on mitigation, it has often been in the context of

policy meetings such as the 10th Conference of the Parties to the CBD (CBD CoP10) where new agendas like TEEB (The Economics of Ecosystems and Biodiversity) are being promoted (MacDonald and Corson 2012). A political ecology approach has also been used when climate change results in policy conflicts, as seen for example in the Canadian Far North Act (P. Smith, Burlando, and Davidson-Hunt 2010), and studies of Inuit women's responses to climate change (Dowsley et al. 2010). As with other political ecology studies of the Arctic, studies of climate change tend to be single-sited and address particular localities rather than being multi-sited studies of larger systems. One reason for the relative lack of political ecology studies on climate change mitigation may be that mitigation attempts (at least in the case of the Arctic) often take place far from the site where effects are being felt.

Transnational Conservation

Within the Arctic, transnational conservation is especially important since many areas of concern either straddle national borders or are completely outside individual national control. Given the internationalization of the state (Brand and Görg 2013), transnational conservation—through the actions of conservation NGOs and international agreements—has become increasingly important. Political ecology has tracked developments in transnational conservation since its inception, often focusing on changing modes of conservation, for example: fortress conservation, sustainable use, community-based natural resource management (CBNRM), community based conservation (CBC), and integrated conservation and development projects (ICDPs). Much of this research has focused on the development of community-based conservation models and the resurgence of protectionist or neo-protectionist conservation (Brechin et

al. 2002; Brosius and Russell 2003; Buscher, Dressler, and Büscher 2007; Dressler et al. 2010; Wilshusen et al. 2002).

Engagement of conservation with communities is made problematic because communities are poorly defined and contain multiple, sometimes conflicting interests (Agrawal and Gibson 1999). On top of this, communities linked to conservation programs often have complex legal statuses, have sometimes grown out of social movements with specific political agendas, and raise questions regarding not only group definition but also questions of group versus individual rights (Brosius, Tsing, and Zerner 1998).

As states, communities, indigenous and environmental social movements, and national and transnational NGOs have come together, discourse has shifted away from political/moral issues toward discussions of institutional development and management (Brosius 1999). Discussions in the social sciences have turned to calls for more effective institutional development at multiple scales (Brechin, Wilshusen, and Benjamin 2003), coupled with institutional ethnography (Heatherington 2005; Macdonald 2002) and event ethnography (Brosius and Campbell 2010) to understand current conservation processes.

Meanwhile, within conservation there have been calls for increased coordination at large scales (Redford et al. 2003). Turns toward large-scale conservation projects have simultaneously reinvigorated calls for increased community involvement in defining and undertaking conservation (Brosius and Russell 2003; Dressler et al. 2010), while charges that large conservation organizations were excluding indigenous groups (M. Chapin 2004) stirred anger and controversy within the conservation community (Flavin 2005). Conservation organizations that want to work with community groups in ICDPs or CBCs

for purely pragmatic reasons have been called to engage stakeholders over issues of rights, rather than simply over economy (Alcorn 2005).

More recently, conversations within conservation have turned toward market-based mechanisms. Many of these follow patterns formerly seen under colonialism, relying on markets as government over incapable local populations (MacDonald and Corson 2012; MacDonald 2005). New market conservation models are tied to earlier attempts to connect conservation with poverty alleviation (Adams et al. 2004), since many modern attempts at integrating conservation and development grow out of a neoliberal global economic philosophy (West 2006). Models of global governance that do not take local and national level complexities into account may be largely unsuccessful (Duffy 2006). The same can be said for the institution of protected areas—failure to consider complex social relations and multiple cultural perceptions can lead to conflict and unexpected social and economic results (West, Igoe, and Brockington 2006).

Environmental Policy

Other emerging areas of study are the anthropology of policy and global policy events. The political ecology of policy includes displacement of politics from conservation through institutionalized simplifications (Brosius 1999c), disconnects between policy discourse and local-scale legibility (Adger et al. 2001), and the ways that policy process can hide the operation of power through the use of seemingly apolitical assessments (Beck, Esguerra, and Goerg 2014). Many of these policy studies from within political ecology maintain a focus on single localities, but there has also been a recent trend toward studying how local voices are heard, silenced, or negotiated within communities of policy experts and policy-setting venues (Brosius 2004, 2006b).

Environmental policy at the international level is often set in large meetings including the Conference of the Parties to the Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC), the Arctic Council, and the World Conservation Congress. These meetings may have thousands of attendees in multiple simultaneous sessions over a period of days or weeks. An event ethnography approach to the politics and performance of these events (Brosius and Campbell 2010; Hagerman et al. 2012; MacDonald and Corson 2012; Maclin and Bello 2010; D. Scott et al. 2014) can be one way to unravel these complexities.

Conclusion

The study of organizations and their roles in environmental governance is wide-ranging and complex. The theoretical basis for such a study draws from sociology, anthropology, international relations, and political ecology. Important aspects to consider include the nature of knowledge, how knowledge is formed and transformed, and how the seemingly rational act of "knowing" is influenced by power, social ties, and materiality. In its work in the Arctic, WWF functions as a knowledge organization (WWF 2008), working through its own explicit network of staff, offices, and stakeholders to influence beliefs, behaviors, and policy. This knowledge work includes the development of texts, maps, and events with help from specialists, scientists, and spokespersons. And, as Alvesson (1993) notes, WWF as a knowledge organization relies on the presence of ambiguity—sorting out what counts as useful or legitimate knowledge is a large part of WWF's work.

As an organization, WWF is explicitly networked and relies on a management structure of networked governance. As I will show in later chapters, the uniqueness of

WWF as a conservation organization stems in part from this network structure, in which WWF=International in Gland, Switzerland functions largely "like a secretariat" (WWF staff member, field notes) and individual National Offices (NOs) and Program Offices (POs) operate in an atmosphere of near autonomy. Within this extended network of offices, the WWF GAP is tasked with facilitating collaboration, communication, and resource sharing to achieve Arctic conservation goals.

The ongoing work of WWF's GAP takes place in a context of ongoing climate change and increased needs for transnational conservation. As North (1990) suggests, WWF's Arctic program is both the result of institutional opportunities and the creator of complex institutions within which conservation takes place. Many of these institutional arrangements are inscribed within WWF's texts—both internal documents and external, published work. In the next chapter, I will discuss my analysis of the WWF GAP's texts since the inception of the Arctic Program in 1992, including changes in how WWF uses knowledge and what is considered appropriate knowledge for conservation. I then move to an analysis of WWF's social network structure (Chapter 4) and to a discussion of the process of translation in two ongoing WWF Arctic initiatives (Chapter 5).

CHAPTER 3

A CULTURE OF CONSERVATION IN WWF: CHANGE AND CONSISTENCY IN CONSERVATION KNOWLEDGE

> Every society has its own understanding of how the natural world works, a repertoire of habits, skills, and styles from which members of a society construct their livelihoods (Berkes and Berkes 2009).

In this chapter, I review key themes in WWF's Arctic conservation work over the past two decades. Specifically, I explore changes in WWF's internal knowledge system, as seen in documents, meeting minutes, and interviews. I begin from the perspective that the culture of WWF's Arctic program[8] has functioned as a knowledge system through time, with knowledge being "human cognitive and innovative processes and the artifacts that support them" (Svelby 1997). In studying WWF's knowledge system I seek to draw attention to organizational culture—a culture of conservation—within the Arctic program. I draw from a text analysis of official archives from Oslo and Anchorage and over 20 years of WWF Arctic Program publications, combined with numerous interviews including both long-time WWF employees and former WWF staff. I examine shifts in what is considered appropriate knowledge about and for conservation, including both explicit and tacit knowing (Blackler 1995; Lam 2000; Nonaka 1994; Polanyi 1966, 2005)

8 A note on names: in this chapter I draw heavily from archival texts and interviews. In the 1990s, WWF's work in the Arctic was coordinated under the Arctic Programme (AP); after 2006, until around 2010, the program was the Arctic Network Initiative (NI); since around 2010, the program is the Global Arctic Program (GAP). While the names have changed, WWF views this as a single continuous effort in coordinating Arctic conservation. I alternate between these names according to the source and time period I am describing. When I am talking about the program over a period of years, I refer to it simply as the "WWF Arctic program."

from 1992 to 2013. I begin with a bigram analysis of key themes in WWF's Arctic work. I then look more closely at the unfolding of conservation practice across five core thematic areas for WWF: the Arctic Council, climate change, polar bears, protected areas, and the Arctic program's circumpolar focus.

Introduction: WWF, Culture, and the Production of Conservation Knowledge

In order to work within the Arctic, WWF relies on a body of conservation knowledge: patterns of beliefs and understandings that are to some extent shared within the organization. By "conservation knowledge" I refer to both knowledge about what is being conserved—ecosystems and species within the Arctic—and the means for conserving it—meetings, policy bodies, and the creation of both expository and performative texts. In those texts, what is said (and what can or cannot be said) is constituted through a "normative exercise of power" (Butler 1997,134) that contributes to consistency over time within the organization.

WWF has worked transnationally in the Arctic since 1992, when it was developed as the WWF Arctic Programme. The program has gone through multiple changes, including name changes (see Footnote 8) over the years, most recently with the development of a series of "Network Initiatives" within WWF, designed to allow resource sharing and collaboration through WWF's networks of offices on what were considered crucial global issues. Planning for the Arctic Network Initiative (now known as the Global Arctic Program or GAP) began in 2007.

WWF's Arctic conservation work is focused in Russia, Canada, Norway, and the US with key supporting offices in those countries as well as The Netherlands, Germany, and other locations. These offices are broadly categorized as National Offices (NOs) and

Program Offices (POs), with each country's offices working independently under their own national-level administration. The Global Arctic Program (GAP), based in Ontario, facilitates cooperation and information sharing between national programs and helps to coordinate major circum-Arctic initiatives.

WWF works on multiple conservation issues throughout the Arctic. These include planning for the establishment of protected areas in a climate-changed Arctic, mapping areas of sea and coastal biodiversity, working with local populations in Chukotka to protect polar bears and walruses, documenting climate change both quantitatively and qualitatively, lobbying to protect Alaskan fisheries, planning for and responding to oil spills in Arctic waters, and more ongoing initiatives on migratory birds, fisheries, pollution, Arctic shipping, and specific threatened ecosystems and species.

While the GAP can be officially defined based on budget lines and chains of staff reporting, in practice WWF's Arctic work extends past the GAP. WWF-International, located in Gland, Switzerland, serves a peripheral role within the network. All of the WWF National Offices whose countries have territories above the Arctic Circle have at least some national programs operating within the Arctic. WWF National Offices (NOs) operate with near autonomy, but are connected to one another both by conservation initiatives and through funding streams—much of which comes through donor offices in the WWF network such as WWF-Netherlands or WWF-UK. In addition, there are multiple multinational collaborations within WWF that are not fully circum-Arctic and are not necessarily facilitated by the GAP. Even within WWF, there is not consensus on where the network of Arctic conservation should be bounded.

Given this heterogeneous structure, where is one to look for a culture of Arctic conservation? The core staff of the GAP represents a fraction of the total Arctic conservation network, but may have a disproportionate effect. Administrative and support staff, in the Human Resources sector for example, are part of the larger network and contribute to the tacit knowledge and culture of WWF, but their work is not limited to the Arctic. I look here to knowledge that is "historically transmitted" (Geertz 1973,89) through symbols and symbolic acts—texts and meetings—to define a culture of conservation within WWF's GAP.

Problem Definition

A key question for this chapter is: How has WWF's culture of Arctic conservation changed over time? I look toward knowledge embedded in documents, meeting minutes, and interviews to identify key tenets of WWF's organizational culture.

At the 2012 American Anthropological Association (AAA) meeting in Montreal, I was discussing my research with a colleague who suggested that, if WWF has a culture, it is a very different sort of culture than one would find among native people or in traditional societies. I suggest, though, that WWF has a dynamic culture in the purest anthropological sense of the word, and that the core of that culture is a knowledge system used by WWF staff for explaining the world and their place within it. This fits within Clifford Geertz's definition of culture as "… an historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men [sic] communicate, perpetuate, and develop their knowledge about and attitudes toward life" (Geertz 1973: 89). Those symbolic forms in the case of WWF include reports, presentations, meetings, office setups, and appropriate

attire. Many aspects of this organizational culture are represented as texts that are available for analysis.

While I would agree with Borofsky et al. (2001) that it is not always necessary to invoke culture in anthropological research, it is clear that within WWF the idea of organizational culture is meaningful. In the planning phases for this research, one of the questions to come out of WWF was "how can the culture of the WWF network best be described?" (WWF email communication 2008). As I moved from office to office, another question that arose repeatedly from WWF staff was "how does the culture of WWF differ between offices?" In both of these cases, WWF staff members see their own culture as something salient, specific, and localizable—to the WWF Network or to individual NOs. In these cases, WWF staff conceptualize culture as a set of skills, artifacts, behaviors, and attitudes (tacit knowledge) with concomitant (explicit) conservation knowledge.

I focus here on organizational culture as the "inherited conceptions" of what Arctic conservation within WWF means, as seen in WWF texts, observations in offices, and interviews, and how the appropriate knowledge for conservation has changed over time within WWF's Arctic program. I base my observations on analysis of Arctic program records from 1992 to 2013, including meeting minutes, planning documents, and newsletters. I also conducted interviews with current and former staff and participant observation in WWF offices around the Arctic. This analysis allows me to answer broader WWF questions relating to organizational culture. Meanwhile, social science research on conservation has been criticized for describing conservation in monolithic

terms (Redford 2011), so addressing the peculiarities of conservation practice is of anthropological concern.

WWF's current and archival texts represent the collected knowledge of WWF staff and other network members over the past two decades. The themes in these documents sit on a continuum of interacting tacit and explicit knowledge (Grant 2007; Polanyi 2005). Much of the jargon within the documents is explicit only to experts in Arctic conservation (Grant 2007). Other, more tacit, text—meeting minutes for example—is impossible to interpret correctly without an understanding of WWF's current and historic patterns of operation. As an anthropologist studying WWF, I do not presume here to translate this body of knowledge entirely into "anthropological knowledge." Rather, I focus on how the knowledge of WWF staff—both in terms of the knowledge that they seek to communicate and the more tacit knowledge in which they are immersed—forms a set of "inherited conceptions" from which staff work.

Theoretical background

Anthropology has a long and ongoing history of studying knowledge—often with the aim of translation from one knowledge system to another. Meanwhile, knowledge within organizations has been researched within the fields of management and organizational studies but less so from an anthropological perspective (see though Rhee 2006). Where anthropologists have studied Western organizations, the focus of study has tended toward power, policy, and practice.

Susan Wright (1994) has identified three key periods in the anthropological study of organizations: the Hawthorne Experiments of the 1920s and 1930s, focusing on working conditions, social systems, and productivity; studies of the shop floor conducted

by Manchester anthropologists in the 1950s and 1960s, with a focus on individual cases as situated in larger social contexts; and a period of studying up from the late 1960s onward, in which the focus of anthropologists is on power structures within and surrounding organizations—often from an activist perspective. Many of these studies can trace some of their roots to Nader's call for "studying up" as an alternative to the top-down approaches of earlier anthropology (Nader 1972).

Recent anthropological studies of organizations have focused on connections between development policy and practice (Mosse 2004), the politics of development (C. A. Corson 2008; Ferguson 1994), environmental organizations (Gatt 2011; Rhee 2006), corporate responses to disaster (Fortun 1998), and international environmental policy events (Brosius and Campbell 2010; Hagerman et al. 2012; MacDonald and Corson 2012; D. Scott et al. 2014). Still, the bulk of anthropological studies are on local populations and their interactions—not on formal Western businesses, NGOs, and agencies.

Knowledge systems

Social scientists and philosophers recognize that knowledge does not exist as a simple assemblage of facts. Knowledge has been variously interpreted as an object, an interpretation of events, a process of "knowing," and as a set of relations between beliefs, activities, and materials (Kakihara and Sørensen 2002). Hobart (1993,17) describes this knowing as "a practical situated activity, constituted by a past, but changing, history of practices." Knowing (versus a static knowledge) is rooted in lived activities within particular places (Ingold 1996). Knowledge systems, whether traditional or scientific, are situated within specific historical and cultural milieu (Agrawal 1995,425). Such a

rhizomic view of knowledge as networked and integrative arguably helps to break down dichotomies of human/nature (Velásquez Runk 2009).

Traditional knowledge systems are recognized as important under multiple international agreements including the Millennium Ecosystem Assessment, the UN Convention on Biological Diversity, the UNESCO Universal Declaration on Cultural Diversity, and others (Nakashima 2010). These knowledge systems are internally coherent and bridge multiple domains—making isolation of domain specific knowledge (e.g. "environmental knowledge") for managerial purposes problematic (Brosius 2006). In terms of traditional environmental knowledge, for example, Brosius points out that Penan speak concretely, metaphorically, emotionally, intentionally, about landscape and environment. Using metaphors to "speak across difference" (Brosius 2006,137) are attempts to translate more tacit knowledge into more explicit (familiar) terms. To paraphrase Polanyi (1966), they can know more than they can say.

This stands in contrast to the monolithic ways that organizational and scientific knowledge are sometimes represented. Scientific knowledge in particular is often represented as non-relative and universal, the "authoritative knowledge of the West" (Purcell 1998,259) or "internationally accepted scientific practice" (Berkes 2002,297). Local and indigenous knowledge are often contrasted against scientific knowledge:

> "Local institutions tend to use their own folk knowledge, often referred to as local knowledge, indigenous knowledge, or traditional ecological knowledge, whereas centralized management agencies tend to use internationally accepted scientific practice and often assume away local knowledge and practice" (Berkes 2002,297).

Here Berkes is writing about "local knowledge" as extra-organizational knowledge held in local communities, which is "assumed away" by non-local managerial

institutions. While this is certainly often true, I argue here that organizational knowledge has its own particularities and—far from being uniformly distributed—is inevitably heterogeneous within organizations (Bateson and Bateson 1987).

I agree with the Agrawal's (1995) assertion that the divide between indigenous and scientific knowledge is an artificial one. Both are knowledge systems, each with their own heterogeneities, complexities, and coherences. I build here on the work of Fischer (2005) in arguing that the domain knowledge of WWF as an organization—related to ecology, climate, and conservation—is incomplete without the knowledge that is necessary to instantiate that domain knowledge. In the case of WWF, this is knowledge about how WWF works and the place of WWF within the world. This organizational knowledge is embedded in institutional structures. And, as Jasanoff (2004) argues, those institutional structures and international knowledge are co-producing.

Document analysis

This research was conducted between 2009 and 2012 as a multi-sited study (Marcus 1995) of WWF's Global Arctic Programme, focusing on social and cultural processes in the production of conservation knowledge. Multi-sited studies of transnational organizations present challenges for the traditional model of long-term ethnographic research (Gusterson 1997; Markowitz 2001). In response, I relied on a mixed-methods approach, centered within a para-ethnographic framework (Holmes and Marcus 2006) in which the expertise and analytic skills of WWF staff are central to the process. Research included participant observation and interviews in multiple locations: Offices in Oslo, Ottawa, Toronto, Anchorage, Juneau, Moscow, Murmansk, and Zeist; and meetings and conferences in Montreal, Copenhagen, and Nagoya. To look at

diachronic processes in the WWF Arctic Programme, I interviewed long-time staff and collected and analyzed texts—both public documents and archived internal files.

While in Oslo, I collected over 800,000 words of archived meeting agendas, minutes, planning documents, and reports (63 documents) covering the Arctic Programme from 1991 until 2001, and again from 2006 until 2007[9]. I also collected over 900,000 words of public documents in the form of the Arctic Programme's quarterly newsletter, the *Arctic Bulletin*, which became *The Circle* in 2009. This is a comprehensive catalog of issues from 1995 through 2013 (67 issues total). I also collected a set of archival program documents from the Anchorage, Alaska office (180 documents), and a cache of documents, presentations, and reports from across the Web (113 documents). Altogether, I compiled more than 2 million words—4000 pages—of WWF texts focused on Arctic conservation.

Given the sheer quantity of text, I opted for an analysis of key themes in Arctic conservation. This narrowed my interest from all terms to a set of terms that I identified *a posteriori* based on WWF publications and interviews with current and former staff. I conducted interviews with current and former staff, including the core of the current WWF GAP team, members of the GAP shareholder group, and two of the Arctic Programme's former directors.

Into the Texts of WWF's Arctic Program

Looking at WWF's public texts reveals both change and consistency in the focus of their Arctic conservation efforts over time, as seen in Figure 3.1.

9 The Arctic program archives in Oslo are incomplete—with most material in the 1991 to 2001 period. Changes in program management and a shift to electronic rather than paper records explain much of this variation. While electronic records are easier to search and process, they are also more closely guarded. I did not have access to shared hard drives or electronic archives.

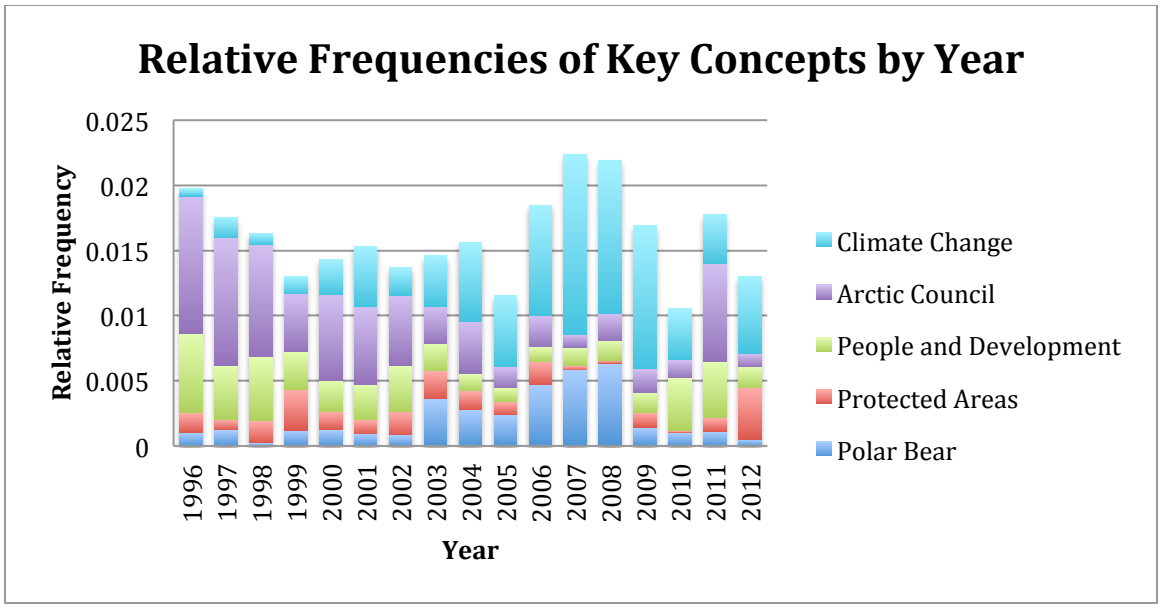

Figure 3.1: Relative frequencies of key concepts by year, based on bigram analysis of text from WWF's Arctic publications *Arctic Bulletin* and *The Circle*.

I analyze WWF's texts using a bigram analysis approach, in which I look at frequencies of word pairs across the entire text. A simple single-word frequency approach is insufficient—taken completely out of context the word "Arctic" (10,900 occurrences) may refer to the Arctic Council, Arctic Circle, Arctic Ocean, WWF's Arctic Programme, etc. A bigram analysis captures key themes by comparing bigram frequencies with expected frequencies of the words of the corpus were distributed randomly. A listing of top bigrams (total bigrams, n=408686) is presented in Table 3.1. While word frequency illustrates common words, bigram analysis focuses on pairs of words that recur together. Here I use the Ngram Statistics Package (NSP) (Banerjee and Pedersen 2003) to locate N-grams and their associative measures (AMs): specifically multi-word expressions (MWEs) related to Arctic conservation and the work of WWF. I

calculated N-gram frequencies and their log likelihood ratios[10] using Ngrams Statistics Package (NSP), a set of programs for analyzing N-grams in text (Banerjee and Pederson 2003). Taking these texts as an embodiment of the "inherited conceptions" of WWF's Arctic conservation, I can track WWF's conservation knowledge over time.

Table 3.1: Top bigrams (two-word clusters) from WWF's Arctic Bulletin/The Circle publications, 1995-2012; where N11 is the frequency of the bigram, N12 is the number of times the first word of the bigram appears first in any bigram, and N21 is the number of times the second term appears second in any bigram. Rank is the ranking of each bigram based on the log-likelihood statistic.

Bigram	**Rank**	**Log likelihood**	**N11**	**N12**	**N21**	**Relative frequency**
climate change	1	11628.93	1214	1970	1814	0.86
polar bear	2	8851.60	852	1385	1233	0.60
arctic council	3	8059.63	1411	10248	2061	1.00
protected area	4	5010.94	583	837	2604	0.41
sea ice	5	4757.51	628	2114	1527	0.45
indigenous people	6	4669.02	481	784	1325	0.34
sustainable development	7	3654.03	422	825	1609	0.30
barents sea	8	3424.96	401	643	2183	0.28
oil gas	9	3214.25	352	1388	644	0.25
bering sea	10	1833.40	216	342	2183	0.15
working group	11	1728.12	165	483	418	0.12
natural resources	12	1718.08	190	614	701	0.13
Arctic	13	1552.32	363	10248	850	0.26
bowhead whale	14	1431.20	130	196	701	0.09
environmental protection	15	1409.33	198	1386	766	0.14
global warming	16	1403.60	157	956	391	0.11

10 The log likelihood measure (Dunning 1993) indicates the ratio of how often an N-gram actually occurs in a body of text versus how often it would be expected to occur based on chance. For my purposes, a ranking of terms based on log likelihood pulls out key conservation themes within WWF's Arctic program, as seen in the texts that WWF staff produce.

organic pollutants	17	1399.10	92	129	138	0.07
northwest territories	18	1343.61	102	242	167	0.07
arctic ocean	19	1225.83	271	10248	574	0.19
arctic countries	20	1188.87	275	10248	630	0.19

I also calculated frequencies for trigrams, 4-grams, and 5-grams. The most frequent trigrams provide limited additional context—for example, that the terms “oil” and “gas” often co-occur with “development.” Fourth and higher-level N-grams mostly include boilerplate text from the newsletters themselves and occur at very low frequencies.

I also ran this analysis on archives of WWF's Arctic program meeting minutes and strategic planning documents, and many of the same terms occur with high frequencies; others ('reporting period', 'coordination office', 'business plan', 'subregional team') are statements about how WWF works. WWF's public documents are full of “know what,” while their internal documents contain “know how.” There is overlap: the Arctic Council, for example, is an example of both a method and a target for Arctic conservation. Because WWF’s record keeping has been inconsistent through the years, it is not appropriate to directly compare their internal texts with their external documents in a quantitative sense. For example, the archives in Oslo contain a gap in information from 2006 to 2011, while those in Anchorage disproportionately favor a single (though important) Bering Sea conservation initiative.

Table 3.2: Top bigrams (two-word clusters) from WWF's internal files: meeting minutes, reports, planning documents, 1992 - 2012. Where N11 is the frequency of the bigram, N12 is the number of times the first word of the bigram appears first in any bigram, and N21 is the number of times the second term appears second in any bigram. Rank is the ranking of each bigram based on the log-likelihood statistic.

Bigram	Rank	Log Likelihood	N11	N12	N21
bering sea	1	3993.94	384	449	815
arctic programme	2	3501.84	715	4885	1303
protected area	3	3368.97	380	499	1238
oil gas	4	3313.50	304	550	393
climate change	5	2215.18	178	245	257
arctic council	6	2157.61	378	4885	519
indigenous people	7	2041.79	205	348	500
reporting period	8	1580.66	124	183	189
barents sea	9	1393.71	160	272	815
whale watching	10	1349.80	107	300	116
working group	11	1188.39	134	395	394
tour operators	12	1183.34	90	132	149
targets attained	13	1176.09	91	267	97
subregional team	14	1170.44	107	165	335
coordination office	15	1100.16	112	228	382
offshore oil	16	1040.22	115	241	519
polar bear	17	999.99	81	171	131
codes conduct	18	988.38	71	94	120
business plan	19	936.14	96	144	579
WWF international	20	896.58	193	2928	556

Key Themes in WWF's Arctic Conservation Work

One element of consistency in WWF's Arctic conservation is the continual generation of texts, most notably (in terms of consistency) the *Arctic Bulletin*, which was later relaunched as *The Circle.* When reading the texts and talking to WWF staff, it was clear that climate change had grown in importance to the organization since the early 1990s, while the length of the publication remained relatively constant (generally 20-24

pages). At the same time, a number of themes reemerged again and again, and these were paralleled in the bigram analysis. I chose to look at the top 20 bigrams, many of which fit neatly into a handful of categories. In an attempt to clarify the main issues in the text, I categorized the top bigrams from these WWF publications into eight thematic groupings (Table 3.3).

Table 3.3: Top bigrams by category, from WWF's Arctic Bulletin and The Circle, 1995 - 2012.

Category	**Bigrams**
Arctic Council	Arctic Council Working Group Arctic Countries
Climate Change	Climate Change Global Warming Sea Ice
Specific Regions	Arctic Ocean Barents Sea Bering Sea Northwest Territories
Threatened Species	Polar Bear Bowhead Whale
People and Development	Indigenous People Sustainable Development Natural Resources
Pollution and Threats	Environmental Protection Organic Pollutants Oil/Gas
WWF	Arctic Programme
Protected Places	Protected Area

The final two themes—WWF and Protected Places—consist of one bigram each. The other six are assembled either according to content (e.g. climate change, sea ice, and global warming form a logical unit) or according to theme. I lumped all geographic regions into a single category (Specific Regions) because while WWF works around the Arctic, the organization tends to highlight different regions in each cycle of their publication to maintain a circum-Arctic perspective.

The bigram analysis of the *Arctic Bulletin* and *The Circle*, echoed my conversations and interviews with current and former staff. Staff stressed, in particular, the importance of the Arctic Council since the GAP's inception and WWF's early recognition of climate change. Staff also spoke in terms of circum-Arctic regions, specifically of 50 Arctic Ecoregions, as the focus for conservation. The category, "WWF" refers specifically to self-referential comments about the Arctic Programme/GAP in the *Arctic Bulletin*/*The Circle*. At least some of those references are text that comes from page footers and other boilerplate text, but staff acknowledge that WWF is very conscious of its own brand image, particularly the panda logo but including the names of WWF programs and initiatives.

In the next sections, I look in more detail at WWF's approach to Arctic conservation as seen in the *Arctic Bulletin*/*The Circle*, archival texts, and interviews with current and former staff. I focus on five knowledge areas: the Arctic Council, Climate Change, Polar Bears, Protected Areas, and WWF's circum-Arctic approach. In each of these areas, I look for key themes over the period from the beginning of the Arctic program to 2013.

Arctic Council

WWF has worked in the Arctic since before the Arctic Council began. In 1991, the Rovaniemi process[11], a series of multinational meetings in Finland, led to the adoption of the Arctic Environmental Protection Strategy (AEPS). In 1991, WWF was already involved with this process, noting the need to take into account "the relationship between the Rovaniemi process and the broader Canadian initiative to create an Arctic Council" (WWF archives, 1991). By this point, WWF already had in place a working group called the Arctic Subregional Team (ASRT) composed of staff from NOs around the Arctic. WWF continued to be involved in the Rovaniemi process, and staff agreed that they should try to be involved with any future Arctic Council (WWF archives, 1992). In 1995, the year before the Ottawa Declaration formally established the Arctic Council, WWF noted in plans for the WWF Arctic Programme (AP):

> Regarding the development of a declaration to establish an Arctic Council, the AP has made a special request to the Senior Arctic Affairs Official's (SAAO) meeting in Washington in September 1995 calling for stronger incorporation of environmental tasks and the AEPS. [WWF staff members] ... played an active role in this important issue, which should be a matter of major concern for the 4th ASRT meeting in Moscow (WWF archives 1995).

Following the development of the Arctic Council, WWF continued pressing for access. In the 1996 annual meeting of the ASRT, staff looked ahead to future work:

> ...policy work should remain the central part of the Arctic Programme. ...It was decided that the Programme would focus on: the overall AEPS process; the Arctic Council and Sustainable

11 The Rovaniemi process was a series of meetings held in Rovaniemi, Finland beginning in 1998. These meetings involved the eight Arctic countries (Canada, Denmark, Iceland, Finland, Norway, Russia, Sweden, and the USA) and were organized around the idea of Arctic environmental protections. The meetings were first suggested by Finland in response to marine pollution from Soviet-era mines (Oude Elferink 1992). Eventually, this process would lead to the proposal for and formation of the Arctic Council.

> Use Working Group; CAFF and PAME[12]. ...WWF has received "ad hoc observer" status for AEPS and Arctic Council meetings and hopes to receive permanent accreditation (WWF archives, 1996).

Through much of the late 1990s, WWF continued work in promoting Arctic conservation policy through the Arctic council as an ad-hoc observer, all the while seeking permanent observer status. Those attempts were complicated by hesitation on the part of Iceland and by ongoing WWF projects concerning fishing and whaling, which were politically charged issues at the time. Meanwhile, WWF staff were lobbying the Arctic Council to maintain a rigorous environmental focus:

> The Arctic Programme was created as a response to the Rovaniemi process, and working with the AEPS and the Arctic Council have always been important (WWF staff J interview[13]).

By 1999, WWF had achieved a position as the first permanent accredited NGO observer to the Arctic Council. This position with the Arctic Council positioned WWF to "...be heard and seen, to have an enthusiastic spirit in our circumpolar WWF Arctic Team, and be attractive to our sponsors" (WWF archives, 2000). WWF staff continues to tout their position within the Arctic Council as a unique organizational position:

> Today our partners would also agree that we are the leading and only conservation NGO that [has] consistent circumpolar coverage with national presence and activities in all eight Arctic countries (WWF archives 2000).

> We really are in a unique position; there are other conservation organizations working in the Arctic, but we are the only one with the history, that has permanent observer status in the Arctic Council... with the relationships that we have (WWF staff Z interview).

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12 CAFF: Conservation of Arctic Flora and Fauna working group of the Arctic Council; PAME: Protection of the Arctic Marine Environment working group of the Arctic Council.

13 I conducted over 40 interviews with current and former WWF staff across the Arctic. For confidentiality purposes, I am listing each interviewee by a unique one or two letter randomly assigned code, from A through AO.

In particular, WWF staff agree that both the position of WWF as an observer and the *history* of the organization within Arctic governance processes are important for how the organization works.

Since receiving permanent observer status, WWF has lobbied the Arctic Council on multiple issues. This includes the effects of pollution on the Bering Sea, Russian radionuclide contamination, and attempts to have the Arctic Council adopt WWF's guidelines on the consumptive use of species as part of the Council's sustainable development strategy. Much of this work has been aimed toward maintaining the stance of the AEPS within the Council's new framework, with the view that the Arctic Council is the main international body for addressing Arctic environmental issues.

> The Arctic is too regional for the CBD [Convention on Biological Diversity], although it definitely applies in the Arctic. There are only eight Arctic countries, and they work together on conservation issues mostly under the Arctic Council (WWF staff X interview).

As the Council has developed through its formative stages in the 1990s and early 2000s, WWF staff saw a clear opportunity to influence the future directions of Arctic governance (WWF staff J interview). The importance of the Council to WWF's overall work in the Arctic has continued under the current WWF Global Arctic Program (formerly the Arctic Network Initiative). As noted by WWF:

> The Arctic Council is an important audience for our work... we are informed by how the Arctic Council works and what the working groups are doing (WWF staff – field notes).

WWF's current relationship with the Arctic Council includes engagements with several working groups (PAME, AMAP, CAFF) and the Senior Arctic Officials meeting, where the RACER project was presented in 2012.

Climate Change

While the WWF Arctic Programme was founded to engage with the Rovaniemi Process, and later the Arctic Council, climate change as an issue has increased in importance slowly. The first mention of climate change in WWF's archives was in 1995, as a passing reference to the "fear that the climate itself may change" (WWF archives, 1995).

The WWF Arctic Programme's early engagements with climate change focused on possibilities and plans. While WWF did run a workshop on climate change at the 1996 World Conservation Congress in Montreal, the Arctic Programme was working on pollution and challenges from Arctic development. In 1996, the ASRT set an objective of having strategies for conserving all climate-vulnerable species and ecosystems in place by 2005 (WWF archives, 2006). The Arctic Program also looked at possibilities for developing case-studies and scenarios for climate change to use in publications and for policy purposes. In the leadup to the 1997 Kyoto meeting of the UNFCCC (where the Kyoto Protocol was adopted), the ASRT discussed Kyoto as an opportunity for media exposure. At the same time, there was internal conflict within WWF over how to approach the climate issue. Climate change was officially in the purview of the WWF climate change campaign[14]. Staff of the Arctic Programme realized that they needed to clarify their climate change position for the future (WWF archives, 1997; field notes). The 1997 report of the annual ASRT meeting contained no mention of climate change—a fact that was noted in the 1998 Arctic strategic plan, which added that it might be worth

14 The climate campaign was officially listed as a Target-Driven Activity (TDA) within WWF; the Climate TDA and the Arctic Programme (both 1990s era names) had different leadership and staff but were in communication with one another (Field notes).

adding climate change formally back in to the work of the Arctic Programme (WWF archives 1998).

> The Arctic program was approached by WWF-Netherlands in 2001 and asked to start a climate change program. Based on that request, we put together an initial plan on that focal project (WWF staff AA interview).

One of the concerns of WWF staff was that climate change was too big to grasp firmly as an issue. "Climate change is an important topic, but also one that is so large that appropriate actions and responses are hard to identify" (WWF archives, 2008). Staff anticipated many effects of climate change including a reduction of sea ice; restricted access to subsistence resources (geese, whales, caribou); and increased erosion and sedimentation resulting from changes in storm patterns.

> The Arctic Programme didn't substantially engage with climate change until after 2002, when WWF established a climate change office in Berlin (WWF staff O interview).

In trying to grapple with the issue of climate change, Arctic program staff took cues from both the Arctic Council—which had prioritized climate change work within both the CAFF and AMAP (Arctic Monitoring and Assessment Program) working groups—and WWF's climate change campaign which was looking for cases from the Arctic to support their own work. By the early years of the new millennium, WWF clearly saw the Arctic as an indicator region for global climate change (field notes).

At the 15th Conference of the Parties (CoP15) to the UNFCCC in Copenhagen in 2009, WWF worked on multiple fronts. Within the actual UNFCCC sessions, the climate campaign was at work lobbying governments for stronger climate regulations. Outside the convention, in a square in the center of Copenhagen, the Arctic program set up a large tent for the week. In the tent, they held discussions and hosted presentations and other

events as part of an effort to raise awareness of the effects of climate change in the Arctic. In just over ten years, climate change had gone from a worrying possibility to a major organizing theme for the program.

Polar Bears

Of all the species in the Arctic, the polar bear (*Ursus maritimus*) has been the most consistently important within WWF's Arctic program. Polar bears are described as "Arctic icons" (WWF archives 1992, 2007; field notes), and WWF's international work on the species far predates the development of the Arctic program: WWF lobbied in support of the 1973 International Agreement on the Conservation of Polar Bears in the early 1970s (WWF archives, 1995). WWF's efforts on the conservation of polar bears closely mirror the rise of climate change as an issue. Prior to 2000, the majority of the concern over polar bears was on poaching and bioaccumulation of toxic substances. From 2000 onward, the focus of polar bear conservation has increasingly been on shrinking sea ice habitat and potential oil spills in ice-free shipping channels resulting from climate change.

WWF's specific work on polar bears is diverse. It includes lobbying the Arctic Council and national governments to reinforce regulations protecting bears, protecting specific areas such as Wrangel Island, described as the largest "maternity ward" for polar bears (WWF archives 2006), and proposing new protected areas in light of predicted climate change effects. In 2003, WWF developed a polar bear tracker web site, through which the public can track the movements of individual radio-collared bears in several areas around the Arctic. In developing the Arctic Network Initiative in 2006, two ongoing

initiatives accounted for approximately 50% of funding needs: the climate mitigation campaign and work on the polar bear (WWF archives, 2006).

As an Arctic icon, the polar bear has been tasked with increasing funds and public visibility for the Arctic program. As early as 1992, the ASRT noted that "Arctic icons such as polar bears and whales should be used to bring in funds" for conservation efforts (WWF archives, 1992). Before the Arctic program was conceived, WWF Canada received major donations for polar bear conservation in 1972 and again in 1975, allowing them to expand work in the Arctic (WWF archives, 1998). Polar bears and climate change were seen as particularly effective fundraising topics for individual NOs (WWF archives, 2000), and as media themes for conferences and other presentations (WWF archives, 2001).

At the same time, some voices within WWF remained wary of the polar bear as an example. Other species such as the snowy owl were discussed as alternate success stories to promote Arctic conservation—with a goal of finding species that were symbolic of the Arctic but not overused (WWF archives, 1998). In the 1990s, the polar bear remained controversial—particularly in respect to subsistence hunting regulations:

> One respondent with experience in this area advised staying with issues such as habitat conservation rather than philosophical debates such as the ethics of polar bear hunting, thereby concentrating on issues of common concern rather than ones likely to expose conflicting views (WWF archives, 1998).

Other staff argued that focusing on species other than polar bears would convey the impression that WWF was serious about conservation and not just seeking a marketing ambassador (field notes). Despite concerns, the polar bear remains an important face for Arctic conservation with WWF striving to "'own' the polar bear in terms of its expertise, information, advocacy and campaigns" (WWF archives, 2007).

Most recently, WWF has proposed the Last Ice Area as a protected home for polar bears along Canada's Northeast coast. I detail this further in Chapter 5. Through the period of this research (2009 – 2013) the WWF GAP maintained a polar bear specialist on staff, making bears the only species in the core program with their own staff representative.

Protected Areas

Much of WWF's work in the Arctic has focused on the establishment of protected areas in regions around the circumpolar North. In 1991, a meeting of WWF staff set out two priorities: the development of a network of protected areas around the Arctic and the production of maps showing resource use, military activities, and protected areas in the Arctic (WWF Archives 1991). At this same meeting, staff agreed to circulate a draft proposal for the future WWF Arctic program to participating NOs before submitting the proposal to WWF International. When the Arctic program was formally launched, one of its chief goals was the promotion of an Arctic protected area network through lobbying efforts in national and international contexts (WWF archives 1992). The importance of protected areas to WWF's work was highlighted in a WWF meeting report: "WWF's core area of competence is and will always be conservation, and protected areas and species should remain the main focus of the AP programme" (WWF 1998).

Many of the protected areas proposed by WWF were located in Russia, including the Great Arctic Reserve in Russia's Taimyr Peninsula. The Russian focus of early Arctic Programme work was facilitated by personal interests and contacts of the program leadership (WWF staff J interview).

> The Taimyr Peninsula was a breeding area for long-migrating species, including brent geese. We worked with Russia as part of

> a German collaboration during the perestroika years to sign an agreement on Taimyr, leading to the Great Arctic Reserve (WWF staff J interview).

In 1995, President Boris Yeltsin outlined a plan for a system of Arctic protected areas which mentioned WWF by name, and supported "the WWF's position that up to 50% of the territory of the [Russian] Arctic should be placed under strict governmental control" (WWF archives 2006). From 1993 to 2006, the total territory of Russian zapovedniks[15] increased by 25% and the territory of Arctic nature reserves doubled (WWF archives 2006). This increase was in spite of a hiatus around the year 2000, when Russian President Putin abolished the State Committee for Environmental Protection, resulting in a temporary hold on any further protected area development (WWF archives 2000).

Protected areas were seen as steps toward a host of goals. As WWF wrote in 1995:

> Protected areas can contribute to ecologically sound sustainable development in a number of ways... , including by protecting soil and water quality, critical wildlife habitat, threatened species, and by providing income and employment, notably from tourism. As part of a comprehensive environmental strategy, protection of a representative sample of the Arctic's terrestrial and marine natural regions is essential. This involves establishing a network of parks or other protected areas within which no industrial activity takes place, thereby conserving nature and supporting traditional subsistence economies which depend on it (WWF archives 1995).

With this in mind, WWF continued to lobby in the Arctic Council for the creation of a circumpolar protected area network. This work included the development of resource and habitat maps, and support for an "Arctic Ring of Life" initiative focusing on protection of ice-edge ecosystems. WWF's work was important in the development of the

15 Zapovedniks include both nature reserves and cultural heritage areas.

Circumpolar Protected Areas Network (CPAN) within CAFF, which was active from 1996 to 2010. The work of CPAN has since been subsumed under other programs including the Arctic Biodiversity Assessment (WWF staff Z interview).

WWF staff are also aware that protected areas may be controversial in come contexts.

> ...proposals for "marine sanctuaries" or "protected areas" can easily generate negative reactions and in some cases, outright obstruction. This attitude is partly based on the perception that protected areas will place new restrictions on native rights to subsistence resources, which are already tightly regulated by federal legislation (WWF archives 1998).

In response, WWF has proposed a stronger integration of indigenous communities within conservation programs. This is seen most recently in proposals for an "Arctic Home" for polar bears in the Canadian north, where indigenous co-management is seen as an optimal output (field notes).

Circum-Arctic Focus

While the Arctic program has been united by a circumpolar vision, the work of the program has shifted from region to region through the years in response to changing political realities. As early as 1992 WWF was working to map biodiversity and threats in the Arctic, to "turn the Arctic to all sides" (WWF staff J interview). Soon after, the publication of the Arctic Bulletin began. In the early years of the program:

> "The Arctic Programme was a strange beast... a sort of regional policy program; Canada was insular, Russia wasn't doing anything" (WWF staff D interview).

And that history of heterogeneity persists within the network; Canada is now the home to the GAP office and WWF Russia is a major player in Arctic conservation, but all of the WWF National Offices still operate independently. As far as conservation work,

WWF has focused on the Russian North, the Bering Sea area, the Barents Sea, and the Northwest Territories of Canada, among others. The current network of NOs, each working on local Arctic issues, results in fairly comprehensive circum-Arctic coverage.

In early years, achieving circum-Arctic collaboration was a challenge, in part because communication was an issue. This was before the advent of email as a means of instantaneous communication; fax, mail, and wired telephones were used until the mid 1990s. In 1991, at a preliminary meeting before the Arctic Programme was formed, neither WWF Canada nor WWF International had responded:

> The meeting noted with particular disappointment the lack of response from WWF Canada. It was noted that WWF Canada during the years have had and still has a number of important projects in the Arctic regions of Canada. In the intergovernmental process (the Rovaniemi process) Canada is a key country... for the work on the protection of flora, fauna and habitats. Thus, it was strongly emphasized that to be really effective future WWF international work on the Arctic must include WWF Canada (WWF archives 1991).

By 1996, most staff had access to email, but communication and collaboration were still dependent on the availability of technology:

> XX still doesn't have email. YY can receive email but can't send it as she must use someone else's computer to access it. Therefore it's not feasible to explore conferencing over the net at this time. The group decided that telephone conferencing should be used as an alternative in between ASRT meetings if necessary (WWF archives 2006).

In reflecting on this trend in technology and communication, one current WWF staff member said:

> We couldn't have done things back then the way that we do them today. The technology wasn't there yet. We still did many of the same things, but the process was definitely slower—we were less responsive (WWF staff O interview).

Since the program was founded, the leadership of the Arctic program has shifted from an office in Oslo to one in Ottawa. The original Oslo office was located both according to the presence of key staff and as a central coordination site for ties to the unfolding Rovaniemi process. Later, the Oslo office was a central site for accessing the shifting leadership of the Arctic Council:

> During the period 2007-2012, there is a political advantage for WWF to coordinate the [Arctic Network Initiative] from Norway. Norway, Sweden and Denmark, who will sequentially chair the Arctic Council, have agreed to finance a more permanent Secretariat in Tromsø, Norway, as well as setting joint priorities, giving WWF open access to the key political Arctic governance process (WWF archives, 2007).

The current work of WWF is very nearly circum-Arctic in focus, with active programs in Russia, Canada, Norway, Finland, Sweden, Greenland (Denmark), and the USA.

Change and Consistency in WWF's Arctic Conservation Knowledge

The WWF Arctic Programme began in 1992 as a response to the Rovaniemi Process leading to the establishment of the Arctic Council, and WWF's work has remained intertwined with the activities of the Arctic Council since then. WWF has also maintained a consistent focus on protected areas within the Arctic and polar bears as iconic species. At the same time, WWF has expanded their circum-Arctic focus—enabled by new technologies that allow better communication between staff—and made a major shift in programming to address climate change as a key threat to Arctic biodiversity.

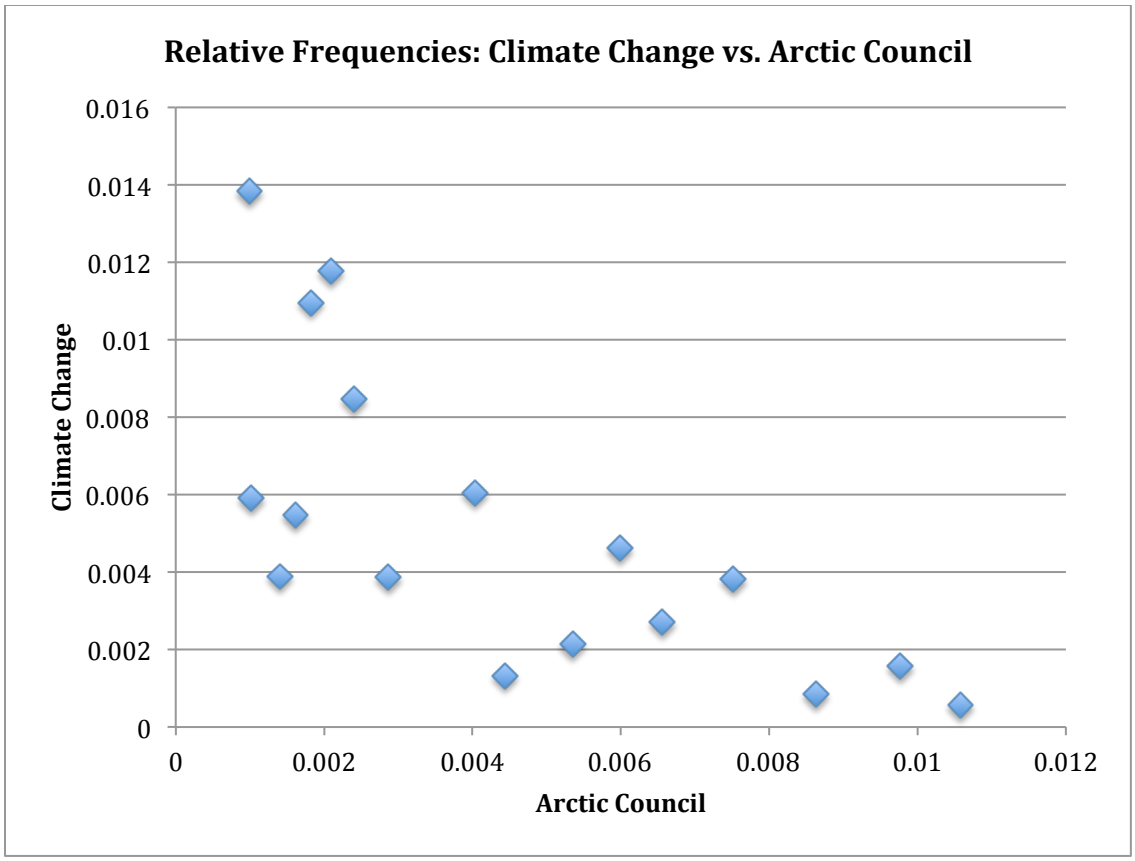

Figure 3.2: Relative frequencies of concepts "Arctic Council" and "climate change" are negatively correlated (r=-0.71, p=0.001).

Although WWF continues to work closely with the Arctic Council, climate change has at least somewhat displaced the Council as a topic for the Arctic Bulletin/The Circle. As seen in Figure 3.2, there is a significant negative correlation between the concepts “Arctic Council” and “climate change” in these publications (r=-0.71, p=0.001). Interviews with current and former staff and directors of the GAP indicate that the Arctic Council has continued to play an important role in the work of WWF, but that the role of the Arctic Council has become more complicated with the rising prevalence of climate change.

WWF has a special status as one of only eleven NGOs serving as an official observer to the Arctic Council. During my interviews, the staff who worked most closely

with the Arctic Council were cagey about their discussions with Arctic Council representatives, serving as very effective gatekeepers for that relationship. Observer status is particularly valued since many nations want, but are unable to achieve, that status. During my research, WWF staff had close contact with members of the Arctic Council on several occasions, but I was not personally able to attend any of those meetings (though I did ask). I did interview one Arctic Council staffer, who confirmed that WWF is an active participant within the bounds of their institutional role as observer.

Meanwhile, climate change has become increasingly important in the work of the Arctic program. Through the course of this research, from the Arctic Tent in Copenhagen during the UNFCCC CoP15 to the Last Ice Area initiative and the RACER (Rapid Assessment of Circum-Arctic Ecosystem Resilience) project, climate change has proven to be a major driver of Arctic programming. Climate change has become an impetus for circum-Arctic collaboration among NOs through meetings, conferences, and program development. The threat of climate change has superseded other threats (for example pollution and overhunting) against the polar bear, and has become a renewed justification for the development of innovative approaches to protected areas.

The rise of climate change highlights both change and consistency in WWF's conservation knowledge. When the Arctic Programme was first conceived in 1992, climate change was a peripheral issue in Arctic conservation—behind pollution and overexploitation of resources. Since then, staff of the Arctic program have increasingly embraced climate change as the key driver of Arctic biodiversity loss. Through projects like RACER and the Last Ice Area, WWF has claimed expert status in the fields of climate change policy and practice. Compared with the conservation work of the WWF

Arctic Programme in the early 1990s, this is a novel development highlighting the incorporation of a new and evolving scientific knowledge into WWF's active efforts. At the same time, WWF adheres to the recommendation that "policy work should remain the central part of the Arctic Programme" (WWF archives 1996) and that "protected areas and species should remain the main focus of the AP [Arctic Programme]" (WWF archives 1998).

Both the RACER and Last Ice Area programs are rooted in the development of novel protected areas—ones based on models of future ecology rather than reflections of the past. The development of protected areas in the case of RACER serves to protect productive areas that are predicted to remain sources of systemic resilience through the end of the current century. In the case of the Last Ice Area, protected areas serve to ensure a home for polar bears in the area where summer sea ice is predicted to persist the longest under climate change conditions. In both cases, WWF seeks to work through policy channels—both at the Arctic Council and at the national level—to implement their recommendations. In effect, WWF has adopted a form of "carbon logic" (Hagerman et al. 2012) in which pre-existing concepts of Arctic conservation are reinforced by, rather than disrupted by, the introduction of the new threat of climate change.

Conclusion: Tacit Knowledge Made Explicit

A large portion of the internal WWF archives consists of meeting minutes and plans for future meetings. WWF is a meeting-driven culture. Early meetings of the WWF Arctic Subregional Team (ASRT) as it was then called were held annually, and communication was still largely by phone and fax. By the late 1990s, email had surpassed faxes as the communication technology of choice. The knowledge of how to function

within WWF—knowledge that is on the more tacit end of the spectrum—is accessible in these texts only after learning about the way WWF operates (Grant 2007). Appendix A includes a list of acronyms that I encountered during this research and, despite my efforts to be thorough, it is probably not comprehensive. This sort of tacit knowledge is organizationally specific; it would not be completely transparent even to conservation professionals from other global NGOs.

The existence of meeting minutes and archived publications from two decades past is, in itself, an important part of the WWF GAP's current culture. As Michael Polanyi noted:

> Only a small fragment of his [sic] own culture is directly visible to any of its adherents. Large parts of it are altogether buried in books, paintings, musical scores, etc., which remain mostly unread, unseen, unperformed. The messages of these records live, even in the minds best informed about them, only in their awareness of having access to them and of being able to evoke their voices and understand them (Polanyi 1962:397).

I was told by several WWF staff members that I may have read more of the Arctic Program's archives than any of the existing staff members. I do not presume to debate their wisdom on that point. In terms of conservation knowledge, however, there is a deep sense of history among WWF Arctic staff—that they are a part of something that can be called historic because of its relative longevity within the Arctic.

Another element of WWF's culture is the constant generation of texts and maps. During my research, I not only collected text—I was asked on some occasions to proofread documents or even to contribute to the creation of collaborative texts[16]. The

16 I proofread initial stages of the RACER handbook and some newsletter pieces. I also wrote a very rough first draft of one conference proposal, which was later re-written substantially and successfully submitted. My work was hailed as a helpful starting place.

public texts created by WWF become artifacts that can move about freely, and thus potentially take on lives of their own as immutable mobiles (Latour 1986). Meanwhile, the meeting minutes and other notes serve as a sort of short-term institutional memory—to be referenced during the course of a project or when a report is due, then filed away. The politics of writing within the organization dictate that some text will always be intended for internal use only; however, the collaborative composition of text is itself an important performative step in the development of organizational identity.

A close look at WWF's archives shows that there are consistent themes in Arctic conservation that have continued through staff changes, climate shifts, and changes in political regimes. These include a focus on developing protected areas, working with the Arctic Council, conservation of key species including polar bears, and a circum-Arctic approach. Some of that consistency may be attributable to a consistent suite of environmental problems—overfishing, pollution, and a pressing need to engage constructively with indigenous and local communities. Even when a new problem is introduced—climate change most strikingly—it serves as a logic for reinforcing existing modes of conservation, although with innovative models such as RACER for meeting new challenges.

Part of this consistency is a result of a "normative exercise of power" (Butler 1997). This can be seen both in the enculturation of new staff and in the work of meetings within WWF. During an interview, I asked one staff member what he saw as a challenge for his job. His response was that, when new staff join WWF, it takes at least a year for them to fully understand how WWF works (WWF staff I interview). Once staff have been present for more than a year, they are usually fully acclimated to the organization.

In this case, being acclimated to the organization includes understanding which means of conservation have the greatest legitimacy within WWF. Similarly, during meetings—even meetings in which there is little if any hierarchy among members—long-standing staff members and experts serve as "mundanely powerful" (Marcus 2013) actors, perpetuating a culture of conservation within WWF. That mundane power consists of setting meeting agendas, editing texts, and exploiting internal and external networks of contacts to move programs forward. In the process, a multiplicity of voices within WWF is normalized and unified into a coherent voice for conservation.

Despite the massive archive collection within WWF, there are still problems in the organization with records and long-term organizational memory. In both Norway and Canada, staff were struggling with document management (field notes), and more than one staff person commented on the importance of mentors as holders of organizational memory. The advent of electronic document storage has greatly increased the number of possible documents for archival storage. In Anchorage, for example, I was able to access electronic versions of some program documents, but I ended up with multiple iterations of some documents—each with slight variations. In most offices, archival materials were in a mix of electronic and paper formats. Staff members were aware that archives existed, but most newer staff members had not actually looked through the documents. A coordinated strategy for managing program archives would ensure the usability of records, and might also provide additional materials for training new staff and familiarizing them with WWF's past work.

CHAPTER 4

THE TIES THAT BIND: PERCEPTIONS AND STRUCTURE OF WWF'S NETWORK

> Reality is reality. It transcends every concept. There is no concept which can adequately describe it, not even the concept of interdependence. – Thich Nhat Hanh

Introduction

In this chapter I examine the structure of WWF's extended network, key staff members' perceptions of that network, and the ways that the network is created and maintained. I draw on informal interviews with current and former WWF staff and their collaborators, meeting notes, documents produced by WWF for and by their Global Arctic Programme, and formal ego-centric network interviews. First, I look at the whole network as a real—but highly constructed—strategy for both organizational governance and the conduct of circum-Arctic conservation. Secondly, I focus on internal perceptions of the WWF Arctic network, especially on the differences in how the network is lived by different individuals in different contexts. Lastly, I look deeper at the ways that the WWF staff works explicitly to extend and maintain their network ties.

The question of actual versus perceived network structure is one that was posed by WWF staff early in the research development process. During the early stages of his research, it became clear that the structure and perception of WWF's network were important points for study. As the research developed during 2008, WWF staff returned to me with three questions reflecting what the staff in Gland saw as important. In an email, WWF staff described their interests as being in the "behavior of the network." The reorganization of WWF's Arctic work into a Network Initiative, one of several such

global initiatives, further underscored the importance of networking and the network concept in general for WWF.

What became more clear as I moved ahead was that, due to the decentralized nature of what was then called the WWF Arctic Network Initiative, there was no one person who could clearly delineate the broad network membership, let alone the complex web of connections within the network. Within each national office, staff were familiar with their own practices and the work of their immediate collaborators. While the core of the Arctic network team were able to list many of the WWF staff who work on Arctic issues, the list was tentative and didn't reflect important connections outside the WWF offices. Rather than a weakness, this lack of knowledge reflects a lack of hierarchy that is a key tenet of WWF's network model.

A fairly small human network scattered around the globe conducts the broad scope of WWF's work. Using a broad definition, the WWF Arctic network includes just over 200 individuals—including administrative staff, interns, associated non-WWF scientists, politicians, and others. Looking only at WWF staff, the network shrinks to under 150, many of whom are peripheral to the development of conservation programs. The core of the WWF Arctic staff fluctuates over time, but includes a dozen or fewer individuals situated within the larger WWF network—staff situated in Canada, Norway, Russia, and the US.

Network Methods

In this chapter I focus on the network structure of the WWF Global Arctic Programme, drawing on research using a combination of methods. These included participant observation, highly-structured egocentric network interviews, semi-formal

interviews, and analysis of WWF archives. I also used a network approach to refine site selection (Burrell 2009) and selection of interviewees (Howard 2002). In addition to my planned research in Oslo, Ottawa, Moscow, and Anchorage, this network ethnography approach resulted in added interviews in Murmansk, Washington DC, Toronto, Zeist, and Juneau.

I elicited egocentric network data in highly-structured interviews with key GAP staff, and then combined that data to give a picture of the whole extended network that no single individual could have outlined (Mardsen 2005). Egocentric data collection is most likely to elicit strong ties, at the expense of weaker ties (Reagans and McEvily 2003), though increasing the sample size for egocentric networks can encourage the inclusion of more weak ties in the data (McCarty 2002). This is particularly important since weak ties may contribute significantly to innovative capacity and social support (Granovetter 1973, 1983). Interviewees were selected according to the following criteria to maximize knowledge of WWF operations:

- Full-time WWF staff
- Individuals paid through the GAP *or*;
- Those with a primary job focus on Arctic issues
- Some interviewees based in each of four countries (Norway, Russia, Canada, USA)
- At least one year on the job

Given those constraints, these interviews included 78% of eligible Arctic staff (7 egocentric interviews). The remainder were excluded based on my desire for relatively equal country weighting (e.g., not having twice as many network interviewees in Canada)

or, in one case, staff availability. In two of the four countries, all of the eligible staff were included. The most restrictive part of the selection process was that each person interviewed have a primary job focus on Arctic issues. There are relatively few people within WWF who fit this description—therefore most of the alters[17] listed are either a) people outside WWF; b) people within WWF who work occasionally on Arctic issues, in addition to other duties; or c) administrative staff such as Human Resources personnel. Egocentric networks may be combined together to give a picture of the whole network (Kirke 1996; Mardsen 2005). In this case, egocentric networks function as a type of cognitive social structure (CSS) sampling (Krackhardt 1987) in which each respondent reports on connections within a localized section of the network (Mardsen 2005). I also conducted informal interviews with over 30 other WWF staff and non-staff individuals who showed up within the egocentric networks, and these interviewees reports of their contacts with the WWF GAP agreed substantially with the perceptions of WWF GAP staff. As an additional check on this data, I also combined the data from these egocentric network interviews with data from other interviews, texts, and participant observation within WWF. This data results in an additional 16 nodes (See Table 4.1 in the row marked "Overall").

Social Network Analysis

Social network analysis (SNA) focuses on descriptions of network interactions and positioning within networks. Rather than focusing on the roles of staff as defined by their organization, SNA relies on connections (links) between actors (nodes) to explain behavior within the organization (Emirbayer and Goodwin 1994). Within the network,

17 In egocentric network terms, the individual being interviewed is *ego*. All of the contacts listed by ego are *alters*.

centrally positioned actors hold relatively more power (Yeung 2005,45). *Centrality* may refer to betweenness (the number of other points that a node lies between), closeness (the distance to other nodes), degree (the number of nodes connected to a particular node), (Freeman 1978) or other measures of a node's importance. I use *eigenvector centrality* as a measure of node importance within the network. The eigenvector centrality of a node is the normalized sum of its ties to its neighbors, in which each tie is weighted by the neighbor's ties, which are in turn weighted by their neighbor's ties, and so on (Wang et al. 2012). Since WWF is largely a cooperative, rather than a bargaining, network (Bonacich 1987), eigenvector centrality is a reasonable proxy for a node's influence within the network.

With respect to social capital, three types of network measures are common in the literature: the functional (or quality of ties); the structural (describing how nodes are connected); and the positional (the positions of actors within the network) (Lakon et al 2008). In practice, these measures may be calculated using two types of study: sociocentric and egocentric. Sociocentric analyses (also known as sociometric or 'whole network') are useful when the boundaries and membership of the network are known, which was not the case here; they require presenting an interviewee with a list of individuals and asking about their connections to each. Egocentric network analysis captures individual-level perceptions of the local network, and may generate functional or structural data. It is useful when social capital is of interest, or when the network is not bounded *a priori*. Egocentric network analysis begins with asking an interviewee (ego) for a list of connections (alters), along with demographic information about each. Then, the interviewer elicits ego's *perception of ties* between every possible pair of alters.

Because the number of possible ties rises exponentially with the number to alters, the data collection process may be lengthy (McCarty 2009). McCarty has suggested alter elicitations of 60 names (2002) and 45 names (McCarty and Govindaramanujam 2005) to a) minimize the bias toward stronger ties that is inherent in egocentric networks and b) make the interview length manageable. This study used an elicitation of 50 alters, based partly on a test-run of an interview eliciting 60 alters that the interviewee described as "mind-numbing" (field notes). Even at 50 alters, all interviewees said that the process was taxing.

Actor Network Theory

While structural network analysis has succeeded in operationalizing the interpersonal networks in which individuals are embedded, some argue that is has done so in an overly structural way at the expense of process and agency (Emerbayer and Goodwin 1994). Actor-Network Theory (ANT) is a view that grew out of the sociology of science and technology (Latour 1992a). ANT, also referred to as the sociology of translation, is rooted in three key principles: impartiality between actors, symmetry in explanation of conflicting viewpoints, and an abandonment of the nature/society dichotomy (Callon 1986). I will use an ANT approach more extensively in Chapter 5. For the purpose of this analysis, though, the egocentric and combined sociometric networks of WWF do not exist in a vacuum: they are actively constructed and maintained through the activities of individuals and the actions of texts, technologies, and other non-human factors. I will return to this in the discussion in looking at how WWF's network is continually being re-established.

The Network Governance Approach in WWF

Network governance is a form of management that relies on social relationships and resource sharing to facilitate work. This form of governance is a counterpoint to both authoritarian, hierarchical control, and market-based management strategies relying on competitive regulation of behavior (C. Jones, Hesterly, and Borgatti 2009). Network-centric organizations are those that rely on network governance for knowledge management and completion of project goals. Theories of network governance are rooted in the idea of embeddedness—that individual and group behavior is moderated by the social networks in which humans are embedded (Granovetter 1985). Much of the research on network governance has addressed inter-organizational coordination (C. Jones, Hesterly, and Borgatti 2009; Koka, Madhavan, and Prescott 2014; Uzzi 1997), which is applicable in this case since WWF's Arctic network is both inter-organizational (spanning NOs and other Arctic conservation organizations) and intra-organizational (within WWF).

WWF has referred to their global presence as the "WWF Network" since at least the 1990s (Doh, Newburry, and Teegan 2003). In the 1990s, WWF revised their mission to focus specifically on biodiversity conservation, sustainable resource use, and pollution reduction. They also revised their operational strategy to emphasize decentralized decision making in the organization. Following the 1992 Earth Summit, WWF also increased partnerships with companies in the private sector (WWF 2009).

Since 2000, the focus of WWF has shifted from local conservation priorities toward a global approach, with a two-pronged strategy of local action combined with lobbying at national and international scales (WWF 2009). The shift at WWF has been

from individual projects toward larger programs—a shift echoed in other transnational conservation and aid organizations (field notes). In the mid '00s, WWF developed several Network Initiatives (NIs) organized around both geographic areas and key conservation themes (field notes; WWF archives). The development of NIs was part of a larger move within WWF toward a network governance model, echoing the 1990 move toward decentralized decision making:

> Before the Network Initiatives, we had 200 ecoregions, and WWF really invested in about 30 of them. Now we have 13 Network Initiatives, and each one attracts money from different National Organizations. Each one has a shareholder team. We have shareholder meetings twice a year—once via video, and once face-to-face (WWF staff – field notes).

Network governance may emerge in cases where conservation programs become too complex for a central authority to maintain hierarchical control (Beratan 2007). With respect to individual decision-making, network governance rests on the idea that individual actors are embedded within interpersonal networks (Grabher 2006; Granovetter 1985) and that the structure of those networks influences the development of collaborations, exchanges, and implicit contracts (C. Jones, Hesterly, and Borgatti 2009). The shift toward less hierarchical, more networked models of governance makes studying informal networks especially important for understanding how work is actually done (Cross, Borgatti, and Parker 2002).

Within WWF, decentralization is described as ideally being a means for making fast decisions without the need for top-down direction:

> WWF is relatively agile, though it can feel more like an oil tanker than a speed boat at times (WWF staff G interview).

> Consensus decisions are made through an escalation model: first the staff, then if needed the shareholders, then the CEO level if necessary (WWF staff D interview).

In the consensus decision process the role of individual staffers is extremely important, as opposed to committees or managers.

> WWF is outwardly directed and mission driven. Everyone [each individual] is responsible—there is no "us" (WWF staff AC interview).

The network governance approach—also described as a counterpoint to work in other conservation organizations—emphasizes individual initiative and autonomy. One long-time staff member described the network approach as a way of avoiding coercion within the workplace:

> ...WWF is nonhierarchical. TNC and CI are hierarchies controlled through DC. We aren't like the McDonalds of Conservation International. We are global in scope, but if you have to talk people into doing things then they will say "yes" and then not do them (WWF staff D interview).

Others described the relations between staff as being based on moral persuasion and trust:

> I see WWF... as nonhierarchical. To get things done you need moral persuasion, not just a reliance on motivating people by policies or rules (WWF staff AD interview).

And on the other side of the Arctic:

> Work in WWF is based on trust, not control. It is about setting things in motion (WWF staff D interview).

When staff first come to WWF, this nonhierarchical structure means that staff need both time and advice to come to terms with the structure of the organization. Mentorship is one important aspect of the network governance process; as staff move through a period of legitimate peripheral participation (Lave and Wenger 1991) when they first come to WWF, many individuals develop informal mentee relationships with long-term staff:

> Working in WWF is really up to individual initiative, but to be successful you have to have a mentor when you come in. It helps

> to have someone you can go to for advice (WWF staff E interview).

In addition, travel through the organization helps to familiarize staff with working processes in other parts of the network. There is an awareness among staff that different WWF offices work in slightly different ways, and that the way each office works influences collaborative efforts. As one staff member in Alaska noted:

> I've only worked here for... [a few] months, so I am still learning the structure. Going to DC and Russia will be very useful (WWF staff V interview).

As I travelled through WWF offices, WWF staff frequently asked me for my perceptions of other WWF offices, noting that I had travelled through more offices than some current staff members. At the Initiative on Climate Adaptation Research and Understanding through the Social Sciences (ICARUS) conference in 2011, I mentioned this fact in a presentation, and was told afterward by a WWF-US staff member: "you are right; I didn't really get a sense of the organization until I had travelled to other offices" (field notes).

While many staff view the network governance model as a strength, it is not altogether unproblematic. The network governance structure of WWF means that there may be many different strategies at work in WWF simultaneously. As one staff member who had left WWF commented:

> WWF was being pulled in all directions, with many three-year plans and strategies. It really is a big beast with many heads (WWF staff AA interview).

The network structure is also in constant need of grass-roots reinforcement. WWF International in Gland, in particular, was cited by several staff members as having top-down tendencies that are counterbalanced by work in the NOs and NIs. The formation of network initiatives was itself an effort promoted through WWF International (field

notes). One staff member connected this tendency to the culture of conservation expertise within WWF:

> There is a tendency for the organization to become top-down, to think of ourselves as leading experts. WWF International has a habit of "calling for" things—it has Teutonic overtones (WWF staff AC interview).

The network governance structure of WWF makes it unique among international conservation organizations. Staff agree that the non-hierarchical structure of the WWF network is a positive element in the work of the organization. In the next section, I look more closely at the structure of the network, including its heterogeneity and decentralization.

The Structure of WWF's Arctic Network

In this section, I draw from a series of egocentric network interviews conducted with key staff in WWF's Global Arctic Program (GAP) to detail the membership and structure of WWF's Arctic network. This network includes both WWF staff and their external collaborators. The network itself is difficult to bound, even for WWF staff, due to the nonhierarchical and heterogeneous nature of WWF. These interviews were structured using the EgoNet software package (McCarty 2011), and data was entered directly into the EgoNet program during each interview. Data from all interviews was then combined in EgoNet to give a picture of the entire network based on overlapping nodes (individuals named in multiple interviews).

Most data visualization was done using Gephi (Bastian, Heymann, and Jacomy 2009) to draw the undirected network. Projections are a Force Atlas 2 model (Jacomy et al. 2011) using linear attractions and repulsions to position nodes. Figure 4.3 was generated in Visone (Brandes and Wagner 2004) after importing EgoNet data using

EgoNet2GraphML (Algorithmics Group 2012). For a more detailed technical description of the EgoNet process, see Appendix B.

In social network research, maintaining confidentiality is a difficult issue (Borgatti and Molina 2005). In particular, in a small organizational network it may be possible for individuals to infer individual identities based on positions within the network (Klovdahl 2005). For example, although the two WWF Arctic staff in Norway show a great deal of similarity (~50%) in their network memberships and substantial agreement on alter-alter ties within the core staff, their peripheral network memberships are different enough that several staff members would likely be able to tell them apart, and possibly to identify specific individuals within the network—even if those individuals are outside of WWF and never consented to being part of the research process. To maintain confidentiality, I am presenting results as summary compiled networks.

Internal and external network membership, listed by national office, is shown in Table 4.1. Table 4.1 also includes a calculation of Blau's heterogeneity index for each site and for both the combined whole network and the whole network with my own network perceptions, based on texts, interviews, and participant observation, included (listed in the tables as "Overall.") Blau's diversity index (Blau 1977) is given by the formula:

$$D = 1 - \sum_{t=1}^{N} P_i^2$$

where D represents diversity, P_i is the proportional abundance of each membership category (WWF Canada, Indigenous and Local Communities (ILC), Governmental, etc.), and N is the number of membership categories. Blau's index represents the probability

that two random individuals from a population will share a given attribute. In this case, that attribute is membership in categories for WWF offices and external organization types. A value of 0 indicates complete homogeneity (all actors in the same category); as heterogeneity increases, the value approaches .91 (in a case with 11 categories).

Table 4.1: Network membership and heterogeneity for WWF's extended Arctic conservation network. Heterogeneity is indicated with Blau's (1977) index.

Percent Network Membership by Category (continued below)

Data Source	Other WWF	WWF Arctic	WWF Norway	WWF Russia	WWF Canada	WWF US
Norway	24.32	14.86	12.16	6.76	8.11	9.46
Russia	7.40	12.35	1.23	27.16	3.70	3.70
Canada	20.25	13.92	3.80	16.46	16.46	11.39
USA	9.38	11.46	1.04	9.38	11.46	26.04
Combined	15.46	6.28	4.35	13.04	8.21	13.04
Overall*	13.90	5.38	4.93	14.35	8.52	12.11

Percent Network Membership by Category (continued)

Data Source	Govern-mental	NGO	Academic	ILC	Other	Blau's Index
Norway	12.16	2.70	2.70	1.35	5.41	0.86
Russia	16.05	4.94	16.05	2.47	4.94	0.85
Canada	7.59	2.53	3.80	3.80	0.00	0.86
USA	9.38	10.42	2.08	3.12	6.25	0.86
Combined	14.49	8.70	9.66	1.93	4.83	0.89
Overall*	14.35	8.07	11.21	1.79	5.38	0.89

Looking in detail at Table 4.1 reveals more characteristics of WWF's network. Within each of the four countries doing the most Arctic work (Canada, Norway, Russia, and USA) Blau's index shows almost identical heterogeneity. The maximum possible heterogeneity in a case with 11 categories is 0.91, in which case each category would contain the same number of members. Organizational heterogeneity may indicate separation between sub-groups, disparity between staff members, or variety among categories (Harrison and Klein 2007). In this case, high heterogeneity indicates that, even within a single national office, Arctic conservationists are embedded within diverse international networks. This heterogeneity conveys several benefits in terms of network effectiveness. Members from different categories are likely to each have different, non-overlapping, external ties—increasing the available information within the network. At the same time, heterogeneous groups within WWF are more likely to avoid structural holes, with benefits of increased creativity and productivity (Burt 2004).

While heterogeneity, in terms of Blau's index, is consistent across national offices, the actual composition of the network differs from country to country. Russia and the US are comparatively insular, with 27.16% and 26.04% of network connections internal to their own NO, respectively. Staff in Norway and Canada have the most WWF connections in non-Arctic NOs (24.32% and 20.25%, respectively), highlighting the breadth of work conducted in both locations. Many of those connections are in funding NOs such as WWF-UK and WWF-Netherlands. The overall layout of the network is shown visually in Figure 4.1 (in which WWF nodes are colored) and Figure 4.2 (in which external nodes are colored). In Figure 4.1, the more insular natures of WWF-Russia and WWF-US stand out. In practice, this means that the WWF staff in Russia and the US who

work on Arctic issues work more often with staff in their own countries than do Arctic-focused staff in Norway and Canada.

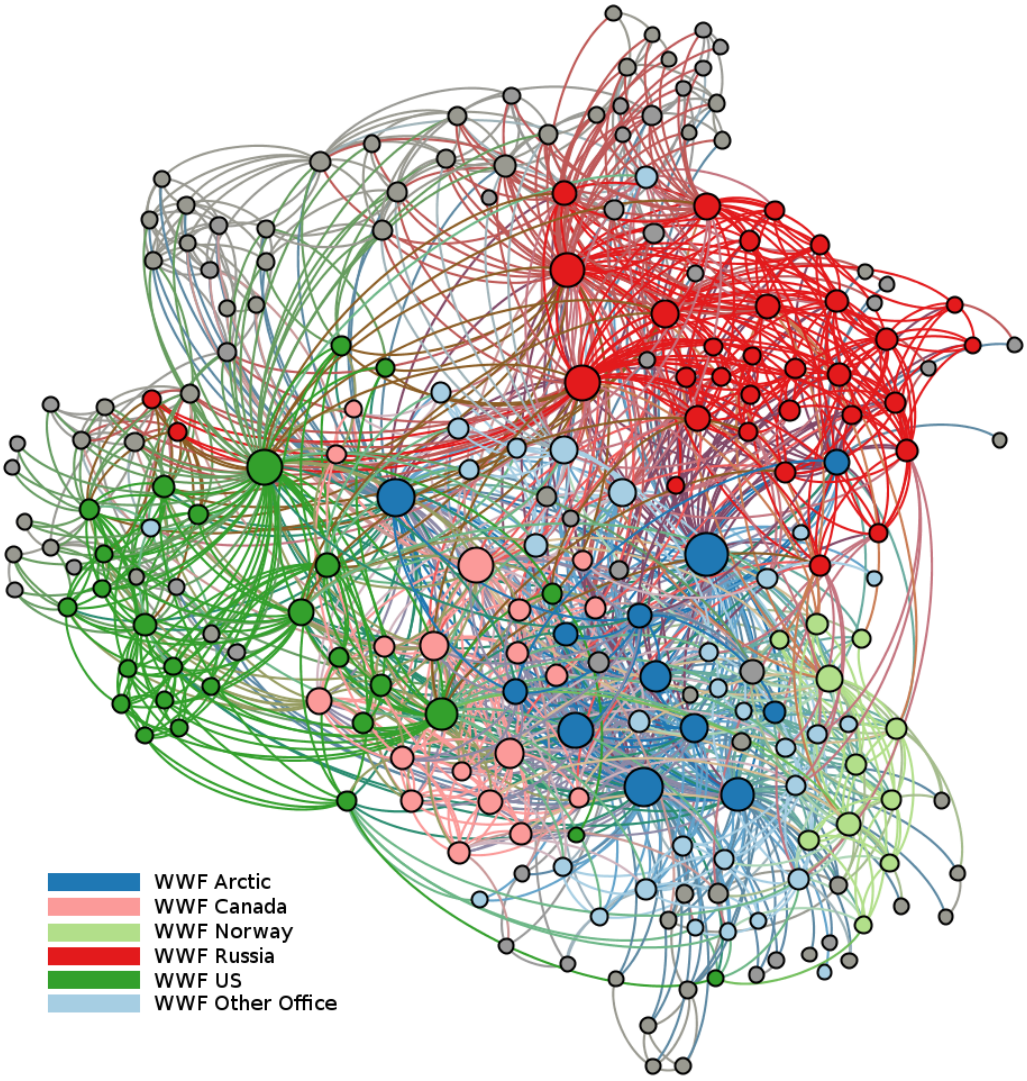

Figure 4.1: The WWF Arctic staff network as revealed by key informants. Grey nodes represent individuals who do not work for WWF. The graph is undirected; node size indicates relative Eigenvector Centrality. Link color is a blend of connected node colors. Nodes are arranged using a Force Atlas 2 algorithm.

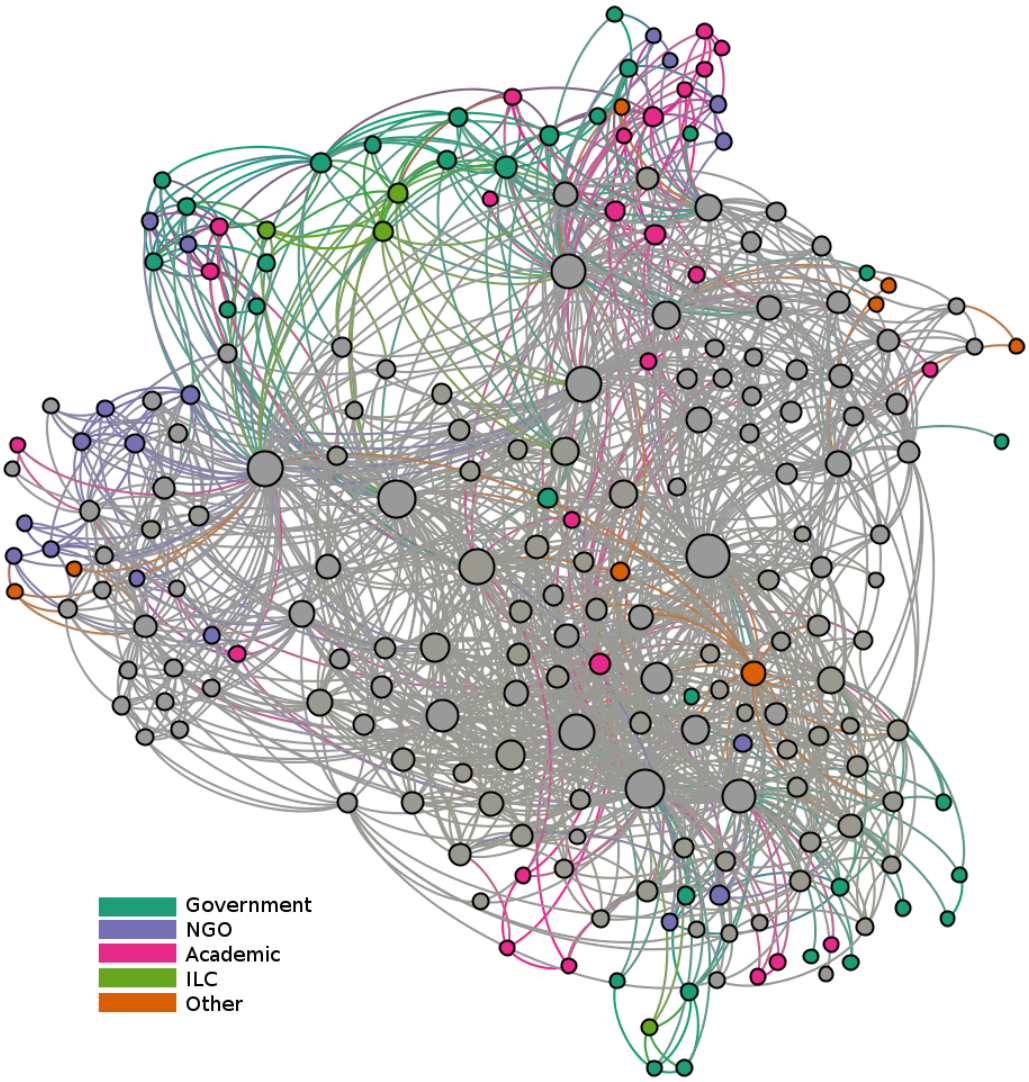

Figure 4.2: The WWF Arctic extended network as revealed by key informants. Grey nodes represent individuals who work for WWF. The graph is undirected; node size indicates relative Eigenvector Centrality. Link color is a blend of connected node colors. Nodes are arranged using a Force Atlas 2 algorithm.

External contacts in Figure 4.2 are widely dispersed around the network. External contacts include strategic partners in communities and other conservation organizations, contacts for distributing WWF's conservation message within governments and the Arctic Council, scientists, academics, consultants, and others. Having these contacts spread throughout the network means that heterogeneous program teams can take

advantage of each staff person's unique resources. As one long-time staff member said in an interview:

> Most external contacts will only have one WWF contact, for efficiency (WWF staff Z interview).

The external contacts of WWF staff provide opportunities for communicating knowledge to diverse groups (Reagans and McEvily 2003) and the potential for facilitating change in other organizations. One WWF staff member described knowledge transfer across the WWF network in terms of WWF's work with oil companies:

> There are a lot of things that are not considered by oil companies, for example an acoustic standard. The US Civil Acoustic Standard is available online for $120, and we can propose a Russian standard based on the US standard. This [knowledge transfer] is part of WWF's work (WWF staff B interview).

WWF's conservation work in the Arctic includes attempts to coordinate with oil companies, mining companies, and other industries whose work has potential negative effects on Arctic biodiversity. In making these connections, WWF intentionally expands their external network:

> We will coordinate with any company as long as we can affect change. The paradox is that the worst companies have the most potential for gain, but also the highest potential reputation gain (WWF staff – field notes).

The expansion of the external network is not only in terms of corporations. WWF also seeks to expand network connections into local communities and indigenous organizations, as reflected in recent WWF hires within the Arctic:

> We've had a habit of creating plans on computers in big cities. We need people who are comfortable and accepted in small communities (WWF staff AC interview).

Lau and Murnighan (2008) suggest that both heterogeneity and sub-groupings into communities are important for understanding organizational dynamics. Table 2 shows modularity and numbers of communities within each network (Blondel et al. 2008). Network heterogeneity, particularly for the most central nodes in the network, has both benefits and potential drawbacks. Heterogeneity is a broad measure of social capital (Borgatti and Foster 2003) and may indicate a strong ability to form inter-organizational partnerships (Brass 2004). At the same time, a high level of heterogeneity may decrease the opportunities for intra-group interaction. This suggests that collaboration within WWF becomes more difficult as staff's ability to reach outside the organization increases. The difficulty of coordinating work was one of the points raised by WWF staff during the research, as I describe in detail later in this section.

In terms of the community structure within these networks, I calculated community groupings (Table 4.2) using the modularity function in Gephi (Bastian, Heymann, and Jacomy 2009), which uses the algorithm developed by Blondel et al. (2008). Community membership does not map exactly onto office location, rather it is a product of ongoing WWF projects, many of which require inter-office collaboration and outreach.

Table 4.2: Descriptive Statistics for WWF's extended Arctic network

	Average Degree	**Network Diameter**	**Average path length**	**Graph Density**	**Modularity**	**Communities**	**# of nodes**
Norway	10.784	3	1.93	0.148	0.284	5	74
Russia	12.1	5	2.13	0.151	0.381	4	81

Canada	16	3	1.9	0.21	0.336	4	79
USA	13.79	3	1.97	0.145	0.411	4	96
Overall	13.932	4	2.35	0.068	0.452	6	207
Combined	14.197	4	2.35	0.064	0.43	6	223

Table 4.2 shows the membership category, eigenvector centrality, and modularity class (calculated community number) for the most central individuals in the network. The most central individuals in the network are from the WWF GAP, WWF US, WWF Russia, and WWF Canada. Individuals categorized as WWF Arctic may be based in any country, as long as they are formally part of the WWF Arctic team. It is interesting to note that, though the Arctic Programme was based for many years in Norway, staff of the WWF Norway National Office have relatively low centrality. Most of the WWF Arctic staff have relatively high levels of centrality. It is also worth noting that the calculated modularity classes of the most central individuals vary—suggesting that the organization's actual structure is relatively flat with central individuals working in many different communities. One of the objectives of creating the Arctic Network Initiative was to facilitate decentralized sharing of resources, and the spread of centrality across the network may indicate that this has been successful.

Just as important as the centrality of nodes—which is a measure of connectivity—is the presence of disconnections within the network. These spaces of disconnection have been described as "structural holes" (Burt 1992). Returning to Figure 4.2, the extended network—those connections outside of WWF—shows many structural holes. This type of structure is characteristic of highly productive teams (Reagans, Zuckerman, and McEvily 2003). In such a network, the core team is able to share information while

drawing on broad external resources. At the same time, WWF can serve a bridging role between external contacts, facilitating information transfer.

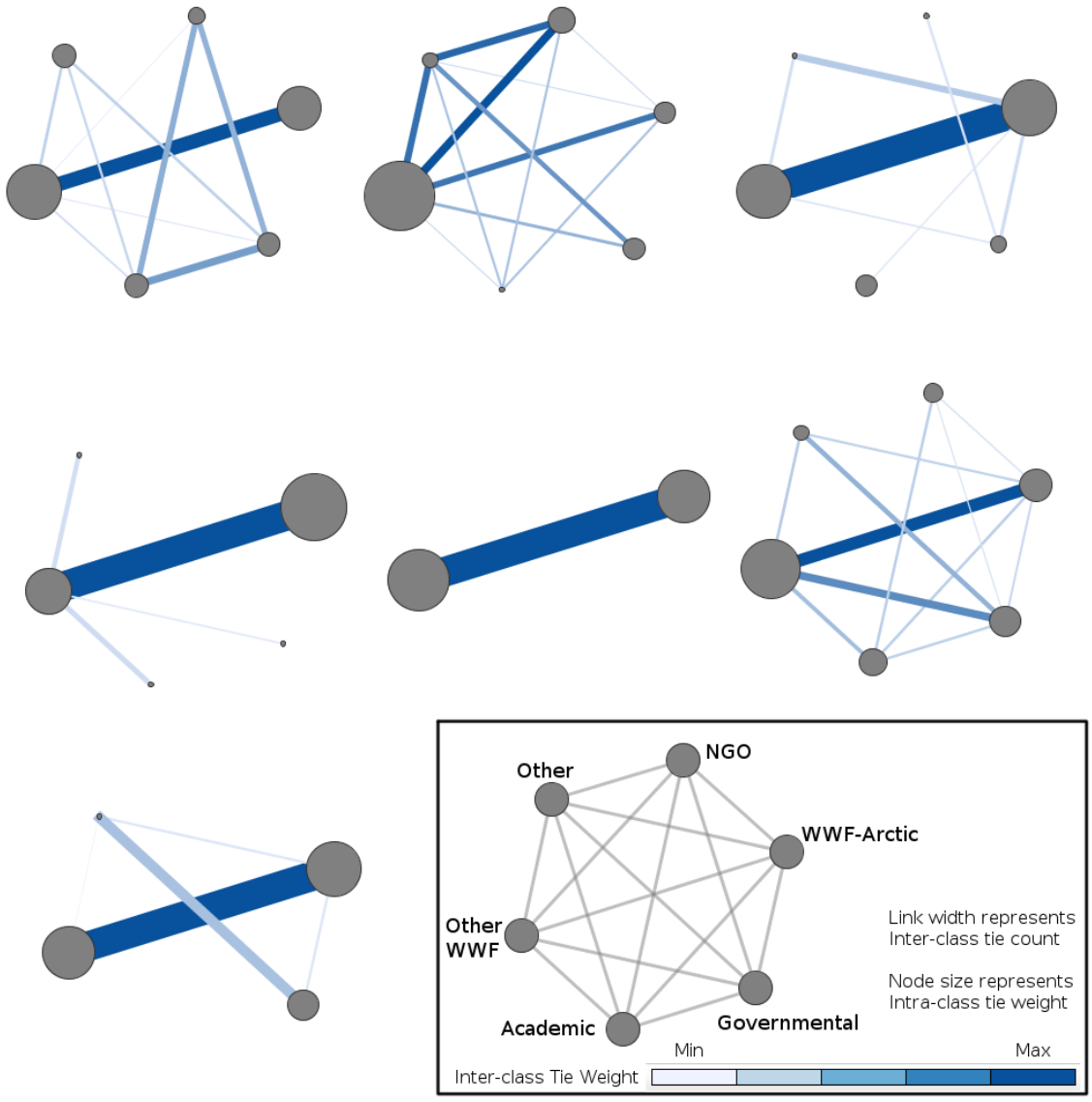

Figure 4.3: Summary egocentric network graphs: connections between alters. These summary graphs of egocentric networks for some key WWF Arctic conservation staff focus on categories of external connections; generated in Visone (Brandes and Wagner 2004) using the method of Brandes et al. (2009). Link width indicates connectedness between sectors; node size indicates connectedness within each sector.

The heterogeneity seen in the overall organization is also seen in the individual, egocentric networks of WWF staff, as seen in Figure 4.3. Each of the seven graphics in this figure is a summary of one individual's egocentric network, with link width representing the strength of connections between sectors and node size representing connectiveness within each individual sector. As Figure 4.3 illustrates, the egocentric network of each interviewee is structurally unique: there is not a generalizable configuration of links, suggesting that the pattern of an individual's connections is a function of her unique history of work within the organization. This heterogeneity is different from the way that many other organizations work. Rather than an entire office—Anchorage, for example—having a main point of contact in the "parent" office in DC, WWF staff develop unique relationships based on the projects in which they work:

> Some people here don't know anyone in the DC office; others have links to multiple people, and others may only know one person (WWF staff AM interview).

This diversity also explains the difficulty that any one person had in attempting to delineate the entire WWF network, since each person's egocentric network is unique.

The unique nature of each egocentric network can contribute to change within the organization. When a person leaves WWF, her network connections are also lost—and replaced with a new and different set of connections:

> Work in WWF is driven by relationships. For example, when _____ came in to the Arctic network she brought her own fisheries connections, but when _____ left, we lost those [other] connections (WWF staff AL interview).

The movement of staff from office to office as they change jobs within WWF also helps to connect WWF offices by bringing in new network connections:

> We hear about the Arctic program, but there is no interaction. They seem too busy to deal with fishery stuff. They were going to do a "fish forever" campaign, but it fell apart. Now that _____ is in the Arctic program, it may help since there is a personal connection (WWF staff AL interview).

The network building continues when WWF staff leave to work in other organizations. During my research, two former heads of the Arctic program were in touch with current staff. Another former WWF staff member described leaving:

> When I left, I stayed in touch; I really missed the old family of WWF (WWF staff AA interview).

Both internal and external connections in the network are created and stabilized in the search for conservation funding. WWF offices in general may be receiving organizations or funding organizations; WWF-UK, Netherlands, and US in particular are funders of global Arctic conservation. Other NOs, such as WWF-Russia are primarily receiving organizations within funding coming from elsewhere. In addition, WWF seeks funding for current conservation initiatives, increasing the complexity of the network picture, as well as the work needed to maintain the network:

> We get money from several different NOs, money for different time periods. Contracts always differ. Donors ask for different kinds of reports (WWF staff B interview).

> Timeframes differ between donors, and everyone wants something different—there is a lot of reporting (WWF staff I interview).

The funding roles of various WWF component organizations is not fixed, and may change over time, as with funding flows:

> We used to be primarily a granting organization, and now that has reversed (WWF staff AC interview).

In this case, what was once an office that provided funding was now seeking funding.

Maintaining an international network of conservationists is not an easy task. As the funding case shows, the development of network connections carries with it a cost in terms of organizational capacity for reporting and coordination. This can be seen in cases where communication doesn't work as planned. In one case, a WWF staff member described difficulties in communication with WWF-US caused by a misunderstanding of US network structure:

> It never occurred to me that there would be this inconsistency within WWF-US. There is confusion about what the mandates and roles should be, blinders about what is outside US interests (WWF staff – field notes).

In another, staff discussed the difficulties of maintaining effective network ties in transnational projects:

> Staffer 1: Different time zones create management difficulties. It is 6am in Vancouver.
> Staffer 2: It has echoes of a forest management project I was involved with, where there was a guy in Indonesia who was up until 1am with his family waiting on a phone call (field notes).

At some point, the coordination of global work becomes a major part of the conservation work of WWF. The difficulties of working in a global, networked organization are not lost on WWF staff:

> Work is hard because we are so widespread. We have to work to keep in touch (WWF staff E interview).

When making decisions about where and with whom work should be done, individual staff have wide latitude in choosing how to work. This organizational structure is what Mintzberg (1979) refers to as an "adhocracy." In some cases, rather than building new network connections, this means that it is more expedient to work with known staff where relationships already exist. One staff member described this in terms of language:

> It is easier to work with _____ because there is no language barrier (WWF staff B interview).

Another staff member described working with the same staff repeatedly across the network, that when working on a new project:

> ...it ends up being about who has worked together in the past (WWF staff AM interview).

The same principal of working with known actors also applies to external WWF contacts, as when staff were discussing the need to fast-track the vetting of new program materials through a group of external experts:

> "We can meet with the usual suspects" (WWF meeting—field notes).

In each of these cases, WWF staff chose for the sake of expediency to maintain existing network connections rather than expanding the network.

Discussion: A History of Change

WWF's Network Initiative approach in some ways parallels the trend towards ecological networks in conservation. Ecological Networks (ENs) are complexes of protected areas at the landscape or ecoregional scale that, in theory, provide stability and resilience (Opdam et al. 2006), though their empirical usefulness has been questioned (Boitani et al. 2007). The interconnected set of WWF offices is similarly intended to provide stability to WWF's circum-Arctic work. The parallels between ecological and social networks are not unnoticed by WWF staff:

> WWF has a tendency to work on adaptation and resilience, but when time is short it is hard to see positive changes. [WWF] also tends to combine climate work with other work, for example on protected areas. It is also important to look at ecological networks, for example on migrating species (WWF staff J interview).

WWF has been engaged in a sustained project of Arctic conservation since 1991 when the WWF Arctic Programme was first conceived. Much of that work has been

localized around particular species or ecosystems, but even in those cases the organization has often framed their work as "circum-Arctic." The places of Arctic conservation often fall into areas that cross or transcend borders. WWF's work within individual nations is controlled by national offices, and the Arctic program serves a coordinating and facilitating role in bringing national resources together. This work is necessarily a network effort. Similarly, the governance of this network is decentralized out of necessity. Each National Office is responsible for its own hiring, its own fundraising, and its own set of national priorities. The GAP provides an external coordinating body that can act without intruding on the sovereignty of the National Offices.

The current GAP is in some ways a stronger iteration of circum-Arctic conservation than WWF's original model. When it was first formed, the Arctic Programme was run out of Oslo, with broad coordination through an Arctic Sub-Regional Team (ASRT) consisting of WWF staff in Arctic countries. The ASRT met yearly on a schedule that generally aligned with meetings of the Arctic Council's CAFF (Conservation of Arctic Flora and Fauna) working group, where the WWF Arctic Programme is an official observer group. Based on WWF archives and interviews with former staff, the work of the ASRT was largely focused on information sharing among and between National Offices, developing position statements on conservation issues, delivering official statements at CAFF meetings, and promoting cooperation between National Offices on conservation issues. Early ASRT meetings were sometimes missing delegates from one or more National Offices due to a lack of travel funding. Reports were submitted in print to the meetings in advance.

Much of this work still continues under the current model, but the development of large transboundary and circum-Arctic conservation initiatives has reinforced the importance of broad networking. At the same time, technological changes have enabled new forms of communication and networking. In interviews with long-time WWF staff, it was clear that the Arctic Programme had, since its inception, focused on building international networks for conservation. That network building was done via telephone, fax, mail, and direct meetings. Documents and position statements were generally developed by a single individual or by collaboration with a single office. With the advent of email, Skype, Dropbox, and organizational document servers, the day-to-day work of WWF has changed.

Changes in the structure of WWF programs are not uncommon, both at the international level and at the level of individual NOs. In the US for example:

> WWF changes strategies at a pace with the rest of the world. When [Carter Roberts] came in, WWF-US became more business focused, moved toward a more market-oriented approach with more efficient fundraising. That model is 6-8 years old now and has adapted over time (WWF staff G interview).

Some of these changes are the result of new leadership (as seen above); others are driven by changing conservation needs or by the availability of new technologies for working.

The RACER (Rapid Assessment of Circum-Arctic Ecosystem Resilience) project, for example, was developed during the course of this research and was one of the major initiatives within the Arctic program. RACER focuses on using climate models and satellite data to identify areas within the Arctic that are likely to be sources of resilience as climate change progresses, with the hope of targeting these areas for conservation. Aside from the GIS mapping and computer modeling, which would have been impossible with such precision when the Arctic program began, the development of this project

consisted of multiple conference calls, sharing of electronic documents, online conversations, and expert workshops, lasting for over a year. The individuals involved in this collaboration are from multiple group memberships (offices and external groups) and multiple communities (modularity classes), and therefore this project increases the overall cohesiveness of the network.

Active Maintenance of Network Ties

More broadly, Arctic conservation can be seen as an amalgam of actor-networks, with associations mediated by individuals, organizations, texts, technologies, and institutions (Latour 2005). Callon (1986) describes the process of network-making as a process of translation involving four "moments" of problematization, interessement, enrollment, and mobilization. Problematization describes the identification of an issue and the inter-definition of actors; interessement involves strengthening associations, enrollment is the acceptance of roles by actors, and mobilization describes the new network taking action. These 'moments' may occur simultaneously or repeatedly, and it may be better to think of them as moments in the mathematical sense, as a *configuration* of individually moving entities, rather than as a series of points in time (Scott et al. 2014).

Within WWF, the majority of individual staff time is spent on activities that can be interpreted as building or strengthening complex networks. Meetings, phone calls, email, joint lunches, and collaborative writing take up almost the entirety of the work day. While a complete Actor-Network Theory analysis of work at WWF is beyond the scope of this chapter, it is useful to think of the active role that the non-human components of the network play in building network structure. The fact that computers with email capacity exist mandates the checking of email and strongly facilitates network

building through email. When staff are travelling or in remote locations, they are absolved of this responsibility. The network-building that WWF staff do on a daily basis is conducted in service of multiple ongoing projects, each of which works toward the creation of a product, or artifact.

A project like RACER has as a *proximate* goal the creation of maps to inform conservation decision-making, but the ultimate success of such a project *lies in the establishment of networks*. The maps developed by RACER are artifacts specifically designed to affect network-building between WWF, CAFF, the Senior Arctic Officials of countries in the Arctic Council, and individual governments and corporations. However accurate the maps that WWF creates may be, they fail as tools if they are not read, understood, and accepted—they are actants in a process of translation. As I observed programs, I noted that project deadlines and release dates were coordinated to meet social deadlines (associated with international meetings) rather than technological ones. Moreover, as noted previously, these projects have strong effects on the internal structure of WWF's network, which in turn facilitates, enables, or hinders future work.

Conclusions

In doing the work of conservation, WWF's circum-Arctic network relies on interconnectivity between offices where the most central staff are distributed. The functioning of this network relies on heterogeneous ties among WWF offices and external contacts. Those external contacts are, in many cases, connected through WWF—making the organization a key nexus for the conservation of the Arctic. At the same time, the heterogeneity of WWF's extended network, both in terms of individual group membership and in terms of community associations within the net, means that WWF

staff must continually work to maintain internal cohesiveness and collaboration. That cohesiveness is a by-product of ongoing projects. WWF staff do not maintain the network of Arctic conservation out of loyalty to the organization, but out of a desire to see conservation succeed:

> People don't support the organization; they support the cause (WWF staff AC interview).

Within WWF, staff work to sustain a heterogeneous web of conservationists, funders, and policy-makers from multiple sectors around the world. This networking is not a path to Arctic conservation, or "how" conservation is done—rather this process *is* Arctic conservation. For WWF, Arctic conservation is, in a real sense, bringing together a mix of resources and people around key issues to produce conservation objects—maps, plans, policy documents, charts, graphs, and statistics. Each of these, in turn, becomes a part of the network, shaping the future configuration of actors for the next moment of conservation.

In terms of concrete suggestions for WWF, staff in Norway, Russia, and the US all commented that, while networking is important, the means of networking is also crucial. While one staff member commented that WWF "mostly works by email" (WWF staff AL interview), others noted that face-to-face meetings cannot be replaced:

> To start a new program, we would really require a face-to-face meeting, not a videoconference. Then we could advance (WWF staff AI interview).

> Face-to-face meetings are important for efficiency (WWF staff AK interview).

Moving forward, it is important to consider the mode of interaction and to balance teleconferencing and email with in-person interactions.

In addition, WWF's organizational structure, in which small groups come together for project coordination, is best described as an adhocracy. Of all organizational structures, adhocracy provides the best setting for innovation and adaptability; at the same time, it may make coordination of mundane tasks more difficult than they would be in a simple command structure or bureaucracy (Mintzberg 1979). When working on cross-border or circum-Arctic issues, these project-based teams include staff from multiple National Offices. An adhocracy requires a large degree of personal initiative and a high degree of individual awareness regarding the structure of one's own network. In developing the internal network, staff redundancies—shared professional competencies and network connections—actually help to stabilize the network by providing resilience in cases where important network members leave (Newig, Günther, and Pahl-Wostl 2010).

Lastly, in several instances WWF staff expressed a desire to expand their external network. Most notably, in the case of the Last Ice Area (see Chapter 5), WWF staff expressed an interest in the area being managed or co-managed by indigenous groups in Canada's North. While adding peripheral network members is relatively easy, adding a community to the network or adding individuals into central positions may be more challenging, and will change the structure of the overall network. Rather than peripheral engagement, adding collaborative members requires altering the network's core. One way to achieve this might be by inviting one or more indigenous representatives to join the WWF Arctic Shareholder's Group.

CHAPTER 5

KNOWLEDGE IS THE NETWORK: WWF AND THE CONSERVATION OF THE ARCTIC

> The organization supports creative individuals or provides a context for such individuals to create knowledge. Organizational knowledge creation, therefore, should be understood in terms of a process that "organizationally" amplifies the knowledge created by individuals, and crystallizes it as a part of the knowledge network of organization (Nonaka 1994,17)

Introduction

In this chapter, I explore the development of knowledge in two concurrent WWF Arctic conservation initiatives: the Arctic Home Campaign and the RACER[18] project. In each case, action occurs through heterogeneous networks of individuals, organizations, species, maps, texts, and tools. The broad strokes of conservation project development here follow Callon's (1986) outline of translation: the process by which these diverse program networks are formed. I describe WWF as a knowledge organization—with an emphasis on knowledge as inputs to and outputs of conservation initiatives. I argue that another, more tacit, type of conservation knowledge is embedded within the relations in and surrounding WWF in the process of project development. As a result, WWF's Arctic conservation knowledge is best viewed as relational process rather than as static information.

The Arctic Home Campaign and the RACER project were the two largest initiatives of the WWF Global Arctic Program during the time of my research. Arctic

18 Rapid Assessment of Circum-Arctic Ecosystem Resilience

Home is a campaign funded by the Coca-Cola Company, perhaps most widely known for the production of white Coke cans during the winter months and associated drawings of stylized polar bears. Funding from Coca-Cola goes to further research, education, lobbying, and management for the Last Ice Area, a region in the Canadian north and Greenland that computer models predict will be the last bastion of summer sea ice in the Arctic. The RACER project also uses computer models, maps, and satellite imagery to predict those areas of the Arctic where productivity is high and predicted to persist under climate change through the year 2100. In both cases, rather than focusing on vulnerable areas where species are currently threatened, WWF is using a predictive approach. In that approach, staff are constructing and disseminating knowledge about the future of Arctic ecosystems in an attempt to influence policy.

In the next sections, I analyze the development of these two programs using Callon's (1986) translation framework. I begin with a review of the theoretical background for the chapter—on knowledge and power and the process of translation. I briefly describe the methods that I employed in collecting data for this chapter (I discuss methods in more detail in Chapter 1) before moving to outline first Arctic Home and then RACER in terms of translation. In the final sections, I discuss WWF's efforts as a knowledge network and what that means in terms of organizational power.

Knowledge, Power, and Translation

Within the political ecology literature, conservation organizations tend to be represented as "powerful" actors in terms of visibility, connectedness, budgets, and influence. Brockington describes conservation organizations clearly in terms of power:

> No discussion of the growth in power of conservation is complete without an appreciation of the power and changing nature of the

> major conservation NGOs. The largest are the Nature Conservancy (TNC), the Worldwide Fund for Nature (WWF), the Wildlife Conservation Society (WCS) and Conservation International (CI). They are some of the biggest NGOs in the world, employing tens of thousands of people and controlling billions of dollars, and with projects and influence all over the world. They are highly visible, particularly in the West – the WWF's panda logo is one of the most successful of all time. All but the WWF are US-based, and even within the WWF, WWF-US is a powerful branch in its own right (Brockington 2008:555).

Brockington's analysis parallels descriptions of conservation NGOs as powerful in countless published articles (Brosius 2006; Chance and Andreeva 1995; Chapin 2004; Doyle and Doherty 2006; G. Holmes 2011; MacDonald 2010; et al.). This perspective is rooted in the observations of researchers in the field. However, it is at odds with many perceptions and experiences of conservationists within the WWF Global Arctic Program, who see the struggles (and failures) of the organization on a daily basis. As an example, reflecting on the Arctic Home campaign, launched in 2011 with a goal of protecting the Last Ice Area in northern Canada and Greenland, one staff member said:

> It is an uphill battle because of our history. We've found that posing conservation in opposition to economic development doesn't work... there was a time when we were calling for "no more leases in the Beaufort Sea," and the legacy of that is still there... mistakes were made on both sides (WWF staff AC interview).

In this case the long history of WWF complicates rather than facilitates conservation. It is more accurate to say that WWF *hopes* to be powerful, and works toward achieving influence. As another staff member added:

> I don't know that you can say that WWF is powerful... we do try to have an effect in the world, but we certainly don't always succeed (WWF staff Z interview).

Lukes (2007) describes power as consisting of three aspects: direct coercion, determination of agendas, and the power to shape perceived self-interest. While political

ecology certainly examines power, including hegemonic power (that loosely parallels Lukes' last category), it sometimes does so with an insistence on *a priori* theorizations of capital, labor, organizations, and the state. Whatever power WWF holds as a conservation organization, though, is a result of numerous negotiations and reconfigurations between both human and non-human components.

Speaking of WWF simply as a "powerful" NGO elides the complexities and encumbrances entailed in the work of conservation, much of which involves the development of conservation knowledge and its mobilization through networks. In this regard, WWF functions as a knowledge organization—with an emphasis on knowledge as both inputs and outputs of conservation initiatives. Holmes (2011) describes this knowledge process in relation to global conservation in general:

> Knowledge supports and reinvigorates conservation, giving practitioners new and better ways of acting, in new places, with new arguments and justifications. Producers and disseminators of ideas are important in the conservation elite, closely linked to NGOs and bureaucracies. NGOs have great ability to produce knowledge and to use it to get resources and shape conservation practice. Much knowledge is in the form of science, which conservationists use (or claim to use) to plan effective actions. NGOs produce more conservation research, with greater policy impact, than universities. Science produces key concepts underpinning conservation (biodiversity, endemism, ecosystem, endangered) and ways of measuring them, which are used by NGOs as calls for action (and consequently money and influence). Such concepts do not translate easily or unaltered into policy, but they permit new arguments and ways of acting, giving new power to conservationists (G. Holmes 2011).

I argue that another, more tacit, type of conservation knowledge is embedded within the relations within and surrounding WWF in the process of project development. Rather than the scientific knowledge that supports conservation initiatives, this is the knowledge of how to move conservation forward by holding meetings, recruiting

supporters, and mobilizing the WWF network. As I discuss in Chapter 4, the heterogeneous and nonhierarchical structure of WWF's network—with its complex of National Offices, Program Offices, funding offices, and external contacts—makes individual initiative and knowledge about how the network functions crucial. In effect, WWF itself works globally as an organizational collaboration within itself, since its parts all move independently. This relational knowledge is integral to how conservation is done and what is considered successful from WWF's perspective.

Given the importance of both tacit and explicit knowledge to WWF's conservation efforts, the success or failure of WWF's work is in many ways a question of the politics of knowledge in Arctic conservation. By politics of knowledge, I refer to several relationships between knowledge and power. One idea is the politics of *knowledge production* (Baert and Rubio 2011). The idea that learning, knowledge creation, and knowledge transfer are political—subject to the effects of power—is not new. Another is the idea of knowledge and power as mutually articulating in the sense of Michel Foucault; that:

> knowledge and power are integrated with one another, and there is no point in dreaming of a time when knowledge will cease to depend on power; this is just a way of reviving humanism in a utopian guise. It is not possible for power to be exercised without knowledge, it is impossible for knowledge not to engender power (Foucault 1980).

Finally, I consider the relational aspect of knowledge—how networks of heterogeneous actors are assembled and stabilized—to be, in and of itself, political.

Kakihara and Sørensen (2002) review four different discourses of knowledge: knowledge as object, knowledge as interpretation, knowledge as process, and knowledge as relation. Social scientists have tended in recent years to argue over the tensions

between objective and interpretive knowledge, while neglecting processual and relational knowledge. Kakihara and Sørensen count process knowledge as including the process philosophy approach of Whitehead (Whitehead 1929) as well as the knowing-as-process approach of Nonaka and Takeuchi (Nonaka and Takeuchi 1995). Kakihara and Sørensen (2002) reference the Japanese philosopher Bin Kimura as an example of relational philosophy. Kimura's position is that being arises out of *aida* (betweenness) or the relational space existing between entities (Odin 1996). By specifying knowledge as a relational process, I am explicitly connecting to the relational sociology of Callon (1986), Latour (Callon and Latour 1981; Latour 2000, 2007b), and Law (1999, 2003) and the process philosophy of Whitehead (1929). In this perspective, knowledge can never be accumulated—it isn't a thing, it has no weight. What appears as the accumulation of knowledge is in fact the formation (and dissolution) of associations—the shifting of heterogeneous networks.

Joan Martinez-Alier, in The Environmentalism of the Poor, asks the question "who has the power to simplify complexity?" (Martinez-Alier 2002,271). He is speaking in terms of ecological valuation, but his question can easily be extended to other knowledges. I want to move away from the question of who—as though power were a physical characteristic of individuals and groups—and toward the question of how. When simplifications occur—and they do occur—during the development of conservation programs and policies, how do they occur? What is simplified away and why? By focusing on networked knowledge and the way that the workings of WWF build on relations between people and resources, I want to look beyond the question of who is powerful toward that of how power is generated and enacted. A relational approach to

knowledge moves us away from questions of objectivity and knowledge domains (scientific knowledge, traditional knowledge, corporate knowledge, and so on) toward knowledge as a process of enactment or performance. And, as a process rather than an object, knowledge itself is both social and political.

In this chapter, I focus on two WWF initiatives in the Arctic: "Arctic Home" and The Rapid Assessment of Circum-Arctic Ecosystem Resilience (RACER) project. I will describe each of these initiatives in terms of translation (Callon 1980, 1986). Callon describes four moments of translation: problematization, interessement, enrollment, and mobilization. These "moments" are generally described, in the social sciences, as phases—time periods when particular types of action occur. It may be more useful to consider a moment, as defined by mathematicians, to be a configuration: that "moments" of translation are in effect relations of actors. I don't mean to imply a quantitative measurement of configurations, or a shape in space. Instead, I want to partially disentangle the solely temporal element from the idea of "moment" while stressing the processual: topology, inertia, force, and power. The resulting relational activity is what we sometimes frame as static "knowledge."

In the moment of *problematization*, actors (people, technologies, species, organizations, and so on) define themselves relative to one other. As Callon notes, "problematization describes a system of alliances, or associations, between entities, thereby defining the identity and what they 'want'" (Callon 1986,8). The associations formed through problematization are stabilized through *interessement*. The effect of interesting other actors is one of identity fixation. "To interest other actors is to build devices which can be placed between them and all other entities who want to define their

identities otherwise" (Callon 1986,9) The result of effective interessement is *enrollment*, in which network members begin to occupy specific roles: threatened species, endangered ice, research scientist, member, government official. The fourth moment is *mobilization*, in which multiple allies are mobilized and voiced by a decreasing number of official speakers. The process of translation is blurry—with these moments occurring in repetition, sometimes incompletely, and in conjunction with other simultaneous translation processes. Translation explains how a few come to speak for the many, including humans and other elements of the social and natural world.

Methods and Setting

This research was conducted between 2009 and 2012 as a multi-sited study (Marcus 1995) of WWF's Global Arctic Program, focusing on social and cultural processes in the production of conservation knowledge. Multi-sited studies of transnational organizations present challenges for the traditional model of long-term ethnographic research (Gusterson 1997; Markowitz 2001). In response, I relied on a mixed-methods approach, within a para-ethnographic framework (D. R. Holmes and Marcus 2006) in which the expertise and analytic skills of WWF staff are central to the process. Research included participant observation and interviews in multiple locations: Offices in Oslo, Ottawa, Toronto, Anchorage, Juneau, Washington DC, Moscow, Murmansk, and Zeist; and meetings and conferences in Montreal, Moscow, Copenhagen, and Nagoya. I also participated in online discussions and teleconferences, and collected and analyzed over 2 million words of documents. For this chapter, I rely on a combination of field notes from participant observation, interviews with current and former staff, and texts from WWF archives and publications.

This research focused heavily on networks in several senses. I used a combination of egocentric and sociometric social network analysis (McCarty 2002; McCarty et al. 2007; Reagans and McEvily 2003). I employed a network ethnography approach (Howard 2002), building my network of interviewees and research sites in part based on that social network analysis. And, I utilize these approaches within an Actor-Network Theory framework. My initial interest in these multiple network approaches came from staff descriptions of WWF's internal structure, which has shifted in the last ten years[19] toward an explicit form of network governance (Grabher 2006).

In the next sections I will describe two ongoing conservation initiatives as processes of translation. In the discussion to follow, I look at the WWF GAP network broadly as a heterogeneous assemblage, and the work that they are doing—the activity of conservation in the arctic—as the construction of knowledge and power.

Arctic Home

The Arctic Home project is an ongoing partnership between WWF and The Coca-Cola Company, and an example of a cause-marketing campaign (S. M. Smith and Alcorn 1991). During the winter of 2011-2012, Coca-Cola turned their iconic cans white as part of a campaign to raise awareness of Arctic biodiversity loss, specifically threats to polar bear populations from vanishing Arctic sea ice. Coke has used images of polar bears in their marketing for more than 90 years (The Coca-Cola Company 2013), and WWF has a strong interest in protecting bear habitats and populations. As part of this initiative, Coke

19 WWF's global structure has arguably followed a network governance approach since at least 1992 when the Arctic program was formed, but it is only in the last decade that WWF has begun referring to its own structure (both in whole and in part) as a network or set of networks.

has donated $2 million USD to WWF, and is matching donations from customers up to $1 million via an online and text-message campaign.

Project documents and press releases describe this collaboration as a partnership between Coke and WWF. The Coca-Cola Company is the formal name of the organization that produces Coca-Cola (a.k.a. Coke). For purposes of this campaign, we have the parent company (The Coca-Cola Company), their flagship brand (Coca-Cola), and the packages that Coke comes in (Coke cans). The campaign also includes caps on other Coca-Cola products and special labels on bottled Coke. The Coca-Cola Company also includes internal divisions of its own (e.g. Coca Cola Canada). Within WWF, funds from The Coca-Cola Company support the Last Ice Area, a project to define, map, and manage the area where summer sea ice is predicted to endure climate change the longest. Arctic Home is in a sense the public front-end, raising awareness and funds for the Last Ice Area initiative.

Problematization

In 2009, the heads of WWF-US and Coca-Cola traveled together to the coast of Hudson Bay to observe the effects of climate change and polar bears in their native habitat. The trip, together with science showing that Arctic ecology was being threatened by changing climate, led to the current partnership (WWF 2011a). The problem: that as ice melts and climate shifts, polar bear habitat is threatened. Female polar bears require sea ice for seal hunting during the summer months, when they take in most of their nutrients for the year, and declining summer sea ice results in underweight bears with lower reproductive success (Laidre et al. 2008; Shadbolt, York, and Cooper 2012). There are a host of questions related to this core problem: How fast will the ice melt? Where

will it remain the longest? What specific effects will melting ice have on polar bears directly? What should be done to manage dwindling resources? What role should people living in the Arctic, particularly indigenous people, play in managing polar bears and other resources? To address these questions, the already-networked core within WWF and Coca-Cola determined a host of actors and defined their identities: iconic bears, threatened ice, expert scientists, indigenous managers, policy advisors, key funders.

In the process of framing the Last Ice Area and Arctic Home, WWF and Coca-Cola also defined themselves as key players in the process of polar bear conservation. For purposes of the Last Ice Area and Arctic Home, WWF and Coca-Cola defined their own identities as obligatory passage points (Callon 1986) within the network they created. In the case of WWF, this is a double-definition—since WWF includes both program managers and noted scientific experts on its staff. Problematization is a starting point where an idea begins to take shape, along with specific tentative roles.

Interessement

The roles defined in the problematization process are bolstered through the development of the formal WWF-Coca-Cola partnership. This is a symmetric process where actors "interest" one another by weakening, cutting, or redefining other possible, competing relations. Once Coca-Cola commits to working with WWF, it becomes unlikely that WWF will engage in a similar, simultaneous campaign with (for example) Pepsi. It also becomes unlikely that Coca-Cola will work so visibly in the Arctic with another conservation organization. These are not just side-effects of collaboration: they are often written into the legal documents that create formal partnerships.

Role definition within WWF began soon after the funding from Coca-Cola was announced. In April of 2011, the GAP was planning for a conceptual meeting, to be sure that everyone was clear on the Last Ice Area concept and plans for moving ahead:

> Staff 1: So, for clarification, is this a meeting of the science nerds or of everybody?
> Staff 2: The first one, this is a technical meeting (WWF staff – field notes).

Plans were made to launch the Last Ice Area project at the international meeting of the Polar Bear Range States in Nunavut in October 2011[20]. In these early stages, a pair of WWF staff were appointed as co-leads for the project and other staff began to be assigned roles—beginning with the "science nerds." Early role definitions also included the technology to be used during the project. Project leaders developed a Google site for document sharing, but noted that there were problems getting everyone to use it:

> We have the H: drive, the O: drive; then when _____ needs something, he emails _____ (WWF staff – field notes).

Once roles are defined, they remain fixed until there is objection or resistance within the network. Later in the development of Arctic Home, the project lead changed, both because of shifting responsibilities within the network and to consolidate the project under one person's guidance.

The roles of other actors are similarly fixed, making competing definitions problematic. In the marketing materials of the program polar bears are identified as a loved icon (The Coca-Cola Company 2013; WWF 2011b) and a species whose home is disappearing. Prior to the Arctic Home project, polar bears already had several competing

20 The meeting was the Meeting of the Parties to the 1973 Agreement on the Conservation of Polar Bears Iqaluit, Nunavut, Canada, 24 -26 October 2011.

identities: icons of the North, endangered animals threatened by hunting, victims of climate change, and resources for indigenous communities. Interessement locks in a specific identity for polar bears. Other identities, such as the competing identity of bears-as-resource, are threatened by the bear's status as a popular icon in Coca-Cola's marketing.

While indigenous people are included within the campaign's role definitions as ideal managers (WWF 2012a, 2012d), the simultaneous exclusion of bears-as-resource has created tension, as when Canadian Minister of Health (and Inuk) Leona Aglukkaq spoke out regarding environmentalists:

> It's about fighting environmentalists that try and put a stop to our way of life, our way of life and hunting, to provide for our families (Payton 2012).

This tension between bears-as-icon and bears-as-resource threatens the role-making process within the Arctic Home campaign and the Last Ice Area. WWF staff repeatedly stressed their hope that the Last Ice Area would be managed by local, indigenous people. That relationship-building would be facilitated by funding from Coca-Cola:

> The money from Coke is a lubricant for relationship-building with indigenous groups (WWF staff – field notes).

Part of the goal of this relationship building was the involvement of local communities in the development of a range-wide Conservation Action Plan for polar bears.

Even the ice is locked into place. The ice is threatened by shifting climate, the result of human activity, largely in the Global South. The last summer ice—the defining characteristic of the Last Ice Area—will cover up to 500,000 square miles (WWF 2011a). The exact location and extent of the accompanying management area, and how it is to be managed to ensure the survival of maximum biodiversity, is to be decided based on

research and policy negotiation—ensuring a relationship between the ice and those scientists and government specialists who are to be enrolled in the process. Interessement helps to identify and prepare for the other entities that must be enrolled (Callon 1986).

Enrollment

As interessement moves ahead, enrollment occurs when actors are locked into their designated roles. Funds are transferred to WWF, the Arctic Home website goes live, and Coke cans change colors. Consumers begin to text donations to Arctic Home, and by the end of the 2011-2012 marketing season (the campaign ran through the winter), the campaign has collected $1.8 million in donations and matching Coca-Cola funds (WWF 2013). These enrollments all require negotiations, whether in the form of legal agreements, ad placements, or factory retooling. In November 2011, Coke changed the color of their historic red cans to white as part of the Arctic Home campaign. Following public confusion over the can color, the cans returned to red (with polar bear graphics) in December 2011. In the enrollment of the cans, a renegotiation was required in order to maintain the larger network.

For the Last Ice Area, the project must also negotiate with the ice. This is a negotiation because, as models of ice extent are deployed to predict future coverage in theory, geophysical forces converge to affect the actual ice in practice. Climate models must be refined as new data is collected; the ice doesn't behave as predicted, but rather in chaotic ways (Holland 2012), with new records for low ice cover in 2012. In this case, the misbehavior of the ice reinforces relations within the network and further weakens competing attempts at enrollment.

Acceptance of enrollment is not guaranteed. In the case of the Last Ice Area, WWF has made it clear that in an ideal situation the dwindling summer ice that survives as habitat would be managed by Arctic indigenous people (WWF 2012a, 2012d). At the same time, by including indigenous managers as actors to be enrolled rather than as obligatory passage points in the construction and navigation of the network, campaign managers have left open the possibility that indigenous groups will not participate. Resistance within some indigenous communities shows that interessement was not entirely successful: the project as framed failed to sever or weaken competing network ties. During the 2012 International Polar Year conference in Montreal, for example, one Inuk activist Tweeted: “Inuit Elder: "polar bears are not coca-cola polar bears"#IPY2012 @PolarBears” and “Inuit elder: “there is not a single polar bear you can hug” #IPY2012@PolarBears” (Field notes).

WWF attempts to walk a line between indigenous enrollment and enrollment of the polar bear. WWF has framed indigenous resource use in terms of species and habitats: “Working with indigenous people, who rely on many of the species and habitats that are important to WWF, is a high priority” (WWF 2012a). Meanwhile, WWF has worked on polar bear conservation since the 1970s (field notes), and the polar bear has gone through multiple enrollments. In the lead-up to the 2009 UNFCCC CoP15 in Copenhagen, for example, WWF drafted the polar bear as a spokesperson[21] for climate change, most prominently in a life-sized ice sculpture of a bear (overlaid on a metal bear

21 “Spokesperson” is a slightly unfortunate word here, since neither WWF nor the iconic polar bear is a “person.” As I show below, the spokesperson concept is used within WWF. It also echoes Callon (1986) who writes that, in mobilization, groups “ensure that supposed spokesmen for various relevant collectivities [are] properly able to represent those collectivities and not betrayed by the latter.”

skeleton) that slowly melted away over the course of the meetings. That enrollment derailed following the Copenhagen meeting:

> We used the polar bear as a motto or spokesperson before Copenhagen. When Copenhagen failed, the whole thing went poof (WWF staff AD interview).

In Arctic Home, polar bears are once again enrolled as spokespersons; the only two things that are described in campaign materials as "icons" are polar bears and Coca-Cola's red cans (The Coca-Cola Company 2011, 2013; WWF 2011a, 2012a, 2012b, 2012c, 2013).

Mobilization

Clearly a process has been set in motion, designed to reach out to scientists, government officials, indigenous leaders, and the wider public. The process also reaches out to the bears, sea ice, and habitats of the Arctic, reducing each of them to a representation with a fixed identity based on the scientific vision of WWF conservationists. The translation process results in an expansion of the network as new actors are enrolled, but at the same time the number of legitimate spokespersons is constrained to a select few. Each group within the campaign gains an official speaker. In the case of WWF and Coca-Cola, those spokespersons are brand identities that occlude the complexities of organizational politics. In the case of polar bears, the iconic bear symbol becomes the spokesperson for wild bears, able to state their needs (pristine habitat) and wants (effective management of the last summer ice). Computer models and mapping technologies speak for the summer ice. Indigenous land managers are, as of yet, not enrolled fully in the campaign and are spoken for by the written program materials.

In the process, translation forecloses competing identities of spokespersons within the network. Bears that are used as food, that are killed and traded, or that live outside the

Last Ice Area are ineffective as spokespersons and are downplayed. The same is true of conservationists who would rely on strict species protection versus negotiation (Jørgensen 2015). In the resulting network—at the end of the translation process—each actor is constrained:

> The social and natural 'reality' is a result of the generalized negotiation about the representativity of the spokesmen. If consensus is achieved, the margins of manoeuvre of each entity will then be tightly delimited. The initial problematization defined a series of negotiable hypotheses on identity, relationships and goals of the different actors. Now at the end of the four moments described, a constraining network of relationships has been built (Callon 1986:15).

Funding from Arctic Home funded research into the Last Ice Area and helped to support the 2013 International Polar Bear Conservation Forum in Moscow, held as a precursor to the 2013 Meeting of the Parties to the 1973 Agreement on Polar Bear Conservation. At the forum, the Director General of WWF gave a keynote address summarizing WWF's view of the problem and vision for solution:

> Scientists predict that within a generation... we will have Arctic ice only in a few fringe areas, in particular in the area known as the Last Ice Area in the northern part of Canada and Greenland. ...We are determined to be focused on building resilience of the polar bear populations and of the Arctic ecosystem to these changes. We are focused on the task of adaptation.
>
> We hope that [parties reach]... an agreement which will commit these governments to working in close collaboration with indigenous peoples, with local communities, with business, with civil society, because it is only that kind of collaboration that will make polar bear conservation possible (WWF Arctic 2013).

This vision—of collaboration between sectors—is both a call for further role-creation and a reinforcement of the Last Ice Area problematization. At the same conference, the presentation on Arctic Home was given by Coca-Cola's Director of Environment and

Community (The Ministry of Natural Resources and Environment of the Russian Federation 2013). The process of translation continued.

The Last Ice Area continues to move ahead. It was referenced as a potential case study of multi-scalar governance in Arctic Council documents on Phase II of the Arctic Resilience Report (Council 2013). In 2014, the Last Ice Area was the topic of a WWF-Denmark presentation at the Arctic Biodiversity Congress in which "knowledge generation" was listed as one of the projects main activities (Frost 2014). And, in the winter of 2014-2015, Coke cans again turned white.

RACER

The RACER project was developed within WWF during 2010 and 2011, with a goal of identifying areas where Arctic conservation can have lasting effects under conditions of rapid climate change (Christie and Sommerkorn 2012). RACER marks a shift in conservation away from species, habitats, or ecoregions and toward key drivers of ecological processes. The project works in two phases. First, RACER identifies and maps *key features* within the Arctic (both terrestrial and marine) that show high species diversity and productivity—with the idea that these areas are important for ecosystem resilience. Second, the process looks at *models* of projected climate change impacts to predict which areas are likely to maintain their function under climate change until the year 2100. WWF places emphasis on the novelty of this predictive approach:

> RACER presents a new view of arctic conservation that, perhaps for the first time, looks ahead to anticipate the impact of change. The approach emphasizes the need to support ecosystems and ecosystem services important to people by addressing the future capacity of these ecosystems to adapt (in the face of rapid warming) rather than by responding only to what's vulnerable now (Christie and Sommerkorn 2012).

Problematization

RACER recognizes that some habitats will likely change so drastically under climate change that concentrating conservation efforts there—in sites of vulnerability—would be futile. Key features that contribute to regional ecosystem function and show predicted resilience to climate change may be better targets. This problematization of climate change installs models and climate scientists as obligatory passage points in the conservation of Arctic ecosystems. At the same time, it identifies other actors and their prospective roles: governments and other planning and management organizations receive information and use it to inform decisions; geographic features and environmental drivers (wind, rainfall, and so on) support primary productivity and biodiversity; satellite data and published scientific papers provide inputs for computer models. The RACER project relies on maps from the Marine Ecoregions of the World (MEOW) (Spalding et al. 2007) and the Circumpolar Arctic Vegetation Map (CAVM)(CAVM Team 2003; D. A. Walker et al. 2005). The CAVM, in turn, was produced through a series of meetings (D. A. Walker and Lillie 1997; D. A. Walker and Markon 1996; D. A. Walker 1995) involving researchers from around the Arctic. It was based on satellite data (D. A. Walker et al. 2002) and information derived from still older maps (D. A. Walker et al. 1995).

Problematization includes defining what the RACER project means for WWF. That definition is fixed early in the process by the establishment of funding ties:

> Staff 1: What do we call what we are doing on an ongoing basis? Is RACER just what we are doing now? Or going forward? I mean, it is not particularly "rapid."
> Staff 2: If the title is based on our target audience, then yes—but donor expectations from the past also have to be fulfilled (WWF staff – field notes).

At the same time, WWF had to define limits for the project. As a project in resilience, this meant setting boundaries for what "resilience" would mean:

> Staff 1: We need a creative way to say "this is how we limit scope."
> Staff 2: Maybe we limit it to ecosystem resilience...
> Staff 1: I have to say, it is not a social analysis—but people are part of ecosystems (WWF staff – field notes).

Ultimately, the decision was made to restrict the analysis to ecosystem resilience and the project moved forward.

Interessement

These network elements are stabilized through the development of written materials, the dedication of staff time within WWF, and interlinkages between WWF's RACER process and an emerging effort at resilience and adaptation planning within the Arctic Council. As part of my research, I took part in a series of virtual meetings in which WWF staff negotiated much of the development of RACER. What appears as a product in the completed RACER Handbook (Christie and Sommerkorn 2012) is a simplification of these negotiations: the result of attempts to enlist specific human and non-human actors.

As roles were developed during the early stages of the RACER project, staff looked forward to the project's release:

> We are informed by how the Arctic Council works, what working groups are doing. Over the past few weeks, we've been looking for a working group to bring RACER forward to the [Arctic Council] ministerial (WWF staff – field notes).

In this case, WWF staff are constrained by their own role as Official Observers to the Arctic Council.

This process of role-creation extends to the role of conservation terms and technologies. The RACER project relies on data sets from Arctic Council working groups, WWF ecoregions, and satellite data. Early in the process, the exact roles of each data set had to be identified:

> The Arctic Council working groups use LMEs (Large Marine Areas). The ecoregion system, though, aligns best with the terrestrial system... most of the ecoregions nest nicely into LMEs... Ecoregions also align with the Canadian system (WWF staff – field notes).

Enrollment

The enrollment of actors in the RACER project was complicated by the tight schedule needed to reach WWF's main target audience: the Arctic Council. Staff within WWF decided that an appropriate venue for launching the RACER initiative would be the November 2011 Arctic Council Senior Arctic Officials (SAO) meeting. This would help to build links between WWF's approach to resilience-based planning and a proposed Arctic Council resilience report. At the same time, the fixed date of the SAO meeting set a deadline for the completion of the RACER handbook, limiting what could be included in the project materials. The tight timeline for RACER development raised concern among some long-time WWF staff:

> In my career, a high-quality, complex project has never come this far in nine weeks. We need to tell the managers that if June 30 is the deadline it won't be the caliber we had hoped for (WWF staff – field notes).

As staff were working with a writing consultant on the handbook, they were still refining the RACER method, but that process had to end in time for graphs to be developed, maps to be drawn, and text to be compiled. Those technical details were shaped in negotiation with staff capacity and Arctic Council scheduling.

As with Arctic home, the enrollment process was not always successful or easy. Connections between the project organizers in Canada and Norway and WWF-Russia, in particular, were sporadic:

> Russia doesn't seem to be prepared; at least they aren't reporting back. We need to see what the bleep is going on (WWF staff – field notes).

Within Russia, staff reported in interviews that some of this difficulty had to do with the resilience focus of RACER, how the process unfolded in its earliest stages (something that I did not observe directly), and the "rapid" analysis—which was not actually very fast. There was a suggestion that "resilience" did not translate well into the Russian scientific literature, and was being imposed from the outside[22]. Members of the core team noted other difficulties with resilience, particularly in sorting out the technical side of the resilience predications. During a 2011 meeting, one staff member noted:

> We are still having difficulty coming to ground with resilience (WWF staff – field notes).

Within WWF-US, the issue was not resilience, but the ecoregion approach:

> There has been backlash from [WWF-US staff member] on the ecoregion approach (WWF staff – field notes).

In the case of WWF-Russia, the translation process eventually moved ahead. The Russian staff eventually "found a way to integrate resilience" (WWF staff – field notes). In the case of WWF-US, field staff remained relatively isolated from the RACER project during the period of my research, though WWF-US analysts were crucial to the technical implementation of the analysis.

22 In an interview, one WWF staff member noted that the closest translation for resilience in Russian was устойчивость (ustoichivost), which is better translated as sustainability or sustainable use (notes – staff W interview).

The RACER handbook details results of two example assessments—one in the Beaufort Sea and one in the Eastern Chukotka ecoregion. More assessments have since been completed in the Central Canada tundra and Russia's Laptev Sea. The larger goal of RACER is to inform policy, planning, and management, but the immediate goal is the development of more assessments in other Arctic regions using "the best available data as rapidly as possible " (Christie and Sommerkorn 2012, 5). At this stage, the Racer Handbook and associated web materials (www.panda.org/arctic/racer) were enrolled as the spokespersons for the models and scientific experts who run them.

The handbook itself is a network document, containing compiled case studies, text written by WWF staff and consultants, and references. In 2011, WWF staff were looking for someone to write a forward for the document. In a staff meeting, they considered several alternatives:

> Staff 1: An Inuit voice? _____? _____?
>
> Staff 2: Maybe two voices, side-by-side: an indigenous voice and a science type like _____... Ideally, from two different countries (WWF staff – field notes).

After discussion they concluded that they wanted to find someone who was familiar with both Canada and Russia. Eventually Robert W. Corell, American climate scientist and well-known veteran of global Arctic research, wrote the forward to the RACER handbook.

Mobilization

The RACER development process was directed in part by the target audience (the Senior Arctic Officials of the Arctic Council). In effect, the *plan* for mobilization was set out during the process of problem definition. During the development meetings for RACER in 2011, the major project deadline (November 2011) was set by the date of the

Arctic Council Senior Arctic Officials (SAO) meeting. As November approached, meetings and teleconferences focused on the design and printing of the RACER handbook, poster, and web site. In October, a design scheme was chosen (one of three presented by the designer). Before the handbook was finalized, it was circulated to a last small group of external reviewers, who were given one week to return comments. A courtesy preview was also sent to permanent members of the Arctic Council. In the second week of November, RACER was released simultaneously in several sites by WWF team members: at the SAO meeting in Luleå, Sweden; at the Problems of Adaptation to Climate Change (PACC) conference in Moscow; and in a poster session at the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) of the Convention on Biological Diversity (CBD) in Montreal[23]. On November 11, the RACER web site[24] went live.

In the push to have RACER done in time for its necessary release, I never heard staff comment that it must be "good enough." Rather, in internal conversations, the focus was on developing a product that would be "world-class" or "have a major impact on Arctic conservation" (WWF staff – field notes). The theme for RACER (ecosystem resilience) was chosen as a response to climate change, but along the way staff noted repeatedly that the 2011 SAO meeting would also mark the introduction of the Arctic Resilience Report (ARR) through the Arctic Council, and a WWF initiative focusing on Arctic resilience would be both timely and auspicious. The co-occurrence of the

23 At the SBSTTA meeting, the Director of the WWF GAP, Alexander Shestakov, served as chair of one of the large Working Groups—but in his role as a representative of the Russian Federation rather than as a WWF leader. In the chairperson role, he refrained from mentioning RACER or WWF specifically. Other WWF staff did present RACER in poster format here, and had black-and-white copies of the RACER handbook available.

24 www.panda.org/arctic/racer

SBSTTA and PACC meetings was fortuitous, and provided extra spaces for WWF staff to put the RACER method and preliminary results into the hands of international policy-makers. Since then, RACER has turned up in documents presented to the UK Parliament by WWF-UK, in Arctic Council documents (Arctic Council 2013b), and in other reports on Arctic resilience (Arctic Council 2013a).

Discussion: Knowledge, Power, and Work

Both of these projects are conservation initiatives for the Arctic based on predictive modeling of climate change and the interactions between climate and the biophysical environment. Both attempt to influence policy, planning, and resource management, though in different ways and at different scales. Both are projects designed explicitly to create and distribute specific types of knowledge within specific communities of decision-makers. And both of these projects deal with ecosystem resilience: RACER explicitly, and Arctic Home (the Last Ice Area) in terms of resilient sea ice ecosystems (Frost 2014). I argue that it is appropriate to look at both of these conservation initiatives from a politics of knowledge perspective.

The process of forming knowledge-networks for conservation may result in WWF exercising influence on a global or regional scale, but it relies on actors who are "mundanely powerful" within the organization (Marcus 2013). In addition to navigating the complexities of the WWF network, those actors engage in a normative exercise of power (Butler 1997), ensuring that the knowledge produced is legitimate and credible within the domain of Arctic conservation.

As WWF works, both of these projects engage in reconfigurations of scale. Relations of Coke cans and consumers around the world translate into management

decisions for specific areas in the north of Canada, to be defined based on the technologies and expertise of scientists and managers in other locations. Shifting climate and increasing emissions of greenhouse gasses lead to changes in computer models of future species distribution, leading some land- and sea-scapes to be classified as resilient and others to be consigned to the realm of futility. In this process, large-scale phenomena (aspects of climate, for example) are modeled as local-level effects. As one staff member noted:

> Whatever we come up with regionally has to make sense locally … (WWF staff – field notes).

In the case of RACER, the analysis of resilience using combinations of data sets means, for WWF staff, that the program is useful at local, regional, and circum-Arctic scales:

> The beauty is, the methodology of RACER is applicable at any scale you choose (WWF staff – field notes).

The local and global are, in a sense, inverted: global processes become embedded within local relations, while local processes and iconic spokespersons are stretched across the world.

These reconfigurations of scale are accompanied by knowledge-work. When WWF and Coca-Cola work together on the Arctic Home campaign, alongside a heterogeneous assemblage of other actors, knowledge is "produced." Knowledge in this case is not simply the idea that summer ice is threatened and therefore the polar bear's future habitat is in jeopardy. That idea is both a declaration of objective Truth and a restatement of the process of problematization.

Agency in this knowledge-work is distributed unevenly through all the heterogeneous network members. This does not mean that individual actors lose their

intentionality. The actors work, alone and in conjunction, to perform the mandate inherent in the initial problem definition.

> In order to function at all, networks require a 'performance' on the part of all enrolled elements. While this performance must be bound by some of the 'ties' that hold the network together, this 'binding' may not completely inhibit the ability of actors to perform in other ways as well. Thus, the network can be acted out at precisely the same time as its precepts are flouted; actors thereby become conformists and non-conformists simultaneously" (Murdoch 1998,366).

The knowledge that results from this process of translation—heterogeneous actors assembling together, inscribing a set of actions upon the world—consists of interlinked tacit and explicit knowledge. In the case of Arctic Home, it includes the aforementioned ideas about the relation of bears and ice, but it also includes knowledge about how the public can help, how corporations can interact, which individuals are key for ensuring a successful partnership, and how conservation is done. The same principle applies in the case of RACER: knowledge about which areas will remain resilient under climate change is the explicit core, but it is surrounded by tacit knowledges: how to use computer models to influence policy, what it means to link programs with the Arctic Council, which parts of the WWF network are most responsive to deadlines, and how a collaboration should and should not be run. In the actual work of WWF staff and their partners this tacit knowledge, the *how* of conservation, is dominant.

A growing body of literature links interactions of tacit and explicit knowledge to both organizational learning and the creation of new knowledge (Nonaka and Takeuchi 1995; Nonaka 1994; Takeuchi and Nonaka 2004). The team-based approach used by WWF, for example, is a mode of working that has become common within many organizations, particularly as management structures have become flattened (Sinclair

1992). High-profile knowledge organizations such as WWF themselves contribute to the legitimacy of policies and networks. WWF's network—the *whole action* of the assemblage of staff, their resources, collaborators, and partners—"embeds certain technical discourses as hegemonic within international organizations and global public policy networks" (Stone 2001,16).

The way that agency is distributed in the whole action—the net-work—of conservation means that tacit knowledge, explicit knowledge, and even incidental knowledge are all intertwined. We can talk about the outputs of the RACER program as a discreet body of knowledge, but that knowledge has no meaning (or at least a vastly different meaning) without the tacit knowledge that surrounds it, for example, knowledge of how the Arctic Council is structured, of how governments and corporations make decisions, and of where the key points of access are for WWF.

As WWF works to form conservation knowledge, it also creates pockets of ignorance. Understanding those ignorances, which are relational gaps created when knowledge processes reconfigure relations, requires an attention to the negative spaces of society – a sort of ethnography of absence that asks which actors are not present, and why. In the Arctic Home campaign and the RACER project, which actors are absent? In both cases, enrollment of indigenous communities has proven difficult. Brosius (2006) has written that:

> ...One could summarize the last 30 years of conservation as an extended encounter between the community and its antinomies: the state, transnational conservation organizations, and other powerful agents (Brosius 2006,227).

Brosius is writing about "the community" here in terms of local communities in sites of conservation. WWF attempts to engage communities differently in each of the two projects described here.

At the 10th Conference of the Parties to the UN Convention on Biological Diversity (CBD CoP10), WWF staff delivered a Side Event on the developing RACER program. Of the many Indigenous groups in the Arctic who were represented at the CBD CoP10, none were in the audience for this presentation. The absence was glaring enough that it was noted by an audience member in a question to the presenter—where were they? The presenter could not say why no indigenous representatives were present: a schedule conflict or something else. It is safe to say that indigenous groups had not been fully enrolled in the WWF conservation initiative before this presentation.

In the Arctic Home campaign, indigenous groups pushed back against protection of the polar bear. Some of this pushback takes place in the public sphere—on Twitter, for example. Publically tweeting "polar bears are not coca-cola polar bears" and "there is not a single polar bear you can hug" (Field notes) shows a lack of enrollment. The complexities of the polar bear case are highlighted by the Canadian Environment Minister and delegate to the Arctic Council, herself an Inuit, who raised an online firestorm when she tweeted a photograph of a dead polar bear from the 2013 Meeting of the Parties to the 1973 agreement on Polar Bear Conservation—at which WWF was promoting the Last Ice Area/Arctic Home campaign. In tweets from the conference, she said:

> Enjoy!! ...My cousin caught his first polar bear last night. Community feast to follow in Arctic Bay! (Twitter feed 2011)

> I will continue to stand up for Inuit and Northern communities who rely on the polar bear hunt. Polar Bears are culturally,

> spiritually and economically important for northerners. (Twitter feed 2011)

WWF has continued to support limited hunting and trade of polar bears (Shadbolt, York, and Cooper 2012). Meanwhile their attempts to negotiate the complex issue of polar bear conservation both from indigenous activists and from environmentalists, who see any hunting or trade as a concession to biodiversity loss (Jørgensen 2015). These other actors are presenting alternative problem definitions, and are recruiting polar bears as alternate spokespersons to convey messages: "bears are traditional resources" or "bears are threatened by hunting and trade."

While I focus in this chapter on power and knowledge, WWF's interests are framed in terms of effectiveness. When confronted with the idea that WWF is a "powerful organization" staff members are often taken aback. They see first-hand the struggles of WWF in trying to control network activities, when those activities are mutually constructed by a host of agents—human, technological, and material. The initial research questions for this project came from within WWF, and included the question: "What works to strengthen (or not) positive behaviour and help us realize our vision and desired outcomes?" (WWF 2008, personal communication). Strengthening positive behavior and realizing desired outcomes are both relational activities.

Those relational activities are not just knowledge; they are power. They are in the words of Latour "matters of concern" (Latour 2004). The net-work of the association enacts power, rather than power being a phenotypic characteristic of some person or group:

> ...something called Power...which is assumed to exist universally in a concentrated or diffused form, does not exist. Power exists only when it is put into action, even if, of course, it is integrated

> into a disparate field of possibilities brought to bear upon permanent structures (Foucault 1982,219).

Rather than power as a force that drives or limits knowledge, the process of undertaking activities is power (Latour 2007b, 86). If WWF is successful in their conservation work, they will influence scientific knowledge, worldviews, and policy through the work of networked people, resources, texts, and technologies.

Rather than beginning as an organization that contains power, WWF begins from a position with certain relations and roles already in place. Within the organization, experienced staff use their knowledge of WWF's extended network to move the projects ahead, recruiting others and mobilizing the network. In the process, the internal political landscape of WWF is occluded beneath a cloak of scientific, technological, and bureaucratic processes. The negotiations that occur within conservation programs, as seen in the cases of RACER and Arctic Home, are necessary and unavoidable from an institutional perspective. They are not side-effects of a successful program: on the contrary, they are the essence by which a successful program is defined.

That does not mean that individuals within WWF fail to see complexity. They are, on the whole, acutely aware of the social and ecological complexities of conservation. It also does not mean that the organization[25] is necessarily deaf to other voices; although the official positions of WWF have taken do not always agree with those of other groups, including indigenous communities[26]. What it means is that conservation itself *is* simplification, since all issues cannot be addressed in all desirable ways simultaneously.

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25 As I discuss both here and in other chapters, it may be more appropriate to discuss WWF as "organizations" plural, since each national office operates as a largely independent entity.

26 The Canadian Far North Act, for example, is an example of WWF Canada taking a public stand that differed from that of some indigenous and local groups (P. Smith, Burlando, and Davidson-Hunt 2010).

Conservation is what is left after other perspectives have been removed during problematization. The process of conservation is both power and knowledge enacted through the development, stabilization, and dissolution of relations.

Conclusions

In this chapter I have examined two ongoing conservation initiatives within WWF's Global Arctic Program as examples of a study in translation. In both cases, WWF staff work to enroll supporters and resources in the service of particular political projects of conservation. As Kent Redford wrote recently:

> With increasing consumption, and demographic, climate and population changes over the next century, conservation will need an even closer engagement with people. To meet this challenge we need careful and informed attention to the details of conservation practice... (Redford 2011,329).

Those details of practice are where conservation *becomes* political. "Behavior is identified as political when others are made use of as resources in competitive situations" (Burns 1961). In the case of conservation organizations like WWF, I argue that it is an empirical mistake to assume that "the organization" is powerful. Certainly each of the WWFs (national offices, program offices, WWF International, and various internal collaborations) has acted in ways that demonstrate power—but that power is a result of programs enacted through heterogeneous networks. Maintaining the organization as a powerful actor coincides with maintaining the structure of those networks. A relational study does not "mean introducing a limitless number of actors and networks, all of which are somehow of equal significance and power. Rather, it means making this issue of power and agency a question, instead of an answer" (Mitchell 2002,52-53).

Political ecologists have engaged with conservation in many ways over the past two decades. These include studies of linked conservation and development (K. Brown

1998, 2003a; MacDonald 2010b; West 2006); community-based conservation and participation (Berkes 2004; Brosius, Tsing, and Zerner 1998; Orlove and Brush 1996), and the role of multiple knowledges in conservation practice (Escobar 1998). Adopting a relational stance that takes into account both social and material networks may provide a path beyond thinking in dichotomies of nature/culture or conservation/use (Velásquez Runk 2009). There is also an emerging body of literature on the practices of conservation organizations, focusing on studies from within those organizations themselves (Gatt 2011; Rhee 2006). Studying the every-day work of conservationists in their offices and writings evinces power and knowledge in their embryonic, and sometimes abortive, states.

We won't know precisely *how* the RACER initiative or the Last Ice Area/Arctic Home have been powerful or changed knowledge until later. Being powerful or knowledgeful is not necessarily the same as being successful by WWF's standards; it means that future relations are altered by WWF's action. Those relations include human-environment interactions that are the explicit focus of conservation, unintended consequences of conservation programs, and the tacit knowledge-power-relations of WWF's work.

WWF has expressed a desire to include specific actors within both of these programs. For RACER, it is the Arctic Council that WWF hopes to enroll. For Arctic Home/Last Ice Area it is indigenous managers for the polar bears' home. In both cases, there is the risk that enrollment will not happen, that interessement will not sever competing network configurations, and that other, incompatible problem definitions will gain prominence. The only way to ensure the inclusion of these key actors is for them to

be defined as obligatory points of passage—which can only happen if they are partners in the process of problem definition. Problematization, though, is a key part of the work of conservation organizations, and therefore of conservation knowledge. Changing the way that problematization happens means, in part, redefining what conservation means to organizations and staff.

CHAPTER 6

CONCLUSION: "A BIG BEAST WITH MANY HEADS"

> We practitioners are not the monolithic conservation depicted in much of the literature. Those concerned with conservation are humans in pursuit of human ends, with the foibles, powers and weaknesses, and institutional constraints that characterize all human endeavours. Rather than making hasty generalizations about the conservation community based on the writings of the few, and advancing simplistic arguments focused on blame, not improvement, why not study us in our full natural history (Redford 2011:329)?

Introduction

The objective of this research was to understand the social and cultural processes that influence Arctic conservation in the context of the WWF Global Arctic Program (GAP). The WWF GAP consists of a core of program staff, embedded in a network of WWF offices and external collaborators, who facilitate collaboration and resource sharing among national offices and promote Arctic conservation. Much of the actual work of Arctic conservation in the context of the GAP consists of developing conservation products (texts and maps) and of mobilizing networks of people and resources around key Arctic conservation projects.

In this chapter, I draw together overarching conclusions and present a summary of recommendations: both for WWF and for other researchers attempting global ethnographies. The first section of this chapter looks at the results in terms of my reframed research questions. The second section covers some key theoretical points arising from this research, particularly relating to research methods in anthropology, the

study of organizations, and the state of the field. The third section is a listing of points for consideration by conservationists and environmentalists in general and WWF in particular. I conclude with reflections on WWF's work in the North and the connection between WWF's heterogeneous networked structure and organizational resilience in a changing Arctic.

Research Questions, Revisited

In this section, I revisit my initial research questions, looking at lessons learned based on my research. From the onset, this research was directed toward three questions from WWF International:

- How can the culture of WWF Network best be described?
- How is the Network perceived (internally) and how does it behave? Are there rules? Are they followed?
- What works to strengthen (or not) positive behavior and help us realize our vision and desired outcomes? (Examples from within)

Following discussions with WWF staff, I identified themes in these questions; the first question, "How can the culture of the WWF Network be best described?" is about both the WWF network and organizational culture. The second question is about the network and about institutions within WWF—both formal and informal. The third question asks specifically about what helps WWF to realize their desired outcomes: how the structuring effects of networks, institutions, and culture work together with the agency of staff within WWF.

After examining those themes, I reframed these questions as:

Q1: What is the role of organizational culture in the WWF GAP?
Q2: What institutional arrangements most strongly influence conservation

outcomes in the WWF GAP?
Q3: How do social networks (both within and outside of the core WWF staff) influence processes within the GAP?

In this section, I revisit these questions with a focus on key themes, salient links to theory, and examples from within the Arctic program.

Organizational Culture

What is the role of organizational culture in the WWF Global Arctic Program?

Anthropologists are notorious for defining and redefining culture. To describe the organizational culture of WWF, I use Geertz' definition of culture as:

> … an historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men [sic] communicate, perpetuate, and develop their knowledge about and attitudes toward life (Geertz 1973: 89).

The culture of WWF, then, *is* those patterns of meaning. WWF encodes many of those meanings within durable texts (meeting minutes, reports, proposals, maps, and other program documents). The organizational culture of WWF informs knowledge and attitudes through meetings, texts, a shared sense of history, and development of relationships.

A culture of meetings

While I was in Ottawa, I was seated in WWF's central office area in a space surrounded by other small offices. Some spaces had doors, some open, others closed. As I was going over my notes from the last meeting, I stopped and looked around: everyone in the office was either in a meeting, preparing for a meeting, or at his or her computer typing. This was not a one-time experience. The same thing happened in Russia, Norway, and Alaska; the culture of WWF is driven by meetings. The idea for this research arose in

a meeting. Meetings are where text is planned, future plans are made and discussed, and the work of maintaining the network is performed. They are places where new network members are enrolled into current projects. They are where staff members reinforce their identities as conservation professionals. They are also often the spaces where the products of WWF's work are presented (the Arctic Council SAO meeting, the CBD SBSTTA meeting, CBD CoP10, the Arctic Tent outside the UNFCCC CoP15, shareholder meetings, GAP team meetings, and so on). As I participated in meetings, I also noted that WWF operates very efficiently; if a meeting is scheduled to last one hour, it will generally end after one hour—an informal institutional constraint on the meeting culture.

Writing nature

Much of WWF's current work is in the generation of texts and maps to inform future conservation. During my research, three high-visibility projects were RACER, the Last Ice Area (and by extension the Arctic Home campaign), and the release of the *Atlas of Marine and Coastal Biological Diversity of the Russian Arctic* (Spiradonov et al. 2011). Each of these projects was developed collaboratively (in meetings) and with a focus on detail. As one staff member said in a RACER meeting:

> "We need to get this right... we want to produce a world-class product" –WWF staff on RACER (field notes).

These texts and maps are designed to be cited, referenced, and used—and in the process they are placed into "black boxes" where the negotiations that form them no longer need to be considered (Callon and Latour 1981,284).

The two million words of text that I collected over the course of my research include nearly one million words of internal documents: meeting minutes, planning

documents, and messages. Most of those documents are from the earlier years of the GAP. Currently, email has replaced faxes and intranets have replaced filing cabinets for these sorts of text—a fact not lost on staff:

> "WWF is an email culture; everyone communicates by email" – WWF staff (field notes).

Both internal and external documents contain consistent themes: the work of the Arctic Council; the prominence of climate change; the importance of protected areas, indigenous and local communities, and threatened species.

Importance of history

The archives of the GAP go back to the Arctic Programme's earliest formation, and the age of the program is a point of pride among older WWF staff. The longevity of the Arctic program is known outside of WWF. In an interview with a staff member of one of the Arctic Council's Working Groups, the GAP's longevity was cited as an important strength. As early as 1992 WWF was working to map biodiversity and threats in the Arctic, to "turn the Arctic to all sides" (interview J notes). Soon after, the publication of the Arctic Bulletin began. In the beginning:

> "The Arctic Programme was a strange beast... a sort of regional policy program; Canada was insular, Russia wasn't doing anything" (WWF staff D interview).

And that history of heterogeneity persists within the network; Canada is now the home to the GAP office and WWF Russia is a major player in Arctic conservation, but all of the WWF National Offices still operate independently.

The history of the organization is also a key in building the WWF network. As one WWF staff member put it in relation to contacting other offices, "personal history is important in establishing connections" (WWF staff – field notes).

Importance of relationships

Based on my analysis of WWF networks (Chapter 4), the relationships that WWF staff form within and between offices constitute 60% of WWF's overall Arctic conservation network. The network is actively maintained in meetings and collaborations, through email and teleconferences as well as in person. Within WWF, who you know is important for the work of conservation. "WWF is all about relationships," one WWF staff member said (Field notes). Other staff members reflected on the importance of relationships with experienced staff, who know how to navigate WWF's maze of connections and resources: "The grey-headed brigade is helpful" (WWF staff D interview); and "to be successful you have to have a mentor when you come in. It helps to have someone you can go to for advice" (WWF staff I interview).

The importance of relationships becomes clear when those relationships are broken:

> We used to have a close collaborator in WWF [National Office]; then, they started to work more directly on [their own] issues. People are changing there; it is the same here. Almost every year there is a new guy in [National office]. It makes it hard. (WWF staff – field notes).

In this case, the lack of a personal relationship between staff members resulted in a structural hole (Burt 1992) in the WWF network—a broken link between offices. And, on the other side of the Arctic:

> Work in WWF is driven by relationships. For example, when _____ came in to the Arctic network she brought her own fisheries connections, but when _____ left, we lost those [other] connections (WWF staff AL interview).

In each of these cases, changes in staff result in reconfigurations of the network, contributing to network heterogeneity. For individuals in the network, the structural holes

(Burt 1992, 2004) that exist between WWF offices ensure that ideas can develop independently in different offices, while providing opportunities for well-connected individuals to exercise social capital.

Institutional Arrangements

What institutional arrangements most strongly influence conservation outcomes in the WWF Global Arctic Program?

I take institutions to be the systems of rules that guide behavior in the workplace, or "ruling relations" (D. E. Smith 1989, 2005). These are the things that identify a WWF staff member as an employee rather than as a parent, a spouse, or a lone environmental activist. Some of these are formalized and explicitly discussed, while others are implicit and have to be understood based on how staff work. Informal rules enforce a particular type of participation in the network: one that is stabilizing and encourages heterogeneity.

Formal rules

Formal rules within the organization cover topics from use of the panda logo to meeting attendance, reporting, and recordkeeping. While I was travelling, WWF was circulating new guidelines for the use of the panda logo. The logo has been around in various forms since the 1961 founding of the organization (Figure 6.1).

Figure 6.1: Evolution of the WWF Panda logo (WWF 2015a).

The rules from WWF on using its panda logo cover size, color, positioning, and when to use the Panda or the WWF lettering and in what combinations. While WWF's panda logo is among the most recognized conservation brands, this type of branding is now common among large conservation organizations (Nicholls 2011).

Another example of a formal rule within WWF deals directly with external meetings. In 2010 I was told that the GAP was working toward a "one meeting, one staff member" policy (field notes) in which costs could be controlled and the network could be best leveraged. At conferences and meetings that require travel, only one WWF staff member would attend and represent the organization. Exceptions would be made for staff members who play key roles in public relations or coordination. This is an example of a rule that is *somewhat* followed. In the case of the RACER release, staff were distributed through three countries[27] simultaneously, in three different meetings, all pushing out the RACER product. In other cases, such as the 2012 International Polar Year (IPY) Conference, multiple staff attended a single meeting. Other formal institutions such as vacation time, work hours, and salary are covered through Human Resources in each office. A more important question is: How do informal rules influence the work of WWF?

Informal rules

Informal rules are most clearly seen when the rule is being broken. During telephone meetings, for example, staff spoke up when the meeting was about to run long:

"I have another meeting waiting..."

27 Actually, four sites if you count the simultaneous going live of the RACER web site. Staff coordinating the web site were in yet another location.

"I need to leave in about five minutes..."

"Well, we have run long already..." (field notes).

The same is true for active participation. During the RACER telephone meetings, staff from WWF Russia were often absent. While this was not a point of conversation or complaint during the meeting, it was often noted:

"I thought X was going to call in?"

"What have we heard from X?"

"I think we should go ahead and start anyway" (field notes).

This is connected to yet another informal rule: that each National Organization is independent, and the flat structure of the network is important to maintain. If there was any hierarchical attempt to direct participation, I was not party to it. Rather, social pressure through the network was used to encourage participation. Such discussions were typically taken "off-line" and reported back later, as in "I talked to X; he says he will try to call-in next meeting" (field notes). The flat structure of WWF is reinforced by a tendency for staff members to each have different external contacts, as I discuss in Chapter 4. This tendency is reinforced by the "one person/one meeting" rule, but it is also reflected in the hiring practices and everyday work of WWF staff. Two different staff members confirmed this tendency explicitly during egocentric network interviews, saying effectively that this is a strategy on WWF's part to increase organizational reach. I will return to the subject of network structure below.

Institutions as arrangements of organizations

When WWF staff speak about institutional arrangements, they are most often using the term "institution" to refer to other organizations, particularly NGOs and intergovernmental organizations. There are unwritten rules about work with other

organizations as well. Throughout WWF I found staff to be very open—except in discussing their relationships with other organizations. This was particularly true in cases where contracts or other legal agreements were in place, specifically in the case of for-profit companies working with WWF. That institutional silence on the part of staff is one example of an informal institution at work: partnerships (particularly developing partnerships) are not to be discussed openly outside the fold for fear of jeopardizing future organizational ties.

While conducting field research I was asked on several occasions to stop writing, to refrain from using my notes in publications, or told that I could not attend specific meetings. In almost every case where this happened, WWF staff were explicitly discussing relationships with other organizations—potential funders, corporate partners, or political bodies. I was told by one staff member that these "closed" relationships are sometimes sensitive, involve dialogue that could be misinterpreted out of context, or involve legal contract negotiations.

Networked Conservation

How do social networks (both within and outside of the core WWF staff) influence processes within the GAP?

For WWF, networks are important in several senses. Each individual has her or his own unique egocentric network (McCarty 2002, 2009), and staff members are embedded within social networks (Granovetter 1985) of other staff and external contacts. WWF's work also relies on networks as heterogeneous assemblages of people, resources, organizations, and artifacts (Latour 2005). The translation process (in which this network is assembled and stabilized) is important in the way individual projects proceed (Callon

1986). Within WWF, important projects have the effect of building and reinforcing network structure (Chapter 5). In terms of both overall circum-Arctic conservation and individual projects, work is managed through a network governance approach (C. Jones, Hesterly, and Borgatti 2009) in an organizational structure that is best described as an adhocracy (Mintzberg 1979).

Inter-office networks

In doing the work of conservation, WWF's circum-Arctic network relies on interconnectivity between offices where the most central staff are distributed. The functioning of this network relies on ties among WWF offices and external contacts. Those external contacts are, in many cases, connected through WWF—making the organization a key nexus for the conservation of the Arctic. At the same time, the heterogeneity of WWF's extended network, both in terms of individual group membership and in terms of community associations within the net, means that WWF staff must continually work to maintain internal cohesiveness and collaboration.

Network Governance and Adhocracy

Within WWF's GAP, the development of policy is carried out by multinational groups operating within dual local and network contexts. The broad WWF Arctic network is not homogeneous: rather, it is composed of several discreet clusters—two of which correspond roughly to US and Russian offices. Many collaborations within the organization are bilateral or trilateral, involving subsets of the larger Arctic network—although 40% of the members of the extended WWF Arctic network are individuals who do not work for WWF: funders, academics, members of indigenous communities, other conservationists, and political officials. As WWF develops new conservation initiatives,

staff enroll and deploy new network members in the service of knowledge development and transformation. The resulting program development glosses over internal complexities and creates a unified voice for conservation.

WWF's network structure consists of interconnected staff, many with unique expertise, who collaborate with one another in project-based teams. Mintzberg (1979) describes this type of organizational structure as an adhocracy.

> ...Support staff gain the most influence in the organization not when they are autonomous but when their collaboration is called for in decision making, owing to their expertise. This happens when the organization is structured into work constellations to which power is decentralized selectively and which are free to coordinate within and between themselves by mutual adjustment. To the extent that conditions favor this pull to collaborate, the organization adopts the Adhocracy configuration (Mintzberg 1979,302).

What Mintzberg refers to as "mutual adjustment" is simply informal communication and coordination (Mintzberg 1979,3). Rather than top-down direction, staff coordinate with one another across the network through informal communication, often email. As one staff member told me: "working in WWF is really up to individual initiative" (WWF staff interview) and "work in WWF is based on trust, not control" (WWF staff interview). Of all organizational structures, adhocracy provides the best setting for innovation and adaptability; at the same time, it may make coordination of mundane tasks more difficult than they would be in a simple command structure or bureaucracy (Mintzberg 1979). When working on cross-border or circum-Arctic issues, these project-based teams include staff from multiple National Offices.

While the project work of WWF operates through adhocracy, the overall WWF network exercises network governance. National Offices operate largely as independent organizations. They are neither in competition nor arranged in a system of hierarchical

control; rather, they coordinate work and resource sharing through their network of connections. A large, decentralized network such as WWF may exhibit greater resilience under conditions of abrupt change (Newig, Günther, and Pahl-Wostl 2010).

Reflections on the Field

Transnational organizations have become driving engines behind conservation initiatives in countries around the world. Understanding the efficacy of these programs as well as their unintentional outcomes has been the subject of increased social research; however, much of that research has focused on local effects, community resistance, and obstacles to achieving program goals (Brosius and Russell 2003; Brosius 1999b; Mascia et al. 2003; Wilshusen et al. 2002). Relatively little attention has been paid to the politics of knowledge and decision making within these organizations—the ways that knowledges are created, legitimated, valorized, and silenced. This imbalance has not gone unnoticed by people in conservation organizations (Redford 2011).

One of the insights of ethnographic projects is that the knowledge systems of the research subjects is important—what is known, what can be known, what knowledge is legitimate. Based on my research, I propose that the epistemological systems of conservationists and anthropologists differ in important ways, some of which are institutionalized within each discipline. What counts as interesting knowledge from an anthropological standpoint may not from that of conservationists. More importantly, the points of passage that make anthropological research doable and fundable within our own institutional frameworks conflict in places with those that make work interesting and important for conservationists. A translation becomes necessary. In my case, my successful NSF proposal was illegible and illegitimate in terms of explaining my work to

WWF staff[28]. I had to translate that document into a suitable "two-pager" that framed my research and rendered it both legible and legitimate for WWF staff.

What I had intended as a fully collaborative project, that began with negotiation of my research questions (broadly focused on institutions, network structure, and organizational culture) and research sites (key Arctic network offices), was in practice difficult to operationalize—at least in part due to the non-hierarchical structure of the larger WWF network. As an anthropologist "insinuating myself" (Holmes and Marcus 2008) into a global, non-hierarchical organization, the opportunities for deep collaboration were limited and fragmentary. Rather, I had to renegotiate my position continually as I moved from office to office.

Working within this transnational network through time and across continents led me away from traditionally imagined fieldwork and toward an episodic anthropology—one that echoed the episodic and virtual connections within the organization itself.

Thoughts for WWF

After spending several months directly in WWF offices, nearly two years travelling episodically between offices, and hours upon hours poring through archival texts and field notes, I offer these thoughts to WWF staff. I see Arctic conservation as a crucial endeavor, and WWF's work as critical in accomplishing that goal. As an anthropologist, there are several points I would raise.

Maintaining the WWF Network

WWF staff spend many hours on the phone, on email, and in meetings in order to accomplish their goals. During interviews, several staff expressed to me that they felt

28 To be clear, WWF staff are completely capable of understanding an anthropology proposal, but it is so far removed from the reality of their day-to-day lives that shifting frames becomes laborious.

much of their workday was lost to this sort of effort: "it seems like I spend more and more time in front of the computer" (WWF staff – field notes). At the same time, new staff members in particular recognize the importance of building relationships with more experienced individuals who know how to navigate WWF's network. They express this in terms of the need for a mentor, the importance of "greybacks," and the time and travel needed to understand WWF's complex network structure.

The work of building cross-cutting relationships is important for ensuring both adaptability and resilience of the overall network. Ties that bridge the gaps between specializations and offices help to increase the capacity for organizational learning and resource sharing (Burt 2004; Newig, Günther, and Pahl-Wostl 2010). This is the case even when those ties are informal, peripheral, or otherwise "weak" (Granovetter 1983). Specifically building additional weak ties—rather than the strong ties formed in permanent, close working relationships—also helps to foster heterogeneity within the system, which leads to redundancies[29] and additional organizational resilience (Berkes 2002; Newig, Günther, and Pahl-Wostl 2010).

The ways in which individuals see their own network (and their place within it) affect the structure of the network (Borgatti and Foster 2003). Moreover, an ability to accurately cognize informal network structure is related to positions of power within that network; either because accurately identifying network structure is itself empowering (Krackhardt 1990) or because positions of power allow for the accurate estimation (or control) of network structure.

29 In this context, redundancies in both network connections and organizational knowledge mean that, if one staff person leaves the network, the remaining network can remain stable.

Day-to-day work contacts (in person or via email, phone, or teleconference) provide opportunities for building both strong and weak ties in the organization. In National Offices where Arctic-connected staff are more insular (Russia and the US), *providing opportunities for informal networking and peripheral participation outside the scope of the National Office will ultimately benefit both the NO* (by increasing the diameter of the national network) *and the Arctic program* (by making a greater breadth of expertise available and increasing redundancies in both staff competencies and network awareness). *Exposure to the wider network is especially important for new staff*, for whom an experienced mentor can provide both access and guidance.

Expanding the External Network

One factor that contributes to network resilience is the overall size of the network. A larger network contributes to effective organizational learning, since larger networks tend to have increased heterogeneity and redundancy (Berkes 2002; Newig, Günther, and Pahl-Wostl 2010). The extended WWF Arctic network of just over 200 individuals includes WWF staff in multiple NOs as well as external contacts. External contacts serve multiple purposes for WWF: they are resources for local knowledge, experts in scientific fields, political contacts, and linkages to other organizations. They also serve as points of contact for WWF to distribute new conservation initiatives. In the RACER process, for example, external contacts served both as experts for providing early feedback and as early distribution nodes for the RACER concept. In cases where those external contacts do not link directly with one another, WWF also serves a bridging role in transferring conservation knowledge between organizations and sectors.

Within the larger WWF network the most centrally placed staff are long-time staff members and those who interact with the most other staff—experts who sit on numerous project teams. These include several members of the WWF Arctic Shareholder Committee, which has broad responsibility for the direction of the GAP. The Arctic program has an informal policy of non-redundancy for external contacts, meaning that staff members try not to replicate one another's external contacts. This was noted explicitly by WWF staff in interviews, and implicitly in conversation when staff were discussing who had contacts in which other organizations. In terms of organizational knowledge and access to external resources, this policy *tends to increase both the size of the network and the number of weak ties present* (Granovetter 1983). While it is a very effective approach for stabilizing and enhancing the WWF network, it tends to frame external contacts as either resources or as an audience for WWF's work.

In several contexts, particularly in association with the Last Ice Area initiative, WWF staff expressed a hope that indigenous and local communities would take on leadership roles in conservation management. In network terms, this entails adding new members as more central nodes. Adding a person as a peripheral member of the network is relatively easy (I added myself as a peripheral member of the WWF Arctic network); integrating a community into the network is more challenging. As an example, one need only look at the work that is required to maintain continual communication and collaboration between WWF National Offices—all of which share a similar mission.

Where WWF seeks a deeper relationship with a group or community, for example with the Arctic Council or with indigenous groups, a different strategy is called for. A closer relationship between groups can be achieved by *increasing the number of contacts*

between community members and WWF staff (multiple, small-scale contacts between several staff members and members of the community) or by *bringing key community members into central roles in the WWF network* (for example, inviting one or more indigenous members to join the Shareholder Group).

Institutional Heterogeneity

At several points in my research, staff mentioned to me that collaborations with other offices (in other nations) were difficult because "they do things differently than we do" (WWF staff – field notes). These included difficulties in communication, collaboration, and moving projects ahead according to desired timelines. As discussed in chapter 4, these were sometimes related to mistaken perceptions of other parts of the network:

> It never occurred to me that there would be this inconsistency within WWF-US. There is confusion about what the mandates and roles should be, blinders about what is outside US interests (WWF staff interview).

In other cases, it was the challenge of maintaining communication:

> Work is hard because we are so widespread. We have to work to keep in touch (WWF staff E interview).

During development of the RACER project, for example, temporary difficulties arose both because of the focus on resilience, which some Russian staff felt to be imposed from outside, and because of a perceived lack of communication from Russia to the rest of the project team. Through a process of informal communication and coordination — mutual adjustment (Mintzberg 1979) — staff were able to successfully coordinate and release the RACER handbook on schedule.

In a heterogeneous organization, itself composed of multiple, largely independent National Offices, it is not surprising that different institutions — ways of doing things —

are present. Social institutions, broadly defined to include both formal and informal rules for behavior, are most resilient when they encourage inclusivity and trust (Adger 2000). As long as national- and office-level institutions meet those criteria, they are likely to persist even if they conflict with institutions in other parts of the network. As a networked adhocracy, WWF staff consistently build trust through their network, as discussed in chapter 4:

> Work in WWF is based on trust, not control. It is about setting things in motion (WWF staff D interview).

At the same time, the heterogeneity of institutions within the larger WWF network contributes to the overall effectiveness of WWF by providing multiple ways of working to achieve goals. Working in the absence of standardization has been shown to increase adaptability and innovativeness (Mintzberg 1979). The institutions at work within WWF are cross-scale in that they link together programs, offices, NOs, and regional and global governance bodies.

> Regarding cross-scale institutions, the insight from resilience and diversity is that it makes sense to continue to develop different kinds of co-management arrangements and other institutional forms. There is no such thing as an optimum arrangement that can be replicated everywhere (Berkes 2002,315).

So, while heterogeneous institutions may create work stress within the international network, *there is a benefit in maintaining diversity and flexibility, as long as inclusiveness and trust are maintained*.

Why Staff Stay

While inclusivity and trust are important, they do not explain either the longevity of the Arctic program or the ability of WWF to retain staff. Within the core of the Arctic program, the most central staff are those who have been working in WWF the longest.

These staff have an important familiarity with the structure of the network that increases their social capital within the organization (Krackhardt 1990). WWF is a respected conservation organization, and I was told by several staff members that WWF's prestige was one reason they had wanted to work for the organization. Others told me that, while WWF was doing good work, they were there because of a personal commitment to environmentalism in general or biodiversity specificly. As one staff member put it:

> People don't support the organization; they support the cause (WWF staff interview).

Other staff members described WWF as an organization that was able to address conservation of the Arctic in nuanced ways:

> WWF demonstrates a long-term interest in Arctic issues. They don't present things in simple black and white. Instead of just doom and gloom, they present solutions (WWF staff Y interview).

> And that is why I really respect WWF: instead of being obstructionist, they try to provide other solutions (WWF staff F interview).

In other words, the same *attention to complexity* that has caused strain with local communities (Payton 2012; P. Smith, Burlando, and Davidson-Hunt 2010) and strict protectionists (Jørgensen 2015) *is attractive to staff members*, who see WWF as offering a middle path between sustainable use and strict protectionism.

Lastly, several staff members—in all the offices I visited—described WWF as a "family" atmosphere. One interviewee who had left the organization said:

> When I left, I stayed in touch; I really missed the old family of WWF (WWF staff AA interview).

Another described WWF as being more than just work:

> It is more of a type of life than just a job (WWF staff Q interview).

This same sentiment was echoed by several former staff members, all of whom maintain some level of contact with their former co-workers. In addition to further extending WWF's network, this highlights the stability of the trust relationships formed within the organization.

Implications and Recommendations

WWF has worked globally in the Arctic since the early 1990s. During that time they have been effective in promoting networks of protected areas and the development of conservation policy at national and international levels, and in raising public awareness of Arctic issues. WWF is also successful at developing a wide range of unique projects to fit the needs of the Arctic's diverse ecosystems and environmental problems.

That said, WWF's global Arctic network is under pressure. Strains result from the internal complexities of maintaining a decentralized international network and from environmental and economic changes in the Arctic—many of which are due to climate change. This research has shown several trends that are important for the Arctic network going forward:

Document management was raised by staff in the US, Norway, and Canada as an issue. As the WWF network continues to develop and grow, it accumulates a wealth of both paper and electronic archives. These have been useful in examining trends in Arctic conservation (Chapter 3), but are also hard to access and sort and are of limited use for current staff.

Recommendation1: WWF could implement a document management strategy for both current and former programs, making archives searchable and accessible

from throughout the network. This would be useful for new staff in training and orientation, for veteran staff as a means of supplementing institutional memory, and for future researchers on Arctic conservation.

Organizational resilience within the Arctic network is a result of informal coordination, shared capacities among staff, shared network connections, and self-awareness of overall network structure. Redundancies in the network ensure that, if one staff person leaves, others are able to maintain network ties and the structure of the overall network will be minimally changed.

Recommendation 2: As WWF staff work, it is important to ensure multiple points of communication between offices in the network. This may be as simple as including additional staff on emails or periodically inviting staff from other offices to give updates on their local work (for example, asking someone from the Murmansk office to give a presentation to the staff in Anchorage). Or, it may involve staff travelling to other offices for face-to-face collaboration.

Expanding the WWF network is necessary for implementing conservation initiatives around the Arctic. While enhancing internal connections contributes to overall network resilience, enhancing external connections provides points for WWF to collaborate and communicate outside the organization. WWF's informal policy of minimizing redundancies in external contacts (having a single WWF point person for each external contact) helps to widen the network.

Recommendation 3: Where possible, WWF might look at ways to fill a bridging role in Arctic conservation—filling in gaps (Burt 1992, 2004) between individuals and organizations that do not communicate directly. Adopting a bridging role increases the centrality (and influence) of key nodes in the network, and eliminating structural holes contributes further to overall network resilience. Where WWF seeks to deepen relationships—for example, in encouraging indigenous groups to co-manage the Last Ice Area—it would be useful to have multiple, frequent points of contact between several staff and community members. It may also be helpful to invite community members to join WWF in a more formal capacity, for example as advisors to the shareholder group.

Climate change has been increasingly important as a driver of both Arctic environmental issues and WWF's conservation programs. WWF is acutely aware of the environmental challenges posed by climate change. Climate change may also pose ongoing economic and political challenges for WWF, including interruption of funding streams, communication challenges between governments, and shifts in conservation needs resulting from increased Arctic resource use.

Recommendation 4: Going into an uncertain future makes focusing on the resilience of the WWF Arctic network especially important. In addition to the recommendations above, WWF might benefit from periodic contingency planning exercises and consultation with experts on the predicted non-environmental effects of climate change.

WWF and the Conservation of the Arctic

The Arctic is melting. The climate within the Arctic is changing faster than in most other areas of the globe, and at a faster rate than ever seen in recorded history (Christie and Sommerkorn 2012). This warming poses threats for people, biodiversity, and ecosystems within the Arctic. It is also an existential threat for Arctic conservation, where traditional models of protected areas and fixed ecosystem-based conservation are insufficient to deal with the shifting climate.

Based on an analysis of WWF archives and publications (Chapter 3), WWF's focus — on work with the Arctic Council, creation of protected areas, protection of key species, people and development — has remained relatively consistent over the past twenty years. The biggest change in the work of the Arctic program has been the incorporation of climate change into the programs main agenda. Today, shifting climate makes much of their work predictive and precautionary, including RACER and the Last Ice Area, both of which use predictive models to define areas where future conservation should be focused. As the Arctic climate continues to shift and global climate change puts additional stresses onto economies, ecosystems, and societies, WWF's work will likely become progressively more challenging. To address these challenges, WWF will need to rely heavily on their network of staff, contacts, and resources.

The overall WWF network is composed of multiple cross-scale interactions that can make work confusing and challenging for staff:

> WWF was being pulled in all directions, with many three-year plans and strategies. It really is a big beast with many heads (WWF staff AA interview).

As staff navigate this network through informal communication and coordination, they increase the network's resilience by developing new ties and increasing the

network's size (Berkes 2002; Newig, Günther, and Pahl-Wostl 2010). The resilience of the WWF network is also increased by the presence of heterogeneous institutions (Adger 2000) and the development of redundancies in both explicit and tacit knowledge (Berkes 2002).

Both the RACER and the Last Ice Area deal in resilience, specifically ecological resilience. RACER focuses on protecting those areas that will continue to contribute to Arctic resilience through the year 2100 based on current data and climate models (Christie and Sommerkorn 2012). To a lesser degree, the Last Ice Area deals with areas where sea ice ecosystems will remain resilient, continuing to provide polar bear habitat into the future (Frost 2014). As RACER was being developed, the social and ecological sides of resilience were explicitly disconnected to limit the scope of the project, even as staff acknowledged that people are part of ecosystems, as discussed in Chapter 5:

> Staff 1: We need a creative way to say "this is how we limit scope."
> Staff 2: Maybe we limit it to ecosystem resilience...
> Staff 1: I have to say, it is not a social analysis—but people are part of ecosystems (WWF staff – field notes).

As staff were having this discussion, part of a planning process that engaged the networked adhocracy of WWF, they were in effect contributing to the increased resilience of WWF's network.

Social and ecological resilience remain connected (Adger 2000; Berkes 2002; Gunderson, Davidson-hunt, and Berkes 2002) and potentially important as a consideration in conservation organizations. A resilience perspective has been used to study management interactions at local, regional, and national levels (Gunderson, Holling, and Light 1995). For WWF, a nonhierarchical governance approach relies on three aspects of the network: distribution of information, collaborative decision-making,

and organizational resilience (Newig, Günther, and Pahl-Wostl 2010), of which resilience is the least discussed. That resilience is key in allowing the network to persist through changes in social-ecological context.

For WWF, strains on the Arctic conservation network may come from social, political, economic, or ecological changes outside the organization. Changes in the climate regime and ecological landscapes of the Arctic may place additional strain on conservation institutions. At the same time, economic effects of both climate change and shifting Arctic resource use may result in new political pressures for the organization. Adapting to the challenges of Arctic conservation in a climate-changed world will require innovation, flexibility, and a continued reliance on WWF's networked approach to knowledge work.

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APPENDIX A

TABLE OF ACRONYMS FOUND DURING THE RESEARCH

Acronym	**Expansion**
AARI	Arctic and Antarctic Research Institute
ACAP	Arctic Council Action Plan
ACEI	Association of Communities in Eastern Iceland
ACF	Alaska Conservation Foundation
ACIA	Arctic Climate Impact Assessment
ADHR	Arctic Human Development Report
AECO	Arctic Expedition Cruise Operators
AEPS	Arctic Environmental Protection Strategy
AEWC	Alaska Eskimo Whaling Commission
AFS	American Fisheries Society
AGU	American Geophysical Union
AIA	Aleut International Association
AMAP	Arctic Monitoring and Assessment Program
AMCC	Alaska Marine Conservation Center
AMSA	Arctic Marine Shipping Assessment

Acronym	Expansion
ANWR	Alaskan National Wildlife Refuge
APAN	Arctic Protected Area Network
APCO	Arctic Programme Coordination Office
APCO	Arctic Programme Coordination Office
ARCON	Arctic Container Project
ARR	Arctic Resilience Report
ASRT	Arctic Sub-Regional Team
ASTIS	Arctic Science and Technology Information System
AVHRR	Advanced Very High Resolution Radiometer
AWRTA	Alaska Wilderness Recreation and Tourism Association
BESIS	Bering Sea Impact Study
BIPRP	Bathurst Inlet Port and Road Project
BLM	Bureau of Land Management
BML	Biodiversity Map Library
BMU	German Ministry for the Environment
BP	BP (formerly British Petroleum)
BSIMPI	Beaufort Sea Integrated Management Planning Initiative
BWM	International Convention for the Control and Management of

Acronym	Expansion
	Ships Ballast Water and Sediments
CAD	Canadian dollars
CAFF	Conservation of Arctic Flora and Fauna
CARC	Canadian Arctic Resources Committee
CAVM	Circumpolar Arctic Vegetation Map
CBC	Canadian Broadcasting Corporation
CBD	Convention on Biological Diversity
CBMP	Circumpolar Biodiversity Monitoring Programme
CC	Climate Change
CCMLAR	Convention for Conservation of the Marine Living Atlantic Resources
CCSM	CCSM climate model
CCSM	Community Climate System Model
CCU	Circumpolar Conservation Union
CHF	Swiss Franc
CIBC	Canadian Imperial Bank of Commerce
CIFAR	Cooperative Institute for Arctic Research
CITES	Convention on the International Trade in Endangered Species

Acronym	Expansion
CLRTAP	Convention on Long-Range Transported Air Pollution
CNRM	CNRM climate model
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSMONOVA	COSMONOVA
CPAN	Circumpolar Protected Area Network
CPAWS	Canadian Parks and Wilderness Society
CrES	Conservation and Research for Endangered Species
CSIS	Centre for Strategic and International Studies
CSWG	Circumpolar Seabird Working Group
CTC	Canadian Tourism Commission
CWS	Canadian Wildlife Service
DANIDA	Danish International Development Agency
DCFN	Deh Cho First Nations
DDT	Dichlorodiphenyltrichloroethane
DNV	Det Norske Veritas
EAG	Expert Advisory Group
EALT	Reindeer Herders Vulnerability Networks Study
EBRD	European Bank for Reconstruction and Development

Acronym	Expansion
EC-CWS	Environment Canada-Canada Wide Standards
ECHO	ECHO climate model
ECHO-G/MIUB	ECHO-G/MIUB climate model
EDC	Endocrine Disrupting Chemicals
EEZ	Exclusive Economic Zone
EFT	European Forest Team
EIA	Environmental Impact Assessment
EKODOSD	Ekosistemi Koruma ve Doa Sevenler Dernegi - Ecosystem Protection and Nature Lovers Association
ENARI	Extreme North Agricultural Research Institute (Russia)
EPA	Environmental Protection Agency
EPMG	European Programme Management Group
EPO	European Policy Office
EPOCA	European Project on Ocean Acidification
EPP	European Policy Programme
EPPR	Emergency Prevention Preparedness and Response
EPSC	Europe and Middle East Sub-Committee
ERBC	Eco-Region Based Conservation

Acronym	Expansion
ESA	Endangered Species Act
ESC	Endangered Seas Campaign
ETC	Environmental Travels Center
EU	European Union
EVOS	Exxon Valdez Oil Spill
FAO	Food and Agriculture Organization
FFEM	Fonds français pour l environnement mondial
FHPP	Fljotsdalur Hydro Power Plant
FNI	Fridtjof Nansen Institute
FWS	Fish and Wildlife Service
GA	GRID-Arendal
GCI	Gwichin Council International
GEF	Global Environment Facility
GEUS	Geological Survey of Denmark and Greenland
GINR	Greenland Institute of Natural Resources
GIS	Geographic Information Systems
GISS	Goddard Institute for Space Studies
GIZ	German International Cooperation

Acronym	Expansion
GRID	Global Resource Information Database
GRID-Arendal	GRID-Arendal
GRIP	Norwegian Centre for Sustainable Development
GSA	Gwichin Settlement Area
GTC	Gwichin Tribal Council
HAMP	Hydro Aluminum Metal Products
HCB	Hexachlorobenzene
HCH	Hexachlorocyclohexane
IAATO	International Association of Antarctic Tour Operators
IAHR	International Association of Hydraulic Engineering and Research
IAPO	International ACSYS Project Office
IARC	International Arctic Research Center
IASC	International Arctic Science Committee
IBCAO	International Bathymetric Chart of the Arctic Ocean
IBPN	Institute for Biological Problems of the North
ICAS	Inupiat Community of the Arctic Slope
ICC	Inuit Circumpolar Conference
ICCH	International Congress on Circumpolar Health

Acronym	Expansion
ICCPR	International Covenant on Civil and Political Rights
ICES	International Council for the Exploration of the Sea
ICSU	International Council for Science
IGO	Inter-Governmental Organization
IISD	International Institute for Sustainable Development
IMAX	IMAX
IMO	International Maritime Organization
IMR	Institute of Marine Research
INCA	Iceland Nature Conservation Association
INSROP	INSROP
IOPs	Inherent Optical Properties
IPCC	Intergovernmental Panel on Climate Change
IPO	Indigenous Peoples Organization
IPS	Indigenous Peoples Secretariat
IPY	International Polar Year
IQ	Inuit Qaujimajatuqangit
ISK	Icelandic króna
ISN	International Relations and Security Network

Acronym	Expansion
IT company	Information Technology company
ITC	Inuit Tapirisat of Canada
ITCIP	International Training Centre for Indigenous Peoples
IUCN	International Union for the Conservation of Nature
IWC	International Whaling Commission
IWCMC	UNEP World Conservation Monitoring Centre
IWGIA	IWGIA
JRP	Joint Review Panel
KfW	KfW-German Develpment Bank
KNAPK	Greenland Hunters and Trappers Association
KNO	Contact Comittee for the Northern Areas
KRC	Kuujjuak Research Centre
lAATO	International Association of Antarctic Tour Operators
lASC	International Arctic Science Committee
LCC	Lansdcape Conservation Cooperative
LMEs	Large Marine Ecosystems
LRTAP	Long-Range Transboundary Air Pollution
LTCA	Linking Tourism and Conservation in the Arctic

Acronym	Expansion
LWFG	lesser white-fronted goose
MAG	Marine Advisory Group
MEOW	Marine Ecoregions of the World
MGP	Mackenzie Gas Project
MMBI	Murmansk Marine Biological Institute
MMPA	Marine Mammal Protection Act
MMS	US Minerals Management Service
MPA	Marine Protected Area
NAFO	Northwest Atlantic Fisheries Organization
NAMMCO	North Atlantic Marine Mammal Commission
NAO	Nenets Autonomous Okrug
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NCAR	National Center for Atmospheric Research
NCM	Nordic Council of Ministers
NDVI	Normalized Difference Vegetation Index
NEAFC	North East Atlantic Fisheries Commission
NEFCO	Nordic Environment Finance Corporation

Acronym	Expansion
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOK	Norwegian Krone
NORDSUP	Nordic Supportive Defence Structures
NPA-Arctic	Russian National Program of Action-Arctic
NPI	Norwegian Polar Institute
NRC	National Research Council
NSF	National Science Foundation
NSIDC	National Snow and Ice Data Center
NWAE	Northwest Atlantic Ecoregion
NWHP	Nunavut Wildlife Health Assessment Project
NWT	Northwest Territories
OSPAR	Oslo and Paris Conventions for the protection of the marine environment of the North-East Atlantic
OSPARCOM	OSPAR Commission
PAME	Protection of the Arctic Marine Environment (Arctic Council)
Pas	Protected Areas

Acronym	Expansion
PBSG	IUCN Polar Bear Specialist Group
PCBs	Polychlorinated Biphenyls
PICES	Pacific Marine Science Organization
PINRO	Polar Research Institute of Marine Fisheries and Oceanography (Russia)
RAC	Regional Advisory Council
RAIPON	Russian Association of Indigenous Peoples of the North
RBCU	Russian Bird Conservation Union
RPA	Regional Programme of Action
RPO	Russian Programme Office
RSA	RSA Insurance Group plc
RSD	Remotely Sensed Data
RurAL CAP	Rural Alaska Community Action Program
SAO	Senior Arctic Official
SAS	Scandinavian Airlines
SDP	Sustainable Development Programme
SDTF	Sustainable Development Task Force (of AEPS)
SDWG	Sustainable Development Working Group (Arctic Council)

Acronym	Expansion
SECO	State Secretariat for Economic Affairs (Switzerland)
SEI	SEI Industries, Ltd.
SFT	Norwegian Pollution Control Authority (Statens forurensningstilsyn)
SGP	Slave Geological Province
SIC	Sea Ice Concentration
SIDS	Small Island Developing States
TEK	Traditional Ecological Knowledge
TIAC	Tourism Industry Association of Canada
TNC	The Nature Conservancy
TRAFFIC	Trade Records Analysis of Flora and Fauna in Commerce
TWS	The Wilderness Society
UAF	University of Alaska Fairbanks
UBC	University of British Columbia
UDEL	University of Delaware
UKMO-HadGEM1	UKMO-HadGEM1 climate model
UN-ECE	United Nations Economic Commission for Europe
UNCLOS	United Nations Convention on the Law of the Sea

Acronym	Expansion
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNEP	United Nations Environment Programme
UNEP-WCMC	UNEP-World Conservation Monitoring Center
UNESCO	United Nations Educational Scientific and Cultural Organization
UNFCCC	UN Framework Convention on Climate Change
UNHDI	United Nations Human Development Index
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USGSBRD	United States Geological Survey, Biological Resources Division
USSR	Union of Soviet Socialist Republics
VNIIPriroda	All-Russian Research Institute for Nature Protection
VNIRO	Russian Research Institute of Fishery and Oceanography
WCMC	World Conservation Monitoring Center (see UNEP-WCMC)
WGMG	Working Group on Methods in Fish Stock Assessment
WHOI	Woods Hole Oceanographic Institution
WMAC	Wildlife Management Advisory Council
WMO	World Meteorological Organization

Acronym	**Expansion**
WRRB	Wek'èezhìi Renewable Resources Board
WSSD	World Summit on Sustainable Development
WWF	World Wildlife Fund or World Wide Fund for Nature

APPENDIX B

DETAILS OF EGONET METHODOLOGY

Prior to the beginning of the research, I set up the formal interview tool using EgoNet (McCarty 2011) to collect data (see Appendix B). Alters were elicited using the following scripted prompt:

> In this section I will ask you to name 50 people who you have worked with in the last year. They may be within or outside of WWF, but your contact with them should be more substantial than inclusion in a single email. If you contacted them again, they would recognize having worked with you.

This is a variation on Burt's (1984) name generator question for the General Social Survey: "Looking back over the last six months…who are the people with whom you discussed an important personal matter?" and follows the pattern used by McCarty (2002, 2009). Including a limit on alters, a specific time frame, and a definition of intimacy helps to reduce measurement error in the elicitation of personal networks (Campbell and Lee 1991). For each alter, I then asked a number of questions about the alter's current workplace (see Appendix B). Then, in the most time-consuming step, I elicited ego's perception of all possible alter-alter ties, referencing the same prompt as above:

> Based on your best knowledge, I'm going to ask you about the relationships between your contacts. Using the same idea of "working with" [repeat part of earlier prompt], have X and Y worked together over the past year? If you are unsure, I will count that as a "no."

During every interview, interviewees expressed uncertainty about some connections, but those were rare enough that each interviewee noted them explicitly without being prompted.

EgoNet (McCarty 2009) provides a utility for combining egocentric networks using alter matching (combining the names of alters). A personal knowledge of the network participants is necessary to do this matching. Care must be taken. For example, if "Pat Smith" and "Pattie Smith" are in two different egocentric networks, are they the same person? EgoNet provides additional information from interviews (see Appendix 1) to help in matching, but a familiarity with the network and its members is necessary to reduce error. The matching function combines ties based on user-chosen settings. For this research, I chose the following settings:

1) Always include ego(s)
2) Tie if majority says tie
3) Ego vote overrides
4) Ego always connected to own alters, even if all others disagree

So, if three egos (x, y, and z) named the same two alters (a and b), a and b are tied in the final network of 2/3 of egos perceive them as tied (see Figure B.1 on combining egonets). The resulting network is undirected—meaning that ties are symmetrical. If a is tied to b, then b is also tied to a. These settings help to minimize the occurrence of false positives. Following combination in EgoNet, the results were exported as a .csv file and cleaned within LibreOffice Calc—where I once again checked the list for nodes that

should be combined, removed unneeded fields, and checked that each node was assigned a unique non-personal ID number.

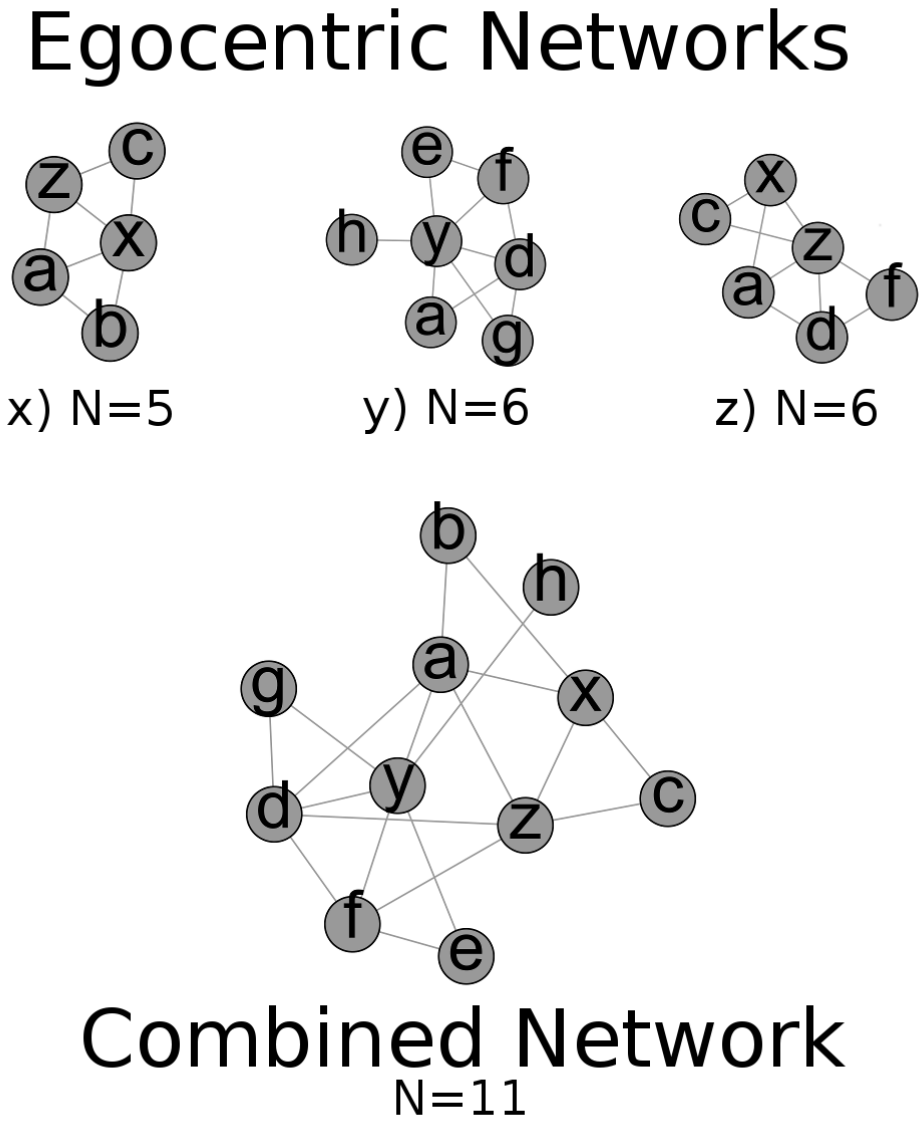

Figure B.1: An example of combining egocentric networks. Here, fictitious egocentric networks (of egos x, y, and z) are combined into a whole network. Smaller networks such as these are easier to visualize than actual networks gleaned from interviews.

QUESTIONS USED IN THE FORMAL EGONET INTERVIEW

1) Are you a current or past WWF employee? (if no, go to Q9)

2) Are you currently working for WWF? (if no, go to Q8)

3) What is (or was) your Job Title at WWF?

4) For how many years (total) have you worked (or did you work) for WWF?

5) In which office of WWF (current or most recent, if more than one)?

- WWF Arctic
- WWF International
- WWF Norway
- WWF Sweden
- WWF Denmark
- WWF Finland
- WWF Russia
- WWF Canada
- WWF US
- Other WWF

6) Have you ever been employed in a different WWF office?

7) Please list the other WWF offices where you have been employed.

8) Former WWF: (go to Q10)

How would you categorize your current employment?

- NGO
- ILC
- Academic
- Funder
- Governmental
- Other

9) Non-WWF

How would you categorize your current employment?

- NGO
- ILC

- Academic
- Funder
- Governmental
- Other

10) Please take a few moments to list individuals (inside and outside of WWF) who you know. [give prompt script—50 alters]

11) Does X currently work for WWF? (if yes, go to Q14)

12) Did X formerly (but not now) work for WWF? (if no, go to Q15)

13) In which office of WWF did X last work? (go to Q17)

- WWF Arctic
- WWF International
- WWF Norway
- WWF Sweden
- WWF Denmark
- WWF Finland
- WWF Russia
- WWF Canada
- WWF US
- Other WWF

14) In which office of WWF does X work? (go to Q17)

- WWF Arctic
- WWF International
- WWF Norway
- WWF Sweden
- WWF Denmark
- WWF Finland
- WWF Russia
- WWF Canada
- WWF US
- Other WWF

15) Alter: non-WWF (go to Q17)

How would you categorize X's current employment?

- NGO
- ILC
- Academic
- Funder
- Governmental
- Other

16) Alter: former WWF

How would you categorize X's current employment?

- NGO
- ILC
- Academic
- Funder
- Governmental
- Other

17) Alter pair questions: Does X know Y? (for each possible alter pair)