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In My Opinion

Relationship-Scale Conservation

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ABSTRACT Conservation can occur anywhere regardless of scale, political jurisdiction, or landownership. We present a framework to help managers at protected areas practice conservation at the scale of relationships. We focus on relationships between stakeholders and protected areas and between managers and other stakeholders. We provide a synthesis of key natural resources literature and present a case example to support our premise and recommendations. The purpose is 4-fold: 1) discuss challenges and threats to conservation and protected areas; 2) outline a relationship-scale approach to address conservation threats; 3) describe the tools and techniques that can be used to implement this approach; and 4) present a case example from rural Alaska, USA, to illustrate relationship-scale conservation. Our case example illustrates how aspects of this approach to conservation were applied to address a wildlife population decline. Tools needed to implement relationship-scale conservation include 1) collecting and documenting narratives of place; 2) measuring and monitoring trust and commitment; and 3) identifying and mitigating threats. We recommend that planners and managers, working with their research partners, redefine and refocus their goals and objectives to include these practices. Doing so will enable them to gain substantial applied knowledge about their stakeholders and foster and maintain place relationships as desired outcomes of conservation. The ultimate outcome is a better prognosis for long-term global survival of protected areas and biodiversity. Published 2014. This article is a U.S. Government work and is in the public domain in the USA.

KEY WORDS conservation threats, literature synthesis, narratives, place meanings, protected area planning and management, relationship to place, stakeholders, trust.

"The only means of conservation is innovation."

—Peter Drucker (Peter 1977:110)

Conservation can occur at any organizational level or scale. This article is about practicing conservation at a relationship scale, which is viewed as innovative in the arena of protected-areas management (Dvorak and Borrie 2007, Dvorak and Brooks 2013). Rather than focusing conservation at landscape, ecosystem, unit, site, or species levels, we focus on relationships between stakeholders and protected areas (i.e., human relationships with places) and between managers and other stakeholders (i.e., interpersonal or inter-group relationships). Our purposes are to 1) discuss challenges and threats that face conservation and the places established for conservation (e.g., protected areas), 2) outline a relationship-scale approach for addressing conservation challenges and threats, 3) describe the tools and techniques that will allow natural resource professionals and their partners to implement conservation at a relationship scale, and 4) present a case example from rural Alaska, USA, to illustrate this approach.

We conducted a review and synthesis of key literature from the natural resources management arena and summarized a case example to describe and support a proposed framework for practicing relationship-scale conservation. The framework is designed to achieve desired conservation outcomes. The case example illustrates how some aspects of this relationship-scale framework were applied to identify, address, and reverse a population decline in mid-continent white-fronted geese (*Anser albifrons frontalis*) that nest in interior and northwestern Alaska. This on-the-ground example was derived from the field experiences of the third author, his colleagues, local village elders, and their conservation partners while they were working at Koyukuk and Nowitna National Wildlife Refuges.

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PROTECTED PLACES

Conservation can occur anywhere regardless of scale, political jurisdiction, or land ownership status. We focus this article on protected areas around the globe to limit its scope. Protected areas are indispensable for the work of biodiversity conservation (Dudley 2008). They are places

that have been established specifically for conservation; natural resources preservation and sustainable uses; and/or related land uses, including subsistence, outdoor recreation and tourism, preservation of cultural values, education, interpretation, and limited resource extraction. These places are established and administered by various entities, including tribal or indigenous peoples and authorities, governmental agencies, non-profit organizations, for-profit organizations, private individuals, local communities, or $\geq$2 entities that share governance (Dudley 2008). Protected areas are most often managed by professionals with appropriate levels of training, skills, and experience in natural science disciplines, natural resources management, or other areas of expertise related to conservation biology.

Most, if not all, protected areas have constituencies or close connections with those who are not directly and legally responsible for their management and administration but who have an interest or stake, in both (i.e., stakeholders). There are numerous challenges to engaging stakeholders in meaningful public participation and environmental decision making, including increased expenses, lack of capacity and consensus, delayed decisions, difficult-to-measure results, contested meanings, governmental authority, and institutional constraints (Yosie and Herbst 1998, Irvin and Stansbury 2004, Kessler 2004, Davenport et al. 2007, Champ et al. 2012). Despite these challenges and constraints, managers of protected areas are generally more effective when they involve stakeholders and include their knowledge and concerns in decision-making processes (Wondelleck and Yaffee 2000, Bryson 2004, Clarke and Jupiter 2010, Lauber et al. 2012, Reed et al. 2013).

Protected-area managers and conservation professionals have traditionally prioritized their efforts toward resource protection issues. Conversely, they have not given planning and management priority to the relationships that individual stakeholders, adjacent communities, and other stakeholders develop with protected areas and natural resources such as fish and wildlife. However, these relationships are important because they represent a vital human element within conservation practice. Relationships reflect the individual and cultural significance associated with protected places, resources, and species. Relationships express values and can indicate long-term individual and group commitments to conservation efforts for protected areas. The objective of relationship-scale conservation is to allow stakeholders and managers to achieve outcomes that are mutually beneficial for people and resource protection. These potential beneficial outcomes may include collective action, consensus regarding desired future conditions, common language and shared values, integration of local knowledge, increased trust, shared goals, and increased capacity for collaboration (Daniels and Walker 2001, Alder and Birkhoff 2002, Brooks et al. 2006*a*).

WHAT ARE PLACE MEANINGS?

People's lives are centered in places, and we continually create meanings about the places in which we live and spend time (Brooks and Williams 2012, Dvorak and Brooks 2013, Dvorak et al. 2013). Social scientists consider the concepts of place and place meanings to be highly relevant to conservation research, planning, and management (Cantrill and Senecah 2001, Farnum and Kruger 2008, Cheng and Mattor 2010, Williams et al. 2013). We consider protected areas to be indispensable as places that provide for human well-being. Our interactions with nature and other people associated with protected areas are tied to long-term attachments, meanings, values, and identities (Williams et al. 1992, Greider and Garkovich 1994, Brandenburg and Carroll 1995, Williams and Patterson 1999, Brooks et al. 2006*b*). This is important because contested values, differing place meanings, and competing uses combine to create the social and cultural context for protected-area management and conservation of natural resources.

Relationship-scale conservation is grounded in the concept of place meanings (Dvorak and Brooks 2013). Protected areas are places that have unique functions, attributes, and other resources; but protected places such as national parks and wildlife sanctuaries are much more than the sum of those unique parts. Protected places are "symbolic environments created by humans" because they confer meaning to nature and the land (Dvorak and Brooks 2013:9, Dvorak et al. 2013). In the context of conservation, place meanings form the foundation of public stewardship and the relationships that develop between stakeholders and protected areas. Through actively interacting and engaging with protected areas and managers over time, stakeholders create place meanings and develop, nurture, and maintain relationships with those places and managers (Manzo 2003, Brooks et al. 2006*b*, Smaldone et al. 2008, Dvorak et al. 2013). An understanding of long-term committed relationships between stakeholders and protected areas is essential for implementing effective conservation (Brooks and Williams 2012, Dvorak and Brooks 2013). To better account for place meanings, we propose that desired conservation outcomes include creating, maintaining, and protecting positive place relationships in addition to positive relations between managers and other stakeholders.

THREATENED PLACES, THREATENED RELATIONSHIPS

Multiple examples exist of how environmental, social, economic, and political forces are threatening conservation and human relationships with protected areas around the globe (Michaelidou et al. 2002, Sodhi and Ehrlich 2010). Habitat fragmentation and degradation have occurred in Australia due to commercial logging, agriculture, and grazing practices; and invasives threaten species richness, endemic wildlife, and biodiversity across the continent (Mackey et al. 2008). Proescholdtz and Nickas (2008) examined special legislative provisions that allow controversial activities in wilderness areas in the United States. They described how grazing, commercial uses, and motorized vehicles continue to expand in legislation and represent ongoing threats to resource conservation and stewardship of protected areas. Mining for fossil fuels has led to deforestation and

environmental contamination in the Amazon Basin, and continued energy exploration and development threaten protected areas and indigenous communities in the watershed (Finer et al. 2008).

Substantial impacts to species have resulted. Losses of global biodiversity due to high rates of species extinction have been documented (Wilson 1992, Meffe and Carroll 1997, Vitousek et al. 1997*a*, Gibbons et al. 2000, Burkhead 2012). In areas characterized by many endemic species, extinction rates were recorded at 100–1,000 times higher than levels predating human habitation in those places (Pimm et al. 1995). Burkhead (2012) estimated the modern extinction rate for freshwater fishes in North America to be 877 times higher than the background extinction rate for these fishes. Approximately 160 non-plant species were listed or proposed for listing under the U.S. Endangered Species Act from 1985 through 1991 (Wilcove et al. 1993). Wilcove et al. (1998) later reported 1,012 imperiled non-plant species. The American Fisheries Society cited substantial levels of endangerment for freshwater fishes and other aquatic species (Angermeier and Williams 1993).

Moreover, relationships that stakeholders develop with protected places, resources, and managers are dramatically affected by global climate change (McKenzie et al. 2004, Cole and Yung 2010, Hobbs et al. 2010, Lovejoy 2010, Dvorak et al. 2011), catastrophic wildland fires (Westerling et al. 2006), oil spills (Wiens 1996, Snyder et al. 2003), and recreational conflicts in urbanizing forest lands in the United States (Brooks and Champ 2006).

These phenomena are powerful forces that manifest themselves as serious challenges and threats to conservation goals and objectives such as biodiversity, ecological integrity, sustainability, and other important social, economic, religious, or cultural values (Dvorak and Brooks 2013). Conservation threats can fundamentally alter protected places in ways that conflict with stakeholders' personal and cultural histories, previous experiences, and place relationships (Dvorak et al. 2011, Dvorak and Brooks 2013). Many conditions that lead people to practice conservation are linked to their relationships with protected places and with those who manage those places. However, some conservation ecologists have overlooked human cultural components such as economic values, environmental values, and place relationships in their assessments of global habitat alteration, alien species, overexploitation, and environmental contamination. Many scientists, managers, and other conservation professionals have instead focused their attention on human ecological factors such as population growth and human-caused impacts and perturbations to protected areas and larger ecosystems. However, to successfully mitigate these threats, managers and other conservation professionals need to more fully integrate a broader range of human dimensions (e.g., cultural values and traditional knowledge) within their analyses of ecosystem viability and conservation practices (McNeely 1992, Vitousek et al. 1997*b*, Michaelidou et al. 2002, Hall et al. 2012). This includes integrating relationships that develop between stakeholders and protected places (Dvorak et al. 2011, Dvorak and Brooks 2013).

Dvorak and Brooks (2013) explained that relationships stakeholders develop with protected places can substantially change as environmental and social conditions change. For example, degraded habitats represent degraded relationships where stakeholders must cope with the loss of what they once knew, loved, and understood. For some stakeholders, a place may become so impacted that it is no longer a special source of subsistence, spirituality, solitude, or other meaningful experiences or personal relationships. The uniqueness of a particular protected place is diminished by the loss of endemic and iconic species and habitats. Stakeholders have to learn to cope with protected areas that have become fundamentally altered by invasive species, extractive industries, environmental disasters, or changes in global climate patterns. Cultural and economic losses that result are nearly impossible to determine because these aspects of place relationships are typically underrepresented in legal, political, and market analyses of impacts (Kirsch 2001, Snyder et al. 2003). Dramatic changes that result from conservation threats can have substantial effects on stakeholder relationships with protected areas and managers (Dvorak et al. 2011, Dvorak and Brooks 2013).

WHY RELATIONSHIPS?

Relationship-scale conservation allows managers at protected areas to mitigate conservation threats and successfully address the challenges they face. We employ the metaphor of a relationship to help us think about, describe, and apply the essential concept of place meanings to conservation and protected-areas management (Lakoff and Johnson 1980). The objective of using relationships in this context is to better understand stakeholders' meanings, values, and experiences at protected areas and their interactions with managers who are responsible for stewardship of the land and its people (Dvorak and Brooks 2013). Human relationships with protected areas and their managers function as important indicators of conservation effectiveness. Managers will be able to identify how, when, and where to address and mitigate threats to conservation goals within protected areas if they closely attend to these human relationships. Moreover, when protected-area managers create and foster on-going relationships between stakeholders and a management organization, they substantially improve public relations and conservation outcomes.

THE NATURE OF PLACE RELATIONSHIPS

Relationships with protected places exist over time in the form of dynamic processes that continuously develop and change shape over the course of individuals' lives (Davenport and Anderson 2005, Brooks et al. 2006*b*, Smaldone et al. 2008, Brooks and Williams 2012, Dvorak and Brooks 2013). Similar to personal relationships in which individual partners are interdependent (Berscheid and Peplau 1983), stakeholders, managers, and protected areas become dependent on each other in ways that are important for conservation science and practice. Likewise, how stakeholders and managers behave within a place relationship can substantially

affect their experiences in that relationship and their future behaviors toward one another and the place (Hinde 1995). Place relationships are not independent from social, cultural, or temporal factors; relationships are embedded in a larger network of meaning consisting of shifting individuals and groups (Laursen and Bukowski 1997, Fournier 1998, Manzo 2005, Brooks and Williams 2012, Dvorak et al. 2013). As place relationships develop, stakeholders, managers, and protected areas become dynamically linked in a continuous process of interaction, sharing, and reciprocity (Hinde 1995).

How a stakeholder experiences and relates to a protected area is affected by a variety of factors related to the stakeholder, the protected area, and other people such as managers. Brooks et al. (2006*b*) presented empirical evidence to demonstrate how a group of stakeholders developed relationships with a protected area in the Rocky Mountains of the United States. They interpreted relationship to place as the active construction and accumulation of place meanings over time. They found that stakeholders developed their place relationships through 1) time and experiences accrued at the protected area, 2) social and physical interactions in and with the place, and 3) an active reflective process that people use to better understand self and affirm commitment to the place and their daily conservation behaviors.

A 3-PRONGED APPROACH

The relationship framework has 3 key dimensions: 1) a person's relationship to self, 2) their relationship to other people, and 3) their relationship with the protected place (Gustafson 2001, Brooks et al. 2007). When protected-area managers have a good understanding of these 3 dimensions, they will be prepared to integrate them within conservation planning and management. This framework represents a solid and practical structure for the management application of place meanings within current planning and management frameworks (Dvorak and Brooks 2013).

The first dimension is a person's relationship to self. People's identities and self images play a crucial role in shaping the character of their lives. Both identities and relationships are cultural expressions that define who we are and hope to become (Greider and Garkovich 1994). Relationships provide meaning in our lives, affect how we think about ourselves, and become the core of who we are as individuals and stakeholders in conservation (Fournier 1998, Brooks and Williams 2012). People create and maintain happiness and positive emotions in protected areas by using these places to better define and understand themselves (Scherl 1989, Haggard and Williams 1992). Knowing who we are relative to a protected area, or a specific resource or conservation issue, provides insights into how we will react to potential conservation threats and changes in land use or management actions.

The second dimension is the relationships to other people and social interactions, which play a substantial role in shaping one's identity and place relationships (Eisenhauer et al. 2000, Gustafson 2001, Kyle and Chick 2004, Brooks et al. 2007). When managers practice relationship-scale conservation, they account for interactions between themselves and relevant stakeholders (Reed 2008, Dvorak and Brooks 2013). In a protected area context, this means interactions with managers and staff; visitors or recreationists; local residents; subsistence hunters, fishers, or farmers; and other stakeholders. Interactions between and among stakeholders have a profound effect on an individual's relationship with a place, how it is being stewarded by managers, and ultimately their relationships with those who manage it.

In relationship-scale conservation, managers recognize and use interactions and exchanges between stakeholders and protected-area planners and managers to build trust and commitment. Trust exists when one party has confidence in the reliability and integrity of its partner in the relationship (Moorman et al. 1992, Morgan and Hunt 1994, Dvorak et al. 2013). Commitment reflects the strength of the bond between partners in a relationship and indicates relationship durability over time and the investment that each partner has made in the other (Dvorak and Brooks 2013, Dvorak et al. 2013). When trust and commitment exist, stakeholders are more confident that their experiences interacting with managers will be positive, and managers are more confident that their interactions with stakeholders will result in desirable outcomes (Dvorak and Brooks 2013, Dvorak et al. 2013). The outcomes will be beneficial to both conservation goals and place relationships that have developed for stakeholders.

The third dimension of the framework is an individual's relationship to a protected area or place therein. Managers must understand how stakeholders develop place relationships at protected areas. Understanding a protected area as a partner in a relationship is important because it represents a context and history of experience in which an individual becomes intimately familiar with and connected to a place (Brooks et al. 2006*b*, 2007). "Without the place, the relationship could not be grounded in a reality," and it would be difficult to fully investigate and address threats to conservation and relationships that affect the place (Dvorak and Brooks 2013:9). Conservation professionals need to examine specific threats and social and cultural forces that affect a place to understand what changes might occur to the relationships stakeholders develop with the protected area and with those managing it.

IMPLEMENTATION TOOLS AND TECHNIQUES

Protected-area managers and other conservation professionals require data-driven assessments to implement relationship-scale conservation (Hall et al. 2012). Dvorak and Brooks (2013) identified 3 target areas of information that provide the tools necessary to document, sustain, and monitor stakeholder relationships: 1) place narratives (following Glover [2003] and Sarbin [1986], we make no distinction between narratives, stories, and storytelling, and we may use these terms interchangeably throughout the paper), 2) trust and commitment between stakeholders and managers, and 3) threats to stakeholder relationships and appropriate mitiga-

tion strategies. Narratives reflect a stakeholder's relationship to self or group in the context of a place such as a park, refuge, or other conservation area; trust and commitment are linked to relationships between stakeholders and managers; and threats are linked to human relationships with protected places (Dvorak and Brooks 2013).

Capture, Document, and Apply Narratives

Humans tell stories to express their personal and place relationships. Storytelling and oral or written narratives are the most fundamental ways they can make sense of and communicate place meanings in relation to their life experiences (Connelly and Clandinin 1990, Patterson et al. 1994, Alder and Birkhoff 2002, Brooks et al. 2004, Glover et al. 2008). Similar to relationships, narratives are holistic because they incorporate time, place, experience, identity, motivations, and causes of events (Mishler 1986, Sarbin 1986, Maines and Bridger 1992). To implement relationship-scale conservation, managers and other conservation professionals require methods to collect and document in-depth qualitative stories about how stakeholders experience the resources at protected areas and what those experiences mean for stakeholder commitment to conservation and protected-area stewardship.

Collecting and studying narratives is a useful method for managers to 1) document the place relationships that stakeholders develop with protected areas and managers; 2) become informed about how much their stakeholders trust that their conservation actions and programs will benefit both humans and natural resources; and 3) learn about conservation threats such as changes to habitat due to warming trends, overharvest of fish and wildlife, or impacts from commercial activities. Protected-area managers and their conservation partners are responsible for learning about stakeholder stories and recognizing when different stakeholders have conflicting stories (Williams 2008).

Careful listening and recording of stakeholder stories about their place relationships requires that managers invite stakeholders to collaborate with them and share control of decision-making processes (Mishler 1986). Policies, formal agreements, and other organizational arrangements that call for close collaboration and sharing of control in decision-making with stakeholders enable managers to truly understand the content and importance of stakeholder stories of place. Outcomes that managers achieve from truly listening and understanding stakeholder stories include shared knowledge of planning and management and a common language for talking about conservation. In the process of interacting with stakeholders, protected-area planners and managers become more familiar with stakeholders and build trust and relationships with them. Stakeholders learn more about managers and can develop a sense of responsibility and commitment to protected-area stewardship (Dvorak and Brooks 2013). These outcomes provide the foundation for participatory planning and management that is truly meaningful for stakeholders and effective for conservation.

Multiple methods are available to collect and document narratives. Because place relationships and the stories that contain them develop over time (Smaldone et al. 2008, Brooks and Williams 2012), they are best captured using longitudinal methods to account for changes through time. Managers and their partners need to ask stakeholders to tell their stories about protected areas and what these places mean to them in the past, present, and future (Brooks and Williams 2012) or conduct cohort studies at systematically determined points in time. Researchers and managers should ask stakeholders to keep journals and do other types of structured writing while visiting a protected area (Fredrickson and Anderson 1999) or taking part in a planning process. Schroeder (1996) asked visitors to write essays about a protected area in Michigan, USA. In-depth interview research is also an effective method for capturing and documenting stakeholders' narratives about protected areas (Patterson et al. 1998, Brooks et al. 2006*b*, Bartley et al. 2014).

Oral-history studies are another important method for collecting narratives (Steiner and Williams 2011, Brooks and Williams 2012, Dvorak and Brooks 2013). Champ et al. (2013) analyzed trip reports in the form of blogs posted on Internet websites by visitors to wilderness areas in the United States. They found that this method of capturing narratives provided personal statements of self and relationships with protected places. Narratives collected from the Internet can be immediately used by managers to monitor place relationships and identify potential conservation threats and social conflicts; these can also be used as sources of material for researchers studying how stakeholders relate to protected places and managers in the long term (Brooks and Williams 2012).

Conservation professionals need to develop processes that enable planners and managers to collect information in a way that makes stakeholders feel valued. In relationship-scale conservation, managers must produce a sense of ownership in the data collection process on the part of stakeholders. This can be accomplished by using a transparent process that provides meaningful feedback to stakeholders about how their stories were used to inform conservation goals and management decisions.

Measure and Monitor Trust

An important component of practicing relationship-scale conservation is accounting for individual stakeholder relationships and interactions with visitors, local residents, and of course, managers. This can be represented by interactions and exchanges that individuals and groups have with protected-area managers and other stakeholders. It is important to understand how stakeholders think about managers in terms of trust or lack thereof. Managers and other conservation professionals working at protected areas need to measure and document levels of trust and commitment that exist in the relationships between different stakeholders. This task provides knowledge about the quality of social interactions and exchanges among stakeholders. Documenting levels of trust and commitment is feasible and effective because the magnitude of trust and commitment can be captured using established methodologies (Dvorak and Brooks 2013).

The concept of trust in natural resources management has been addressed in a number of research studies. Trust is the perception of shared values, direction, goals, perspectives, and beliefs (Winter et al. 1999, Cvetkovich and Winter 2003). In addition to these cognitive dimensions of trust, social relationships between individual stakeholders and a resource management agency have important structural components such as the frequency and quantity of planning meetings in which stakeholders are enabled to interact and strengthen ties with planners and managers (Smith et al. 2013). In other words, the number, quality, and diversity of opportunities for individuals to get involved with agency planning and decision-making are examples of the structural dimensions of relationships.

A variety of psychometric measures of the cognitive dimensions of trust have been used in studies related to natural resources management (Winter et al. 1999, Borrie et al. 2002, Lijeblad et al. 2009, Dvorak et al. 2013, Smith et al. 2013). Using surveys, researchers or conservation professionals working with researchers should ask stakeholders to what extent they trust management in their efforts to manage protected areas (Dvorak and Brooks 2013). Lijeblad et al. (2009) used survey questions to examine stakeholder beliefs and attitudes about manager responsiveness and integrity and stakeholder confidence in managers at the Bitterroot National Forest. Dvorak and Brooks (2013) suggested using a protected-area approval rating as a survey tool to assess and monitor levels of stakeholder trust and commitment for management. They recommended that this survey tool be used to demonstrate stakeholder support for conservation and management and track changes in that support over time.

Participatory appraisals (Beebe 1995), qualitative interpretive approaches (Mishler 1986, Patterson and Williams 2002), action research (Stringer 1999), and collaborative learning models (Daniels and Walker 2001, Alder and Birkhoff 2002, Schusler et al. 2003) can also be used to measure and document levels of trust and commitment. Focus groups (e.g., Freeman 2006, Champ et al. 2012), listening sessions, and sharing circles may be used to examine trust and commitment. Researchers can use social network analysis to provide insights into patterns of trust and communication between stakeholders (Reed 2008). Managers and researchers can solicit public feedback through websites, social media, and blogs in which visitors and other stakeholders write stories, both positive and negative, about their experiences and interactions with managers at protected areas (e.g., Williams et al. 2010, Champ et al. 2013).

Identify and Manage Threats

Meffe and Carroll (1997) recommended that social scientists work to understand the conditions under which stakeholders might replace narrow and short-term self-interest decisions with ones that are long term, contribute to ecosystem sustainability, and are socially cooperative. Information about place relationships and relationships between stakeholders and protected-area managers can provide a foundation for investigating and impeding species imperilment, environmental degradation, and other conservation threats. Because it is a key component of implementing relationship-scale conservation, protected-area managers and planners need to identify relevant external and internal threats to conservation and place relationships (Dvorak and Brooks 2013).

In the context of conservation planning, social and cultural forces and ecological processes are inextricably connected and should not be examined separately; managing threats to place relationships and threats to natural resources simultaneously is the key to sustainable conservation (McNeely 1992, Michaelidou et al. 2002, Stewart et al. 2012). Managers should frame the task of identifying conservation threats by how those threats impact current and future place relationships of their stakeholders. Managers should prioritize actions that mitigate negative impacts to place relationships to complement similar actions that protect resource integrity and achieve conservation objectives (Dvorak and Brooks 2013). Planners and managers need to identify and prioritize which threats they should integrate within current planning frameworks and procedures that already include formal resource assessment, issue scoping, and public involvement (e.g., processes used to implement the National Environmental Policy Act, Endangered Species Act, and federal rulemaking in the United States). Relationship-scale conservation provides managers with opportunities to inform various stakeholders about diverse goals and objectives for mitigating threats to conservation and place relationships. Sometimes, managers will need to discuss with stakeholders how to adapt to threats and changes that are outside their combined control, such as the effects of global climate change, natural or economic disasters, civil unrest, and wars (Dvorak and Brooks 2013).

THE CASE OF A DECLINING GOOSE POPULATION IN ALASKA

Background and Context

Waterfowl population status, trends, and harvest regulations applicable to goose populations nesting in Alaska are reviewed and monitored annually by the U.S. Fish and Wildlife Service (USFWS), in concert with the U.S. Geological Survey, state of Alaska, other Pacific Flyway and Central Flyway state and provincial jurisdictions, the Alaska Migratory Bird Co-management Council, and other stakeholders (D. Marks, D. Marks and J. Fischer, E. Mallek and D. Groves, United States Fish and Wildlife Service, unpublished data). In the early 1990s, there was considerable concern about overabundance of arctic-nesting snow geese (*Chen caerulescens caerulescens*) and urban-nesting Canada geese (*Branta canadensis*) among the flyway organizations. At the same time, the mid-continent white-fronted goose population, as a whole, was also increasing, so managers collectively liberalized the harvest regimen for these species. By the mid-1990s, field biologists at national wildlife refuges and local village-based subsistence hunters began to notice a decline in abundance of white-fronted geese that nest in northwestern and interior Alaska (Spindler et al. 1999,

Fischer 2010). Several protected areas were affected, including Koyukuk and Nowitna National Wild Refuges.

Stakeholder Collaboration and Relationships

Since the 1950s, the Central Flyway management scheme had made substantial efforts to incorporate views of stakeholders living in state and provincial jurisdictions, which include the migration and wintering areas of geese that nest in interior and northwestern Alaska. However, little had been done to incorporate the views of the largely Alaska Native peoples who live in villages located among the arctic and sub-arctic nesting grounds. In many parts of Alaska, spring hunting of waterfowl, particularly geese, has long been an important ingredient in subsistence diets and economies, representing the first fresh meat available after a long winter. This customary and traditional practice is culturally significant for many Alaska Native peoples, but it was not officially recognized and legally allowed by the original 1918 Migratory Bird Treaty Act. Wildlife managers and subsistence advocates in the region had long known about the importance of waterfowl hunting to inhabitants in nearly all rural Alaskan villages, but without broader legal change, they were powerless to act. At times, the illegal but highly traditional spring subsistence hunts created controversy, discord, and mistrust between agencies and subsistence harvesters (Burwell 2005). Passage of the necessary legal authorizations and their implementation proved to be challenging and elusive. Finally, in 1978, an amendment to the Migratory Bird Treaty Act legalized subsistence waterfowl hunting on the nesting grounds. However, the complex, international renegotiation of subsistence provisions in existing treaties with Canada, Japan, Russia, and Mexico was not accomplished until 1997 (Case and Voluck 2012).

In 2000, the Alaska Migratory Bird Co-management Council was established by the USFWS with a purpose of formalizing involvement of subsistence harvesters in reviewing the regulatory framework for the newly established window for subsistence waterfowl hunting (i.e., 10 Mar to 1 Sep). Prior to formation of this management council, local managers encouraged local people's involvement informally through existing federal or state provisions or through local refuge offices. Success was variable and highly dependent on the level of trust that local managers and stakeholders had built and maintained.

Narratives

Aerial and ground surveys of waterfowl in general, and white-fronted goose abundance in particular, began shortly after the new national wildlife refuges were established by the Alaska National Interest Lands Conservation Act in 1980 (ANILCA). When a sharp decline in white-fronted goose abundance in western interior Alaska became apparent after a decade of western science-based monitoring, I was curious as to whether it was a short-term drop or part of a longer term trend. The only way to find out would be to ask waterfowl hunters who lived in the region. In 1995, I (M. Spindler) began to informally interview rural village elders, most of them Alaska Native peoples in the age range between 65 and their 80s. These are people who grew up reliant on the hunting of waterfowl when they were young, and still actively hunted at the time of the interviews. Oral-history interview techniques were used to obtain a perspective that pre-dated the agency's work to collect scientific data on waterfowl abundance.

Sidney Huntington of Galena (a village patriarch, who had also been a long-time member of the Alaska Board of Game) said, "There is absolutely no comparison … I used to lie on my back and watch formation after formation go by, thousands and thousands … In the 1950s, there used to be thousands of geese on the Koyukuk River. The amount of ducks and geese back then was unbelievable … then, pretty soon they were gone." Steven Attla of Huslia noted, "Geese, there was a lot of geese a long time ago, more than today … seems like today, there's not that much geese, really. When we hunted back then, we hunted for everybody … There's not that much being killed today than it used to be. A long time ago, there used to be an awful lot of geese and ducks … why they are kind of disappearing I don't know what's going on …."

After 2 interviews, I realized that there was a great need to document, in a more systematic way, the local subsistence harvesting and fishing patterns, and people's perceptions about, and relationships, with habitats and the local environment. I developed a more formal approach, integrating oral-history information into existing refuge monitoring protocols for all subsequent interviews, which helped in part fulfill a mandate in ANILCA to consider local traditional knowledge in federal management (Spindler 2000). There was also a need for the regional public radio station to broadcast more locally relevant programming, so a partnership was borne that formatted each individual's interview about a specific topic into a 3- to 7-minute segment that could be easily aired. This series was entitled *Raven's Story* and was archived at the Oral History Collection named *Project Jukebox* at the University of Alaska Library (Schneider et al. 2002). It is easily available on-line for non-commercial research and educational purposes.

I interviewed >40 elders from 8 rural Alaskan communities in the region between 1995 and 1999, using consistent techniques. Approximately 15 of the interviews contained substantially relevant historical information on hunting geese and abundance of geese (Schneider et al. 2002). The elders' local knowledge of geese abundance and subsistence hunting patterns corroborated, and provided an additional historical dimension prior to availability of the scientific data collected by agencies that indicated a white-fronted goose decline. The oral history also strongly suggested that the decline was long term, having begun decades earlier than the initiation of aerial and ground surveys conducted by the agency.

I found the Koyukuk Athabascans, and most non-Natives who lived in the area a long time, to have extremely strong ties to their traditional subsistence hunting and fishing grounds. Through the voices of elders, I experienced a genuine love and respect for what nature provides that has been documented in ethnographic studies (Nelson 1983). Additionally, I found an interesting combination of highly protective attitudes toward the land and water combined with a strong cultural belief that fish and wildlife resources need to be used when they present themselves for the taking.

There are also strong taboos against wasteful use, and a belief in treating all creatures with respect, including their remains after death. Some of these beliefs align with agency conservation goals. A majority of local rural people want to see their traditional subsistence areas continue to provide healthy habitat with nearly guaranteed future hunting and fishing opportunities.

Trust and Commitment

In rural Alaska villages, newcomers and agency employees, in particular, must earn trust. The first several interview requests I made were repeatedly denied. It was only after several repeated requests that people would usually agree to sit down and speak with me. Once it became known that I had interviewed several folks, it became easier to gain additional interviews. Similarly, as the project became more widely known from segments broadcast on the public radio station, subsequent interview requests were more easily granted. In Koyukuk Athabascan culture, listening to elders is highly respected.

In addition to the systematic gathering of traditional ecological knowledge through *Raven's Story*, it was necessary to formally address the white-fronted goose decline locally by encouraging dialog with the tribal councils in the 8 villages within and surrounding the nesting area. Each year, I made it a point to visit with each of the 8 village councils for a formal question and answer session about the status of the geese, and discuss possible actions to address the decline through the Central Flyway process. I earned trust and respect through the combination of my involvement in this project aimed at listening to elders along with formal and frequent visits with tribal councils.

Just as the Koyukuk Athabascans are committed to their place, their subsistence hunting and fishing grounds, local people also look to agency people for a sign of their commitment. Usually, that turns out to be a test to see how many years the newcomer lasts in the rural village setting. When long-term commitment to the local area by agency employees is shown, trust increases. In the Koyukon region of Alaska, that testing period exceeds 5 years, more or less. This is in direct contrast to some agency practices of frequently moving management staff between duty stations to increase their experience to secure promotions. This pattern of governmental agency behavior directly undercuts the development of trusting relationships between managers and stakeholders (Jacobs and Brooks 2011).

In the case of understanding and addressing the white-fronted goose decline, the need for trust and commitment extended well beyond the local area. In the context of the Central Flyway, credibility first had to be established regarding scientific data that showed a decline in abundance (Spindler et al. 1999). Next, we had to use radio- and satellite-telemetry movement data, and analyses of survival rates based on long-term banding studies, to elucidate possible reasons for a regionalized decline within a larger meta-population that was growing (Ely and Schmutz 1999; Webb 2006; Ely et al. 2013; D. Marks, unpublished data). These studies showed that decline was likely related to differential mortality associated with the early nesting phenology of the segment of the white-fronted goose population in interior-northwestern Alaska relative to the later phenology of the other segments nesting in the Alaskan and Canadian arctic (Ely et al. 2013). Under this hypothesis, the early arriving geese would experience higher, early hunting season mortality. It took several years of attendance and making presentations at various Central Flyway Technical Committee meetings to earn trust, acceptance, and show commitment. The same reliance upon relationships at the local level had to be demonstrated at the flyway level, but in a different way. Instead of the local, rural context, where listening to elders and talking to tribes is paramount, this had to occur in another realm where interagency relationships among professionals, diplomacy, and acceptance of other scientific works are critical to successful waterfowl management on a continental scale.

Threats

In my 3 decades of natural resource management experience, I have found that it is usually better to devise a local solution to a problem than to elevate it to higher management levels. It is usually better to be proactive and solve problems and address threats to conservation when they are first identified rather than to let them worsen, and fester, and ultimately require more complicated and exhaustive solutions. One can extend this to the relationship techniques presented here. Rather than wait for a problem to worsen and elevate to higher levels of responsibility and complexity, we try to discuss issues frequently and informally at the local level. This has been largely successful in my career at multiple levels.

In this current era of instant communication and reliance on computers, with reduced budgets, and field offices facing threats of consolidation to more centralized locations, I perceive that it may become more challenging to continue our efforts at relationship building in rural areas and at local levels. It could become more difficult to meet with local constituencies and stakeholders face-to-face as frequently as is ideal for building trust and demonstrating commitment. We need to monitor and guard against these changes.

Outcomes

Over a 10-year period, we reversed a regional population decline of white-fronted geese. The regional population began to increase once the Central Flyway recommended adjustment of management parameters to account for the early phenology of the interior-northwestern Alaska segment and reduced the threshold for liberalized hunting regulations in the migration and wintering areas. Subsistence harvesters are once again successful at taking sufficient white-fronted geese.

Regular visits to tribal council meetings increased trust, overall, between these villages and the USFWS. To this day, relations between the USFWS and most of the middle Yukon and Lower Koyukuk River villages are generally good, even with some serious and recent fish allocation controversies (e.g., Chinook salmon [*Oncorhynchus tshawytscha*]). At a recent meeting, the Second Chief of the tribal council in one village pointed to me in my refuge uniform and said,

"There's the man who brought back our speckle-bellied (white-fronted) geese."

In addition to resolving a regional goose population decline, a partnership was developed to document patterns in subsistence harvest and trends in habitat conditions by relying upon interviews of village elders whose lives spanned the time just after the gold-rush at the turn of the last century to modern times. The stories captured in the interviews increased acceptance of traditional ecological knowledge among migratory bird biologists in Alaska, especially in situations where scientific data are lacking. This example of relationship-scale conservation includes important aspects of the approach described here, and conservation outcomes were realized in other places far from Alaska, discussions of which are beyond the scope of this article.

RECOMMENDATIONS

Implementing relationship-scale conservation should become a higher priority for fish and wildlife managers and other conservation professionals, and it should be applied more often and at all levels of organization. This case example demonstrated that narratives, trust, and commitment were critical to success in reversing a specific population decline. These aspects of the approach were applied between managers and local rural residents and in differing but important ways, at the larger continent-wide Central Flyway scale. This demonstrates that a relationship approach is appropriate and effective for both local, place-based, and landscape-scale conservation efforts.

We recommend managers use these tools to implement relationship-scale conservation: 1) collect and document stakeholders' narratives of place; 2) measure and monitor trust and commitment that stakeholders have for management; and 3) identify and manage threats to conservation goals and place relationships. It is important to recognize that a number of psychometric, qualitative interpretive, participatory research, social learning models and techniques, and/or informal practices may be appropriate depending on the protected area and problems and threats facing managers and other stakeholders. We discussed several methods for implementing these tools, but we recommend that it is best left to the discretion of conservation professionals and their partners, working on the ground, to determine how to measure, interpret, and document these types of data in a manner that best fits the context of place and their situational needs (Reed 2008, Dvorak and Brooks 2013).

Managers and other conservation professionals will need to integrate the 3 types of data into existing planning processes, public involvement, permitting, monitoring, education, and law enforcement (Dvorak and Brooks 2013). Stewart (2012) recommended that planners and managers engage stakeholders by reacting to and discussing stories of place that they hear, read, and/or collect. Managers must get closely involved with their constituents' stories of place and with their own place meanings (van Riper et al. 2011), and stories of how to practice conservation (Hummel 1991). Armed with this feedback and experience, planners and managers can then develop a credible set of narratives that is grounded in stakeholder knowledge; integrated across various meanings of place; and believable for both stakeholders and managers. A higher order, collaborative, or shared, story is the result (Connelly and Clandinin 1990, Stewart 2012, Tomeo 2013), and it should be presented in a way that reflects a protected area's purpose, history, resource and cultural values, and future desired conditions (Dvorak and Brooks 2013). We recommend that protected-area planners and managers, working with their research partners, reorganize their planning and management strategies and redefine and refocus their goals and objectives to include these practices of relationship-scale conservation.

CONCLUSION

Practicing relationship-scale conservation will enable managers to more effectively mitigate conservation threats and better account for place meanings and the needs and values of stakeholders and societies (Gray 1983, Brooks and Williams 2012, Dvorak and Brooks 2013). Doing so will enable planners and managers to gain substantial applied understanding and usable knowledge about their stakeholders and, in the process, achieve a number of quality conservation outcomes, including a better prognosis for long-term global survival of protected areas and biodiversity.

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