

THESIS

THE ROLES OF SCIENCE, CONFLICT AND CONSENSUS IN NATURAL
RESOURCE COLLABORATION: LESSONS FROM AN INACTIVE
COLLABORATIVE GROUP

Submitted by

Aleta Rudeen

Department of Forest, Rangeland and Watershed Stewardship

In partial fulfillment of the requirements

For the Degree of Master of Science

Colorado State University

Fort Collins, Colorado

Fall 2009

Copyright by Aleta Rudeen, 2009

All Rights Reserved

COLORADO STATE UNIVERSITY

October 30, 2009

WE HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER OUR SUPERVISION BY ALETA RUDEEN ENTITLED THE ROLES OF SCIENCE, CONFLICT AND CONSENSUS IN NATURAL RESOURCE COLLABORATION: LESSONS FROM AN INACTIVE COLLABORATIVE GROUP BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE

Committee on Graduate Work

Paul Meiman

Advisor: Maria Fernandez-Gimenez

Co-Advisor: Jessica Leigh Thompson

Department Head: Michael Manfredo

ABSTRACT OF THESIS

THE ROLES OF SCIENCE, CONFLICT AND CONSENSUS IN NATURAL RESOURCE COLLABORATION: LESSONS FROM AN INACTIVE COLLABORATIVE GROUP

Collaboration is emerging as a potential solution to contentious natural resource management issues, but there is a need for deeper investigation of the causes of success and failure in these processes, and specifically the roles of consensus-based decision-making and the integration of science in collaboration. To address these gaps, I interviewed participants in an inactive collaborative group in the Intermountain West and analyzed their perceptions of science, success and consensus. This collaborative group did not reach a consensus decision with respect to its primary objective and also struggled with hurdles to the effective communication and integration of science in their decision-making process. I assessed participants' perceptions of the group's success, and explored the roles of conflict, communication and consensus decision-making in relation to the group's process and outcomes. I also investigated the various ways in which science was used to inform decisions and how the communication and integration of science affected the group's acceptance of science for decision-making. I found that the group experienced entrenched and intractable conflict, power inequalities, and hurdles to effectively incorporating science into decision-making. Participants were supportive of the use of scientific evidence for land management decisions in theory, but had difficulty

applying science in practice. Major challenges to using science as a basis for collaborative decision-making were the group's inability to access information and lack of scientific information relevant to specific resources, sites and decision-making scales. Participants' acceptance of science varied with the perceived effectiveness and objectivity of individuals who communicated science to the group, and group members questioned whether science could inform decisions that were fundamentally value-based, such as whether a specific area should be designated as Wilderness or made available for energy development. Interviews revealed that collaboration improved communication and relationships among group members, and resulted in more comprehensive input on federal land management decisions than would not have occurred without collaboration. However, the unsuccessful attempt at consensus also decreased trust among some participants and may have discouraged them from participating in future collaborations. The apparently conflicting positive and negative outcomes of this collaborative group led to an apparent paradox whereby both the group's positive outcomes and its failure to achieve its goal are attributable to the group's commitment to consensus-based decision-making as the basis for its dialogue.

Aleta Rudeen

Department of Forest, Rangeland and Watershed Stewardship

Colorado State University

Fort Collins, CO 80523

Fall 2009

ACKNOWLEDGEMENTS

Thank you to the participants in the Intermountain Public Lands Cooperative (pseudonym) for their participation in this research, Maria Fernandez-Gimenez, Jessica Leigh Thompson, Paul Meiman, the Center for Collaborative Conservation at Colorado State University, the Colorado Agricultural Experiment Station, the Carpenter Ranch, and my friends and family for their support.

TABLE OF CONTENTS

LIST OF TABLES.....	x
CHAPTER ONE: INTRODUCTION AND LITERATURE REVIEW.....	1
Literature Review.....	3
Public Lands and the Sagebrush Rebellion.....	3
Natural Resource Collaboration.....	7
Conflict in Collaborative Settings.....	11
Collaborative Process.....	20
The Role of Science in Natural Resource Collaboration.....	24
Evaluating Collaboration: Success, Trust and Consensus.....	40
Summary.....	45
CHAPTER TWO: RESEARCH QUESTIONS AND METHODS.....	47
Research Questions.....	47
Primary Research Questions.....	48
Secondary Research Questions.....	48
Methods.....	49
Modified Grounded Theory.....	50
Coding Categories and Data Analysis.....	52
Ground-truthing.....	53

CHAPTER THREE: PROCESS, CONFLICT AND POWER.....	55
Introduction.....	55
Background.....	56
Public Lands in the West.....	56
Background and Formation of the IMPLC.....	59
Collaborative Process.....	63
Membership and Ground Rules.....	63
Meetings and Facilitation.....	65
Conflict.....	69
Power.....	74
Summary.....	78
CHAPTER FOUR: THE ROLE OF SCIENCE IN COLLABORATIVE DECISION- MAKING.....	80
Abstract.....	80
Introduction.....	81
The Role of Science in Natural Resource Collaboration.....	82
Adaptive Management.....	89
Research Objectives and Questions.....	91
Methods.....	92
Findings.....	93
Use of Science in the IMPLC.....	94

Availability, Applicability and Relevance of Science.....	97
The Role of Science in Value-based Issues.....	101
The Role of Science in Conflict.....	104
Communication of Science.....	106
Adaptive Management.....	109
Discussion and Conclusions.....	116
CHAPTER FIVE: PERCEPTIONS OF SUCCESS AND THE ROLE OF CONSENSUS AND TRUST IN NATURAL RESROUCE COLLABORATION: A CASE STUDY OF AN INACTIVE COLLABORATIVE GROUP.....	125
Abstract.....	125
Introduction.....	125
Success in Collaboration.....	127
Consensus-based Decision-making.....	129
Social Capital, Trust and Transparency.....	130
Research Questions.....	132
Methods.....	133
Findings.....	135
Perceptions of Success.....	136
The Role of Consensus-based Decision-making.....	144
Trust and Transparency.....	155
Discussion and Conclusions.....	161

CHAPTER SIX: CONCLUSION AND LESSONS LEARNED.....	166
Lessons Learned.....	166
LITERATURE CITED.....	172

LIST OF TABLES

<u>Table 1</u> : Sample Coding Categories for IMPLC Interview Data.....	54
<u>Table 2</u> : Reasons that the IMPLC was considered successful and unsuccessful by participants.....	140
<u>Table 3</u> : Participant response taxonomy about whether or not they thought the IMPLC was useful and their reasoning.....	148
<u>Table 4</u> : Taxonomy of participants' reasoning behind the IMPLC's inability to reach its goals and come to a consensus agreement.....	152

CHAPTER ONE

INTRODUCTION AND LITERATURE REVIEW

Collaboration is emerging as a potential solution to many of the contentious land management issues in the West. Natural resource collaboration involves stakeholders from diverse interests and perspectives working together to reach common goals for natural resource management (Ball, n.d.). There is a need for more information about these processes and their outcomes. I use the case study of the Intermountain Public Lands Cooperative (IMPLC) (pseudonym) to address some of these knowledge gaps and identify lessons learned from a collaborative process that did not achieve its main goal. Studies of collaboration have shown that it can be a useful tool in effective land and conflict management, but there are gaps in the scholarship about collaborative process, long-term outcomes of collaboration, the use of science in collaborative decision-making, and consensus-based decision-making. Specifically, case studies of collaboration are often single point in time assessments. Also, many of the studies on collaboration focus on successful processes, but there are lessons to be learned from failed attempts. Additionally, there is a lack of information about how science can be used to inform decision-making in these processes. Finally, debate exists over the use of consensus-based decision-making in collaboration.

The IMPLC was formed in order to alleviate some of the stakeholder conflict over federal land management and to provide public feedback to the Bureau of Land Management (BLM) for their revision of the local Resource Management Plan (RMP). The IMPLC was comprised of a wide variety of stakeholder participants and experienced high levels of conflict. Core contentious issues included wilderness proposals, proposed oil and gas development and leasing, and greater sage-grouse habitat. This BLM resource area is also valued for its aesthetic beauty, recreational opportunities, wildlife habitat, cultural heritage, and the forage it produces for private livestock operators who hold grazing permits on the public land. The collaborative group is currently inactive.

This research analyzes the IMPLC collaborative process to better understand the roles of conflict, science, and success in a collaborative group that did not achieve its main goal of crafting a consensus community alternative to the BLM's RMP revision. Research questions focused primarily on 1) process – including conflict and power; 2) the integration of science in decision-making; and 3) perceptions of success and the roles of consensus and trust. I found that the group experienced entrenched and intractable conflict, power inequalities, and hurdles to effectively incorporating science into decision-making. The IMPLC also achieved social benefits as a result of collaboration, leading to an apparent paradox whereby both the group's positive outcomes and its failure to achieve its goal are attributable to the group's commitment to consensus-based decision-making as the basis for its dialogue.

This thesis is organized as follows. The remainder of this chapter reviews the literature on collaboration related to my research questions. Chapter Two presents the research questions and objectives and outlines the research methods. Chapter Three

provides an introduction to the IMPLC collaborative process and analyzes the sources of conflict within the group and the power dynamics among stakeholders. Chapter Four examines the role and perceptions of science in collaboration, and Chapter Five explores perceptions of success, trust and the role of consensus in the IMPLC. Chapter Six summarizes the conclusions of the research in relation to the initial research questions and synthesizes lessons learned and implications for collaborative practice. The main chapters in which data are presented (3-5) are organized as three scientific manuscripts, in anticipation of submission to peer-reviewed journals. Thus, although a complete literature review for the thesis is provided in this chapter, relevant parts of this review will reappear in each of the three manuscript chapters.

Literature Review

Natural resource management issues tend to be complex and involve a multitude of diverse stakeholders. Varied perspectives are inherent to these situations and collaborative groups provide a potential venue for open deliberation and public involvement, which include a wide variety of perspectives and value systems. The success of these groups varies, however, and more information is needed to better understand sources of conflict, the roles of science and consensus-based decision-making in collaboration, and potential avenues to promote success in natural resource collaboration.

Public Lands and the Sagebrush Rebellion

Many land management conflicts in the Western United States have their roots in the way in which the West was settled. The Homesteading Acts of the late 19th and early 20th century were a form of federal land disposal, giving ownership to those who would

put to use large tracts of land for farming or livestock ranching (Loomis, 2002). The West was more conducive to livestock than crop production due to the arid climate (Loomis, 2002). Economically feasible livestock operations required larger tracts of land than most could afford to own, and livestock grazing expanded onto the surrounding federal lands, which were used on a first come, first served basis (Hardin, 1968, Loomis, 2002).

As a result of competition among open range livestock producers to graze federally owned and unregulated (open access) forage resources, there was little incentive to maintain rangelands for long-term ecological sustainability and public lands were often severely overgrazed (Loomis, 2002). Although the Department of the Interior was controlling animal numbers on public lands as early as 1898, the Taylor Grazing Act of 1934 is responsible for many of the grazing regulations that are in place on BLM lands today (Holechek et al, 1989, Coggins et al., 1993, Loomis, 2002). The Act was passed largely because of the actions of concerned ranchers in the West (Holechek, 1989). The Taylor Grazing Act placed administration of remaining public lands with the Grazing Service (later renamed Bureau of Land Management), which regulated and allocated grazing privileges through a system of permits on BLM lands (Holechek et al, 1989, Coggins et al., 1993, Loomis, 2002). The resulting patchwork of private and public lands and the use of leased public lands for private livestock operations creates a complicated network of management, communication and conflict among ranchers, local and federal agencies and other stakeholders (Coggins et al., 1993).

Today, close to half of the land area of the eleven western continental states in the U.S. is publicly owned (Loomis, 2002), and one-third of those lands are federally owned

and operated (Mollison and Eddy, 1982). This affects both federal and private land uses, and provides for greater expanses of open space than in the eastern portion of the U.S., where most of the land is fragmented by privatization and development. Ranching operations in the western U.S. lease public lands for livestock grazing to supplement or substantiate their operations, especially in areas where drought and arid climates limit forage production, and the cost of land is high (Resnik et al., 2006). In recent years, amenity migration (relocation due to socio-cultural and landscape features rather than for economic purposes) has been a major change in resource-dependent communities, which has altered population size and value systems (Bartoš, et al., 2008, Kruger et al., 2008).

Adding to the issue and strain on federal land use and management, many natural resource agencies in the United States underwent budget cuts in the 1980s and 1990s, while simultaneously experiencing an increase in demands (Wondolleck and Yaffee, 2000). Land management agencies are under increasing pressure to manage lands for multiple uses, from ecological as well as social perspectives. The Bureau of Land Management (BLM) must manage land for productive use of renewable resources (e.g. livestock grazing), extraction of non-renewable resources (e.g. oil and gas development), and both motorized and non-motorized recreation, as well as conservation values (e.g. wildlife habitat), which is a complicated task and often leads to conflict (Coggins et al., 1993, Nelson, 1995).

The Sagebrush Rebellion of the late 1970s and early 1980s and its recurrence in the 1990s, resulted from the desire for more localized control of federal lands in the West (primarily by ranchers and local governments) (Coggins et al., 1993, Nelson, 1995). The Rebellion aimed to transfer federal public lands to state governments, or to increase the

responsiveness of federal agencies to local land management interests relative to national interests (Mollison and Eddy, 1982). According to Nelson (1995), the Sagebrush Rebellion largely died out due to internal contradictions, where local governments simultaneously wanted to evict the federal government and localize land, but also needed federal funding in order to manage those lands.

The Sagebrush Rebellion represents a long-standing sentiment in the West about land management and federal control and many Westerners are resentful of federal land ownership and management (Kemmis, 2001). This culture of local control and skepticism or bitterness toward federal government still permeates many ranching communities in the western U.S. and often conflicts with the local, and especially national-level conservation interests for those lands. Many of the natural resource conflicts over land management issues are grounded in core value differences about how public lands should be managed and by whom.

Both local- and national-level stakeholders have legitimate and vested interests in how public lands are managed. Because stakeholder perspectives and values about federal land management are diverse, collaboration can provide a venue to address core differences and incorporate better, more comprehensive and cohesive stakeholder feedback in management actions. Also, collaboration can potentially reduce litigation (and thus costs) associated with land management. This literature review will focus on the roles of conflict, science, success and consensus in natural resource collaboration. I will first provide an overview of collaboration and key themes in the natural resource conflict literature, focusing on managing specific types of conflict, stakeholder relationships, social capital, politics, power and communication. Next, I will discuss the

role of science in collaboration, its ability to manage conflict, its role in decision-making and the communication of science in deliberative processes. Finally, I will discuss the role of consensus-based decision-making, focusing on its measures of success, trust and process-related outcomes.

Collaborative natural resource management and the role of science in conflict management are relatively new areas of interest and expertise in natural resource science. While literature and interest in these issues have increased significantly in the past decade, significant knowledge gaps remain. The research on natural resource collaboration often focuses on “snapshot”, or single point-in-time studies of collaboration, provides insight into process more than products of collaboration, and generally concentrates on successful partnerships. Additionally, little is known about the role of science in conflict and collaborative processes. Further information is needed to better understand natural resource collaboration in a longitudinal framework with a focus on outcomes and degrees of success. There is also a need to better understand the role of science in relation to both communication and process in natural resource collaborative groups.

Natural Resource Collaboration

Natural resource collaboration provides a venue through which the needs and interests of local people can be voiced and heard, and local cultural and socio-economic issues addressed when federal land management planning and regulatory processes are locally applied (Singleton, 2002). Collaboration is defined as “...a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is

possible” (Gray, 1989, p. 11). Collaboration has proven to be a possible solution to many natural resource issues and conflict situations (Wondolleck and Yaffee, 2000, Daniels and Walker, 2001, Schuett et al., 2001, Conley and Moote, 2003, McKinney and Field, 2008). In particular, collaboration has been advanced as a means to build social capital, decrease conflict, improve communication and stakeholder relationships, cultivate better decisions and increase social legitimacy for those decisions, and educate stakeholders on resource issues (Rasmussen and Brunson, 1996, Wondolleck and Yaffee, 2000, Daniels and Walker, 2001, Conley and Moote, 2003, Pretty and Smith, 2004, McKinney and Field, 2008).

Collaborative processes partnered with new approaches to managing conflict have surfaced in response to increased public interest in, changing values about, and escalating conflict over natural resource issues (Wondolleck and Yaffee, 2000). People in the United States are increasingly rejecting the traditional top-down approaches to natural resource decision-making and are looking to hold a more significant role in the process (Fisher et al., 1991, Koontz and Thomas, 2006). Multi-stakeholder collaboration is a promising format to manage many of these natural resource conflict issues (Wondolleck and Yaffee, 2000, Daniels and Walker, 2001, Schuett et al., 2001, Conley and Moote, 2003, Cronin and Ostergren, 2007).

Many stakeholders view management agencies as closed-door operations, with little or no opportunity for meaningful public input and traditional decision-making methods often meet resistance from stakeholder groups, frequently resulting in litigation. The extensive use of lawsuits and appeals of top-down public land management decisions in the United States indicates the inability of traditional public participation processes to

effectively address all public concerns and interests (Moote and McClaran, 1997). While federal law requires public input via the National Environmental Policy Act (NEPA), the NEPA process is formulated for documenting public opinion rather than giving a meaningful format for public participation; whereas collaborative natural resource management is seen as an open, inclusive, deliberative process. Federal land management agencies in the United States have also begun to recognize the need for a shift in the way stakeholder input on natural resource decision-making is obtained and cultivated in order to generate sustainable policies. While collaborative processes are still far from perfect, the opportunity to incorporate deliberative, democratic decision-making rather than the traditional top-down approach provides the possibility to better represent stakeholder interests, and improve local accountability and legitimacy for decisions (Daniels and Walker, 2001, Cronin and Ostergren, 2007). Scholars have argued that the transition to collaborative resource management from more traditional decision-making has produced more long-term solutions, which enjoy greater support from involved parties (Rasmussen and Brunson, 1996). While collaboration does not eliminate opposition for natural resource management decisions, it can reduce future conflict over those issues by increasing stakeholder buy-in.

Scholars recognize many potential benefits of collaboration, including sustainable decision-making, social and ecological system improvements, improved relationship and capacity-building, conflict management, increased social capital, trust and transparency and improved communication (e.g. Rasmussen and Brunson, 1996, Wondolleck and Yaffee, 2000, Daniels and Walker, 2001, Leach and Pelkey, 2001, Schuett et al., 2001). These benefits are evidenced in the outputs and outcomes of natural resource

collaboration. Outputs are specific products of a collaborative process, such as protocols, agreements and the implementation of decisions. Outcomes of collaboration refer to the impact collaborative outputs have on social circumstances and the environment (Koontz and Thomas, 2006), such as changes in social capital or ecosystem health as a result of the collaborative process or its decisions. There are many potential outcomes of collaboration, and it is important to understand that there are multifaceted benefits of collaborative processes, outside the official purpose outlined by the group. Leach et al. (2002) remind us that outcomes of collaboration can be difficult to measure. Social outcomes are easier to identify than ecological outcomes, however both represent a weakness in the available literature.

Although there are numerous proponents of collaboration, critics caution that collaboration can cause disenfranchisement of both local and distant stakeholders, co-opt conservation advocates, require unreasonable amounts of time, lead to compromise solutions, delegitimize conflict, and lead to questions of the common good (McClosky, 1999, Toker, 2004, McKinney and Field, 2008). While collaborative processes promote stakeholder engagement in decision-making, these drawbacks call into question whether collaboration can actually lead groups to achieve their objectives and point to potential shortcomings of the process. Conley and Moote (2003) state:

As proponents of collaborative approaches to resource management, we are unnerved by the ways in which these processes have been portrayed as a cure-all. We are similarly troubled by knee-jerk criticisms of collaborative processes that are based on an opposition to collaboration in principle rather than evaluation of specific processes and outcomes (p. 382).

In summary, the collaborative approach to natural resource management can be a basis for encouraging and improving upon stakeholder involvement in decision-making

processes to increase social, economic and ecological sustainability. While collaboration has been generally adopted by scholars and managers as an improved model for decision-making, there are many lessons still to be learned about the collaborative process. More information is needed to understand the long-term social outcomes of collaboration, particularly when goals are not reached. The collaborative process can take many forms, and information is needed to help find the best possible options. Additionally, information is needed about how to most effectively use science in collaborative decision-making. This thesis will address these knowledge gaps in an effort to better understand the role of science, conflict and consensus in natural resource collaboration and its outcomes.

Conflict in Collaborative Settings

Natural resource conflict is often a result of fundamental differences in how stakeholders view and value land use and planning, though there are many other factors that also influence conflict. There are also many ways to understand and make sense of environmental conflict. Conflicts can be analyzed on the basis of intractability, framing, value systems, and trust. Additionally, environmental conflict situations can be affected by communication, information sharing and science, power, political systems and stakeholder relationships. Here I attempt to introduce some of the key concepts, which will help to make sense of environmental conflict within the context of collaboration.

Legislation and litigation are two traditional approaches to managing environmental conflict in the United States. Both are “adversarial processes,” which Daniels and Walker (2001) argue sustain conflict rather than resolving it. While collaboration may be an improved, alternate means to manage environmental conflict,

information is still needed on how to promote success in collaborative efforts. This is particularly important with issues such as wilderness designations, wildlife habitat, and oil and gas development, where positions are often based on personal value systems more than differences in communication or knowledge. Natural resource conflict cannot be avoided, but it can be managed (Daniels and Walker, 2001, Rasmussen and Brunson, 1996). Daniels and Walker (2001) state that actual resolution of conflict situations, where core incompatibilities are eliminated, is unlikely. Instead, they suggest that in light of the complexity of conflict in these situations, management of the conflict to avoid it becoming destructive is more realistic (Daniels and Walker, 2001). Much of the scholarly literature on conflict uses the terms conflict resolution and conflict management interchangeably, however here I argue that “resolution” should be interpreted loosely and “management” of conflict is a more accurate statement pertaining to conflict in collaborative settings.

Despite considerable expertise devoted to environmental conflict dispute resolution, “...many of these conflicts remain mired in controversy, tied up in litigation, and riddled with long-standing tensions that defy resolution” (Lewicki and Gray, 2003, p. 1). Forming a better understanding of the factors, which instigate conflict or express existing conflict, will help manage natural resource disputes. Daniels and Walker (2001) describe conflict management as a triangle of three dimensions of conflict that are interrelated: substance, procedure and relationship. In their review of literature defining conflict, Daniels and Walker (2001) found that conflict is not necessarily defined by scholars as “inherently positive nor negative”, but rather “has the potential to be either” (p. 28). They also found that nearly all literature on conflict involved parties that are

interdependent and recognized some form of incompatibility in the parties' goals or interests (Daniels and Walker, 2001).

Additionally, environmental conflict is often based on one of three factors: misunderstanding, interests or values (Rasmussen and Brunson, 1996). Rasmussen and Brunson (1996) state that value-based conflicts in natural resources often are the most difficult to address, and generally require extensive time and skilled facilitation. Well-managed conflict through collaborative decision-making has potential long-term benefits for communities and environmental planning. However, the transaction costs (e.g. resources, time, and travel expenses) can be substantial for participants in collaborative processes (Margerum, 2007).

There are many different ways to make sense of conflict in natural resource issues and in collaboration. Framing, social capital (including stakeholder relationships and trust), power, politics, and transparency are some of the lenses through which we can understand conflict. In the sections below, I briefly review some of these factors that influence conflict in collaborative decision-making processes.

Framing

Framing is how people shape, organize and focus the world around them (Gray, 2003). Stakeholders often use framing to engage in and handle conflict situations, and it is particularly prevalent when dealing with intractable conflict. Intractable conflicts, as defined by Lewicki and Gray (2003), are "...characterized by considerable intensity, persist indefinitely over long periods of time, and cannot be resolved through consensus-building efforts or by administrative, legal, or political solutions" (p. 1).

Additionally, people experience and interpret reality in different ways based on their past and present experiences. Framing helps provide a point of reference for interpretation of natural resource conflict issues and helps people understand them. Gray (2003) says that "[f]rames are used to (1) define issues, (2) shape what action should be taken and by whom, (3) protect oneself, (4) justify a stance we are taking on an issue, and (5) mobilize people to take or refrain from action on issues" (p. 15). Gray (2003) also states that researchers must recognize that all stakeholders do not hold the same or similar frames in environmental cases. She explains that the process of framing for an individual is complex, and a person will often have multiple or contradicting frames at once (Gray, 2003).

Framing affects the way people view and communicate about natural resource issues in collaborative settings. It can influence the behavior of stakeholders and is common in conflict situations. A good understanding of framing can help inform conflict and collaboration for natural resource issues. The concept of framing will also help make sense of how stakeholders relate to one another.

Stakeholder Relationships, Social Capital and Trust

Schuett and Selin (2002) found in their study of thirty collaborative groups that stakeholder relationships were one of the most important keys to success in the collaborative process. Difficulties with interpersonal relationships in collaboration can create a polarized situation, where conflict is focused on people and positions rather than issues. Collaboration has both the capacity to overcome these difficulties and significantly improve stakeholder relationships. Alternatively, it can further entrench interpersonal conflicts if not managed correctly.

Collaboration also has the capacity both to influence and be influenced by stakeholder relationships. d'Estrée (2003) states that improved stakeholder relationships increase the likelihood that agreements can be implemented and that long-term rather than short-term success is reinforced by such change. Improved stakeholder relationships in environmental conflict will often result in reduced hostility (d'Estrée, 2003). These relationship improvements can positively affect collaboration, particularly the ability of stakeholders to resolve future disputes (d'Estrée, 2003).

While relationships have a large influence on conflict management in collaborative process, information is needed to better understand how relationships impact the process and how they can be effectively managed. Social capital is closely related to stakeholder relationships and group capacity. Social capital describes relations of trust, reciprocity, and exchange, the evolution of common rules and the role of networks (Pretty and Smith, 2004). Social capital is dependent on personal relationships and networks, which are factors that can increase the capacity of a group to achieve future goals (Leach and Sabatier, 2003). Pretty and Smith (2004) state that increasing natural capital in resource management depends on high social capital. They suggest that in communities with high social capital, where a communities' "...knowledge is sought, incorporated, and built upon during planning and implementation of conservation and development activities ... are more likely to sustain stewardship and protection over the long term" (Pretty and Smith, 2004, p. 632).

Trust is an integral part of social capital. Stakeholder trust can be positively or negatively affected during the collaborative process. A study by Wagner and Fernandez-Gimenez (2008) shows that stakeholders' trust in natural resource agencies increased as a

result of collaboration, because of agency efforts to make their process and decision-making more transparent and inclusive. Increased trust in natural resource management agencies can potentially improve their ability to implement natural resource decisions, as stakeholder groups view their management with less skepticism.

Schuett and Selin's (2002) survey of collaborative groups also found that trust was an important part of the collaborative process. The study reveals that the establishment of trust among all stakeholders was integral in the success of any group (Schuett and Selin, 2002).

More information is needed to understand how social capital and trust are affected by the collaborative process, particularly when collaboration does not reach its goals. Understanding stakeholder relationships is also an important component to increasing our knowledge of social capital as well as other factors such as process and communication.

Transparency

Closely associated with the concept of trust in collaboration, is transparency. Transparency is the act of being open about ones motives, goals and actions in a collaborative process (Wagner and Fernandez-Gimenez, 2008). Transparency in communication and process can greatly increase levels of trust within a diverse group, and honesty has been identified as a critical factor in multi-stakeholder collaborations (Schuett and Selin, 2002, Wagner and Fernandez-Gimenez, 2008). However, actual or perceived lack of transparency in a group can significantly damage levels of trust and social capital. In their study, Wagner and Fernandez-Gimenez (2008) found that transparency among participants increased social capital. Transparency is essential to managing conflict situations effectively in collaborative processes. Improved

transparency can be achieved by dependable and predictable behavior, particularly when this behavior is maintained over long periods of time (Wagner and Fernandez-Gimenez, 2008).

Positional Bargaining in Collaborative Process

During a collaborative process, there is a tendency for people to hold onto their positions and defend them based on their perceptions and convictions (termed positional bargaining) (van den Belt, 2004). Positional bargaining can lead to degraded stakeholder relationships in collaboration. The concept is explained by Fisher et al. (1991) to occur when parties take a position on an argument and the resultant bargaining process locks involved parties into those positions. Positional bargaining can be useful to stakeholders in helping them anchor and give reference to the conflict (Fisher et al., 1991). However, as people continue to argue their position, it becomes increasingly difficult for them to remove themselves from that position or reach a compromise (Fisher et al., 1991). Additionally, personal identity with the position will increase and the negotiation process can turn into the upkeep of identity rather than the conflict at hand (Fisher et al., 1991). This may derail the process away from the initial conflict issues and instead focus on the interests of the involved parties (Fisher et al., 1991). Fisher et al. (1991) suggest that positional bargaining will lead to feelings of ill will and resentment between groups, particularly when more than two groups are involved, because interest groups have been known to form alliances and further entrench the conflict. In dealing with conflict and collaborative groups, the discussion process will benefit by avoiding specific stakeholder positions and instead focusing on subject matter.

Power

Power relationships, authority to make decisions and represent stakeholder interests, and division of interests make collaboration in natural resource management a challenge (Wondolleck and Yaffee, 2000). Collaborative processes generally restructure power over natural resource issues and power sharing is an essential component of collaboration (Sandstrom, 2009). “Moves to decentralize governance of natural resources necessarily imply rearranging institutional structures, redefining rules, reforming relationships, and redistributing power” (Raik et al., 2008, p. 729). Power inequalities can be difficult to work around in natural resource collaboration. Power in natural resources can manifest as ownership, rights, control, access or use of resources (Raik et al., 2008). When power inequalities exist, stakeholders have difficulty trusting the collaborative process to fairly represent their point of view. Such perceptions will often discourage participation by individuals or groups or create disincentives to compromise. Power inequalities can also cause stakeholder groups that feel inferior to be less likely to come to mutual agreements where their interests are in any way compromised.

Raik et al. (2008), in their article *Power in Natural Resources Management* introduce different theoretical views of power and its expression. They cite Dahl’s (1957) work, introducing the concept of power as coercion – a common understanding of power in natural resources where power is the ability of one person to get another person to do what they want (Raik, 2008). The second construct of power according to Raik et al. (2008) is constraint – or the act of ensuring inaction for issues, using nondecision making. The third power construct introduced by Raik et al. (2008) is that of structure,

where the reallocation of power over natural resources to local people may effectively aggravate or reproduce social hierarchies that were preexisting by “institutionalizing power asymmetries” (p. 735). Finally, Raik et al. (2008) present the realist view of power as perhaps the most applicable to natural resources, which is the “...socially structured power to act...” (p. 737) within the social structures of natural resource professionals.

Success in natural resource collaboration depends on equality of power among stakeholders, both in reality and in perception. Little information exists on how to help compensate for power disparities in the collaborative process, and research is needed to address the issue. While the disparity of power in natural resource fields has been studied at an abstract level, there has been little exploration of how power works in natural resource collaboration and there is a need for research that reflects how power in the management of natural resources is exercised and how this relates to practice (Raik et al., 2008).

Politics

Political climate often plays an integral role in natural resource collaboration and collaborative natural resource management processes are political by nature (Walker and Hurley, 2004). However, politics in collaboration can derail the process. The presence of political objectives outside collaborative decision-making causes disputes that may not align with the goals of the group. Additionally, stakeholders’ political motives or platforms can create barriers to decisions and communication and increase conflict within the group.

Walker and Hurley (2004) describe a case in Nevada County, California where collaboration failed due to politics involved as opposed to the process itself. They state that existing tensions were amplified instead of mitigated by the collaborative process (Walker and Hurley, 2004). In their case, failure was attributed to development and growth-related tensions, ideology of landscape, the roles of government in relation to private land and the struggle between the conflicting groups on these topics (Walker and Hurley, 2004). Walker and Hurley's analysis of a failed collaborative process pointed out the need for greater attention paid to political conflict as a part of the process. While politics are unavoidable in collaboration, collaborative process design should pay close attention to how political conflict influences the process.

Collaborative Process

Collaboration opens the doors for new ways of viewing and thinking about natural resource decision-making processes and there are many ways that collaboration can be carried out. Collaboration provides a venue to address multiple stakeholder needs and concerns in a deliberative and participatory manner, and methods for engaging in collaboration vary. Daniels and Walker (2001) caution that while mediation techniques have been applied to environmental collaborative processes, traditional methods of mediation may be insufficient to adequately address natural resource conflicts due to their complexity. They state that the multiparty and complex nature of environmental cases requires mediation methods that also "...address relationship and procedural aspects of conflict as well as substance" (Daniels and Walker, 2001, p. 52).

The collaborative process designer must decide who should participate, whether or not to use a third-party mediator, what the goals for the group are, and how decisions

should be made. There are many approaches to dealing with these issues in collaborative processes, as well as differing and varied opinions on the most appropriate techniques. Additionally, the success of collaboration hinges in part on tailoring the collaborative approach to the specific situation (Daniels, 2009). Because different types of public participation have strengths in different aspects to natural resource issues, integrating several types of participation (i.e. workshops, meetings, committees) may be more successful than choosing only one approach (Chess and Purcell, 1999). In this section I describe major types and procedural approaches to collaboration in an attempt to better understand the benefits and trade-offs of different styles, and discuss key procedural challenges such as fostering constructive communication among stakeholders.

Collaborative Process Design and Challenges

There are a great variety of ways to design and implement collaboration. Some of the main types of natural resource collaboration include coordinated resource management (Moote and McClaran, 1997, Paulson, 1998), collaborative watershed management groups (Cronin and Ostergren, 2007), community-based collaboration (McKinney and Field, 2008), and others. When implementing a collaborative approach, factors that must be considered include the facilitation, communication and membership as well as how the group will make decisions.

The choice of whether to use an *outside facilitator* is an important initial design decision. Rasmussen and Brunson (1996) identify varying potential for collaboration and the need for facilitators based on the types of conflict involved. They say that collaborative processes work well for conflicts based on misunderstandings, because people can look at the same information together (Rasmussen and Brunson, 1996).

Conflicts based on misunderstandings do not always require facilitators, but they can be useful, according to the authors (Rasmussen and Brunson, 1996). Conflicts that are based on differing interests work well with collaborative processes, according to Rasmussen and Brunson (1996), however the process requires more time from parties and very often a facilitator is critical to overcoming feelings of mistrust among stakeholders. Finally, they state that

...[f]or a collaborative process to be successful with value-based conflicts, the participants must be empowered to make decisions, communicate with each other, share available information, and have a trusted third party facilitator. The facilitator in these conflicts must possess a high level of skill in the process itself and is generally brought in from outside the situation in which the conflict is occurring (Rasmussen and Brunson, 1996, p. 449).

Obtaining *broad stakeholder representation* among participants is a second major design issue in collaborative processes. In order for collaborative decision-making processes to accurately reflect the public's desires for land management, it is essential to have a group that represents the population as well as possible (Moote and McClaran, 1997, Cronin and Ostergren, 2007). Additionally, public participation must be voluntary in order to promote the success of collaborative processes (Rasmussen and Brunson, 1996). Toker (2004) states that deliberative democratic processes assume equality and representation, however stakeholder involvement is not always representative. This will continually be an obstacle in collaboration.

Finally, *effective communication* among stakeholder groups in natural resource collaboration is an essential part of the process (Schuett et al., 2001). Good communication is necessary to identify relevant issues, overcome conflict, improve relationships, promote discussion, and come to better and more sustainable decisions.

Communication is also relevant to the role of science in collaborative processes, which will be addressed in a later section. Cultivating effective communication is a difficult task and is difficult to measure. Lack of good, effective communication in the collaborative decision-making process can have large negative impacts.

Fisher et al. (1991) identify two types of communicators in participatory processes: hard negotiators and soft negotiators. They explain that soft negotiators will give in easily in order to reach consensus, however the person will usually end up feeling exploited (Fisher et al., 1991). The hard negotiator, states Fisher et al., (1991) turns the negotiation process into a 'contest of wills', does not give in and exploits the other participants. The hard negotiator takes a more extreme stance on issues and often produces not only a negative response from other participants, but also alienates them (Fisher et al., 1991). Their book, *Getting to Yes: Negotiating Agreement Without Giving In*, outlines 'principled negotiation', a process that focuses on the merits of the issue rather than the people involved (Fisher et al., 1991). This tactic of refocusing conflict and conversations on the issues and interests of participants, rather than peoples' positions, potentially improves communication in the collaborative process, and increases chances for success.

In other areas of research, participants may have unintentional or unanticipated barriers to communication. According to Rasmussen and Brunson (1996), stakeholders in the collaborative process often do not possess the negotiation and communication skills necessary to participate. They state that in these cases, the collaborative process must provide training on communication skills in order for stakeholders to meaningfully and effectively participate in the process (Rasmussen and Brunson, 1996). Training helps

direct communication toward active listening and framing arguments and positions so that they are productive to the conversation rather than destructive.

Designers and facilitators of collaborative process should pay extra attention to the creation of an atmosphere where information exchange can occur freely and that promotes effective communication between stakeholders (Schuett et al., 2001).

Relatively little is known about how communication affects and is affected by the collaborative process. Research should focus on factors that influence communication and how to promote effective communication between stakeholders.

The Role of Science in Natural Resource Collaboration

Environmentally sustainable decisions depend on scientific information to promote ecosystem health and predict ecological consequences of decisions. Ecosystems that are managed for a variety of demands (such as public lands) should incorporate the “...best available scientific information, and management decisions should represent the application of available science” (Weeks and Packard, 1997, p. 236). However, scientists and stakeholders experience many hurdles to better incorporation of scientific information into collaborative decision-making. Scientific data must be available and accessible to stakeholders, perceived as accurate and applicable to the issue, and well-communicated. Further information is needed to understand how process in collaboration influences the use of science in decision-making and how science can be most effectively integrated into the collaborative process.

Public involvement in management decisions suffers from a paradox of the requirements for both inclusive deliberation and technical competence (Daniels and Walker, 2001). This paradox contributes to the hurdles of effective incorporation of

science into decision-making and makes the effective communication of science more difficult for scientists who are not trained in communicating technical information to a lay audience. Daniels and Walker (2001) elaborate that;

[c]itizens demand technically sound decisions, but as situations become more complex, fewer people have the technical background needed to either meaningfully contribute to, or critique, the decisions. And by the same token, these complex situations often touch people's lives in fundamental ways (Daniels and Walker, 2001, p.4)

While the public may be viewed by some as technically inept, their ability to grapple with and grasp complex scientific concepts is often underestimated (Fischer, 2000).

Nevertheless, the capacity of the public to participate in technical, science-based conversations will continue to be an important and often frustrating aspect of collaborative processes.

This research aims to understand how science was integrated and accepted by IMPLC participants for collaborative decision-making. I examine how different people presenting scientific information were perceived and accepted by the community, and how information was used and understood by IMPLC stakeholders. I analyze how stakeholders in collaboration perceive scientific information, and how perceptions of scientific information are influenced by who presents the information and how they present it.

Challenges of Using Science in Collaboration

While science and problem-solving appear to go hand-in-hand, the way in which the public relates to science has a large impact on how that information is perceived and wielded (Kim, 2007). Sustainability of both ecological and social systems requires a more collaborative role for science and scientists in the decision-making process and

there is a lack of information concerning specific methods for integrating both local knowledge and science in policymaking processes, particularly stakeholder partnerships (Palmer et al., 2007, Failing et al., 2007). According to Cash et al. (2003);

...scientific information is likely to be effective in influencing the evolution of social responses to public issues to the extent that the information is perceived by relevant stakeholders to not only be *credible* [adequacy of scientific arguments and evidence], but also *salient* [relevance of data to decision-making needs] and *legitimate* [objectivity of data and scientists] (p. 8086).

In order to better incorporate science into natural resource collaborative processes, research is needed on how to effectively cultivate credibility, salience and legitimacy of information, as well as how to communicate that information most effectively.

Palmer et al. (2005) argue that ecological scientists have not done enough to collaboratively engage with other stakeholder groups, management agencies and experts, despite the inherent need for interdisciplinary ecological science. Ecologists have a long-standing reputation for disseminating information in a manner that is intended for a narrow scientific audience and to a large degree have failed to make that information applicable and/or useful to decision-makers in natural resources (Risser, 1993, Powell and Colin, 2008). Such disconnect is often due to research that does not directly relate to management questions (Palmer et al., 2005) as a result of both scientific tradition and practice. Additionally, scientists frequently either lack access to, or as researchers fail to give priority to, the questions for which user-groups seek answers (Palmer et al., 2005). In order to incorporate science into collaborative decision-making, decision-makers must have better access to information and have the technical skills needed to decipher that information. Data relevant to management questions must be available to decision-makers, and scientific information must be effectively communicated.

In environmental conflict situations, stakeholders generally have largely unequal access to and understanding of pertinent scientific information, which may be available but difficult for stakeholders to access (Adler et al., n.d.). Most lay people do not have easy access to technical information sources such as scientific journals and research databases. Additionally, stakeholders may not know or be able to articulate what information is needed, or possess ways to identify the information or who they should get in touch with in order to access the information (Adler et al., n.d.). Additionally, scientific information is often technically complex, and therefore not easily conducive to use by a broader lay audience (Daniels and Walker, 2001). According to Powell and Colin (2008), bottom-up citizen engagement and influence on science and technology and its policy requires continual top-down assistance and encouragement. Their findings indicate;

...without some assistance from people within institutions and without systematic institutional support, ‘average’ lay citizens—even empowered citizens—are unlikely to have enough resources, access, energy, and power to engage with scientists and policy makers in ways that will have meaningful societal outcomes” (Powell and Colin, 2008, p. 132).

Thus the integration of science in collaboration requires better access to scientific resources and participant learning, as well as to the scientists themselves.

Scientific inquiry and questions from decision-makers often address issues at a scale and scope, which are difficult to combine for informed decision-making purposes. Thus, decision-making in natural resource fields often lacks scientific information, even when the information is partnered with an articulated need (van Wyk et al., 2008). While policy and land management should be based on ecologically sound information, policy decisions are often driven by values instead. The incompatibility of science and

questions from the public, in some cases, is a result of the scale and scope of scientific research relative to public processes, which are carried out differently and can be difficult to merge. Scientists often research ecological issues at a scale that does not offer direct counsel to decision-makers or link directly to public interest or need (Norton, 1998). This incompatibility between data sets generated for research and the data needed for management discourages the use of science in decision-making.

Scientists lack incentives to disseminate information to the public, largely due to the nature of scientific inquiry and its institutions (Powell and Colin, 2008). Failing et al. (2007) state that while public values and involvement in natural resource decision-making have changed over recent years, often asking different questions of science – scientific methodology and its role in policy have not kept pace with such changes and in many cases have kept to more traditional scientific methods (Failing et al., 2007). The tradition of scientific inquiry has long specified a discrete role for scientists and research. This communication misalignment between information gatherers and seekers in natural resources is due in part to cultural or contextual differences between scientists and other stakeholder groups (van Wyk et al., 2008). While attempts to close these gaps have been made, disconnect between the producers and users of scientific knowledge remains, both in the communication of scientific findings, as well as the management applicability (in terms of size, scale or usefulness) of the scientific research being conducted. Collaborative natural resource management requires the scientific community to re-think this paradigm, but this may be a difficult task for scientists due to: 1) the culture of science, 2) the lack of incentives (scientists are not generally rewarded for spending long

hours at public meetings) (Powell and Colin, 2008), and 3) many scientists lack the communication skills to participate effectively.

Better use of science for decision-making requires improved multi-directional flow of information, ideas and questions. Stakeholders may view scientific information with skepticism. Issues of dueling science may arise or a scientist's credibility may be questioned leading to increased skepticism. Public engagement in science requires capacity building for citizens, but also willingness from policy makers, institutions and scientists to engage with the public, a task which may be difficult to accomplish (Powell and Colin, 2008). Nevertheless, Palmer et al. (2005) advocate that ecological sustainability "...depends on ecologists being not only stellar researchers, but also becoming purveyors of knowledge that actively informs decisions" (p.9-10).

In sum, while there should be increased emphasis on scientifically based management decisions within natural resource collaboration, there are many barriers to effectively integrating those knowledge systems. More information is needed to explain how science can be successfully conducted at a scale relevant to decision-makers, and communicated to the public in a manner that is understandable and increases their knowledge of ecological systems and processes. Further research will help to identify strengths and weaknesses of science and scientists in collaborative natural resource management planning, and provide insight on how such integration can be improved in order to meaningfully engage the public and better inform land management and policy decisions.

Science and Conflict

There are several factors challenging the use and communication of science in conflict. For the purposes of this review, I will address two key issues: determining how to integrate scientific and technical information, and how to manage disagreement over the interpretation of the data. Potentially, the use of science in decision-making is a means to alleviate or overcome core conflict in natural resource collaboration. However, due to the nature of scientific inquiry, its availability, relevance and communication, science can fail to achieve this outcome, instigating further debate over data and becoming a source of conflict instead. The use of science to inform controversial decisions can be laden with issues such as: dueling science and experts affecting data collection and communication; deal-making and political issues causing good information to be an afterthought; misdirected funding resulting in unusable or irrelevant data; and unresolved disagreements over key issues by experts leaving uncertainties (Adler et al., n.d.). Adler et al. (n.d.) advocate that processes such as collaboration provide a venue to address some of these problems, if properly implemented and managed. However, these serious issues regarding the use of scientific data in collaboration beg further research to understand how to incorporate science so that it can effectively manage, rather than escalate, conflict.

According to Adler et al. (n.d.), many collaborative natural resource management efforts could be "...wisely and amicably resolved if good scientific and technical information were better integrated into the search for solutions" (p. 5). By encouraging conversations to be based on scientific data rather than positions and values in consensus-based decision-making processes, science can help establish common ground between

stakeholders who otherwise hold very different views about conservation and its value (Leach, 2006). However, science does not always accomplish these objectives and deciding what science is “most appropriate” for policy decisions often becomes an issue of personal values (Daniels and Walker, 2001), which can lead to disagreement.

Science can be a source of conflict due to disagreement over the data itself, its interpretation or its management implications. This conflict often results in a need to differentiate between fact-based and value-based knowledge claims; where fact-based claims (given some level of uncertainty) describe existing or possible conditions, whereas value-based claims describe conditions that ‘should be’ (Failing et al., 2007). Adler et al. (n.d.) argue that conflict over scientific information is rarely due to the technical knowledge itself, and more often a result of other factors including:

... (a) perceived or actual competition over interests; (b) different criteria for evaluating ideas or behaviors; (c) differing goals, values and ways of life; (d) misinformation, lack of information, and differing ways of interpreting or assessing data; and/or (e) unequal control, power, and authority to distribute or enjoy resources” (p. 17).

Thus it is not only difficult to integrate science, but also to separate scientific knowledge from culture, power, and values. Nevertheless, in order to manage conflict, collaborative decision-making should utilize the best available science and make an effort to focus conversation on establishing facts. Deliberative processes benefit from efforts to reach agreement on key scientific facts, with the assumption stated by Failing et al. (2007), that there is a truth to nature, which is, in theory, ‘knowable’. While this view is theoretically useful, lack of available scientific knowledge for natural resource decisions coupled with the shortcomings discussed previously (limited data sets, communication and cultural and

institutional barriers), makes it less applicable to decision-making, and value systems are more difficult to differentiate from science.

There are several recommendations for using science to manage conflict in natural resource collaboration. Failing et al. (2007) recommend a thorough examination of “competing knowledge claims” in an attempt to better understand the knowledge claims, their implications and select the best-fit management actions. Leach (2006) suggests that a professional forum of scientific experts, in which a facilitator pressures them to justify claims in the presence of their peers, may be useful to build consensus for scientific issues that are disputed in collaborative processes. Other approaches to integrate science into decisions-making include joint fact-finding (Weible and Sabatier, 2009), citizen science (Cooper et al., 2007, Couvet et al., 2008, Silvertown, 2009) and adaptive management (Holling, 1978, Bormann et al., 1995, Murray and Marmorek, 2004, Walkerden, 2005, Allan et al., 2008), all of which involve non-scientists in the information gathering process. Public participation in generation of scientific information can potentially change public perceptions about the value of scientific evidence (Cooper et al., 2007).

Communicating Science

Natural resource decision-makers require technical information to support good management decisions, but scientists often have trouble communicating ecological concepts to the public. In part, this is due to the sheer complexity of ecological systems, exacerbated by the lack of ecological or scientific knowledge on the part of the public (Norton, 1998, Daniels and Walker, 2001). This situation relates to the paradox of public participation outlined by Daniels and Walker. However, it also extends to verbal and

written communication skills of scientists when dealing with a lay audience. Scientists often find it difficult to effectively communicate findings from empirical research to resource managers in applied research settings (van Wyk et al., 2008). As a result, scientific information is generally recycled into existing scientific communities, using standard or typical means to disseminate knowledge. Communication of technical, scientific concepts suffers from the traditional dissemination of science, the complexity of the concepts and the ability of the scientists to effectively relay information. This review highlights research on how the public perceives and accepts science and scientists, how science is incorporated into participatory processes, common challenges to communicating science with public audiences, and the social context in which scientific information is communicated.

Public Acceptance of Science

Science has traditionally been viewed by the American public as a policy-neutral and objective process, resulting in a relatively positive view of science (White and Hall, 2006). However, White and Hall's (2006) recent analysis shows the public is becoming increasingly skeptical. The authors state that "...the public may know, articulate, and accept the traditional view of science, while at the same time maintaining skepticism about how it is utilized in any given circumstance" (White and Hall 2006, p.309). Public doubt, they argue, has been a result of several factors, including the media's exposure of incorrect or socially influenced science; scientific experts who disagree over information in the public arena; and politicians' use and exploitation of scientific knowledge and its uncertainty (White and Hall, 2006).

Public acceptance of science is also influenced by the relationship of the community to the scientific information provider. Resource-dependent communities and user groups such as ranchers may rely on factors external to the scientific process to judge scientific information (Weeks and Packard, 1997). Weeks and Packard (1997) state that “such factors include the historical relationship the community has with the managing agency, the extent to which scientific explanations match local experience, the conceptual fit between managers’ and communities’ views of the appropriate relationship between humans and nature, and the resources available to the community to argue against regulation” (p. 236). Similarly, environmental conflict must incorporate other knowledge systems, such as local knowledge and experience, culture, tradition and ‘remembered knowledge’ in addition to scientific and technical information (Adler et al., n.d.). However, the acceptance of local knowledge systems alone is not enough to bridge the science and decision-making gap.

Engaging Stakeholders in Scientific Processes

Powell and Collin’s (2008), article on citizen engagement in science and technology addresses the difficulty of integrating the public in science. They raise the question of whether,

...academic and government institutions really [are] prepared to respond in a meaningful way to the full range of recommendations, concerns, and questions citizens might raise about science and technology when they engage in these [public engagement] projects... (Powell and Colin, 2008, p. 130).

Recognizing the difficulty of encouraging scientists to engage with the public, Poliakoff and Webb (2007) present four factors that predict whether scientists are likely to take part in public engagement activities: the first, is whether or not they had done so in the past.

The more informative, three, include: the scientist's attitude toward public engagement; perception of the extent to which colleagues were engaging with the public; and perceived capability of doing so effectively (Poliakoff and Webb, 2007).

Collaborative processes must integrate science in a way that better facilitates and promotes communication about science. Powell and Colin (2008) suggest that public engagement in science should cultivate reflexive, transparent, and two-way communication, relationships and projects between citizens, scientists and its organizers in order to be successful. They state that scientists are generally trained in giving lectures, but in order to promote true inclusivity and democracy for communication with lay audiences, scientists, like citizens, should be trained and given incentives for engaging meaningfully with the public (Powell and Colin, 2008).

Challenges to Communicating Science

The conventional scientific format for publishing research is often difficult for non-scientific decision-makers to interpret and apply to management, and can sometimes lead to the lack of use or misuse of scientific information (Risser, 1993). The hurdle of effectively communicating science so that it can and will be accessed and properly interpreted is extremely important as decision-making continues to involve the public. The willingness and ability of scientists to take a meaningful role in collaborative, public processes will influence the extent to which science is effectively incorporated into the decision-making process. According to Davies (2008), scientists tend to think of communication with the public using a 'deficit model' geared toward education and one-way communication because they assume lay people lack knowledge about science (Davies, 2008). In order for this paradigm to shift, scientists must acknowledge other

forms of knowledge, and think more broadly of communication as multi-directional debate and dependent on context (Davies, 2008). While not all scientists view public engagement as a 'knowledge vacuum' as Davies (2008) calls it, many have difficulties communicating about science with lay people.

Additionally, scientists are generally not trained to communicate effectively with the public and may feel the uncomfortable, or lack the proper skills, experience and knowledge, to accomplish this task. Powell and Colin (2008) found that scientists lack enthusiasm for engaging with the public; some showing apprehension, and that few scientists have experience or training in dealing with the public. Additionally, they found that scientists, used to being the expert, are often uncomfortable with the type of questions the public asks them, some of which are outside their field, they cannot answer, or may regard values, ethics, regulations and risks, or technical details (Powell and Colin, 2008). This lack of comfort and/or experience when dealing with the public on the part of scientists creates a communication barrier that may be difficult to bridge in collaborative processes.

In some cases poorly communicated, scientific presentations or conversations can be misinterpreted or rejected by stakeholders. Norton (1998) asserts that this is due to the disconnect between knowledge systems of scientists and the public, and the presentation techniques utilized by scientists, where terminology is not always understandable to the audience. Thus it is important to improve upon not only the number and scope of opportunities for scientists to engage in public deliberative processes, but also the quality of communication utilized by those scientists in order to have a meaningful impact on the process and its stakeholders.

Weeks and Packard (1997) argue that the public may lack a thorough understanding of science, but their rejection of ‘scientific management’ is more complex than suggested by the deficit model. They articulate that “[p]ublic acceptance of scientific knowledge may be affected by non-scientific phenomena” (p. 237), and that scientific evidence may not always be judged by the same criteria used by scientists (Weeks and Packard, 1997). Weeks and Packard (1997) also emphasize the social context of scientific communication. They state that “[t]he deficit model assumes that the message is more important than the messenger and that it will be heard even if the messenger is not trusted” (p.237), thereby ignoring social context of communication which may in fact be a more important factor in determining public acceptance of scientific information (Weeks and Packard, 1997). Further exacerbating the issue, people tend to accept information which “reinforces their initial position” or personal values (van den Belt, 2004, p. 4).

Norton (1998) asserts that the discipline of ecological science has had a low level of impact on environmental policy-making as a result of “...ecologists’ implicit adoption of a serially organized mental model for relating facts and values in the policy process” and has resulted in disconnect of jargon and language between evaluation and description (p. 362). This closed language that scientists have adopted, argues Norton (1998), makes it more difficult for decision-makers to locate the correct data as well as properly interpret that data for the decision-making process. While not all experts would agree with Norton that disconnect between science, management and policy creates a scenario where ecology fails to inform policy, it is clear that disconnect exists, and improved communication across fields is necessary.

In summary, public acceptance of science and scientists' abilities to communicate with the public in tenuous terrain poses several implicit challenges for incorporating science into natural resource collaborative efforts. Improved understanding of how scientists communicate as well as how audiences perceive and integrate scientific information may improve the quality of scientific dialog in environmental decision-making processes. Ultimately, more information is needed to determine the most effective ways to communicate and integrate science into collaborative public participation processes.

Adaptive Management

Adaptive management (AM) is a process of applying the principles of scientific experimentation to natural resource management, providing a means to make better management decisions in the face of scientific uncertainty. It provides one potential approach to overcome some of the challenges of integrating science into natural resource decision-making. Adaptive management operates on the premise that environmental management and policy should be adaptive rather than reactive in nature, such that management and policy integrate ecological, economic and social systems early and throughout the planning and implementation of management actions or policies (Holling, 1978). Adaptive management of ecosystems aims to embrace uncertainty and acknowledge that we will never have complete understanding or comprehensive knowledge available to support decisions (Holling, 1978, Murray and Marmorek, 2004). Adaptive management operates by learning through the management process and adapting subsequent decisions (Bormann et al., 1995). While uncertainty about management can erode confidence in actions, AM enables management to proceed in the

face of uncertainty, gaining confidence by systematically improving the chances of achieving desired outcomes (Murray and Marmorek, 2004).

Additionally AM is more able to manage uncertainty and account for interdependencies of “complex social-ecological systems,” by broadening participation in the scientific process in order to understand and manage those systems (Levrel et al., 2009, p. 173). Uncertainty in ecosystems is – and will continue to be – inherent to natural resource management (Holling, 1978, Murray and Marmorek, 2004). Decisions must be made in spite of the unknown and must anticipate the unanticipated and unexpected in dealing with management (Holling, 1978). Adaptive management design embraces these factors, promoting system resilience by assessing, monitoring, evaluating and re-thinking management decisions throughout the process (Holling, 1978). Adaptive management relies on monitoring and assessment to continually refine and inform management practices (Ringold et al., 1996).

Adaptive management is an iterative process, where participants first identify management needs, uncertainties and specific questions, and plans are designed to implement AM based on those needs and uncertainties (Holling, 1978, Moir and Block, 2001). This is followed by rigorous monitoring, which continues to inform management actions and design, and is used to restructure management questions and monitoring efforts as knowledge is built and tested (Holling, 1978, Moir and Block, 2001). Adaptive management employs these specific procedures and protocols, requiring rigorous consideration of all phases of policy, management and assessment. However, the term ‘adaptive management’ has often been misapplied (Murray and Marmorek, 2004, Gregory et al., 2006), which may dilute the concepts and applications of AM (Murray

and Marmorek 2004). Project managers may sometimes believe that they are using AM if their management includes "...any semblance of 'adapting', either to knowledge or events", rather than a specific set of procedures and actions that pay close attention to monitoring and assessment (Murray and Marmorek, 2004, p. 1).

Critiques of adaptive management include: issues of scale, where AM often fails to address long-term or slow ecosystem feedbacks and responses (Moir and Block, 2001); lack of attention to management needs and inability to provide explicit guidance for management actions during the AM process (Gregory et al., 2006); and unfeasible geographic and time requirements relative to available resources to rigorously monitor and assess during the AM process (Gregory et al., 2006). Additionally, institutional barriers exist, such as management agency protocol and planning for land management and monitoring. These factors make AM difficult to implement from theory to successful on-the-ground adaptive management (Stankey et al., 2003).

Ringold et al. (1996) suggest that adaptive management is particularly applicable when managing large and complex ecosystems. Federal lands are good candidates for AM because they are generally areas with dynamic ecosystems and high levels of uncertainty (Moir and Block, 2001). However, AM must be well-understood and implemented in order to benefit the process of large-scale ecosystem management plans.

Evaluating Collaboration: Success, Trust and Consensus

Defining Success in Collaboration

Success in collaboration is characterized in a number of ways. Success can be defined in terms of process (e.g. whether it was inclusive, fair, legitimate, etc.), outputs (e.g. activities undertaken, products), and outcomes (changed social and ecological

conditions). Information is still needed to explore the definitions and criteria for success to promote “successful” collaborative approaches that meet the group’s goals.

Additionally, Leach et al. (2002) state that when measuring success, multiple measures are necessary due to the fact that collaborative partnerships are taking on ‘multiple goals simultaneously’. In this thesis, I explore how participants in the Intermountain Public Lands Cooperative collaborative partnership conceptualized success, and whether they perceived benefits to participation even though the group’s nominal goal was not achieved.

Success can be defined by whether or not a group is able to reach its goals, environmental outcomes or in relation to more general social outcome criteria such as improved relationships, communication, social capital or trust. Collaborative processes that do not reach their goals can have other positive long-term effects, such as ‘improved relationships’ and ‘increased understanding’ (Conley and Moote, 2003). McKinney and Field (2008) found that collaboration improves social and political capital, as well as community capacity to act collaboratively on future issues. However, Conley and Moote (2003) state that failed collaboration, where goals are not reached, can come at a heavy cost. These costs include effort, time, and potentially social capital that is “...consumed rather than built” (Conley and Moote, 2003, p. 373).

Evaluation of collaborative processes will potentially help increase our understanding of the limits and the potential of collaboration (Conley and Moote, 2003). However, indicators of a successful process, such as satisfaction, legitimacy of decisions, improved stakeholder relationships and communication, can be difficult to measure. Additionally, to understand what leads to success or failure of collaborative processes, we

need to identify and measure the factors that influence success and analyze the relationship between these factors and the group's success or lack thereof. Research by Leach and Pelkey (2001) shows that local, case-specific factors are important in determining collaborative success, making a generic or generalizable collaborative procedural protocol difficult to construct.

Scholars disagree over the most appropriate measures of success in collaboration. Coglianesse (2003) questions whether satisfaction is an appropriate measure for successful decision-making, arguing that there is no guarantee satisfaction in decisions will result in the most appropriate decisions. Additionally, the author states that satisfied participants represent only a subset of the affected population and not the whole (Coglianesse, 2003). Also, participant satisfaction fails to adequately address ecological or broader social outcomes. However, participant satisfaction could arguably be the closest we are likely to get to understanding and measuring success in stakeholder decision-making processes.

This thesis attempts to unpack some of the participant perceptions and interpretations of success in IMPLC. I do not aim to measure success, but rather understand how IMPLC participants perceived success. Due to the fact that the IMPLC was unable to reach its primary goal of creating a community alternative for the BLM's RMP revision, I expected to find that participants viewed the IMPLC as a failed attempt at collaboration. However, my analysis revealed that most people perceived the process as both successful and unsuccessful in different ways.

Consensus-Based Decision-Making

There are many approaches to collaborative processes, though the collaborative public participation model of decision-making is relatively new to natural resource

conflict issues. Debate exists over the types of process that are most effective, and collaborative approaches are particularly difficult to execute when extreme conflict exists among stakeholder groups. Consensus is just one model of decision-making and not all natural resource collaborative processes apply consensus. While there are a variety of labels for consensus-based land management, all have a commitment to reach a mutual agreement and seek win-win solutions while educating participants and promoting community (Peterson et al., 2005).

Collaboration does not require consensus decision-making in order to engage stakeholders in meaningful and participatory dialog. However, many traditional models of natural resource collaboration use consensus as a goal of the decision-making process. The consensus model is a process where all stakeholders unanimously reach agreement on a decision that they all can live with and which makes every effort to meet the interests of all parties (Susskind, 1999). Consensus decisions, state Susskind et al. (1999), reach more creative solutions and are more readily implementable than those made by non-consensus processes. In contrast, Peterson et al. (2005) argue that a focus on consensus encourages the status quo rather than promoting change by reifying power inequalities and relationships and by granting veto power to individual interests. They argue that dissent and conflict are inherent in democracy, and decision-making should recognize those differences rather than attempt agreement, which masks conflict and projects an ‘illusion of objectivity’ (Peterson et al., 2005). Consensus-based decision-making could potentially further entrench conflict issues and cause an even higher level of polarization among participants. Leach (2006) responds to criticisms of consensus presented by Peterson et al. (2005), asserting that consensus does not necessarily preclude

an argument model, nor does the goal of consensus necessarily inhibit interdisciplinary deliberation, negotiation, debate or conversations, and that consensus can take a variety of forms and is not necessarily doomed to stalemate or status quo. While Toker (2004) and Peterson et al. (2005) argue that consensus is outdated and its implementation problematic, Leach (2006) argues that there is not yet enough empirical evidence to justify these claims and cautions that “[b]y dismissing consensus before the evidence is in, we risk missing an opportunity to improve the way society charts its ecological future” (p. 574).

The IMPLC collaborative group used a consensus model for their decision-making. While they were not able to reach their goal of consensus, the study described in this thesis examines how the goal of consensus decision-making affected the collaborative process and how consensus affected and was affected by perceptions of success and failure. Additionally, I investigated how the goal of consensus affects communication and process during collaborative decision-making. This project was conducted to deepen our understanding of the role of consensus-based decision-making in natural resource collaboration, and its impact on both process and outcomes.

Methods of Evaluating Natural Resource Collaboration

More research is needed to evaluate and identify indicators for success in collaboration. Schuett et al. (2001) state that “...further research should not only explore success during the collaborative process, but also outcomes associated with it” (p. 591). They say that methods such as case studies and in-depth interviews would be good techniques to collect data in order to better evaluate collaboration and its outcomes (Schuett et al., 2001).

Specifically, collaborative efforts should be monitored in order to better understand both the possible positive outcomes as well as the limitations associated with collaboration. Both single case studies and larger multiple-case studies have strengths and weaknesses in understanding community-based natural resource management (Agrawal and Chhatre, 2006). Ethnographic, in-depth approaches to evaluating collaboration are more adaptable to changes in variables and facilitate a more complete understanding of variable interactions, which are more complex (Conley and Moote, 2003).

Summary

Public land management in the western United States has shifted toward a more inclusive, collaborative approach to decision-making. While there have been many successes in participatory approaches to land management, there are also many lessons to be learned from those groups that did not reach their goals. The primary objective of this research project is to investigate what constitutes success and failure in a natural resource collaborative group and identify lessons learned.

Additionally, good, scientific information should be an integral component of collaborative land management decision-making, but suffers from ineffective communication, a lack of public understanding and little incorporation of scientific concepts in policy decisions. The role of science in natural resource collaboration is the second area of focus for this research project.

The third objective of this research is to inform the current debate in the literature over whether or not the goal of consensus-based decision-making can and should be the goal of natural resource collaborative groups. Again, experts call for increased data to

understand how the goal of consensus affects decision-making and whether or not consensus-based collaboration has the capacity to move the process away from traditional approaches and paradigms toward a more collaborative and innovative process.

Finally, this research presents a comprehensive and cohesive case study of a bona fide collaborative group. Walker and Hurley (2004) suggest that much of the current literature on collaboration is too narrowly focused on institutions and procedures for predicting success and failure in collaborative processes, and Conley and Moote (2003) call for in-depth, inductive methods, including interview-based research and case studies to better understand and evaluate collaborative process.

Ultimately, this research on the IMPLC collaborative group will provide an in-depth case study of a collaborative group that did not reach its goals. While the IMPLC was unable to reach a consensus agreement, there are many lessons to be learned to build upon and improve the collaborative process. Research will focus on the roles of communication, conflict and science in the IMPLC, while also addressing other collaborative process issues, particularly the goal of consensus decision-making.

CHAPTER TWO

RESEARCH QUESTIONS AND METHODS

Research Questions

This research on the Intermountain Public Lands Cooperative (IMPLC) aims to understand major themes and lessons learned from a collaborative group that was unable to achieve its primary goal. My research questions are focused primarily on 1) process – including conflict and power; 2) the integration of science in decision-making; and 3) perceptions of success and the roles of consensus and trust. First, analysis for this research focused on major lessons learned from the IMPLC collaborative process, seeking to better understand core areas of conflict. Power was an emergent theme from interview data that was further analyzed. Second, I wanted to know how the IMPLC used science to inform decision-making, and to examine participant perceptions of science, and identify the hurdles for incorporating science into community-based collaboration in this context. Third, I wanted to know whether the goal of consensus was required in order to have had a successful process, despite the group’s inability to reach their goal of a consensus agreement. Perceptions of success was part of my original research questions, and the role of consensus was an emergent theme from interview responses regarding success. I developed the following research questions to address each of these themes.

Primary Research Questions

1. What are the roles of conflict, communication and science in natural resource collaboration?
2. How do these factors shape one another and in what ways can they influence the success of collaborative processes?

Secondary Research Questions

- (1) What are the major lessons learned from the IMPLC collaborative process?
 - a. Was the IMPLC collaborative process effective?
 - b. What changes would have improved the process?
 - c. How did the conflict management approach contribute to or detract from success?
 - d. How did power inequalities affect decision-making and collaborative process?
- (2) How did the IMPLC incorporate science in decision-making and what were the major hurdles?
 - a. How was science used in the IMPLC to inform decision-making?
 - b. How did the communication about science affect the acceptance of scientific information?
 - i. What types of presentation techniques were used to communicate scientific knowledge?
 - ii. Did miscommunication occur? How and why?
 - c. What factors influenced IMPLC participants' acceptance of science?
 - d. Did science play a role in conflict situations? How and why?

- e. What are the major lessons learned about the use of science in decision-making?
- (3) How was the IMPLC successful and unsuccessful as a collaborative group?
- a. What were the benefits and outcomes of the IMPLC?
 - i. Process (e.g. collaborative learning)
 - ii. Outputs and products (e.g. input to RMP revision)
 - iii. Outcomes (e.g. increased or decreased social capital, trust among participants)
 - b. Can these indicators of success help predict success (and prevent failure) for future collaborative groups?
 - c. Can collaboration result in a worse situation than would have existed without collaboration?
 - d. Would the IMPLC have been capable of reaching a consensus agreement for the RMP revision under different circumstances (a different collaborative approach or more time)?
 - e. Was the goal of consensus-based decision-making required for the process to be useful?

Methods

I used an interview-based case study to research the IMPLC. I conducted twenty-one in-depth, semi-structured interviews with IMPLC participants. Participants were identified using a networking method. Respondents were selected based primarily on other stakeholder recommendations, as well as based on their stakeholder group and I also reviewed IMPLC meeting materials to identify participants. Sampling continued

until nearly all recommended participants had been interviewed, and at least one participant was interviewed from each stakeholder group. Interviews ranged from thirty minutes to three hours in length and averaged just less than one and a half hours. Interviews covered a wide range of topics about the IMPLC collaborative group. Interview questions were mostly consistent across all interviews, though not all participants were asked exactly the same questions, nor did all participants respond to each question in order to include their response in the IMPLC analysis. The semi-structured approach allowed emergent themes to be identified in interviews.

Interviews were audio-recorded, transcribed and coded using NVivo data analysis software as well as Microsoft Excel spreadsheets. Interviews were compared against one another to identify unifying themes as well as variations among respondents. Indicators of success and failure and the use of science in the collaborative process were compared against existing collaborative literature in order to identify generalizable results versus information specific to the IMPLC. While twenty-one interviews were conducted, one interview was not audio-recorded due to technical difficulties. For this interview, I relied on hand written interview notes, but they were not complete enough to include for most portions of the data analysis. Meeting materials and IMPLC documents were also reviewed in order to gain baseline information on the group and for reference during data analysis.

Modified Grounded Theory

This research utilized a modified grounded theory approach to data analysis. While Glaser and Strauss (1967) advocated for a purely inductive approach to grounded theory analysis without specific research questions, for the purposes of this research a

modified approach was more applicable because it was important to answer specific questions of the data in order to identify meaningful results. While some concepts in this thesis were emergent from interview data, it was the focus of this research to better understand several specific issues in order to better inform land management collaborative processes, using these as specific research questions.

Grounded theory methodology is designed to create concepts which then provide a theoretical context for the subject of study (Corbin and Strauss, 1990). Grounded theory, as outlined by Strauss and Corbin (1990), is a theory, which is gathered and systematically analyzed throughout the research process, and is derived from the data. The use of grounded theory in research must pay close attention to the temperament and inclinations of the researcher, as this will have an effect on the ability of that person to produce good results (Huchinson and Wilson, 1993).

Traditional grounded theory has three major steps in the coding process. These are open coding, axial coding and selective coding (Starks and Trinidad, 2007, Strauss and Corbin, 1990, Corbin and Strauss, 1990). Open coding is the process of categorizing data by grouping concepts around phenomena, axial coding puts data back together by using the categories and sub-categories from open coding to make new meaning, and selective coding systematically integrates these categories and relationships (Strauss and Corbin, 1990). These steps are not meant to be linear, but rather used in constant comparison and tested throughout the process.

Despite the more rigid methodology by Glaser and Strauss, Fendt and Sachs (2008) advocate that grounded theory method can be a powerful and useful tool in both its traditional and modified forms. They state that the utilization of a modified grounded

theory, where there is less focus on iterative, rigorous coding and more focus on the data, can be more useful in some cases (Fendt and Sachs, 2008). They state that a modified approach to grounded theory allows the researcher to be more insightful and productive in asking questions of their data, rather than spending all their time coding (Fendt and Sachs, 2008). Additionally, Fendt and Sachs (2008) argue that modified grounded theory may be more realistic for researchers looking at specific problems or phenomenon with their data. Therefore, I used a modified grounded theory approach to analyze my qualitative interview data.

Coding Categories and Data Analysis

In order to apply grounded theory methodology to a specific research question (modified grounded theory), relevant interview segments were first identified and selected through open coding of interview transcripts. Using these selections, a more traditional grounded theory inductive method of analysis took place with the selected data. It should be noted that in addition to the modified grounded theory approach, research questions were also emergent from the data. Preliminary open coding and analysis of interviews showed the roles of science, collaborative process, success and consensus decision-making as areas that required closer analysis. The interviews were broadly coded for general themes and these sections were then selected for further analysis, or axial coding in this research. Conley and Moote (2003) caution that evaluator bias exists when researching outcomes of collaboration, where different researchers would likely weigh criteria differently, even if standard measurement criteria were established and the same process analyzed.

Interviews were openly coded for portions of interview responses that were relevant to the research question. They were then coded a second time to make distinctions between perspectives on these topics. Finally, through selective coding, recoding, and constant comparison, themes were created to relate to the overall phenomenon. Using coding and taxonomies as well as direct quotes, interview data were analyzed to highlight interesting findings about these themes.

Coding categories for the IMPLC interview transcripts were both pre-determined and emergent. A partial list of coding categories for IMPLC research are shown in Table 1.

Ground-truthing

The final step of this research was to conduct a community meeting with IMPLC members. I presented research findings and validated results with local stakeholders. In the spirit of participatory action research, not only did I validate research findings in this meeting, but also provided pertinent feedback to the community. I shared results and major findings and insights in hopes that they will be able to take this research to help frame future collaborations. The timing for this meeting coincided with University thesis submission deadlines so results were not incorporated into this thesis.

Table 1. Sample coding categories for IMPLC interview data

Costs and benefits of collaboration	For the BLM			
	For the group	Success		
		Failure		
Ecological outcomes				
Demographics and background information	Participant expectations			
	Job description or stakeholder ship			
	IMPLC background and specifics			
	Goals			
Lessons learned from the IMPLC	BLM	Process		
		Reputation		
	Collaboration			
Outcomes, lessons from the IMPLC				
Power				
Process	Communication			
	Conflict	Transparency		
		Willingness or ability to collaborate		
		Other		
	Facilitation			
	Incentives to collaborate			
	Outcomes			
	Relationships			
	Stakeholder representation (group makeup)			
	Trust			
RMP revision	Issues	conflict		
		positions		
Revision				
Role of consensus	Communication			
	Decisions			
	Feasibility			
	Goals			
	Is consensus required for benefits?			
Science	Adaptive management			
	Applicability			
	Relevance			
	Communication	Presentations	Person/affiliation	
			Presentation style	
	Other			
	Conflict			
	Use of science in IMPLC			
Value-based issues				

CHAPTER THREE

PROCESS, CONFLICT AND POWER: BACKGROUND INFORMATION ON AN INACTIVE COLLABORATIVE GROUP

Introduction

The Intermountain Public Lands Cooperative (IMPLC) was formed to alleviate some of the stakeholder conflict over public land use and to provide feedback to the BLM for their revision of the local Resource Management Plan (RMP). However the IMPLC was unable to reach its primary objective of crafting a consensus community alternative for the BLM's RMP revision and the group is now inactive. Core conflict over the use of public BLM lands included citizen proposed wilderness and road-less areas, BLM identified wilderness characteristics, oil and gas development and leasing, greater sage-grouse habitat and livestock grazing. Despite many social benefits from the collaborative process, the IMPLC experienced intractable and entrenched conflict, and goals and values were incompatible among stakeholders.

This chapter outlines the IMPLC collaborative process, reviews areas of conflict and describes power dynamics in the group. This descriptive chapter is intended to provide an overview of the IMPLC and its process, and identify the primary themes and issues that permeate the discussion of the IMPLC in this thesis. This chapter uses document review and interview transcripts as the basis for the description of the IMPLC process, and conflict and power dynamics within the group. Intermountain Public Lands

Cooperative documents were used but not cited in this review in order to maintain participant confidentiality.

While collaboration is a potential avenue for overcoming some conflict, in the case of the IMPLC, despite some improvements in social capital, the collaborative process was not able to manage core areas of conflict. Real and perceived power inequalities existed in the IMPLC, acting as a barrier to trust and collaboration. Nevertheless, IMPLC participants generally viewed the collaborative effort as a productive and beneficial process.

Background

Public Lands in the West

Many land management conflicts in the Western United States have their roots in the way in which the West was settled. The Homesteading Acts of the late 19th and early 20th century were a form of federal land disposal, giving ownership to those who would put to use large tracts of land for farming or livestock ranching (Loomis, 2002). The West was more conducive to livestock than crop production due to the arid climate (Loomis, 2002). Economically feasible livestock operations required larger tracts of land than most could afford to own, and livestock grazing expanded onto the surrounding federal lands, which were used on a first come, first served basis (Hardin, 1968, Loomis, 2002).

As a result of competition among open range livestock producers to graze federally owned and unregulated (open access) forage resources, there was little incentive to maintain rangelands for long-term ecological sustainability and public lands were often severely overgrazed (Loomis, 2002). Although the Department of the Interior was

controlling animal numbers on public lands as early as 1898, the Taylor Grazing Act of 1934, is responsible for much of the grazing regulations that are in place on BLM lands today (Holechek et al, 1989, Coggins et al., 1993, Loomis, 2002). The Act was passed largely because of the actions of concerned ranchers in the West (Holechek, 1989). The Taylor Grazing Act placed administration of remaining public lands with the Grazing Service (later renamed Bureau of Land Management), which regulated and allocated grazing privileges through a system of permits on BLM lands (Holechek et al, 1989, Coggins et al., 1993, Loomis, 2002). The resulting patchwork of private and public lands and the use of leased public lands for private livestock operations creates a complicated network of management, communication and conflict among ranchers, local and federal agencies and other stakeholders (Coggins et al., 1993).

Today, close to half of the land area of the eleven western continental states in the U.S. is publicly owned (Loomis, 2002), and one-third of those lands are federally owned and operated (Mollison and Eddy, 1982). This affects both federal and private land uses, and provides for greater expanses of open space than in the eastern portion of the U.S., where most of the land is fragmented by privatization and development. Ranching operations in the western U.S. lease public lands for livestock grazing to supplement or substantiate their operations, especially in areas where drought and arid climates limit forage production, and the cost of land is high (Resnik et al., 2006). In recent years, amenity migration (relocation due to socio-cultural and landscape features rather than for economic purposes) has been a major change in resource-dependent communities, which has altered population size and value systems (Bartoš, et al., 2008, Kruger et al., 2008).

Adding to the issue and strain on federal land use and management, many natural resource agencies in the United States underwent budget cuts in the 1980s and 1990s, while simultaneously experiencing an increase in demands (Wondolleck and Yaffee, 2000). Land management agencies are under increasing pressure to manage lands for multiple uses, from ecological as well as social perspectives. The Bureau of Land Management (BLM) must manage land for productive use of renewable resources (e.g. livestock grazing), extraction of non-renewable resources (e.g. oil and gas development), and both motorized and non-motorized recreation, as well as conservation values (e.g. wildlife habitat), which is a complicated task and often leads to conflict (Coggins et al., 1993, Nelson, 1995).

The Sagebrush Rebellion of the late 1970s and early 1980s and its recurrence in the 1990s, resulted from the desire for more localized control of federal lands in the West (primarily by ranchers and local governments) (Coggins et al., 1993, Nelson, 1995). The Rebellion aimed to transfer federal public lands to state governments, or to increase the responsiveness of federal agencies to local land management interests relative to national interests (Mollison and Eddy, 1982). According to Nelson (1995), the Sagebrush Rebellion largely died out due to internal contradictions, where local governments simultaneously wanted to evict the federal government and localize land, but also needed federal funding in order to manage those lands.

The Sagebrush Rebellion represents a long-standing sentiment in the West about land management and federal control and many Westerners are resentful of federal land ownership and management (Kemmis, 2001). This culture of local control and skepticism or bitterness toward federal government still permeates many ranching

communities in the western U.S. and often conflicts with the local, and especially national-level conservation interests for those lands. Many of the natural resource conflicts over land management issues are grounded in core value differences about how public lands should be managed and by whom.

Both local- and national-level stakeholders have legitimate and vested interests in how public lands are managed. Because stakeholder perspectives and values about federal land management are diverse, collaboration can provide a venue to address core differences and incorporate better, more comprehensive and cohesive stakeholder feedback for management actions. Also, collaboration can potentially reduce litigation (and thus costs) associated with land management by cultivating stakeholder buy-in and accountability for decisions.

Background and Formation of the IMPLC

The BLM resource area where the IMPLC was based is located in the Intermountain West and encompasses one large county and portions of two others. Bureau of Land Management lands in the resource area occupy over one million surface acres and approximately two million acres of subsurface mineral estate. The primary land use in the area formerly consisted of sheep and cattle ranching and wheat production. Local residents have since diversified and population has increased significantly. Since 1970, the largest county in the IMPLC has experienced a one hundred percent population increase, and its neighboring county – also a stakeholder in the IMPLC collaborative and public lands, experienced a 200 percent increase.

The resource area is valued for its ranching land, open spaces, physical beauty, recreation opportunities, greater sage-grouse habitat (a threatened wildlife species), oil

and gas potential, wilderness characteristics, biodiversity, cultural heritage (petroglyphs), and conservation potential among other uses and attributes. Due to the diversity of opinions about the use and value of public lands, public interest has manifested in varied ways, including legislative requests, lawsuits, and community discussions. The local government in the area was seeking more localized control of land management on BLM land. The IMPLC was originally formed as a community group with a broader focus to provide community feedback for public land management in the area. However, when the BLM decided to revise their local Resource Management Plan, that goal shifted, with an aim to craft a consensus community alternative for the BLM's RMP revision. A major premise of this decision was that if the IMPLC was able to reach consensus on a community alternative, it would be in the BLM's best interest to adopt that revision as their preferred alternative for the RMP revision.

Due to wilderness characteristics identified by the BLM in a section of the resource area, and citizen proposed wilderness designations, the BLM field office began an amendment process for the original RMP. However, the resource area also needed to address other issues, including oil and gas development and travel-related road development issues. After receiving requests from the local government and environmental organizations, the BLM decided to revise the entire RMP for the area, rather than proceed with an amendment to the existing plan. The RMP revision would determine the extent to which oil and gas development would or would not occur in the resource area, affecting conservation and development efforts. The role of the IMPLC was to provide community input to the BLM for public lands management. When the

BLM decided to revise their RMP, the IMPLC decided their goal was to create a consensus community alternative for the RMP revision.

The most contested portion of the resource area was where the wilderness characteristics were identified, an area which also represents the greatest oil and gas development potential. This portion of land also has the largest expanse of roadless area in the resource area, which facilitates environmental goals and restricts access and recreation. The area also provides wildlife corridors and habitat for large game animals. Some stakeholders are concerned about the impact that oil and gas development (and requisite road development) would have on area resources. While wilderness characteristics have been identified, the BLM still must honor its multiple use mandate.

There are a variety of social and ecological costs and benefits associated with both wilderness designations and oil and gas development. Increased oil and gas development in the area would require not only drilling, but also new road development – some in proposed wilderness areas. County revenue would increase from oil and gas development, jobs would be created for local citizens and grazing permittees could benefit from greater access to their grazing areas with the creation of new roads. However, the county is also responsible for replacing and repairing roads and infrastructure, which may mean additional costs that outweigh the revenues gained (Tharp, 2008). Landowners who do not own the subsurface mineral rights below their private property adjacent to areas that are being developed, run the risk of oil and gas development on their land. Landowners that own their mineral rights could potentially profit from selling those rights to area developers. Additionally, oil and gas development has a long history of negatively affecting landscapes and the construction of new roads

can be ecologically damaging because roads fragment landscapes, often introduce noxious weeds, which are difficult to control, and increase vehicle traffic. Other environmental concerns associated with development include increased recreation access via the new roads (potentially also negatively affecting cultural heritage by greater exposure to the public), negative effects on ecosystem services and area biodiversity, effects on greater sage-grouse habitat and populations as well as other wildlife species, and increased pollution.

It is BLM policy to solicit and incorporate public input as early as possible in the NEPA process, ideally before draft alternatives have been developed (Taylor, 2003). Involvement of the public by the BLM requires not only facilitation of the process, but also active solicitation of participation, including locating and engaging the public (Taylor, 2003). A RMP includes multiple land use alternatives, allocating different levels of use and conservation for the area resources. The BLM indicates their agency preferred alternative in the final Environmental Impact Statement (EIS). A community alternative refers to one of these land management alternatives created by the relevant stakeholders through a consensus process. According to BLM policy, should a community alternative be reached by full consensus in the NEPA process, that alternative, if appropriate, should also be the BLM's preferred alternative (Taylor, 2003). Consistent with this policy, IMPLC members understood that if they came to consensus on a community alternative, it would be in the best interest of the BLM to use that alternative as its agency preferred alternative for the RMP revision.

Collaborative Process

The IMPLC collaborative group enabled the BLM to achieve better and more comprehensive public input to the RMP revision. The IMPLC collaborative group consisted of a wide range of stakeholders and interests, with 150 people on the mailing list. Meetings usually consisted of thirty to sixty core participants. Membership included political representatives, federal and state agencies, oil and gas industry, off highway vehicle and other recreation interests, local citizens, ranchers and farmers, representatives from the BLM, wild horse advocates, conservationists, wilderness and environmental advocates. Intermountain Public Lands Cooperative participants generally felt that the group had representative stakeholder involvement, and that they had made significant efforts to recruit participants. However, the IMPLC did not include any tribal involvement. The BLM identified four Native American tribes as cultural and historic stakeholders for the resource area. Failure to effectively solicit Native American involvement in collaborative natural resource planning is relatively common in the United States (Cronin and Ostergren, 2007). One participant stated that the lack of Native American involvement in the IMPLC was not for lack of trying and that there were several attempts made to include those stakeholders in the IMPLC process.

Membership and Ground Rules

Each IMPLC member had the choice to participate as either a formal representative of their agency or organization or as an individual stakeholder. Members were responsible for catching up on material should they miss meetings and agreed to follow ground rules developed by the group, participate in discussions, and engage in a manner that avoided destructive language. If an IMPLC member objected to a proposal,

the IMPLC protocol stated that it was the member's responsibility to provide an explanation for their objection as well as to suggest an alternative solution. The IMPLC members also agreed that they would avoid surprises in terms of news, work proactively, and be explicit with others about any issues that were not obvious. This meant that participants had an obligation to disclose and be transparent about any and all information relevant to the IMPLC about their actions both in and outside the group pertaining to BLM land management.

As a part of the group's ground rules, it was agreed that the BLM would work with the IMPLC to accomplish their goals, but would refrain from participating in the consensus process. It was also the BLM's responsibility to provide appropriate information, including potential decisions that would interfere with policy, and not to use the IMPLC as their only source of public input. Ground rules stated that the BLM should recognize a consensus decision as representing the full diversity of stakeholder viewpoints, and to take that input seriously when revising the RMP.

Despite suggestions made by the facilitator, the group refused to define membership, choosing to maintain an open membership process. However, the group remained relatively stable in terms of active members and despite some speculation about newcomers entering the process and derailing the discussion, such an event never occurred at a scale that fully disrupted the process, according to most participants.

The group's desire was to have an open process and to work together on all issues through consensus-based decision-making. One participant stated that the IMPLC:

...was not willing to delegate any authority to the subgroups, and usually most groups will say 'look that's a really complicated issue, I'm okay assigning those five diverse people to go work something out' and then ... bring it back to the us for approval of the whole group. This group [the

IMPLC], you'd set up the subgroup of five, all of them wouldn't come, so you'd end up with another group of forty ... and [we even tried having the five people at the table, but everyone else still in the room, but they said] 'no, we don't want to do that'. I mean ... they wanted consensus, they wanted to be egalitarian about it, but ... when push came to shove no one was a driver or a decision-maker.

As stated by this participant and others, the IMPLC decided collectively that they wanted to have a completely open, consensus-based process, with all stakeholders at the table.

Quite a few interview respondents from the local community felt to varying degrees that they were in some way a driver for the initiation of the IMPLC collaborative process. One respondent reflected on this phenomenon as possibly one of the reasons for high levels of buy-in to the process by the local community:

I think frankly ... that everybody kind of thinks it was their idea in a way is why it was able to get off the ground. I mean if ... [participant A from the conservation community] thought you know, that [participant B from the local government] had started it, [participant A] wouldn't have participated ... [or] might have participated but ... [participant A] wouldn't have thought it was so useful. So I think [the fact] that there was a diversity of folks that kind of launched it probably made it more successful.

Meetings and Facilitation

The IMPLC met frequently, at least once a month, and sometimes more often. The IMPLC spent considerable amounts of time strengthening relationships between members by communicating differences, concerns and telling stories.

The IMPLC protocol for consensus decision-making defined consensus as unanimous agreement made by all parties present. The IMPLC defined consensus as an agreement where parties would be able to 'live with' proposals, and members could register their dissent without desiring to block the agreement. Much of the consensus accomplishments of the IMPLC consisted of process-oriented topics such as their

operating protocols for the group, collaborative process and the way to move forward. The IMPLC was not able to come to consensus on the RMP community alternative for the BLM resource area (see Chapter Five). After two years, the BLM ceased funding for a facilitator with recognition that consensus was unlikely to occur. Stakeholders procured more funding for a facilitator for a few more months, after which the group decided to discontinue meeting, believing that consensus was not possible.

The IMPLC met twenty-three times as a full group between 2002 and 2006. Meetings were time consuming, and many stakeholders commuted from other towns and cities, some taking up to four or five hours to drive to meetings. Nearly all interview respondents referred to the full group meetings as exhausting and time consuming:

[The meetings were] really long. You know, we would meet for eight hours, then turn around and meet the next day for eight hours ... It used to be about once a month, but once things really got going, we'd meet twice a month ... And they were a little stressful, but not really contentious ... It wasn't that it was so stressful that people were throwing things at each other [though there was one instance where that occurred]. It was just really long meetings, and you get frustrated sometimes – they just go around and round, and you know, you spend hours on word-smithing a stupid goal – and you want to beat your head against the table. And, so, that's why, even though some of them were challenging, and I enjoyed kind of working on it, but the meetings were tough. So that was just one aspect that I didn't enjoy a lot.

The frustration of lengthy meetings with circular debates was a common theme in interview responses. The metaphor 'banging their head against something', several times referring to a brick wall, was relatively common in IMPLC interviews.

Time commitments were not restricted to the meetings, but also the IMPLC communicated outside of meetings, with emails, phone calls, trainings, workshops and subcommittees. This participant states that facilitation for the IMPLC was effective, and that it consisted of more than meetings, but also other types of communication:

... I don't know how [the facilitator] handled that group, I mean you know it was a large group ... it was a tough group. Plus, not only within the group but then outside of the group you know trying to handle the people when you'd go home ... the emails and ... I mean if I looked at my email – I still have emails on here that just overpower you and just, it was amazing, just amazing. It was a truly amazing process...

The IMPLC involved a third-party facilitator early in the process. The BLM provided the funding for the facilitator, which is not typical in BLM public participation processes. In the case of the IMPLC, a conflict assessment was conducted by a separate contractor before the hiring process for the facilitator occurred. The collaborative group collectively interviewed facilitators to work with the group and the group came to a consensus agreement about which facilitator was best suited for the job. Participants were enthusiastic about the process of collectively interviewing and reaching consensus on selecting a facilitator.

Interviews generally focused on the inability of the group to overcome core conflict rather than placing blame on the facilitation of the process, though there were complaints about the contractor that did the situation assessment. The general positive attitude about the facilitation indicates that the collaborative selection of facilitators is a beneficial process, and may have helped achieve some of the benefits of collaboration for the IMPLC.

Participants generally felt that the facilitation of meetings was very effective:

The facilitation was top notch. I could not have said, recommended one thing, I don't think she made one mistake ... she had the most experience, I mean, when she's getting people to agree about [other difficult conflict issues such as the facilitators past projects], but you can't get people to agree about public lands. It just really highlights how contentious these issues are compared to some other issues that you think are intractable. Try working on public lands in the West ... she networked [looking for other ideas of what to try]... she tried as hard as she could to really get the group to come to agreement ... it took us two years and hundreds of hours,

but without her, it would have taken so much longer, I mean it just really helped to have her keep it on track...

Participants often commented on the fact that the IMPLC was the facilitator's first process to not reach consensus to illustrate how entrenched the natural resource conflict was for this particular group.

One criticism of the facilitation by a few IMPLC stakeholders was that there were times where people were allowed to talk far longer than necessary and use demeaning language, when they should have been cut off:

...[there were times where the facilitator] let things go on longer than I certainly would have – insulting or demeaning language and obvious power plays and control of the discussion ... [that were] unnecessary and certainly against the norms that were established by the group...

While very few participants geared criticism of the process toward the facilitation itself, there were some similar comments over the facilitator allowing some discussion to go on longer at times than it should have in their view. This same participant later said:

...[the facilitator] did a pretty good job of agenda setting, and relatively trying to keep us on the agenda and setting norms and going through all the steps that people have to do to invest themselves as a group, so except for that particular instance [above], I'd say the facilitation was good – above average, [but] like I said, you know, you're dealing with some powerful people and [the facilitator] wasn't willing to step up to that in my opinion.

However this comment did not reflect the opinion of the group as a whole. Near the end of the collaborative process the facilitator put a one-minute time cap on comments in order to expedite discussions.

The facilitator tried a variety of strategies to structure meetings and discussions. Participants often stated that the meetings were expertly run, but that there did not seem

to be any tactics that could effectively manage core areas of conflict. One respondent stated:

We tried everything – I mean it went on for, for several years – with different types of format. Some meetings were topical, some were organizational, some were small group, some were big group, we used every [approach]...

And added:

It was good to switch it up. That I would say. But back to the initial [question]: *was the whole thing effective?* I don't know. You got a bunch of people in the room talking about issues a lot. We had to use different techniques because none of them were necessarily working and, I think it was good that the techniques changed – it ... would have been terribly boring [otherwise].

This respondent highlights both the inability of different techniques to influence the process, but also that the variety was good for the group.

Conflict

Conflict in the IMPLC was entrenched and difficult to manage, though participants were generally friendly to one another during meetings. Most participants stated that there were very high levels of conflict:

...[conflict was based on] different values, you know. You have a side coming from the standpoint [of] old uses and traditional western value ... [versus] a preservationist standpoint and a conservation standpoint. Starkly opposite. And ... I don't want to try to, you know, pigeonhole anybody, or kind of make blanket statements on anybody's behalf because even the environmental groups have respect for agricultural culture. Ranching and coal were never an issue, which was pretty neat ... But ... the root of the conflicts is just that different philosophy ... oil and gas restrictions are hurting the economy unnecessarily, versus, you know there're not enough [restriction], and oil and gas impacts are too great. I mean we could talk for days and days about conflict because everybody disagreed with somebody else about something. You know, even two ranchers would disagree about some minor point they would have, some minor conflict. Environmentalists might not be on the same page about everything, so, not only were there huge conflicts between interests, but there were little conflicts within interests as well ... Tons of disagreement,

and lots of conflict, but like I said before, it was a respectful type of conflict.

While conflict existed, participants rarely cited direct instances of conflict during interviews and instead focused on broader pictures of conflict and differences in values and personalities. One participant stated:

There wasn't a lot of overt conflict, it's a very polite community, and rarely would you even hear people say, you know, anything to directly cross somebody, but in fact the group had a pretty good sense of humor most of the time. But I would say, most of the time the conflict was really about, it was a philosophical conflict almost, I mean you really couldn't even get them to subsidize issues half the time, they just, as much as they in theory kind of said they wanted to, you know, sit down at the table together it was very hard to get productive work out of the group.

This participant was relatively personally removed from some of the core conflict issues, however, and others had a more negative experience of conflict in the IMPLC.

Respondents speculated that some IMPLC participants lacked incentives to collaborate due to their purpose for engaging in this collaborative group, their activities outside the process, and other alternatives available to them. In references to participant's best alternative to a negotiated agreement (BATNA), one respondent outlined:

Not everybody was motivated to come to agreement, and in particular we always talked about BATNA ... best alternative to a negotiated agreement, and, for some people at the table, instead of sitting at the table trying to come to an agreement, frankly their BATNA was better away from the table...

This participant as well as others stated that one of the main reasons for IMPLC's inability to come to consensus was due to participant's having better alternatives away from the table. Though this same respondent also stated that later in the IMPLC Process, participants misjudged their own and others BATNAs, as trust declined:

...I really felt like people were misjudging what their alternatives were, and misjudging what their opponents alternatives were...

One participant responded to a question about whether or not people were willing to collaborate, and the general process of the IMPLC, stating:

...I think the folks from [the local government] worked very hard to convince BLM that this was a worthwhile endeavor and to get it ... funded and allow it to happen, and you know, BLM stepped up to the plate with funding with the full intention of facilitating and providing whatever was necessary to allow this collaborative process to occur. And I think [the local government] was fully committed in the beginning and there was a lot of optimism on everyone's part to make this happen but, so from that standpoint yes ... in the beginning I think there was a very strong desire for: 'let's try this, lets you know sit down at the table'. But once it became known what each segment of the community was asking for, the barrier started going up and it became apparent ... [that] there were these outstanding issues that each side would stand up and ... like the oil and gas folks would say: 'if you think we're ever going to agree on wilderness in [the most contested portion of the resource area], forget it, it's not going to happen'. I mean they wouldn't even talk about it. And the wilderness folks would stand up and say: 'if you think we're going to let you oil and gas [companies] damage the wilderness characteristics that have been identified [in that particular portion of the resource area], you can forget it'. And so ... I think if, in the very beginning of the process, we would have identified those drop dead issues, I think there would not have been so much optimism ... regarding a collaborative process...

Participants of the IMPLC often speculated about others' willingness and incentives to collaborate as well as about what went on behind the scenes of the collaborative group. Three common theories about participant intention to collaborate emerged. 1) Oil and gas developers lacked incentive to compromise, knowing they would likely still obtain leases due to increased emphasis on resource extraction by the federal government under the George W. Bush administration. 2) Environmentalists were there not to be collaborative but rather to stall the process until federal administration changed. 3) Local government was attempting to go up the chain of

command to get their interests met outside the process by using direct contacts at the federal government level. As one participant stated:

...I think a lot of people from the county speculated that for the environmental groups it was more in the environmental groups' interest to play well, but to not come to agreement, not make any progress forward because we had to get to an administration, and this was ... right before the second Bush administration, and so people were thinking 'well we can make it to there' and then you know, after the administration changed: 'can we make it to the next'. And you know these things can play out for a zillion years, and so I think people were always kind of measuring and doing end runs and that included [local government] officials, trying to, in a productive way, I don't even know if there were always [local government] officials, it included all sides of the, the debate, a variety of people trying to go up um the chain of command to get access and to see you know ... can we slide our paper in the side here and ... then coming back to play at the table...

This statement highlights some of the key areas where participants both speculated and acted outside of a truly collaborative effort.

In response to the question of whether or not they would participate in a process like the IMPLC again in the future, one interviewee commented:

I think ultimately the decision would be made to participate again. Not necessarily that I think it would be beneficial, because like I said you might participate for defensive reasons. But if that's kind of the big game in town, and [if] the agency or the real decision[-making entity]... has blessed it with some significance, okay, then, you've got, you've got to participate in some way.

This statement highlights that the IMPLC process may not have been the most productive way for some stakeholders to have their needs met. Rather, some felt an obligation to participate in order to have their interests at the table, not because they felt it was the most appropriate venue. This perspective is largely born from skepticism about other stakeholders' incentives to collaborate. One proponent of resource development in the

area responded to a question about their incentive to collaborate despite the position of the federal government, stating:

...you have your lease and it's a valid and existing right ... you ... pay for your leases, leases are put [up] for nomination, you lease something and you pay for that. That's a valid and existing right for your property. So I think the incentive was ... there's many you know, stipulations and rules and those types of things and stipulations that are put upon ... federal and BLM permits ... I guess that was part of us talking to the, to the stakeholders – and [oil and gas] industry saying, the importance of collaboration and working on this as a collaborative group, is that, everyone has their input: 'tell us your side of the story, tell us what is important' ... [a participant from oil and gas interests] made up a chart, actually... and it was kind of interesting, and they put all the timing stipulations on the chart, and it was ... when you could drill and when you couldn't drill and it ... showed that within this chart with all the raptor stipulations and the sage-grouse stipulations and the crucial winter habitat for this and deer and elk and all of that type of thing there was only a small window of opportunity to drill which was, sometime, in some opportunities less than three months, or three months only. So that was kind of an interesting thing to show BLM, to show other people, this is really the only opportunity to drill, because of all of these stipulations you put upon us. So it gave, what the incentive is for other organizations to do this, is that it tells them: 'these are the reasons we have concerns about certain things, certain regulations that you put upon my – as a permittee, as a whatever, is because I'm not allowed to use my valid and existing right because of this'...

In the case of the IMPLC, a situation assessment had been conducted by a separate contractor, and the facilitator applied for the mediation position after the assessment had been conducted. Participants were generally dissatisfied with the first contractor, but very happy with the work done by the facilitator, in large part because the group selected their facilitator. In hindsight it would have been more beneficial to couple the assessment and mediation. Without having conducted the situation or conflict assessment, the facilitator was less knowledgeable about participants' BATNAs. While the facilitator had access to the assessment, if the facilitator would have conducted the

assessment, they would have had a better understanding of the conflict and stakeholders.

The facilitator for the IMPLC stated:

In retrospect, I think it's better to keep the assessment and mediation together I guess, because I think I would have set the mediation up fundamentally different, had I done an assessment and spent a lot more time talking to the groups about what their alternatives were. Because quite frankly ... I think they had better alternatives not at the table.

This statement points to the need to conduct a situation assessment, but also to focus that assessment on peoples' alternatives in order to effectively structure the collaborative process. Also, the idea the participants had better alternatives away from the collaborative approach, was shared by several other participants.

Power

Power in the IMPLC took various forms, including cooperating agency status, personal connections, public support, ability to stall the process, or having interests that coincided well with those of the current federal administration. The prevailing western conservative culture in the area where the IMPLC was operating is often skeptical and distrustful of government agencies and their motives. Local government officials in the area wanted a more localized approach to land management for BLM lands and the IMPLC was born in part from an effort by the local government to gain more control over the decisions for public lands. This was made possible in part because of personal connections of some IMPLC participants in the federal government. One respondent commented:

...[the local government] saw an opportunity to try to, you know, 'we got a new sheriff in town with the Bush administration, and we can try to get some things in place that we think will work more to the way we think they should be working, they'll be amenable to it'. ... some different proposals that came out were, basically it was proposals to have, you know the [local government] appoint you know, boards, trust boards, to

make the decisions for the public lands, okay, and how they'd be managed with these appointees. And ... they would get these things from the ... Department of Interior, because some of the folks around here have direct ties and direct access to some of those folks...

This participant goes on to state that it was a combination of the local government's interest in and access to area public land management and policy that finally brought them to the formation of the IMPLC, coupled with the BLM recognizing a greater need for more comprehensive local input on lands management. However, as one participant states, while the local government was seeking more control of federal lands, they also had a sincere interest in engaging the local community and a wide variety of stakeholders in decision-making:

...[the local government] was trying to sell this to the Department of Interior, and they said: 'Sorry, this is illegal. As much as we like you [local government], this seems a little illegal even for our radical right administration'. So if that wasn't going to work, then the [local government along with the local BLM office], got the idea of: 'well let's, let's get a real collaborative community group together'. Because the [local government] was sincere about participating and getting locals to participate. And that's something the BLM was all about too, so they set up ... training[s], and invited ... people from the local community ... and folks got really interested, and they said: 'hey let's, let's keep this group going', and that's when the [Intermountain Public Lands Cooperative] was kind of formed.

This participant recognizes both the local government's desire for more control over public lands, but also their enthusiasm for better, more comprehensive public engagement from local stakeholders.

Much of the environmental community also cited the local government's efforts to "run away with the public land management" as a key area of environmental concern and an impetus for engaging in the IMPLC. Some participant's personal connections to the Department of Interior was also cause for much of the speculation from other

participants about the actions of local government in the collaborative process and about their actions outside the collaborative effort. One participant stated “I don’t think collaboration was ever [the local government’s] real goal in it, they pretty much wanted hi-jack a whole BLM resource area.” The same participant elaborated:

Every [local government official] for as long as I can remember, they’ve all ran for office [on the platform]: ‘there will never be a wilderness area in [this] county’, you know, and ... one of the reasons I originally participated is I thought they might, you know, be able to use [the IMPLC] as this political cover that ‘okay we can agree to you know, such and such areas being wilderness because you we’ve got the backing of the stakeholders – oil and gas, ranchers, and people that usually oppose it’ ... but ... they pretty much took the, the stance that ... not one acre of this one and a half million acres of this resource area will have any conservation designation on it, and they never did budge from that. So how do you reach consensus ... on something like that? How do you compromise?

Interview respondents speculated about others’ willingness to cede power during the IMPLC collaborative process. Some participants from conservation interests felt that local government and oil and gas developers at the table in the IMPLC were likely to have their interests met with or without the collaborative effort, because they were aligned with interests of the federal government. According to some respondents, this created a disincentive for those stakeholders to act collaboratively or make compromises in the process. One participant stated “[t]hey were going to get their way no matter [what]...” because of the conservative federal administration at the time of the collaborative effort.

Several participants felt that there was a genuine intention to act collaboratively by those with greater power, however the actual action of doing so was more difficult for participants and some had a hard time giving up their power for the process, despite their intentions:

...for example, I think the [local government] sometimes felt like ‘of course we’re going to share, we’re going to let people pull up a seat at the table and help make these decisions, but, you know, we’re still in charge of things’. And so I mean it’s one thing to offer seats at the table and it’s, you know, kind of another one to offer seats at the table and really engage in ... common decision-making and, particularly when BLM, at different levels was sending various different signals, so I think, it was a big leap [for] a lot of people to go from what had been a fairly hierarchical process to you know, ‘let’s try to do this together’ ... I think people sometimes meant it philosophically but they didn’t make the actual practical leap to pen on paper.

This participant felt that those with greater power in the collaborative process had the intention of giving up or reallocating power for the sake of the process, but were not able to execute that intention.

Cooperating agency status with the BLM was another way that participants had power. One participant described this as power that would potentially be used without the IMPLC or if the IMPLC was unable to reach consensus:

...[with] cooperating agency status ... there is a defined role for local government that sit above the citizenry ... it’s both statutory and regulatory in nature ... and those agencies that choose to exercise and use this, this deal have a ... different conversational relationship with, with the decision-making agency than does the public. And we said early on, we choose to use this table [the IMPLC], but everybody is made very well aware of that if this table isn’t used appropriately, we reserve the right and will continue to use our role through cooperating agency status. Which to me was the right way to do it because everybody gets a seat at [the IMPLC] table, only some get a seat at [the cooperating agency] table ... and what we were trying to [do] in that was give the [environmental groups] and those that had issue with us a real – if they were willing to exercise it – a real dialog and interaction with the community...

Another person from a different perspective on cooperating agency status said:

...I think everyone did have equal weight in the IMPLC discussions, but, knowing that the [state wildlife agency] and [the local government] had cooperating agency status in the process, put everyone at a little bit of a disadvantage and I think that, in my opinion that became pretty obvious ... [they had] a greater opportunity to get their way. Not that they *would* get their way, and, but you know, they had the upper hand and it became

apparent that the [wildlife agency] was taking a position where you know they wanted to establish some radius around the [sage-grouse] lek sites and then it also became obvious that [the local government] wanted to implement the surface occupancy restrictions in exchange for eliminating season stipulations and, so, the discussions really centered around those two positions and, you know no single entity that made up the rest of the IMPLC group really had enough power to override one of those two positions. So I guess from that standpoint, we're all equal and from that standpoint the fact that we couldn't come to an agreement on those two major issues, and the fact that we didn't come up with a community alternative, kind of led itself to the idea that, that all of the other representing entities have equal weight or lack of any dominance.

Whether or not those with cooperating agency status actually *had* more power than other participants in the IMPLC process, their status affected perspectives on power. Those that had cooperating agency status often felt that they were genuinely using the IMPLC *instead* of that status in support of a more collaborative, community-based approach. However, some participants without that status, felt that this was one more example of how local government interests would be met should the IMPLC not be able to reach agreement.

The IMPLC process, similar to most collaborations, experienced power inequalities. Interviews varied on perceptions of other participants' power, indicating that there was widespread speculation about power and authority in the group. Interviews suggest that perceptions of power inequality have the same effect on other participants' feelings and actions as real power inequality.

Summary

The IMPLC incorporated diverse stakeholder interests and tackled difficult, entrenched issues. Most participants found the facilitation to be effective, but believed the process was not able to overcome core conflict between competing values and interests. Respondents felt that stakeholders were unwilling to collaborate on contentious

issues and lacked incentives to compromise. The facilitation of the IMPLC would have benefited from coupling the situation assessment with the mediation. Clarification of participants' BATNAs before beginning mediation would have helped improve trust and transparency in the group and structure the collaboration. There was much speculation about what went on behind the scenes between stakeholder groups and what people would do after the fact, despite statements about improved transparency. This was due in part to perceptions of power inequalities between stakeholders. While participants felt that the process of collaboration was very beneficial to the local community and area stakeholders, suspicions about others' motives and use of power persist both during and after the conclusion of the IMPLC collaborative process.

CHAPTER FOUR

THE ROLE OF SCIENCE IN NATURAL RESOURCE COLLABORATIVE DECISION-MAKING: A CASE STUDY OF AN INACTIVE COLLABORATIVE GROUP

Abstract

Collaboration is emerging as a potential solution to contentious natural resource management issues, but there is a need for deeper investigation of role of science in the process, including participant perceptions of its usefulness for decision-making, its role in conflict, and its ability to address management questions. To address these gaps, I interviewed participants in an inactive collaborative group in the Intermountain West and analyzed their perceptions of how science was used in the process. This collaborative group did not reach its primary objective and struggled with the effective communication and integration of science into their decision-making process.

I found that for this group, science was both a means to overcome conflict as well as a source of increased conflict. Participants questioned whether science could inform the environmental decisions with which they were grappling due to questions about the validity and scale of scientific information, and its relevance for resolving value-based conflict. The individual who presented scientific information and their communication style played a large role in how science was perceived. Finally, participants found adaptive management to be a useful learning experience, but were concerned about the

feasibility of its implementation. Ultimately, participants were supportive of using science for decision-making in theory, but had concerns about its utility for the specific management decisions they faced.

Introduction

The Intermountain Public Lands Cooperative (IMPLC) (pseudonym) is an inactive community-based collaborative group located in the Intermountain West. The IMPLC was formed in order to alleviate stakeholder conflict over land use in a Bureau of Land Management (BLM) resource area. Later, its main function became to provide public input to the BLM for their revision of the local Resource Management Plan (RMP). Key areas of conflict concerning the RMP revision were proposed oil and gas development and wilderness designations, as well as concerns about wildlife habitat, recreation and livestock grazing.

Science can potentially help manage conflict and produce better, more informed land management decisions in collaborative groups. However, there are gaps in the available literature about how stakeholders perceive and use scientific information for land management decisions in a collaborative context. Research is needed to understand how science can be used to better inform decision-making, how science influences conflict, and how to communicate scientific evidence effectively. While there are many hurdles to the use of science for collaborative decision-making, a better understanding of how stakeholders perceive and accept scientific information, and the communication of science, can help guide and improve the use of science in collaboration.

Collaboration has been indicated as a possible means to overcome natural resource conflicts and promote social, economic and ecological sustainability (e.g. Adler et al., n.d., Leach, 2006), but there is relatively little research on the long-term effects of collaboration on sustainability. While many agree that natural resource decisions should and can be based on scientific evidence (Weeks and Packard, 1997), information is needed to understand how stakeholders interpret and use that information for decision-making. The ability of lay audiences to incorporate scientific information effectively into decision-making has been questioned (Daniels and Walker, 2001), and highlights the types of information produced by scientists, as well as the accessibility of scientific information (Palmer et al., 2005).

This chapter seeks to improve our understanding of the role of science in collaborative resource management by exploring how science was incorporated into the IMPLC collaborative process, including the attempted use of adaptive management. The analysis focuses on the hurdles participants encountered with scientific evidence, and participants' perceptions of the role science played in conflict and collaborative decision-making. This chapter begins with a synthesis of existing literature about the role of science in collaborative resource management, followed by a description of the case study and methods, presentation of the findings, and discussion of their implications for collaborative practice.

The Role of Science in Natural Resource Collaboration

Environmentally sustainable decisions depend on scientific information to promote ecosystem health and predict ecological consequences of decisions. Ecosystems that are managed for a variety of demands (such as public lands) should incorporate the

“...best available scientific information, and management decisions should represent the application of available science” (Weeks and Packard, 1997, p. 236). Also, science is potentially a means to manage conflict and establish common ground in collaboration (Adler et al., n.d., Leach, 2006). However, scientists and stakeholders experience many hurdles to better incorporating scientific information into collaborative processes to manage conflict and inform decision-making. In order to do so effectively, scientific data must be available and accessible to stakeholders, perceived as accurate and applicable to the issue, and well-communicated. Further information is needed to understand how procedural factors, communication of science and scientific data influence the use of science in decision-making and how science can be most effectively integrated to the collaborative process.

Public involvement in management decisions suffers from a paradox of the requirements for both inclusive deliberation and technical competence (Daniels and Walker, 2001). This paradox contributes to the hurdles of effective incorporation of science into decision-making and makes the effective communication of science more difficult for scientists who are not trained in communicating technical information to a lay audience. Daniels and Walker (2001) elaborate that;

[c]itizens demand technically sound decisions, but as situations become more complex, fewer people have the technical background needed to either meaningfully contribute to, or critique, the decisions. And by the same token, these complex situations often touch people’s lives in fundamental ways (p.4).

While the public may be viewed as technically inept, their ability to grapple with and grasp complex scientific concepts is often underestimated (Fischer, 2000). Nevertheless,

the capacity of the public to participate in technical, science-based conversations will continue to be an important and often frustrating aspect of collaborative processes.

While science and problem-solving appear to go hand-in-hand, the way in which the public relates to science has a large impact on how that information is perceived and wielded (Kim, 2007). Sustainability of ecological and social systems requires a more collaborative role for science and scientists in the decision-making process but there is a lack of information concerning specific methods for integrating local knowledge and science in policymaking processes, particularly stakeholder partnerships (Palmer et al., 2007, Failing et al., 2007). According to Cash et al. (2003);

...scientific information is likely to be effective in influencing the evolution of social responses to public issues to the extent that the information is perceived by relevant stakeholders to not only be *credible* [adequacy of scientific arguments and evidence], but also *salient* [relevance of data to decision-making needs] and *legitimate* [objectivity of data and scientists] (p. 8086).

In order to better incorporate science into natural resource collaborative processes, research is needed on how to effectively cultivate credibility, salience and legitimacy of information, as well as how to communicate that information most effectively.

Palmer et al. (2005) argue that ecological scientists have not done enough to collaboratively engage with other stakeholder groups, management agencies and experts, despite the inherent need for interdisciplinary ecological science. Ecologists have a long-standing reputation for disseminating information in a manner that is intended for a narrow scientific audience and to a large degree have failed to make that information applicable and/or useful to decision-makers in natural resources (Risser, 1993, Powell and Colin, 2008). Such disconnect is often due to research that does not directly relate to management questions (Palmer et al., 2005) as a result of scientific tradition and practice.

Scientists frequently either lack access to, or as researchers fail to give priority to, the questions for which user-groups seek answers (Palmer et al., 2005). In order to incorporate science into collaborative decision-making, decision-makers must have better access to information and have the technical skills needed to decipher that information.

In environmental conflict, stakeholders generally have largely unequal access to and understanding of pertinent scientific information, which may be available but difficult for stakeholders to access (Adler et al., n.d.). Most lay people do not have easy access to technical information sources such as scientific journals and research databases. Additionally, stakeholders may not know or be able to articulate what information is needed and may lack ways to identify the information or who they should get in touch with in order to access the information (Adler et al., n.d.). According to Powell and Colin (2008), bottom-up citizen engagement and influence on science and technology and its policy requires continual top-down assistance and encouragement (Powell and Colin, 2008). Their findings have been that;

...without some assistance from people within institutions and without systematic institutional support, 'average' lay citizens—even empowered citizens—are unlikely to have enough resources, access, energy, and power to engage with scientists and policy makers in ways that will have meaningful societal outcomes (Powell and Colin, 2008, p. 132).

Thus the integration of science in collaboration requires better access to scientific resources and participant learning, as well as to scientists themselves.

The incompatibility of science and questions from the public, in some cases, is a result of the scale and scope of scientific research relative to public processes, which are carried out differently and can be difficult to merge. Thus, decision-making in natural resource fields often lacks scientific information, even when the information is partnered

with an articulated need (van Wyk et al., 2008). Scientists often research ecological issues at a scale that does not offer direct counsel to decision-makers or link directly to public interest or need (Norton, 1998). This incompatibility between data sets generated for research and the data needed for management discourages the use of science in decision-making. While policy and land management should be based on ecologically sound information, policy decisions are often driven by values instead. Collaboration also requires that data relevant to management questions is available to decision-makers, and communicated effectively.

Science has traditionally been viewed by the American public as a policy-neutral and objective process, resulting in a relatively positive view of science (White and Hall, 2006). However, White and Hall's (2006) recent analysis shows the public is becoming increasingly skeptical. Those authors state that "...the public may know, articulate, and accept the traditional view of science, while at the same time maintaining skepticism about how it is utilized in any given circumstance" (White and Hall 2006, p.309). Public doubt, they argue, has been a result of several factors, including the media's exposure of incorrect or socially influenced science; scientific experts who disagree over information in the public arena; and politicians' use and exploitation of scientific knowledge and its uncertainty (White and Hall, 2006).

van Wyk et al. (2008) propose that the communication misalignment between information gatherers and seekers in natural resources is due in part to cultural or contextual differences between scientists and other stakeholder groups. Scientists lack incentives to disseminate information to the public, largely due to the nature of scientific inquiry and its institutions (Powell and Colin, 2008). Failing et al. (2007) state that while

public values and involvement in natural resource decision-making have changed over recent years, often asking different questions of science, scientific methodology and its role in policy have not kept pace and in many cases have kept to more traditional scientific methods. The tradition of scientific inquiry has long specified a discrete role for scientists and research. Collaborative natural resource management requires the scientific community to re-think this paradigm, but this may be a difficult task for scientists due to: 1) the culture of science, 2) the lack of incentives (scientists are not generally rewarded for spending long hours at public meetings) (Powell and Colin, 2008), and 3) many scientists lack the communication skills to participate effectively. Additionally, scientists are often used to being the expert and may be uncomfortable with the types of questions the public asks them, some of which are outside their field, they cannot answer, or regard issues of values, ethics, regulations and risks, or technical details (Powell and Colin, 2008).

Successful use of science in natural resource decision-making can depend on social context (Weeks and Packard, 1997) and the incorporation of science can be affected by the relationships of the community to information provider and the way in which the public perceive and accept science and scientists. Some of the difficulties include the use of technical jargon, complex graphs and diagrams, or a condescending tone. Resource-dependent communities and user groups such as ranchers may rely on factors external to the scientific process to judge scientific information (Weeks and Packard, 1997, Fernandez-Gimenez et al., 2005). Better incorporation of science to decision-making requires scientists to think more broadly of communication as multi-directional debate and dependent on context (Davies, 2008) and decision-makers to

communicate more effectively with scientists about what information is needed for management decisions.

There are several recommendations for using science to manage conflict in natural resource collaboration. Failing et al. (2007) recommend a thorough examination of “competing knowledge claims” in an attempt not to eliminate differences, but rather to better understand the knowledge claims, their implications and select the best-fit management actions. Leach (2006) suggests that a professional forum of scientific experts, in which a facilitator pressures them to justify claims in the presence of their peers, may be useful required to build consensus for scientific issues that are disputed in collaborative processes. Other approaches to integrate science into decisions-making include joint fact-finding (Weible and Sabatier, 2009), citizen science (Cooper et al., 2007, Couvet et al., 2008, Silvertown, 2009) and adaptive management (Holling, 1978, Bormann et al., 1995, Murray and Marmorek, 2004, Walkerden, 2005, Allan et al., 2008), all of which involve non-scientists in the information gathering process. Public participation in the generation of scientific information can potentially change the perception held by the public about the value of scientific evidence (Cooper et al., 2007).

In sum, while there should be an increased emphasis on scientifically based management decisions within natural resource collaboration, there are many barriers to effectively integrating those knowledge systems. More information is needed to explain how science can be successfully conducted at a scale that is relevant to decision-makers, and communicated to the public in a manner that is understandable and increases their knowledge of ecological systems and processes. Further research will help to identify strengths and weaknesses of science and scientists in collaborative natural resource

management planning, and provide insight on how such integration can be improved in order to meaningfully engage the public and better inform land management and policy decisions.

Adaptive Management

Adaptive management (AM) is a process of applying the principles of scientific experimentation to natural resource management, providing a means to make better management decisions in the face of scientific uncertainty. It provides one potential approach to overcome some of the challenges of integrating science into natural resource decision-making. Adaptive management operates on the premise that environmental management and policy should be adaptive rather than reactive in nature, such that management and policy integrate ecological, economic and social systems early and throughout the planning and implementation of management actions or policies (Holling, 1978). Adaptive management of ecosystems aims to embrace uncertainty and acknowledge that we will never have complete understanding or comprehensive knowledge available to support decisions (Holling, 1978, Murray and Marmorek, 2004). Adaptive management operates by learning through the management process and adapting subsequent decisions (Bormann et al., 1995). While uncertainty about management can erode confidence in actions, AM enables management to proceed in the face of uncertainty, gaining confidence by systematically improving the chances of achieving desired outcomes (Murray and Marmorek, 2004).

Additionally AM is more able to manage uncertainty and account for interdependencies of “complex social-ecological systems,” by broadening participation in the scientific process in order to understand and manage those systems (Levrel et al.,

2009, p. 173). Uncertainty in ecosystems is – and will continue to be – inherent to natural resource management (Holling, 1978, Murray and Marmorek, 2004). Decisions must be made in spite of the unknown and must anticipate the unanticipated and unexpected in dealing with management (Holling, 1978). Adaptive management design embraces these factors, promoting system resilience by assessing, monitoring, evaluating and re-thinking management decisions throughout the process (Holling, 1978). Adaptive management relies on monitoring and assessment to continually refine and inform management practices (Ringold et al., 1996).

Adaptive management is an iterative process, where participants first identify management needs, uncertainties and specific questions, and plans are designed to implement AM based on those needs and uncertainties (Holling, 1978, Moir and Block, 2001). This is followed by rigorous monitoring, which continues to inform management actions and design, and is used to restructure management questions and monitoring efforts as knowledge is built and tested (Holling, 1978, Moir and Block, 2001). Adaptive management employs these specific procedures and protocols, requiring rigorous consideration of all phases of policy, management and assessment. However, the term ‘adaptive management’ has often been misapplied (Murray and Marmorek, 2004, Gregory et al., 2006), which may dilute the concepts and applications of AM (Murray and Marmorek 2004). Project managers may sometimes believe that they are using AM if their management includes “...any semblance of ‘adapting’, either to knowledge or events”, rather than a specific set of procedures and actions that pay close attention to monitoring and assessment (Murray and Marmorek, 2004, p. 1).

Critiques of adaptive management include: issues of scale, where AM often fails to address long-term or slow ecosystem feedbacks and responses (Moir and Block, 2001); lack of attention to management needs and inability to provide explicit guidance for management actions during the AM process (Gregory et al., 2006); and unfeasible geographic and time requirements relative to available resources to rigorously monitor and assess during the AM process (Gregory et al., 2006). Additionally, institutional barriers exist, such as management agency protocol and planning for land management and monitoring. These factors make AM difficult to implement from theory to successful on-the-ground adaptive management (Stankey et al., 2003).

Ringold et al. (1996) suggest that AM is particularly applicable when managing large and complex ecosystems. Federal lands are good candidates for AM because they are generally areas with dynamic ecosystems and high levels of uncertainty (Moir and Block, 2001). However, AM must be well-understood and implemented in order to benefit the process of large-scale ecosystem management plans.

Research Objectives and Questions

There are many barriers to effective integration of science into collaborative natural resource decision-making. The objective of this research was to explore the role of science in the IMPLC process and identify ways to improve the use of science in natural resource collaboration. My specific research questions were: 1) When was science useful to inform decision-making and when was it not useful? 2) What role did science play in diminishing or escalating conflict? 3) How did the presentation and communication of science affect participants' acceptance of the information? 4) How did

participants perceive adaptive management and what effect did AM have on the incorporation of science for decision-making?

Methods

In this qualitative case study, I used semi-structured interviews and a modified grounded theory approach to collect and analyze data on the use and perceptions of science in the IMPLC. The IMPLC mailing list included approximately 150 people, about thirty to sixty of whom attended meetings regularly and participated actively in the group. I interviewed twenty-one participants between August 2008 and November 2008, using semi-structured, in-depth interviews. Participants were identified using a networking method, and sampling continued until nearly all recommended participants had been interviewed, and at least one participant was interviewed from each stakeholder group. Interviews ranged from thirty minutes to three hours in length and averaged about just less than one and a half hours. Interview questions covered a range of topics including communication, conflict, the role of science, social capital, collaborative process and success in the IMPLC. Interviews were audio-recorded, transcribed and coded using NVivo qualitative data analysis software and Microsoft Excel spreadsheets.

Analysis for this chapter focused broadly on respondents' perspectives on the use of science for decision-making in the IMPLC, and their perspectives on adaptive management. I used a modified grounded theory approach in this analysis (Fendt and Sachs, 2008). Grounded theory is the systematic gathering and analysis of data in the research process, and undergoes three steps of open, axial and selective coding (Starks and Trinidad, 2007, Strauss and Corbin, 1990, Corbin and Strauss, 1990). Open coding is the process of categorizing data by grouping concepts around phenomena, axial coding

puts data back together by using the categories and sub-categories from open coding to make new connections and meaning, and selective coding systematically integrates these categories and relationships (Strauss and Corbin, 1990).

Modified grounded theory, asks specific questions of the data – allowing the researcher to be more insightful and productive when looking at specific problems or phenomena (Fendt and Sachs, 2008). During the analysis of interview texts, I identified emergent code categories, then compared the interviews to identify themes and variations within and among respondents and stakeholder groups. The IMPLC interviews were openly coded for portions of interview responses that were relevant to the research question about science and adaptive management. They were then coded a second time to make distinctions between perspectives on AM, science, its presenters, and its usefulness in theory and practice. Finally, through selective coding, recoding, and constant comparison, themes were created to relate to the overall phenomenon. Using coding, matrices and taxonomies as well as direct quotes, interview data were analyzed with some interesting findings about these themes. Indicators of effective use of science for decision-making were compared against existing collaborative literature in order to determine whether this case confirmed or contradicted existing theory and empirical findings, which would either strengthen existing generalizations or undermine them. Emergent themes throughout the analysis process were assessed based on their applicability and relevance to the research questions.

Findings

Science was both a source of increased conflict as well as a means to overcome conflict in the IMPLC. The group encountered several barriers to the effective use of

science to inform decision-making, including the lack of available science, available science that was not relevant to specific management issues, lack of site-specific scientific data, and the irrelevance of science to value-based decisions. The acceptance of scientific information largely depended on how it was communicated and stakeholders' perceptions of the information presenter or source with respect to objectivity, familiarity with local culture and concerns, and attitude towards the audience.

Use of Science in IMPLC

The IMPLC dealt with a range of issues where scientific evidence was needed or used to provide specific information for management decisions. These were mostly associated with core areas of disagreement about the resource area, including oil and gas development, greater sage-grouse habitat (a threatened wildlife species), wilderness characteristics, livestock grazing, and off-highway vehicle (OHV) impacts. Specific information needs about the greater sage-grouse included its habitat characteristics, and potential effects on the species and its habitat of specific management actions and development, such as the time of year, type and proximity of drilling, road creation, and livestock grazing. Information was also needed about the effects of OHV use on rangeland ecosystems, wildlife, and cultural resources. There was also a large need for specific information about the potential impacts and benefits of oil and gas development (i.e. road creation, potential drilling techniques, and potential for production, as well as impacts on natural and cultural resources). General information was also needed on ecosystem health and sustainability.

The IMPLC used a variety of means to incorporate science into the decision-making process for these issues. Experts from various research and professional

backgrounds were invited to present to the group, often using PowerPoint presentations. Some subcommittees of the IMPLC conducted scientific studies (such as a state university-led OHV monitoring effort) to inform management decisions. Stakeholders occasionally brought in their own experts to present scientific data about IMPLC issues. Additionally, individual stakeholders gave scientific presentations at meetings. The BLM as well as other federal agencies regularly provided scientific presentations at IMPLC meetings using their staff. The IMPLC incorporated adaptive management (AM) trainings and workshops into their process, aiming to incorporate AM in the RMP revision.

Scientific information was communicated at IMPLC meetings in a variety of ways, including PowerPoint presentations, talks, site visits, and interactive trainings. Nevertheless, most participants felt to varying degrees that the science provided was not sufficient for their purposes. Eleven interview participants stated that there was a clear need for more scientific information in the IMPLC, while only one respondent found there to be sufficient science for the group's purposes. This person felt that science was available, but that IMPLC participants were not able to properly interpret the data. One respondent described science in the IMPLC, stating that sometimes they conducted workshops on scientific issues, and...

...otherwise it was during, during meetings, you know, we would set aside half an hour or even it wasn't on the agenda, there would be a little session... Some of it was formal, some of it was informal, some of it was coming from BLM, some of it was coming from other agencies, and then some of it was coming from the interests. Where environmentalists or oil and gas companies would get a biologist in to talk their end of the science or you know, what they thought the results meant or stuff like that...

The somewhat loose use of science in the IMPLC allowed for a variety of presentation forms and presenters, including presentations by stakeholder groups. Participants were supportive of the open-process with information-sharing, but also identified a need for more science and most participants felt that there was a need for more objective sources of scientific information.

Given the inherently ecological nature of the issues with which IMPLC was dealing, there was an overall sense from the group that the IMPLC lacked the science to inform those decisions. This view stemmed from participants feeling that there were too few presentations on specific scientific evidence and/or a perception that data were not available for these issues at all. One participant, outlining some of the perceptions about the way science was and could be used in the IMPLC, stated:

...I think science was supposed to be used, and in some areas was, but, science is numbers, well mostly, usually, and numbers can mean anything you want them to say, and so the different stakeholders would present their own set of numbers, and I might ... present my set of numbers, and you present your set of numbers on the same issue, and they'd look entirely different, based on where I wanted to go, and where you wanted to go. And, I've seen that quite a lot. I've seen science presented as, 'well let's look at this. A little bit of a dummy would see anything different here', and based on what you gave me, I could agree, but that wasn't the whole picture, I might say. And so, while science was purported to be the basis for a lot of things, and in some cases it was good, and it was used, and I think [in] quite a few cases and issues ... it was dueling science.

While other participants generally had greater confidence in the validity and applicability of science for land management, these issues of dueling science and the applicability of data to management in the IMPLC were common throughout the interviews. The following sections will elaborate on these themes.

Availability, Applicability and Relevance of Science

Three major themes that emerged from interviews about the use of science in the IMPLC were the availability, applicability, and relevance of science. Participants stated that in many cases science was not available for decision-making, and questions arose about the science that was available, regarding both its relevance to IMPLC issues and its applicability for IMPLC land-management purposes. One participant commented:

I think on a fairly regular basis we always tried to have whatever we knew was factual basis out there ... and to try to lay down as much factually and ... to get a lot of clarity on that ... 'do we all agree with these basic solid steps here?' and then to build on that in terms of 'ok, now what [does] that mean in terms of policy' ... but I, you're just talking [about] a huge piece of land with not a lot of data, so I think we reasonably tried to use what was there.

As this participant stated, while attempts were made to base discussions on scientific data, participants felt that sufficient data was often not available to the IMPLC. In particular, the IMPLC lacked scientific evidence on oil and gas drilling and sage-grouse habitat.

Another participant, stated:

I left my masters degree thinking that all the decisions in ... rangelands were made by science, you know? When should you put cattle in the pasture ... how do you reclaim a disturbed surface ... when [do] grasses grow and you know the, the taxonomy behind 'em and what it takes and all this stuff. And when you get into the world of federal land management, science is not out the window, it's just, it flat out doesn't exist. Nine out of ten items out there don't have science behind it. You use judgment to make a call ... politics trumps science. It does. It does. And the reason is that science doesn't exist in the areas you need it.

The misalignment of available science and the information needs of policy and decision-makers was a common frustration for IMPLC participants.

Additionally, participants stated that there was dueling science, which could only be resolved with the use of policy, due to a lack of good, concrete scientific answers:

...science is just sort of a word you can throw around, but there's not a lot of ... really good science on a lot of these issues. One [and a half] million acres. I mean you got the [sensitive plant species], what's the science on impacts of grazing on it? I don't know. A cow stepping on it probably isn't very good for it, build an oil and gas well on top of it wouldn't be good for it. I know that those are direct impacts, but, I don't got a study in my back pocket about how many AUMs or how many cow hooves, what proximity to a gas well is going to affect that rare plant that grows nowhere else on earth, you know? And when that's put back in your face: ... 'well what's the science that supports you position that this whole area should be off limits to oil and gas drilling, simply because there's some rare plants that grow there?' It's like: 'what's the science to support your position that there's millions of dollars to be made drilling for oil and gas there?' You know, and it's the same sort of thing. So ... for a lot of things the science didn't matter, and the bottom line was, you know, bigger political issues.

The issue of policy and values deciding decisions rather than science, as this participant pointed out, also relates to the problem that science could not effectively address issues at a management level.

Another problem that participants brought up was the cost of science. People felt that getting good scientific information was a costly endeavor and questioned whether or not this was feasible. Thus science was perceived as not only unavailable, but also for some people the development of scientific research to address these management questions was also perceived as unfeasible.

Participants also felt that scientific information needed to be site-specific to their area in order to be relevant:

...when it comes to some of the science and some of the data collection ... one thing that we did learn is we need more science and we need more data collection ... [it's] certainly apparent [that] we need a lot more of that. We do need more. And I think with, for example, with sage-grouse we need more science in relation [to this state], we need – I'm not

speaking for other states because there is some out there [for those states] ... but in this state we need more science in relation to oil and gas, in relation to sage-grouse, in relation to other wildlife. And I think that's important. We don't have that yet and we need to develop that, we need to work on that, we need to have more science for that. So, I think that, the BLM and [other federal agencies], you know did present ... some science ... and I think the environmental groups tried to present some science but ... we didn't have science that was related within our area within [this state]. We had science that was from [other states] ... and I don't think we had anything that was site specific...

This participant addresses both the need for scientific information specific to their area of management, as well as the lack of science that links land use actions to specific issues, such as the effects of oil and gas development on sage-grouse.

Intermountain Public Lands Cooperative participants expressed that information was needed about the greater sage-grouse species, effects of oil and gas development, oil and gas potential for the area and effects of management actions for different interests (i.e. wilderness, wildlife, grazing, recreation, and energy development). Respondents also voiced a theme that when information was available for these more contentious, interrelated and large-scale management issues, data sets were limited by their relevance (whether or not information was specific to their question and needs) and applicability (whether or not participants knew how to or could *apply* information to land management).

Several participants felt that the available science was either too site-specific and could not be extrapolated to management-relevant spatial scales or lacked site-specificity. The relevance of scale was a key point for participants, who felt that while science is necessary in decision-making, research data are often are not applicable to landscape-scale management decisions. One such participant stated:

...could you find science on sage-grouse? Yes. Reclamation? Yes. Oil and gas drilling? Yes. But did it answer whether oil and gas could be drilled in [a particular portion of the resource area] and still reclaimed? No.

This person and others felt that while scientific information was available on the smaller, more straightforward issues, the group's major decisions were at a much broader scale, and that scientific information that applied these larger-scale, more complex, decisions was not available. For example, participants felt that information was available for management questions that were well researched and familiar such as the effects of grazing in their area and effects of fire for management purposes. However, broader issues dealing with how different facets of the ecosystem affected and were affected by other management actions, such as oil and gas development on sage-grouse leks and brooding sites, lacked scientific evidence for decision-making.

Participants felt that there was a large need for more scientific information that was a site-specific to the contested areas both in terms of scale and scope. One participant stated, elaborating on issues of site specificity:

...there were a lot of studies coming out of [other Intermountain West states] and that was a problem ... because those were the data sets that the environmentalists had available to really build their case on ... for protecting that area and ... [the local government] as a defender of the oil and gas industry was very critical of the available science because ... as I remember ... the reasons for their lack of confidence in existing data was that, that data was taken in another location and in another area and didn't really apply to [this county] and to the conditions we have there ... and that in and of itself, that issue right there created major conflict...

Participants felt that lack of site-specific, good science was a major barrier to its incorporation for decision-making. Another participant stated:

...clearly lateral drilling at the point in time in my mind where ... you were starting to see it in different places in the country increasingly, there's lots of talk about it [in another area of the Intermountain West], so

I think a lot of people from the environmentalist side were thinking: ‘well, there’s some potential there ... why don’t we pursue that’, and ... a lot of the oil and gas folks ... were like: ‘eh, this is a different geology here, it’s not going to work’. And I think there wasn’t enough trust or knowledge to know ... which was the case.

This participant highlights not only the need for more information, but for that information to be site-specific to the contested areas in order for stakeholders to be able to use science in decision-making for a specific area of land.

While participants appeared to be in favor of using scientific information for natural resource decision-making in theory, the actual application of science to IMPLC decisions was problematic. Respondents felt that there was a lack of relevant science for their specific questions, needs and locations. They also felt that data collection and science were not conducive to the questions they needed answered, such as landscape-scale management outcomes and system-wide consequences for actions (or inaction).

The Role of Science in Value-based Issues

While many participants agreed that science was an important component to land management decision-making, some questioned its relevance to issues that were value-based. Many participants stated that the decisions the IMPLC was dealing with in the RMP revision were value-based issues. These issues were the core points of conflict in the IMPLC, including proposed oil and gas development, wilderness designation proposals, livestock grazing and greater sage-grouse habitat. These decisions were particularly contentious for the specific portion of the resource area, where most of the participants had a large stake. Interviews revealed that some participants felt that while scientific information would have been useful, it could not inform or resolve the core

conflicts in the IMPLC and that many of the group's questions were about policy rather than science.

Among the issues where conflict was high, livestock grazing and greater sage-grouse habitat were seen as more conducive to scientific answers (though limited by the applicability and relevance of available data). Decisions about oil and gas development and wilderness designation were more likely to be seen as issues that science would not be able to address given their grounding in people's values about land.

Seven participants felt that the core value-based issues in the IMPLC could not be resolved by science and only one respondent felt that science could address those value-based concepts in order to inform decision-making. Value-based issues, some participants said, did not lend themselves to science as compared to the more straightforward management decisions:

...it's easy to convince people – whether you're a rancher or whether you're simply interested in healthy plant communities – it's easy to convince them that fire's good. If you're a rancher, fire inevitably leads to more livestock feed, if you're into ecosystem health, I mean the science leads you right there. [But] when you're talking about oil and gas and you're talking about you know, say for example, wilderness values ... I mean, you get into a direct conflict with; [a value that] the nation needs energy you know, these companies deserve to make money off of this resource ... versus ... [a value that] there's certain parts of the landscape that ought not to be part of human progress ... I mean those are eternal questions and they don't always lend themselves to scientific answers.

This respondent, as well as others, felt that the IMPLC's core areas of conflict were not questions of science but rather of individual values. They felt that science was not applicable to those concepts. Another participant stated:

...science will never come along to tell you whether wilderness is good or bad. Or to tell you whether this country should be drilled for oil or not.

Another said:

...a lot of the issues for [the most contentious portion of the resource area] doesn't have a thing to do with science, so science didn't matter at all with a lot of the arguments that the group was chewing on, you know, it was ... value differences. And that was tough.

Value-based issues, stated some, were not issues of science, and could only be addressed using policy rather than science, as opposed to the combination of the two.

One participant made their point by stating that "...policy trumps science". Another participant said:

Science was used where it could be used. A lot [of] what we deal with isn't necessarily science-based, it's more make a management call, or what's right, or what feels right. I hate to say it. But that's [what] a lot of it comes down to.

However, another respondent argued that many of the issues IMPLC was dealing with – such as oil and gas development and sage-grouse habitat – directly related to science, and later said: "...we were not able to separate science from values and so it just became kind of manipulative."

The IMPLC did not come to agreement on these core issues, in part because they were value-based, participants' values conflicted fundamentally, and many participants did not perceive that science could help them make a decision about such issues. While science could potentially tell us something, for example, about the social and environmental benefits of wilderness and the social and ecological costs and benefits of oil exploration, some respondents did not perceive science to be able to inform those issues. As one person concluded: "So yeah, you need to get through all the science in the world, and you still need to weigh in what's peoples values."

The Role of Science in Conflict

Nearly all respondents found science to be both a source of conflict and a means to overcome conflict, though science was more often mentioned as a source of conflict in the IMPLC. In many cases, participants thought of science as a useful tool in creating baseline information for discussions and in helping resolve conflict on issues where values did not play a role. However, many also said that scientific information was largely contested when it related to issues about which people had strong feelings, political viewpoints, or values. When science addressed these more contentious issues, participants often questioned information based on the presenter or the interest group they represented.

Nearly all participants thought of science as both a means to overcome conflict as well as a cause of increased conflict. One respondent stated:

...[science was] looked to as a source to overcome conflict, but it never did... it just kind of gave us a fertile ground to continue debating.

This statement shows how participants thought broadly of science as useful in decision-making, but had issues when specific scientific information was seen as biased or not credible. Another respondent said:

I think [science] was mostly a point of conflict. What it did was introduce a whole new thing we could fight about: 'our guy says ... 3:20 spacing', our guy says '6:20 spacing', 'well your guy's an idiot for these nineteen reasons'. It just, it created this new spiral into the depths of stupidity, every time, no matter whose science it was...

This participant highlights the conflict over the use of science for decision-making and points out that much of the conflict was centered around dueling science presented by different stakeholders and leading to skepticism among IMPLC participants.

One person responded to the question about science's role in conflict outside the most contentious sites in the resource area by stating:

...I would put it right in between [a means to overcome or a source of increased conflict], but maybe I would have said it's the former. I think it actually, the group agreed more on some science than they disagreed, and therefore I think it helped the effort more than it hurt it.

Many participants felt that science was a productive means to inform decision-making and manage conflict when issues were less controversial, less based on personal values, and when data were available from a variety of sources. Science tended to deepen conflict in the IMPLC when it addressed more contentious issues, with limited available data and fewer information sources. Stakeholder trust was high in science that was seen as objective, but when science attempted to address core, value-based, issues, skepticism over the validity of data was also high, increasing conflict. Participants tended to hold a positive view of science in theory, but were more critical of science's ability to overcome conflict when it addressed specific decisions about on-the-ground management. This is consistent with my finding that people were generally supportive of the use of science for their land management decision-making purposes, but where scientific data was less available or was not presented at a management-relevant scale, science deepened existing conflict when dealing with value-based issues. One respondent stated:

...I went in whole heartedly, you know this was a great idea, this would be ... an example for future [resource management] plan reviews and, you know that dream diminished almost by the week ... early on things were good because we were always talking about framework, and ... [took] classes together and we never really got in to the details of ... 'okay what are we going to recommend, what is it that we want to happen with the plan'. So ... at first I would say it was almost a year that we went through just talking about issues in general and I mean getting to know each other – the team building and stuff – and it was a lot of fun and that actually

kept the optimism high because everybody ... did that. [But] eventually it came down to the nitty gritty.

This participant suggests that the process of collaboration and talking broadly about science was positive for the IMPLC, however, the actual detailed discussion of how to apply science to effective management deepened stakeholder conflict.

Communication of Science

Scientific presentations in the IMPLC were made by a variety of individuals, from a range of organizations, and were supported by different funding sources. Presenters of scientific information included state and federal agency representatives, researchers from a state university, invited scientists, IMPLC stakeholder participants, and contactors hired by stakeholder groups. Many participants referred to instances of dueling science when multiple interest groups presented different data on similar issues.

One respondent, who felt that science was often a point of conflict in the IMPLC, stated:

The one thing that I always thought was interesting is that, for some folks, it didn't matter what information [was provided] – what scientific basis – ... it seemed that it didn't matter. And I wanted to know if, if it even matters to them, if it even influences their positions whatsoever. When, you know, when we worked in numbers and do everything, and show them that there's, you know, there's nine days worth of gas in [the most contentious portion of the resource area], does that even matter to them, or is it just about ideology...? Because I'll tell you what I know, and it's the latter.

This participant was not only frustrated by the conflict, but also by how science was communicated.

Another participant commented on presentation bias in the IMPLC:

Whenever it was a stakeholders' numbers, whether it was from the environmental community or from the energy industry, it was just viewed ... as to promote your position. When the numbers came from a neutral

source of some kind, even the BLM – I have to compliment the BLM ... a lot of times, they brought forth science that ... even though the person [that] presented it might have had a personal opinion, they were, they presented it in such way [that] it was viewed much more fairly and ... if it conflicted with what one position-holder or another thought, then they would always bring that up too. But anyway, the neutral parties, which BLM [-] I mean, this office here, I have to compliment them on the people they had involved. I thought they did a good job of being neutral ... in the IMPLC. I mean they may have had agendas, but they didn't show. And then we had some, like for sage-grouse, we had some science that was done by an independent contractor, or [a state university] or someone, and that science was normally accepted.

This participant mentions that scientists who acknowledged data that conflicted with their presentations of science were more trusted to provide objective information. Several other respondents also used the example of a presenter addressing conflicting evidence as a sign of being a neutral source of scientific information.

Unsurprisingly, stakeholders were generally accepting of science that was presented and funded by sources they perceived as sympathetic to their interests and more skeptical of the validity of science presented by opposing interests. One respondent stated:

We didn't have anything that was – they said it was peer reviewed, but we couldn't confirm that it was peer reviewed. So I mean, and maybe, it may not be, and we couldn't get that confirmed. So that, that was our concern, I think that we, you know we do want to have, I think it was very apparent that we do need to have more, more studies and more science that is peer reviewed [and relevant to] our area...

However, some scientific communication was seen as more objective by a majority of interests. These were presentations given by government agency representatives (to a lesser degree) and academics (to a greater degree). Participants were also more accepting of studies they were directly involved in, such as specific adaptive management projects and community-based monitoring.

The personality and reputation of the person presenting science also had a large impact on how their information was accepted. Government natural resource agencies were seen by many respondents as relatively neutral sources of information, and the process of collaboration in the IMPLC likely increased the trust in science from the BLM specifically, as a result of the transparent process and relationship-building with local BLM staff. University scientists were generally more trusted to provide objective information than any other source. However, there were two exceptions to this norm. The first was an agency representative who was perceived by many as highly knowledgeable, objective and one of the most credible sources of information. The second was one academic researcher whose methods were questioned by IMPLC participants. His arrogant response to the group caused participants to view his science as even less reliable. Perceptions of these two individuals were affected by their personalities: the agency representative, according to respondents, did not take the side of any interest during meetings, was known to criticize multiple points of view, and had a long-standing relationship with the local community. The academic was seen as arrogant and had no standing with the community. Personality and relationship of the presenter to the community may play a larger role in the acceptance of information than other factors.

Stakeholders were supportive of the open process of the IMPLC, including the opportunity for anyone to present information. However, interviewees commonly cited the interest group-related presentations of science as examples of bad or dueling science in the interviews. As one participant commented:

I would say there were some presentations made that were presented as science, but I'm not sure they were and I think that's why there maybe was continued conflict because, what was presented as science was, was skewed in my opinion toward whoever was making the presentation.

Many interview participants perceived that scientific presentations that were funded and presented by members or employees of interest groups with specific agendas were not examples of good, objective science. These presentations tended to increase conflict and skepticism about science. Respondents were generally supportive and trusting of information that was presented by either those sympathetic to their interests or which came from a voice without a clear stake in the IMPLC.

Adaptive Management

The IMPLC incorporated trainings and workshops about adaptive management in their collaborative process, and AM was ultimately incorporated into the BLM's RMP revision. IMPLC participants had mixed feelings about and varied understanding of AM. Respondents generally felt that AM could be a potentially useful and meaningful management approach, but were concerned that there was incomplete understanding within the group about the concept and its implications. Many were also unsure whether the BLM had the necessary funding and personnel to implement AM over a large resource area.

Adaptive management training in the IMPLC process involved scientists and graduate students from a state university as well as scientists affiliated with the Collaborative Adaptive Management Network (CAMNET), who made presentations and conducted educational workshops about AM concepts and the AM process for the IMPLC. The IMPLC had a goal of seeing AM incorporated into the new RMP in some form. Earlier analysis of the IMPLC when the group was still active found that the incorporation of AM to the RMP revision was frustrating for IMPLC members because the innovative approach of adaptive management was constrained by the BLM agency

and RMP revision processes. However the BLM did eventually include AM in their final RMP revision despite the lack of a community alternative.

Several consistent themes arose from the interviews including: 1) lack of common understanding of AM, 2) concerns about whether AM could be implemented in practice, 3) concerns about lack of BLM resources to properly implement AM, and 4) fear of other stakeholders manipulating the AM process to meet their interests. While adaptive management is supposed to be used to manage environmental uncertainty, analysis of participant perceptions in the IMPLC revealed that it effectively *increased* regulatory uncertainty about land management for the RMP revision. Stakeholders felt that the use of AM in the RMP meant that even if their needs were incorporated into the initial revision, the management plan could change over time, no longer meeting those needs.

Intermountain Public Lands Cooperative workshops addressed AM at the scale of a single issue, OHV impacts, and the macro scale, application of AM to land management at the RMP level. While most IMPLC participants were in favor of the application of AM to public lands, their ideas of *what* AM means and *how* it would be incorporated to BLM land management varied. In recognition of this difference, many interviewees were concerned about whether AM would be appropriately implemented in the final RMP revision.

Seventeen of the twenty interview respondents commented on the discussion and use of adaptive management in the IMPLC. Most participants felt that despite the opportunities and sessions for learning about AM, its application was still somewhat unclear in terms of on-the-ground land management:

...some folks I think kind of got the impression that, you know, adaptive management means you can do whatever you want to, as long as you're

trying to meet a goal in the end at some point, and that's not what it means. You got sideboards, you got indicators, you know, that you're going to be looking for and everything, and so yeah, some of it really didn't get through very well I don't think to, to all the participants. And I think there was a lot of different ideas at the end as to what it means.

One respondent saw adaptive management, not as a strict protocol, but rather a management technique that was already in place:

People like [participant A] will shrug his shoulders and say 'oh, well that's just typical what you do in day to day business: adapt when you need to, change when you need to'. Other people thought it was a, a god send and 'oh how great, how come we've never used this before?' And other people felt [like] we've been using it all along. And, so it was a flash word that was used and accepted by the group. It was put into the resource management plan, it, when you talk to BLM they'll tell you that this was the first plan in the nation that's got adaptive management incorporated into it. If you talk to [participant A], he'll tell you that every plan out there has got adaptive management in it. So, so I guess to me, my belief on it is it's a pile of fluff that is just good business management. You should be doin' it and adaptive management's a fluffy name that got stuck with it. And because it's a fluffy name that's in this RMP, it's gonna, all the sudden, be the poster child for the nation ... But anybody that implements any plan knows that it's flexible and it's a catch phrase.

Others, however, understood adaptive management as a very specific set of procedures, and thought that it would potentially improve the resource area's land management.

Because of this difference in understanding about adaptive management, some participants were wary of its implementation, feeling that if everyone did not understand the rigor involved in AM, it would be poorly implemented. In response to whether the IMPLC members were all on the same page about the meaning of adaptive management, one respondent commented:

...once we got through the trainings, I think it was. There was an example that I kind of like to give, where, [we were at a meeting] – it wasn't a IMPLC meeting, but it was public ... and we were talking about adaptive management, and [a participant who was also a member of the IMPLC] kind of stood up and said: 'We want adaptive management where, you know, you monitor every ten years towards meeting your outcome, and,

you know a rancher can do whatever he wants to in that time, as long as he meets the outcome at the end.’ And we ha[d], just BLM staff going off the hook, it’s like: ‘you don’t know what you’re talking about, that’s not acceptable to us’. And that type of misunderstanding can really hurt the process because, now you have BLM staff and environmentalists that are going: ‘I’m not getting near adaptive management if that’s what it means to you’. So it was good that the training kind of straightened this out and said ‘no, you know, we’ve got a process’ and ... the ranchers and the [local government] ... just had a really different idea what the threshold, and what all the, what the monitoring was, and that type of thing. As far as the framework and the process [in the IMPLC], everyone was right on. But as far as the devils, the devils and the details, they were not, you know, very close...

Another participant responded to questions about the IMPLC’s common understanding of AM concepts as follows:

I doubt that [participants] were all on the same page [about adaptive management]. I think from ... where we started – we were definitely not on the same page – but when we finally got to the end, we were a lot closer. There were still those position[-based] fears of different stakeholders that they might get whacked with it, even though it wasn’t supposed to be. But you know, you start out with your position, and you defend it. If anything that comes along that you feel [is] a threat to it, even though it may not be ... then you’re very apprehensive. And I think those that had apprehensions still had them, but they were willing to go ahead and say, ‘well, this is the way it works, as long as these safeguards are in it, well then, ok.’ There weren’t all hearty supporters.

This participant expressed a commonly held view that while IMPLC participants did not all share similar feelings or understandings of adaptive management, most were closer to agreement toward the end than early in the process.

Additionally, participants commonly felt that the AM concept was easy to swallow in theory for the IMPLC, but that its specific application was less understood and less trustworthy in management:

...the environmental point of view ... thought that the BLM was way too lenient before they, before the triggers were in place, and the oil and gas industry thought it should be more lenient, and ranching, God knows what they were thinking – [well,] I know what they were thinking: they wanted

the triggers to be pretty lenient, particularly when it came to grazing, because they didn't want to be doing something, and then suddenly have the BLM say 'nah, we've gone far enough, we've got to back up and go back to the original form'.

Another participant from a different perspective stated:

...I don't know that the environmental community – and I'm talking about extreme environmental – you know, I don't know why, but that they are on the same page with [adaptive management]. They, they liked the data collection, they liked the monitoring, they understood about you know, putting money on the ground, they understood about science-based [management]. All those things they answered. But then when we talked about ... adaptive management – that they might have year-round drilling ... then it wasn't okay. So it was, it was kind of difficult to get to some agreement with those [issues].

Another participant said:

...I think ... there was theory and practice. In theory adaptive management could work, in practice – extract the people used adaptive management for least possible management ... for oversight and rules, the ability to change that ... I mean, for us you could easily say that: 'okay grouse population is dropping and you need to change it' but then [other participants] looked at it the other way – that adaptive management was only a way to take more out of the land and reduce restrictions. But ideally it worked both ways, and unfortunately what the problem with it was, you start out too lax you could do more harm than even if you see that adaptive management is not working, you could change it back ... you know, fixing things after they're broken is a lot harder than not fixing them, not hurting them in the first place. But ... I think, in theory adaptive management could work, but you know whether you're involved – the coalition types or whatever – you know ... as far as I knew and had heard, that was not an example of how adaptive management was employed, it was employed as a ... lease regulatory approach and we didn't get into it very long because that kind of came more, more toward the end it seems like but I had never [heard] of a – what I would call an environmentally friendly application of that.

Another respondent stated:

...well like [one academic that conducted AM trainings] looks at [adaptive management] from the academic standpoint, okay. And with structured trials, controls, you know different things like that. Academia ... looks at it that way. I understand that – kind of tough to apply that to most of the things we do in the field, but that doesn't mean you can't do adaptive

management in terms of trying some different things. You have objectives you try, try to figure out: ‘why is it working that way’, and adjust, based on what you’re seeing, you know, but it’s not necessarily the scientific design. So that’s just a basic difference there.

And continued:

[So] I do think there’s a little bit of a disconnect between academic views of adaptive management, and how you apply it, and, on the ground for like resource management application. And so there I think there could be a better communication of real world application, okay. I think there needs to be, I’m just talking off the top of my head, but it’s like, you know, learned a little bit about what we do and what we phase before we start trying to define how adaptive management works, because it may not work that way in a real world situation.

These responses highlight the perceived challenges to the feasibility of implementing AM procedures to land management, the perceived disconnect between academic theory and on-the-ground practice, and lack of understanding of the scientific rigor involved in AM.

As one respondent stated:

I remember feeling in meetings at the end there, that people were conveniently forgetting that you had to have measurable goals and you then had to actually measure whether you were attaining your goals, because people were not setting out – weren’t able to agree on measurable outcomes that would then be the benchmark for whether or not you know adaptive management could continue. So ... what I kept saying to myself in my head at least, was that adaptive management is only as good as ... the objectives you spell out and the monitoring that you do. If you don’t have monitoring, if you had adaptive management as just flexibility ... and people kind of were forgetting the monitoring part.

One reason for the inability of the BLM to implement AM in the way academia recommends, according to many participants with environmental interests, is a lack of financial resources. Concern existed about whether or not the BLM would have the resources to follow-up with the extensive monitoring that would be required. Monitoring can be expensive to implement and maintain, and environmental advocates in particular, were concerned about whether or not the BLM had the resources necessary to carry out

that effort in the resource area. One participant stated that "...they just don't have the resources to do that..." Another said:

...you know environmentalists, kept saying: 'we're great with it, as long as you keep monitoring, we don't believe you yet that you can monitor' because it's something that BLM has always had a hard time doing. A hard time getting money for. So, you know environmentalists are really arguing from the side of, you know, 'let me see your process, if you're, if your goal is good enough, and threshold is good enough, and we like your indicators, and your monitoring, we like your monitoring plan, then we like adaptive management'...

Another participant stated:

I think they made some progress [on adaptive management] and it was eye opening to some people, but for the environmentalists, basically ... I think they just, they couldn't get by the lack of finances for implementation, lack of finances for enforcement, and if you don't have that, to them it was like you can't do it. And so, I think in theory I think lots of people thought it was an interesting idea and in practicality the implementation was just where it broke down for a lot of people.

Finally, some respondents feared that because of disconnect about AM among IMPLC participants, its implementation for land management would be used to promote others' positions rather than as a rigorous management protocol:

...so everybody kind of was using [adaptive management] for their own purposes and so in the end, we ended up being very skeptical of some of the stuff. ...everybody's awareness and understanding of adaptive management probably increased but it was used as sort of this, it was being used by different entities to try to get what they wanted.

Another participant feared that some were promoting AM with the goal of taking advantage of AM to advance their interests:

...[adaptive management] is one of the riskiest concepts around. It's, actually it's an excellent idea, but it can't work if it is simply an escape route for responsibility...

Discussion and Conclusions

This research aimed to understand how IMPLC participants perceived science in the collaborative process, the hurdles participants encountered with the use of scientific evidence, the role science played in conflict and collaborative decision-making, and how adaptive management was perceived by stakeholders. This study identified many barriers to the effective use of scientific information for land management decision-making in a collaborative setting. Intermountain Public Lands Cooperative participants valued and supported the use of scientific evidence for land management purposes, but its incorporation to decision-making in the IMPLC was a difficult task.

Overall, this research indicates that the use of science was insufficient to help IMPLC members overcome core conflicts and find common ground on contentious, value-based issues. The IMPLC experienced dueling science, particularly with regard to science presented by multiple, different stakeholders. Additionally there were hurdles to the incorporation of science based on perceived availability and relevance of data. Intermountain Public Land Cooperative interviews revealed the following core themes related to the effective use of scientific information in their collaborative process: 1) science as a cause of and solution to conflict, 2) limited ability of science to inform value-based management decisions, 3) lack of science relevant to specific management issues, sites, or decision-making scales, 4) the communication of scientific information, and 5) uncertainty about scientific information. Ultimately, I found that IMPLC participants were supportive of the use of scientific data to inform decision-making in theory, but were less sure, and in some cases skeptical or concerned, of practical applications of science for land management in the IMPLC.

Based on this analysis of the IMPLC, the scope and scale of science in collaborative natural resource management, as well as its communication could be improved in order to positively incorporate it into decision-making. These findings are consistent with those in the literature regarding the barriers to incorporating science (e.g. Adler et al., n.d., Daniels and Walker, 2001, Palmer et al., 2005, Failing et al., 2007, Powell and Colin, 2008, van Wyk et al., 2008), though with an added emphasis on management-relevant science. While scientists and scientific institutions may be uncomfortable with altering their research questions and methods to address management needs and stakeholder questions (e.g. Norton, 1998, van Wyk et al., 2008), such a shift is essential to the use of science for management purposes (e.g. Palmer et al., 2005, Davies, 2008).

Intermountain Public Lands Cooperative participants found science unable to resolve value-based management conflicts. While the engagement of science in collaboration can potentially help inform values with science (e.g. Weible and Sabatier, 2009), and establish common ground (e.g. Leach, 2006, Adler et al., n.d.), research on the IMPLC suggests that participants were not able to effectively achieve these outcomes. This could be a result of either the nature of value-based issues, or the presenters of scientific information inability to communicate effectively about how science can have an impact on value-based issues. For instance, while science may have been unable to inform *whether* there should be wilderness designations in the resource area or oil and gas should be drilled, science could play a role in helping evaluate the potential impacts, benefits and costs of these actions by telling us something about the social and environmental costs and benefits of wilderness and the social and ecological costs and

benefits of oil exploration. However, with a limited timeline and budget, it is unclear how much scientific data collection could take place to inform these questions. Further information is needed to understand how collaborative process can overcome the perceived and actual barriers of using science to inform value-based land management decisions in collaboration.

Intermountain Public Lands Cooperative stakeholders thought science was important in theory, but in this collaborative process, poorly understood or poorly presented science actually increased uncertainty about management decisions. For example, AM increased uncertainty due to lack of common understanding and concerns about its on-the-ground implementation. In the IMPLC, science was a source of greater uncertainty and increased conflict when concern existed about specific management actions, the objectivity of some presentations of science, and incomplete information about, specific questions. These findings are consistent with White and Hall's (2006) research, where stakeholders are often willing to accept and incorporate science for decision-making in theory, but not in practice; finding information inapplicable once data are presented.

While some science incorporated into the IMPLC process lacked site-specificity and was not always perceived as objective, stakeholders also used these discrepancies as a platform to dispute nearly all scientific data when it countered their interests. Thus, conflict increased over science, often reverting issues back to values and positions rather than using science for a source of information and a means to establish common ground. It appears that science was unavailable in many cases, but was also disputed in other cases where it was available, based on the information source and interpretation.

The need for science and scientific presentations to be conducted at management relevant scales is a difficult problem (e.g. Norton, 1998). Interview data of the IMPLC suggests that there was a clear need for more synthesis and interpretation of scientific data by scientists in order to understand how science could inform decision-making. However, this does not merge well with the culture of scientific inquiry (e.g. Powell and Colin, 2008). Moir and Block (2001) highlight this problem, stating: “Research seldom has clear a answer to contested management issues” and continue:

Even the best monitoring designs and data streams provide, at most, conclusions that are limited by statistical caveats. The universal scientific conclusion is ‘more research is needed,’ which is, of course, ingrained in the scientific method. Scientists bold enough to venture into the murky future are often hammered by their scientific peers who point out the statistical uncertainties (p. 144).

Because scientists are trained *not* to over-generalize their results, it can be difficult to integrate scientific evidence into decision-making, the very place that would most benefit from that information.

Intermountain Public Lands Cooperative participants were more accepting of science that was presented by institutions or individuals that they trusted. Aside from trust in those sympathetic to their interests, consistent with a study by Weeks and Packard (1997), most participants also perceived that university scientists were unbiased and objective, so long as they were communicated effectively and were humble. Agencies were also viewed as neutral, when the presenter was well known and was relatively objective throughout the process for all issues (Weeks and Packard, 1997), especially if they had demonstrated such objectivity.

To some, a panel of scientists would have provided a more clear and informative discussion about management, and they felt participants would have been more likely to

trust and incorporate scientific data if given the chance to hear several experts discuss and deliberate about issues, rather than one expert presenting at a time (e.g. Failing et al., 2007). This also would have helped to address concerns about the objectivity of scientific information, not by deceiving participants into believing in all science, but by allowing different experts to help them establish common ground, highlight areas that need further information, and identify what could and could not be answered using scientific evidence.

The integration of adaptive management to the IMPLC process was a productive learning experience, however there was also uncertainty about how AM would and could be implemented for BLM land management. While it appears that IMPLC participants were on largely unequal footing in terms of their understanding and acceptance of adaptive management initially, they were able to make headway in reaching a common understanding. Respondents were still skeptical about each others' understanding of adaptive management, the way in which it will be implemented, whether or not BLM had available resources to implement AM on the ground and monitor, and whether other stakeholders would be able to manipulate AM to their advantage. While the IMPLC was able to learn about AM and many participants cited the fact that the BLM incorporated adaptive management into the RMP revision as a success in the IMPLC process, relatively high levels of uncertainty remained about the use of AM for the RMP revision.

Interview respondents were concerned that formal AM terminology was lost on some IMPLC participants, and feared that it would be misapplied. This is consistent with Murray and Marmoraek's (2004) finding that AM terminology tends to be misused. Additionally, Murray and Marmorek (2004) state that adaptive management "...is not a

trial-and-error, adapt-as-you-go process” (p. 1). Interview data possibly confirms the fear held by some participants that others felt AM essentially meant one could manage adaptively. Thus despite the positive view of AM trainings and workshops, these educational events did not unify stakeholders’ understanding of concepts enough to ease the fear that AM would be misapplied.

Ultimately, discussions about adaptive management in the IMPLC contributed to a positive learning component that was successfully integrated into the RMP revision, but AM was not able to manage conflict in the IMPLC and high levels of skepticism and concern remain about adaptive management. This research found that AM was not effective in managing in the face of uncertainty for the IMPLC, contrary to its purpose (e.g. Holling, 1978, Murray and Marmorek, 2004). While AM was a beneficial learning process and helped focus discussion (e.g. Leach, 2006), it introduced new levels of management uncertainty in the IMPLC and was unable to overcome positional differences and establish common ground.

There is a clear need for increased emphasis on scientific information for decision-making in collaboration, both in terms of the science that is conducted, available and presented, and how that science is perceived, understood and used. Intermountain Public Lands Cooperative participants found the integration of science into decision-making to be a difficult task given the scientific data used and the way that science was presented and communicated. While this suggests a need for scientists to do research that addresses management questions (e.g Palmer et al., 2005), it also suggests that participants in collaborative processes need to take a larger part in the scientific process as well as communicate with scientists about their land management questions.

Collaborative groups would benefit from increased participation from scientists, particularly groups similar to the IMPLC, which span a large range of topics. The need for engagement from scientists may mean that scientists need greater incentives to engage with the public (e.g. Powell and Colin, 2008). The tradition of scientific inquiry will likely produce results at a timeline longer than the decision-making process. It would help if collaboration participants had a clearer understanding of the potential for adaptive management to overcome this divide by merging research and management. Adaptive management can help answer emergent management questions in a scientifically rigorous way. This research indicates that IMPLC participants would have welcomed and accepted increased scientific information for informing land management decisions. The negative responses about science's ability to provide useful information largely had to do with participants' experiences of limited and dueling science, rather than an overall negative view of science.

In conclusion, while science should be included in land management decision-making, integrating scientific information in a collaborative setting presents challenges. In order for science to be more useful in collaborative processes, information should be both site-specific and synthesized at scales relevant to management needs. I found that organizational affiliation, funding source, and personal qualities of presenters of scientific information affected how stakeholders perceived the information presented. Federal agencies and universities were more likely to be seen as unbiased, however the presenter's style and reputation played a large role in participants' acceptance of the information. Finally, it is unclear what role science can play in making value-based decisions.

Leach (2009) calls for innovation and creativity in natural resource collaboration and careful attention paid to local, case-specific factors when implementing collaborative design. This may be the case for using science in the IMPLC. Ultimately, stakeholders required a site-specific, innovative scientific response to management questions. Yet when AM was presented as a means to address ecosystem uncertainties, the IMPLC was unable to make the conceptual leap from theory to practice.

From this research, I found that scientific evidence can be better incorporated to decision-making by making more data available that is relevant to management needs, specific to the area and well communicated by a source that is viewed as objective. However in the absence of any one of these factors or when dealing with value-based issues or scientific uncertainty, the likelihood that participants will use science to make decisions is relatively low; instead they will rely on other factors to evaluate and make decisions about management actions.

CHAPTER FIVE

PERCEPTIONS OF SUCCESS THE ROLE OF CONSENSUS AND TRUST IN NATURAL RESOURCE COLLABORATION: A CASE STUDY OF AN INACTIVE COLLABORATIVE GROUP

Abstract

Collaboration is emerging as a potential solution to contentious natural resource management issues, but there is a need for deeper investigation of the causes of success and failure in these processes, and specifically the roles of consensus-based decision-making and communication in collaborative processes. To address these gaps, I interviewed participants and analyzed their perceptions of the roles of communication, conflict, science and success in the Intermountain Public Lands Cooperative (IMPLC) group. The IMPLC is an inactive collaborative group that did not reach a consensus decision with respect to its primary objective, to craft a community alternative for the Bureau of Land Management's Resource Management Plan. I assessed participants' perceptions of the group's success, and explored the roles of conflict, communication and decision-making in relation to the group's process and outcomes. I found that participants perceived benefits from the collaborative process, and felt that there were some positive outcomes despite the lack of a consensus decision on the Resource Management Plan alternative. This analysis highlights the benefits associated with the

goal of consensus-based decision-making as well as the long-term costs of attempting consensus when the goal is not achieved.

Introduction

People in the United States are increasingly rejecting the traditional top-down approaches to natural resource decision-making and are seeking a more significant role in the process (Fisher et al., 1991). Natural resource collaboration has proven to be a possible solution to many natural resource issues and conflict situations (Conley and Moote, 2003, Schuett et al., 2001, Wondolleck and Yaffee, 2000, Daniels and Walker, 2001). In particular, collaboration has been put forth as a means to increase the social accountability and legitimacy of decisions (Wondolleck and Yaffee, 2000, Daniels and Walker, 2001). Agencies have therefore begun to take a more collaborative approach to natural resource management, shifting away from the traditional top-down approach (Daniels and Walker, 2001, Cronin and Ostergren, 2007). There are several areas that merit further research, which will be analyzed in this study of the Intermountain Public Lands Cooperative (IMPLC) group, an inactive collaborative group that did not achieve its primary objective. First, there are many lessons to be learned from unsuccessful collaborative groups, but the reasons for failure are rarely examined, and most research has investigated factors associated with success. Second, snapshot (single point in time) approaches to research on collaborative groups are less comprehensive and less likely to link process to products. Longitudinal studies of these groups can provide insight into the effectiveness of collaborative natural resource efforts by linking process to outcomes. Third, it is necessary to measure the outputs and outcomes of collaboration. Finally, information is needed to understand how consensus-based decision-making influences

collaborative processes, especially communication and conflict within these processes, and its feasibility as a goal for collaborative groups.

The IMPLC is a collaborative, community-based group located in a Bureau of Land Management (BLM) resource area in the Intermountain West. The IMPLC was formed in order to alleviate some of the stakeholder conflict over land use and later to provide public input to the BLM for their revision of the local Resource Management Plan (RMP). The IMPLC's goal was to craft a consensus community alternative for the BLM's RMP revision. One key area of conflict in the RMP revision was a proposal for increased oil and gas development permits on BLM land, which would require not only drilling, but also new road development in proposed wilderness areas. Currently, the IMPLC is inactive and is an example of an attempt at collaboration that did not meet its primary goal. The IMPLC tried and was not able to come to consensus on some of the core value-based land management issues for the RMP revision, and the group stopped meeting in 2006.

The goal of this chapter is to examine how IMPLC participants perceived success and failure, to identify some of the outcomes from a collaboration that was unable to reach its goals, to explore the role of consensus-based decision-making and its relation to perceptions of success and the outcomes of this collaborative process and to understand the role of trust in relation to these concepts. The chapter is organized as follows. First I briefly review the literature on definitions of success, consensus-based decision-making and trust in collaborative processes. I then present my research questions, followed by a description of my methodology. I present my findings and interpretations in the following section, and conclude with a brief discussion and conclusions.

Success in Collaboration

Success in collaboration is characterized in a number of ways. Success can be defined in terms of process (e.g. whether it was inclusive, fair, or legitimate), outputs (e.g. activities undertaken, products), and outcomes (e.g. changed social and ecological conditions). Information is still needed to explore the definitions and criteria for success to promote “successful” collaborative approaches that meet the group’s goals.

Additionally, Leach et al. (2002) state that when measuring success, multiple measures are necessary due to the fact that collaborative partnerships are taking on “multiple goals simultaneously”. My purpose in this chapter is to explore how participants in the Intermountain Public Lands Cooperative collaborative partnership conceptualized success, and whether they perceived benefits to participation even though the group’s nominal goal was not achieved.

Success can be defined by whether or not a group is able to reach its goals, or in relation to more general criteria such as improved relationships, communication, social capital or trust. Collaborative processes that do not reach their goals can have other positive long-term effects, such as ‘improved relationships’ and ‘increased understanding’ (Conley and Moote, 2003). McKinney and Field (2008) found that collaboration improves social and political capital, as well as community capacity to act collaboratively on future issues. However, Conley and Moote (2003) state that failed collaboration, where goals are not reached, can come at a heavy cost. These costs include

effort, time, and potentially social capital that is "...consumed rather than built" (Conley and Moote, 2003).

Evaluation of collaborative processes will potentially help increase our understanding of the limits and the potential of collaboration (Conley and Moote, 2003). However, indicators of a successful process, such as satisfaction, legitimacy of decisions, improved stakeholder relationships and communication, can be difficult to measure. Additionally, to understand what leads to success or failure of collaborative processes, we need to identify and measure the factors that influence success and analyze the relationship between these factors and the group's success or lack thereof. Research by Leach and Pelkey (2001) shows that local, case-specific factors are important in determining collaborative success, making a generic or generalizable collaborative procedural protocol difficult to construct.

Scholars disagree over the most appropriate measures of success in collaboration. Coglianesse (2003) questions whether satisfaction is an appropriate measure for successful decision-making, arguing that there is no guarantee that satisfaction in decisions will result in the most appropriate decisions. Additionally, he states that satisfied participants represent only a subset of the affected population and not the whole (Coglianesse, 2003). Also, participant satisfaction fails to adequately address ecological or broader social outcomes. However participant satisfaction could arguably be the closest we are likely to get to understanding and measuring success.

This chapter attempts to unpack some of the participant perceptions and interpretation of success in the IMPLC. I do not aim to measure success, but rather understand how IMPLC participants perceived success. Due to the fact that the IMPLC

was unable to reach its primary goal of creating a community alternative for the BLM's RMP revision, I expected to find that participants viewed the IMPLC as a failed attempt at collaboration. However, my analysis revealed that most people perceived the process as both successful and unsuccessful in different ways.

Consensus-Based Decision-Making

There are many approaches to collaborative process, though the collaborative public participation model of decision-making is relatively new to natural resource conflict issues. Debate exists over the types of process that are most effective, and collaborative approaches are particularly difficult to execute when extreme conflict exists between stakeholder groups. The IMPLC used the consensus model as a goal in their decision-making, however not all natural resource collaborative processes apply consensus-based decision-making. While there are a variety of labels for consensus-based land management, all have a commitment to reach a mutual agreement and seek win-win solutions while educating participants and promoting community (Peterson et al., 2005).

Consensus decisions, state Susskind et al. (1999), reach more creative solutions and are more readily implemented than those made by non-consensus processes. In contrast, Peterson et al. (2005) argue that a focus on consensus reifies power inequalities and relationships and leads to stalemates due to veto power of single groups. Therefore, consensus may favor the status quo rather than looking to new solutions and perspectives (Peterson et al. 2005). They argue that dissent and conflict are inherent in democracy and decision-making should recognize those differences rather than attempt agreement, masking conflict and giving an 'illusion of objectivity' (Peterson et al., 2005). However,

consensus-based decision-making could also potentially further entrench conflict issues and cause an even higher level of polarization among participants. Leach (2006) responds to criticisms of consensus presented by Peterson et al. (2005), asserting that consensus does not necessarily preclude an argument model, nor does the goal of consensus necessarily inhibit interdisciplinary deliberation, negotiation, debate or conversations. Consensus can take on a variety of forms and is not necessarily doomed to stalemate or status quo (Leach 2006). While Toker (2004) and Peterson et al. (2005) argue that consensus is outdated and its implementation problematic, Leach (2006) argues that there is not yet enough empirical evidence to justify these claims and cautions that “[b]y dismissing consensus before the evidence is in, we risk missing an opportunity to improve the way society charts its ecological future” (p. 574).

The IMPLC collaborative group used a consensus model for their decision-making. While they were not able to reach their goal of consensus, I examine how the goal of consensus decision-making affected the collaborative process and how consensus affected and was affected by perceptions of success and failure. Additionally, I sought to better understand how the goal of consensus affects communication and process during collaborative decision-making. This research will deepen our understanding of the role of consensus-based decision-making in natural resource collaboration, and its impact on process and outcomes.

Social Capital, Trust and Transparency

Social capital is a term in literature that is closely related to stakeholder relationships and group capacity. Social capital describes relations of trust, reciprocity, and exchange, the evolution of common rules and the role of networks (Pretty and Smith,

2004). Social capital is dependent on personal relationships and networks, which are factors that can increase the capacity of a group to achieve future goals (Leach and Sabatier, 2003). Pretty and Smith (2004) state that increasing natural capital in natural resource management depends on high social capital. They suggest that in communities with high social capital, where a communities' "...knowledge is sought, incorporated, and built upon during planning and implementation of conservation and development activities, then they are more likely to sustain stewardship and protection over the long term" (Pretty and Smith, 2004, p. 632).

Trust is an integral part of social capital. Stakeholder trust can be positively or negatively affected during the collaborative process. Additionally, stakeholder trust in natural resource agencies can increase as a result of collaboration, due to the effort made by agencies to make their process and decision-making more transparent and inclusive (Wondolleck and Yaffee, 2000, Wagner and Fernandez-Gimenez, 2008). Trust in natural resource management agencies can potentially improve their ability to implement natural resource decisions, as stakeholder groups view their management with less skepticism.

A survey of thirty collaborative groups conducted by Schuett and Selin (2002) found that trust is an important part of the collaborative process. The study revealed that the establishment of trust among all stakeholders is integral to the success of any group (Schuett and Selin, 2002). More information is needed to understand how social capital and trust affect and are affected by the collaborative process, particularly when collaboration does not reach its goals. Understanding stakeholder relationships is also necessary to increase our knowledge of social capital, communication, and the collaborative process.

Trust and transparency are closely associated with one another in collaboration. Transparency is the act of being open about ones motives, goals and actions (Wagner and Fernandez-Gimenez, 2008). Transparency in communication can greatly increase trust within a diverse group, and honesty has been identified as a critical factor in multi-stakeholder collaborations (Schuett and Selin, 2002, Wagner and Fernandez-Gimenez, 2008). However, actual or perceived lack of transparency in a group can significantly damage levels of trust and social capital. In their study, Wagner and Fernandez-Gimenez (2008) found that transparency among participants increases social capital. Transparency is essential to collaborative process and managing conflict situations effectively and can be achieved by dependable and predictable behavior, particularly when this behavior is maintained over long periods of time (Wagner and Fernandez-Gimenez, 2008).

Research Questions

This chapter addresses three overarching research questions. (1) What were the perceptions of success in the IMPLC and how did conflict and communication in the group influence success? (2) How did the goal of consensus-based decision-making affect the process and outcomes of the Intermountain Public Lands Cooperative collaborative group? (3) How did the Intermountain Public Lands Cooperative collaborative process and the goal of consensus affect trust?

With respect to question one, I wanted to understand how characteristics of the process such as perceived inclusiveness, fairness, legitimacy and communication affected participant perceptions of success in the IMPLC. I hoped to use these indicators of success to help predict success and prevent failure in future collaborative groups. To address this question I also explored indicators of failure, and determined how those

indicators could be identified before or during the process in order to best manage and facilitate productive collaboration.

The goal of consensus-based decision-making can potentially provide a more inclusive and fair process, but also has associated problems. In pursuing question two, I sought to understand effects of attempting consensus on the process and outcomes of a group that was not able to reach a consensus agreement. There are many ways to facilitate and encourage conversation in collaborative process. Here, I attempt to increase our understanding of potential impacts from the goal of consensus-based decision-making.

The third research question regarding trust ties in to social capital and the capacity of the group to work and act together. After analyzing interview data for success and consensus, it became apparent that trust was an important factor with regard to understanding the IMPLC participant perspectives and process outcomes.

Methods

The IMPLC mailing list included approximately 150 people and thirty to sixty individuals attended meetings regularly and participated actively in the group. I interviewed twenty-one participants (twenty were used in this analysis) between August 2008 and November 2008, using semi-structured, in-depth interviews. Interviews ranged from thirty minutes to three hours in length and averaged just less than one and half hours. Interviews were audio-recorded, transcribed and coded using NVivo qualitative data analysis software and Microsoft Excel spreadsheets. Participants were identified using a networking method, and sampling continued until nearly all recommended participants had been interviewed, and at least one participant was interviewed from each

stakeholder group. The main interview questions covered a range of topics including communication, conflict, the role of science, social capital, collaborative process, consensus and success in the IMPLC.

Analysis for this chapter focused on respondents' perspectives of success, failure, consensus-based decision-making and the value of the collaborative process. I used a modified grounded theory approach in my analysis (e.g. Fendt and Sachs, 2008). Grounded theory employs systematic collection and analysis of data in the research process, and involves open, axial and selective coding (Starks and Trinidad, 2007, Strauss and Corbin, 1990, Corbin and Strauss, 1990). Open coding is the process of categorizing data by grouping concepts around phenomena, axial coding puts data back together by using the categories and sub-categories from open coding to make new connections and meaning, and selective coding systematically integrates these categories and relationships (Strauss and Corbin, 1990).

Modified grounded theory, asks specific questions of the data – allowing the researcher to be more insightful and productive when looking at specific problems or phenomena (Fendt and Sachs, 2008). The IMPLC interviews were openly coded for portions of interview responses that were relevant to the research questions. They were then coded a second time to make distinctions between perspectives on these topics. Finally, through selective coding, recoding, and constant comparison, themes were created to relate to the overall phenomenon. Using coding and taxonomies as well as direct quotes, interview data were analyzed with some interesting findings about these themes.

The IMPLC interviews were broadly coded for general themes, and relevant sections were then selected for further analysis, or axial coding, in this chapter. Interviews were openly coded for portions of interview responses that were relevant to the research questions. They were then coded a second time to make distinctions between perspectives on process, the usefulness of the IMPLC and of consensus. Finally, through selective coding, recoding, and constant comparison, themes were created to relate to the overall phenomenon.

During the analysis of interview texts, I identified emergent code categories, then compared the interviews to identify themes and variations within and among respondents and stakeholder groups. Indicators of success and failure, trust and the role of consensus in the collaborative process were compared against existing collaborative literature in order to determine whether this case confirmed or contradicted existing theory and empirical findings, which would either strengthen existing generalizations or undermine them. Emergent themes throughout the analysis process were assessed based on their applicability and relevance to the research questions.

Findings

While IMPLC participants were not able to come to a consensus agreement on their primary objective of crafting a community alternative for the BLM's RMP revision, all respondents perceived benefits from the collaborative process. Interview participants referred to success and failure in terms of both reaching goals and other process outcomes such as changes in communication, relationships and conflict. Most participants felt that while the IMPLC was unsuccessful by the traditional standard of reaching goals, it was still a valuable process, and therefore successful in some respect. Additionally, many

participants felt that while consensus may not have been possible for the IMPLC on the core issues for the RMP revision, the process of attempting a consensus-based decision was beneficial. However, consensus also contributed to the reason that the IMPLC was unable to reach its goals in the end. I also found that trust was initially low, increased during the process and then declined toward the end, when it became apparent that consensus was not possible for the group. Additionally, despite the perceived benefits from collaboration, participant trust declined, both trust in other participants and trust in the collaborative process.

Perceptions of Success

An earlier analysis of the IMPLC when the group was still active, revealed that conflict in the group was high, though small successes had occurred. That analysis stated that it was too early to decipher whether or not the group had been successful overall. Not long after, the group ceased meeting. My analysis suggested two separate ways of thinking about the word “success” in the IMPLC. Nearly all participants used both meanings in order to talk about the perceived benefits and outcomes from the IMPLC collaborative process. First, success was used to describe whether or not goals were reached. Second, it was also used to articulate other benefits from the process and highlight a generally shared feeling that a failure to reach goals did not necessarily indicate process failure because the other social and possibly ecological benefits outweighed the costs.

Nearly all interview participants stated that the IMPLC was both successful and unsuccessful as a collaborative group. Respondents agreed that the IMPLC was unsuccessful in the classic sense of the reaching its goal of crafting a community

alternative to the RMP revision. While there was variation in the degree to which respondents felt the IMPLC was successful, the perceived benefits and quality of communication were enough for many participants to state that overall, the collaboration was still a success. Some of these products that indicated success included increased social capacity, social capital, communication and improved relationships, the opportunity to provide better and more comprehensive input to the BLM and better represent the community and stakeholder interests in a public format, and a more thought-out and informed RMP revision. While some deemed the IMPLC a failure because it did not reach its goal, all participants cited benefits from the process and most felt that these benefits were enough to consider the IMPLC both a success and failure overall.

Table 2 is a taxonomy depicting the reasons people felt the IMPLC could be considered successful or unsuccessful as a collaborative group. This taxonomy does not represent reasons that led to failure or success, but rather participant justifications for their classification and terminology of the terms success and failure (or unsuccessful).

Participants' use of the word "success" to describe the IMPLC in a way that reached beyond the overarching goal of the group was not uncommon. One comment, which was similar to several other interviews and is a good example of how people felt, stated:

I have a positive view of the [IMPLC] and part of that is because I really enjoyed it. And I really enjoyed it because I got to know so many people from so many different backgrounds and interests and values and I really understood, most of the time, where they were coming from. And so from my point of view, I don't know, to me that's successful, that's a success because we did build trust, we did open lines of communication that weren't open before...

Table 2: Reasons that the IMPLC was considered successful and unsuccessful by participants

Unsuccessful	Consensus Community Alternative for RMP Revision		Consensus not reached	Core issues	
			Issues remaining in RMP		
			May still end up in litigation		
	Costs vs. benefits	Was it worth...	...the time?	...the money?	
	Process	Picking contractor			
	Power inequalities		Perceived		
			Actual		
Potential					
Successful	Learning	How to collaborate	Process		
		BLM process	Communication		
			Policy and limitations	How decisions are made	
		Ecological/science			
	Increased Awareness	Issues			
		Positions/values			
		Other participants			
	Interpersonal relationships and social capital		Better communication		
			Better understanding		
			Friendships		
	BLM	Relationship with Community		Transparency	
				Trust	
				Interpersonal	
				Reputation	As an agency
		Communication	Individual BLM employees		
			Understanding stakeholder issues		
			Listening to stakeholders		
Open communication with community					
RMP Revision	Better vetted, well thought-out				
	Potentially less dispute				
	More representative of stakeholder interests				
	Opportunity to provide input				
Process	Facilitation	Style/form			
		Group consensus on choosing facilitator			
	Communication				

While most participants did not share similar sentiments of having particularly *enjoyed* the process, many felt similarly that the benefits from the conversations and attempts at

decision-making in the IMPLC were enough to consider the collaborative group a success despite a lack of consensus agreement on the RMP revision. One respondent stated:

But at least, at least I think that we sat around the table, we talked, we got the conversation going, we... expressed everyone's views, we... knew where everyone's coming from... and I think that's a better way of doing business.

This respondent went on to say that a lack of consensus was not necessarily a failure:

...I think that's the thing, you know I just think we're just, we're shooting so high to sky that we're thinking we're going to get one hundred percent consensus and, and if you don't, it's not a failure.

Another participant, in response to a question about whether or not the effort was successful, replied:

I think it was, um, from the standpoint that I don't know of any other time or situation where that many people have continued to talk and work together to discuss issues, um, at the level they were at, um, you know, it's pretty difficult to keep forty to sixty people coming to meeting on a continuous basis, and they were successful in doing that so, you know whether they accomplished all of the things they wanted to accomplish, no they probably didn't, but was it worth while and therefore successful, yes I think it was.

Another participant, in response to the question: 'was the IMPLC successful?' replied:

Definitely. I think it made for a better [resource management] plan. I think everyone in that group thinks the RMP is better for that effort. And then I think that the relationships that we built because of... some of the informal, existential type benefits, the stuff that's not all about the plan, which is about relationships and communication and trust and that type of thing. So I think in both those regards they were successful, the only question is whether it was really worth the money.

As indicated in these responses, nearly all participants felt that the IMPLC had some successes, most of which related to improved social relationships and communication, or to a better, well-thought-out RMP revision. However, questions of worth also arose. One participant stated:

I think that we, I do think that we've benefited from doing it. Now, was it worth it, well, it's hard to say, you know. In terms of time, in terms of the expense, we put a lot of BLM expense and time into it, other stakeholders and participants put a tremendous amount of time and expense into it. I mean, all the trips and traveling and money spent on that kind of stuff, geeze you know. And I don't know how you measure that. Was it worth it? I don't know. You'll probably get a different answer depending on who you talk to and how frustrated they are with the whole experience.

One criterion for success is learning. A participant stated: "I got a real education you know, I was, I'm glad I participated." Another participant perceived other benefits:

...everybody ha[d] a better understanding of where different interests [we]re coming from, um, I think everybody came to recognize other people as human beings that were nice people, even if you disagree, and I think... the local BLM staff... came away with even more respect, not for the agency, not for the contractor, but for the individual BLM staff in that office, who were trying desperately to make some good out of all these endless meetings, so I do think that was a positive...

Increased mutual understanding and respect are aspects of social capital. These findings support earlier research conducted on the IMPLC to suggest that the group experienced increased social capital as a result of their collaboration.

Another participant stated that the IMPLC was able to come to agreement on many smaller issues, but could not agree when it came down to the few core topics for the RMP revision. They elaborated on the subject of success relative to success in decision-making and consensus:

...But there were three main [issues] that really didn't get consensus, the hardest ones consensus wasn't achieved. So, [the IMPLC] was phenomenally successful at giving BLM upfront opinion[s] on a plan. Hands down, in this nation, there's not a BLM plan that will come out as well vented as this draft does. And... there will be less controversy over this BLM plan's draft, than any other plan in the nation because of it. There are still core areas that we didn't work through. But the organization is a huge success, because it gave BLM community perspectives on topics that—and it was funny, because there were lots of things that BLM would have never even thought of that this group brought

forward, and those other topics. Hugely successful when it came to BLM doing an RMP.

This participant brings up several important issues in their statement. The IMPLC was successful in providing feedback to the BLM for their RMP revision and in giving people the opportunity to thoroughly flush out the various issues. This participant uses both meanings of the word success by stating that it was not successful in reaching consensus on the core issues (oil and gas, wilderness designations and wildlife), but that the group was successful in achieving a good, quality conversation. The issue of consensus-based decision-making is fleshed out more thoroughly later in this chapter.

While the IMPLC was generally considered successful in improving social relationships and a failure in accomplishing goals, questions remain as to how people will apply lessons they learned from the IMPLC to similar collaborative situations in the future. One participant stated that despite some of the benefits from the IMPLC, overall the process and the group's inability to reach goals "radicalized" him, particularly in his relationships with other participants. Another participant, who advocated that the IMPLC was a complete success in terms of crafting an RMP despite the community alternative, also stated that "...it burned me out on trying to work with people is what the IMPLC did to me". This participant said that the consensus-based model for decision-making was good in that it did not alienate people; however the process was enough to make him not want to participate in future collaborative efforts where, according to him, people could not compromise. This participant also said:

"...[t]hat process to me leaves a sour spot in my gut, the two years of collaboration, because I don't think the people were truly, the other side... was never—I just really don't believe they were there to reach agreement. I truly believe I opened up and said 'alright, [we hate] these kinds of things, but we'll meet in the middle if you can' and I don't feel like the

other side tried to give any. I think they just tried to suck us towards their side. And, so, if... any federal agency, asks to do this, if I felt they were there in good faith, I'd probably would be easy to deal with, but if I suspected there was not genuine effort to give on that, I'd have a hard time, I'd be hard nosed at those meetings, yeah.

This participant also recognized that the reason he would participate pertained more to the fact that he is required to by his job than because he would voluntarily take part in another collaborative effort. This same participant went on to say that while he gained from the process of the IMPLC, identifying deal-breakers early in the process was a lesson learned, but also resulted in not attempting collaboration in another group based out of the same area for other natural resource issues:

I didn't lose anything. I gained all. Even for the parts where I was burned, it educated as to what to watch out for in the future. And that saved our tail, and the IMPLC saved our tail on [the other collaborative effort] because we knew right up front, 'alright, lets find out the deal breakers upfront where can't go through this'. And it was actually thanks to [another participant, who] said, 'alright, we'll be collaborative, but only if right up front, you identify your deal breakers or things you won't give on', and that was awesome because we saved a, we realized we were not going to agree on a couple key issues for [that group] and we just abandoned the meetings, and agreed to fight.

This comment brings up interesting issues for the long-term outcomes of collaboration when it is unable to reach its goals, as this person felt that a lesson learned from the IMPLC was to opt out of collaboration. Another participant also felt that the inability of the IMPLC to reach its goals will affect future collaborative efforts, despite success in terms of process. This participant first outlined ways in which the IMPLC was successful, saying:

You know it was successful from an individual point of view because it got people that don't normally talk together, to talk together, there were some relationships made that wouldn't have been there otherwise...

However, they also said that the IMPLC was unable to actually make progress on the long-term public lands issues, and finished by stating:

...we got nowhere In my opinion, it certainly put some cautionary tail on any future collaborative efforts...

Another participant stated a similar sentiment about the long-term outcomes being to opt out of collaboration, responding to whether or not they would embark on a similar process in the future as a result of lessons from the IMPLC, this participant stated they would:

Probably not [do it again] ... under the same framework ... there's actually one going on that actually I'm hesitating getting into ... it's a community vision plan and that's relatively collaborative, and on the more, I'm more on the local level and probably would, federal lands stuff is just as too much at stake for people ... You know, unless there were – I mean I could be convinced I mean in theory a collaboration I think could work but the reality of it is, I don't know you have to both do a more blood oath to commit to collaboration versus you know, just getting out of everyone you can.

This participant was from a different stakeholder group and was referring to a separate collaborative effort than both of the previous participant statements, indicating that multiple stakeholders have chosen to opt out of different collaborative situations as a result of the IMPLC's inability to reach a consensus community alternative.

The perceived success in terms of social benefits of the IMPLC paired with opting out of future collaboration as a result of the IMPLC's inability to reach consensus is somewhat contradictory in terms of outcomes of collaboration. This concept will be discussed further in the discussion section of this chapter.

Analysis of the IMPLC data suggests that participants had varied perceptions of success. However most people identified frustration and perceptions of failure with the collaborative process. This was particularly evident with regards to meeting goals and

decision-making, as well as perceived success due to the level and quality of conversations that occurred. Many IMPLC participants generally felt that the process and outcomes were enough of a success to outweigh a failure to reach goals. This concept will be analyzed further in the following section. Perceptions of success vary within a collaborative process and different stakeholders may walk away from the same experience with entirely different interpretations of success, the trick is to be able to identify indicators of perceived success and keep the group moving toward those and away from indicators of failure.

The Role of Consensus-based Decision-Making

In their initial list of agreed-upon rules, IMPLC participants committed to using consensus-based decision-making. It was their decision as a collaborative to use consensus, and according to some parties, the group would not consider any other type of decision-making process. In this section, I explore the role of consensus-based decision making in the IMPLC and how it contributed to different types of success or failure in the group.

I found that a majority of the participants felt that the IMPLC collaborative process was beneficial, despite a lack of consensus and unattained goals. Additionally, most participants agreed that consensus was probably not possible given the group makeup and goals. However, participant understanding of the definition of consensus may have varied. Many IMPLC participants contrasted consensus with compromise or voting systems. Several participants felt that a consensus process gave participants veto power, which made it a non-majority process, and therefore a safer way to participate. It is important to know and understand these differences of perception in order to

understand how people valued and weighed a consensus process, as well as their knowledge of alternate decision-making systems for comparison purposes.

To assess the role of consensus in the IMPLC, I asked three main questions of most participants. These questions were: 1) Was the process of the IMPLC useful/did it have some benefits? 2) Was a consensus community alternative for the RMP revision possible? and 3) Did it require the goal of consensus-decision-making in order to have had a useful and productive process?

The analysis revealed that most participants answered the first question (was the process useful) as “yes”, the second (was a consensus-based RMP revision possible) “no” and many answered the third (was the goal consensus necessary in order for the process to have been useful) “yes”. In general, participants felt that the process and conversations in the IMPLC were useful, however reaching a consensus agreement was probably not possible. When asked whether or not the goal of consensus was required in order to have achieved a process that was as useful as it was, there was more variance in responses. While fewer participants directly answered the third question, quite a few of them thought that the goal of consensus was indeed helpful or even required. This section outlines findings from these three interview questions and how they relate to the role of consensus decision-making.

Was the Process Useful?

This interview question relates to the earlier analysis on perceptions of success, though more loosely defines benefits without the specific associated terminology of “success” and “failure”.

Nearly all the participants found the IMPLC to have been beneficial. All but one of the twenty interview participants gave a positive indication of the usefulness of the process. Of the nineteen respondents that answered the question, sixteen people gave a definite and often enthusiastic “yes,” – they thought the process and conversation of the IMPLC was very beneficial. Three of the nineteen people stated that it was a beneficial process, but had a few reservations or were slightly less enthusiastic and definite in their response compared to the other sixteen. None of the participants felt that the IMPLC was useless or had no benefits.

Table 3 is a taxonomy of how participants felt the process was beneficial or useful and their reasoning. The two possible responses from interview data are “YES” and “YES/kind of”. Those themes that flow from the “YES/Kind of” group are in addition to sentiments from the “YES” responses, which were not isolated to the more solid respondents.

Table 3. Participant response taxonomy to whether or not they thought the IMPLC was useful and their reasoning.

Was it Useful?	YES	RMP revision benefited			
		Conversations	Good quality		
			Finally having the discussion face-to-face		
			Transparency		
			Tackling the issues		
		Relationship building and trust building			
		BLM hearing opinions			
		Hearing each others’ perspectives and new information			
		YES/kind of	All Reasons Above		
			Reasons for "kind of"	Did not achieve goals/decisions	
				Conversations/frustrations	
				Some trust degraded	
				Some relationships degraded	
				Were the benefits worth the costs?	Time
Money					
Effort					

Participants generally felt that the IMPLC process was a good use of time and were pleased with the process and associated conversation. One participant stated:

...but I am immensely pleased with the outcomes of having everyone in the room in being listened to. And I'm saying that as there's a bunch of stuff in that plan that pisses me off ... but, you know, I thought that, it was just a great process. Now whether or not it's worth, you know, the cost benefit ratio and time invested for some people, I have no idea. For me, personally, it was well worth my time.

Questions of time and money often arose during interviews, though most people felt that for them personally, the process was still worth it. Another participant voiced a similar sentiment with regards to the process relative to the cost in terms of time said (in response to whether or not the process was worth it for them):

Yeah, oh yeah... I don't know if it was useful to the, to the degree that it was worth the amount of time that it took...

This was one of the three respondents whose interview was coded as “YES/kind of” during axial coding rather than “YES” definite. Some of the nineteen more definite responses felt that IMPLC was immensely beneficial despite a lack of consensus. One participant stated that not only was the conversation useful, but also the non-consensus RMP revision process and product benefited:

...[there were areas that we] didn't reach consensus, and that doesn't matter. Let me be clear about that. What matters, is BLM heard the differing views. They would never have heard those views without the IMPLC. So it doesn't matter that we didn't agree on things. The point is when BLM when back to the drawing—went back to write that plan, they knew where every side was coming from, and they had the knowledge to make the best balance they could. That's what the group's all about.

This participant, as well as others, found the IMPLC to be hugely beneficial for the RMP revision despite a lack of a consensus community alternative. Participants felt that the process allowed for the expression of differing views, new information provided to the

BLM, and the development of a solid plan that will potentially face less controversy. Many respondents felt that the IMPLC process and resulting conversations allowed for public involvement and opinions to be incorporated into decision-making in ways that would not otherwise have been possible.

In many cases, participants felt that the process was so useful that they would do it all over again if given the choice. While most respondents also stated feelings of frustration, loss and anger when thinking back on the IMPLC, most of those people also said that they still got something out of the process, and either they or the larger community benefited from the IMPLC process. One participant highlighted these feelings, stating:

I gained skills. I gained some friendships, lost some time, lost my temper a couple of times you know, um, but yeah... you know I'm sure, I'm sure I gained more than I lost personally.

Another participant felt similarly and stated:

It sucked, I mean, I will say, you know, going and working sixteen hour days, spending just thousands upon thousands and thousands of hours, you know... The nights you know, at the office 'til one, two in the morning, I mean, those are things that were difficult. But like I said, I think it was all worthwhile in the end, whether or not people reached the resolution that they wanted, and I think, you got to look at things in a little bit more, I don't know, unbiased perspective. You invest in—you invest in things to, to you know, see a variety of different outcomes, and in this case I view it as I invested in my community...

For most participants, the enormous and even painful investment of time was worth developing relationships, learning, and the opportunity to consider a variety of perspectives

Was Consensus Possible?

Most participants felt that consensus on a community alternative for the RMP would not have been possible given the circumstances of the collaborative group. While some participants said that consensus may have been possible under different circumstances, such a change in goals, issues or membership, only one participant felt that the IMPLC would have been able to come to consensus if given more time *without* changing those variables. In other words, given the participants involved and the issues on which the group was attempting to achieve consensus, only one person thought that if given more time, a consensus agreement would have been possible. The fact that such a large majority of respondents felt that the IMPLC would not have been able to come to consensus suggests that a consensus community alternative for the local Resource Management Plan was not a realistic goal for this group.

Extended analysis examined variation among participant views regarding the possibility of consensus and the reasons why they viewed it as possible or impossible. All of the twenty participants addressed whether or not consensus would have been possible given the circumstances of the group. Of these, fifteen respondents stated that the IMPLC definitely would not have been able to come to consensus on the core issues of the RMP revision. Four respondents gave qualified no. These four respondents indicated that they thought consensus was unlikely, and probably would never have occurred, but were a little less definite than those who directly said “no”. Only one respondent thought consensus would have been a possible goal for the IMPLC to achieve if given more time. It should be noted that this participant as well as one of the participants that gave a less certain “no”, were two of three interview respondents who

did not actively participate in the IMPLC to the very end. Table 4 is a taxonomy depicting some of issues that respondents discussed with regards to why they thought consensus was or was not possible for the IMPLC.

Table 4. Taxonomy of participants’ reasoning behind the IMPLC’s inability to reach its goals and come to a consensus agreement.

Was Consensus Possible?	YES	Needed more time/funding				
	NO	Respondents that replied "probably not" rather than "no"	More time			
			National vs. local players			
			Politics	National		
				Local		
		Membership	Open process			
			Newcomers can derail discussions			
			National stakeholders	National membership to groups		
				Federal lands = public stakeholderhood	Validity of stake	
					Impact	
		Local stakeholders				
		Core issues	Incompatibility	Uses		
				Values		
				Beliefs		
			Entrenchment			
			Framing and conflict			
			Issues of single use	Wilderness	No way to coexist	
		Oil and gas				
		Lack of incentives	Better options elsewhere	Litigation		
				Court		
			Other’s lack of transparency			
		Lack of trust in others				
		Politics/politicians	Local			
			National			
			Policy	Federal		
				Local		
		Stakeholder influence				
		Decision-making	Authority - stakeholders			
BLM vs. group						

Participants gave a variety of reasons that the IMPLC was unable to come to consensus on the RMP revision. People generally felt that the core issues with which the IMPLC was grappling, including oil and gas development and wilderness designations, were issues that they would never be able to agree on. Participants also noted that

consensus was not possible given the wide range of stakeholders (and opposing perspectives) involved. Some participants felt that the open process paired with those core issues would never have produced consensus agreement. One participant articulated this sentiment by stating:

...and that's the difficulty, you have a big, a big group, that's completely nebulous in concept and completely open in membership, it's difficult getting things done at those meetings.

The core issues in the RMP revision, oil and gas exploration and wilderness designation, were associated with fundamentally incompatible natural resource values, namely a highly utilitarian view and a strongly preservationist perspective. Wilderness proponents believed that wilderness by definition and function cannot coexist with oil and gas development, and vice versa. The IMPLC experienced entrenched conflict and core incompatibilities of land-use perspectives. One participant highlighted the intensity of the issues and the improbability of consensus, by stating:

...I tend to think that the natural resource disputes are more entrenched ... I mean, the way you talk about it in mediation and stuff is you can't really expand the pie, you've got to divide the pie, and uh, you know that it's mine or it's yours, and I think they've done some creative stuff [for some natural resource issues in other areas where people have thought about] ...not so much expanding the pie of creative solutions but thinking a little bit about what can coexist and where can we just divide. ...And my guess is, in [the local government] I mean there are clearly areas where 'this is the best for the wild horse range', but in a lot of those areas it's also best for you know off road riding and jeeping and other things and, people really feel very passionate about their own, own interests...

This respondent also stated that:

...although I think there are times where I think you had hope of full consensus, most of the time it was just narrowing down the areas of agreement and disagreement.

One participant responded to the incompatibility of the core issues and stakeholders' inability to compromise on those issues by stating:

...I think the big, glaring example is with the wilderness issue and [a particular portion of the resource area], or other areas, but [that particular area] being one of the key wins, or the most key win, that the wilderness advocate groups, there just wasn't any ability for them to compromise on the issue, you know, that they had to go for: 'this needs to be preserved in a wilderness state' or they aren't doing their job. ...and by the same token you got to recognize like [the local government], lets say on the other side couldn't go for that, you know, so there's these inflexible diametrically opposed points that made it futile to try to collaborate on that issue.

The IMPLC was unable to compromise on the core issues, and most participants were too far entrenched to come out of their positions. Another respondent stated:

...On certain things that weren't your core issues, people were willing to compromise on process, or, whatever, but in terms of the core issues that were really underneath this, like what happens to [a particularly contentious portion of the resource area], which is a, what you quote a zero sum issue, no, oil and gas industry wants in, [others] want to protect it as wilderness, and the ranchers, I shouldn't say ranchers, [local government], representing ranchers, um, they basically brought everybody together thinking, I believe, that they would convince everybody to go their way, I don't know why they felt that, but um, so now, I think on the core issues nobody in the end felt it was within their best interest to compromise.

Another participant said:

We weren't able to collaborate. In general... I mean, ... we have our locked-in positions and people were not willing to, they say you don't use the word compromise in collaboration, but a reality is you do have to compromise if you want one hundred percent of the land to be graze anything less is a compromise, and just the opposite if you want one hundred percent preserved, anything less would be compromise and most people were not willing to compromise on any of the key issues.

Some people were wary as to whether or not other participants even had incentives to come to agreement on some issues:

...It changed over time, I think people were more willing to look at compromise solutions over time. [But] overall, people went into it

thinking, 'I'm going into this process, either because I'm going to get what I want out of this process, or I'm going to make damn sure they don't get what they want out of the process'.

Such a sentiment about other people's willingness to collaborate and a lack of incentives was a common theme in the interviews. A lack of incentives and perceived lack of incentives for others was a reason people did not work towards consensus-based decisions. Respondents generally felt that they were truly willing and attempting compromise and collaborative decision-making and that participants holding opposing views were not. Many participants, regardless of their value orientations or stakeholder group, mistrusted other participants' intentions.

In sum, participants felt that the IMPLC was not capable of reaching a consensus community alternative for the RMP revision. Nearly all respondents believed consensus was not possible. Their reasoning included politics (see Chapter Three), incompatibility of land-use goals and value systems, disincentives to collaborate, and the stakeholder groups.

Was the Goal of Consensus Required to Achieve the Perceived Benefits of the Process?

Most respondents had not thought about the role of consensus in achieving the benefits of the process that they perceived, and some found this question difficult to answer. Of the twenty participants, fifteen sufficiently understood and answered the question. Of these fifteen, four respondents stated a definite yes, that in order to attain the benefits of the process, consensus-based decision-making was required. Six respondents stated a "yes/probably" answer, where they thought there was truth in the statement but were less certain of their convictions. Three people said "no", that they did not think consensus was required for the process to have been beneficial, and two

respondents clearly stated that they were unsure. Overall, nearly all participants felt the process was beneficial to some degree and that consensus was not possible. Of these, nine also thought, to varying degrees, that the goal of consensus decision-making was needed in order for the process and conversation to have been as useful as it was.

One participant articulated both the advantage and cost of open process with the goal of consensus by stating:

...consensus is process of sort of an iterative, how about now? What if we tried this? How about now? What if we try this? Where everyone agrees to keep trying and keep trying until we know we've done the very, very best to maximize everyone's gain. You can't do that in a in a drop in open membership process... You can but then you're signing yourself up for what [the IMPLC] ended up being [-] just this on-going-always-something-new, always-do, you know new issues new people, new concerns, there's no way to end it.

Another participant statement about lessons learned from the IMPLC process and the lack of consensus articulated:

Yeah, if someone came up to me and said 'Should we go through this in our community', I'd say 'Yes'. It was worth it. But I'd advise somebody: you got your tough areas, don't expect consensus on them. I expected consensus on those tough areas, and I was wrong ... I think I'd do what we did on [another more recent local collaborative effort]. I'd say 'okay, raise your hand if you're never going to give on this subject and give me a justification why'. And I'd just avoid them.

This highlights the issue of a failure to reach goals causing decreased trust in stakeholders to be able to overcome those core issues through the collaborative process.

Another participant gave a cost/benefit statement, arguing that the goal of consensus is what got them to the table and having the conversation in the first place, but also served to inhibit their goals:

...I think it [the goal of consensus decision-making] was necessary, it ultimately prevented [the IMPLC] from reaching its success, but given

that I don't think it could have ever reached that success, I'd say it was a good thing to process-wise.

Another participant stated:

...you couldn't have one without the other. I mean, without consensus-based decision-making we had not reason to be together. So it helped, because it helped keep, you know a civil discourse. If it was just going to be you know, democracy rules, then people would be arguing more and there'd be no reason to listen ... without [consensus] you have no basis for discussion.

These participants voiced a common sentiment amongst IMPLC members that the consensus-based decision-making helped the group to continue a productive conversation and to attempt to maximize everyone's gain. However, it was also a process that did not enable them to achieve their goal of consensus on a community alternative for the RMP revision.

The IMPLC's employment of consensus-based decision-making was the reason that some participants engaged in the process in the first place. One such respondent stated: "Well I don't think we [would] have come to the table... if it wasn't consensus based..." This participant, as well as others, felt that the use of a consensus model was the only way that they could be sure of fair process in the IMPLC. These respondents felt that the employment of consensus decision-making gave them a voice that would otherwise not be heard and that existing power inequalities would have otherwise dominated. This perspective generally came from people that felt they would have been marginalized in a majority-vote democratic decision-making process.

Trust and Transparency

Interviews suggested that IMPLC participants felt others were relatively transparent, but that trust between participants was and continues to be low, despite some

changes during the process. Responses varied as to whether or not trust changed over time, but most agreed that trust was initially low in the beginning of the process and ended low. Some believe that trust changed very little, while others stated that trust increased as a result of the process of the IMPLC. However, as the collaboration began to decline near the end, trust also declined as a result. The group's inability to reach goals caused a decline both of trust in *other participants* as well as trust in the *process of collaboration* to overcome core conflict.

Participants generally felt that relationships and transparency improved but trust did not. One person said:

...[the IMPLC] got better at transparency, and they got better at talking to each other, you know, as, as moving away from seeing the interests, seeing the person instead, they were very chatty and friendly at the end and chummy as hell. But I don't think that they ever really remotely trusted each other...

Another respondent agreed with increased friendship but not trust, and elaborated:

...friendship grew, you know in the sense that you know if I saw anybody along, any of them on the street I'd go up and give them a hug and ask about you know their kids or whatever, you know? So ... maybe respect is what grew. I mean ultimately, like I said, the [other stakeholder group] wasn't going to move off their position because they didn't feel like they had to, and, so, I trust them to continue to look out for their own self-interest, am I'm sure that they trust me to do the same for myself. So I just think it was more in a human level, you recognize they're good people and some of them are really fun people... do I trust that they would pull me out of the road if a speeding car was coming? Yes. Do I think they're going to push really hard for their position against mine? Yes...

This participant articulated that while friendships, and in some cases, respect, grew out of the process, trust between participants to collaborate fairly did not. This finding is consistent with Wagner and Fernandez-Gimenez's (2008) finding that consistency and predictability of other stakeholders' behavior is an important factor in building social

capital, even when other's views are at odds with a participant's views. Wagner and Fernandez-Gimenez's (2009) more recent work also found a negative correlation between collaborative experience and trust. Another IMPLC participant who felt that they did not personally build trust as a result of the collaboration, stated:

I think it seemed like [trust] declined along the way at times, but in the end, we were right back at our camps and we had very much distrust. ...[though I respected the candidness of some other participants]... But the age old, I'm sure the stakeholders sat back in their offices as we did here and said 'I wonder what they're going to do next? Do you think they're going to move on that issue? Or it looked like they moved – what's their angle?' you know, that would [happen] between meetings, so I'd say it was not a lot of trust.

This person felt that while people were transparent during meetings about their motives, there was still much distrust and speculation about the actions of other participants outside the IMPLC. Another participant said:

I think trust was more of an issue of a one-on-one sort of thing than... the enviros bec[o]me trusting of the gas companies or vice versa, and I don't think there ever will be [trust]. There won't be.

This participant later elaborated that "...trust happens [/increased] on an individual basis, and at the same time there will never be complete trust". This respondent voiced the sentiment that the process of the IMPLC and the change in relationships increased some trust on a personal basis, but not on a positional basis and that people in the IMPLC process were not able to overcome issues of trust despite those improved relationships.

Another respondent voiced similarly:

...not everyone that was on the opposite side of the table was untrustworthy, so some trust was improved but it was, it was, clique-ish isn't the right word but there were sects, there were groups of people that pretty much came in with an agenda so even the people that I might have been able to trust from that group I ... felt that they were getting marching orders from others in the group...

Participants generally seemed to feel that personal relationships were improved but never for entire positions or stakeholder groups and not for the purpose of the collaborative effort.

One participant articulated that "...[the IMPLC] has its roots in a lack of trust...", indicating IMPLC's low level of trust from the beginning. Perceptions of trust varied by participant and often by the interest that they represent in the process. Many participants from the conservation and environmental communities viewed trust as starting and staying low throughout the entire IMPLC process, whereas agency, government, ranching and industry representatives had a tendency to think that trust increased somewhat during the course of the IMPLC process, but was low at the beginning and end of the IMPLC. Respondents from environmental and conservation interests often expressed doubt that other participants would relinquish power and compromise over decisions in the IMPLC based on past interactions and experiences. One participant commented on the difficulty environmental stakeholders had in trusting other participants in the process as follows:

...you know for environmental [interests] to go into [that county], you know you could just tell [they] have this hunkered down look of 'I'm going to get rolled'. And, and you know [some of those participants were] no shrinking violet in terms of personality, and [can hold their] own in any room. But you know you could tell that it was just like; this is a tough place for, for environmentalists to, to try to pitch their discussion...

Another participant, who took a more positive view on trust in the IMPLC, identified the divide between the environmental interests and others pertaining to issues of trust by stating:

There wasn't a lot of trust between some of the interests. Environmental groups and [the local government] mostly had the long protracted history... So, right off the bat there you weren't starting with a lot of

trust, same with environmentalists and oil and gas. But that started to build - the creation of the protocols really helped to bind the group together. First thing we needed to do was figure out how this group was going to work, how they're going to make decisions and so forth, and that was a long process... And that really helped. The structure of the protocols helped manage trust a lot, because it talked about in there, it says, you know, 'Don't work behind the group's back, you know, don't do this in media' and it really got to a lot of the issues that people didn't trust in the other people about, or things that would sabotage a trustful relations. So, I think that really helped to get well, 'everyone's on the same page here, and I can at least trust people not to violate this protocol', because that would really look bad for them. It would really go against their own interests to do that. So that was a good first step in kind of healing some of the trust issues...

Some participants felt that the inability to reach their goals caused trust to decline below its initial level at the start of the process. One respondent said: "I'd say, for me, I probably had more trust in the beginning than I did towards the end..." and that "...I went into it open, willing to collaborate". Another stated: "I think it, over time [trust] went in the dump". Another said:

For me [trust] decreased. I started out trusting people more than I do now. After it was all over with, because I feel that people were not honestly there to compromise on points, I mean. You're going to—I bet you every person you ask that question to going to have a different answer on that...

One such participant argued that

...to be fair I think that the trust broke apart right at the end because of the time frame [as well as other issues] ... and then the end of [the IMPLC] was, was more artifact of, of BLM budgets and timeframes than [anything else] ... [and if] we could have kept the IMPLC going ... I think the trust would have come back...

This person also identified themselves as possibly having a more optimistic outlook on the IMPLC than many participants. Though one other participant agreed with the budget and timeline having a direct effect on trust, stating:

...once you hurry this process, it's—that's, when, I believe when you start hurrying things, that's when ... the seeds of mistrust are sewn, because

folks feel that things are moving too quickly for them to either react or be proactive. And I think that ... that's sort of helped move things to some folks being dissatisfied in the end.

Nevertheless, most participants did not blame the timeline for their lack of trust in one another, but focused more on the issues, other stakeholders and interest groups.

One participant commented on the lack of trust throughout and after the process of the IMPLC by stating:

I think in some cases [participants] did find that they could at least communicate with each other but I don't think they ever trusted each other and I don't think they do today. You know I think if anything, what it did was, was show them that they were right and not trusting if you will.

The idea that participants learned that they could not trust each other has had other longer-term social outcomes. Trust in other community members and stakeholder groups has remained low as a result of the IMPLC member's inability to reach consensus.

While fewer participants commented on transparency, most agreed that transparency was very high for the group compared to trust. While a few felt that transparency about some participants' goals was lacking, most felt that people were relatively transparent about their goals and motives. One participant clarified the distinction between trust and transparency, stating:

I don't think that trust ever changed, what they got better at was transparency, you know [the IMPLC] had a really strict rule of no surprises, so when they were going to attack one another or do something that seemed counter to the process, they would, they were very good about telling each other.

The issue of attacking one another but being transparent about it is at the core of the distinction between trust and transparency for the IMPLC. Some participants agreed that transparency was one of the strong suits of the IMPLC:

...this process was so transparent and I think that that's what was so important. That ... the information was just out there, we knew what [the BLM] were doing, they knew what we were doing, it was public information. Up until you know the, the draft EIS [environmental impact statement] and when it came it out, so it was, that transparency was really important and the information that they received from us was um, was extremely important...

Another participant stated that transparency, despite a lack of trust and other core issues, was one of the things that made the IMPLC successful in terms of process for the group:

...Was it worth it? I mean, yeah, probably, at least the group, you know, was let into the process, and that transparency just counts for so much, even if they're not going to collaborate. Transparency bought us something. I don't even know if I would have done that differently.

This is consistent with Wagner and Fernandez-Gimenez's (2008) finding that transparency helps promote successful collaboration.

The IMPLC helped participants to appreciate and respect one another more. Individual relationships improved and participants better understood where others were coming from and were more able to communicate effectively as a result. However, trust in others only appeared to have improved in terms of the trust in others to be transparent (though to varying degrees), and in areas not directly related to the collaborative process. The one place where trust definitely increased was from the community stakeholders toward the BLM area office and its staff, consistent with Wagner and Fernandez-Gimenez's (2008) findings.

Discussion and Conclusions

The IMPLC collaborative group was unable to reach its goal of crafting a consensus community alternative for the BLM's RMP revision for the resource area. This research found that the IMPLC participants perceived the collaborative effort as both successful and unsuccessful. Participants agreed that there were many benefits from

the collaborative effort apart from the consensus community alternative and most felt that consensus probably was not possible for the RMP revision. Perceived benefits from collaboration and social indicators of success are consistent with literature on collaboration. The IMPLC experienced improved communication and relationships (Schuett et al., 2001, McKinney and Field, 2008), some increased trust (Leach and Pelkey, 2001) (though trust declined for the most part) and other indicators of social capital, as well as increased legitimacy for decisions (Daniels and Walker, 2001). Additionally, participants had the opportunity to engage in a collaborative process and provide meaningful input to the BLM for their RMP revision. However, my results also indicate that the goal of consensus may have other roles in collaborative process, and that relationships can both degrade and improve as a result of collaboration. This result confirms findings by Wagner and Fernandez-Gimenez (2008) in a study of members from eight different collaborative groups in the Intermountain West.

Lessons from the IMPLC indicate that participants had a positive perspective on the process, but that they may not engage in another collaborative effort for similar issues in the future due to a lack of trust in the other stakeholders and skepticism about whether goals are achievable. This finding deviates from those of McKinney and Field. In their survey of collaborative groups in the Rocky Mountain West, McKinney and Field (2008) found that collaboration improves social and political capital, relationships, communication, trust and participant ability to collaborate on future efforts. I found that while the IMPLC participants included improved communication, relationships and some elements of social capital in their description of benefits to collaborative process, trust declined as well as their willingness and ability to engage in future collaborative efforts.

The increased transparency associated with a federal agency engaging in collaboration cultivated trust with the agency as a result of the IMPLC, a finding which is consistent with Wagner and Fernandez-Gimenez (2008) and Wondolleck and Yaffee (2000).

However, the long-term negative social outcomes from a group that was unable to reach its primary goal is consistent with Conley and Moote's (2003) hypothesis about the heavy costs of failed attempts at consensus.

Consensus-based decision-making had both positive and negative outcomes for the IMPLC. Positive outcomes were improved communication and a thorough deliberative process. Negative outcomes were setting a potentially unrealistic goal and then failing to meet it. These outcomes indicate that the process of attempting consensus can improve communication, social capital, and the quality of decision-making, findings that support some claims often made about collaboration (e.g. Wondolleck and Yaffee, 2000). However, as Conley and Moote (2003) warn, my results show how unsuccessful attempts at consensus can also potentially undermine social capital and confidence in collaborative process when goals are not reached.

The IMPLC's failure to achieve its primary goal, despite an overall positive perspective on the collaborative group, may deter participants from collaborating on other projects when similarly difficult issues present themselves in the future. My findings raise an important question: what is more important in collaboration, process or outcomes? My results suggest that a process that is perceived as legitimate and beneficial to participants may not outweigh the negative effects of its ineffectiveness in reaching consensus. The paradox is that the commitment to consensus made the perceived benefits possible, but also may have undermined the ability of the group to achieve its

primary goal of agreement on a community alternative for the RMP. Thus, while consensus may have lent legitimacy to the process, kept participants motivated and engaged, and therefore created opportunities for increased learning and mutual understanding, it also contributed to unrealistic expectations and ultimately disappointment and disillusionment among participants when their goal of agreement was not achieved. This disappointment, in turn, may discourage participants from investing in future collaborative efforts. It also showed that consensus was not likely possible for this group. While I found that participants perceived the process as beneficial and in some cases successful, it did not necessarily translate into future social capacity for overcoming core differences.

Perceptions of success and the role of consensus in natural resource collaboration require more in-depth research. While much of the literature on collaboration identifies a variety of benefits produced by collaboration (Moote and McClaran, 1997, Wondolleck and Yaffee, 2000, Daniels and Walker, 2001, Lafon et al., 2004, Koontz and Thomas, 2006, McKinney and Field, 2008, Wagner and Fernandez-Gimenez, 2008), I found that rigid adherence to a procedural goal of consensus decision-making can yield both positive and negative outcomes simultaneously. The IMPLC is likely a text-book example of a case in which participants holding opposing views and positions were unable to compromise on core value-based issues (Paulson, 1998, Rasmussen and Brunson, 1996), suggesting that the group was not a strong candidate for successful consensus-based decision-making from the outset.

The implications of the IMPLC's experience for participants in collaborative processes are several. Participants in the collaborative process should carefully consider

the potential costs and benefits of engaging in a consensus-based decision-making process. While the IMPLC found that the goal of consensus helped cultivate a process that was perceived by many as successful due to increased social capital, improved communication, extensive deliberation, and high-quality input to the BLM, costs were also accrued. Failure to reach consensus was the catalyst for burnout among participants and has deterred some participants from collaborating on other projects. Therefore, I recommend that collaborative groups employ consensus cautiously. When used in contentious, entrenched conflict scenarios, the failure to reach consensus can have other negative effects. In particular, collaborative groups should consider whether the potential of undermining the capacity and willingness of community members to engage in future collaborative problem-solving is worth the risk that commitment to consensus decision-making may entail.

CHAPTER SIX

CONCLUSION AND LESSONS LEARNED

This thesis investigated the role and perceptions of conflict, science, consensus and success in an inactive collaborative group. Research questions focused primarily on 1) process – including conflict and power; 2) the integration of science in decision-making; and 3) perceptions of success and the roles of consensus and trust. I found that the IMPLC experienced entrenched conflict and was not able to overcome many of its core conflicts. Science was difficult to use in decision-making and while participants had a positive view of science, they were skeptical of the ability of available science to inform on-the-ground management decisions. There were many social benefits from collaboration and the IMPLC was both successful and unsuccessful as a collaborative group. Consensus both helped the group to achieve many of their social benefits but also was the reason for their inability to reach goals. This chapter focuses on the lessons learned for collaborative practice from this research.

Lessons Learned

The goal of crafting a consensus community alternative to the Bureau of Land Management's (BLM) Resource Management Plan (RMP) revision was unrealistic for the IMPLC. Despite the benefits from the collaboration process, ultimately the group's inability to reach its goal had negative impacts on participants' trust and their willingness and capacity to work together on future efforts. However, participants were able to

improve communication and relationships (especially with the BLM), and provide better, more comprehensive input for public lands management, as well as increase participant and BLM understanding of the area and its stakeholders. Therefore, a lesson learned may have been to take more time finding out whether or not goals are attainable before embarking on a large-scale task like the RMP revision. While it was beneficial for participants to discuss and deliberate about contentious issues, those topics were not strong candidates for consensus-based decision-making. One participant stated a lesson learned was “Don’t try that. The whole resource management plan as ... your first [collaborative] project...”, indicating both unrealistic scope and timeline for IMPLC goals.

The timeline was another lesson learned from the IMPLC. Large-scale collaborative efforts take time, particularly in the case of the IMPLC, which incorporated diverse stakeholders and high levels of conflict and value-based differences. The process of coming up with protocols, building relationships and trust, and improving communication alone takes significant amounts of time and is critical to the later success of a group. Similar large-scale collaborative processes are not likely to reach consensus on a timeline that matches federal agency goals.

Additionally, I found that collaborative processes in which goals are not reached, run a high risk of consuming social capital and decreasing capacity to work collaboratively in the future. Thus, collaboration can be a productive and worthwhile endeavor, and the process of building consensus can increase social benefits such as improved relationships, trust, communication skills, and awareness of others’ values and perspectives. However, the process goals and timeline must be attainable in order to

achieve and maintain those benefits, and in the case of the IMPLC, some social capital (particularly the capacity to act on future projects) was consumed as a result of goals that were not reached.

While the IMPLC dealt with complex issues for which consensus was unattainable in their timeline, my recommendation is not to avoid system complexity in collaboration. Indeed, the very fact that the IMPLC addressed and deliberated about those issues was part of the perceived success. Additionally, participants viewed those discussions as a success in terms of the opportunity for the BLM to have a better, more in-depth understanding of stakeholder concerns and interests. Instead, I suggest that collaboration should embrace complexity, but not expect consensus for those issues early or at all in a time-limited process.

It may be worthwhile, when conducting a conflict assessment and deciding on protocols, to spend significantly more time discussing participant motives and their alternatives early and throughout the process. Daniels (2009) states that conducting a conflict assessment is an important precursor to collaborative success. Research of the IMPLC confirms this finding and adds that not only is it essential to successful process, but also should be coupled with the facilitation in order to achieve those benefits and effectively tailor the process. Should the process already be operating (as was the case with the IMPLC), conducting a second situation assessment would benefit the facilitation design.

Most participants found the facilitation of the IMPLC to be very effective and had few thoughts on how the facilitation could have been improved, though some felt that taking a more strict approach with participants on contentious issues would help. Nearly

all participants stated that having a third-party facilitator was essential to the process, and the IMPLC would not have been possible without it. Additionally, the facilitator was esteemed as very skillful and knowledgeable, which helped the group achieve many of their benefits. The fact that the group collectively interviewed and selected the facilitator for the IMPLC had a lot to do with their enthusiasm about the collaborative process design. Consensus on selecting a facilitator was one of the keys to some of the benefits. Most criticisms of the process were focused on factors outside the facilitator's control, keeping conflict focused on the actual conflict issues.

Power relationships are unavoidable in collaboration. The IMPLC experienced a variety of power inequalities among stakeholders. I suggest that perceived and real power inequalities have a similar effect and can equally influence participants' actions. Despite transparency about power, participants speculated widely about how and whether it would be wielded. Careful attention should be paid to power inequalities in the collaborative process, though transparency about power may not be sufficient to mitigate speculation.

The goal of consensus cultivated participation in the IMPLC with the hope of a potential shift in power, based on the history of conflict between interests in the area. I suggest that a rearrangement of power relationships and changes in communication, such as consensus-based decision-making, will help communities promote participation and help foster creativity in decision-making. However, it may not require the goal of consensus to achieve these objectives. I suggest that other innovative approaches may also be able to accommodate these goals. This is consistent with Daniels' (2009) call for innovation in natural resource collaborative design.

Additionally, each participant's best alternative to a negotiated agreement (BATNA) should be determined and publicly acknowledged before embarking on a collaborative process, and process design should take BATNAs into account. These may change over time and as federal policy and administration change. In-depth, periodic assessments to decide whether the process is working, and whether it should be continued helps manage the effectiveness of the process and continue to tailor collaboration to the group and its stakeholders.

The open membership process utilized by the IMPLC allowed for broader stakeholder participation. However, many people expressed concern about leaving the process open throughout collaboration. A process with specific goals and significant time constraints may benefit from moving to a closed process in the final stages of collaboration, where all participants at the table remain, but the group does not allow newcomers. Defined membership should only occur well in to the collaboration, and probably only if dealing with strict timelines. While there were few instances of late arrivals derailing the process in the IMPLC, the speculation that this could happen was a prevalent theme in interview responses.

Federal agencies have much to gain from promoting stakeholder collaboration. In addition to the arguments for natural resource collaboration, federal agencies also gain community trust and support as a result of their increased transparency and having taken the time to listen to stakeholder values and interests (Wagner and Fernandez-Gimenez, 2008). I recommend that federal agencies take this into account when deciding whether or not to engage in and finance collaborative process. These benefits may not be easily quantifiable, but are relevant for the future capacity of that agency.

Finally, science has the potential to overcome core conflict by focusing on facts rather than values. However, careful attention must be paid to its use and communication in collaborative processes. Stakeholders may reject scientific information when it is poorly communicated.

It is beneficial to engage stakeholders in the process of scientific inquiry. However in general, there is a need for scientific information that is 1) disseminated to the public for decision-making; 2) relevant to decision needs; 3) site-specific to areas or interpreted for a specific area; and 4) collaboratively negotiated among stakeholders.

In sum, I found that the IMPLC was a beneficial collaborative process, but its long-term social outcomes were negatively affected by its inability to build consensus. Collaboration should embrace complexity of issues, but also create realistic goals in terms of scope and time, at least until enough time and work has gone in to building meaningful trust and social capital.

LITERATURE CITED

- Adler, P. S., Barrett, R. C., Bean, M. C., Birkhoff, J. E., Ozawa, C. P. & Rudin, E. B. (n.d.). Managing Scientific and Technical Information in Environmental Cases: Principles and Practices for Mediators and Facilitators. pp. 76. RESOLVE, Inc. U.S. Institute for Environmental Conflict Resolution. Western Justice Center Foundation.
- Agrawal, A. & Chhatre, A. (2006). Explaining Success on the Commons: Community Forest Governance in the Indian Himalaya. *World Development*, **34**, 149-166.
- Allan, C., Curtis, A., Stankey, G. & Shindler, B. (2008). Adaptive Management and Watersheds: A Social Science Perspective. *Journal of American Water Resources Association*, **44**, 166-174.
- Ball, A. (n.d.). Introduction to Collaborative Process: Managing Natural Resource Disputes - No. 1. University of Nevada, Reno, Cooperative Extension.
- Bartoš, M., Kušová, D., Těšitel, J., Kopp, J. & Novotná, M. (2008). Amenity Migration in the Context of Landscape-Ecology Research. *Journal of Landscape Ecology*, **1**, 5-21.
- Bormann, B. T., Cunningham, P. G. & Gordon, J. C. (1995). Adaptive Management, Best Management Practices, or Both? *SAF National Convention*. Portland, Maine.

- Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., Jager, J. & Mitchell, R. B. (2003) Knowledge Systems for Sustainable Development. *PNAS*, **100**, 8086-8091.
- Chess, C. & Purcell, K. (1999). Public Participation and the Environment: Do We Know What Works? *Environmental Science and Technology*, **33**, 2685-2692.
- Coggins, G. C., Wilkison, C. F. & Leshy, J. D. (1993). *Federal Public Land and Resources Law*. The Foundation Press, Westbury.
- Coglianesse, C. (2003). Is Satisfaction Success? Evaluating Public Participation in Regulatory Policymaking. *The Promise and Performance of Environmental Conflict Resolution* (eds R. O'Leary & L. B. Bingham), pp. 69-89. RFF Press, Washington DC.
- Conley, A. & Moote, M. A. (2003). Evaluating Collaborative Natural Resource Management. *Society and Natural Resources*, **16**, 371-386.
- Cooper, C. B., Dickinson, J. L., Phillips, T. & Bonney, R. (2007). Science Explicitly for Nonscientists. *Ecology and Society*, **13**.
- Corbin, J. & Strauss, A. L. (1990). Grounded Theory Research: Procedures, Canons, and Evaluative Criteria. *Qualitative Sociology*, **1**, 3-21.
- Couvet, D., Jiguet, F., Julliard, R., Levrel, H. & Teysseire, A. (2008). Enhancing Citizen Contributions to Biodiversity Science and Public Policy. *Interdisciplinary Science Reviews*, **33**, 95-103.

- Cronin, A. E. & Ostergren, D. M. (2007). Democracy, Participation, and Native American Tribes in Collaborative Watershed Management. *Society and Natural Resources*, **20**, 527-542.
- d'Estrée, T. P. (2003). Achievement of Relationship Change. *The Promise and Performance of Environmental Conflict Resolution* (eds R. O'Leary & L. B. Bingham), pp. 111-128. RFF Press, Washington DC.
- Daniels, S. E. (2009). Insights and Applications: Exploring the Feasibility of Mediated Final Offer Arbitration As a Technique for Managing "Gridlocked" Environmental Conflict. *Society and Natural Resources*, **22**, 261-277.
- Daniels, S. E. & Walker, G. B. (2001). *Working Through Environmental Conflict: The Collaborative Learning Approach*. Praeger Publishers, Westport, CT.
- Davies, S. R. (2008). Construcing Communication: Talking to Scientists About Talking to the Public. *Science Communication*, **29**, 413-434.
- Failing, L., Gregory, R. & Hartstone, M. (2007). Integrating science and local knowledge in environmental risk management: A decision-focused approach. *Ecological Economics*, **64**, 47-60.
- Fendt, J. & Sachs, W. (2008). Grounded Theory Method in Management Research: Users' Perspectives. *Organizational Research Methods*, **11**, 430-455.
- Fernandez-Gimenez, M. E., McClaran, S. J. & Ruyle, G. (2005). Arizona Permittee and Land Management Agency Employee Attitudes toward Rangeland Monitoring by Permittees. *Rangeland Ecology & Management*, **58**, 344-351.

- Fischer, F. (2000). *Citizens, Experts and the Environment: The Politics of Local Knowledge*. Duke University Press, Durham.
- Fisher, R., Ury, W. & Patton, B. (1991). *Getting to Yes: Negotiating Agreement Without Giving In*. Penguin Books, London.
- Glaser, B. G. & Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine de Gruyter, Hawthorne, NY.
- Gray, B. (1989). *Collaborating: Finding Common Ground for Multiparty Problems*. Jossey-Bass, San Francisco.
- Gray, B. (2003). Framing of Environmental Disputes. *Making Sense of Intractable Environmental Conflicts: Concepts and Cases* (eds R. J. Lewicki, B. Gray & M. Elliot), pp. 11-34. Island Press, Washington DC.
- Gregory, R., Ohlson, D. & Arvai, J. (2006). Deconstructing Adaptive Management: Criteria for Applications to Environmental Management. *Ecological Applications*, **16**, 2411-2425.
- Hardin, G. (1968). The Tragedy of the Commons: The population problem has no technical solution; it requires a fundamental extension in morality. *Science*, **162**, 1243-1248.
- Holecheck, J.L., Pieper, R. D. & Herbel, C. H. (1989). *Range Management: Principles and Practices*. Prentice-Hall, Inc., Englewood Cliffs.
- Holling, C. S. (1978). *Adaptive Environmental Assessment and Management*. John Wiley & Sons, Chichester.

- Huchinson, S. A. & Wilson, H. S. (1993). Grounded Theory the Method. *Nursing Research: A Qualitative Perspective* (ed P. L. Munhall), pp. 209-240. National League for Nursing Jones & Bartlett Publishers, Boston.
- Kemmis, D. (2001). *This Sovereign Land: A New Vision for Governing the West*. Island Press, Washington D. C.
- Kim, H.-S. (2007). A New Model of Communicative Effectiveness of Science. *Science Communication*, **28**, 287-313.
- Koontz, T. M. & Thomas, C. W. (2006). What Do We Know and Need to Know about the Environmental Outcomes of Collaborative Management? *Public Administration Review*, 111-121.
- Kruger, L. E., Mazza, R. & Stiefel, M. (2008). Amenity Migration, Rural Communities, and Public Lands. *Forest Community Connections: Implications for Research, Management, and Governance* (eds E. M. Donoghue & V. E. Sturtevant), pp. 127-142. RFF Press, Washington D.C.
- Lafon, N. W., McMullin, S. L., Steffen, D. E. & Schulman, R. S. (2004). Improving stakeholder knowledge and agency image through collaborative planning. *Wildlife Society Bulletin*, **32**, 220-231.
- Leach, W. & Sabatier, P. (2003). Facilitators, Coordinators, and Outcomes. *The Promise and Performance of Environmental Conflict Resolution* (eds R. O'Leary & L. B. Bingham), pp. 148-174. RFF Press, Washington DC.

- Leach, W. D. (2006). Theories about Consensus-Based Conservation. *Conservation Biology*, **20**, 573-575.
- Leach, W. D. & Pelkey, N. W. (2001). Making Watershed Partnerships Work: A Review of the Empirical Literature. *Journal of Water Resources Planning and Management*, 378-385.
- Leach, W. D., Pelkey, N. W. & Sabatier, P. A. (2002). Stakeholder Partnerships as Collaborative Policymaking: Evaluation Criteria Applied to Watershed Management in California and Washington. *Journal of Policy Analysis and Management*, **21**, 645-670.
- Levrel, H., Etienne, M., Kerbiriou, C., Le Page, C. & Rouan, M. (2009). Co-Modeling Process, Negotiations, and Power Relationships: Some Outputs From a MAB Project on the Island of Ouessant. *Society and Natural Resources*, **22**, 172-188.
- Lewicki, R. J. & Gray, B. (2003). Introduction. *Making Sense of Intractable Environmental conflicts: Concepts and Cases* (eds R. J. Lewicki, B. Gray & M. Elliot), pp. 1-10. Island Press, Washington DC.
- Loomis, J. B. (2002). *Integrated Public Lands Management: Principles and Applications to National Forests, Parks, Wildlife Refuges, and BLM Lands*. Columbia University Press, New York.
- Margerum, R. D. (2007). Overcoming Locally Based Collaboration Constraints. *Society and Natural Resources*, **20**, 135-152.

- McClosky, M. (1999). Local Communities And The Management of Public Forests. *Ecology Law Quarterly*, **25**, 624-629.
- McKinney, M. & Field, P. (2008). Evaluating Community-Based Collaboration on Federal Lands and Resources. *Society and Natural Resources*, **21**, 419-429.
- Moir, W. H. & Block, W. M. (2001). Adaptive Management on Public Lands in the United States: Commitment or Rhetoric? *Environmental Management*, **28**, 141-148.
- Mollison, R. M. & Eddy, R. W., Jr. (1982). The Sagebrush Rebellion - A Simplistic Response to the Complex Problems of Federal-Land Management. *Harvard Journal on Legislation*, **19**, 97-142.
- Moote, M. A. & McClaran, M. P. (1997). Implications of Participatory Democracy for Public Land Planning. *Journal of Range Management*, **50**, 473-481.
- Murray, C. & Marmorek, D. R. (2004). Adaptive Management: A Spoonful of Rigour Helps the Uncertainty Go Down. *16th International Annual Meeting of the Society for Ecological Restoration*. Victoria, British Columbia, Canada.
- Nelson, R. H. (1995). *Public Lands and Private Rights: The Failure of Scientific Management*. Rowman & Littlefield Publishers, Inc, London.
- Norton, B. G. (1998). Improving ecological communication: the role of ecologists in environmental policy formation. *ecological applications*, **8**, 350-364.
- Palmer, M. A., Bernhardt, E. S., Chornesky, E. A., Collins, S. L., Dobson, A. P., Duke, C. S., Gold, B. D., Jacobson, R. B., Kingsland, S. E., Kranz, R. H., Mappin, M. J.,

- Martinez, M. L., Micheli, F., Morse, J. L., Pace, M. L., Pascual, M., Palumbi, S. S., Reichman, O., Townsend, A. R. & Turner, M. G. (2005). Ecological Science and sustainability for the 21st century. *Frontiers in Ecology and the Environment*, **3**, 4-11.
- Paulson, D. (1998). Collaborative Management of Public Rangeland in Wyoming: Lessons in Co-Management. *Professional Geographer*, **50**, 301-315.
- Peterson, M. N., Peterson, M. J. & Peterson, T. R. (2005). Conservation and the Myth of Consensus. *Conservation Biology*, **19**, 762-767.
- Poliakoff, E. & Webb, T. L. (2007). What Factors Predict Scientists' Intentions to Participate in Public Engagement of Science Activities? *Science Communication*, **29**, 242-263.
- Powell, M. C. & Colin, M. (2008). Meaningful Citizen Engagement in Science and Technology: What Would it Really Take? *Science Communication*, **30**, 126-136.
- Pretty, J. & Smith, D. (2004) Social capital in biodiversity conservation and management. *Conservation Biology*, **18**, 631-638.
- Raik, D. B., Wilson, A. L. & Decker, D. J. (2008). Policy Review: Power in Natural Resources Management: An Application of Theory. *Society and Natural Resources*, **21**, 729-739.
- Rasmussen, A. G. & Brunson, M. W. s. (1996). Strategies to Manage Conflicts Among Multiple Users. *Weed Technology*, **10**, 447-450.
- Resnik, J., Wallace, G., Brunson, M. & Mitchell, J. (2006). Open Spaces, Working

- Places: Local Government Programs Can Slow Loss of Rangelands - But Only if Urban and Ranching Interests Find Ways to Work Together. *Rangelands*.
- Ringold, P. L., Alegria, J., Czaplewski, R. L., Mulder, B. S., Tolle, T. & Burnett, K. (1996). Adaptive Monitoring Design for Ecosystem Management. *Ecological Applications*, **6**, 745-747.
- Risser, P. G. (1993). Making ecological information practical for resource managers. *ecological applications*, **3**, 37-38.
- Sandstrom, C. (2009). Institutional Dimensions of Comanagement: Participation, Power, and Process. *Society and Natural Resources*, **22**, 230-244.
- Schuett, M. A. & Selin, S. (2002). Profiling Collaborative Natural Resource Initiatives and Active Participants. *North. J. Appl. For.*, **19**, 155-160.
- Schuett, M. A., Selin, S. W. & Carr, D. S. (2001). Making It Work: Keys to Successful Collaboration in Natural Resource Management. *Environmental Management*, **27**, 587-593.
- Silvertown, J. (2009). A New Dawn for Citizen Science. *Trends in Ecology and Evolution*, **24**, 467-471.
- Singleton, S. (2002). Collaborative Environmental Planning in the American West: The Good, the Bad and the Ugly. *Environmental Politics*, **11**, 54-75.
- Stankey, G. H., Bormann, B. T., Ryan, C., Shindler, B., Sturtevant, V., Clark, R. N. & Philpot, C. (2003). Adaptive Management and the Northwest Forest Plain: Rhetoric and Reality. *Journal of Forestry*, 40-46.

- Starks, H. & Trinidad, S. B. (2007). Choose your method: A comparison of phenomenology, discourse analysis and grounded theory. *Qualitative Health Research*, **17**, 1372-1380.
- Strauss, A. L. & Corbin, J. (1990). *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Sage Publications, Newbury Park.
- Susskind, L. (1999). An Alternative to Robert's Rules of Order for Groups, Organizations, and Ad Hoc Assemblies That Want to Operate by Consensus. *The Consensus Building Handbook: A Comprehensive Guide to Reaching Agreement* (eds L. Susskind, S. McKearnan & J. Thomas-Larmer), pp. 3-60. Sage Publications, London.
- Susskind, L., McKearnan, S. & Thomas-Larmer, J. (1999). Introduction. *The Consensus Building Handbook: A Comprehensive Guide to Reaching Agreement* (eds L. Susskind, S. McKearnan & J. Thomas-Larmer), pp. xiii-xxii. Sage Publications, London.
- Taylor, W. R. (2003a). Procedures for Implementing Consensus-Based Management in Agency Planning and Operations. (ed U. S. D. o. t. I. Office of Environmental Policy and Compliance).
- Taylor, W. R. (2003b). Procedures for Implementing Public Participation and Community-Based Training. (ed U. S. D. o. t. I. Office of Environmental Policy and Compliance).

- Tharp, F. (2008). Boom! Boom!: In Western Colorado, an Energy Boom of Unprecedented Proportions has been Layered on top of a Thriving Amenity Economy. Which will Come out on Top? *High Country News*
- Toker, C. W. (2004). Public Participation or Stakeholder Frustration: An Analysis of Consensus-Based Participation in the Georgia Ports Authority's Stakeholder Evaluation Group. *Communication and Public Participation in Environmental Decision-Making* (eds S. P. Depoe, J. Delicath, W. & M.-F. A. Elsenbeer), pp. 175-200. State University of New York Press, Albany.
- van den Belt, M. (2004). *Mediated Modeling: A System Dynamics Approach to Environmental Consensus Building*. Island Press, Washington.
- van Wyk, E., Roux, D. J., Drackner, M. & McCool, S. F. (2008). The impact of scientific information on ecosystem management: making sense of the contextual gap between information providers and decision makers. *Environmental Management*, **41**, 779-791.
- Wagner, C. L. & Fernandez-Gimenez, M. E. (2008). Does Community-Based Collaboration Increase Social Capital? *Society and Natural Resources*, **21**, 324-344.
- Wagner, C. L. & Fernandez-Gimenez, M. E. (2009). Effects of Community-Based Collaborative Group Characteristics on Social Capital. *Environmental Management*, **44**, 632-645.

- Walker, P. A. & Hurley, P. T. (2004). Collaboration Derailed: The Politics of "Community-Based" Resource Management in Nevada County. *Society and Natural Resources*, **17**, 735-751.
- Walkerden, G. (2005). Adaptive Management Planning Projects as Conflict Resolution Processes. *Ecology and Society*, **11**, 48.
- Weeks, P. & Packard, J. M. (1997). Acceptance of Scientific Management by Natural Resource Dependent Communities. *Conservation Biology*, **11**, 236-245.
- Weible, C. M. & Sabatier, P. A. (2009). Coalitions, Science, and Belief Change: Comparing Adversarial and Collaborative Policy Subsystems. *The Policy Studies Journal*, **37**, 195-212.
- White, D. D. & Hall, T. E. (2006). Public Understanding of Science in Pacific Northwest Salmon Recovery Policy. *Society and Natural Resources*, **19**, 305-320.
- Wondolleck, J. M. & Yaffee, S. L. (2000). *Making Collaboration Work: Lessons from Innovation in Natural Resource Management*. Island Press, Washington D.C.