LEADERSHIP DYNAMICS IN COLLABORATION: LESSONS FROM THE MIDDLE FORK JOHN DAY RIVER INTENSIVELY MONITORED WATERSHED COLLABORATION

by

ANDREW D. DUTTERER

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THESIS APPROVAL PAGE

Student: Andrew D. Dutterer

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This thesis has been accepted and approved in partial fulfillment of the requirements for the Master of Science degree in the Environmental Studies Program &
the Master of Community and Regional Planning degree in the Department of Planning, Public Policy and Management by:

Richard D. Margerum	Chairperson
Patricia F. McDowell	Member

and

Scott L. Pratt	Dean of the Graduate School

Original approval signatures are on file with the University of Oregon Graduate School.

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THESIS ABSTRACT

Andrew D. Dutterer

Master of Science & Master of Community and Regional Planning

Environmental Studies Program & Department of Planning, Public Policy and Management

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Title: Leadership Dynamics in Collaboration: Lessons from the Middle Fork John Day River Intensively Monitored Watershed Collaboration

This study explores leadership dynamics in collaborative governance. The research features a collaboration case study of sixteen federal and state agency and NGO stakeholders. The collaboration is conducting a ten-year, basin-scale monitoring project of salmonid habitat restoration projects in the Middle Fork John Day (MFJD) River basin in Eastern Oregon. The monitoring project is known as an intensively monitored watershed (IMW), one of sixteen throughout the Pacific Northwest.

The research is guided by the following question: How do leadership dynamics in the MFJD IMW collaborative governance structure facilitate effective collaborative process or create limitations to that process? This study uses qualitative research methods in evaluating multiple research sources. Insights from this study may prove valuable in providing guidance on effectively structuring and managing basin-scale collaborative habitat monitoring projects, including future IMW projects. This study further aims to contribute to research on collaborative leadership for the greater scholarship on collaboration.

CURRICULUM VITAE

NAME OF AUTHOR: Andrew D. Dutterer

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene
Middlebury College, Middlebury, Vermont

DEGREES AWARDED:

Master of Science, 2016, University of Oregon
Master of Community and Regional Planning, 2016, University of Oregon
Bachelor of Arts, 2001, Middlebury College

AREAS OF SPECIAL INTEREST:

Watershed science
Collaborative watershed management
Stream restoration planning
Natural resources policy
Fisheries management

PROFESSIONAL EXPERIENCE:

Partnerships Coordinator, Oregon Watershed Enhancement Board, May 2016 – present

Executive Director, Deschutes River Alliance, April 2015 – May 2016

Focused Investment Partnerships Program Specialist, Oregon Watershed Enhancement Board, June 2014 – April 2015

Research Assistant, Pat McDowell and Middle Fork John Day River Intensively Monitored Watershed (IMW), May 2013 – September 2013

Program Assistant, Trout Unlimited Upper Deschutes Home Rivers Initiative, August 2010 – September 2011

General Manager, Deschutes Angler Fly Shop and Guide Service, March 2005 – July 2010

GRANTS, AWARDS, AND HONORS:

Oregon Fellowship, Portland State University Hatfield School of Government, 2013 – 2014

John and Karen Baldwin Family Scholarship in Environmental Planning, University of Oregon Department of Planning, Public Policy and Management, 2013 – 2014

Promising Scholar Award, University of Oregon Environmental Studies Program, 2011 – 2012

Coeta and Donald Baker Research Support Award, University of Oregon Environmental Studies Program, 2011 – 2012

PUBLICATIONS:

Dutterer, Andrew D. and Richard D. Margerum. (2014). "The Limits of Policy Level Collaboration: A Meta-Analysis of CALFED." *Society & Natural Resources: An International Journal*. 28(1), 21-37.

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CHAPTER I: INTRODUCTION

Overview

In recent decades, collaboration has emerged as a widely used approach to natural resource management. This is largely due to the recognition that environmental problems are diffuse in nature, may involve overlapping jurisdictions, and may constitute 'wicked' problems, all of which incorporate a range of entities with a vested stake in the solutions. Collaboration offers many advantages to practitioners in addressing environmental problems. Such advantages allow stakeholders to pool resources, stage a collective platform for funding, resolve differences, identify collective advantages and gains, and develop consensus-driven solutions to environmental problems.

Habitat monitoring is one field in which collaboration has proven particularly well-suited. Habitat monitoring is the science of systematically surveying and evaluating a specified natural resource to assess indicators of change. Habitat monitoring may focus on a specific habitat type, such as a river, forest, or estuary; or, habitat monitoring may focus on a specific animal species. Collaboration is well-suited for habitat monitoring due to the complexity of fish and wildlife habitat and the many inputs that can influence both habitat degradation and restoration. A habitat monitoring project may use any number of different study designs, and monitoring may occur before restoration actions to collect baseline data, or after restoration actions to detect change in habitat, habitat ecosystem function, or species population, among other variables.

The literature on habitat monitoring notes that in spite of significant funding allocated for habitat restoration projects in the U.S., little funding has been afforded to habitat monitoring research (Curry et al. 2010, Leider et al. 2005, Roni et al. 2005). In spite of this, monitoring is a critical aspect of habitat restoration as it serves as the primary mechanism for evaluating the effectiveness of restoration actions and informing future restoration work. The performance of existing and future monitoring efforts is increasingly important given the relative lack of funding for this type of research. Contemporary political, social, and economic imperatives of achieving successful habitat

restoration work for species recovery also demand that monitoring is a key part of the habitat restoration field.

As a result, monitoring projects should be structured for optimal efficiency and effectiveness. Doing so will maximize the benefits of the monitoring project relative to the cost. Collaboration, as an approach to habitat monitoring, allows stakeholders to conduct more comprehensive and sophisticated monitoring projects, and collectively benefit from collaborative advantage. One interview participant for this study observed an underlying recognition among stakeholders in this case that, "Collaboration takes them further down the road with greater benefits."

This study will evaluate leadership in collaboration by focusing on a habitat monitoring project on the Middle Fork John Day River in Eastern Oregon. This collaboration includes 16 state and federal agency and nongovernmental organization (NGO) stakeholders researching the impacts of extensive river restoration aimed at rehabilitating anadromous fish populations in that watershed. Leadership is only one aspect of collaboration, but it is an important one. Leadership is integral in driving collaboration toward positive outputs and outcomes, but at the same time leadership should maintain the collaborative space that is necessary for stakeholders to innovate solutions to complex environmental problems and generate consensus-based solutions (Kallis et al. 2009, Lurie 2004).

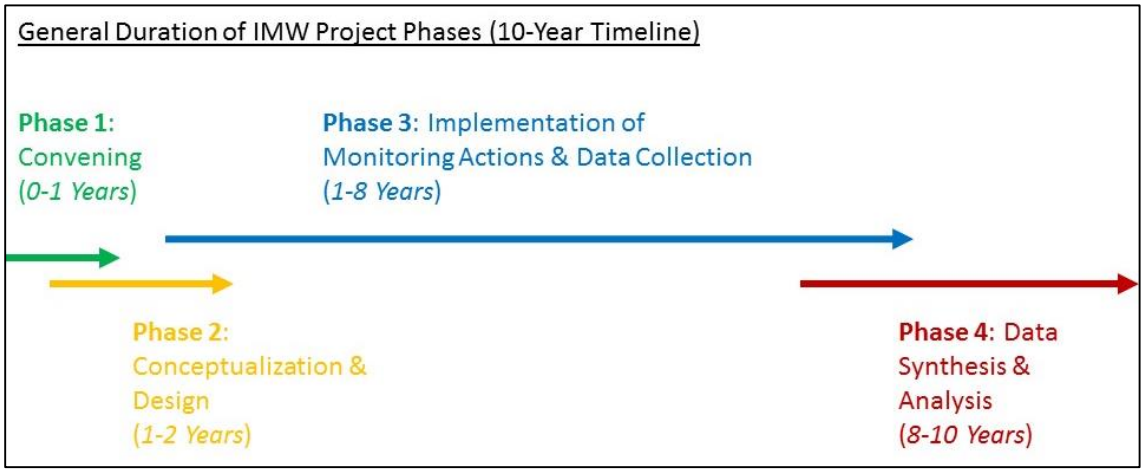
An extensive literature review for this study revealed that understanding leadership dynamics in collaboration is a significant research gap in the greater scholarship on collaboration. As one author observes concerning collaborative habitat monitoring: "Thus, often overlooked in a project with multiple partners is the need for clear leadership, transparent decision-making and a consistent coordination process" (Roni et al. 2010, 141). This study employs qualitative research methods to evaluate multiple sources of evidence related to the MFJD IMW case study. The study ultimately aims to contribute to the scholarship on collaboration, and provide lessons learned for existing and future collaborative habitat monitoring research projects.

Contextual Background: Intensively Monitored Watershed (IMW) Projects

In 2005, the Pacific Northwest Aquatic Monitoring Partnership, a consortium of federal and state natural resource management agencies and Pacific Northwest Native American tribes, recommended the development of a network of Intensively Monitored Watershed (IMW) projects throughout the Pacific Northwest. These IMW projects were envisioned as long-term monitoring research efforts focused on the response of local salmonid populations to habitat restoration. Research demonstrates that rivers featuring habitat improvements yield greater smolt to adult return ratios than rivers without habitat improvements (Beechie et al. 2013). However, studies verifying this correlation have tended to focus on short-term, site-specific habitat improvements. IMW projects offer opportunities for more sophisticated, holistic, and river basin-scale research on the cumulative effects of habitat improvements impacting anadromous fish populations.

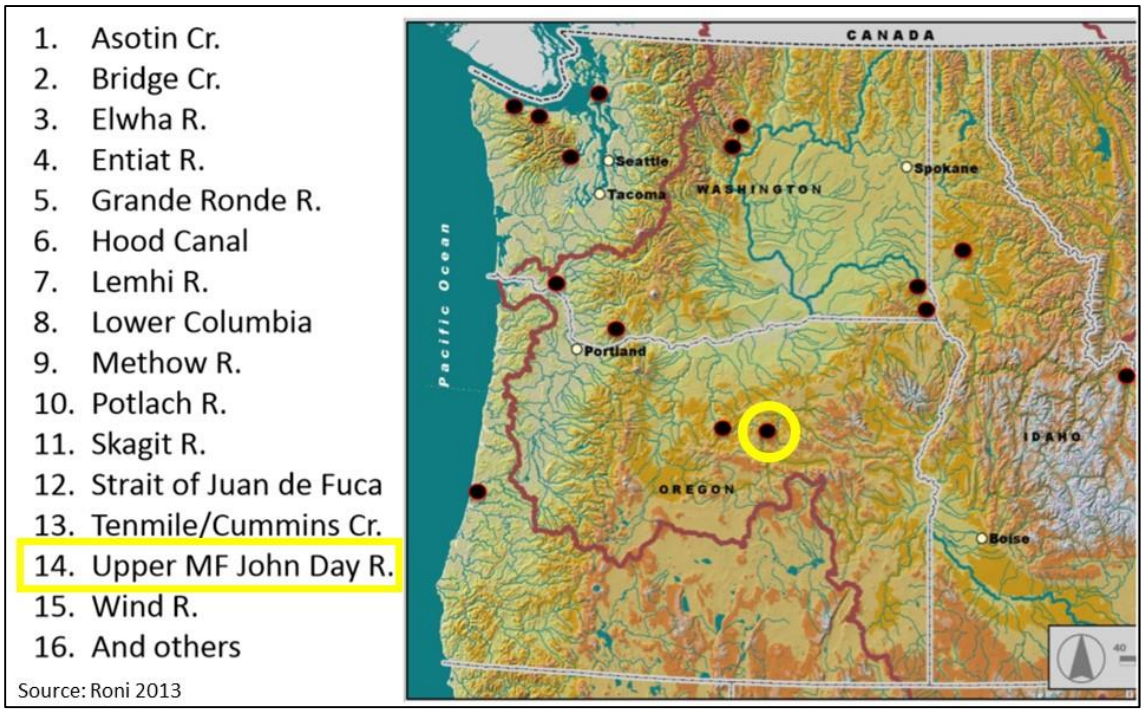
IMW projects generally encompass four unique phases: 1) convening and establishing the IMW; 2) conceptualization and design; 3) implementation of monitoring actions (data collection); and 4) data synthesis and analysis (see Figure 1). These projects are intended to follow 10-year timeframes, but the duration of each project phase may vary given the individual IMW project. Project phases may also have periods of overlap during the transition of one phase to the next. The 10-year timeframe allows researchers to account for natural variations in fish populations and habitat ecosystem functions.

Figure 1 – IMW Project Phases Timeline



Currently, IMW monitoring research is underway at fifteen strategically selected salmonid habitat restoration sites in Oregon, Washington, Idaho, and most recently, California (see Figure 2). In each case, scientists and restoration practitioners collaborate on monitoring efforts to develop a robust data set that will inform future habitat restoration actions in the region. The results from these IMW projects will provide insight on optimal locations for salmonid habitat restoration efforts and effective restoration methods and implementation strategies.

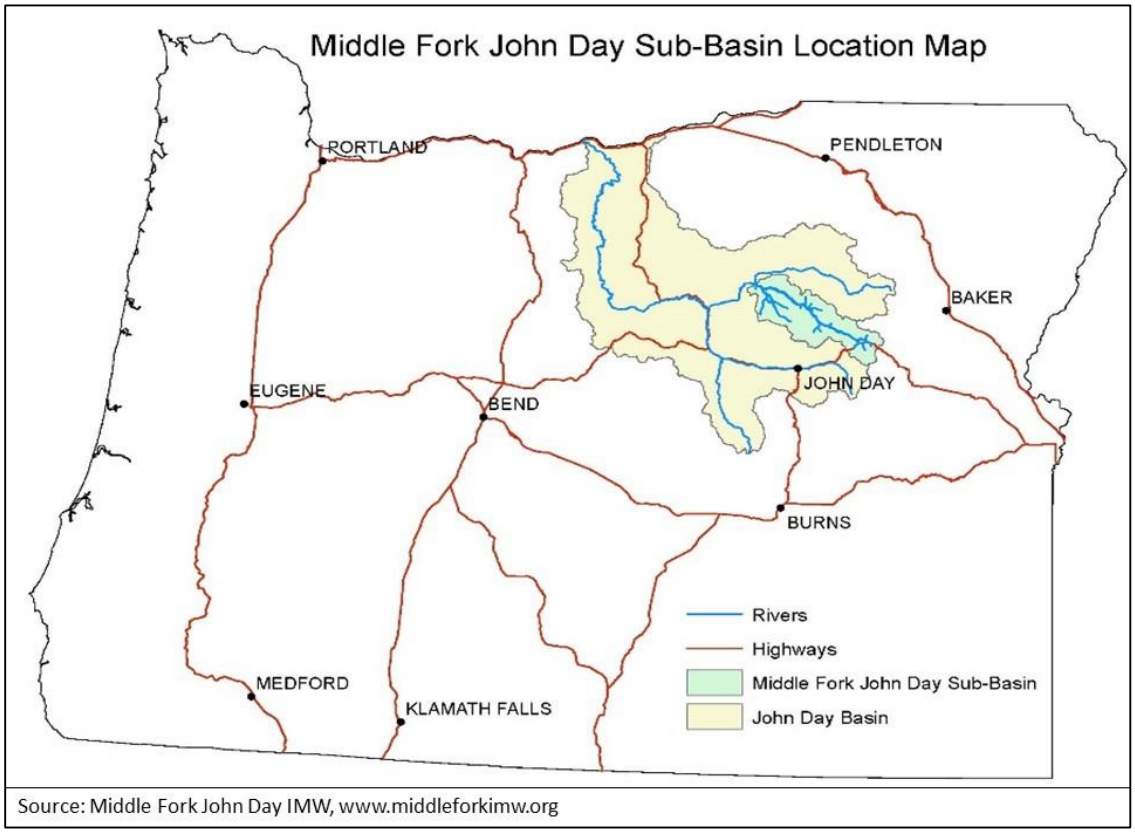
Figure 2 – Map of IMW Projects in the Pacific Northwest



Contextual Background: Middle Fork John Day River IMW

In 2007, the Middle Fork John Day River (MFJD) was designated as an IMW project site. The MFJD runs west out of Oregon's Blue Mountains for 73 miles before its confluence with the North Fork John Day River near Monument, OR. The MFJD basin includes roughly 800 square miles in its watershed area (see Figure 3). The MFJD hosts wild runs of summer steelhead and spring Chinook salmon, as well as a resident population of bull trout.

Figure 3 – Map of Middle Fork John Day River Sub-Basin



The MFJD is located in Grant County, an area where streams have historically been heavily exploited for gold mining. This includes both placer mining and river dredging, methods that are particularly damaging to river channel morphology. Currently, Grant County's primary industries are cattle ranching and farming. Forestry has also been a long-standing industry in this region. In the absence of best management practices, each of these industries can render a heavy toll on riparian ecosystems and associated natural river functions, thus severely impacting fish habitat. Such impacts on fish habitat include:

- Loss of riparian fish cover, which provides refuge habitat;
- Altered channel form and response to natural conditions, which decreases spawning habitat and habitat complexity for rearing and cold water refugia for adult migrants; and
- Loss of capacity to recruit woody debris to the river, which can also decrease rearing habitat and cold water refugia for adult migrants.

Thus, the MFJD River has experienced a long history of alteration to the river ecosystem through diverse human industries.

John Day River basin summer steelhead were listed as Threatened under the Endangered Species Act (ESA) in 1999. John Day River basin spring Chinook are currently considered a species of concern and have been proposed for listing to NOAA Fisheries (that decision still forthcoming as of this writing). Both species are included in the Mid-Columbia evolutionary significant unit (ESU).

The ESA listing and concerns over anadromous fish populations generated political attention and funding that have supported extensive habitat restoration and monitoring work in the MFJD River basin. Since 2006 over 20 significant habitat restoration and enhancement projects have been implemented to benefit steelhead and spring Chinook recovery. Such projects include the remeandering of channelized reaches of the river, large wood placement in strategically selected locations in different reaches of the river, and the removal of cattle grazing from the riparian zone through fencing, among others. The potential for anadromous fish recovery is considered strong given the all-wild salmon and steelhead runs (no hatchery supplement) and absence of dams in the John Day River basin

The MFJD River was proposed as an IMW site in 2007 by NOAA Fisheries following the planning and implementation of restoration projects in the basin. The MFJD River was considered a strong candidate for an IMW project given the potential for anadromous fish species recovery, the commitment of federal and state funding to the project, the involvement of cooperative land owners in the basin, and the pre-existing presence of the Middle Fork John Day Working Group that was focused on restoration actions and provided the foundation for convening the IMW collaboration.

As an IMW site, NOAA Fisheries (via the Pacific States Marine Fisheries Commission) and the Oregon Watershed Enhancement Board committed ten years of funding for monitoring research in the MFJD to begin in 2008.

Sixteen stakeholders convened in a collaborative approach to directing this basin-wide monitoring effort. The stakeholders represent a diversity of scientific perspectives on habitat restoration and monitoring, and include a mix state and federal agencies, NGOs, and research institutions. Individuals from each stakeholder agency or

organization were invited to participate generally based on the MFJD being included in the geographic scope of their working region and/or their expertise in a specific monitoring research area.

The MFJD IMW stakeholders include:

- Bonneville Power Administration
- Confederated Tribes of Warm Springs
- EcoLogical Research, Inc.
- Integrated Status & Effectiveness Monitoring Program
- NOAA Fisheries
- North Fork John Day Watershed Council
- Oregon Watershed Enhancement Board
- Oregon Dept. Fish and Wildlife
- Oregon Dept. of Environmental Quality
- Oregon State University
- Pacific States Marine Fisheries Commission
- The Freshwater Trust
- The Nature Conservancy
- University of Oregon
- US Forest Service
- US Bureau of Reclamation

The MFJD IMW group has been working diligently to assess the effectiveness of restoration projects in the MFJD through in-depth monitoring research efforts. The MFJD IMW has followed the same basic timeline of project phases as other IMW projects (Figure 1, p.3). Through the course of this study, the MFJD IMW collaboration has been in transition from Phases 3 to 4, or data collection to data synthesis and analysis.

Ultimately, the MFJD IMW group strives to determine:

- The limitations to fish recovery in the MFJD River;
- The optimal habitat conditions for spawning adult fish and rearing juvenile fish, and how best to restore those habitats in the MFJD River;
- The impacts on channel morphology as a result of different restoration techniques;

- The cause/effect of changes in MFJD River water temperature on adult and juvenile salmonid populations; and,
- A myriad of subsidiary questions connecting restoration actions to impacts on anadromous fish populations.

The elements of river biology and ecosystem function researched by MFJD IMW stakeholders are diverse and far-ranging. The stakeholders (also known as individual researchers or principal investigators) study a range of river characteristics, including: stream temperature, sediment transfer, pool scour at large woody debris placements, composition of rocky substrate, seasonal volume, riparian ecosystem function and development, groundwater transfer and its influence on hydrologic characteristics, macroinvertebrate populations, and fish populations (at numerous life stages).

Given the complexity of research design and multi-stakeholder involvement, the MFJD IMW has developed a collaborative framework for coordinating efforts and communication in order to achieve monitoring goals. Representing this framework are planning and implementation documents generated by and for the collaboration, as well as progress reports for the funders of the project- Oregon Watershed Enhancement Board and the Pacific States Marine Fisheries Commission.

This collaborative framework also includes a Coordinator who organizes meetings and agenda items. The collaboration hosts monthly conference calls to share updates, research findings, and discuss organizational and planning items, among other topics. These calls are typically 2 hours in length. Additionally, the collaboration meets in person biannually. These “face-to-face” meetings span a full day and are held in the town of John Day, Oregon, located near the MFJD River. These meetings generally consist of stakeholder research updates in the form of PowerPoint presentations, and discussions related to the planning of monitoring efforts, needs and challenges facing the collaboration, budget planning, and proposed restoration actions, among other topics.

The collaboration maintains an online database for storing research data, which is accessible to all stakeholders in the collaboration. The collaboration also hosts an active website that describes the river basin, the need for restoration actions there, the importance of IMW monitoring work, and includes a quarterly research update from each

stakeholder (www.middleforkimw.org). Additionally, the website serves as a repository for peer-reviewed publications stemming from research conducted as part of the MFJD IMW.

Problem Statement

IMW projects are predicated on collaboration as an approach to habitat monitoring. Margerum (2011, 62) observes that in cases where there is a perceived crisis, such as an ESA-listing, the result may be: "…significant media and political attention on the river system, leading to new policy negotiations and joint funding to help restore the river basin." As the majority of existing IMW monitoring projects concern ESA-listed fish species (Leider 2005), this monitoring research is critically important for informing state and federal agencies of the best methods and management for salmonid habitat restoration.

Following the listing of summer steelhead in the John Day River basin, both the Oregon Department of Fish & Wildlife and NOAA Fisheries produced species recovery plans to provide guidance on restoration actions, outline benchmarks for recovery, and articulate funding needs. This political attention brought with it the necessary funding to support restoration actions and monitoring in the MFJD River basin. However, despite the importance of monitoring to habitat restoration, a model framework, protocol, or guide that IMW collaborations can reference while designing their collaborative structure does not currently exist. As a result, in the case of the MFJD IMW, the collaboration initially developed in a loose, organic fashion with no formal leadership role having been designated at the outset.

IMW efforts excel in research design, data collection, and scientific integrity. However, the political dimensions and management relationships that define the collaborative structure of these projects may be undervalued and underdeveloped. As a result, IMW projects risk operating at less than optimal efficiency, compromising data collection and synthesis processes, and eroding the development of meaningful outputs presenting the project's findings. These factors may dilute the capacity for the collaboration to share its findings with others. They may also have implications on the

level of commitment of existing and future funders who require strong accountability for expenses and outputs. Lastly, these factors may limit other restoration practitioners in their use the findings and analysis of IMW projects to inform future habitat restoration work.

Purpose of the Study

The purpose of this study is to explore leadership dynamics in collaboration. More specifically, the study is intended to contribute to an understanding of how collaborative leadership dynamics can facilitate effective collaboration or create limitations to the collaborative process.

It is commonly recognized that collaborative efforts are increasingly used as an approach to natural resource management among state and federal agencies (Ansell and Gash 2008, Connick and Innes 2003, Ferreyra and Beard 2007, Firehock 2011, Karkkainen 2001, Layzer 2008, Lurie 2004, Margerum 2011, Morse 2010, Randolph and Bauer 1999, Sabatier et al. 2005, Walker and Senecah 2011, Wondolleck and Ryan 1999). However, collaborative structure and process that is not applied appropriately given the context of the environmental problem or practiced effectively by the collaboration may not yield desired or optimal results.

Dukes (2001) asserts: "There have been collaborative processes on issues where such efforts may well have been appropriate and potentially helpful, but the process failed to live up to its potential because best practices were not followed" (12). More specifically, Roni et al. (2010), contend that "Monitoring of restoration projects, however, continues to be inadequate and limited guidance exists on how to design rigorous monitoring to evaluate river restoration" (119). Roni et al. (2010) go on to describe the complexities of coordinating large-scale restoration monitoring projects, such as IMW projects, and point to the potential for these challenges to be overcome by, "improving the coordination and leadership of the project" (141). Therefore, this research may prove valuable to future IMW projects, or other collaborations of similar scale and purpose, in providing guidance on effectively structuring and managing basin-scale collaborative habitat monitoring projects.

Further, an assessment of leadership dynamics in the collaborative structure of the MFJD IMW project will add to the existing scholarship on collaboration. There is an identified need in the collaboration literature for more research pertaining to leadership in collaboration (Crosby and Bryson 2010, Floress et al. 2011, Huxham and Vangen 2005, Margerum 2011, Ospina and Foldy 2010, Ryan 2011, Silvia and McGuire 2010, Walker and Senecah 2011, Wondolleck and Ryan 1999). As Linden (2002) writes: "Collaborative leadership is about a shared leadership style that we're only recently starting to understand and define" (154). This study will provide insights on leadership in collaboration relative to habitat monitoring projects, and may also be applicable to collaboration in other fields as well.

CHAPTER II: LITERATURE REVIEW

This study includes an extensive literature review encompassing roughly 50 scholarly articles and books related to collaboration, many of which are specific to natural resources management. These sources were chosen for relevant discussions of collaborative governance structures, collaborative operating dynamics, and leadership in collaboration. This chapter summarizes the history and current state of collaboration as an approach to natural resources management, outlines the definition and theory behind collaboration, and explores leadership in collaboration as discussed in the literature. This chapter concludes with a review of two leadership tables developed through this literature review that will serve as the mechanism by which the findings from this study will be evaluated.

Collaboration in Natural Resource Management

Collaboration as an approach to natural resource management (NRM) reflects a movement away from traditional NRM approaches. Collaboration is viewed as a response to the growing need of NRM to adapt to ever-evolving environmental conditions and associated political and social response (Ansell and Gash 2008, Connick and Innes 2003, Ferreyra and Beard 2007, Firehock 2011, Karkkainen 2001, Layzer 2008, Lurie 2004, Margerum 2011, Morse 2010, Randolph and Bauer 1999, Sabatier et al. 2005, Walker and Senecah 2011, Wondolleck and Ryan 1999). In fact, one scholar characterized collaboration as, "a quiet revolution in American environmental governance" (Firehock 2011, 1).

Collaboration literature commonly cites the evolution of collaboration having begun in the 1990s in response to the recognition of increasingly complex environmental problems of the 1980s (Ansell and Gash 2008, Layzer 2008, Margerum 2011, Randolph and Bauer 1999, Wondolleck and Ryan 1999). The use of collaboration has since pervaded many sectors of NRM, including global government agencies, nonprofit organizations, advocacy groups, business and industry, and citizen groups (Walker and Senecah 2011, 112).

Collaboration has vigorously evolved in NRM for numerous reasons. As a result of advances in ecosystem science, environmental managers are increasingly recognizing the scope and interconnectivity of political, social, and economic components persistent in environmental problems. Contemporary environmental problems have also become more complex with increasing populations and interests competing for natural resources. Some scholars also assert that existing environmental regulations driving NRM, such as the Endangered Species Act and the Clean Water Act, are too narrowly focused and poorly suited to resolve contemporary environmental problems (Layzer 2008, Margerum 2011, Sabatier et al. 2005).

In response, collaboration is well suited to address diffuse environmental problems that may span multiple jurisdictions. Collaboration also offers practitioners a strategy to approach intractable problems, which may create seemingly unresolvable conflict (Ferreyra and Beard 2007, Firehock 2011, Imperial 2005, Innes and Booher 2010, Linden 2008, Lurie 2004, Margerum 2011, Walker and Senecah 2011).

In identifying the need to link social, economic, and political networks in addressing environmental problems, environmental managers turn to collaboration. Collaboration offers environmental managers the opportunity to (Innes and Booher 2010, Margerum 2011):

- Share resources and build community around problem solving;
- Convene stakeholders with diverse perspectives, knowledge, and interests;
- Build ongoing institutional learning capacities at local and regional scales;
- Incorporate nongovernmental organizations; and,
- Develop network resiliency through the implementation of problem-solving strategies.

As a result, collaboration offers a governance structure that is adaptable, resilient, and creates strong networks for implementing consensus-driven decisions over long periods of time. Further, collaboration represents an approach to NRM that avoids litigation and associated protracted, contentious efforts to resolving environmental issues.

Collaboration differs greatly from the traditional, top-down approach to NRM. As Innes and Booher (2010) explain:

> Traditional governance relies on a concept of bureaucracy characterized by a top down hierarchy under central control. Agencies have closed boundaries in the sense that participation in decision making is only by those who have roles in that agency… In collaborative governance by contrast a structure typically involves distributed control, open boundaries, and interdependent, nested network clusters of participants (201).

In contrast to traditional NRM, collaboration is, "distinguished from traditional organizational models by horizontal rather than hierarchical relationships, voluntary participation, and shared goals" (Lurie 2004, 43). The 'decide-announce-defend' approach typically associated with top-down governance offers little room for outside input or adaptation to evolving environmental conditions and technological research. Traditional NRM may also provoke resistance from advocacy organizations and industry alike, in some cases resulting in litigation (Innes and Booher 2010, Layzer 2008, Lurie 2004, Ryan 2001, Sabatier et al. 2005). As a result of the many advantages that collaboration offers environmental managers, some scholars suggest that collaborative efforts are now transforming long-standing, traditional institutional structures and norms in NRM (Innes and Booher 2010).

In spite of the increasing importance of collaboration in NRM, some scholars argue that collaboration is not a panacea for addressing contemporary environmental problems (Dukes 2011, Karkkainen 2001, Layzer 2008, Lurie 2004, Margerum 2011). Criticisms of collaboration include (*ibid*):

- The lines of authority and divisions of responsibility are typically ill-defined;
- Stakeholder participation is often voluntary and rules tend to be provisional, therefore the structure and outcomes of collaboration are not enforceable through conventional channels;
- Collaboration is time and resource intensive and thus requires strong commitments of funding and other incentives to sustain efforts;

- Collaboration can be used as a means to avoid conflict or address lowest common denominator outcomes (i.e. 'low-hanging fruit') without commitment to tackling the more intractable components of the problem; and lastly,
- Collaboration may be vulnerable to misbalances in management or stakeholder input.

As Imperial (2005) notes: "Unilateral action, litigation, legislative intervention, markets, and hierarchical control remain alternative strategies [to collaboration]" (311).

Collaboration Definition & Theory

Collaboration has been defined in many ways. In fact, according to Margerum (2011), "Over the years, these [collaboration] concepts have been captured by several different terms, including integrated environmental management, ecosystem management, place-based natural resources management, grassroots environmental management, watershed management, collaborative governance, and collaborative planning" (6). Differing definitions of collaboration can be problematic to theory building because they blur the distinction between collaboration as an institutional approach to NRM and collaboration as it may have been employed in case-specific examples (Ansell and Gash 2008, Imperial 2005, Linden 2002, Margerum 2011).

Margerum (2011) defines collaboration as: "Collaboration is an approach to solving complex problems in which a diverse group of autonomous stakeholders deliberate to build consensus and develop networks for translating consensus into results" (6). Similarly, Linden (2002) describes collaboration as: "Collaboration occurs when people from different organizations (or units within one organization) produce something together through joint effort, resources, and decision making, and share ownership of the final product or service" (7). Contemporary institutional definitions of collaboration consistently contain a similar suite of core principles, outlined and discussed below (Ansell and Gash 2008, Imperial 2005, Layzer 2008, Linden 2002, Lurie 2004, Sabatier et al. 2005).

Collaboration is inclusive and incorporates stakeholders with diverse perspectives (Ansell and Gash 2008; Dukes 2001; Firehock 2011; Huxham and Vangen 2005; Innes and Booher 2010; Layzer 2008; Linden 2008; Margerum 2008, 2011; Sabatier et al. 2005; Walker and Senecah 2011; Wondolleck and Ryan 1999). Collaboration seeks to include all stakeholders who have a vested interest in the problem and outcome, as all parties are intended to be equally involved in decision making. Stakeholders might include: scientific experts, elected officials, members of the public, people with local knowledge, state and federal agency representatives, NGO personnel, industry representatives, and a range of others.

Generally, stakeholder selection in the convening process is critical to ensure representation of all interests. This process empowers what might otherwise be neglected or underserved stakeholder voices. Although some collaborations are convened as a result of a regulatory or legislative determination, participation is typically voluntary. As Margerum (2011) observes, "The stakeholders create the depth of a collaborative approach" (7). Stakeholders generally build social, organizational, and implementation networks that strengthen the fabric of the collaboration. In this way, stakeholders may become more committed to the consensus-building process, implementation of solutions, and adaptive management strategies following implementation.

Collaboration occurs at different scales (Crosby and Bryson 2010; Margerum 2008, 2011; Imperial 2005). Margerum (2011) observes three fundamental scales within the spectrum of collaboration typologies: action-level, organizational-level, and policy-level collaboration. Margerum (2011) extensively discusses the collaborative governance structure and network dynamics existing at each of these scales. Action-level collaborations generally focus on on-the-ground implementation of NRM programs, such as habitat restoration. Organizational-level collaborations focus on program development and joint action among managing organizations. While government agencies may be the focus of such efforts, nongovernment and local government entities may also be integral at the organizational-level. Policy-level collaborations are characterized by high-level decision making that instructs policy, legislation, or administrative rules.

The MFJD IMW reflects key dimensions of organizational-level collaboration. Determining this scale of collaboration placed a clearly defined theoretical framework

around the MFJD IMW collaboration, and served to narrow the scope of the literature review and case study research for this study.

Collaboration requires shared problem definition among stakeholders to achieve consensus (Innes and Booher 2010, Lurie 2004, Gray 1989, Layzer 2008, Lurie 2004, Margerum 2011). As Lurie (2004) describes: "Theories of collaboration maintain that bringing together people with different perspectives regarding a problem can produce creative synergy. It can also create conflict if participants do not develop a mutual appreciation for, or understanding of, partners' viewpoints. When partners have not gone through a self-reflective process and come to a conclusion that collaboration serves their interests, the likelihood of authentic collaborative behavior decreases" (230). Thus, it is important for the consensus-building process that stakeholders are able to understand the environmental problem through the perspective of other stakeholders.

Collaboration requires authentic dialogue. A critical pathway to maintaining productive collaborative process is through what Innes and Booher (2010) describe as 'authentic dialogue'. Authentic dialogue is thus a fundamental tenet of the collaborative process (Connick and Innes 2003, Innes and Booher 2010, Layzer 2008, Margerum 2011). As Innes and Booher explain:

> It is within dialogue where ideas and choices emerge and where confusing and conflicting views and knowledge can be transformed into something that is both rational and meaningful. Dialogue is neither debate nor argument. In its simplest definitions it is conversation, and exchange of ideas, or a discussion between representatives of parties to conflict that is aimed at resolution… In dialogue, participants penetrate each other's polite superficialities and defenses and, in responding to one another in an authentic and empathic way, forge relationships (119).

Authentic dialogue allows the collaboration to facilitate an understanding of the problem definition, offer voice to first-hand local knowledge and stakeholders with diminished degrees of power within the collaboration, generate creative problem solving, and achieve consensus on resolving conflict or developing solutions to environmental problems. Innes and Booher (2010) also discuss the importance of 'agonism' in collaborative dialogue, and the potentially positive effect of impasse, or stalemate, in the deliberative process. These authors also refer to agonism and stalemate as "an essential

source of creativity," (104) and the "stimulus that changes the dynamic," (105) when collaborative processes are faced with challenging problems.

Collaborative efforts may utilize a facilitator. A facilitator may be responsible for organizing meetings, guiding discussion toward authentic dialogue, and providing direction and accountability on next step actions (Ansell and Gash 2008, Dukes 2001, Floress et al. 2011, Margerum 2011). Margerum (2011) describes the facilitator as: "An effective facilitator is a person (or people) with the time and skills to support the consensus-building process in a way that allows participants to work through a process smoothly, efficiently, and deliberatively" (91). The facilitator may be appointed from within the collaboration, or may be hired or volunteer from outside the collaboration. It is important that the facilitator operate in an unbiased and inclusive manner in order to build trust among stakeholders.

Collaboration involves a process, which when executed properly can yield optimal results (Imperial 2005; Innes and Booher 2010; Karkkainen 2001; Margerum 2008, 2011; Randolph and Bauer 1999). Collaborative process involves:

- Convening stakeholders;
- Engaging stakeholders in authentic dialogue;
- Establishing group and decision rules;
- Open and transparent data sharing among participants; and,
- The acquisition of funding to sustain the collaborative effort.

Building trust among stakeholders is commonly cited as a key component to process, as trust holds a collaboration together during the more challenging aspects of problem solving and conflict resolution (Crosby and Bryson 2010, Innes and Booher 2010, Linden 2008, Margerum 2011).

Ultimately, effective deliberation and creative problem solving can culminate in consensus. Consensus-based decisions are ones that the stakeholders have developed collectively and cooperatively. As Margerum observes, "…in most cases it means an agreement that everyone can live with" (7). Generally, if the consensus-based decision or solution has strong agreement and support, then commitment to implementation will also be strong.

Networks are an essential component to the collaborative process (Margerum 2011). Networks may help move the deliberation phase to consensus, and more importantly, networks help sustain collaborative efforts through implementation and subsequent adaptive management addressing evolving environmental conditions.

Lastly, in terms of collaborative process, it is generally recognized that collaboration is an *approach* to NRM rather than simply a *process*. Collaboration is not a linear step-based process, but rather implies a long-term, ongoing commitment among stakeholders through decision making, implementation, and adaptive management. The collaboration may be required to adapt to changing environmental conditions or relationships among stakeholders, revisit consensus decisions for further evaluation, and adjust implementation strategies over time. Collaborative process is designed to be adaptable to these phenomena and resilient to change.

Collaboration may yield additional positive outcomes beyond consensus-driven solutions and implementation. Collaboration can benefit local communities by highlighting local knowledge in problem solving and improving self-management in communities. It can improve general knowledge of the environmental issues being addressed and policy development in the area or region in which the problems exist. Lastly, collaboration builds social, political, and intellectual capital that can be important during implementation, for sharing resources among stakeholders and outside the collaboration, and in future NRM efforts in the region.

Leadership in Collaboration

Despite an expanding volume of scholarship around collaboration as an approach to NRM, studies specific to leadership within collaboration remain limited (Crosby and Bryson 2010, Floress et al. 2011, Linden 2002, Ospina and Foldy 2010, Ryan 2001, Silvia and McGuire 2010, Wondolleck and Ryan 1999). Collaboration literature may address themes associated with leadership, such as the role of a facilitator or the leadership dynamics around convening a collaboration. However, few of the authors comprising the literature review for this research address collaborative leadership head-on to evaluate the characterization, definition, and skills associated with collaborative

leadership; the influence of leadership on collaboration; or the advantages and limitations of collaborative leadership in collaboration. As Silvia and McGuire (2010) explain:

> The research question that *is* the 800 lb. gorilla in the room remains largely unaddressed: What is leadership in multi-actor settings? What behaviors characterize such a leader, and most important, how does leadership in these types of settings differ from leadership in single-agency contexts, if at all? Any discussion of action in multi-actor settings must necessarily begin with answers to these questions, yet few researchers have actually sought to define, identify, and explain leadership in such settings (264).

It is clear from the literature on collaboration used in this research that practitioners encounter the need to understand the role and function of leadership in collaboration, yet lack sufficient scholarly insight or guidance in this important area. Consequently, this identified need is now infiltrating the research emphasis of collaboration scholars. Margerum (2011) observes that the theme of collaborative leadership is becoming more prevalent in literature from a range of fields, including management, organizations, and public policy. Huxham and Vangen (2005) explain that a study they conducted on leadership in collaboration was not driven by a research agenda they had developed through other projects. Instead, the research for their collaborative leadership study was inspired by colleagues in the policy analysis field who had identified the demand for such information and the importance of it to policy makers (45).

One reason that scholarship on collaboration has turned its attention to leadership dynamics is due to the recognition that leadership is an essential and critical component to successful collaborative process (Ansell and Gash 2008, Crosby and Bryson 2010, Huxham and Vangen 2003, Linden 2002, Margerum 2011, Randolph and Bauer 1999, Walker 2011). In the course of such recognition, the distinction between collaborative leadership and traditional, hierarchical leadership has come more clearly into focus.

The collaboration literature generally recognizes traditional, hierarchical leadership as ‘command and control’, in which authority is centralized in leadership ranks (Feldman and Khadamian 2001, Innes and Booher 2010, Walker 2011). This type of leadership is viewed as decisive, values efficiency and the proper chain of command,

operates in the framework of conventional communication and decision-making channels, and recognizes that the leader "controls the manner in which others participate in making and implementing decisions" (Walker 2011, 125). Traditional leadership reserves accountability for decisions and outcomes and does not offer the flexibility in decision making and implementation that is a cornerstone of collaboration (Feldman and Khadamian 2001, Morse, 2010, Vangen and Huxham 2033, Walker 2011).

By contrast, collaborative leadership guides the collaborative process rather than representing power or authority (Feldman and Khadamian 2001, Huxham 2003, Huxham and Vangen 2005, Walker 2010, Wondolleck and Ryan 1999). Innes and Booher (2010) distinguish the generative approach of collaborative leadership, which supports collective learning, problem definition, and creative solutions. Collaborative leadership empowers stakeholders to achieve consensus-based decisions and solutions. Silvia and McGuire (2010) observe that the stakeholders, structure of collaboration, and problems faced in collaborative settings are different from those present in traditional NRM; therefore, the skills, behaviors, and approach of collaborative leadership must also be different.

Individual and Network Leadership in Collaboration

An extensive literature review for this study revealed two types of leadership in collaboration. First, *individual leadership* refers to the collaboration being driven by one or more individuals involved in the collaboration. Second, *network leadership* refers to leadership in which the structure, norms, and rules of the collaboration guide the way people act and provide direction for the collaboration.

Through the literature review for this study, several leadership features emerged thematically for both types of collaborative leadership. In order to operationalize each of the leadership features to understand how they work in action, numerous supporting indicators were identified in the literature. The leadership features and supporting indicators are outlined below in Table 1 for individual leadership in collaboration (p.24) and Table 2 for network leadership in collaboration (p.27). These tables also list the authors from the literature review that support indicators in their own research.

Individual leadership in collaboration (Table 1, p.24) refers to leadership dynamics in which one or more individuals guide the collaboration. Individual collaborative leadership is different from what may be thought of as typical leadership in that the individual isn't making decisions for the collaboration, instead, that individual guides the stakeholders through the collaborative process and consensus-based decisions. The individual leadership features cover a suite of characteristics, ranging from planning and organizational activities, convening the collaboration, championing the collaboration and its cause, managing the collaborative process, possessing intangible leadership qualities, and budget management.

Network leadership in collaboration (Table 2, p.27) refers to leadership dynamics in which the structure, norms, and rules of the collaboration guide the way people act and provide direction for the collaboration. This may include aspects of the collaboration such as: guidelines for stakeholder coordination, general operating procedures, communication norms, and planning and decision-making processes. The accountability that stakeholders have to these aspects and to one another to abide by them, further enforces the network leadership dynamic in the collaboration. In network leadership there are not clear hierarchies or hierarchical structure among stakeholders. Instead, network settings are a shared power and leadership situation, in which a group of stakeholders makes and implements decisions collectively. As seen in Table 2 (p.27), numerous authors in this literature review discuss network leadership, but of those, several in particular look at network leadership in greater depth: Huxham and Vangen 2005, Imperial 2005, Linden 2008, Lurie 2004, Margerum 2011, and Silvia and McGuire 2010. Theory on network leadership is also present in the scholarly literature on public administration.

Thus, individual and network leadership are very different from one another. One relies on the expertise, commitment, and guidance of a single individual; while the other relies on the structure and norms that the collaboration collectively establishes for itself to provide guidance. Both leadership types are intended to maintain the collaborative process- convening stakeholders, facilitating authentic dialogue, guiding the collaboration toward consensus-based decisions, and sustaining the collaboration through implementation. Yet, each leadership type approaches the collaborative process

differently. These differences are most visible in the various leadership features outlined in Tables 1 and 2 (p.24 and p.27, respectively).

While the literature typically highlights each type of leadership independently, these leadership types may also have some overlap in collaboration. Several authors discuss how one or the other leadership type may emerge as more relevant and impart greater influence on the collaboration given the challenges, needs, or demands that the collaboration may face at a given time (Crosby and Bryson 2010, Huxham and Vangen 2005, Innes and Booher 2010).

In distinguishing individual and network leadership types, Tables 1 and 2 (p.24 and p.27, respectively) become key components of this study. The tables define each leadership type through the various leadership features and indicators in the literature, and thus serve as the mechanism through which the evidence from this research will be filtered. This involves organizing the evidence from all research sources used in this study by the indicators under each leadership feature, and then identifying the themes and patterns that emerge among the evidence following that organization process. Processing the evidence in the MFJD IMW case through the leadership tables will reveal insights concerning the research question: How do leadership dynamics in the MFJD IMW case facilitate effective collaborative process or create limitations to that process?

This analytical approach relies on normative ideals expressed in the collaboration literature that maintain that strong collaborative process yields better outputs and outcomes (Innes and Booher 1999, Innes and Booher 2010, Koontz and Thomas 2006). Thus, the literature proposes that the greater the degree to which the evidence from the MFJD IMW reflects the leadership features in Tables 1 and 2 (p.24 and p.27, respectively), the more 'effective' the collaborative process is in that case. If the evidence diverts from or contradicts the leadership features expressed in Tables 1 and 2, then leadership can be deemed a limitation to the collaborative process.

Table 1: Individual Leadership in Collaboration

Leadership Feature	Indicators	Reference(s)
The collaborative leader manages meeting planning and logistics for the collaboration.	• Create meeting agenda • Organize format of meetings • Conduct meeting follow-up	Floress et al. 2009, Griffin 1999, Huxham 2003, Huxham and Vangen 2005, Linden 2002, Vangen and Huxham 2003
	• Manage meeting process	Ansell and Gash 2008, Griffin 1999, Imperial 2005, Innes and Booher 2010, Ryan 2001, Vangen and Huxham 2003
The collaborative leader convenes the stakeholders for the collaboration.	• Determine who to invite • Ability to bring people together • Inspire buy-in among invitees	Huxham and Vangen 2005, Innes and Booher 2010, Linden 2002, Linden 2008, Margerum 2011, Vangen and Huxham 2003
	• Individual has credibility and clout • Individual has passion for the issue, can articulate the goal of the collaboration, and illustrate its importance	Floress et al. 2009, Huxham and Vangen 2005, Innes and Booher 2010, Linden 2002, Linden 2008, Lurie 2004, Wondolleck and Yaffee 2000
	• The convener(s) must be unbiased and trusted among stakeholders	Ansell and Gash 2008, Linden 2002, Linden 2008, Margerum 2011
The collaboration typically has at least one 'champion' or key individual driving the effort at all times.	• The champion is usually a peer, member of the core group, or senior leader who inspires collaboration • The champion keeps senior leaders involved	Crosby and Bryson 2010, Floress et al. 2009, Huxham and Vangen 2005, Linden 2002, Margerum 2011, McDermott et al. 2011, Ryan 2001, Walker and Senecah 2011, Wondolleck and Yaffee 2000,
The collaborative leader is a 'shepherd' of the process who maintains	• Enable parties to see they can meet goals through joint action	Ansell and Gash 2008, Crosby and Bryson 2010, Linden 2002, Linden 2008, Margerum 2011, Ospina and Foldy 2010, Walker and Senecah 2011

productive stakeholder engagement and guides the collaboration toward consensus-based decisions.	• Keep focus on big picture in times of conflict • Help resolve conflict	Huxham and Vangen 2003, Imperial 2005, Linden 2002, Lurie 2004
	• Engage parties in joint problem solving and visioning tasks	Ansell and Gash 2008, Huxham and Vangen 2005, Innes and Booher 2010, Linden 2002, Linden 2008, Ryan 2001, Margerum 2011, Walker and Senecah 2011,
	• Prioritization of issues at hand	Floress et al. 2009
	• Maintain open communication among stakeholders	Chrislip and Larson 1994, Crosby and Bryson 2010, Ryan 2001, Vangen and Huxham 2003, Walker and Senecah 2011,
	• Identify the skills, resources, and capacity present in the collaboration	Crosby and Bryson 2010, Walker and Senecah 2011
	• Maintain technical credibility	Ryan 2001
	• Use 'pull' to engage stakeholders in the collaborative process as a collaboration is a voluntary process	Crosby and Bryson 2010, Floress et al. 2009, Huxham and Vangen 2005, Imperial 2005, Linden 2002, Linden 2008
	• Adopt a 'systems thinking' to understand the forces driving the collaboration, and to adapt and integrate/disintegrate aspects of the collaboration to those forces	Crosby and Bryson 2010, Huxham and Vangen 2005, Innes and Booher 2010
Individual collaborative leadership requires a suite of skills and personal qualities to be successful.	• Provide confidence, hope, and resilience • Inspire others to stay involved	Linden 2002, Linden 2008, Lurie 2004, Margerum 2011, McDermott et al. 2011, Ryan 2001, Vangen and Huxham 2003
	• Strong interpersonal skills	Imperial 2005, Linden 2008, Margerum 2011, McKinney and Harmon 2004

	• Emphasize building relationships and trust among stakeholders	Crosby and Bryson 2010, Linden 2008, Margerum 2011, McKinney and Harmon 2004, Silvia and McGuire 2010, Walker and Senecah 2011, Vangen and Huxham 2003
	• Modest and humble- more interested in organizational success than personal glory	Linden 2002, Linden 2008
	• Requires high resource levels, including energy, commitment, and continual nurturing	Feldman and Khadamian 2001, Huxham and Vangen 2000, Huxham and Vangen 2005, Linden 2008, Margerum 2011, Ryan 2001, Walker and Senecah 2011
	• Most collaborative leadership skills can be learned	Linden 2002
The collaborative leader may be closely involved with the collaboration's funding and budget.	• Raise funds and provide resources	Floress et al. 2009, Innes and Booher 2010
	• Maintain access to the budget	Huxham and Vangen 2005

Table 2: Network Leadership in Collaboration

Leadership Feature	Indicators	Reference(s)
Network leadership is distributed through the structure and work of the collaboration.	Power rests less with the individual actor or organization and more with the structure of the collaboration. This type of shared power has been labeled 'synthetic authority'.	Lejano and Ingram 2009, Lurie 2004, Margerum 2011, Silvia and McGuire 2010, Walker and Senecah 2011
	Leadership is found in the work of the collaboration, not in specific individuals.	Ospina and Foldy 2010, Walker and Senecah 2011
	Collaborative leadership is not only enacted by key participants, but also by the structures and communication processes embedded within the collaboration.	Feldman and Khadamian 2001, Huxham 2003, Huxham and Vangen 2005, Innes and Booher 2010, Wondolleck and Ryan 1999
Network leadership is driven by networks of stakeholders that emerge to address demands or challenges that the collaboration faces. This emergent network leadership is transitory as other networks may emerge to address new and/or evolving needs.	Stakeholders build networks and distribute responsibilities according to knowledge and expertise. The collaboration's capacity for coordination impacts efficacy.	Ferreyra and Beard 2007, Floress et al. 2009, Lurie 2004, Margerum 2011, Ospina and Foldy 2010, Silvia and McGuire 2010
	Emphasizes stakeholders' ability to collectively adapt to new settings and changing conditions.	Margerum 2011
	Identity formation may be essential to making the collaboration work effectively. Network leadership creates boundary experiences to promote identity formation.	Beech and Huxham 2003, Crosby and Bryson 2010, Ferreyra and Beard 2007
	Inspirational, directional, and decisional roles are deliberately or emergently divided between	Huxham and Vangen 2005, Lejano and Ingram 2009, Margerum 2011

	stakeholders in a non-hierarchical and impermanent way in a manner described as ‘shared leadership’.	
	The initial convening leaders will at the appropriate time step back and let the collaborative process and structure take its course to lead the collaboration.	Innes and Booher 2010, Linden 2008
The strength of network leadership is influenced by resource demands and constraints.	Network leadership can be influenced by financial commitment of participating organizations to the collaboration.	Floress et al. 2009, Margerum 2011, Vangen and Huxham 2003

CHAPTER III: METHODS

This study's research question, qualitative research methods, and research limitations are discussed in this chapter.

Research Question

This study seeks to answer the following question: How do leadership dynamics in the MFJD IMW collaborative governance structure facilitate effective collaborative process or create limitations to that process? The purpose of this question is to evaluate how leadership in collaboration can be structured to generate optimal efficacy of the collaborative process. The literature on collaboration supports the idea that better collaborative process yields better outputs and outcomes (Innes and Booher 1999, Innes and Booher 2010, Koontz and Thomas 2006). An understanding of this research question can support future similar collaborative efforts in establishing best leadership practices benefiting the collaborative process.

Methodology

Numerous qualitative research methods were employed for this research. First, the research relies on case study analysis (Huxham and Vangen 2005, Imperial 2005, Cheng and Daniels 2005, Yin 2014). The primary case study under evaluation is the MFJD IMW collaboration. The selection of this case stemmed from the researcher's employment in the summer of 2013 in river habitat monitoring on behalf of a stakeholder participating in this collaboration. At that time, the collaboration was conducting extensive habitat monitoring research for the IMW project, but the researcher identified the absence of studies conducted reflectively on the collaboration itself.

Second, the research included an extensive review of IMW-related documents, both for the MFJD IMW and other IMWs in the Pacific Northwest. This review covered 31 different documents in total:

- 7 conference presentations
- 9 project reports
- 5 implementation plans
- 4 IMW-related journal articles
- 6 budget reports

Authors Imperial (2005) and Floress et al. (2011) highlight the importance of document review as a research method in evaluating collaboration case studies. Reviewing these documents provided an understanding of the collaborative governance structure and insights on leadership in the MFJD IMW and comparable IMW projects. Comparable IMW projects were selected based on the following criteria: restoration activity, targeted species, number of stakeholders, and complexity of the monitoring research. These criteria sought to align comparative IMW projects with the MFJD IMW in scale and monitoring actions in order to create valid comparisons between collaborations.

Third, semi-structured, in-depth interviews were conducted with key participants in the MFJD IMW and other IMW projects. Each interview lasted 30-60 minutes and was recorded to ensure the accuracy of the data collected. Interviews were guided by the same set of ten predetermined questions to maintain consistency of data collection. Telephone interviews were conducted with individuals who could not be reached in person.

Interviews were conducted on a confidential basis. However, the MFJD IMW included anywhere from 25-35 individuals over the two years that the research for this study occurred. In some cases, those individuals had been working together on the IMW project for many years. So, interview participants were made aware prior to interviews that readers, particularly stakeholders from the MFJD IMW collaboration, might be able to deduce their identity based on the discussions of findings in this study.

In all, six individuals were interviewed for this research. Interview subjects were selected purposefully and strategically to account for the following criteria:

- Interviewees collective experience encompassed the full duration of the IMW project;
- Individuals from state and federal agencies and NGOs were represented;
- Individuals involved in a wide range of monitoring activities were represented;
- Individuals who had served as Coordinator for the MFJD IMW were included;
- Individuals who have been closely connected to funding were included; and,
- Individuals who have been involved in other IMW projects were included.

Interviews for this research therefore include a strong cross-section of stakeholder representation and dynamics.

Fourth, meeting observations were conducted as part of this research. The importance of meeting observations in evaluating collaboration case studies is highlighted by several authors in the literature on collaboration (Cheng and Daniels 2005, Floress et al. 2011, Huxham and Vangen 2005). Meeting observations included:

- Two face-to-face meetings, one in September 2013 and one in April 2014 (each eight hours in length) in John Day, Oregon with all available MFJD IMW stakeholders; and,
- Seven monthly conference calls between September 2013 and October 2014 (each two hours in length) with all available MFJD IMW stakeholders.

The MFJD IMW hosts face-to-face meetings bi-annually and conference calls monthly for all stakeholders as part of the collaboration's general operating structure. Stakeholders are generally expected to participate in all meetings, particularly face-to-face meetings, but often there are a few absences among stakeholders at all meetings. Meetings are an important form of communication for the collaboration as stakeholders tend to be widely dispersed throughout the state of Oregon (e.g. John Day, Salem, Corvallis, Eugene, etc.). Thus, the face-to-face meetings are important because these are the only times of the year that the stakeholders will meet in person. Meeting observations

were performed in an 'observer as participant' role, where the role as researcher was known to the stakeholder members of the MFJD IMW (Creswell 2014, 191).

Lastly, the research included a review of 225 emails among the MFJD IMW collaboration. The emails reviewed for this research occurred between September 2013 and December 2015. In an 'observer as participant' role, the researcher for this study was part of the email list-serve that included all MFJD IMW stakeholders and numerous other individuals from various sectors of the natural resource management field interested in the work of the collaboration. The email communications generally covered topics including: the coordination of meeting planning and topics of discussion, prioritization of monitoring activities and research implementation, budgetary questions and concerns, and stakeholder funding requirements. Emails did not cover the entire scope of topics to be discussed, but often set up more in-depth discussions for monthly conference calls or face-to-face meetings. Email is also an important form of communication for the MFJD IMW since the stakeholders in this collaboration are spread throughout the state of Oregon.

There are two additional points concerning the research methods in this study that are worth noting. First, individual stakeholders and subcommittees in the MFJD IMW collaboration communicated outside of the meetings and emails reviewed for this research. Unless addressed by interview participants, these communications were not included in the research for this study.

Second, the researcher in this study was previously employed as a research assistant to one of the collaboration's stakeholders. Funding for that position was provided by the MFJD IMW collaboration. The researcher continued to participate in the collaboration as part of this stakeholder's research team for most of the period during which the research for this study was conducted. The researcher clearly communicated in two face-to-face meetings that this study was taking place and explained the topic of this study in a brief presentation to the MFJD IMW collaboration in April 2014.

Therefore, the stakeholders in the collaboration recognized the researcher as an 'observer as participant', knowing that the researcher was conducting this study during their interactions (Creswell 2014, 191). The researcher's history of involvement with the MFJD IMW collaboration may have benefited this study as it provided greater depth of

understanding of stakeholder dynamics, structure, and function of the collaboration. This may have also increased or eased access to each of the research methods, including interview participants.

The coding process for this research was deliberate and methodical. In order to assess all elements of leadership dynamics, the researcher captured anything that was expressed relating to 'leadership' through each of the research sources outlined above. This collection comprised the evidence for this research. This approach allowed for multiple perspectives through gathering evidence from each research source, and thus challenged any presupposed theoretical framework about leadership dynamics in collaboration (Huxham 2003, Huxham and Vangen 2005).

The process of coding the research evidence involved:

1) Sorting evidence according by each indicator in the individual and network leadership tables (Tables 1 and 2; p.24 and p.27, respectively).
2) Identifying emergent themes among the evidence concerning each leadership feature, including (but not limited to):
    - How prevalent or important some leadership features are relative to others;
    - The timing of the importance of different leadership features during the course of the collaboration;
    - The tensions among stakeholders at various times either related to leadership or in the absence of leadership;
    - The patterns of different research sources (interviews, meeting observations, emails) producing varying degrees of evidence for each indicator.
3) Articulating these themes in writing in the "Findings" chapter (Ch.V, p.42) of this study.

Meeting observations and emails were reviewed and coded before interviews. This was done to reduce potential researcher bias from the influence of interview participant's responses.

Using multiple methods to conduct the research allowed for triangulation and assessment of leadership dynamics in the MFJD IMW collaboration. Cheng and Daniels (2005) support the use of multiple methods: "Furthermore, by using multiple sources of data and multiple networks (interviews, content analysis, and participant observation), we are constantly able to check tentative findings from the analysis of one set of data against analyses of the other data sources" (40). This study incorporates perspectives of IMW collaborations outside of the MFJD IMW case study to provide some comparative analysis of IMW collaborations. Doing so strengthens the application of collaboration theory from the literature to the MFJD IMW case study (Imperial 2005).

Limitations

As with any study, this research poses several limitations. First, researcher bias in the process of coding evidence and drawing interpretations to inform the findings (Ch.V, p.42) is an inherent limitation in qualitative research. Further, researcher bias may influence the weight or degree of measure given to particular leadership features relative to others, which informs the Implications (Ch.VI, p.59) discussed in this study.

Second, the MFJD IMW is an ongoing project. Therefore, the research sources, interviews in particular, do not reflect a consideration of the entirety of the project. Additionally, the evaluation of findings in this study relies on the normative assumption that better collaborative processes lead to better outputs and outcomes (Innes and Booher 1999, Innes and Booher 2010, Koontz and Thomas 2006). Because this study was conducted prior to the completion of the IMW project that assumption cannot be evaluated.

Third, as discussed earlier in describing interviews for this research, participants were made aware of the possibility that readers will infer their identity based on the context of discussions in the "Findings" chapter (Ch.V, p.42). This may have caused interview participants to feel constrained in what they could or could not share during interviews.

Lastly, case study research poses an inherent limitation in its capacity to generalize conclusions to a broader scale (Cheng and Daniels 2005, Floress et al. 2011). The implications from the MFJD IMW case are most relevant to future IMW collaborations, but projecting these implications to the broader scholarship on collaboration imposes assumptions in the generalizing process.

CHAPTER IV: RIVER AND SALMON HABITAT RESTORATION MONITORING

Since 2006, over 20 significant restoration projects have been implemented in the Middle Fork John Day River basin in response to the listing of summer steelhead as Threatened and the proposed listing of spring Chinook under the Endangered Species Act (ESA). The river's ecosystem and the anadromous and resident fish populations it supports are well-poised to benefit from these restoration actions. Habitat monitoring is critical for assessing the results of restoration and determining the effectiveness of different restoration actions. The diverse restoration techniques and practices used in the MFJD River basin offer an exceptional learning opportunity for future restoration efforts in other river basins. This chapter discusses a literature review of salmonid habitat monitoring, which provides a foundation for monitoring definition and theory for the purpose of this study. A review of relevant case studies in the literature also helps elucidate these concepts in practice.

Background & Purpose

According to Roni et al. (2010) "Monitoring is technically defined as systematically checking or scrutinizing something for the purpose of collecting specified categories of data" (120). In natural resources management, this means persistent sampling over a predetermined timeframe to establish change in the biological function of a habitat or the population of an animal species. Generally, in the restoration field resources (funding, staff, etc.) typically go toward the implementation of restoration actions. However, monitoring is an important component of restoration planning as monitoring research can assess the degree of success of the restoration project and provide insight on future restoration design and implementation (BPA & NOAA Fisheries 2013, OWEB 1999, Reid 2001, Roni et al. 2010).

There are several different types of habitat monitoring, including: baseline trend, implementation (compliance), effectiveness, and validation monitoring (Roni et al. 2010). The appropriate habitat monitoring approach may be selected based on the conditions and

research directives required of the specific restoration project. Effectiveness monitoring is the approach used in IMW projects.

Effectiveness monitoring is used to determine whether restoration actions result in the desired physical and biological effects and intended outcomes of a restoration project (BPA & NOAA Fisheries 2013, Crawford and Rumsey 2009, Roni et al. 2010). Effectiveness monitoring is the approach best suited for adaptive management, as this type of monitoring can inform future actions through the evaluation of past actions (Crawford and Rumsey 2009, Reid 2001). For example, in the case of the MFJD IMW, one very large restoration project involved the placement of large woody debris in the river. The effectiveness of this restoration action can be assessed through various measures of the river channel's physical response to the presence of the large woody debris and through any increase or decrease in fish populations utilizing the newly created habitat. This information can then guide practitioners in selecting new locations for large woody debris placement on the river, and inform necessary modifications to the design of the large woody debris assembly to improve the effectiveness of future installments.

Design & Protocols

There is an extensive body of literature around designing monitoring programs. In some cases, there are handbooks specific to the habitat or species to be monitored. However, each case study is different, and there is no one specific design that can be used uniformly across all cases. Therefore, monitoring programs must be designed specific to each habitat and/or species, with key questions and hypotheses guiding the optimal monitoring research design in that case (Roni et al. 2010). Monitoring research projects generally always involve: "goals and objectives, defining clear hypotheses, selecting the appropriate monitoring design and parameters, implementing the programme and analyzing and communicating results" (Roni et al. 2010, 121). Other factors influencing the scale and complexity of the monitoring research include: land ownership and access to the habitat, seasonality of research opportunities, logistics around coordinating

research equipment, managing and coordinating multi-stakeholder participation, and funding, among others.

One key aspect of effectiveness monitoring efforts is data sharing and the publication of findings. Roni et al. (2010) highlight communicating the results from effectiveness monitoring research projects through websites, annual reports, conference proceedings, and ideally peer-reviewed publications. The importance of sharing results in a broad spectrum of venues allows environmental managers to coordinate adaptive management of the specific restoration project for which the monitoring research is being conducted, as well as provide insight for future restoration efforts (BPA & NOAA Fisheries 2013, Crawford and Rumsey 2009, PNAMP 2005, Reid 2001, Roni 2013, Roni et al. 2010).

For instance, there are 16 IMW projects currently underway in the Pacific Northwest, reflecting an increasing trend over the past ten years. Restoration practitioners in new IMW river basins can use existing research to guide restoration actions and subsequent monitoring research. BPA & NOAA Fisheries (2013) explain that the data and findings from these efforts can be used for the following purposes: "Identifies the extent of habitat improvement needed to improve fish populations on a landscape scale; provides data to develop or improve models that predict benefits of habitat improvement; reveals what combination of habitat improvements deliver greatest benefits for fish; [and] documents relationships between habitat quality and fish survival" (17).

Effectiveness monitoring is not without its challenges and limitations. Practitioners point to issues with monitoring design, procedural problems with implementation, and personnel turnover as common challenges to monitoring efforts (Reid 2001, Roni et al. 2010). Roni et al. (2010) also point to challenges with leadership and coordination among stakeholders during project management, data collection, and data sharing as a common concern.

From the standpoint of analyzing monitoring data, issues with the natural variability of environmental conditions and projects that span periods of unusual or anomalous environmental influences can be problematic for large-scale, long-term monitoring projects (BPA & NOAA Fisheries 2013, Roni et al. 2010). In other words, salmon and steelhead populations are exposed to a wide range of habitats from ocean

conditions to spawning tributaries, and varying degrees of habitat quality over the course of their life cycles. Isolating the influence of restoration actions on salmon and steelhead populations can therefore be difficult, thus complicating an understanding of the effectiveness of individual restoration actions.

Effectiveness Monitoring in Intensively Monitored Watershed Projects

According to authors Crawford and Rumsey (NOAA) in their guide to monitoring ESA-listed salmon and steelhead (2009), an Intensively Monitored Watershed (IMW) is: "A watershed that is monitored to the extent that the limiting factors are followed and the impact of management actions on fish or habitat can be demonstrated" (100). The fundamental purpose of an IMW project is to discern the relationships between restoration actions and habitat conditions that affect fish survival and productivity throughout an entire watershed (Beechie et al. 2013, BPA & NOAA Fisheries 2013, Crawford and Rumsey 2009, Curry et al. 2010, PNAMP 2005, Roni 2013).

By contrast, monitoring at the project, reach, or local scale may produce results that are subject to wider interpretation. Reasons for this include: smaller scales do not account for factors in other parts of the watershed, smaller scales may reflect "[population] preference rather than benefits to the population", the scope of monitoring does not capture the full population at smaller scales, and different implementers have not employed consistent experimental approaches between scales in the watershed (Curry et al. 2010, 1). Conducting effectiveness monitoring at the watershed scale may address these issues. According to the Pacific Northwest Aquatic Monitoring Partnership (PNAMP), the coordinating entity for IMW projects, these projects seek to answer the following basic questions: "Does the collective effect of restoration and/or management actions result in improved watershed condition and fish response? Why or why not? What are the causes of those responses?" (2005, 3).

IMW monitoring efforts must persist long enough to acquire data that extends beyond the yearly natural variation of fish population abundance. For many IMW projects, this means a duration of ten years or more (Crawford and Rumsey 2009). This creates substantial demands for funding and political feasibility that require careful

consideration of the watershed and target species for which an IMW project will be designated. Initially, determining IMW project locations was opportunistic, but ultimately those determinations will be based on filling research gaps (Leider 2005). IMW projects are designated based on the following criteria: stakeholder cooperation and support, species to research, type of ecological community, class of management action, geographic or political area(s) of concern, desired level of certainty or confidence in results, and costs (*ibid*).

IMW projects feature unique design characteristics depending on the river basin and its characteristics, the associated restoration actions, and the species populations to be monitored. However, all IMW projects share the following structural components:

1) IMW projects begin with a "power analysis" to determine which reaches within the watershed will yield the most representative data (Crawford and Rumsey 2009).
2) IMW projects use a before-after/control-impact (BACI) experimental design whenever possible to track changes in habitat conditions and impacts on fish populations. Alternatively, IMW projects may use reference conditions for comparative analysis between rivers or watersheds in the region (Crawford and Rumsey 2009, PNAMP 2005, Roni 2013).
3) IMW watersheds should host full life stages (fry, juvenile, adult) of each fish species in question, and fish population data for each life stage should be available prior to the restoration actions whose impacts are being monitored. For example, in the MFJD watershed, restoration projects were preceded by at least one year of baseline monitoring of fish populations (BPA & NOAA Fisheries 2013), and there is periodic data regarding local fish populations dating back to 1990.
4) Landowners and managing agencies in the watershed should be included in the planning and implementation of all restoration and monitoring actions in order to ensure consistency of coordination and control of restoration conditions during the monitoring period.
5) Given the relatively long duration of an IMW monitoring project (i.e. 10 years or more), secure funding for the duration of the project, clear coordination among

participants, and strong collaborative practices are important to sustain an IMW project to completion.

Practitioners that account for these basic design principles will provide a strong foundation for an IMW project to then incorporate components of research design that address the unique characteristics of a particular river basin.

CHAPTER V: FINDINGS

This chapter presents the findings of this study. These findings are based on evidence discovered through multiple sources and qualitative research methods, outlined in the "Methods" chapter (Ch.III, p.29) of this study. The coding process used to manage the evidence and inform the discussion of findings is also outlined in the "Methods" chapter.

Individual Leadership in the MFJD IMW Collaboration

As discussed in the "Literature Review" chapter (Ch.II, p.12), individual collaborative leadership refers to leadership dynamics in which one or more individuals guide the collaboration. Table 1 (p.24) depicts key individual leadership features, which are supported by a collection of indicators cited in the literature. The findings discussed here are organized according to the structure of Table 1 and the leadership features and indicators outlined therein.

The collaborative leader manages meeting planning and logistics for the collaboration. The indicators in the literature supporting this individual leadership feature include: creating the meeting agenda, organizing the format of meetings, conducting meeting follow-up, and managing the meeting process.

This individual leadership feature was largely driven by funding. As discussed in the "Contextual Background: Middle Fork John Day River IMW" subchapter (Ch.I, p.4), NOAA Fisheries/Pacific States Marine Fisheries Commission and the Oregon Watershed Enhancement Board partnered to provide funding for the MFJD IMW collaboration. Each year, the collaboration was awarded a budget from these funding entities that was then allocated by the collaboration according to its needs and expenses.

The stakeholders recognized the importance of this leadership feature and created a funded position (from the collaboration's annual budget), called the Coordinator. The Coordinator position was filled by multiple individuals over the course of the IMW project. Each successive Coordinator represented a different agency or organization, and held varying positions within those entities. In September 2015, funding for the

Coordinator position was eliminated. The Coordinator at that time and an individual from a funding entity stepped up to share the responsibilities of the Coordinator position. Interview participants expressed the importance of keeping this position filled. Interviews also revealed that the individual from the funding entity was particularly interested in having the responsibilities of the Coordinator fulfilled. That individual was accountable for reporting to the funding entities through progress reports for the collaboration, and the Coordinator position played an important role in managing those reports among stakeholders.

Interviews suggest that while the Coordinator position had established responsibilities, the role was performed differently based on the personalities of the individuals occupying the position. The Coordinator role was described as "massively amorphous", yet there was consistently an emphasis placed on leadership around the responsibility of setting meeting agendas. One participant stated: "The agendas drive the beast. The monthly agenda is the one time to coalesce all those powerful brains [other stakeholders]." The implication being that the stakeholders are very busy in their work outside of the collaboration, and the agenda drives the focus of the IMW work that each stakeholder will pursue between monthly meetings. Based on email evidence, agendas were customarily developed by the Coordinator, then shared with the group prior to meetings for the opportunity to provide feedback. Agendas were circulated via email anywhere from a week to a day prior to a meeting.

The collaborative leader convenes the stakeholder members of the collaboration. The indicators in the literature supporting this individual leadership feature include: determining who to invite to the collaboration, possessing an ability to bring people together, inspiring buy-in among invitees, an individual with credibility and clout, articulating the goal(s) of the collaboration, and an individual who is trusted among stakeholders.

This leadership feature was discussed in interviews (not meetings or emails) as participants recounted past events. By all accounts, the MFJD was deemed an appropriate setting for an IMW project by individuals from NOAA in 2007. One individual from NOAA was particularly influential in establishing the MFJD IMW because of past experience initiating IMW projects in other Pacific Northwest river basins prior to 2007.

While this individual had credibility among the MFJD IMW group, according to interviewees, the convening of the IMW did not stem from that one individual's efforts alone.

Instead, the convening of the MFJD IMW was driven by several organizations who sought to capitalize on existing conditions in the MFJD River basin. Those convening organizations included: NOAA, OWEB, and several landowners such as the Confederated Tribes of Warm Springs, the US Forest Service, and the Nature Conservancy. The conditions that provided the foundation for an IMW project were: ongoing restoration actions, a pre-existing working group implementing restoration projects (Middle Fork John Day Working Group), and the commitment of long-term funding to the project. As one participant from OWEB explained: "Part of what we did early on was provide some leadership in terms of getting them [the MFJD Working Group] organized and starting to think about broader than the working group they already had, to start to develop an IMW. And that included developing a study plan, and defining a geography, and adding a whole bunch of other elements, particularly monitoring aspects, to the work they had been doing before." This interview participant also noted that it was critical during the convening phase to establish the support of the Middle Fork John Day Working Group to generate buy-in for the IMW within the local community.

The last indicator of this individual leadership feature, the convener being trusted and unbiased, was not supported by evidence from the research. It is not known why this indicator lacked evidence. However, it could be due to the MFJD IMW having been convened by several organizations, as opposed to a single individual. Another reason may be that although the MFJD IMW was convened on a voluntary basis, it was heavily incentivized by funding from the outset and therefore efforts on the part of a single individual to rally stakeholders together were largely unnecessary.

The collaboration typically has at least one 'champion' or key individual driving the effort at all times. The indicators in the literature supporting this individual leadership feature include: the champion is a peer, member of the core group, or senior leader who inspires participation among stakeholders in the collaboration.

IMW-related documents, emails, and meeting notes suggest that the collaboration has had an individual serving in the 'champion' role throughout the project. However, the

champion role shifted during the different phases of the collaboration (convening, conceptualization and design, implementation, data synthesis and analysis; Figure 1, p.3).

In phases 1 and 2, the champion was described by one interview participant as being several individuals who, "had a lot of knowledge in certain areas, and had some of the larger contracts, and were doing the lion's share of the work, and were simply well respected scientists. They stepped forward and others followed their lead." During phase 3 (implementation), evidence from interviews, meeting notes, and emails placed less emphasis on the champion role. During this phase, the role was more aligned with the Coordinator position. The champion role at this point became associated with representing the MFJD IMW collaboration in the public sphere, as evidenced by individuals in this role giving presentations at conferences and providing written content for IMW-related journal articles.

The collaborative leader is a shepherd of the process who maintains productive stakeholder engagement and guides the collaboration toward consensus-based decisions. The indicators in the literature supporting this individual leadership feature include: enabling stakeholders to meet goals through joint action, resolving conflict, engaging stakeholders in joint problem solving, prioritizing issues, maintaining open communication among stakeholders, identifying stakeholders' skills and resources for use in the collaboration, maintaining the collaboration's technical credibility, using 'pull' tactics to keep stakeholders engaged in an otherwise voluntary process devoid of central authority, and adapting to external forces through 'systems thinking'.

First, the importance of this individual leadership feature was most evident as the MFJD IMW collaboration began a shift in project phases from implementation (data collection) to data synthesis and analysis (phase 3 to 4; Figure 1, p.3). This shift began in earnest in 2015, as the project will sunset in 2018 after 10 years of operation. As evidenced in meeting notes, the collaboration predicted the final phase would take several years to complete. Interview evidence revealed that the shepherd role in this case involved guiding stakeholders to organize and coordinate the sharing and analysis of individual research data to produce the project's final report. That report will serve as the culminating output of the collaboration. As one stakeholder noted in a 2014 meeting: "I

think we're hitting the point in the study where we need to think about accomplishments."

The importance of the shepherd role was illuminated by evidence suggesting that the MFJD IMW lacked a strong shepherd of the process during the transition of project phases. This was particularly the case in the transition of the implementation (data collection) to data synthesis and analysis phases (phase 3 to phase 4; Figure 1, p.3). This transition was different from other project transitions for several reasons: 1) the data collection phase was the longest of any phase in the project so stakeholders were firmly entrenched in network leadership processes at the time of the transition; 2) at the time of the transition stakeholders were focused on the completion of their independent research and less so on the completion of the IMW project; and, 3) data synthesis and analysis (phase 4) is arguably the most challenging phase of the IMW project as stakeholders must consider and integrate enormous amounts of data and collectively draw conclusions from their research. In one meeting, a stakeholder observed: "We know we need to collaborate, we just need to figure out how."

Several key individuals tentatively emerged to assume the shepherd role at various times during the transition. However, none decisively fulfilled the role according to the indicators supporting this leadership feature in the individual leadership table (Table 1, p.24). For example, the collaboration struggled with what outwardly might have been an obvious and easy first step in the transition- to provide stakeholder's access to a shared data server and a develop an organization protocol for uploading data to that server. Without individual leadership in the form of a shepherd role, this process was discussed in meetings for almost a full year before being resolved.

Further evidence of the lack of individual leadership fulfilling the shepherd role occurred in a May 2014 meeting. At that time, a key individual, who had at other times emerged as an individual collaborative leader, suggested that the collaboration assemble a "data management subcommittee" to address the issues surrounding the data server and facilitating data sharing. The identified need for a subcommittee at that time revealed that individual leadership was not present in the shepherd role. Eventually, in June 2014 the collaboration opted to bring on a PhD student for the purpose of overseeing the data synthesis process. Based on meeting notes and emails it was evident that this individual

quickly began taking steps to coordinate stakeholders and push this process forward. It is difficult to tell how effective this individual was in the shepherd role as the transition of project phases was still ongoing at the time the research for this study was completed.

Perhaps one limitation to an individual emerging firmly in the shepherd role was the collaboration's lack of a shared goal or vision for what was to be accomplished at the completion of the project. This lack of consensus among stakeholders on what the collaboration's final product or report should be proved challenging for the collaboration. One participant observed: "You know, the shared goal thing, I can't express how important that is. One shared goal. [Leadership is important] because you need to point people at something. And they need to agree that they're all doing the same thing." In the absence of a shared goal or vision, individual leaders were less inclined to emerge in the shepherd role due to the lack of direction in which to guide the collaboration.

Second, while the shepherd role was not adequately filled during this transition in project phases, it was at other times filled by an emergent individual leader in the collaboration. This was done through the prioritization of issues, an indicator supporting this leadership feature (Table 1, p.24). In this case, issues were prioritized through the use of the collaboration's budget and funding requirements.

These actions were mostly driven by individuals associated with funding agencies. At various meetings, budget discussions were used to direct funding toward particular research efforts, thus guiding the collaboration's attention and energy to those areas. For instance, during a budget development process at one meeting, funding was directed to support the final data synthesis phase of the project while simultaneously reducing funding for some monitoring research activities.

Additionally, funding requirements, such as quarterly and annual reports, were made a high priority by representatives from the funding entities. These funding requirements are the mechanism by which the funding entities enforce accountability of the stakeholders in the collaboration for spending public dollars on the IMW project. These requirements thus represent an external pressure on the IMW that demands compliance. As one interview participant observed: "Because the IMW is slated to sunset after 10 years, we have to move forward to produce a document and do a lot of analytical procedures with the data that we do have. [INDIVIDUAL] brought most of that

leadership and impetus to transition to move away from collecting data to analyzing data that we already have. And I think that mostly comes from a contractual obligation…they [the funding agency] have requirements for reporting and we need to fulfill those requirements." Thus, based on this leadership indicator, at times representatives from the funding entities emerged in a leadership role as shepherd of the process, guiding efforts through budget management and maintaining compliance with funding requirements.

Third, although the literature suggests that maintaining technical credibility for the collaboration is an individual leadership indicator, in this case it proved to be a network leadership effort. The MFJD IMW makes a concerted effort to incorporate technical information from outside the collaboration to inform planning and decision making. Such outside sources include: guest speakers at meetings who present research relevant to the MFJD IMW project; relevant published articles, theses, and dissertations generated through MFJED IMW research that are shared by stakeholders in the collaboration; and a weather station that was installed at the main MFJD research station by a land owner after purchasing with input from the collaboration so that the data can be shared with all stakeholders.

Fourth, in some cases technical expertise proved to be a catalyst for emergent leadership in the shepherd role outside of the transition in project phases. Generally, during the implementation phase stakeholders gravitated to their unique areas of expertise. However, according to interview participants, stakeholders associated with research entities, such as universities and ODFW, were viewed as possessing technical expertise spanning a range of monitoring activities. According to one interviewee, "They've seen things happen on the ground, they are in a position of authority because they have the knowledge and have seen the restoration and changes and understand where the data gaps lie. They're able to identify needed monitoring actions." Individual leadership based on technical expertise was noted as especially important during the conceptualization and design phase (phase 2; Figure 1, p.3). During that phase, a wide range of monitoring research knowledge was important to leading the research design and implementation plan that the collaboration would follow during the implementation phase to follow (phase 3).

Lastly, evidence from all sources revealed that joint problem solving proved to not be an indicator of individual leadership based on the shepherd role. For example, the MFJD IMW features several subcommittees, each established on a voluntary basis by stakeholders with expertise in a particular area. Among those are the Habitat and Website subcommittees. Subcommittees emerge to address pressing challenges or demands, then seem to fade in relevance once those needs are met. While the research for this study did not cover subcommittee work, the products and problem-solving recommendations the subcommittees produced were discussed in the meetings and emails included in this research. Comprised of several individuals each, these subcommittees develop solutions to challenges such as: developing a basin-wide restoration inventory, determining focal points for future monitoring research, and designing the website to showcase MFJD IMW research publications and increase public outreach, to then recommend to the collaboration. Thus, joint problem solving proved to be largely driven by network leadership than individual leadership.

Individual collaborative leadership requires a suite of skills and personal qualities to be successful. The indicators in the literature supporting this individual leadership feature include: providing confidence, hope, and inspiring others to stay involved in the collaboration; possessing strong interpersonal skills; building relationships and trust among stakeholders; being modest and letting the collaboration take credit for success; providing energy, commitment, and constant nurturing of the collaboration; and possessing the capacity to learn individual collaborative leadership skills.

Based on the evidence, the Coordinator position in the MFJD IMW assumes more of this individual leadership feature than other emergent leadership roles. In fact, the indicators of building relationships and nurturing the collaboration are important aspects of the Coordinator role. The Coordinator engages the collaboration for organizational, logistical, and reporting aspects, which all tend to demand the most frequent and regular communication. One interview participant described this role as: “It’s like a bad waiter: if they come around too much it’s annoying, if they don’t come around enough it’s annoying. I called it ‘strategic nagging’. You gotta bump people on occasion.”

One indicator of this leadership feature that was given significant attention during interviews is building relationships and trust within the collaboration. It is clear that the collaboration values relationship and trust building. The Coordinator and stakeholders emphasize doing so through a welcoming atmosphere and one-on-one interaction, particularly with those that are new to the collaboration. Based on meeting notes and interview evidence, the collaboration seems to be successful in building trust among stakeholders, although that process takes time, as with any collaboration. The Coordinator position helped accelerate that process by serving as a central point of contact for new stakeholders and sharing stakeholder contact information when needed.

Despite the collaboration's success in building trust among stakeholders, multiple interview participants noted the challenges associated with turnover. One participant stated: "That really makes people less effective- the more they shift in and out, in my view. Because when they shift in, I don't know who the person is, I don't know their job title…I don't know what their expertise is. And until you work with someone for a while you don't learn those things about them. Because you don't want to interrupt the conversation and say, 'Well, who are you? Can you describe yourself to me?' [laughs]."

Another participant explained: "The amount of institutional knowledge that you lose when you have someone who's been doing something for a couple years and then leaves is…immeasurable." Another participant emphasized the value in having one Coordinator for the full duration of the collaboration, something the MFJD IMW collaboration has lacked: "It would be nice if you could start that situation with somebody who had the trust already of the folks. We have such variable leadership within the IMW. It would be nice if we could just say, 'This is our man/woman from day one'. And that's it, for 10 years." Turnover in this position was largely due to demands on individuals' time from their home agency or organization that trumped their participation as Coordinator in the IMW.

One indicator of this individual leadership feature that was not evident was inspiring the group to stay involved. This is likely because the collaboration had been underway for seven years by the time this research started and the stakeholders were already deeply engaged in the effort.

Additionally, individual leadership indicators such as strong interpersonal skills, modesty, and aptitude to learn collaborative skills were not evidenced by any sources in this research. However, because these indicators reflect individual personality traits there is increased subjectivity in identifying research evidence that supports each indicator. This makes measuring these indicators relatively difficult. Despite that difficulty, the lack of support for this individual leadership feature may be indicative of the group relying on emergent individual leadership, not elected individual leadership. Had the latter been the case, the participants in this research would have been more likely to have reflected on leadership skills of various individuals during an election process.

The collaborative leader may be closely involved with the collaboration's funding and budget. The indicators in the literature supporting this individual leadership feature include: raising funds and providing resources for the collaboration, and maintaining access to the budget.

Across all research sources, evidence suggests that individuals representing funding entities have the potential for greater influence on the direction of the collaboration than other stakeholders. This was apparent on several occasions during meeting deliberations around setting budgets. In one instance, a representative from a funding entity determined that outreach was important to the IMW, but the funding directed to this area of the project would be small so as to not to detract from monitoring research. In another instance, a representative from a funding entity insisted that services and actions related to data management and integration be incorporated into the budget to account for the shift in project phases of the collaboration (data collection phase 3 to data synthesis and analysis phase 4). This individual suggested budgeting for an outside consultant to perform duties around this new project work. Other stakeholders in the collaboration did not respond well to that idea, feeling that their individual research efforts might be threatened by this reallocation of funds.

Individual leadership was also enabled by access to the budget. For example, in one case the Coordinator continued with a planned meeting to discuss the upcoming year's budget in spite of stakeholders representing federal agencies not being able to attend due to a federal government furlough.

While access to the budget facilitated individual leadership at times, it also created some challenges. First, emails and interviews revealed a slight ongoing tension between those with access to the budget and stakeholders who rely on knowing the budget to plan their research activities. Second, one participant noted that: "People naturally look to OWEB to run these things, but it's a weird circumstance that you have someone who holds the purse strings actually running it but the real expertise is not inside the purse strings. The purse strings facilitate the expertise." Therefore, the collaboration can benefit from individual leadership associated with budget access and management if the individual(s) provide strong collaborative leadership based on fulfilling individual leadership features outlined in Table 1 (p.24). If not, then this leadership feature can impose limitations to the collaboration.

Network Leadership in the MFJD IMW Collaboration

As discussed in the "Literature Review" chapter (Ch.II, p.12), network leadership in collaboration refers to leadership dynamics in which the structure, norms, and rules of the collaboration guide the way people act and provide direction for the collaboration. Table 2 (p.27) depicts key leadership features, which are supported by a collection of indicators cited in the literature. The findings discussed here are organized according to the structure of Table 2 and the leadership features and indicators outlined therein.

Network leadership is distributed through the structure and work of the collaboration. The indicators in the literature supporting this network leadership feature include: power rests less with any individual and more with the structure of the collaboration, also known as 'synthetic authority'; leadership is found in the work of the collaboration, not in specific individuals; collaborative leadership is enacted by the structure and communication processes embedded within the collaboration.

The concept of 'synthetic authority' refers to the accountability that stakeholders have to the structure and operating processes used by the collaboration, and to one another to abide by that structure and processes (Lurie 2004). Synthetic authority reflects network leadership as it guides the actions and behaviors of stakeholders in the

collaboration. This leadership feature proved to be a strong influence in the network leadership of the MFJD IMW.

Synthetic authority as a network leadership indicator is evidenced across all sources for this research. First, synthetic authority is found in the expectation of stakeholders to provide research updates for one another at monthly conference calls and presentations at bi-annual face-to-face meetings. The collaboration's established schedule that requires monthly conference calls and bi-annual meetings provides network leadership in that it demands accountability of stakeholders through participation. As one interview participant observed: "The schedule is key because it keeps people talking. Otherwise you could have people that might meet once a year. The calls are not necessary but they're helpful."

Second, stakeholders are expected to organize and upload their data to a central data storage site serving the collaboration so that other stakeholders can access that information. The procedure guiding this process was slow to materialize, but since it has been in place, meeting notes suggest that stakeholders have responded well to using the data storage site.

Third, the exercise of allocating the collaboration's annual budget is done in the presence of all stakeholders so that budgeting decisions are accessible for discussion. This budget deliberation process imparts accountability on each stakeholder to responsibly and fairly request and spend money for individual research efforts.

Lastly, synthetic authority drives the expectation of stakeholders to provide progress reports for the MFJD IMW website and project funders. The former benefits the collaboration in terms of public engagement, the latter is a requirement for funding awards. According to meeting notes and interviews, the collaboration has been successful at providing detailed and timely reports.

However, network leadership through synthetic authority did reveal some challenges. This was evident in several interviews where participants expressed a lack of organization or operating norms in the beginning phases of the collaboration, translating to a lack of network leadership at that time. One participant described leadership as being "amorphous" in the beginning, and that working with other stakeholders took some acclimating. This participant further explained the state of leadership in the early phases

of the project: “I would have felt more comfortable at the beginning with stronger leadership, but I like the way things are set up now because I have a voice within the group, as do others. If I would have known there was a leader, and I didn’t have to worry about things myself, I could have gone to that person to help understand things. On the other hand, if we had a strong leader in the beginning, I might have taken on less or been a little less engaged.”

Lastly, there was only moderate evidence supporting the indicator of network leadership being found in the work of the collaboration and not individual stakeholders. This was apparent in the respect that each stakeholder held for one another’s expertise or knowledge concerning individual roles in pursuing monitoring activities. However, it was clear that while this type of network leadership was sufficient for coordinating stakeholder activities during the implementation phase (phase 3), it did not have the capacity to drive the collaboration through the transition in project phases 3 and 4 (Figure 1, p.3). For example, one interview participant observed: “If OWEB doesn’t push that [data collection to data synthesis] transition, then people will just continue to collect data. The agencies will compile loads of data that never gets used. Everyone is focused on the mechanics of collecting data and doing the monitoring.”

Network leadership is driven by networks of stakeholders that emerge to address demands or challenges that the collaboration faces. This emergent network leadership is transitory as other networks may emerge to address new and/or evolving needs. The indicators in the literature supporting this network leadership feature include: building networks among stakeholders and creating capacity to coordinate efforts within these networks, the stakeholders’ ability to collectively adapt to new settings and changing conditions, creating identity forming and cross-boundary experiences for the collaboration, dividing leadership roles between members in a ‘shared leadership’ approach, and convening leaders who will establish collaborative processes then step back and allow the network process to guide the collaboration.

The research evidence reveals a moderate degree of network building opportunities among stakeholders in the MFJD IMW, but those opportunities were not sufficient to contribute to supporting network leadership for the collaboration. Project updates on monthly conference calls and presentations at face-to-face meetings are

examples of the collaboration supporting network building opportunities. Another example is subcommittees that form around stakeholder's expertise relative to particular issues or problems. One participant notes that, "Subcommittees work well because the bigger group talks about a concept but you drill in with three to four people who are more motivated or for whatever reason are able to commit more time and energy."

In spite of this, the evidence also reveals that network building opportunities did not support network leadership. First, one stakeholder observed in a meeting that although there is some coordination among stakeholders on monitoring actions, "There is not enough synergy between team members, it feels like the group is working in pairs, not as a team. We need more synthesis." This stated concern was attributed to a lack of communication among stakeholders. The collaboration did a strong job of communicating to coordinate monitoring research efforts, but did not develop networks of researchers for the purpose of communicating about synthesizing monitoring research to answer critical research questions for the project. Evidence from meeting observations suggests that stakeholders from universities seemed more inclined to create networks for discussing monitoring research. It was not clear based on the evidence whether this was due to the specific monitoring actions the university stakeholders were engaged in, or whether it was due to the academic culture in which these stakeholders customarily work.

Regarding the stakeholders' ability to adapt to new settings and changing conditions, there is not strong evidence in the research to support this indicator of network leadership. However, the evidence across all sources indicates that the collaboration struggled, at least for a period of time, to transition into the final phase of the project focused on data synthesis and producing a final report. While this transition is recognized as a critically important shift in project phases (Figure 1, p.3), the stakeholders faced significant challenges in setting up a data storage mechanism for the collaboration, gaining individual access to that data storage to upload data, and developing a standard protocol for organizing that data for the purpose of the data synthesis process. Network leadership thus proved to be ineffective in guiding this transition.

In terms of identity formation and the creation of boundary experiences as an indicator of network leadership, most of these actions resulted from efforts to define and

promote the work of the MFJD IMW to the public. Identity formation is evidenced in the MFJD IMW website, which features project updates and publications resulting from MFJD IMW research; an IMW booth hosted at the Grant County fair in summer 2014; a Twitter account to provide project updates to the public; and meeting discussions around ways to recruit members of the public to the biannual face-to-face meetings. The importance of identity formation was evident in one meeting, where during a budget discussion regarding whether to allocate support for the website a stakeholder asserted: "This is an opportunity to give the group something we lack at this point, which is a group mentality."

Relative to shared leadership as an indicator of network leadership, interview evidence suggests that this indicator was present in the collaboration, but it was difficult for participants to articulate its existence or influence. Shared leadership may have been happening, but it did so in an organic and unintentional fashion. In this case, shared leadership was not deliberately divided through network leadership, but was evident as an emergent network leadership function.

One participant described this emergent shared leadership phenomenon as: "It's been a shared role sometimes, and other times it's been different roles but shared perhaps maybe between OWEB and in this case now ODFW. But other folks take the lead too when something is happening like a big project, or a fish salvage, or coordinating with scientists for the bunk house at the Tribal property. I mean, other folks step up and provide leadership on those different topics. I believe in that, I don't think it needs a captain all the time, I think you encourage more ownership where you have leadership roles where it makes sense."

The evidence suggests that shared leadership was an important network leadership feature, however unintentional it may have been. Multiple interview participants noted the need for leadership in a scientific capacity as well as an administrative capacity. Other interview participants observed the importance of individuals from higher level positions within their home agency or organization bringing a big picture perspective to the collaboration. Finally, another interview participant recalled that at times the collaboration considered establishing an Executive Committee to oversee the project, but funding limitations prevented the collaboration from doing so.

At times, shared leadership was assumed by an agency or organization, and at other times, it was an individual. The evidence suggests that some of this was due to certain personalities lending themselves more naturally to leadership positions. In other cases, it was due to OWEB's role as funder; an agency's or organization's technical expertise, such as university researchers or ODFW; or a land owner's role, typically the Confederated Tribes of Warm Springs, in hosting the restoration and monitoring activities. Thus, network leadership in the collaboration facilitated individuals stepping up in a shared leadership format to address specific tasks or projects.

The last indicator of this network leadership feature is the convening leaders establishing processes and operational norms to drive network leadership, then stepping back to allow those processes to lead the collaboration. Despite looking for evidence of this indicator, the indicator was not strongly supported by any sources in the research. However, it was noted through several interview participants that stakeholders from universities played a large part in directing the design of monitoring actions in the beginning of the project. Once the monitoring design and implementation plan was completed, these same stakeholders worked within the network leadership structure established in that design and plan.

The strength of network leadership is influenced by resource demands and constraints. The indicators in the literature supporting this network leadership feature include: network commitment can be expressed through financial commitment by participating organizations to the collaboration.

The evidence across all sources supports this network leadership feature in the MFJD IMW. For example, OWEB commits funding to the collaboration and also manages a significant yearly federal grant from the Pacific States Marine Fisheries Commission. OWEB creates organizational processes to manage the collaboration's funding that serve as network leadership.

For example, OWEB maintains stakeholder accountability to produce progress reports that satisfy grant requirements. In one meeting, an OWEB representative rallied stakeholders to showcase their work progress in these reports by stating: "NOAA is rumbling at the moment. This is our opportunity to report back and look good for future funding." In another case, an interview participant claimed: "OWEB's strength in

leadership comes because they held the contracts and they give out the money. That all speaks loudly when you're trying to provide leadership."

While providing and managing funding represents one form of commitment to the collaboration, another form of commitment not expressed in the literature that emerged in this research is that of resources such as time, equipment, and labor. If these resources were monetized they would represent significant contributions to the collaboration. One interview participant noted that their stakeholder contributions exceeded that which was funded, largely by way of unpaid volunteer work. However, that was acceptable because many of the other stakeholders had likely made similar commitments of resources. Thus, any significant resources, not just funding, can provide an avenue to developing network leadership in collaboration.

In summary, the research evidence in this case reveals extensive findings related to both individual and network leadership in collaboration. A summary of the findings discussed in this chapter can be found in the "Conclusion" chapter (Ch.VII, p.68) of this study. The next chapter, "Implications" (Ch.VI, p.59), discusses the meaning of these findings and explores the lessons that these findings offer for future IMW projects and the scholarship on collaboration.

CHAPTER VI: IMPLICATIONS

This chapter evaluates and discusses the findings from this study. The MFJD IMW case offers insights on the following research question: How do leadership dynamics in the MFJD IMW collaborative governance structure facilitate effective collaborative process or create limitations to that process?

These insights provide lessons on leadership in collaboration for habitat monitoring projects, including other IMW efforts currently underway and those that may be established in the future. This case also contributes to an understanding of leadership in collaboration for the scholarly literature on collaboration in natural resources management.

Discussion of Leadership Dynamics in Collaboration for IMW Projects

The findings of this study provide lessons for collaboration in IMW projects, both for those that are currently underway and for projects that may emerge in the future.

The Coordinator position clearly serves an important function in the MFJD IMW collaboration. However, the Coordinator position is not necessarily a leadership role. The Coordinator position reflects one individual leadership feature in managing meeting planning and logistics for the collaboration, and meets some indicators of the leadership feature that outlines the skills and personal qualities of an individual collaborative leader. However, the Coordinator position does not fulfill other substantive individual leadership features. For the most part, the Coordinator position manages administrative business for the collaboration and serves as a central point of contact for information sharing.

It was evident that this position would benefit the collaboration more if it were filled by one individual throughout the duration of the collaboration. Turnover in this position proved challenging for Coordinators and stakeholders alike in maintaining consistency in collaborative processes, group norms, and working knowledge of the history of the collaboration's efforts. Future IMW projects should consider creating a staff position such as the Coordinator in the MFJD IMW. To improve this position, IMW collaborations should create a clear job description so that the responsibilities and

expectations of the job are understood by all involved in the collaboration. The job description should emphasize developing meeting agendas and serving as a point of contact for information sharing among stakeholders. The job description should also include facilitation skills, as the Coordinator in the MFJD IMW often assumed a facilitator role during meetings and conference calls. A clear job description will allow stakeholders to more easily identify areas where emergent leadership is needed to then step up and fill those needs.

The shepherd role is a critical individual leadership feature in the MFJD IMW collaboration, particularly during shifts in project phases (Figure 1, p.3). This was most evident during the shift from data collection (phase 3) to data synthesis and analysis (phase 4). The importance of this role was emphasized by the evidence that a strong shepherd role did *not* exist for the collaboration during that transition. The process of organizing data management protocols and uploading data to the collaboration's shared server to begin the data synthesis process materialized slowly, which created an undercurrent of inertia in the collaboration during the transition. Individuals representing a funding agency emerged in a tentative shepherd role at that time. This occurred because those individuals were concerned with accountability for reporting requirements. This interim, tentative shepherd role existed until an individual was ultimately recruited for the express purpose of guiding the collaboration through the data synthesis and analysis phase.

Furthermore, individual leadership in the form of the shepherd role was limited by the collaboration's lack of a clearly articulated, shared vision for the ultimate goal or final product of the collaboration to be achieved in phase 4. In spite of the strength of leadership abilities of the individuals that emerged in the shepherd role, without a common goal guiding the efforts of the collaboration, the shepherd role was constrained in its capacity to effectively navigate this period of transition. The literature asserts that the champion role in collaborative leadership can be important in articulating the goals of the collaboration. The MFJD IMW did not have an individual in a strong champion role capacity to facilitate articulating the goals of phase 4 of the IMW project.

By contrast, network leadership proved to be a strong leadership type during the implementation of project phases. Synthetic authority contributed greatly to the strength

of network leadership in the MFJD IMW and revealed that it is a powerful leadership feature in network leadership in collaboration. This is evidenced in the collaboration's strength in coordinating monitoring activities in phase 3 (implementation of data collection) and maintaining numerous operating processes and communication norms during this project phase. Synthetic authority also functions to maintain commitment, momentum, and progress for the collaboration. This is critical in collaborations like IMW projects that span long timeframes and include multiple stakeholders, as it would otherwise be easy to divest in the collaboration due to time constraints or other priorities pulling stakeholders away from the collaboration.

Yet, synthetic authority relies on establishing clear operational, procedural, and communication norms early in the existence of each project phase and maintaining buy-in from stakeholders in respecting those norms. Those norms should be adapted to the purpose of each new project phase and not rely on the conditions of the previous phase. Individual leadership in the form of the shepherd role can provide guidance in this respect. In this way, each stakeholder feels accountable to fulfilling the expectations of the collaboration's processes, and stakeholders will in turn hold one another accountable to those processes as well.

Therefore, a significant lesson for future IMW projects is that the shepherd role is critical during periods of transition in project phases, while network leadership is important in maintaining stakeholder coordination and guiding the collaboration once each project phase has been established. As one interview participant observed: "I think the successful IMWs need leadership and it should be a person, who champions in that purview and the value of their leadership comes from the fact that they can lead the project through the pinch points. Sometimes the pinch point is funding, sometimes it's project implementation, sometimes it's design, which means outreach to the private landowners, but without that…" Thus, the shepherd role should be an assigned leadership position during transitions in the project that carries with it an acceptable degree of authority in the collaboration. In addition, collaborative process and communication norms should be established early in each project phase to enable greater significance of the synthetic authority that will strengthen network leadership during implementation of each project phase.

This case revealed another significant lesson for IMW projects, which is individual leadership is not required to pursue joint problem solving among stakeholders, but it is necessary for effective strategic visioning. Joint problem solving is a process in which stakeholders collectively develop optimal responses to problems; strategic visioning is the exercise of defining the goals of the collaboration and outlining how those goals will be achieved over time. Network leadership proved capable of achieving joint problem solving due to the operating and communication processes embedded in the collaboration's structure. Subcommittees and face-to-face biannual meetings were strong catalysts for joint problem solving. Strategic visioning, however, struggled without individual leadership to drive the integration of stakeholder ideas and move the collaboration toward consensus. The challenges associated with the collaboration developing a shared vision and roadmap for producing a final report are an example of this limitation to collaborative process.

Network building opportunities were present in the MFJD IMW collaboration, but not to the extent that they provided strong network leadership for the collaboration. Had stakeholders established stronger networks in the years during data collection (phase 3) and focused more energy on developing research questions across monitoring research actions, the process of transitioning project phases from data collection to data synthesis (phase 4) would likely have been easier. Doing so would have provided clearer goals for emergent leadership in the shepherd role in guiding the collaboration during that transition.

Each stakeholder's accountability to their home agency or organization may have been a complicating factor in developing strong networks among stakeholders. This may have discouraged or prevented some stakeholders from straying from the core mission of their home agency or organization to pursue network building opportunities with other stakeholders. Additionally, this accountability may have limited stakeholders in pursuing tasks that fell outside the scope of work of their job or placed demands on their time that is otherwise commanded by the home agency or organization.

Perhaps one approach to achieving increased network building is to build more boundary spanning opportunities among stakeholders. Stakeholders had a tendency to retreat to their own areas of expertise and rarely did any stakeholder question others'

approaches to their research. In future IMW projects, more attention should be directed at examining the 'what and why' of each research methodology and approach. Regular and systematic self-reflection should incorporate big picture research questions intended to synthesize research methods and provide the basis for a final report. This exercise in network building may provide greater cohesion among stakeholders and their research efforts within the collaboration and thus strengthen network leadership.

The MFJD IMW developed numerous network leadership processes around budget development and reporting requirements. These operational norms emerged as a strong influence in a space that was otherwise occupied by few other network leadership structures. Future IMWs should be wary of allowing funding requirements to influence too greatly the network leadership processes that the collaboration adopts. While these network leadership processes may offer the funding agency the greatest degree of accountability for the funding requirements, these processes may not necessarily establish network leadership processes that benefit the unique aspects or demands of the collaboration. Defaulting to funding requirements to drive collaborative process and communication norms can be a limitation to network leadership as it masks what may be the collaboration's genuine network leadership needs.

The findings from this study revealed an additional lesson relevant for IMW collaborations that was not addressed in the literature. The notion of land ownership and its influence on collaborative leadership was discussed on a tangential basis during numerous interviews. Evidence from these interviews illustrated that land ownership is particularly important during the convening phase (phase 1; Figure 1, p.3), when buy-in from the land owner(s) is critical to establishing an IMW. It is also important during the conceptualization and design phase (phase 2) while planning monitoring activities for implementation (phase 3).

Further, the land owner(s) should be conscientiously included in all aspects of the collaboration throughout its duration. One interview participant described a scenario in a different IMW project where an individual responsible for managing the land did not approve of the IMW project and thus excluded access to the property, thereby terminating the collaboration. Land owners may not necessarily want to contribute to the planning, implementation, or evaluation of the project, but their participation is critical, and in this

sense carries a powerful leadership position. A land owner that does not want to participate directly may nonetheless be compelled to facilitate the work by granting property access based on the ecological and community benefits that the project may generate. If a land owner is engaged in the project, as is the case in the MFJD IMW, individuals representing the land owner may offer valuable contributions to the collaboration in the form of providing additional funding and other resources, as well as serving as a conduit to the local community.

Ultimately, individual and network leadership in the MFJD IMW were not mutually exclusive. The collaboration required both types of collaborative leadership, and each type was better suited to facilitating effective collaboration when it emerged at the appropriate time. Individual and network leadership were still unique and operated independently of one another, but the collaboration required a periodic interchange of the two. In effect, individual leadership was required to steer the ship, but network leadership was necessary to move the ship in that direction. Future IMW projects will benefit from identifying significant project phase shifts in advance, and assigning or electing an individual(s) to provide collaborative leadership during periods of transition. Once the project phase shift has occurred successfully and individual leadership has helped the collaboration establish a shared goal and unified vision for the ensuing phase, the collaboration can rely on its network leadership to provide effective collaborative process moving forward.

In all, this case reveals that leadership in collaboration can be messy. Individual and network leadership may emerge as more relevant and important at different periods through the duration of the collaboration. At times, these leadership types may overlap as they emerge to address various challenges or demands that the collaboration may face. At other times it is important that the collaboration recognize which leadership type can be more beneficial to effective collaborative process and plan accordingly.

Discussion of Leadership Dynamics in Collaboration for Collaboration Literature

The findings from this study provide insight on leadership in collaboration that contribute to the scholarly literature on collaboration in natural resources management.

At the convening stage, the MFJD IMW case reveals that collaboration does not require a single individual to spearhead the convening of a collaboration, as is typically asserted in the literature. An individual may provide credibility and guidance for the effort, but convening a collaboration can be accomplished by numerous individuals representing different organizations. More important to the convening process is the availability of funding and pre-existing conditions suitable to collaboration. Buy-in for the project among the local community and relevant land owners also prove to be critical factors in the convening stage.

The literature on collaboration emphasizes the importance of an individual providing leadership for the collaboration by serving in the champion role. The champion role was not clearly distinguished or defined by stakeholders in the MFJD IMW, and shifted unceremoniously to different individuals throughout the duration of the collaboration. In the MFJD IMW, the champion role was recognized more as a spokesperson for the collaboration than as an individual driving commitment to the effort.

Access to and management of the budget proved to be influential in the MFJD IMW collaboration, but in a manner different from what is discussed in the literature. Huxham and Vangen (2005) note that in collaboration, "those who hold the 'purse strings' are perceived to be powerful, while others feel disempowered and unable to influence collaborative outcomes, even when alternative sources of power are available" (173). This concept is supported by other authors as well (Floress et al. 2011, Huxham and Vangen 2000). These case settings may present different power dynamics than those present in the MFJD IMW, but they provide an interesting comparison from the literature, nonetheless. The findings from the MFJD IMW case suggest that while individuals from the funding agencies managed budget access, budget development, and funding reporting requirements, these potentially empowering influences were used to

generate network leadership features as opposed to being reserved for the benefit of individual leadership or power.

This case study strongly supports an issue in collaboration that is widely cited in the literature. Turnover impacts the effectiveness of collaboration because it diminishes institutional memory, creates knowledge gaps, disrupts existing networks, and requires attention to relationship and trust building (Floress et al. 2009, Linden 2002, Margerum 2011, McDermott et al. 2011). However, the findings from this research revealed an interesting nuance around turnover relative to leadership in collaboration that is not addressed in the literature.

Turnover reduces the number of individuals eligible to assume emergent leadership roles in the collaboration. This is because stakeholders may be better positioned to assume individual leadership roles if they've been involved in the collaboration for a longer period of time. This may be through seniority, possessing an understanding of personalities in the group, having a working knowledge of the issues and problem solving strategies the collaboration has used previously, or because the individual has already established trust among other stakeholders. In any case, turnover impacts the pool of qualified emergent leaders based on these criteria. Turnover may also mean that an individual who is new to the collaboration and less qualified for an emergent leadership role is thrust into that position prematurely.

The literature points to the influence of funding commitment by stakeholders to the collaboration as a network leadership feature. However, the literature largely overlooks the commitment that stakeholders will make to the collaboration in the way of other resources such as time, labor, and equipment. These elements should not be undervalued when assessing stakeholder commitment and its influence on network leadership in collaboration.

Lastly, the individual and network leadership in collaboration tables developed for this study can be a valuable contribution to the scholarship on collaboration. These tables are based on an extensive literature review that included roughly 50 sources on collaboration (scholarly journal articles, books, etc.). These tables therefore provide a strong foundation for evaluating leadership dynamics in collaboration. One aspect of the tables that may benefit from being revised exists in the individual leadership table, under

the shepherd of the process leadership feature. A possible revision here would include greater scrutiny of the indicators supporting this leadership feature to determine if these indicators might be parsed out into two separate leadership features. With as many indicators as are currently supporting that leadership feature, it could potentially cloud the interpretation of research evidence from other case studies. Separating this one leadership feature into two leadership features may serve to facilitate more focused coding of evidence in future applications. Despite that, the use of these tables in coding the evidence in the MFJD IMW case study proved to be a sound process that was efficient and illustrative of leadership dynamics in this case. These tables may serve as a strong catalyst for evaluating leadership dynamics in other collaboration case studies in the future.

CHAPTER VII: CONCLUSION

This study evaluates leadership dynamics in the Middle Fork John Day (MFJD) River intensively monitored watershed (IMW) collaboration. This study is guided by the following research question: How do leadership dynamics in the MFJD IMW collaborative governance structure facilitate effective collaborative process or create limitations to that process? Insights from this study may prove valuable in providing guidance on effectively structuring and managing basin-scale collaborative river habitat monitoring projects. Future IMW efforts in the Pacific Northwest, or other collaborations of similar scale and purpose, can benefit from this shared understanding of leadership in collaboration. This study further aims to contribute to an understanding of leadership in collaboration to the scholarship on collaboration.

Summary of Findings (Chapter V)

The evidence from this research yielded a range of findings pertaining to individual and network leadership in collaboration. Those findings and supporting evidence are assessed in detail in the "Findings" chapter (Ch.V, p.42) of this study. A summary of key findings is outlined below.

Key findings related to individual leadership in collaboration:

- Individual leadership in managing meeting planning and logistics for the collaboration was mainly carried out by the Coordinator position. However, the Coordinator position did not assume other individual leadership roles beyond this one individual leadership feature.
- Convening the MFJD IMW collaboration was driven by several organizations as opposed to a single individual collaborative leader. Convening the MFJD IMW relied on pre-existing conditions that were instrumental in providing the foundation for an IMW project.
- The individual leadership feature of the 'champion' role was for the most part not well distinguished in the MFJD IMW collaboration. In later project phases, the

champion role was filled by an individual representing the MFJD IMW in public engagement.

- The individual leadership feature of a 'shepherd' role in the collaboration was most evidently important during transitions in project phases (Figure 1, p.3). However, the MFJD IMW lacked strong individual leadership fulfilling the shepherd role during the transition of project phases 3 and 4 (data collection to data synthesis and analysis). This was in part due to the collaboration lacking a clear shared goal or vision for the project's final outputs (e.g. final report).
- During phase 2 of the project, conceptualization and design, the shepherd role was assumed by emergent leadership. These individual leaders emerged based on their technical expertise and knowledge in guiding the monitoring research design and activities.
- During phase 3 of the project, implementation and data collection, the shepherd role was again assumed by emergent individual leadership. These emergent individual leaders were largely connected to funding agencies who managed the collaboration's budget and funding reporting requirements.
- Maintaining technical credibility for the collaboration was not achieved through individual collaborative leadership. Instead, it was fulfilled by network leadership in the collaboration.
- Joint problem solving proved not to be guided by individual collaborative leadership but instead was driven by network leadership in the collaboration.
- Trust building among stakeholders was an important individual leadership feature for the collaboration. Trust building was promoted in part by the Coordinator position but more so by network leadership in the collaboration. Trust building was limited by turnover among stakeholders.
- Close involvement with the collaboration's funding and budget enabled individuals associated with the funding agencies supporting the MFJD IMW greater potential to serve as emergent leaders. However, this leadership feature only benefits the collaboration if those emergent leaders also fulfill other individual collaborative leadership features (Table 1, p.24).

Key findings related to network leadership in collaboration:

- Synthetic authority, or the accountability of stakeholders to the structure and processes used by the collaboration, and to one another in abiding by that structure and process, proved to be a strong network leadership feature in the MFJD IMW. This was particularly the case during the implementation of each project phase.
- The MFJD IMW collaboration provided some opportunities for network building among stakeholders. However, these opportunities were not sufficient in establishing network building as a strong network leadership feature.
- Identity formation as a network leadership feature was supported by the collaboration's outreach efforts in defining and sharing the work of the MFJD IMW with the public.
- Shared leadership was an important network leadership feature in the MFJD IMW collaboration. Shared leadership occurred on an emergent basis as network leadership facilitated groups of stakeholders to assume leadership roles relative to specific projects or challenges facing the collaboration.
- Funding and resource commitment proved to be a strong facilitator of network leadership in the collaboration. This case highlighted the commitment of resources aside from funding (time, equipment, and labor) as being equally influential in supporting network leadership in collaboration.

Summary of Implications (Chapter VI)

The findings from this study offer a wide range of insights on leadership in collaboration. Those insights and supporting evidence are discussed in detail in the "Implications" chapter (Ch.VI, p.59) of this study. A summary of key implications is outlined below.

Leadership Dynamics in Collaboration – Lessons Learned for IMW Projects

- The Coordinator position is an important role in an IMW project, but is not necessarily a leadership role. This position can benefit from decreased turnover

and increased clarity of responsibilities. Defining this role more clearly will pave the way for increased emergent leadership by stakeholders in other areas of the collaboration.

- The ‘shepherd’ role is a critical individual collaborative leadership feature, particularly during times of transition in IMW project phases. IMW collaborations would benefit from identifying transitions in project phases in advance and assigning an individual(s) to this role with an acceptable degree of authority.
- Synthetic authority, or the accountability that stakeholders have to the structure and process used by the collaboration, and to one another to abide by that structure and process, provides strong network leadership. However, synthetic authority relies on sound operating and communication processes to be determined at the outset of an IMW project, as well as immediately following adaptations in collaboration governance appropriate to new project phases.
- Individual leadership is not required to pursue joint problem solving among stakeholders, but it is necessary for effective strategic visioning. Despite strong individual leadership in the shepherd role, that role is limited if the collaboration has not established a strategic vision for project outputs and outcomes.
- IMW collaborations should plan network building opportunities among stakeholders throughout the project. Increased network building opportunities can provide greater cohesion among stakeholders and their individual research efforts and thus strengthen network leadership in the collaboration.
- Budget management and funding reporting requirements can create operational processes and communication norms that provide network leadership for the collaboration. However, IMW collaborations should establish these processes and communication norms relative to challenges and projects the collaboration must address. Defaulting to funding requirements to generate collaborative process and communication norms can be a limitation to network leadership as it masks what may be the collaboration’s genuine network leadership needs.
- Land ownership should be viewed as a leadership function, and land owners should be included in the collaboration on this premise. This means that land

owners should be invited to be stakeholders and the land owner(s) can determine to what extent they want to exercise leadership in the collaboration. Land owners should also be involved in the convening process to be a part of discussions concerning the monitoring actions and necessary access proposed relative to their property. Doing so in both aspects can facilitate positive contributions and buy-in from land owners and the local community.

- IMW collaborations should be prepared to use both individual and network leadership types in the course of an IMW project. Individual leadership is optimal for establishing each new phase of an IMW project, while network leadership is well suited for maintaining coordination among stakeholders during the implementation of each phase. Stakeholders in IMW collaborations should plan accordingly in order to achieve optimal effectiveness in collaborative process throughout an IMW project.

Leadership Dynamics in Collaboration – Lessons Learned for the Scholarship on Collaboration:

- Despite the literature on collaboration commonly citing the need for individual leadership while convening a collaboration, the MFJD IMW case study demonstrates that convening a collaborative project can be achieved by multiple individuals representing different organizations, given the appropriate funding and pre-existing conditions for collaboration.
- The literature on collaboration typically illustrates the 'champion' role as an individual leader who maintains stakeholder buy-in; provides big picture perspective and direction; and manages stakeholder recruitment, relationships, and turnover. Although the champion role was not well distinguished in the MFJD IMW, it tended to function outwardly as a spokesperson for the collaboration to the public, as opposed to assuming the individual leadership functions listed above.

- The literature points to budget access and management as being a catalyst for individual leadership. This case revealed that budget access and management was used by individuals to create network leadership processes instead.
- This case supports the observation consistently identified in the literature that turnover among stakeholders can be a limiting factor to collaboration. This case study took that observation a step further in identifying impacts of turnover specific to collaborative leadership. Turnover reduces the availability of eligible collaborative leaders and may mean that an individual less qualified for a leadership role is thrust into that position.
- The literature commonly highlights funding as an indicator of commitment to the collaboration and influences network leadership as a result. This case study reveals that the commitment of resources other than funding (time, equipment, and labor) can influence network leadership dynamics as well.
- The individual and network leadership in collaboration tables developed for this study may serve as a strong catalyst for evaluating leadership dynamics in other collaboration case studies in the future.

This study revealed that both individual and network leadership dynamics led to largely effective collaborative process in the MFJD IMW collaboration. However, the lessons outlined above and discussed in detail in the "Implications" chapter (Ch.VI, p.59) may improve collaborative leadership dynamics in existing or future IMW project collaborations. These lessons may also contribute to a greater understanding of leadership in collaboration in the literature on collaboration. This study assumes that effective collaborative governance and process, including leadership dynamics, results in positive collaborative outputs and outcomes (Innes and Booher 1999, Innes and Booher 2010, Koontz and Thomas 2006).

Future Research

This study identified several areas in need of future research on leadership in collaboration. First, the MFJD IMW case suggests that research on leadership in collaboration can benefit from increased attention to the concept of 'shared leadership' in the literature. Shared leadership appeared to be a significant underpinning of both individual and network collaborative leadership types in the MFJD IMW case, yet stakeholders had a difficult time articulating how this leadership feature materialized in the MFJD IMW collaboration.

Second, the scholarship on collaboration can benefit from research on the difference between leadership in collaboration relative to collaborations focused on conflict resolution versus collaborations focused on joint action. It may be that in cases of joint action, such as collaborative monitoring projects, an exchange of individual leadership and network leadership at key times during the project is an optimal approach. However, conflict resolution may rely more heavily on individual leadership throughout the duration of the project. Existing studies on leadership in collaboration do not intentionally evaluate leadership in these distinct collaborative paradigms.

Third, the MFJD IMW and other IMW projects included in this study had secured funding for the duration of the project. Future research could evaluate leadership in collaboration for collaborative monitoring projects that don't have secured funding. In the absence of funding, individual collaborative leadership may command a more prominent role in collaborative governance.

Lastly, the literature on collaboration may benefit from an analysis of the outputs and outcomes of collaborations in which leadership dynamics facilitated effective collaboration versus those in which leadership dynamics created limitations to the collaborative process.

Continued research on collaborative governance proves to be an important component of improving effective collaboration in river habitat monitoring research projects. As Leider et al. (2005) observe: "There is a growing realization and risk of losing significant funding for salmon and habitat recovery if the region [Pacific Northwest] does not demonstrate the coordinated monitoring necessary to answer basic

questions posed by appropriators" (3). Given the cost and relatively long time frame over which monitoring research may occur, it is essential that practitioners employ best collaborative practices, including collaborative leadership, in order to ensure the ability to effectively report on river habitat restoration outcomes through monitoring.

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