



**A SURPRISING SYMBIOSIS:
EXAMINING THE MUTUALISM IN DEPARTMENT OF DEFENSE
CONSERVATION PARTNERSHIPS**

THESIS

Andrew J. Lankow, Captain, USAF

AFIT-ENS-MS-18-M-134

**DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY**

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

DISTRIBUTION STATEMENT A.
APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.

The views expressed in this thesis are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the United States Government. This material is declared a work of the U.S. Government and is not subject to copyright protection in the United States.

AFIT-ENS-MS-18-M-134

A SURPRISING SYMBIOSIS:
EXAMINING THE MUTUALISM IN DEPARTMENT OF DEFENSE
CONSERVATION PARTNERSHIPS

THESIS

Presented to the Faculty

Department of Operational Sciences

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Logistics & Supply Chain Management

Andrew J. Lankow, BS

Captain, USAF

March 2018

DISTRIBUTION STATEMENT A.
APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.

AFIT-ENS-MS-18-M-134

A SURPRISING SYMBIOSIS:
EXAMINING THE MUTUALISM IN DEPARTMENT OF DEFENSE
CONSERVATION PARTNERSHIPS

Andrew J. Lankow, BS

Captain, USAF

Committee Membership:

Maj B. T. Hazen, PhD
Chair

Col M. A. Douglas, PhD
Member

Abstract

Because of the DoD's unique and significant role in the conservation of natural resources, military leaders and natural resource managers need a trail guide to frame interagency collaboration in a way that shapes productive partnerships. The purpose of this research was to examine successful DoD conservation partnerships in order to identify key success factors (KSFs) and the most prominent challenges faced, and how those characteristics enable the accomplishment of each partner's objectives. The research questions were answered through a comprehensive literature review and the use of the multiple-case study method. 19 key informants from three installations participated in semi-structured interviews, and the solicitation of documentation and archival records from the same installations provided additional data.

The research identified four themes of KSFs that enhance a partnership's ability to overcome four key groups of challenges. The presence of these KSFs, and the partnership's ability to overcome the challenges, leads to the achievement of three main categories of organizational objectives. The culmination of this effort was the development of a collaborative guide and framework to outline the key elements in the formation and maintenance of successful partnerships. Finally, recommendations to implement this framework, along with recommendations for future research, are discussed.

Acknowledgments

I would like to express my sincere appreciation to my faculty advisor, Maj Ben Hazen, for his guidance, support, and trust throughout the course of this endeavor. The insight and experience were certainly appreciated. Similar thanks go to my reader, Col Matthew Douglas, for guiding my introduction to the world of research and helping me solidify the direction this project. I would also like to thank Mr. J. Douglas Ripley, current member of the NatureServe board of directors, without whom this research would not have been possible.

My gratitude goes out to all my AFIT classmates, who have filled the last 18 months with friendships and memories that will last much longer than anything we learned here. Finally, an extra special thank you goes to my amazing wife for her patience and support throughout this thesis effort. Your attitude, understanding, and sacrifice never go unnoticed, and I am extremely grateful.

Andrew J. Lankow

Table of Contents

Abstract	iv
Acknowledgments.....	v
List of Figures	viii
List of Tables	ix
 I. Introduction	 10
Background	10
Problem Statement	17
Research Questions (RQ)	17
Investigative Questions (IQs).....	17
Methodology	18
Limitations	19
Outcomes and Implications.....	19
Summary	20
 II. Literature Review	 21
Introduction	21
Conservation Science	21
Social Science and the Human Dimension	25
Collaboration.....	28
Challenges and Conflict	33
DoD Conservation Partnerships	35
Conclusion.....	41
 III. Methodology.....	 45
Chapter Overview	45
Research Design.....	45
Validity and Reliability	48
Researcher's Role.....	50
Ethical Considerations.....	50
Case Selection	51
Data Collection.....	53
Summary	57

IV. Analysis and Results.....	58
Chapter Overview	58
Analysis	58
Results	61
Key Success Factors.	62
Challenges and Barriers to Success.	64
Objectives and Outcomes.	66
DoD Conservation Partnership Model & Summary	68
V. Discussion, Conclusions, and Recommendations.....	70
Chapter Overview	70
Discussion	70
Common Ground.	70
Leadership.....	74
Organizational Climate.	81
Relationships.....	84
Conclusions	93
Significance and Implications of Research	95
Limitations	98
Recommendations	100
Final Thoughts.....	102
Appendix A—AFIT Institutional Review Board Exemption Approval	103
Appendix B—Case Study Protocol	104
Appendix C—Complete Code System	108
Appendix D—Quad Chart	123
References.....	124

List of Figures

Figure	Page
1. Initial conceptual framework of interorganizational collaborative Department of Defense conservation partnerships	42
2. Description of the three installations whose conservation partnerships were selected as cases to be studied.....	52
3. Representation of provisional codes used for the first iteration of coding	59
4. Tag clouds illustrating the most common words used throughout the interviews (top) and additional data (bottom)	60
5. Overview of Key Success Factors (KSFs) extracted from interviews and additional data.....	63
6. Overview of Challenges and Barriers to Success extracted from interviews and additional data	65
7. Overview of key Outcomes and Objectives extracted from interviews and additional data.....	67
8. Model of successful DoD Conservation partnerships.....	69

List of Tables

Table	Page
1. Summary of key success factors (KSFs) for collaboration, as informed by the literature, in theory and in practice	30
2. Strategies employed to improve the validity and trustworthiness of the study and findings	49
3. Summary of interview participants	56
4. Complete breakdown of the three components of successful DoD conservation partnerships, as modeled in Figure 8	96

A SURPRISING SYMBIOSIS: EXAMINING THE MUTUALISM IN DOD CONSERVATION PARTNERSHIPS

I. Introduction

Background

Leaders engaged in the complex efforts of biodiversity conservation on military lands need to know how to forge productive, effective partnerships across institutional boundaries. By identifying the common characteristics present in the most successful of these multi-faceted collaborations, this research seeks to assist those leaders in realizing the interconnectedness of their seemingly contradictory objectives in order to accomplish their own organizational goals.

At first glance, the objectives of conservation biologists and the United States military may seem completely incompatible; however, deeper examination reveals a rich history of the harmony between the two diverse groups. For instance, in 1803 US Army Captain Meriwether Lewis was given explicit instructions by President Thomas Jefferson to notice and comment on the soil, the plant and animal life— “especially those not known in the U.S. The remains & accounts of any which may be deemed rare or extinct” (US Fish & Wildlife Service, 2004). According to the National Parks Service, Lewis led the Corps of Discovery in scientifically describing over 300 species of mammals, birds, reptiles, fish, and plants, to include some of our nation’s most iconic species like the grizzly bear, grey wolf, and pronghorn antelope. Fast-forwarding to the 20th century

reveals a formalization of the importance of natural resource management with legislation that signaled the beginning of a more widespread environmental consciousness throughout the country.

Specifically regarding federally-managed lands, two key pieces of legislation require all federal agencies to provide for the conservation and rehabilitation of natural resources, with special emphasis on threatened and endangered species. First, the Sikes Act of 1960, signed into law by President Eisenhower, mandated cooperation between the Departments of the Interior and Defense, as well as state fish and wildlife agencies, in order to plan, develop, and maintain natural resources on military installations. Although it was amended numerous times, a distinctly important update occurred with the Sikes Improvement Act of 1997, which “broadened the scope of military natural resources programs, integrated natural resources programs with operations and training, embraced the tenets of conservation biology, invited public review, and strengthened funding for conservation activities on military lands” (US Fish and Wildlife Service, 2015). The Act also directs the development and implementation of Integrated Natural Resource Management Plans (INRMPs) by DoD installations with significant natural resources in cooperation with the USFWS and state fish and wildlife agencies. These all-important documents allow DoD installations to implement ecosystem management principles in coordination with various stakeholders in order to ensure that military operations and natural resource conservation efforts are integrated and consistent with stewardship and legal requirements, all without any net loss in the support of the installation’s unique military mission (US Fish and Wildlife Service, 2004). In other words, each installation’s

INRMP is the source document for guiding all relevant natural resource conservation planning and implementation activities via interagency collaborative efforts.

In addition to the Sikes Act, the Endangered Species Act (ESA) is another expression of the country's dedication to preserving its natural heritage. Enacted by Congress in 1973, the ESA charges federal agencies with the responsibility to protect all "listed" threatened or endangered species (TES) along with their formally-declared critical habitat (with threatened species being those that are likely to become endangered in the near future). Once a species is listed, it becomes illegal to "take" (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect), interfere in vital breeding and behavioral activities, or degrade critical habitat (National Wildlife Federation, 2017a). Additionally, Section 7 of the ESA, titled "Interagency Cooperation," requires federal agencies to consult with the USFWS if any activity they plan, fund, authorize, or conduct may affect a listed species. If the USFWS determines that the activity is likely to affect a listed species, then a biological assessment may be prepared in order to determine the activity's actual effect.

In protecting the numerous TES, along with the habitats and ecosystems which house them, the ESA is another means of promoting biodiversity conservation. Short for "biological diversity," the term biodiversity refers to, most simply, the variety of life. However, beyond merely the diversity of species, biodiversity encompasses also the genetic variation within species, as well as the variety of ecosystems and habitats (National Wildlife Federation, 2017b). While the diversity of life certainly deserves protecting for its own inherent beauty, the reality is that when resources are needed to fund conservation efforts there is an expectation of some type of more tangible return on

investment. In this sense, the value of biodiversity can be thought of broadly as the set of ecosystem services which it offers: provisioning services such as providing food, medicine, and fuel; regulating services to include the modulation of diseases and water purification; and cultural services such as aesthetic, recreation, and educational values (B.A. Stein, 2008).

The Department of Defense (DoD) has an especially important role to play, given that its approximately 29 million acres of land are home to 380 installations that have significant natural resources, as defined by the Sikes Act (Boice, 2006). Shielded from the effects of rapidly spreading suburbanization, housing developments, and strip malls, DoD lands have become havens for biodiversity that must now be managed and protected. To illustrate the magnitude of this issue, consider the following: more than 250 DoD installations harbor at least one federally-listed TES and 425 TES can be found on DoD lands in total. Further, 24 at risk-species (on the verge of being listed, according to the NatureServe database) appear to be restricted to individual DoD installations and occur nowhere else (Benton, 2004; Boice, 2006; Dalsimer, 2017). Additionally, based on a density calculation of number of federally-listed species per unit area, “the significance of military lands exceeds that of any other [federal] agency by a factor of three” (Stein, Scott, & Benton, 2008: 343).

The framework by which the DoD has decided to conserve its abundance of biodiversity is termed ecosystem management, as outlined in Department of Defense Instruction 4715.3: Natural Resources Conservation Program. The principles of ecosystem management include, by using adaptive management and relying on the best science and data available, maintaining and improving the sustainability and native

biodiversity of ecosystems, supporting sustainable human activities, and developing coordinated approaches to work toward overall ecosystem health. This holistic approach intends to maintain and promote the provisioning and regulating services delivered by healthy ecosystems, along with other ecological processes such as disturbance regimes, hydrological processes, and nutrient cycles (Ripley, 2008).

However, there remains a significant caveat in the regulations that clarifies the priorities of the DoD conservation programs: DoD Instruction 4715.3 articulates clearly that the principal purpose of DoD-owned natural resources is to support mission-related activities. Further, it states that all natural resource conservation programs are for the purpose of ensuring continued access for realistic military training and testing and that conservation efforts directed towards federally-listed species should be conducted “when such action is practicable and does not conflict with military mission or capabilities.” The challenge, then, faced by every DoD installation is to balance its federally-mandated natural resource stewardship responsibilities with its primary military mission.

In support of this process, the DoD’s Natural Resources (NR) Program “strives to maintain the long-term sustainability of DoD lands and resources to enable realistic, mission essential testing, training, and operations. . . and avoid or minimize costs that could otherwise result in natural resources related restrictions or delays” (Dalsimer, 2016: 1). In other words, the key to successful synchronization of natural resource management and conservation with military training and operations is to appreciate that the former directly supports the latter, in two primary ways. First, conservation efforts within the ecosystem management paradigm recognize the interconnectedness of the complex relationships between individual species, their habitats, and other natural processes; with

this established, it is necessary to practice sound conservation biology in order to maintain the integrity of the ecosystems that provide warfighters with myriad different training environments. Second, natural resources managers play a key role in ensuring compliance with numerous policies and laws, the violation of which could cause costly delays, restrictions, or penalties. For this exact purpose, a significant tool available to those personnel charged with these responsibilities is the aforementioned INRMP. In accordance with Section 318 of the FY 2004 Defense Authorization Act, a well-written, up-to-date, comprehensive, fully-implemented INRMP can allow the USFWS to exempt DoD lands from the critical habitat designation that usually occurs on land that harbors endangered species. Therefore, the practice of sound, collaborative, proactive conservation efforts can directly eliminate a significant compliance, consultation, and administrative burden (Lamb, Willis, & Wyckoff, 2008).

With this idea of mutualism in mind, countless partnerships have been formed and developed to accomplish productive biodiversity conservation and natural resource management that also enables the military mission. On DoD installations throughout the United States, stakeholders from the military world and the conservation world have joined forces to accomplish their seemingly contradictory, yet realistically compatible, objectives. Numerous DoD conservation directives, to include DoDI 4715.3, encourage and promote the establishment of partnerships across institutional boundaries and the collaborative efforts that are necessary for landscape-spanning conservation work. Additionally, the ESA requires a partnership between the DoD and the two federal agencies responsible for administering the act, the US Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Association (NOAA) Fisheries Service.

However, in addition to those federally-mandated partnerships, countless formal and informal partnerships have emerged between and amongst military natural resource managers, local communities, private conservation groups, educational institutions, and state and local governments. While the complete list is expansive, examples these partnerships are the National Military Fish & Wildlife Association, the Readiness and Environmental Protection Integration (REPI) Program, the DoD Partners in Amphibian and Reptile Conservation (PARC), the DoD Partners in Flight, and formal partnerships with organizations such as NatureServe and the Nature Conservancy.

Examining the work of such collaborations at the installation-level reveals achievements across the entire spectrum of natural resource conservation; however, as with all fields, certain accomplishments stand out above the rest as singularly successful. Each year since 1962, the Secretary of Defense Environmental Awards have recognized individuals, teams, and installations for outstanding conservation achievements, innovative environmental practices, and partnerships that improve quality of life and promote efficiencies without compromising mission success. Given that in FY 2015 the DoD spent \$1.3 billion to comply with environmental law and \$377 million to protect natural and cultural resources, leaders and decision makers should be especially aware of how to encourage, promote, build, and capitalize on effective collaboration that occurs in this field (US Department of Defense, 2016). By investigating the partnerships which have been previously lauded, this research seeks to identify and characterize what factors enable such successful collaborations and how they can be fostered. Although this endeavor is largely inductive and exploratory, it has a degree of theoretical foundation in the fields of human behavior and collaboration. In recognizing the inherently human

nature of such an undertaking, this investigation will shed light on the social dynamics of DoD conservation efforts and what it takes to forge a fruitful partnership.

Problem Statement

Because of the DoD's unique and significant role in the conservation of natural resources, military leaders and natural resource managers need a trail guide to frame interagency collaboration in a way that shapes productive partnerships.

Research Questions (RQ)

What characteristics define successful DoD conservation partnerships? How do stakeholders capitalize on these characteristics to accomplish their objectives?

Investigative Questions (IQs)

- 1.a. What are the key success factors that lead to effective DoD conservation partnerships?
 - 1.b. How do stakeholders foster, develop, and capitalize on these characteristics?
- 2.a. What are the most prominent challenges faced in collaborative DoD conservation efforts?
 - 2.b. How do successful partnerships overcome these barriers?
- 3.a. What are the primary objectives for each stakeholder? What is considered success?
 - 3.b. How does collaboration contribute to this success?
4. How do partnership characteristics contribute to the achievement of each partner's objectives?

Methodology

The four investigative questions were addressed using a multiple-case study research design, using three military installations in Washington state as the cases to be investigated: Joint Base Lewis McChord, Naval Base Kitsap, and Naval Air Station Whidbey Island. Multiple sources of evidence were collected and analyzed, as recommended by Yin, in order to develop converging lines of inquiry and to enhance the construct validity of the study (2003). First documentation and archival records (e.g., training presentations, formal guidance, public affairs releases, news articles, management guidebooks, briefings) were collected from the selected teams and installations. Using initial and descriptive coding methods, these sources of evidence were coded in order to identify the major themes and concepts as related to the IQs.

Additionally, the IQs were examined by conducting semi-structured interviews, both in-person and via the telephone, with key stakeholders from the three installations. Such stakeholders included natural resource managers and the military leaders with whom they interact the most, representatives from state agencies, and representatives from partner conservation nongovernmental organizations (NGOs). The access to appropriate sources of expert knowledge was facilitated by Dr. J. Douglas Ripley, the former Air Force Director of Natural Resources and current board member at NatureServe. After data collection, the interviews were transcribed manually and coded using initial and descriptive coding in a first round of analysis, followed by a combination of axial, theoretical, and focused coding in a second round of analysis. Finally, this data was analyzed inductively for trends that revealed themes and insights about the strengths of successful conservation partnerships and how they are effectively

leveraged, the challenges faced and how they are overcome, and how these characteristics enable the various stakeholders to accomplish their organizational objectives.

Limitations

Considering the inherent limitations of multiple case study research, the generalizability of these results might be limited. By focusing on military installations in Washington alone, a degree of control was introduced, but at the expense of a wider scope and, thus, more generalizable implications. Further, participants in this study might have provided responses that attempt to paint their programs and installations in the best possible light, thus introducing some degree of social desirability bias. This bias was partially mitigated in the research protocol as multiple viewpoints and alternative sources of evidence were used to triangulate research findings.

Outcomes and Implications

The results of this study can be used to inform military leaders and natural resource managers when developing and improving their DoD-conservation partnerships. Specifically, the study will reveal the key success factors of these collaborations and how they were cultivated, as well as the challenges faced and how they were overcome. Moreover, this study will uncover what each of the stakeholders consider to be success, and what partnership characteristics enable those objectives to be met. This collection of outcomes will be organized in a conceptual framework showing the key relationships between the constructs, thereby allowing leaders to allocate resources and make decisions more effectively.

Finally, the results of this study will ideally prove useful in two different contexts. First, researchers looking to investigate similar questions about other pertinent natural resources issues, such as invasive species management, will be able to replicate the design in order to help craft future studies. Second, practitioners in other fields that regularly cross organizational boundaries in order to accomplish their objectives—such as humanitarian assistance and disaster relief—will be able to use the resultant recommendations to improve their own variety of collaborative partnerships.

Summary

This chapter outlines the background, problem statement, research and investigative questions, methodology, limitations, and outcomes and implications associated with a qualitative look at the characteristics of successful DoD conservation partnerships. The next chapter will focus on a review of the appropriate literature, with an emphasis on collaborative partnerships, the complexities of conservation issues, the DoD's unique role to play, and the fundamental human element of conservation partnerships. Chapter III will then describe the methodology used to collect the data and perform this research, while Chapter IV will discuss the data analysis and results. Finally, Chapter V will include a summary of the conclusions to be drawn, recommendations, and ideas for areas of future research.

II. Literature Review

Introduction

This literature review establishes a knowledge base for exploring the characteristics of successful DoD conservation partnerships and how stakeholders capitalize on those characteristics to accomplish their objectives. By discussing the multiple layers of this topic, a picture begins to emerge of the complexities of working collaboratively across organizations and agencies to preserve biodiversity and maintain healthy ecosystems on military lands. Specifically, this review covers five areas of the existing literature, legislation, and government reports: a) conservation science in general and its innate challenges; b) the imperative of including social science in conservation in order to account for the inherent human dimensions; c) collaboration in general, as well as specifically in a conservation and natural resource management context; d) conflict and challenges inherent in collaborative conservation, as well as its criticisms, and e) the DoD's unique role in collaborative conservation partnerships.

Conservation Science

Since its emergence over 30 years ago, conservation biology has continually demonstrated its multidisciplinary pursuit of a coherent goal: the protection and preservation of Earth's biological diversity (Meine, Soule, & Noss, 2006). However, articulating a precise definition of such "biodiversity" has remained an elusive endeavor (Noss, 1990; Redford & Richter, 1999; Stein, 2008; Unnasch, 2008). A common thread throughout the literature draws on Noss's (1990) concept of multiple levels of biological organization: three primary attributes—composition, structure, and function—nested into

a hierarchy that includes regional landscape, community ecosystem, population-species, and genetic levels of organization. In other words, beyond merely the diversity of species, biodiversity encompasses also the totality of genetic variation within species, as well as the variety of ecosystems, habitats and natural landscapes, and the relationships among them (National Wildlife Federation, 2017b).

In their *Strategic Plan for Biodiversity 2011-2020*, The United Nations Environmental Programme's Convention on Biological Diversity (an intergovernmental agreement between 196 countries) asserts that biodiversity is essential for ecosystem functioning and the provision of human well-being, food security, clean air and water, local livelihoods, and economic development (2010). To clarify and amplify the need to protect such an important asset, the organization's foundational report defines conservation as:

The management of human use of the biosphere so that it may yield the greatest sustainable benefit to current generations while maintaining its potential to meet the needs and aspirations of future generations: Thus conservation is positive, embracing preservation, maintenance, sustainable utilization, restoration, and enhancement of the natural environment.” (World Resources Institute [WRI], 1992: 228)

Even though the *Global Biodiversity Strategy* has maintained clear conservation objectives and implementation plans for over 35 years, conservation biology's moral and practical mission of stopping biodiversity loss has been fraught with challenges and complications (Meine et al., 2006; Sandbrook, Adams, Buscher, & Vira, 2013; WRI, 1992).

The idea of “ecosystem management,” as coined in 1992 by US Department of Agriculture Forest Service Chief F. Dale Robertson, was a new way of trying to address the exceedingly complex issues of natural resources conservation (Defries & Nagendra,

2017). In applying a coarse filter to focus on ecological systems (rather than a fine filter to emphasize individual species), ecosystem management has gained traction within the conservation field, as well as amongst federal government natural resources managers to include the Department of Defense (Boice, 1996; Gibb, 2005; Lamb et al., 2008; Lawson, Regan, & Mizerek, 2008; Noss, 1987; Unnasch, 2008; Wondolleck & Yaffee, 2000). This new paradigm represented a shift away from the two incompatible schools of thought that dominated conservation philosophy for nearly a century: maximum sustainable yield of renewable resources and preservation by means of excluding human habitation and development from remaining wilderness areas (Callicott & Mumford, 1997).

While the implementation of ecosystem management seems to make sense given the nature of ecosystem dynamics, this approach has proven to be a thorny one. The duties of managing ecosystems properly, using natural resources responsibly, and protecting endangered species adequately are exceedingly complex. With so many different stakeholders, each with their own sets of values, norms, goals, and cultural identities, agreeing on mutually beneficial objectives—and how to best pursue them—is a tall task. In fact, ecosystem management and natural resources issues have even been termed “wicked problems,” a characterization that emphasizes how there is no clear definition of the problem and, therefore, no easily identifiable solutions (Defries & Nagendra, 2017; Leong, Emmerson, & Byron, 2011). Rittel and Webber (1973) define 10 distinguishing properties of wicked problems, including that they have no definitive formulation, they have no stopping rule, there is no immediate or ultimate test of a solution, there is no opportunity to learn by trial-and-error, they are all essentially unique, and every wicked problem can be considered to be a symptom of another problem.

The inherent wickedness of conservation problems is particularly worrisome because of the immense importance of biodiversity. When decisions have to be made about how and where to allocate resources, there is an expectation of some type of tangible return on investment—and conservation is no exception. In this sense, the value of biodiversity can be thought of widely as ecosystem services: a) provisioning services such as providing food, medicine, and fuel; b) regulating services to include the modulation of diseases and water purification; and c) cultural services such as aesthetic, recreation, and educational values (Stein, 2008). In fact, the benefit to cost ratio of maintaining a global network of protected conservation lands has been estimated to be as high as 100:1 (Balmford et al., 2002). However, there is also an ethical argument to be made about the particularly anthropocentric framing of the ecosystem services view of conservation, and why nature deserves protecting for its own intrinsic value. While a complete expansion of these ideas is beyond the scope of this review, it should be noted that these two ideas are not necessarily mutually exclusive and it has even been argued that the intrinsic value of nature actually underlies the ecosystem services paradigm (Batavia & Nelson, 2017).

That there is so much at stake seems to have little effect on humanity's activities, as the majority of global indicators—including those measuring consumption, pollution, invasive species introductions, habitat loss, and species extinction risk—have shown either no significant improvement or a worsening situation by 2020, relative to 2010 (Tittensor et al., 2014). As measured by some of those indicators, the loss of biodiversity significantly affects the function of ecosystems and the well-being of humanity (Johnson et al., 2017). This view is substantially supported by two decades of research: “There is

now unequivocal evidence that biodiversity loss reduces the efficiency by which ecological communities capture biologically essential resources, produce biomass, decompose and recycle biologically essential nutrients” (Cardinale et al., 2012: 60). When considering both the ecosystem services and intrinsic value frames of conservation, the logical, practical, and moral reasons for the importance of conservation highlight how critical it is to work toward a better understanding of the field’s best practices.

Social Science and the Human Dimension

Another reason for the inherent complexity of these seemingly “environmental problems” is that, at their root, the disruptions of Earth’s ecosystems are a human behavior problem (Amel, Manning, Scott, & Koger, 2017). The imperative of including social science in conservation to account for the inherent human dimensions is widely espoused (e.g., Bennett et al., 2016, 2017; Forstchen & Smith, 2014; Mascia et al., 2003; Muller-Rommel & Meyer, 2001; Sandbrook et al., 2013; Viseu, 2015). There is also extensive literature on the various research designs and methods to enable a more consistent and effective implementation of environmental social science. Such methods span the whole spectrum, from qualitative to quantitative, in order to address the complex human-environment interactions (Cox, 2015; Drury, Homewood, & Randall, 2011; Newing, Eagle, Puri, & Watson, 2011; Young et al., 2006).

Although it may seem counterintuitive, recognizing that conservation efforts are as much about people as they are about species and ecosystems has led to the employment of several theoretical frameworks to try to explain phenomena in this field. For instance, institutional theory has been used to examine how institutional pressures are

interpreted and applied in ways that influence firm incentives and actions regarding pro-environmental behavior (Delmas & Toffel, 2004; Elinor Ostrom & Cox, 2010). Inspiring collective effort toward long-term abstract goals (as required in conservation) is difficult, especially when pressures from external stakeholders are interpreted differently by local leaders and managers (Amel et al., 2017).

Building on this foundation, the social-ecological systems (SES) framework is purported to have “recently enabled researchers to begin the development of a common language that crosses social and ecological disciplines to analyze how interactions among a variety of factors affect outcomes” (Ostrom & Cox, 2010: 1). Under the conditions of uncertainty and complexity that characterize systems of human-environment interactions, the SES framework has been proposed as a way to effectively consider social and ecological trade-offs, allow compromises to emerge, and facilitate multidisciplinary efforts (Armitage et al., 2009; Ban et al., 2013; Elinor Ostrom, 2009). Additionally, Ajzen’s (1991) foundational theory of planned behavior (TPB)—which posits that the intention to engage in a behavior can be predicted by attitude toward the behavior, subjective norms, and perceived control of the behavior—has also been employed in a variety of pro-environmental and conservation contexts (Harland, Staats, & Wilke, 1999; Kaiser, Hubner, & Bogner, 2005; Saunders, Brook, & Eugene Myers, 2006; Steg & Vlek, 2009). In acknowledging that conservation actions are merely the product of human decision-making, the TPB has been used to predict behaviors such as green tourism (Han, Hsu, & Sheu, 2010), reforestation (Karppinen, 2005), and water conservation (Lam, 1999).

At first blush, one might question how these theories could be applied to advancing conservation policy and objectives. However, an increased understanding of human behavior can be achieved through using a variety of social sciences—anthropology, economics, psychology, sociology, political science, etc.—each of which provide their own unique view of such behavior (Bennett et al., 2016; Mascia et al., 2003). In terms of applying the associated behavioral insights, Bennett et al. (2016) describe ten distinct ways that these social sciences can contribute to conservation, including descriptive, diagnostic, reflexive, generative, innovative, and instrumental reasons. Additionally, Reddy et al. (2017) propose a set of eight guiding questions that define the conservation problem as a behavior change problem. This critical acknowledgement of the inherently anthropocentric nature of conservation solutions opens the door for the application of human behavior-oriented theories, providing a possible roadmap for how and where practitioners can target interventions.

Despite the abundance of support for integrating the social sciences into conservation efforts, such an integration is not without challenges. Some authors contend that the conservation social sciences are still misunderstood, underutilized, and suffer from a lack of awareness of their scope and purpose within the conservation community (Bennett et al., 2016, 2017). Specifically, Bennett et al. (2016) identify four categories of barriers—ideological, institutional, knowledge, and capacity—to successfully integrating the social sciences into conservation efforts. Finally, Hare et al. (2017) outline eight broad challenges that exist in complex social-ecological contexts, including clarifying definitions and concepts, overcoming institutional resistance to change, and legitimizing decision-making processes.

While these critiques and challenges are legitimate, there is no question that the efforts to correct and overcome them are an important piece of advancing the understanding and effectiveness of conservation science. In fact, Mascia et al. go so far as to say “The real question . . . is not whether to integrate the social sciences into conservation but how to do so” (2003: 649). This study seeks to address one significant aspect of the myriad human dimensions of conservation: collaboration between diverse individuals, groups, and organizations. In doing so, the social dynamics of forming, maintaining, and successfully employing such partnerships will be illuminated.

Collaboration

Given the importance of human dimensions in conservation and natural resource management, a particular strategy that is highlighted is the use of collaborative partnerships. There is a rich base of literature focusing on collaboration, however one of the remaining challenges for building a comprehensive theory has been to establish a consensus on a precise definition of the topic. For example, in a special issue of the *Journal of Applied Behavioral Science* dedicated to collaboration, there were at least seven different definitions, leading Wood and Gray (1991) to synthesize them as follows: “Collaboration occurs when a group of autonomous stakeholders of a problem domain engage in an interactive process, using shared rules, norms, and structures, to act or decide on issues related to that domain” (146). In the same review, numerous theoretical perspectives are examined according to how they address the existing preconditions that enable collaboration in the first place, the actual process of collaboration, and the outcomes of collaboration (Wood & Gray, 1991).

More recently, Ansell and Gash (2007) conducted a comprehensive review of 137 cases of collaboration in varying policy sectors in order to identify the conditions under which collaboration will be an effective approach to management. The starting conditions and institutional design factors found to be important in this review (including facilitative leadership, interdependence, uncertainty power-resource-knowledge asymmetries, incentives for participation, prehistory of cooperation or conflict, clear ground rules, and process transparency) reflect findings throughout the literature (Ansell & Gash, 2007; Bryson, Crosby, & Stone, 2006; K. Emerson, Nabatchi, & Balogh, 2012; Thomson & Perry, 2006). These key success factors (KSFs) of effective collaborations are summarized in Table 1, along with those from the rest of the literature highlighted in this review. Table 1 also illustrates whether or not each particular set of KSFs is mentioned in the context of collaboration in general, in the context of conservation and natural resource management (NRM), and in the context of DoD conservation partnerships.

Similarly, the factors critical to the collaboration process itself that were identified in Ansell and Gash's (2007) review are representative of the literature. These success factors include, commitment to process, shared understanding, intermediate outcomes, face-to-face dialogue, trust-building, and engagement of stakeholders throughout the process (Bryson et al., 2006; Emerson et al., 2012; Hare et al., 2017; Thomson & Perry, 2006). Finally, the key outcomes identified throughout the literature include achievement of goals, creation of public value, generation of social capital, joint learning, new innovative strategies, and increased capacity to leverage resources (Bryson et al., 2006; Faulkner & de Rond, 2000; Sagawa & Segal, 2000; Thomson & Perry, 2006).

Table 1. Summary of key success factors (KSFs) for collaboration, as informed by the literature, in theory and in practice

<i>Author(s), Year</i>	KSFs	Collaboration	NRM	DoD
<i>Ansell & Gash, 2007</i>	• Leadership • Communication • Trust Building • Commitment • Shared Understanding	Y	N	N
<i>Armitage et al., 2009</i>	• Trust Building • Social Learning	Y	Y	N
<i>Boice, 2003</i>	• Stakeholder Involvement • Senior Management Commitment • Continuity • Resources • Accountability • Training • Performance Metrics	N	N	Y
<i>Bouwen & Taillieu, 2004</i>	• Interdependence • Common Interest • Shared Understanding	N	Y	N
<i>Bryson & Crosby, 2006</i>	• Trust Building • Leadership • Conflict Management • Accountability	Y	N	N
<i>Clark et al., 1996</i>	• Common Interest • Pooled Resources • Sound Decision Making	N	Y	N
<i>Cox et al., 2010</i>	• Accountability • Conflict Management	N	Y	N
<i>Emerson et al., 2012</i>	• Leadership • Resources • Shared Understanding • Commitment • Trust • Interdependence	Y	N	N
<i>Gray, 1985</i>	• Interdependence • Positive Expectations • Perceptions of Legitimacy • Distribution of Power	Y	N	N
<i>Hare et al., 2017</i>	• Distribution of Power • Relationship Building • Accountability	N	Y	N
<i>Jamal & Getz, 1995</i>	• Common Interest • Shared Understanding • Interdependence	Y	N	N

	• Positive Expectations • Resources • Distribution of Power			
<i>Lauber et al., 2017</i>	• Compatible Objectives • Resources	N	Y	N
<i>Leong et al., 2011</i>	• Common Interest • Transparency • Trust • Relationship Building • Flexibility	N	Y	N
<i>Powledge, 2008</i>	• Trust • Communication	N	N	Y
<i>Selin & Chavez, 1995</i>	• Distribution of Power • Organizational Culture • Communication • Shared Understanding	Y	Y	N
<i>Stern & Coleman, 2015</i>	• Trust	N	Y	N
<i>Thomson & Perry, 2006</i>	• Commitment • Trust • Relationship Building • Common Interest • Pooled Resources • Interdependence	Y	N	N
<i>Wondolleck & Yaffee, 2000</i>	• Common Interest • Compatible Objectives • Flexibility • Commitment • Resources • Entrepreneurship	N	Y	N
<i>Wood & Gray, 1991</i>	• Autonomy • Shared Norms & Rules • Resources	Y	N	N

Building on the foundation of the aforementioned collaboration frameworks and theories, there is a substantial basis of literature focusing on the application of collaborative processes to conservation science and the management of natural resources. The abundance of such literature is indicative of what Leong et al. (2011) have dubbed as the “New Governance Era,” shifting from top-down models of governance to more collaborative ones. These partnerships have been studied in the context of multi-level stakeholder engagements between state agencies, federal government organizations, non-

profit organizations, and universities across the globe (Kretser, Glennon, & Smith, 2017; Leong et al., 2011; Pomeranz et al., 2014; Pringle, 2017; Yaffee & Wondolleck, 2000).

Many studies continue to build on the human dimensions discussed earlier in this review. For example, Cox, Arnold, & Villamayor (2010) analyzed 91 studies and 71 cases which evaluated Ostrom's (1990) design principles for managing complex interactions between social systems and natural systems, such as communities of users managing common-pool resources. In their review, Cox et al. (2010) determined that the primary role of the design principles is to determine the necessary initial conditions for building trust and reciprocity, which is in line with other work focusing on the importance of trust in these contexts (Rodgers, Willcox, & Willcox, 2017; Stern & Coleman, 2015; Wondolleck & Yaffee, 2000). Still more studies have focused on other complex human aspects of conservation partnerships, such as the functions of high-quality decision processes (Clark & Brunner, 1996), the challenges of institutional resistance (Hare et al., 2017), and the tension inherent in meeting obligations to diverse stakeholders (Rudolph & Riley, 2014).

Further, many authors have expanded on Emerson's (2012) framework of drivers, collaborative processes, and outcomes and applied it to a conservation and natural resource management context. Commonalities throughout the literature are abundant: drivers of partnerships include time, availability, technical capacity to engage, and the importance of the external context of the problem (Armitage et al., 2009; Cox et al., 2010; Rodgers et al., 2017); aspects of the collaboration process focus on decision making, trust, shared understanding, and facilitative leadership (Clark & Brunner, 1996; Rodgers et al., 2017; Yaffee & Wondolleck, 2000); outcomes of such arrangements

include increased capacity (personnel and resources), credibility with partners, building understanding, and building support (Kretser et al., 2017; Lauber, Connelly, Niederdeppe, & Knuth, 2017; Wondolleck & Yaffee, 2000).

Finally, any literature review on topics like these would be incomplete without discussing the contributions of Wondolleck and Yaffee (2000). Through their comprehensive assessment of more than two hundred collaborative natural resource management initiatives over the course of a decade, the authors determined that “successful collaborative efforts:

- Build on common ground established by a sense of place or community, mutual goals or fears, or a shared vision;
- Create new opportunities for interaction among diverse groups;
- Employ meaningful, effective, and enduring collaborative processes;
- Focus on the problem in a new and different way by fostering a more open, flexible, and holistic mind-set;
- Foster a sense of responsibility, ownership, and commitment;
- Recognize that partnerships are made up of people not institutions;
- Move forward through proactive and entrepreneurial behavior; and
- Mobilize support and resources from numerous sources.” (21)

In reading these characteristics, it is evident that Wondolleck and Yaffee’s (2000) conclusions are consistent with those of the previously discussed literature, in terms of focusing on the human and social complexities of partnerships while incorporating various aspects of the collaboration theory. This theoretical foundation will be the basis of an initial conceptual framework, presented at the end of this review, that will guide the development of the case protocol for the remainder of the study.

Challenges and Conflict

The group dynamics that form the heart of collaboration present significant practical and managerial challenges for all stakeholders involved. Wondolleck and

Yaffee (2000) suggest that all the criticisms of collaboration can be distilled to the following challenges: institutional and structural barriers (lack of opportunity or incentives, conflicting goals and missions, inflexible policies and procedures, and constrained resources), barriers due to attitudes and perceptions (mistrust, group attitudes about each other, organizational norms and culture, and lack of support for collaboration), and problems with the process of collaboration (unfamiliarity with the process, lack of process skills, and managing the tension between the process and the world around it). Inherent in each of these challenges (if properly identified) is an accompanying solution, or path to success, for any particular partnership. For example, if progress is being hindered by conflicting goals, then a process of finding common ground must be undertaken; if mistrust and a toxic organization culture are suppressing productivity, then leaders of the stakeholder organizations must step in to make change and build trust; if there is a lack of process skills, then training must be accomplished or an experienced facilitator must be hired. Undoubtedly, while many of these solutions are simple, few are easy; this is where the complex social and organizational dynamics of collaboration in practice collide with the means of changing human behavior in theory.

While the benefits of collaboration are widely championed, conflict is actually not uncommon in conservation partnerships, so efforts toward productive conflict management are required (Peterson, Peterson, Peterson, & Leong, 2013). Again, although conservation conflicts can sometimes make their way into the media as human-wildlife conflicts, they are truly conflicts between humans that must be managed through building effective partnerships. Therefore, conflict management techniques are closely tied to many of the tenets of collaboration theory, and include getting stakeholders to “recognize

problems as shared ones, and engage with clear goals, a transparent evidence base, and an awareness of trade-offs” (Redpath et al., 2013: 100).

Further, as opposed to consensus—where the primary metric of success is agreement—some view conflict to be a necessary component of a healthy and productive collaboration (Kenney, 2000). In terms of challenging assumptions, critically examining the reasoning of others, debating scientific claims, and identifying areas of disagreement, conflict can be the antidote to the diluted solutions produced by consensus-based decision-making processes (Peterson, Peterson, & Peterson, 2005, 2006). In a stinging indictment of consensus processes, Peterson et al. (2006) assert that their use in

contentious and power-laden environmental disputes, nevertheless, reinforces apathy by setting unrealistic expectations for harmony among divergent stakeholders; reinforces ignorance and legitimizes damage to the environment by suggesting that one opinion is as good as another, no matter the evidence; and represses public debate, reinforcing existing power relationships by favoring agreement over argument. (577-578)

Rather than suppressing it at all costs, it is argued that productive conflict between stakeholders should be embraced by process managers as a means of improving decision making (Peterson et al., 2013). By being able to anticipate what sources and types of conflict may likely appear in a collaborative partnership, all parties will be more prepared to either manage them productively or successfully extract the benefits resulting from their friction.

DoD Conservation Partnerships

Although the complexity of these issues has been established in many contexts, one particular setting provides a unique set of circumstances that may offer insights into what is necessary for fruitful conservation efforts to take place: conservation partnerships

on military installations. The DoD has a unique role to play in conserving our nation's biodiversity because lands managed by the DoD harbor more than three times the density of federally-listed endangered species per hectare than any other federal agency (Stein, Scott, & Benton, 2008). Additionally, in terms of sheer numbers, the DoD is responsible for managing 425 federally-listed threatened and endangered species and 523 at-risk species across 344 installations, accounting for total expenditures of \$1.32 billion from fiscal year 1991 to fiscal year 2016 (Benton, 2004; Dalsimer, 2017). According to former DoD Natural Resources Program manager L. Peter Boice (2006), "The DoD's challenge is to balance the need to use its air, land, and water resources for military training with its stewardship responsibility to conserve these resources for future generations" (4).

This complex balance is the focus of numerous federal statutes and DoD directives that encourage and promote the collaborative efforts and establishment of partnerships across institutional boundaries that are necessary for landscape-spanning conservation work. For example, the ESA requires a partnership between the DoD and the two federal agencies responsible for administering the act, the USFWS and the National Oceanic and Atmospheric Association (NOAA) Fisheries Service. Additionally, the Sikes Act of 1997 directs all military installations with significant natural resources to develop and implement INRMPs, the purpose of which is to balance the natural resource management with the mission requirements of the installation, in coordination with the USFWS and the appropriate state agencies. Finally, DoDI 4715.03 authorizes and encourages the formation of public-private partnerships, interagency agreements, regional partnerships as a means of realizing ecosystem-based management, and all partnerships as a way of going beyond mere compliance (Department Of Defense, 2011).

Various cooperative agreements exist as formalizations of interagency partnerships, such as the Sikes Act Tripartite Memorandum of Understanding between the DoD, the USFWS, and the Association of Fish and Wildlife Agencies. Agreements like this serve to further the relationship between such agencies and encourage regular interaction and information sharing. Despite recognizing the benefits of these partnerships, a 2003 U.S. General Accounting Office (GAO) report titled *Military Training: Implementation Strategy Needed to Increase Interagency Management for Endangered Species Affecting Training Ranges* found that follow-through was lacking in cooperative management actions. As a response to this finding, the Threatened, Endangered, and At Risk Species Interagency Research Coordination Manual was created for users who are looking to build interagency partnerships or look for specific information about an agency (Mulrooney, Boice, Dalsimer, Golla, & Rutherford, 2010). This research could also serve as a means of addressing that GAO finding by providing a framework to facilitate more successful cooperative management and collaborative partnership.

In addition to those federally-mandated partnerships, myriad formal and informal partnerships have emerged between and amongst military natural resource managers, local communities, private conservation groups, educational institutions, and state and local governments. Widely varying stakeholders have joined forces—from the local installation level to the regional and national level—to accomplish productive natural resource management and biodiversity conservation that also enables the military mission. The complete list is expansive, and includes partnerships like National Military Fish & Wildlife Association, the Readiness and Environmental Protection Integration (REPI) Program, the DoD Partners in Amphibian and Reptile Conservation, the DoD

Partners in Flight, and formal cooperative agreements with organizations such as NatureServe, the Nature Conservancy, and the Center for Natural Lands Management. These partnerships have varying purposes, including promoting resource stewardship, increasing public awareness and appropriate use of resources, and improving management efficiencies, all while enhancing the military's ability to train and operate on their installations (Boice, 2003).

An additional type of partnership is with state and private entities “to acquire conservation easements that preserve habitat, thereby relieving anticipated environmental restrictions that would restrict, impede, or interfere with military training, testing, or operations on the installation” (Powledge, 2008: 146). These types of conservation easements are part of the effort, termed “buffering,” to halt the negative effects of encroachment of installation boundaries by civilian development and population growth. The buffering idea was adopted and formalized by the Army as the Army Compatible Use Buffer (ACUB) program, and later expanded by the DoD in 2003 (Powledge, 2008). Another notable form of partnership is the Cooperative Ecosystem Studies Units (CESU) Network, whose partnerships between federal agencies, host universities, and partner institutions provide research, technical assistance, and training to federal land management, environmental, and research agencies. From fiscal year 2002-2015, the DoD funded 862 projects through the CESUs, totaling nearly \$218 million and achieving savings through cost avoidance of roughly \$28 million (Frisinger, 2016).

There is very limited existing literature focusing specifically on conservation partnerships in military settings. However, the few articles do identify best practices of what makes a good partnership, such as stakeholder involvement, senior management

commitment, continuity, meeting diverse stakeholder expectations, the importance of key leaders improving cooperation, and good communications both within the installation and with off-base partners (L.P. Boice, 2003; L. L. Creswell, 1994; Gibb, 2005). This research will use these contributions as a foundation, but also seeks to build upon this list for the benefit of the diverse stakeholders involved in these efforts.

Also highlighted in the literature are the barriers to cooperation faced by DoD conservation partnerships. For instance, in examining cooperation between the DoD and the USFWS, Creswell (1994) highlights the conflict between the short-term interests of the military services and the longer-term focus of some science-based objectives. This time-scale mismatch reflects what is also highlighted as a barrier in other conservation settings (Redpath et al., 2013). Numerous other constraints are present in the literature, falling into three categories: planning process impediments, leadership and accountability impediments, and interagency relationship impediments (L. L. Creswell, 1994). Further barriers to success that have been identified include common communication breakdowns and conflict characterized by avoidance rather than direct contention (Lee Jenni, 2011; Lee Jenni, Peterson, Cubbage, & Jameson, 2012). Finally, the GAO (2003) highlighted several reasons for lack of cooperation in interagency endangered species management, such as poor information sharing, too many policies with too little follow-through, and conflicting priorities for endangered species.

Finally, the literature has indeed emphasized the benefits of collaborative DoD conservation partnerships. For example, Boice (2003) identifies the benefits to include improving the understanding of the DoD's mission and stewardship responsibilities, reducing conservation pressures on DoD lands, enhancing resource sharing and reducing

costs, and increasing flexibility for training. In addition, Creswell (1994) asserts that despite the barriers she identified in her same study, there are sound reasons (beyond mere legal compliance) to seek cooperation: reduced program delays, reduced long-term costs, and better management decision-making from improved information. Further benefits from partnering with the community, other federal agencies, NGOs, regional landscape-level partners, and educational institutions include providing additional resources, enhancing available expertise, and building a network based on trust and teamwork (Powledge, 2008). In order to highlight these benefits, enhance existing partnerships, and encourage the formation of new ones, the USFWS created the annual Military Conservation Partner Award, with criteria like communication and cooperation with partners, program diversity, and creative projects. Finally, the endangered species roundtable hosted by the DoD and the USFWS provides numerous benefits to its hosts and the thirteen other participating agencies, such as sharing early alerts of upcoming policies, creating opportunities for cooperative problem solving, and improving staff communication (Dalsimer, 2016).

Because of its unique and significant role in the conservation of natural resources and biodiversity, the DoD represents an ideal context for examining collaborative partnerships. This review has highlighted existing contributions to three areas: a) the understanding of what characteristics distinguish successful DoD conservation partnerships, b) what challenges are common and how they are overcome, and c) what are the benefits of such partnerships and how they are achieved. Using these contributions as a foundation, this research seeks to both add support to the extant

information as well as uncover new knowledge that can be utilized by practitioners and process managers.

Conclusion

The totality of the findings synthesized in this review has led to the development of an initial conceptual framework of successful DoD conservation partnerships, as shown in Figure 1. While the theoretical underpinnings discussed in this review provided a critical knowledge base of where to begin and how to frame this problem, the theories did not directly inform the development of this framework. Rather, since this is largely an inductive study, the majority of the specific details of each construct will be formed directly from the data that is gathered and analyzed.

This model serves to highlight three main constructs of successful DoD conservation partnerships: the key success factors (KSFs), the challenges and barriers to success, and the purpose or benefits of such partnerships. Each partnership is formed by the contributions from a variety of stakeholders, including state agencies (such as the Department of Natural Resources or Department of Fish and Wildlife), nongovernmental conservation organizations, civilian natural resource managers on DoD installations, military trainers and leaders, and universities. The first construct, the KSFs, is composed of the characteristics or strengths that make a particular partnership successful (IQs 1a and 1b). Informed by the literature and theory in this review, the KSFs expected to appear in the data include facilitative leadership, process transparency, and communication. However, as is the case for the other two constructs as well, the majority of KSFs in the final model are expected to come from the data.

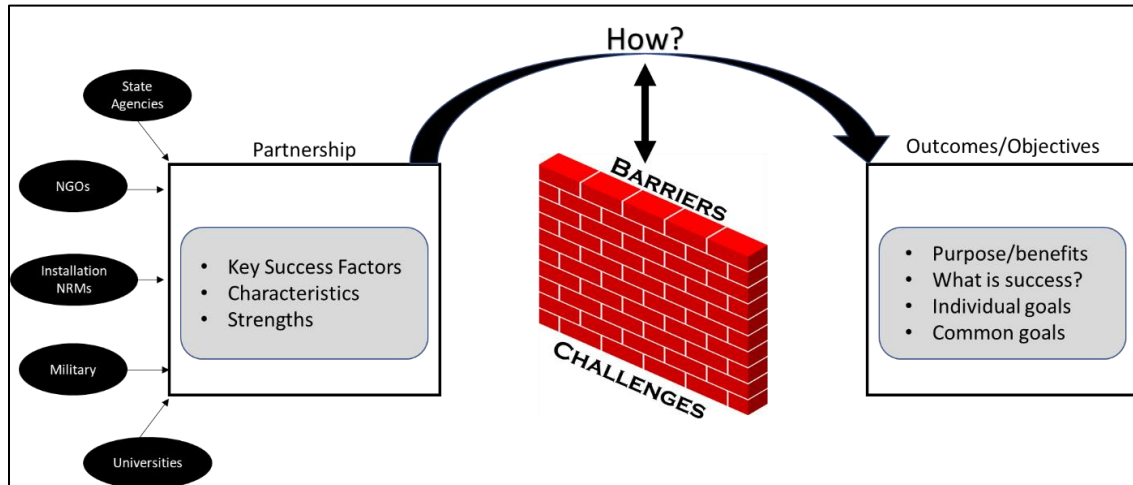


Figure 1. Initial conceptual framework of interorganizational collaborative Department of Defense conservation partnerships

Next, the challenges faced by each partnership are shown, with an arrow representing how the most successful partnerships overcome these barriers to success (IQs 2a, 2b, and 4). Based on this review, some of the expected barriers to success include a time-scale mismatch, poor information sharing, and conflicting priorities. The link between the barriers and the means by which successful partnerships overcome those barriers represents the idea that each challenge facing a partnership inherently contains an accompanying plan to address that challenge. For example, if a partnership is facing a challenge of conflicting priorities, then that necessitates a process to find common ground and agree on mutually beneficial or, at least, compatible objectives.

The third and final construct illustrates the outcomes and objectives of each successful collaborative partnership (IQs 3a and 3b). Components of this construct include the espoused purposes and benefits of forming partnerships and dedicating resources to collaborative processes. Also included is a point about what actually

constitutes success for a conservation partnership, which, as evidenced by this review's discussion of the complexities of conservation issues, is not a simple idea.

This literature review provided a foundational knowledge base for exploring the characteristics of successful DoD conservation partnerships and how stakeholders capitalize on those characteristics to accomplish their objectives. The review first discussed the basics of conservation science. Highlighted were the importance of conserving biodiversity in terms of its intrinsic value and the provision of ecosystem services, as well as the inherent complexity and “wickedness” of ecosystem-level natural resources issues. This complexity was illuminated further by identifying conservation problems as characteristically human problems, and covering the essential human dimensions and social aspects that make conservation issues so wicked.

One of the methods of addressing such complex conservation problems is through interorganizational collaboration, which was explored from a general theoretical perspective as well as from a natural resources conservation perspective. The key success factors of such partnerships that were identified include facilitative leadership, process transparency, and communication, among others. Common challenges and barriers to success were also explored, including conflicting goals, attitudes and perceptions, and a lack of collaboration skills. The final step was to provide an overview of conservation partnerships within the DoD specifically. This exploration highlighted many of the same key success factors, indicating that the characteristics of a partnership successful in the DoD context may be the same as any other context. The same holds true for the majority of challenges that were identified; however, a few notably differed from those of the general context (such as a time-scale mismatch, poor information sharing, and too many

policies with too little follow through), indicating that the organizational structures or processes that distinguish DoD conservation partnerships may be creating unique barriers to success.

Despite the presence of conflict, as examined by Lee Jenni et al. (2012), focusing on the more successful DoD partnerships can reveal best practices in terms of how to develop compatible objectives, maintain effective communication between stakeholders, and address the complex issues of biodiversity conservation and endangered species protection on military installations. The next chapter, Chapter III, discusses the methodology used to collect and analyze data from natural resources managers, installation commanders, state agencies, and private conservation organizations to determine such best practices.

III. Methodology

Chapter Overview

The purpose of this chapter is to discuss the concepts and processes used to examine the research question, and subsequent investigative questions, outlined in Chapter I. A review of the research design will be included, along with the rationale behind the selection of the subjects. Additionally, the processes used to collect the data will be described, followed by a summary of the chapter.

Research Design

Qualitative research methods are rooted in the social sciences, and have since been applied across the spectrum of scientific inquiry (Creswell, 2014). Qualitative research seeks to fulfill a distinct purpose, such as: description, or revealing the multifaceted nature of complex phenomena; interpretation, or enabling a researcher to gain new insights, develop new perspectives, or uncover problems with phenomena; verification, or testing the validity of theories and generalizations within specific real-life contexts; and evaluation, or judging the efficacy of certain policies and practices (Leedy & Ormrod, 2013; Peshkin, 1993). Rather than trying to simplify complex issues into easily digestible conclusions, qualitative research recognizes the varying perspectives of participants and intends to communicate such intricacies and nuances. In other words, the researchers conducting these studies “enter the scene with a sincere interest in learning how [the participants] function in their ordinary pursuits and milieus and with a willingness to put aside many presumptions” (Stake, 1995: 1).

Ralph Waldo Emerson noted that, “Shallow men believe in luck. Strong men believe in cause and effect” (1860). Despite Emerson’s convictions, there is an entire genre of research that seeks not to determine cause and effect (as does quantitative research), but rather to understand how complex phenomena work. The distinct characteristics of qualitative research have been enumerated by many different authors. Some of the main features are the following: the research takes place in the natural setting of wherever the behavior being studied occurs, the research is inherently interested in the perspective of the participants, the researcher is the primary data gathering instrument, the research has the capacity to be reflexive, the data analysis has a highly inductive component, and the research is distinctly reliant on the interpretation of the researcher (J. W. Creswell, 2014; Hatch, 2002; Stake, 1995, 2010). By embracing the personal experience, intuition, and interpretation of the researcher, qualitative research, by its very definition, depends on human perception in order to understand (rather than explain) real-world processes, situations, systems, and relationships.

Researchers today are becoming increasingly more aware of the benefits that qualitative approaches and the interdisciplinary incorporation of the social sciences can bring to conservation and sustainable natural resource management (Bennett et al., 2017; Cox, 2015; Moon, Brewer, Januchowski-Hartley, Adams, & Blackman, 2016; Newing et al., 2011). This realization can be deconstructed into two components. First, the ecosystem management approach, as adopted by the Department of Defense in 1994, is beginning to be recognized as a “wicked problem,” with the inherent complexity of ecosystems, the inability to anticipate consequences of interventions, the lack of clear-cut solutions, and the varied perspectives of diverse stakeholders (Defries & Nagendra,

2017). This host of characteristics immediately identifies these issues as candidates for qualitative research methods. Similarly, many “environmental problems,” to include conservation, natural resource management, and ecosystem management, are fundamentally human behavior problems (Amel et al., 2017). Because human behavior occurs within contexts such as cultural worldviews, social networks, political beliefs, and organizational roles, qualitative methods normally associated with the social sciences are one important way that researchers can seek a better understanding of the inherently human nature of conservation and natural resource management issues. In particular, such qualitative methods can be useful in investigating the complexities associated with the social dynamics of collaborative conservation partnerships.

Within the realm of qualitative research, many different specific designs exist in order to provide a framework for the collection, analysis, and interpretation of data. For example, five designs that are popular in the social sciences today are narrative research, phenomenology, grounded theory, ethnography, and case studies (J. W. Creswell & Poth, 2017). This study employed the case study research design, where a particular event, process, individual, or relationship is studied in depth, within its context, through a variety of lenses (Baxter & Jack, 2008; Leedy & Ormrod, 2013). According to Yin (2013), the case study design is beneficial when answering research questions like “how” or “why,” when the investigator has little or no control over the behavioral events being studied, and when the boundaries between a contemporary phenomenon and its context are not clearly evident. The case study approach was chosen due to the exploratory nature of the research and investigative questions, which required interpretation on the researcher’s behalf in order to understand the participants’ multiple perceptions and

experiences. Additionally, the researcher had no control over the behaviors being studied, and the context within which the participants operate was critical to forming and reporting a true picture of each case.

Case study research is most often conducted from a constructivist perspective, which emphasizes “pluralistic, interpretive, open-ended, and contextualized perspectives toward reality” (Creswell & Miller, 2000: 125-126). According to this paradigm, validity of a study can generally be assessed on the basis of four criteria: dependability, or how reliably the research procedures and findings could be replicated due to thorough documentation; credibility, or how well the findings represent the truth of the respondents; confirmability, or the degree to which the findings are a result of the respondents’, rather than the researcher’s, experiences and perspectives; and transferability, or the degree to which findings are applicable to other contexts (Guba & Lincoln, 1981). Case study research creates many opportunities to implement such measures of validity and trustworthiness; a summary of the strategies used in this study is presented in Table 2.

Validity and Reliability

Qualitative validity can be thought of as the strategies used by researchers to demonstrate the credibility of the conclusions drawn in their studies (J. W. Creswell & Miller, 2000). In this study, multiple strategies were implemented in order to establish validity of the procedures and findings. First, to enhance the dependability of the research, the procedures were outlined in a detailed case study protocol with semi-structured interview script (Appendix B) that was provided to all respondents at least 24 hours before the interview. This approach led to consistent interview structures, which

resulted in the development of a case study database in MaxQDA that was utilized throughout the study. In terms of credibility, the triangulation of different sources of evidence (interviews, documentation, archival records) added more strength to the themes that were converged upon. Next, participants were provided copies of their interview transcripts and an executive summary of the study. This member checking was employed to determine the accuracy of the findings, based on the participants' evaluations of major themes and conclusions.

Table 2. Strategies employed to improve the validity and trustworthiness of the study and findings

Validity Criteria	Strategies Employed
<i>Dependability</i> (how reliably the procedures could be replicated with the same results)	• Developed a case study protocol • Provided a questionnaire to all respondents before the interview • Built and used a case study database
<i>Credibility</i> (how well the findings represent the truth of the participants)	• Gathered data from multiple sources of evidence (triangulation) • Utilized member checking
<i>Confirmability</i> (degree to which the findings are a result of the participants', rather than the researcher's, experiences and interests)	• Reported reflexively on researcher's perspectives and biases • Employed peer debriefing
<i>Transferability</i> (degree to which findings are applicable to other contexts)	• Described case contexts and finds in thick, rich detail • Implemented replication logic in design phase

As for the confirmability of the study, peer debriefing was employed throughout the data collection and analysis. Also, in the spirit of the reflexivity discussed earlier as a key component of qualitative research, the researcher's own biases were revisited in the interpretation of the major findings and themes. Finally, to enhance the transferability of

the study, two strategies were employed: a replication logic was implemented in the design phase and a rich, thick description was used to convey the findings along with the all-important context and perspectives through which the data was gathered.

Researcher's Role

Qualitative work is unique in its capacity to be reflexive, wherein the researcher's ability to keep track of his influence on a setting and be aware of his biases and emotional responses are exactly what allows him to get close enough to the human element of the phenomenon being studied to begin to understand it (Hatch, 2002). As discussed earlier, interpretation on the researcher's behalf is a hallmark characteristic of qualitative research. Due to my previous experiences, I am aware that I bring certain biases, beliefs, and values to this study that cannot be avoided, as they are a fundamental part of who I am; however, every effort was made to recognize and manage these biases and ensure objectivity.

Ethical Considerations

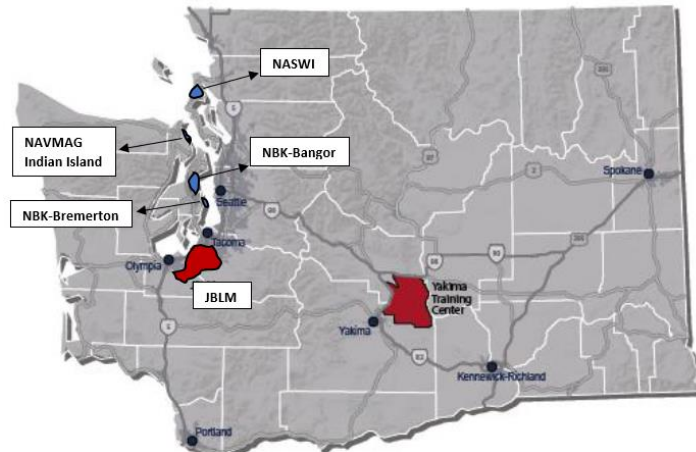
Although all types of research need to account for ethical issues, the in-depth, unstructured nature of qualitative research means that ethical considerations take on a more prominent role in qualitative studies (Ritchie & Lewis, 2003). Researchers have a responsibility to avoid harm for participants in collecting data, do justice to participants in the analysis of the data, and maintain confidentiality and/or anonymity in the reporting of the findings. In this study, numerous measures were undertaken to respect the rights of the participants: 1) the purpose and objectives of the research were clearly communicated to all interviewees, verbally and in writing, 2) written consent was obtained from all

participants, prior to any interview being conducted, 3) a research exemption was filed with the Air Force Research Laboratory's Institutional Review Board (approval shown in Appendix A), 4) all research materials, to include verbatim interview transcriptions and final reports, were made available to all participants, and 5) the attribution of comments to identified participants, in reports and presentations, was avoided.

Case Selection

The research and investigative questions in this study were addressed using Yin's (2003) multiple-case study design in an instrumental fashion, as explained by Stake (1995). As such, the selected cases were helpful in accomplishing something other than understanding those particular cases; i.e., the selected cases helped to illuminate an understanding of DoD conservation partnerships in general. Therefore, the research will be reported without presenting any significant findings from the individual cases, as described by Yin (2003). Conservation partnerships at three military installations in Washington State were used as the cases to be investigated: Joint Base Lewis McChord (JBLM), Naval Base Kitsap (NBK), and Naval Air Station Whidbey Island (NASWI).

These particular locations were purposively selected for a number of reasons. First, limiting the research to one region, and particularly one state, controls a certain degree of variability that could be introduced by different regions' geographic factors, socioeconomic status, and political, cultural, and social climates. However, despite their similarities, these selections also offer cross-case differences due to their unique service and primary mission characteristics (see Figure 2).



Joint Base Lewis McChord (JBLM):

- Third largest installation in the Army: 40,000 soldiers and airmen and 15,000 civilians, while supporting 127,000 retirees and 60,000 family members.
- 91,000 acres—comprised of 32 maneuver areas, four impact areas, 67 live-fire ranges, and 50 artillery or mortar firing points—supports artillery and maneuver training, land-warrior system testing, and operational airlift missions.
- Hosts nearly 90% of the remaining South Sound prairie habitat, which supports three federally-listed endangered species: the Taylor’s checkerspot butterfly, streaked horned lark, and Mazama pocket gopher.

Naval Base Kistap (NBK):

- Sixth biggest naval base in the US, with 13,000 active duty members, 14,000 civilians, and 19,000 family members, while supporting 12,000 retirees.
- Encompasses more than 10,000 acres as a conglomerate of five installations in the area. Supports the Navy’s fleet throughout the PNW, playing host to over 70 tenant commands.
- Hosts critical research, development, test, and evaluation sites for underwater systems in one of the least developed and most ecologically important estuaries in the Puget Sound.

Naval Air Station Whidbey Island (NASWI):

- Home to 8,000 active duty, 2,000 civilians, and 13,000 family members, in support of all Navy EA18-G Growler electronic attack squadrons and eight Maritime Patrol and Reconnaissance squadrons.
- 55,729 acres of land and water; 47,342 of those acres are in OR, at NWSTF Boardman, which includes air-to-ground ranges, terrestrial impact areas, and special use airspace. Manages 14.5 miles of shoreline, 1,147 acres of wetlands, and 24.5 miles of streams
- Awarded for exemplary work in north Puget Sound salmon restoration and a comprehensive conservation plan to prevent the federal listing of the Washington ground squirrel.

Figure 2. Description of the three installations whose conservation partnerships were selected as cases to be studied (all facts and numbers from the US Army, US Navy and the Readiness and Environmental Protection Initiative)

Additionally, this region was identified as being of particular interest due to the recent notable environmental success of its military installations. Specifically, NASWI won the FY2016 Chief of Naval Operations Environmental Award in the Natural Resources Conservation category, NBK won the same award in the Environmental Quality category, and JBLM was recognized as a nominee in the 2016 Secretary of Defense Environmental Awards for the Environmental Restoration category. Although not every one of these awards directly reflects on the quality of the conservation partnerships on the installation, there can be a reasonable expectation for a certain degree of cooperation, collaboration, and support amongst the varied stakeholders on environmental issues in general, which will prove useful in attempting to identify the common characteristics of particularly successful partnerships.

According to Yin (2003), the critical logic underlying the use of multiple-case studies is that “each case must be carefully selected so that it either (a) predicts similar results (a *literal replication*) or (b) predicts contrasting results but for predictable reasons (a *theoretical replication*)” (47). In this study, due to each case being selected as an example of a successful partnership, a literal replication was predicted from case to case. In conclusion, the three selected military installations in WA represent particularly interesting instances of conservation and natural resource management, which may be able to help illuminate the nuances of the partnerships being studied.

Data Collection

The IQs were investigated by conducting semi-structured interviews with key stakeholders from the three installations, throughout a three-week period from September

8th, 2017 to September 28th, 2017. While some interviews were conducted via the telephone, the majority were conducted face-to-face at the participant's workplace. Two site visits were also conducted, which allowed for numerous informal conversations and observations of partnerships in action. The interview questions were developed from the IQs to focus on several aspects of interorganizational conservation partnerships, including how they function, what makes them successful, how they help stakeholders achieve their objectives. The choice to use semi-structured interviews was made deliberately, in order to guide the conversation in a productive manner while still allowing participants the latitude to describe their own perceptions of reality in these contexts.

The case study protocol and semi-structured interview guide (as shown in Appendix B) were sent to all participants at least 24 hours before the interview took place to allow for preparation. Audio recordings were made of each interview, although notes were also taken before, during, and after interviews, as well as during site visits and informal conversations. After each interview, the majority of which lasted between 30 and 60 minutes, the audio recordings were transcribed manually into Microsoft Word. This structured approach led to a consistent interview format that resulted in the development of a case study database in MAXQDA 12. The development of such a database allowed for easy storage, organization, categorization, and recall throughout the iterative process of data collection and analysis.

Informants consisted of installation natural resources managers (including members of the environmental staff), the senior military officials with whom they interact the most, members of state agencies, and members of private conservation groups that

partner with the installations. In total, 16 interviews were conducted, with two having multiple participants present, leading to a total of 19 formal participants (see Table 3). The access to appropriate sources of expert knowledge was facilitated by Dr. J. Douglas Ripley, the former Air Force Natural Resources Manager in the Environmental Division of headquarters U.S. Air Force at the Pentagon. Dr. Ripley is currently a member of the Board of Directors for NatureServe, a non-profit that provides proprietary wildlife conservation-related data, tools, and services to private and government clients, partner organizations, and the public.

Access to subsequent informants proceeded via a combination of snowball sampling and purposive cold-calling based on the potential informant's organization and position, which are the two most common methods of recruitment for qualitative social science in conservation (Moon et al., 2016). Dr. Ripley sent out numerous initial rounds of emails to former colleagues, a few of whom responded, became key informants, and facilitated further access to additional informants. This method of sampling is especially salient because "given the importance of social networks, trust, and reputation in human interactions, [it] is frequently the most, or only, feasible way to obtain access to many remote respondents" (Cox, 2015: 63).

Additional materials were gathered for triangulation purposes, including archival records and documentation maintained by the selected teams and installations (e.g., training presentations, formal guidance, public affairs releases, news articles, management guidebooks, briefings). This was an opportunity to analyze the official communications of the organizations, how they wish to be perceived, and what message they want to send to the public. Documents were obtained via open source, such as the

internet, as well as from the participants during and after interviews and site visits. All additional materials were added to the case study database, building a robust catalog of data to be analyzed inductively for trends that would reveal themes and insights about successful DoD conservation partnerships.

Table 3. Summary of interview participants

<i>Organization</i>	<i>Position</i>	<i>Interview Length</i>	<i>Phone/ In-Person</i>
JBLM			
	Natural Resource Manager (NRM)	49:14	In-person
	NRM	42:58	In-person
	NRM	21:50	In-person
	NRM	49:13	Phone
	Senior Military Official (SMO)	49:13	Phone
	SMO	25:56	In-Person
	SMO	39:52	In-person
	NRM	34:06	In-person
	NRM	1:08:54	In-person
	NRM	1:08:54	In-person
	NRM	1:08:54	In-person
NBK			
NASWI			
State Agencies			
NGOs			
Totals			

Summary

This chapter began by discussing the research method and particular design that were undertaken, the case selection, the researcher's role in interpreting the findings, the measures taken to ensure validity and reliability, and how the data was collected. In using the multiple-case studies design, this research seeks to gain an in-depth of understanding of the complex, interdisciplinary phenomena of interorganizational conservation partnerships on military installations. Data collected through semi-structured interviews with key informants will reveal key themes that can then be used to address the research and investigative questions identified in Chapter I and further develop the initial conceptual framework. Next, Chapter IV will present an in-depth analysis of the data.

IV. Analysis and Results

Chapter Overview

This chapter discusses the analysis of interview and supplemental data in order to determine the details of three aspects of successful DoD conservation partnerships: key success factors, strategies for overcoming common barriers to success, and how the partnership contributes to the accomplishment of each stakeholder's organizational objectives. On this basis, an overview of the coding structure and process will be provided, followed by a description of the major findings from each case and the key themes overall. Finally, in addition to answering the investigative questions, an expanded conceptual model of collaborative DoD conservation partnerships will be developed and presented.

Analysis

After consolidating the data from all sources of evidence into the case study database, analysis of the interview data proceeded through a number of steps with different coding methods in order to answer the investigative questions: a first iteration using provisional coding, a second round using initial and descriptive coding, and a third round using a combination of axial, theoretical, and focused coding. The first round of coding began with the construction of a list of provisional codes (Figure 3), generated from the literature review and the researcher's experiences collecting data—from the interviews, informal conversations, and direct observations. Three main categories correspond with the three phases of the initial conceptual framework developed in

Chapter II: key success factors and characteristics of the partnership, the common challenges and barriers to success faced by such partnerships, and the outcomes or objectives desired by the partnerships.

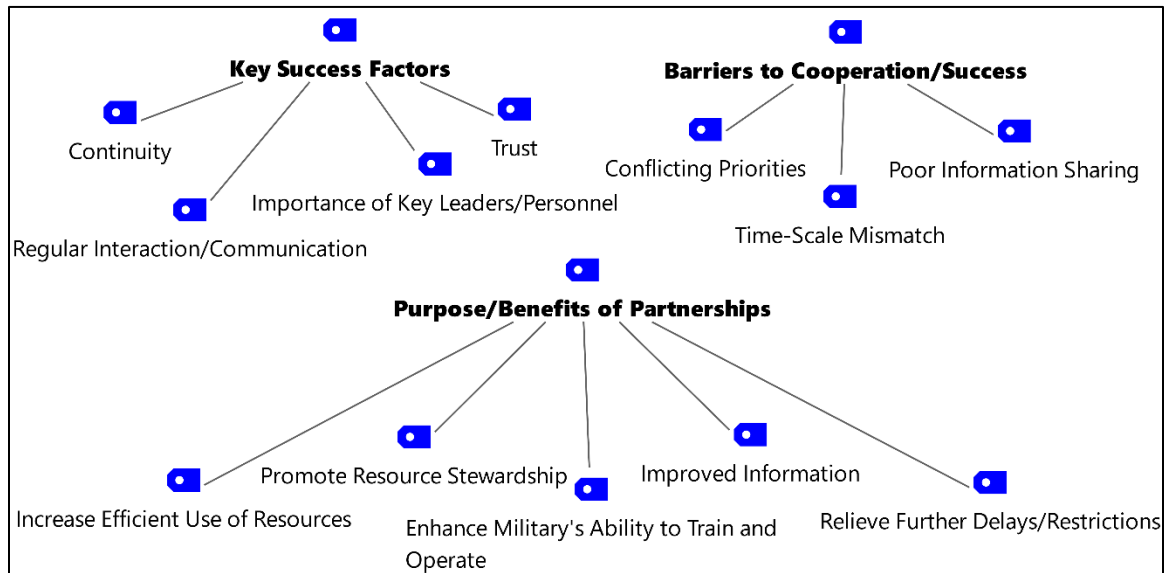


Figure 3. Representation of provisional codes used for the first iteration of coding

After the first iteration of coding, a second iteration was completed using a combination of initial, descriptive, and in-vivo methods. As described by Saldaña (2016), these three coding methods are elemental in that they have “basic but focused filters for reviewing the corpus and they build a foundation for future coding cycles” (97). Using these open-ended approaches allowed for the assignment of basic, descriptive labels to build on the groundwork established by the provisional codes. In order to gain a better understanding of the data as a whole, a tag cloud was built separately in MAXQDA for both the interview data and the entirety of the additional data (strategy documents, regulations, public relations material, news articles, newsletters, briefings, and informal conversations). As shown in Figure 4, these illustrations highlight the most commonly

During this effort, a combination of axial, theoretical, and focused coding were used to organize the existing codes based on their conceptual similarities, their relation to one another, and their contribution to the primary themes of the research (Saldaña, 2016).

An ultimate cycle of coding was then performed in order to accurately rename newly-formed codes and categories, delete the codes that had been rendered useless by the previous cycle, and finalize the structure to best illuminate the major themes and concepts. Throughout each iteration of coding, detailed memos were recorded in order to describe new codes and capture emerging insights about the connections between codes and categories and the relationships to the major themes. Because these memos also documented procedural details (such as in which iteration the code was formed) and are located in the case study database, they add a key contribution to the dependability of the study. A complete breakdown of the final code system, with accompanying definitions and memos, can be found in Appendix C.

Results

In following Yin's (2003) replication logic for multiple-case study designs, it was anticipated that the three individual cases would produce similar results given their reasons for being selected. Further, because this multiple-case study was performed with an instrumental intent, as defined by Stake (1995), in-depth analysis was not performed on the three individual cases. Therefore, because the individual cases mainly served as the evidence base for the study, detailed reporting of results for the individual cases will not be presented. Instead, this section will focus mainly on cross-case analysis in support of the major themes and concepts of the study as a whole. The investigative questions focus on three main concepts: the key success factors, the biggest challenges and barriers

to success, and the desired outcomes or objectives for the partnership. The remainder of this section will report on the key findings for each concept in order to complete a conceptual model of successful DoD conservation partnerships.

Key Success Factors.

Through the successive iterations of analysis, clear themes and patterns emerged regarding what the interview participants considered to be the key success factors (KSFs) for the conservation partnerships in which they are stakeholders (IQ 1a). As shown in Figure 5, interview participants across all three cases identified KSFs that fell within four main categories: Common Ground, Leadership, Relationships, and Organizational Climate. It should be noted that in order to maintain clarity and concision, the level of granularity depicted in Figure 5 mirrors that of the conceptual model. However, as illustrated by the gray horizontal arrow indicators, there are numerous KSFs that contain more specific sub-categories which will be addressed in the Discussion.

Regarding the Common Ground theme, the four principal KSFs identified were Compatibility (including Mutual Benefit, Common Goals, and Shared Values), Compromise, Conflict Resolution, and Functional Integration. With the size of the circles representing the number of occurrences in the data relative to the column total, it can be seen that Compatibility was the most heavily-mentioned KSF within the Common Ground theme.

As indicated by its title, the two main KSFs in the next theme were identified as two different forms of Leadership: Dynamic (including Importance of Key Leaders/Personnel, Chain of Command Support, and Vision) and Managerial (including

Expectation Management, Funding, and Clear Objectives/Processes). Within this theme, Dynamic Leadership emerged as the KSF that was identified most frequently.

Code System	Interviews	Additional Data	SUM
▼ Key Success Factors			0
▼ Common Ground			0
> Compatibility	●	●	89
Compromise	●		7
Conflict Resolution	●	●	9
Functional Integration	●	●	8
▼ Leadership			0
> Dynamic	●	●	80
> Managerial	●	●	29
▼ Relationships			0
> Relationship Building	●	●	143
> Information Management	●	●	93
▼ Organizational Climate			0
> Culture	●	●	20
Diversity	●	●	11
Σ SUM	349	140	489

Figure 5. Overview of Key Success Factors (KSFs) extracted from interviews and additional data

The third theme, Relationships, proved to be the most commonly mentioned of all four themes, with more than double the number of codings than the next closest. The Relationships theme is comprised of two KSFs: Relationship Building (including Early Involvement, Listening/Respect, Trust, and Communication/Interaction) and Information Management (including Outreach/Education/Training, Scientific Integrity, and Transparency). Between these two KSFs, Relationship Building was mentioned most commonly and also represents the number one most frequently-identified KSF of all.

The final theme was categorized as Organizational Climate, which signifies two KSFs: Culture (including Environmental Ethic and Success Breeds Success) and Diversity. This theme was the least-represented throughout the data; however, within this theme, Culture was the leading KSF.

As can be seen in Figure 5, the entirety of the additional data (strategy documents, regulations, public relations material, news articles, newsletters, briefings, and informal conversations) was also coded to identify KSFs. Although represented by a fewer number of codings overall, three of the top four KSFs from the additional data match up with those from the interviews. With the converging lines of inquiry from multiple sources of evidence, these findings are likely to be much more accurate while also addressing the potential problems of construct validity within case study research (Yin, 2003).

Challenges and Barriers to Success.

Regarding IQ 2a, strong patterns appeared in the interview data surrounding what the participants considered to be the greatest challenges or barriers to success faced by their partnerships. As shown in Figure 6, these challenges were categorized into four themes: Conflict, Organizational Characteristics, Complexity, and Resource Constraints. Within the first theme, Conflicting Priorities/Objectives was identified as the main challenge along with poor Information Sharing and a fundamental Time-scale Mismatch between conservation objectives and military objectives. The second theme, Resource Constraints, contained elements of Funding, Personnel, and Time. Four different challenges were identified within the next theme, Complexity, including: the Human Element, Regulatory Burden, Scientific Interpretation, and Wicked Problems. Between these four challenges, the Human Element was the most commonly-identified, by far.

The final theme to emerge, Organizational Features, was the most heavily-cited of the four themes, and Turnover of military personnel was illuminated as the top challenge within that theme. Closely following Turnover was Culture Differences, Bureaucracy, and Chain-of-Command Distance.

Code System	Interviews	Additional Data	SUM
▼ Challenges & Barriers			0
▼ Conflict			0
Conflicting Priorities	●		14
Information Sharing	●	●	11
Time-scale Mismatch	●	●	13
▼ Constraints			0
Funding	●		15
Personnel	●		5
Time	●		3
▼ Complexity			0
Human Element	●		11
Regulation Change/Volume	●		4
Scientific Interpretation	●		2
Wicked Problems	●		3
▼ Org. Features			0
CoC Distance	●		7
Bureaucracy	●		11
Culture	●		14
Turnover	●	●	17
Σ SUM	124	6	130

Figure 6. Overview of Challenges and Barriers to Success extracted from interviews and additional data

As illustrated in Figure 6, Challenges and Barriers to Success hardly make an appearance anywhere in the additional data. At first glance, this may seem astounding given the diversity of the sources of evidence that are included within that construct.

However, upon closer inspection, one can understand why this is the case: items such as public affairs releases, strategy documents, training slides, and newsletters are not likely to publish explicitly about challenges or barriers to success. Rather, that type of information is likely to make an appearance in a positive fashion, within which a challenge is implied. For example, if a conservation NGO publishes an article in a newsletter about negotiation strategies or keys to effective compromise, this might imply that a common challenge they face is finding common ground with stakeholders. Or, if an installation's newspaper highlights the ongoing efforts to maintain communication and build trust between a military trainer and the base natural resources manager, this could be implying that there had previously been a culture of mistrust. Even with implicit challenges, passages like these would likely have been coded within the KSF categories of Common Ground or Relationships, and therefore would not make an appearance in the Challenges and Barriers framework.

Objectives and Outcomes.

To address IQ 3a, the interview transcripts and additional data were analyzed for insights regarding the objectives of DoD conservation partnerships and how the partnerships' characteristics contribute to realizing those outcomes. Figure 7 shows the summary of these outcomes, organized into three categories: Conservation Benefits, Military Benefits, and Synergy.

Code System	Interviews	Additional Data	SUM
▼ Objectives/Outcomes			0
▼ Conservation Benefits			0
Ecosystem/Habitat	●	●	28
Species	●	●	26
Resource Stewardship	●	●	13
▼ Military Benefits			0
Ability to Train	●	●	53
Preventing Delays	●	●	33
Improved Understanding	●	●	13
▼ Synergy			0
Net Benefit	●	●	78
Improved Information/Expertise	●	●	25
Flexibility	●	●	9
Pooled Resources	●	●	43
Σ SUM	133	188	321

Figure 7. Overview of key Outcomes and Objectives extracted from interviews and additional data

Within Conservation Benefits, the specific outcomes were identified as being related to Ecosystem/Habitat-level benefits, Species-level benefits, and a general promotion of Resource Stewardship. Between these three, the main focus was on the larger ecosystem- or landscape-level benefits regarding habitat protection/restoration or the relationships between species, their habitats, and the ecosystem as a whole.

In term of Military Benefits, the outcomes or objectives that emerged from the data were enhancing the military's Ability to Train, Preventing Further Delays or restrictions, and generating an Improved Understanding of the military's role and mission. Within this category, Preventing Further Delays was mentioned by interview participants the most, although the advantage over Enhancing Further Delays was marginal.

Finally, four outcomes were identified within the Synergy category, which was the most commonly-cited of the three categories: Net Benefit, Improved Information/Expertise, Flexibility, and Pooled Resources. Between these four outcomes, Pooled Resources was identified the most by interview participants. As Figure 7 illustrates, the Outcomes and Objectives of DoD conservation partnerships were well-represented in the additional data, with Net Benefit, Enhancing the Ability to Train, and Pooled Resources being the top three most-identified outcomes.

DoD Conservation Partnership Model & Summary

Using the groundwork of analysis performed on the interviews and additional data, a model was developed to illustrate the dynamics of collaborative DoD conservation partnerships (Figure 8). The model is organized into three vertical sections, which correspond with three main concepts addressed by the investigative questions (from left to right): KSFs of DoD conservation partnerships (IQ 1a), the critical Challenges and Barriers to Success faced by such partnerships (IQ 2a), and the achievement of desired Outcomes/Objectives (IQ 3a). Underneath each of the three main concepts are the categories and elements extracted from the data (as shown in Figures 5, 6, and 7). The key to this model lies in the connections between elements, which illustrate how the KSFs enable successful partnerships to confront the critical challenges and overcome the barriers to success in order to accomplish their organizational objectives (IQs 1b, 2b, 3b, and 4). The illumination of these connections will form the basis of the Discussion and Conclusion, presented next in Chapter V.

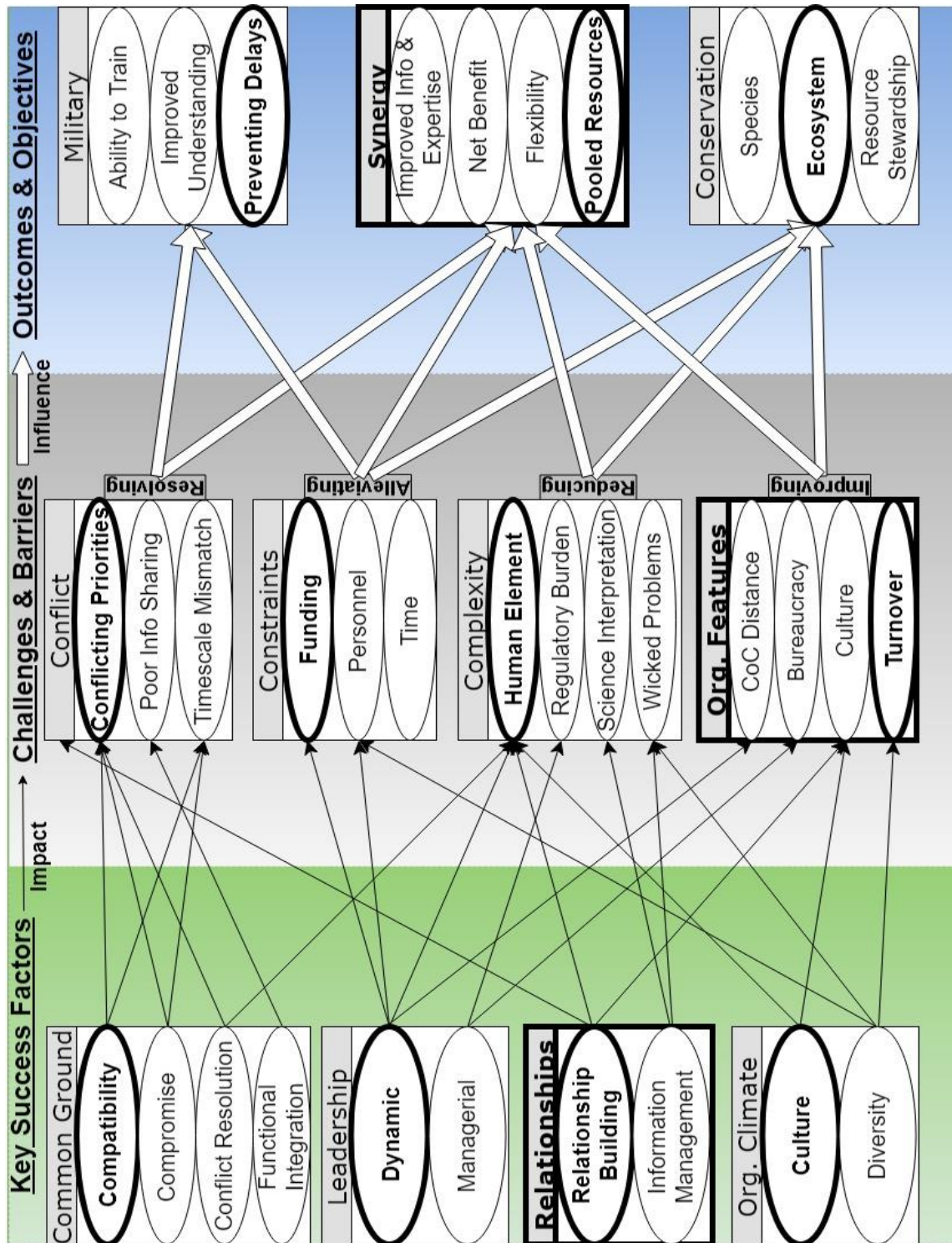


Figure 8. Model of successful DoD conservation partnerships, where each bolded element represents the most commonly identified component of its category.

V. Discussion, Conclusions, and Recommendations

Chapter Overview

In this chapter, a discussion is first presented of the findings introduced in Chapter IV, as framed by the model of successful DoD conservation partnerships (Figure 8). In the body of this discussion, bolded text represents **Key Success Factors (KSFs)**, italicized text represents the *Challenges and Barriers to Success*, and underlined text represents the Outcomes and Objectives. Next, conclusions will be delineated in order to clearly answer the research question: what characteristics define successful DoD conservation partnerships, and how do stakeholders capitalize on those characteristics to accomplish their objectives? The significance and implications of this research will then be presented, followed by the study's limitations. Finally, this chapter will conclude with recommendations for action and for future research.

Discussion

Common Ground.

Throughout the data, numerous aspects related to the theme of **Common Ground** emerged as key success factors (KSFs) in developing and maintaining successful conservation partnerships. In particular, **Compatibility** was identified most often as a critical ingredient for success. Participants emphasized that cultivating **Compatibility**—through the recognition of **Mutual Benefit** and **Shared Values**, and the establishment of **Common Goals** and compatible objectives—lays the foundational structure for a successful partnership. The bulk of these ideas focused on establishing that the conservation objectives and the military objectives are not only **Compatible**, but rather

integral to each other's success. For example, one natural resource manager (NRM) asserted that "the reason the program's successful is because we understand that there's a symbiotic relationship between conserving the natural resources and giving them a place to train." This idea, which was echoed across the whole range of stakeholders, contends that recognizing the **Mutual Benefit** achieved by partnership efforts relieves the tensions created by *Conflicting Priorities* and a *Timescale Mismatch* between partners. While military training is often focused on short-term objectives, conservation objectives are often on much larger time-scales. However, partnership efforts can contribute to the realization that conserving the natural resources on an installation enhances the military's Ability to Train in a sustainable manner for the long term by maintaining healthy Ecosystems and Preventing Further Delays or restrictions. As summarized by one DoD NRM,

The bigger picture is that when you take people's efforts that have been going on separately, and you combine funding and combine expertise, and you work together toward a **Common Goal**, you're going to accomplish more. The classic Synergy, they call it, where the whole is greater than the sum of its parts.

By resolving these types of conflicting priorities and, therefore, taking advantage of Pooled Resources, conservation partnerships are able to achieve together what neither side could achieve on its own.

The next KSF to emerge within the **Common Ground** theme was **Compromise**, which plays a similar role to **Compatibility** in addressing *Conflicting Priorities*. However, one key difference is that **Compromise** was mentioned almost exclusively by Senior Military Officials (SMOs), although only half of the SMOs interviewed brought it up. This suggests a difference in vocabulary between military and conservation professionals that may be representative of a larger difference in culture. While the

Compatibility espoused by many different stakeholders is built on the idea that all sides can accomplish their ideal outcome, **Compromise** requires that each side concede something in order to achieve an acceptable outcome. As expressed by one SMO responsible for training, there is

tree-hugging granola crunchers on one side screaming that [the installation] should be shut down and this whole area should be turned into a biosphere . . . On the other side, yelling from the other goal line, is the military [commander] . . . All he cares about is, I am not going to send my soldiers off to combat that have not gotten the training, and if [an endangered species] gets in the way, f*ck ‘em . . . We stand close enough—we’re still on opposite sides of the 50-yard line—but we’re close enough to reach our hand out, shake hands, and say “okay.” Sometimes they’re going move me left a little bit, sometimes I’m going to move them right a little bit. But we’re the honest brokers that say, “here’s trying to accomplish both.” Can we have both?... Yes. But both sides need to be willing to give a little bit in order to get both.

Emphasizing **Compromise** as a solution to *Conflicting Priorities* implies a belief that two sides are at completely odds, rather than merely trying to articulate their **Common Goals** or **Shared Values**. In this sense, **Compromise** is aimed more at maintaining the Ability to Train while accomplishing separate acceptable Conservation outcomes, as opposed to unifying towards Synergy and a Net Benefit.

The third KSF related to finding **Common Ground** is **Conflict Resolution**, which offers a concrete solution to two very large and ambiguous barriers to success: the complex *Human Element* and differing organizational *Cultures*. Having a means of formal **Conflict Resolution**, in terms of a moderator or facilitator in meetings, can be a productive way to address personal or organizational/cultural differences that inhibit progress from being made. **Conflict Resolution** was identified as a KSF by participants from installation natural resources offices, state agencies, and conservation NGOs, suggesting the wide utility of this concept. For example, when asked what advice he

would give to a different installation looking to form a successful conservation partnership, a state NRM remarked that a moderator is “a helpful thing to have in most cases like that where you have a diverse group. Even though we’re more or less on the same page with most things, there’s always going to be differences of opinions.” Having a facilitator present in meetings, especially the important meetings or the ones where many diverse stakeholders are present, can help confront the complex *Human Element* that characterizes collaborative partnership efforts. With as many different attitudes, perceptions, beliefs, and biases that are present in conservation partnerships on military installations, having a trained moderator facilitate discussions can help diffuse the tensions that arise from such differences in *Culture* in order to produce that Synergy and Net Benefit.

The final KSF in the **Common Ground** theme is **Functional Integration**. This is another KSF that is more focused on the practical nature of working together (as opposed to the more conceptual **Compatibility** and **Compromise**). The key to a successful partnership, says one installation NRM, is not only having congruent goals, but having “enough **Functional Integration** to work towards those goals in an effective way.” In terms of how to integrate, the conservation director of one NGO details that the development of a cooperative agreement or some other formal agreement “certainly helps. And that can delineate your shared values and your visions, making sure your vision’s correct for both parties, that you’re not talking past each other in a sense. So that’s a very concrete step to take.” Focusing on more effective **Functional Integration** is a way to improve the *Poor Information Sharing* that was identified as a barrier to success by NRMs, SMOs, and state agencies alike.

Particularly regarding the dissemination of information (such as training boundaries and restrictions) down to the lowest levels of operational units, more established cooperative agreements and processes could facilitate a more educated and better trained force. Additionally, better **Functional Integration** combats a more strategic level of *Poor Information Sharing*, such as the military side not fully understanding the role that the NRM's play in facilitating the military mission on the installation. While this was not an issue with the installation commanders that were interviewed, there was a desire among NRM's to "link why what it is we're doing is important to them. Because I think there's a disconnect. Why do I care about a hazard tree? Why do I care about this wetland? And it's our job to explain to them why they care." Addressing these types of misunderstanding can lead not only to an Improved Understanding of each function's role, but also to an enhanced Ability to Train in healthy environments with fewer restrictions.

Leadership.

The second most-commonly identified theme of KSFs was **Leadership**, within which two main categories emerged: **Dynamic** and **Managerial**. **Dynamic Leadership**—comprised of the **Importance of Key Leaders/Personnel**, **Chain-of-Command (CoC) Support**, and **Vision**—can be thought of as the interpersonal, inspirational, decisive leadership that is commonly juxtaposed with management.

The first KSF within **Dynamic Leadership** focuses on the **Importance of Key Leaders/Personnel**. When asked about their particular partnerships, participants from all stakeholder groups continually offered anecdotes of certain individuals who were key to their successful collaborative efforts. Whether describing the support they received from

individuals in formal leadership positions, or simply their colleagues who took the lead on a specific aspect of the partnership, it is clear that personalities play a large role in successful collaborative conservation. Functions of these **Key Leaders/Personnel** include providing encouragement or support for risk-taking, effectively utilizing *Personnel* and securing *Funding* in order to alleviate such constraints, and tackling the tricky *Human Element* that complicates partnerships. For example, one DoD NRM attributed much of their success to a colleague who has worked for organizations on different sides of these issues, stating that “he was really key to getting rid of some of that long-running bias between the two programs. They just didn’t get along, and he helped to start to break that down and get it moving in the right direction.” In other words, having an individual who is comfortable navigating groups where there are a lot of different interests at play can reap great benefits.

Two other traits repeatedly emerged when participants were describing the efforts of **Key Leaders/Personnel: Commitment/Passion** and **Entrepreneurship**. Statements about **Commitment/Passion** also included persistence, ownership, and the desire to go beyond mere regulatory compliance in order to truly Promote Resource Stewardship while enhancing the military’s Ability to Train. These segments often focused on the key NRMs who had been in their same position for numerous decades, although not exclusively. For instance, the director of one state agency highlighted

the need to have somebody whose job it is to coordinate everything who really believes in the project. I always call them the energizer bunnies. You need people who are committed to it . . . who really want it to succeed . . . and help drive it. It’s not just something to check off the list.

In addition to **Commitment/Passion**, the other trait of **Key Leaders/Personnel** that continually emerged is a sense of **Entrepreneurship**, which includes components of creativity, persistent problem solving, and initiative. For example, one senior installation NRM emphasized that

You've got to be creative. You hit a wall, you look for other solutions. My kids grew up in Tumwater, and they have a football coach who's a legend, he's the biggest winning coach in state history, and he'd tell the kids "NGU NNGU: never give up, never never give up.

In particular, partnerships with NGOs can add a degree of Flexibility that is needed to not be afraid to fail, to push the envelope in order to confront the *Bureaucracy* that is a barrier to success. Because NGOs do not usually experience the type of constant, regular *Turnover* that military organizations do, they are able to better maintain that type of creative, **Entrepreneurial** problem solving. This way of operating is also necessary to make the most of constrained *Funding*, so partnerships with NGOs also serve the purpose of creating a set of Pooled Resources that can be leveraged in a more creative, flexible manner.

The second KSF to emerge within **Dynamic Leadership** was **Chain-of-Command (CoC) Support**, which represents the backing of leaders not only in the military chain-of-command, but also **Key Leaders** from various elements of the community (such as the local municipalities, counties, and Native American tribes). While the quantity of coded segments of this KSF was not as great as others, it was evident from the interviews that **CoC Support** was a main ingredient of success. As one DoD installation NRM stated,

Early in my career, around the turn of the century, my old boss told me . . . there's two kinds of Commanding Officers [CO]: there's hunters and there's golfers. If

your CO is a hunter, your job is going to be easy. If your CO is a golfer, he may just not care anything about your critters on the base.

Evidence for this KSF also comes from the structure of this multiple-case study design, and the selection of cases based on a replication logic. With the three cases being purposively selected due to their successful conservation partnerships, one would expect similar KSFs to emerge between the cases. Therefore, with **CoC Support** being highlighted at one installation, it would be reasonable to expect the same at the other two, which held true. Based on the interviews not only with the installation commanders, but with the NRMs and NGOs who rely on their support, this level of backing—both financial and otherwise—remained important.

While **CoC Support** within the military structure is critical to the success of collaborative efforts within the installation boundaries, the support from other leaders in the community is necessary for the myriad efforts that take place outside the fence as well. Through the purchasing of conservation easements, the Army Compatible Use Buffer (ACUB) program (a component of the DoD's Readiness and Environmental Protection Initiative, or REPI) attempts to ease the conservation burden of the installation. DoD conservation partners work to establish populations of federally-listed Endangered Species on lands outside the installation, in order to limit the restrictions imposed on training lands within the installation, while protecting the installation's boundaries from further development and encroachment. In bringing attention to, and garnering support for, large-scale initiatives like these, **Dynamic Leadership** can attempt to confront the barrier of *CoC Distance*, or the challenges presented by having higher commands make decisions about funding and implementation without being in location, "on the ground."

The final KSF represented in the theme of **Dynamic Leadership** is **Vision**, or the ability of to provide a clear path for the organization to achieve a certain purpose or objective. Participants from all different stakeholder groups repeatedly expressed the importance of **Key Personnel** leading collaborative efforts in a way that unites diverse teams toward a desired outcome. For example, one NGO NRM continually praised the leadership of a partner DoD NRM, emphasizing that “he keeps people focused on the purpose for this program, and the need for measurable success, and I think that’s really important.” This **Dynamic Leadership** ability to tackle the complex *Human Element*—diverse groups of stakeholders with diverse interests—directly produces the type of Synergy and Net Benefit that are the objectives of collaborative conservation partnerships.

In addition to **Dynamic**, **Managerial** emerged as the second main category within the overall KSF theme of **Leadership**. **Managerial Leadership** is concerned with more practical matters such as navigating the *Bureaucracy* through **Expectation Management** and the establishment of **Clear Objectives/Processes**, easing the *Regulatory Burden*, and securing **Funding** in order to address resource *Constraints*. The DoD NRMs who were interviewed often act as the liaison between the military’s interests and those of the partner organizations, and therefore need to be clear with each side about what to expect from the partnership. In describing the importance of listening to outside organizations, one DoD installation NRM highlighted this balancing act: “To understand what folks value, what they’re trying to accomplish, being open minded, being an advocate for the resource, but also an advocate for the military and managing that expectation on both sides.” Additionally, to many of the NRMs who were interviewed, having **Clear**

Objectives/Processes was considered to be a prerequisite for success. According to one DoD NRM,

whether you're big into it or not, process is important. When you have a lot of partners, you need to come to agreement, you need to meet on a regular basis and maybe have some sort of an annual work plan or strategy . . . You need to have means of conflict resolution, various other things that need to be worked out because the process [of natural resource management] has a lot of uncertainties in it.

In doing so, partnerships are able to overcome some of the roadblocks presented by a large *Bureaucracy* on their way to producing the Improved Information and Expertise that is sought after.

Easing the *Regulatory Burden* is another main function of **Managerial Leadership**. Although none of the participants had ever encountered anybody intentionally trying to violate the regulations, regulatory aspects nonetheless make up a large focus of partnership administration. Regarding both the military's regulations about collaborative partnerships and the regulatory agencies', there are concerns about keeping up with the sheer volume and rate of change. As one SMO stated, "I guarantee that the rules will be different in 10 more years from now, and in 10 years they'll look back at what we were doing in 2017 and think 'man, those guys were idiots.'" That SMO believed it was a part of his job, along with his installation's NRM, to maintain continuing education and continuing training in order to stay in front of those changes and Prevent any Further Delays or restriction. In another example of the DoD NRMs acting as liaisons between the military side and the private conservation NGO side, NGO NRMs are often dependent on their DoD partners in navigating the military's regulations. For example, in discussing his ability to interpret the rules and guidelines as they change every year, one NGO NRM commented that his counterpart "has been really good at

paying close attention to how those changes work and figuring out how we reinterpret what we're doing so that we still fit into these new guidelines." With the NGO partners being so cognizant of the changing military guidelines, they are best able to achieve that Net Benefit that comes from improving the health of the Ecosystem and status of the Endangered Species while enhancing the military's Ability to Train.

Additionally, a portion of those regulation changes are concerned with the allocation or prioritization of funding, which was highlighted across stakeholder groups as both a KSF under the concern of **Managerial Leaders** as well as the biggest and most common type of *Resource Constraint*. This makes sense that Funding was considered to be both: it is extremely critical to the success of partnerships (as confirmed by the fact that Pooled Resources was the most-identified key outcome or benefit of the Synergy category), so therefore it represents a critical barrier to success when not present. Even more than funding in general, the ability to secure consistent **Funding** was identified as a KSF (and the lack thereof as a challenge). As one state agency NRM framed it, "If you have consistent funding then you can support people over years, over time. If you have inconsistent funding then you have to start and stop all the time. You can't make much ground." Another NRM from a private conservation group elaborated on the frustrations that come with the inconsistency or uncertainty of funding:

In the middle of having awarded us with projects that were ongoing, like research and things that we've been counting on and building our plans around, and suddenly "boom!" it shut down, and we don't know when it's coming back, we don't know what it's going to look like.

Therefore, the ability for **Managerial Leaders** to secure that consistent **Funding** represents a key element of success, especially for achieving the type of long-term Conservation Benefits that are often the objective of these partnerships. Of course, this

ability is no easy task, as it is deeply intertwined with the challenges of *Conflicting Priorities*, the complex *Human Element*, and the differences in *Culture* that determine what projects are prioritized for funding.

Organizational Climate.

The third theme of KSFs to emerge in the data was **Organizational Climate**, which contains the two main categories of **Culture** and **Diversity**. The first element of the **Culture** category is an **Environmental Ethic** that contributes to the sense of Resource Stewardship that these partnerships seek to promote. This was an interesting finding because, when selecting the cases, the unique culture of the Pacific Northwest was anticipated to play some role in the success of their conservation partnerships. While elaborating the distinct culture of this region is beyond the scope of this paper, Ron Judd sums it up nicely in his Seattle Times article titled *If You Weren't Born in Seattle or the Northwest, You'll Never Be One of Us*:

The good fortune of being born here brings with it a physical imprinting: You are a literal product of the fine mist, heron feathers, fish bones and short winter days that define us. . . More than most Americans, we are shaped by our environment; our souls are fired by the natural world around us.

This strong **Environmental Ethic** was echoed by both military and civilian stakeholders alike as a contributor to the success of conservation partnerships in the region.

Interestingly, the two strongest endorsements came from SMOs who have spent the majority of their lives living elsewhere, and are therefore better positioned to comment on the distinctiveness of the region. In commenting on how the understood **Compatibility** between training and conservation objectives is unique in the PNW, one SMO stated that here she noticed “it is not necessarily contrary to what we’re trying to do. At other

installations, we tend to roll our eyes at the desert tortoise or the red cockaded woodpecker [other federally-listed endangered species]; that's not the case here." Rather than the typical eye-rolling that accompanies conservation efforts in other locations, the **Environmental Ethic** of the PNW is a source of strength for these partnerships. It is manifested in a belief that, as a whole, the military, civilian, and contract workers on the installations in the PNW have an increased concern for natural resource stewardship, conservation, and reducing their environmental footprint. Another SMO commented that, after moving to the region, he saw

a love of the environment that's a love of the water, a love of the mountains, a love of the air quality . . . So, I think we have a higher percentage of people that really believe in the environmental piece of what we're doing. And it's not a republican-democrat thing, or a liberal-conservative thing, but people just enjoy living here and I think it carries across the board.

Because no single belief is universal across an entire region of the country, the *Human Element* undoubtedly complicates this aspect of partnerships as well. The spectrum of beliefs that exists within the **Environmental Ethic** can also lead to *Culture* differences between different groups of stakeholders (e.g., between the military and the private conservation NGOs), which must be resolved in the name of achieving each set or organizational objectives.

In addition to the contributions of the **Environmental Ethic**, the other KSF related to **Culture** is the prevalent belief that **Success Breeds Success**. This sentiment, emerging from various stakeholder groups, works in a couple of different ways. First, there is the belief that starting small, demonstrating that things can be accomplished, and that the partners are better together than apart will, in turn, lead to bigger and better partnerships. Although this sounds like a snowball effect, one NGO NRM preferred a

boulder metaphor, saying “the bigger traction you get is when you’re not trying to push the boulder up the hill, but you’re looking for the boulders that are ready to roll. And that just starts things going.” Similarly, when a partnership is successful, its conservation efforts are more visible (meaning more attention for funding) and more opportunities will open up for collaborating and partnering with other agencies. As one state agency NRM affirmed, “a good partnership begets other good things and allows you to reach further and grow and develop as a partnership where you can actually access different programs and different functions.” Therefore, having a culture of sustained success can open up even further opportunities to succeed due to the augmented Pooled Resources that result from such partnerships.

The other way a belief that **Success Breeds Success** is critical to DoD conservation partnerships is from a leadership perspective. As opposed to private conservation organization, or even state agencies, it is expected that military leadership at an installation will change every couple of years. When an installation already has a history of successful collaborative efforts, a new commander should recognize that and want to capitalize on that foundation that has already been established. One senior installation NRM offered his take on this phenomenon:

To be honest with you, things spiral up or they spiral down. So, when a commander comes in here and they’ve been told that this is a quality program, nobody wants to screw up a quality program. Commanders are commanders for a reason, they’re in their position because they’re smart people. They may put their own flavor on it, they may put their emphasis in certain areas, they may bring other ways that they enhance the program, but they’re smart enough to know that they want to build the program, not ignore it or let it fall apart.

By leveraging the existing successful partnerships, leaders are able to further grow that momentum by alleviating resource *Constraints*, securing more **Funding**, garnering more

attention from other prospective partners, minimizing the effects of *CoC Distance*, and wrestling the *Bureaucracy*. These positive outcomes of the success “boulder effect” combine together to produce the classic Synergy, where Improved Expertise and Pooled Resources enable the whole to be greater than the sum of its parts.

In addition to **Culture**, the other main category within the **Organizational Climate** theme is **Diversity**. Maintaining a broad, inclusive vision that values contributions from a wide spectrum of partners is a key factor in the success of conservation partnerships. As one state agency NRM declared, “there’s kind of some Synergies that have come out of the partnerships by bringing people together from different backgrounds, different perspectives, and different expertise.” Adding more partners in general can generate Flexibility by mitigating the negative effects of high *Turnover* rates, *Personnel Constraints*, and *Time Constraints*, but especially so when those individuals or organizations come from diverse backgrounds. Sustaining a **Diversity** of expertise and perspectives can also help to address the *Wickedness* of collaborative conservation problems with different ideas about what solutions are best in certain scenarios. Participants acknowledged that while this **Diversity** can partly be a source of some of the disagreements and *Conflict* that act as barriers to success, overall it is viewed as a net positive and a strength.

Relationships.

By far, the most commonly identified theme of KSFs was **Relationships**, containing two main categories: **Relationship Building** and **Information Management**. This theme was the most prevalent in every stakeholder group and, as a whole, appeared nearly twice as often as the next closest theme (**Leadership**). Participants often

mentioned it immediately when asked about what makes a partnership successful, and highlighted its critical importance with superlatives like “it all boils down to the **Relationships**” or “it all runs on the **Relationships**.” **Relationship Building** emerged as the most common of the two categories within this theme, highlighting the inherently human nature of these issues, as identified in the literature review. Participants discussed the importance of getting to know their partners on a personal level, which can help navigate the *Bureaucracy* that tends to bog down interagency and interorganizational collaborative efforts. Certain partnerships between agencies are mandated by regulation, but building and maintaining that relationship between official inspections or regulatory actions can make a significant impact. As one installation NRM stated,

I learned this a long time ago: When you call somebody, you ask them how they’re doing, and hopefully you know something about them. They own a boat, “Oh, have you been out in the boat lately?” Oh, you like fishing, “how’s fishing been? Oh, you just had a grandkid?” As silly as that sounds, that person now starts to own that relationship with you.

Building relationships on an interpersonal level like this requires the expenditure of time and effort, but provides the foundational bedrock of resolving *Conflicts*, shaping the *Human Element* of conservation in a positive manner, and improving the tension created by differences in *Culture* between stakeholder groups. Working to overcome these specific barriers to success by better understanding each other’s needs and goals reaps significant benefits in the form of Synergy and Improved Information within the partnership.

Within the category of **Relationship Building**, four sub-categories emerged throughout the data: **Early Involvement**, **Listening/Respect**, **Communication**, and **Trust**. To start, participants highlight the importance of involving key partners early in

the process of developing and planning a project, which can help to establish **Clear Objectives** and identify major problems that could cause delays at inopportune times later in the project (such as with permitting). Additionally, to address the complex *Human Element*, better buy-in can be fostered, “better partnership, better trust, if they see it being put together rather than just having it handed to them. They feel like they’re a part of its development rather than ‘here, here’s something good, just take it.’”

Developing that buy-in early is an important part of the **Relationship Building** process, considering that solid, productive, trusting relationships take a long time to build. Once established, and if maintained, partners can capitalize on that early buy-in later in a project when the inevitable challenges arise.

The next sub-category, **Listening/Respect**, is virtually a prerequisite for any type **Relationship Building** in any context; therefore, it is no surprise that it emerged as a KSF in DoD conservation partnerships, and it virtually needs no explanation. Mutual **Respect** and good **Listening** allows partners to productively work through the challenges of conservation partnerships, such as *Conflicting Priorities*, *Poor Information Sharing*, and *differing Scientific Interpretations*. Participants emphasized that **Listening** is critical to understanding what each partner truly values, which is necessary for clearly understanding their goals and objectives. This clear understanding, along with a **Mutual Respect** of the goals and objectives, is vital for coming to solutions that allow all sides to achieve their desired outcomes, and especially when deciding how to prioritize projects for funding.

The second-most prevalent sub-category within **Relationship Building** is **Trust**, which was represented across the spectrum of stakeholder groups. This comes as no

surprise, given the frequency of **Trust** appearing as a KSF in the literature review (Ansell & Gash, 2007; Bryson et al., 2006; K. Emerson et al., 2012; Leong et al., 2011; Stern & Coleman, 2015; Thomson & Perry, 2006). **Trust** is another fundamental element of healthy **Relationships** and productive partnerships that—just like most aspects of the complex *Human Element* of conservation issues—is much simpler in name than in practice. **Trust** comes in many forms (e.g., in collaborative natural resource management: dispositional, rational, affinitive, and procedural), and exists across multiple levels and referents (e.g., individual, team, and organizational), each with its own set of antecedents and consequences (Fulmer & Gelfand, 2012; Stern & Coleman, 2015). Further Stern and Coleman (2015) assert that **Trust** development is especially complex in collaborative natural resource management “as interests, values, and problem definitions often conflict, power distributions are not often equitable, and different forms of risk and vulnerability are not shared equally” (121). Therefore, a full elaboration of the **Trust** dynamics between stakeholders and across organizational, political, social, and natural boundaries is beyond the scope of this research.

However, interview participants did highlight the importance of **Trust** underscoring practically all **Relationship Building** efforts because, as one installation commander said, “if we don’t have that, it doesn’t matter what we say or how we say it.” This is representative of an overall belief that trust between stakeholders is built up over time, but yet can be broken in an instant. The risk of this happening is increased heavily by the fact that military leadership experiences so much *Turnover*. This point was emphasized by a DoD NRM in an informal conversation when describing the installation’s partnerships with local Native American tribes: “You get a CO who’s only

here for 2 years, and with one insult (because they don't get it and are rolling out soon), they could undo a decade of work.” This same sentiment was applied to the general public and surrounding communities, which operate under widely varying conceptions of **Trust** of the military. Participants also discussed aspects of **Trust** from a **Leadership** perspective, in terms of feeling comfortable to take risks knowing they have their leaders' support. This type of internal **Trust** was extended to the relationship between military stakeholders and NRMs within an organization, and is necessary for establishing a common sight picture regarding the **Compatibility** of each sides' goals and objectives. Through these various avenues, **Trust** directly contributes to a Net Benefit in terms of both military outcomes and conservation outcomes.

The final construct within the category of **Relationship Building** is **Communication**, which—taking into account the sum total of interviews and additional data—was the one factor identified as most critical to the success of DoD conservation partnerships. Even the participants, during the interviews, had sense of how important of a KSF **Communication** is, as evidenced by one DoD NRM's comment that “I think everyone would nod that communication's gotta be the biggest one.” While **Communication** exists in many forms, and will be discussed later in a different context, here the participants highlighted a type of open interpersonal dialogue that is both a product of and a key ingredient in the formation of strong **Relationships**. As one installation NRM offered,

I didn't get in a position like this because I'm a great biologist. I got to where I am because I'm able to talk to other people. I mean, God bless the biologists that are just the heady nerds that can really get in there and can just nerd it out. I love it, it's great . . . but it's really the interpersonal communication that can get you where you need to go from a larger land management standpoint.

All groups of stakeholders emphasized the importance of regular interaction in building the **Trust** that is necessary for resolving any *Conflict* that arises. Whether it is through an established schedule of interorganizational meetings, or simply an “open door policy” between an installation commander and the installation’s natural resources staff, this type of **Communication** is instrumental in developing an Improved Understanding between stakeholders, **Managing Expectations**, developing **Common Goals**, identifying challenges and a plan to overcome them, and balancing agendas in order to ensure a Net Benefit.

In addition to **Relationship Building**, the other main category to emerge within the theme of **Relationships** was **Information Management**, with three elements: **Scientific Integrity**, **Transparency**, and **Outreach**. As a KSF, **Scientific Integrity** is comprised of the participants’ beliefs regarding the importance of sound scientific processes within collaborative conservation frameworks. One DoD NRM highlighted this idea, stating

you need to be sure you do things technically right, that you document them, that you fill in information gaps in your knowledge through research, that you have technical review of what people are proposing to do, and so on and so forth, and all of that needs to be figured out.

Consistently utilizing these types of objective scientific processes can help overcome several common barriers to success. First, it helps to clarify the differences in *Scientific Interpretation* that can sometimes occur between different stakeholder groups.

Additionally, it can be a means of addressing the interpersonal dynamics present within the *Human Element* of conservation, as well as the differences in *Culture* that exist organizations with diverse purposes and missions. No matter the specific challenge that **Scientific Integrity** is employed to address, participants stressed its importance in the

process of producing the Improved Information and Expertise that accompany successful partnerships.

The second element within **Information Management** is **Transparency**, which exists on the other side of the same coin as **Trust**. Participants often mentioned **Trust** and **Transparency** in the same sentence, almost as synonyms; however, slight differences could be detected based on the context of the specific questions and responses. If **Trust** is focused on an interpersonal human relationship dynamic, **Transparency** is more of a management style, a structural process, or a characteristic of an organization. **Transparency** is certainly a key component of building **Trust** within a relationship, whether that relationship is external one (e.g., with the public or with the regulating agencies) or an internal one (e.g., between different installation functions, between a CO and the NRM staff, or between military trainers and the NRM office). One installation commander left no doubt when saying “There’s a **Transparency** and a **Trust** there that is a key component to success with partnerships period. Whether we’re talking here with the ones on the installation or the ones off the installation.” In terms of external relationships, participants highlighted the importance of being up front with regulating agencies if a mistake or violation occurs, which also strengthens relations with the general public and the local communities surrounding an installation. This Improved Understanding on the public’s behalf is a critical element of sustaining a partnership’s success in terms of maintaining the military’s Ability to Train and Preventing Further Delays in the future. For internal relationships, **Transparency** is a key component of that open dialogue highlighted by participants when discussing the importance of **Communication**. In this context, it is necessary for aligning *Conflicting Objectives*,

overcoming challenges by working together, and providing decision makers with

Improved Information and Expertise. One DoD NRM stressed the importance of being

transparent with his installation commander by telling him

is this a good project or a bad project, what would make this project better, all of those things and not being afraid to have that interaction. And give him the straight dope, give him the straight advice, ya know? I know you want this, but this may not be the best reason or best thing, and here's why I think that.

In underscoring two other critical KSFs, it is clear why **Transparency** developed as one of the main elements within the **Relationships** theme.

The final component to emerge within the category of **Information Management** was **Outreach**, representing this category's most commonly identified KSF. **Outreach** is comprised of two elements: 1) **External**, where DoD partnerships seek to educate the public and local communities about their responsibilities and conservation efforts; and 2) **Internal**, where DoD NRMs team up with installation leadership in order to educate and train installation personnel about their responsibilities and obligations. **External Outreach** efforts take on many different forms. Public meetings, hearings, news releases, field trips on base, and websites seek to educate communities that often times are completely unaware of the role the military plays in conserving the region's endangered species and other natural resources. These efforts are often a part of the National Environmental Protection Act (NEPA) process, which requires the opportunity for the public to comment on proposed actions and projects. Managing the misinformation that exists in the public sphere, especially regarding the military's role in the region, includes getting ahead of those stories by providing the facts with consistent **Transparency**. Being involved in the local communities can be a means of garnering support from not only the general public, but from potential funders as well. Further, **External Outreach**

can pay dividends in the form resiliency within a partnership that works to maintain the military's Ability to Train. As explained by one senior civilian NRM, “when there’s a crisis or something, if there’s enough of a critical mass of people in the community that understand what you’re trying to do, a small bump in the road doesn’t have to shut your program down.” Considering the unique **Environmental Ethic** of the region, educating the public about the military’s contributions to natural resource stewardship—and how those efforts are compatible with the military’s mission—goes a long way towards generating that support of the community.

Similar to the work that takes place outside the installation, **Internal Outreach** occurs within the fences in order to educate operational units who have to coexist with federally-listed endangered species and observe other natural resource regulations. Part of these efforts overlaps with the KSF of cultivating **Compatibility**, when trying to establish why the units need to care about respecting the military’s stewardship responsibilities. Often times, however, the education is more practically focused on the legal obligations of the installation to follow the regulations. As a part of a federal agency, military installations could face severe penalties, delays, and restrictions for violations of the Endangered Species Act or other federal natural resources statutes. Therefore, a challenge for NRMs and installation leadership is to determine how to best get the information to the lowest level that needs to know it. Working together to decide on the appropriate target audience and method of distribution—while managing the *Burden of Changing Regulations*—is critical to maintaining their installation’s Ability to Train and Preventing Further Delays. Another challenge for installation leadership is to

interpret and communicate any changes in the regulations, which occur frequently due to updated scientific knowledge, for example. As one installation commander phrased it,

The rules we have today are much, much different than we had 50 years ago, or 40 years ago, or even 10 years ago. So, it's part of life that you have to maintain continuing education, continuing training, and it's all part of the bigger picture.

Similar to the benefits of other **Internal Outreach**, this easing of the *Regulatory Burden* plays a large role in maintaining the military's Ability to Train in an environment relatively free from exorbitant regulations. Doing so, coupled with the efforts of **External Outreach**, is critical to the success of DoD conservation partnerships.

Conclusions

In light of the fact that in-depth analysis was conducted on three separate cases of DoD conservation partnerships, it is difficult to articulate the overall conclusions in a clear, succinct manner. While each case was studied individually, the research goal was not to necessarily understand each individual case or even to discuss the similarities and differences between them. Rather, due to its instrumental nature of this multiple-case study, the goal was to use the three cases to illuminate key themes and concepts about DoD conservation partnerships in general. With the replication logic used in the study design, the three cases were selected in part because they had all exhibited various measures of success before, leading to the prediction that similar key themes and concepts would emerge for each case. This prediction held true throughout the analysis of the interview data and the additional data, leading to the model (Figure 8) that depicts the dynamics of successful DoD conservation partnerships as a whole.

The overall research question asked what characteristics define successful DoD conservation partnerships, and how the various stakeholders capitalize on those characteristics to accomplish the objectives of the partnership. To answer this question, four investigative questions were developed. IQ 1a focused on the key factors that contribute to successful partnerships. As articulated in Table 8, the KSFs identified in this study are organized according to four main themes: Common Ground (Compatibility, Compromise, Conflict Resolution, and Functional Integration), Leadership (Dynamic and Managerial), Relationships (Relationship Building and Information Management), and Organizational Climate (Culture and Diversity). Question 2a addressed the biggest and most common challenges faced by such partnerships. According to the interview participants and additional data, the four main themes of challenges and barriers are also organized into four: Conflict (Conflicting Priorities, Poor Information Sharing, and Timescale Mismatch), Constraints (Funding, Personnel, and Time), Complexity (Human Element, Regulatory Burden, Science Interpretation, and Wicked Problems), and Organizational Features (CoC Distance, Bureaucracy, Culture, and Turnover). Finally, IQ 3a concentrated on what is considered success for a DoD partnership and its stakeholders. Three themes of Outcomes and Objectives emerged from the data: Military (Ability to Train, Improved Understanding, and Preventing Delays), Conservation (Species, Ecosystem, and Resource Stewardship), and Synergy (Improved Information and Expertise, Net Benefit, Flexibility, and Pooled Resources).

The remaining IQs tackled what Yin (2003) considered to be at the heart of case study research: the “how” questions. IQ 1b addressed how the KSFs are developed, fostered, and capitalized on, while IQ 2b focused on how the most successful DoD

conservation partnerships overcome the challenges they face. Finally, IQs 3b and 4 asked how a partnership contributes to the desired outcomes of the stakeholders, and how the partnership's characteristics contribute to the achievement of the partnership's objectives. While the "what" questions are answered neatly in Table 4, the complex answers to these last four "how" questions lie within the nuances of Figure 8. These tangled connections between the various elements in the model reveal a behind-the-scenes look at the subtle—yet intricate—dynamics of successful DoD conservation partnerships.

Significance and Implications of Research

As an instrumental case study, this research was never intended to assign cause and effect. Instead, three cases were studied in-depth in order to gain a better understanding of the dynamics of DoD conservation partnerships as a whole. The findings, however, align quite well with what the literature says regarding collaboration theory and the KSFs for effective collaboration (Table 1). Trust, communication, leadership, and commitment are all examples of KSFs that made frequent appearances in the literature as well as the interviews and additional data (Ansell & Gash, 2007; Bryson & Crosby, 2006; Emerson et al., 2012). In terms of collaborative conservation partnerships, this research contributes to the growing body of conservation social science. Specifically, it adds to the foundation laid by Wondolleck and Yaffee (2000), who conducted a comprehensive assessment of more than two hundred collaborative natural resource management initiatives over the course of a decade. No new, radical constructs or strategies for implementation were discovered; however, this is not surprising, as the range of possible answers for these IQs is really not very wide.

Table 4. Complete breakdown of the three components of successful DoD conservation partnerships, as modeled in Figure 8, where each bolded component represents the most commonly-identified element of its category

Key Success Factors	Challenges & Barriers to Success	Outcomes & Objectives
Common Ground • Compatibility ○ Mutual Benefit ○ Common Goals ○ Shared Values • Compromise • Conflict Resolution • Functional Integration	Conflict • Conflicting Priorities • Poor Information Sharing • Timescale Mismatch	Military • Ability to Train • Improved Understanding • Preventing Delays
Leadership • Dynamic ○ Importance of Key Leaders/Personnel ▪ Commitment/Passion ▪ Entrepreneurship ○ CoC Support ○ Vision • Managerial ○ Expectation Management ○ Funding ○ Clear Objectives/Processes	Constraints • Funding • Personnel • Time	Synergy • Improved Info & Expertise • Net Benefit • Flexibility • Pooled Resources
Relationships • Relationship Building ○ Early Involvement ○ Listening/Respect ○ Trust ○ Communication • Information Management ○ Outreach ▪ Internal ▪ External ○ Scientific Integrity ○ Transparency	Complexity • Human Element • Regulatory Burden • Science Interpretation • Wicked Problems	Conservation • Species • Ecosystem • Resource Stewardship
Organizational Climate • Culture ○ Environmental Ethic ○ Success Breeds Success • Diversity	Organizational Features • CoC Distance • Bureaucracy • Culture • Turnover	

For example, it comes as no surprise that trust, communication, and compatibility are at the heart of a process that is reliant on strong interpersonal relationships to succeed. This research nevertheless provided a unique setting to affirm the effectiveness of many of the same pillars of strong collaborative conservation partnerships.

Because of the DoD's unique role in the conservation of natural resources and protection of endangered species, this research imparts benefits to the DoD and the conservation world alike. Based on density, military lands harbor three times more federally-listed species than any other federal agency, and 380 installations have significant natural resources as defined by the Sikes Act (Stein et al., 2008; Boice, 2006). Given that in FY 2015 the DoD spent \$1.3 billion to comply with environmental law and \$377 million to protect natural and cultural resources (including over 400 federally-listed species), leaders and decision makers should be especially aware of how to encourage, promote, build, and capitalize on effective collaboration that occurs in this field (US Department of Defense, 2016). With this level of financial support and commitment, the DoD will benefit from any advancement of knowledge related to the dynamics of successful conservation partnerships.

Given that the objectives and benefits of these partnerships intersect with those of other federal agencies, state agencies, universities, and private conservation organizations, the utility of this research is not limited to the DoD alone. All of the stakeholders involved in conservation efforts with the DoD can benefit from these findings through an increased understanding of which KSFs define particularly successful partnerships. By knowing what characteristics to value, leaders and decision makers can allocate scarce resources (time, personnel, and funding) in a more effective manner, in

order to target particularly impactful factors. In doing so, organizations across the spectrum of stakeholders can efficiently and deliberately address key challenges. Being able to anticipate which barriers to success are most likely to arise in collaborative conservation efforts should allow stakeholders to develop proactive plans to overcome those barriers. Using Figure 8 as a baseline framework, partners can begin to articulate the nuanced complexities involved in the development and maintenance of conservation partnerships in order to accomplish their organizational objectives.

Limitations

As with any study, a certain amount of reflection reveals factors within the research design and data collection processes that can only be described as sub-optimal. For example, this study was designed under the baseline assumptions that collaborative partnerships are the best way to address conservation issues, that these types of conservation interventions are actually beneficial for the environment, and that humans should even be imposing their own interpretations of what is best for the Earth. In other words, this research left no room for any dissenting opinions about the efficacy of conservation partnerships, but rather framed the data collection in a way that only focused on the factors that contributed to success for the partnerships being studied.

In the same vein, the interview questions steadily imply (and explicitly say) that the three cases were selected due to their history of success, so it is not unreasonable to assume that some level of social desirability bias influenced the responses. By over reporting the positives and under reporting the negatives (due to the nature of the questions), it would be unlikely for an interview to possibly reveal that conservation

partnerships are not in the best interest of the military and the environment. This same effect likely also shaped the data analysis, given that qualitative research hinges on the researcher's interpretation of that data as influenced by accompanying biases, perspectives, and beliefs (as expanded in Chapter III). Further, regarding participant sampling, no true dissenters were included. Although interviews were sought with leadership from operational units and trainers, in an effort to seek out such dissenting opinions, follow-through was weak and the interviews never occurred. One SMO involved with training offered the closest thing to a dissenting opinion about conservation efforts in general, but his responses mainly focused on compromise and conflict resolution due to the direction that the questions pushed him.

Other limitations were introduced by not accounting for some effect of the power dynamic or power inequality relationship in the military chain of command and organizational structure. Even with anonymity being a condition for the interviews, in this setting participants were unlikely to identify leadership (for example) as a barrier to success. Also, no elements of public opinion were considered in a meaningful way, even though the local communities make up an entire stakeholder group that certainly effects the military's actions. Through housing developments and other commercial enterprises, the civilian population's encroachment around the installation's fences provides the impetus for much of the conservation intervention that takes place both within the installation and off-base through the purchase of easements. The public also effects the military's projects through the inclusion requirements of statutes like NEPA, as well as through litigation in some circumstances. Admittedly, this research did not do an

adequate job of considering those dynamics in the formation and implementation of DoD conservation partnerships.

Recommendations

Despite the limitations, the process of conducting this multiple-case study—along with its findings—provide a basis for recommendations for action and future research. First, even though the three cases that were studied focused much of their time and effort on endangered species protection, this model could be implemented to address other facets of natural resource management. For example, this framework could be applied to inform collaborative management of invasive species, which is a current focus of the DoD Natural Resources program. Considering the focus given to components of the human element (culture, relationship building, leadership) in this study, the same model could be applied in other contexts without much need for change. In terms of the outcomes and objectives being modeled, the synergy theme will likely still be appropriate, while the other two themes can be adapted to suit the needs of the prominent stakeholders.

Expanding the application of this model could even go beyond natural resources issues to be relevant in other endeavors that regularly cross organizational borders to accomplish their objectives. For example, humanitarian assistance/disaster relief (HA/DR) is a prime example of a DoD mission set where military organizations routinely work with other federal agencies, state agencies, and NGOs. These partnerships are largely analogous to DoD conservation partnerships, in that each stakeholder group must find common ground in order to overcome their challenges and accomplish their own

mission. In this sense, the model developed in this research would be largely applicable to these HA/DR partnerships due to its emphasis on compatibility, dynamic leadership, relationship building, and organizational culture as KSFs. Again, while synergy would likely remain a desired outcome for any partnership, the other groups of objectives could be tailored to fit the specific context and the dynamics of the model would remain largely unaffected.

In terms of future research, this study illuminated numerous ideas that seem worth pursuing in further efforts. First, a study to determine individuals', partnerships', or installations' motivation to go beyond mere environmental compliance would be worthwhile. While this study considered the environmental ethic of the region at a very surface level, a deep examination of the political, social, and cultural contexts of conservation partnerships and how those factors influence the success of the partnership would be valuable. Next, the study of a negative case, as recommended by Yin (2003), would provide a control in order to inform the efficacy of the model produced in this study. Although positive cases with notably successful partnerships were deliberately selected, studying an installation with notably poor or failing conservation partnerships would provide a useful look at the other side of the coin.

Additionally, trust was highlighted as a major KSF, but a comprehensive investigation of this topic was beyond the scope this research. Therefore, a deeper dive on trust would be informative, such as examining the components of trust theory (antecedents, relevant forms of trust, and intervening factors) specific to DoD conservation partnerships (Stern & Coleman, 2015).

Considering the fundamental human nature of conservation partnerships (relationships was the most commonly identified KSF), an examination of the social network dynamics of collaborative conservation would highlight which specific relationships are most important in determining the success of a particular partnership effort. Finally, due to the limits on the scope of this research, no meaningful analysis was included of the public's impact as a stakeholder. Participants—SMOs, particularly—emphasized the importance of having the support of public opinion. Therefore, a large-scale study of the opinions and attitudes of the local communities (both inside the installation and outside), and their effects on the success of partnerships, would be valuable.

Final Thoughts

While costs and drawbacks do exist, the benefits of conservation partnerships that were illuminated through this research seem so evident that they would be difficult to argue against no matter where one stands on the stakeholder spectrum. While the military sustains an enhanced ability to train in realistic, healthy environments well into the future, conservationists are better able to implement the necessary interventions to protect endangered species, preserve ecosystems, and promote resource stewardship. Additionally, the synergy produced—particularly through pooled resources and improved expertise—allows the partnership to achieve more together than any individual stakeholder could have achieved alone. Therefore, the mutualism that characterizes this surprising symbiosis should continue to be pursued and prioritized at installations throughout the DoD.

Appendix A—AFIT Institutional Review Board Exemption Approval



DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY
WRIGHT-PATTERSON AIR FORCE BASE OHIO

15 Aug 2017

MEMORANDUM FOR Maj Benjamin T. Hazen, PhD (AFIT/ENS)

FROM: Brett J. Borghetti, Ph.D.
AFIT IRB Exempt Determination Official
2950 Hobson Way
Wright-Patterson AFB, OH 45433-7765

SUBJECT: Exemption determination on exemption request from human experimentation requirements (32 CFR 219, DoDD 3216.2 and AFI 40-402) for "Examining Successful Conservation Partnerships on Military Installations Research Study", dated 14 Aug 2017.

1. Your request was for exemption based on the Code of Federal Regulations, title 32, part 219, section 101, paragraph (b) (2) Research activities that involve the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior unless: (i) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) Any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.
2. Your study **qualifies for this exemption** because your survey was recorded in such a way that human subjects cannot be identified, directly or through identifiers linked to the subjects.
3. This determination pertains only to the Federal, Department of Defense, and Air Force regulations that govern the use of human subjects in research. This determination is only for the research outlined in the exemption request letter. If the research changes from what was described in the request letter, or the data received is determined to be different than described in the request letter (e.g. unexpected identifying information is discovered in the data), please cease research efforts immediately and contact me as soon as possible for determining course of action.

8/15/2017

X 

Signed by: BORGHETTI, BRETT J. 1009082820
BRETT J. BORGHETTI, Ph.D.
AFIT Exempt Determination Official

Appendix B—Case Study Protocol

TALKING PAPER ON

DoD CONSERVATION PARTNERSHIPS RESEARCH PROJECT

- The purpose of this talking paper is to introduce a research study being conducted by the Air Force Institute of Technology (AFIT). The objective of the study is to uncover the characteristics that define successful conservation partnerships on military installations. The best practices revealed from this study will help diverse stakeholders, such as DoD natural resource managers and military leadership, forge successful partnerships and achieve their own organizational objectives.

- Issue / Research Problem Statement

- The importance of conserving of our nation's natural resources—namely, its biodiversity—has been formalized with numerous key pieces of legislation, such as the Sikes Act of 1960 and the Endangered Species Act of 1973, throughout the past five decades. Although ethical and aesthetic reasons are undoubtedly relevant, the more tangible value of biodiversity can be thought of broadly as the set of ecosystem services which it offers: provisioning services such as providing food, medicine, and fuel; regulating services to include the modulation of diseases and water purification; and cultural services such as aesthetic, recreation, and educational values.

- The DoD has an especially important role to play, with its 29 million acres of land. Shielded from the effects of rapidly spreading suburbanization, housing developments, and strip malls, DoD lands have become havens for biodiversity that must now be managed and protected. To illustrate the magnitude of the issue, 425 federally-listed threatened or endangered species (TES) can be found on DoD lands in total, and military lands harbor three times as many TES per unit area as any other federal agency. The challenge, then, faced by every DoD installation is to manage its federally-mandated natural resource stewardship responsibilities along with its primary military mission. One of the keys to accomplishing this balancing act is the formation of interorganizational partnerships in support of sound, collaborative, proactive conservation efforts that can directly eliminate a significant compliance, consultation, and administrative burden.

- Research Objectives

- Uncover the characteristics of the most successful DoD natural resource conservation partnerships.

- Determine how such partnerships are leveraged to help each stakeholder achieve their organizational objectives.

- Research Methodology

- Semi-structured interviews, content analysis of organizational documents

- Points of Contact

-- Principal Investigator, Maj Benjamin Hazen, Associate Professor, AFIT, Department of Operational Sciences: benjamin.hazen@afit.edu or (937) 255-3636 x4337.

CONSENT TO PARTICIPATE IN INTERVIEW

DoD CONSERVATION PARTNERSHIPS RESEARCH PROJECT

You have been asked to participate in a research study conducted by researchers from the Air Force Institute of Technology (AFIT), Graduate School of Engineering and Management, Department of Operational Sciences. The main purpose of the project is to uncover the characteristics of successful DoD natural resource conservation partnerships and how stakeholders capitalize on them to accomplish their objectives. The results of this study will be included in a thesis report and briefing, as well as possible research publications. You were selected as a possible participant in this study because of your knowledge of and experience with natural resource conservation partnerships on military lands. Please read the information below and ask questions about anything you do not understand before deciding whether or not to participate.

- This interview is voluntary. You have the right not to answer any question, and to stop the interview at any time or for any reason. I expect that the interview will take 30-60 minutes.
- You will not be compensated for this interview.
- The information you tell us will be kept confidential.
- I would like to record this interview so that I can transcribe it and use it for analysis as part of this study. I will not record this interview without your permission. If you grant permission for this conversation to be recorded, you have the right to revoke permission and/or end the interview at any time.
- Data collection for this project will be completed by December 2017. All interview documents will be stored in a secure work space until 1 year after that date. The documents will then be destroyed.

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

(Please initial)

[] I give permission for this interview to be recorded and transcribed.

Name of Subject:

Signature of Subject _____ Date _____

Signature of Investigator _____ Date _____

Please contact Maj Hazen with any questions or concerns at benjamin.hazen@afit.edu or 937-255-3636 x4337.

Questions for Natural Resource Managers

1. What are the main objectives in your position? Does the installation's military mission impact your ability to successfully meet those objectives?
2. How do you feel those objectives should be balanced with the installation's primary mission and military training objectives?
3. How would you rate the quality of your partnerships with the base military leadership? Can you elaborate?
4. How would you rate the level of support you receive, towards accomplishing your conservation objectives, from the base's military leadership? Can you elaborate?

Questions for Military Leadership/Trainers/Operators

5. What are the main objectives in your position? Do any natural resources conservation issues impact your ability to successfully meet those objectives?
6. How do you feel your objectives should be balanced with the conservation issues?
7. How would you rate the quality of your partnerships with the base natural resources managers? Can you elaborate?
8. How would you rate the level of support you receive towards accomplishing your primary military mission from the natural resources managers? Can you elaborate?

Questions for All Interviewees

9. How is the effectiveness of DoD conservation programs measured? What would you say defines success?
10. What do you believe, if any, are the benefits derived from DoD conservation partnerships?
11. What are the biggest/most prominent strengths or key success factors that enable successful DoD conservation partnerships?
12. How are these strengths fostered, developed, and capitalized on?

13. What are the biggest/most prominent challenges facing conservation efforts/partnerships on DoD lands?
14. How do the most successful partnerships overcome these barriers?
15. What are the characteristics of a DoD partnership that supports each stakeholder in accomplishing their objectives?

Appendix C—Complete Code System

Codebook

2/22/2018

Code System

1 Key Success Factors	0
1.1 Common Ground	0
1.1.1 Compatibility	54
1.1.1.1 Mutual Benefit	22
1.1.1.2 Common Goals	9
1.1.1.3 Shared Values	4
1.1.2 Compromise	7
1.1.3 Conflict Resolution	9
1.1.4 Functional Integration	8
1.2 Leadership	0
1.2.1 Dynamic	0
1.2.1.1 Importance of Key Leaders/Personnel	25
1.2.1.1.1 Commitment/Passion	28
1.2.1.1.2 Entrepreneurship	13
1.2.1.2 CoC Support	7
1.2.1.3 Vision	7
1.2.2 Managerial	0
1.2.2.1 Expectation Management	7
1.2.2.2 Funding	12
1.2.2.3 Clear Objectives/Processes	10
1.3 Relationships	0
1.3.1 Relationship Building	33
1.3.1.1 Early Involvement	6
1.3.1.2 Listening/Respect	15
1.3.1.3 Trust	32
1.3.1.4 Communication	57
1.3.2 Information Management	0
1.3.2.1 Outreach	0
1.3.2.1.1 External	50
1.3.2.1.2 Internal	18
1.3.2.2 Scientific Integrity	4
1.3.2.3 Transparency	21
1.4 Organizational Climate	0
1.4.1 Culture	6
1.4.1.1 Environmental Ethic	8
1.4.1.2 Success Breeds Success	6

1.4.2 Diversity	11
2 Challenges & Barriers	0
2.1 Conflict	0
2.1.1 Conflicting Priorities	14
2.1.2 Information Sharing	11
2.1.3 Time-scale Mismatch	13
2.2 Constraints	0
2.2.1 Funding	15
2.2.2 Personnel	5
2.2.3 Time	3
2.3 Complexity	0
2.3.1 Human Element	11
2.3.2 Regulatory Burden	4
2.3.3 Scientific Interpretation	2
2.3.4 Wicked Problems	3
2.4 Org. Features	0
2.4.1 CoC Distance	7
2.4.2 Bureaucracy	11
2.4.3 Culture	14
2.4.4 Turnover	17
3 Objectives/Outcomes	0
3.1 Conservation Benefits	0
3.1.1 Ecosystem/Habitat	28
3.1.2 Species	26
3.1.3 Resource Stewardship	13
3.2 Military Benefits	0
3.2.1 Ability to Train	53
3.2.2 Preventing Delays	33
3.2.3 Improved Understanding	13
3.3 Synergy	0
3.3.1 Net Benefit	78
3.3.2 Improved Information/Expertise	25
3.3.3 Flexibility	9
3.3.4 Pooled Resources	43
4 Future Research	5
5 Success Defined	34
6 Partnership Quality	14
7 Partnership Example	77

7.1 Buffering/Encroachment/REPI	36
8 Role/mission	37
9 Legal/Regulatory Obligation	42
10 Interview 16	0
10.1 P1	14
10.2 I	16
10.3 P2	17
11 Interview 10_Focus Group	0
11.1 I	22
11.2 P1	20
11.3 P2	22
11.4 P3	22

1 Key Success Factors

Used to identify the key characteristics highlighted as critical to a successful cooperative conservation partnership. This category basically also includes strategies for overcoming the barriers and challenges that are identified. In other words, saying "this is what successful partnerships do" is the same as saying "this is a strategy that successful partnerships use to overcome that barrier." Overcoming barriers is success and being successful is overcoming barriers.

1.1 Common Ground

Highlights instances where participants discussed the importance of different stakeholders in a partnership working together to find common ground. Subcategories include Compatibility, Compromise, Conflict Resolution, and Functional Integration.

1.1.1 Compatibility

Instances of participants identifying the importance of cultivating compatibility through the subcategories of Mutual Benefit, Common Goals, and Shared Values. Also refers to instances of identifying success as both parties accomplishing their objectives.

1.1.1.1 Mutual Benefit

Emphasizes the KSF where all stakeholders receive a benefit from the partnership.

1.1.1.2 Common Goals

Where participants emphasize the importance of stakeholders actually having common goals (as opposed to just a vague notion of compatibility).

1.1.1.3 Shared Values

Shows instances of participants emphasizing the need for all stakeholders to share similar values, which inform their actions of cultivating compatibility.

1.1.2 Compromise

Highlights segments where participants identified the ability to compromise as a KSF. Note of interest: occurs more frequently with SMOs, perhaps indicating a difference in mindset between military officials and NRMs.

1.1.3 Conflict Resolution

Shows where the ability to resolve conflict successfully is identified as a KSF. This includes having a mediator/facilitator present at meetings, etc.

1.1.4 Functional Integration

Shows segments where participants highlight functional integration (mainly in-vivo) as a KSF.

1.2 Leadership

Shows where participants highlight Leadership as a key factor for successful partnerships. Subcategories include Dynamic Leadership and Managerial Leadership.

1.2.1 Dynamic

Shows passages emphasizing dynamic, interpersonal, influential leadership as a KSF. Subcategories include the Importance of Key Leaders/Personnel, Chain of Command Support, and Vision.

1.2.1.1 Importance of Key Leaders/Personnel

Instances of the importance of key leaders and other personnel being identified as KSFs for conservation partnerships. This highlights the enormous impact that individuals can have on the success of partnership and conservation efforts.

1.2.1.1.1 Commitment/Passion

Includes segments about commitment and passion, as well as persistence. Could also include "support," prioritizing, or accountability. Also, effort, "going the extra mile", and ownership.

1.2.1.1.2 Entrepreneurship

Includes segments about entrepreneurial behavior being a KSF for partnerships. Also includes bits about creativity, problem solving, initiative, flexibility, etc. Consider combining this with vision, motivation, commitment.

1.2.1.2 CoC Support

Segments where participants talked about the importance of having support from the more elevated levels of the chain of command.

1.2.1.3 Vision

Segments about the importance of a partnership having a clear vision of what is success and how it will be achieved.

1.2.2 Managerial

Shows passages highlighting Managerial Leadership as a KSF for successful partnerships. Subcategories include Expectation Management, Funding, and Clear Objectives/Processes.

1.2.2.1 Expectation Management

Segments where participants talked about leaders needing to manage expectations on both sides of the

military-conservation partnerships.

1.2.2.2 Funding

Segments emphasizing the all-important role of available resources (money) in enabling partnerships to succeed.

1.2.2.3 Clear Objectives/Processes

Where participants emphasized the need for leaders to lay out clear objectives for a partnership and establish clear processes to be followed.

1.3 Relationships

Theme of KSFs that emphasizes the critical role that Relationships play in the success of DoD conservation partnerships. Subcategories include Relationship Building and Information Management.

1.3.1 Relationship Building

Highlights segments about the importance of building relationships, both internal to the installation and external with the local community and public. Subcategories include Early Involvement, Listening/Respect, Trust, and Communication.

1.3.1.1 Early Involvement

Where participants highlighted the importance of involving key partners early on in the process to establish rapport and prevent costly delays when a project is further along.

1.3.1.2 Listening/Respect

Mainly self-explanatory, highlighting listening and respect within a partnership as a KSF. Also includes bits about collaboration and having a collaborative mindset.

1.3.1.3 Trust

Used to highlight instances of trust being identified as a key success factor for conservation partnerships. Trust and transparency are really two sides of the same coin... trust is what is developed between people--the human dynamic, the human element--whereas transparency is more of a management style, a process, a piece of bureaucracy, a characteristic of an organization or process.

1.3.1.4 Communication

Highlights instances of regular interaction and communication being identified as a key success factor for conservation partnerships. Key facets include regular interaction, open dialogue, etc.

1.3.2 Information Management

Shows segments emphasizing the role that proper information management plays in the success of partnerships. Subcategories include Outreach, Scientific Integrity, and Transparency.

1.3.2.1 Outreach

Includes passages about the importance of spreading the word about an installation's NR management and stewardship responsibilities and how they are integrated with and integral to the mission. Subcategories include External Outreach and Internal Outreach.

1.3.2.1.1 External

Shows where participants emphasized communicating with the public and local community.

1.3.2.1.2 Internal

Shows where participants highlighted the importance of outreach within the installation's boundaries, in terms of training and education (in addition to more traditional forms of outreach, as well).

1.3.2.2 Scientific Integrity

Emphasizes the need in a partnership to practice productive conservation and natural resource management based on sound scientific principles.

1.3.2.3 Transparency

Mainly focused on relationships with the public, but also includes bits about transparency with coworkers, other partners and lower levels of the organization (e.g., the soldiers), and being up front with regulators.

1.4 Organizational Climate

Highlights passages talking about various aspects of the organization's climate as a KSF for productive DoD conservation partnerships. Subcategories include Culture and Diversity.

1.4.1 Culture

Highlights a culture of environmental stewardship, going beyond mere compliance, etc. This applies to both the culture of the organization (military unit, NGO, etc.) as well as the local community. Subcategories include Environmental Ethic and Success Breeds Success.

1.4.1.1 Environmental Ethic

Highlights the unique environmental/conservation ethic of the region, as it relates to successful partnerships.

1.4.1.2 Success Breeds Success

Shows segments that highlight the phenomenon that success in partnerships leads to more success, and so on. A successful partnership garners attention, which results in increased funding levels, which then results in more successful partnership efforts (for example).

1.4.2 Diversity

Diversity of background, experience, and expertise (i.e., diverse, inclusive, wide-ranging, encompassing, etc.). Such diverse sets of values mean that multiple different forms of trust are important.

2 Challenges & Barriers

Identifies the various instances of challenges and barriers to successful cooperative partnerships. Being aware of the challenges and barriers that commonly plague partnerships like this can make stakeholders aware of what to predict, and can allow them to put structures, processes, and procedures in place to proactively prevent unproductive partnerships. Subcategories include Conflict, Constraints, Complexity, and Organizational Features.

2.1 Conflict

Highlights instances of conflict being identified as a barrier to successful cooperative partnerships. This is not necessarily about the type of confrontational/interpersonal conflict, but includes subcategories of Conflicting Priorities, Information Sharing, and Time-scale Mismatch.

2.1.1 Conflicting Priorities

Shows segments where participants highlighted conflicting priorities as a barrier to success.

2.1.2 Information Sharing

Highlights instances of poor information sharing being identified as a barrier to successful cooperative partnerships. Also includes a lack of understanding of another group's processes (e.g. why can't we just push this permit through faster?). Includes mentions of education and training as well.

2.1.3 Time-scale Mismatch

Highlights instances of a time-scale mismatch being identified as a challenge or barrier to successful cooperative partnerships. This mismatch usually occurs between military objectives (focused on short-term targets) and conservation objectives (focused on long-term targets).

2.2 Constraints

All different types of constraints that were highlighted as particular challenges for partnerships to overcome. Subcategories include Funding, Personnel, and Time.

2.2.1 Funding

Not only lack of funds, but also the fluctuations in funding levels that make long-term planning and sustainment difficult and the different legalities of how certain money can be spent and combined with other funds.

2.2.2 Personnel

Shows how a lack of sufficient numbers of qualified personnel is a barrier to successful partnerships.

2.2.3 Time

Details the challenge of time constraints in accomplishing everything that is necessary for successful collaborative conservation.

2.3 Complexity

Complexity refers to the massive amounts of ever-changing rules and regulations, that are based on ever-changing science, that are interpreted and implemented by ever-changing leaders and politicians with different perspectives and trust levels and personalities. This code absorbed Scientific Interpretation in the second iteration of emergent coding because instances of different parties interpreting the science in different ways is a prime example of the complexity of implementing environmental policy/law. This code also absorbed 'personalities' in the second iteration and combined it with a new code (Human Element) for the same reasons as above. In addition to Human Element, two other codes were added to the Complexity theme: Wicked Problems and Regulatory Burden.

2.3.1 Human Element

Absorbed 'personalities' in second iteration of emergent codes. This code includes all instances of the human element complicating conservation: different attitudes, perspectives, backgrounds, experiences, and perceptions of various stakeholders, to include the public. Could possibly be combined with 'culture,' as culture is a human construct that is interpreted and perceived by groups and individuals in different ways. In so many instances, the success or failure of a program (which, in turn, has far-reaching, long-term, second- and third-order consequences) hinges on the personality of one (or two) individuals.

2.3.2 Regulatory Burden

Highlights the sheer volume of regulations surrounding environmental programs, conservation, and partnerships, along with the ever-changing nature of those regulations. Some of the rule changes are related to regulations about funding, such as how projects get prioritized for funding.

2.3.3 Scientific Interpretation

Refers to the differences in interpretation of the science that sometimes complicates conservation partnerships.

2.3.4 Wicked Problems

Conservation in general, and ecosystem management, is a wicked problem. This is closely related to the

human element.

2.4 Org. Features

Highlights various characteristics of an organization that act as barriers to success for partnerships. This code was created on the second iteration of emergent coding and absorbed Turnover, Bureaucracy, Culture, and Organizational Detachment (which was changed to CoC Distance) as sub-categories.

2.4.1 CoC Distance

This code refers to instances of the Chain of Command having a fundamental misunderstanding of the situation, usually as a result of being too far removed.

2.4.2 Bureaucracy

Highlights instances of participants talking about the typical bureaucratic processes that act as a barrier to smooth, effective, efficient collaborative conservation.

2.4.3 Culture

This code is applied to statements concerning the differences between stakeholders in organizational culture, assumptions about other groups, or even political climate/environment. Includes military culture, as well as the environmental ethic culture.

2.4.4 Turnover

This code will be used to highlight instances of interviewees identifying high personnel turnover rates as a challenge or barrier to successful partnerships. New personnel are a challenge because, as also identified by this analysis, trust and relationship building are so important to these processes. Trust and relationship building take time and persistent, consistent effort, so new personnel rotating in to either side of a partnership immediately creates a blank slate that must be acknowledged and necessitates an entirely new trust- and relationship-building effort.

3 Objectives/Outcomes

Shows the desired/intended outcomes and objectives of conservation partnerships, which inform the benefits of such partnerships. Subcategories include Conservation Benefits, Military Benefits, and Synergy. Some of these codings come from questions like "what is success?" and "what is your mission/role/goal/objectives?" because the answers inherently imply what the benefits of partnerships are. Assuming that everyone is acting in a manner they believe is beneficial to their organization, then saying "this is the goal of entering into this partnership" implies that the outcome of accomplishing that goal is a benefit of that partnership. Additional benefits include the ability to provide eco-therapy to combat veterans and inmates through the Veteran Conservation Corps and Sustainability in Prisons Project.

3.1 Conservation Benefits

Highlights the benefits of partnerships concerning conservation objectives, focusing on the Ecosystem/Habitat level, the Species level, and a general promotion of Resource Stewardship.

3.1.1 Ecosystem/Habitat

Shows segments highlighting the prevention of land development, number of acres protected, larger landscape-scale conservation efforts.

3.1.2 Species

Segments that emphasize the protection of individual species or the benefits of partnerships that impact individual species.

3.1.3 Resource Stewardship

Highlights how conservation partnerships promote an attitude of and a belief in natural resource stewardship.

3.2 Military Benefits

Shows segments highlighting the benefits that the military receives from conservation partnerships, including an enhanced Ability to Train in realistic/healthy environments, a Prevention of Further Delays/Restrictions, and an Improved Understanding of the military's mission and stewardship responsibilities.

3.2.1 Ability to Train

Highlights how conserving natural resources on military lands enhances the ability to train in healthy, realistic, sustainable environments.

3.2.2 Preventing Delays

Emphasizes how good and proper conservation compliance prevents further delays/restrictions, in terms of training/operations or projects on the base (construction, etc.).

3.2.3 Improved Understanding

Shows how conservation partnerships produce an improved understanding of the military's mission and stewardship responsibilities. Could include national recognition, awareness, understanding, improved perceptions, etc. All of these positive improvements can facilitate public cooperation/participation, reduce the chance of further delays, build new partnerships and synergies, etc. Reduces angst, anger, and misperceptions in order to prevent future lawsuits/interference.

3.3 Synergy

Segments emphasizing the objectives/benefits of partnerships where each partner is able to achieve more

together than it would have been able to achieve alone.

3.3.1 Net Benefit

Instances where subject mentioned the simultaneous benefits for both 'sides': shifting the conservation burden off-base (and thus enhancing the military's ability to train and operate by removing/reducing restrictions and delays), as well as improving the overall status of the species. Could be a means to incorporate the 'Compatibility' codings as well.

3.3.2 Improved Information/Expertise

Could include the creation of additional partnerships or professional networks (which facilitate further knowledge sharing and improved information for all parties involved), or access to agencies/individuals. Can lead to program resiliency, as in, "if there's enough of a critical mass of people in the community that understand what you're trying to do, a small bump in the road doesn't have to shut your program down for six months or something like that." Includes organizational learning.

3.3.3 Flexibility

Shows segments where conservation partnerships resulted in increased flexibility for the partners to find creative solutions.

3.3.4 Pooled Resources

Emphasizes the objective/benefit of partnerships where the partners enjoy the combined resources of all stakeholders. Could include financial resources, personnel, or time.

4 Future Research

Shows segments that could produce ideas for recommended future research.

5 Success Defined

Responses to the question "What defines success for a conservation partnership?" Informs benefits/objectives for the partnership.

6 Partnership Quality

Highlights segments where participants described the quality of the partnerships in which they're currently stakeholders.

7 Partnership Example

IDs specific examples of DoD conservation partnerships in action, which could be used at the beginning of the analysis to set the stage. These codings could also be incorporated throughout the rest of the write-up to provide real-world context for whatever is being discussed.

7.1 Buffering/Encroachment/REPI

Encompasses a broad range of ideas, including issues with encroachment on DoD installations, the buffering efforts to combat that encroachment, and the successes/challenges of the REPI program. This is a broad group of Partnership Examples, but also provides deeper information about why these programs are successful, etc.

8 Role/mission

IDs when an interviewee describes his or her role and position. Could be used to help write a summary about the interview participants and their roles/positions. Also, do I need to include a blurb about the mission at each installation? Will be used to provide context for the analysis.

9 Legal/Regulatory Obligation

Highlights where participants mentioned their legal or regulatory obligation to conserve the installation's natural resources.

10 Interview 16

Organizational code for Interview 16, which contained multiple participants.

10.1 P1

Organizational code, showing Participant 1's responses.

10.2 I

Organizational code, showing the Interviewer's parts.

10.3 P2

Organizational code, showing Participant 2's responses.

11 Interview 10_Focus Group

Organizational code for Interview 10, which contained multiple participants.

11.1 I

Organizational code, showing the Interviewer's responses.

11.2 P1

Organizational code, showing Participant 1's responses.

11.3 P2

Organizational code, showing Participant 2's responses.

11.4 P3

Organizational code, showing Participant 3's responses.

A Surprising Symbiosis: Examining The Mutualism in DoD Conservation Partnerships



Problem Statement

Because of the DoD's unique and significant role in the conservation of natural resources, military leaders and natural resource managers need a trail guide to frame interagency collaboration in a way that shapes successful partnerships.

Introduction

While the objectives of conservation biologists and the DoD may seem contradictory at first, deeper examination reveals a more nuanced relationship. DoD installations across the globe implement ecosystem management principles in coordination with diverse stakeholders to ensure that military operations and natural resource conservation efforts are integrated and consistent with stewardship and legal requirements, all without any net loss in the support of the installation's unique military mission (US Fish and Wildlife Service, 2004). Therefore, leaders engaged in the complex efforts of biodiversity conservation on military lands need to know how to forge productive, effective partnerships across institutional boundaries. By identifying the common characteristics present in the most successful of these multi-faceted collaborations, this research seeks to assist those leaders in realizing the interconnectedness of their seemingly contradictory objectives in order to accomplish their own organizational goals.

Research Objectives

- What are the key success factors that lead to effective DoD conservation partnerships?
- What are the most prominent challenges faced in collaborative DoD conservation efforts?
- What are the primary objectives for each stakeholder? What is considered success?
- How do partnership characteristics contribute to the achievement of each partner's objectives?



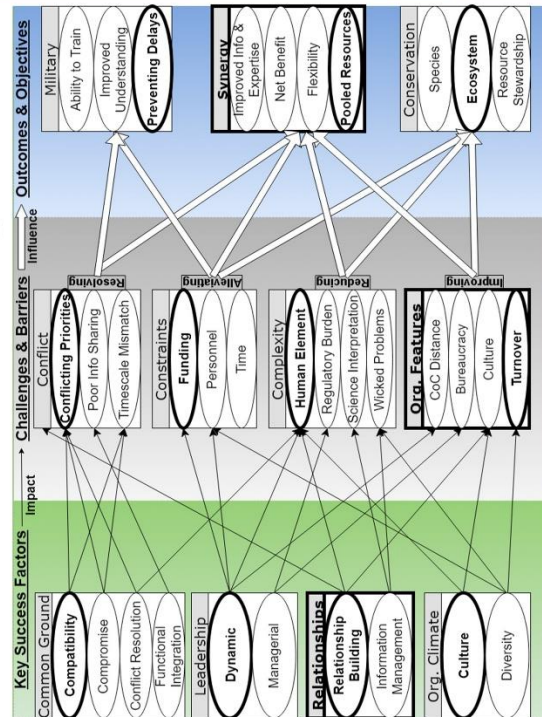
Capt Andrew J. Lankow

Advisor: Maj Benjamin T. Hazen, PhD

Reader: Col Matthew A. Douglas, PhD

Department of Operational Sciences (ENS)

Air Force Institute of Technology



Significance and Implications

- Provides a unique setting to affirm the effectiveness of many of the same pillars of strong conservation partnerships, such as compatible objectives, trust, and communication
- Given DoD's financial support of and legal obligation to the conservation of natural resources, leaders and decision makers should be especially aware of how to encourage, promote, build, and capitalize on effective collaboration that occurs in this field
- By knowing what characteristics to value in addressing key challenges, stakeholders can more effectively and efficiently allocate scarce resources to ecosystem management

Methodology

- The research questions were answered through a comprehensive literature review and the use of the multiple-case study method
- 19 key informants from Joint Base Lewis-McChord, Naval Base Kitsap, and Naval Air Station Whidbey Island participated in semi-structured interviews
- The solicitation of documentation and archival records from the same installations provided additional information
- Data was organized and analyzed for key themes using MAXQDA12

Limitations

- By focusing on key success factors, this research left no room for dissenting opinions about the efficacy of conservation partnerships
- Some degree of social desirability bias likely shaped participants' responses, as well as the analysis of the data
- Did not include inputs from the public as a stakeholder group

Recommendations

- Implement the model to address other facets of natural resources, such as invasive species management
- Adapt the model to other fields where interorganizational collaboration is prominent, such as humanitarian assistance/disaster relief
- Conduct a study of a negative case, or an installation with notably underperforming conservation partnerships, as a control
- Examine the social network dynamics of collaborative conservation to highlight which relationships are most important for success

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Amel, E., Manning, C., Scott, B., & Koger, S. (2017). Beyond the roots of human inaction: Fostering collective effort toward ecosystem conservation. *Science*, 356(6335), 275–279.
- Ansell, C., & Gash, A. (2007). Collaborative Governance in Theory and Practice. *Journal of Public Administration Research and Theory*, 18, 543–571.
- Armitage, D. R., Plummer, R., Berkes, F., Arthur, R. I., Charles, A. T., Davidson-Hunt, I. J., Diduck, A. P., Doubleday, N. C., Johnson, D. S., Marschke, M., McConney, P., Pinkerton, E. W., & Wollenberg, E. K. (2009). Adaptive co-management for social-ecological complexity. *Frontiers in Ecology and the Environment*, 7(2), 95–102.
- Balmford, A., Bruner, A., Cooper, P., Costanza, R., Farber, S., Green, R. E., Jenkins, M., Jefferiss, P., Jessamy, V., Madden, J., Munro, K., Myers, N., Naeem, S., Paavola, J., Rayment, M., Rosendo, S., Roughgarden, J., Trumper, K., & Turner, R. K. (2002). Economic Reasons for Conserving Wild Nature. *Science*, 297, 950–953.
- Ban, N. C., Mills, M., Tam, J., Hicks, C. C., Klain, S., Stoeckl, N., Bottrill, M. C., Levine, J., Pressey, R. L., Satterfield, T., & Chan, K. M.A. (2013). A social-ecological approach to conservation planning: Embedding social considerations. *Frontiers in Ecology and the Environment*, 11(4), 194–202.
- Batavia, C., & Nelson, M. P. (2017). For goodness sake! What is intrinsic value and why should we care? *Biological Conservation*, 209, 366–376.
- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, 13(4), 544–559.
- Bennett, N. J., Roth, R., Klain, S. C., Chan, K., Christie, P., Clark, D. A., Cullman, G., Curran, D., Durbin, T. J., Epstein, G., Greenberg, A., Nelson, M. P., Sandlos, J., Stedman, R., Teel, T. L., Thomas, R., Verissimo, D., & Wyborn, C. (2017). Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation*, 205, 93–108.
- Bennett, N. J., Roth, R., Klain, S. C., Chan, K. M. A., Clark, D. A., Cullman, G., Epstein, G., Nelson, M. P., Stedman, R., Teel, T. L., Thomas, R. E. W., Wyborn, C., Curran, D., Greenberg, A., Sandlos, J., & Verissimo, D. (2016). Mainstreaming the social sciences in conservation. *Conservation Biology*, 31(1), 56–66.
- Benton, N. (2004). *Species at Risk on Department of Defense Installations: Revised Report and Documentation*. Retrieved from <http://www.natureserve.org/species->

risk-department-defense-installations

- Boice, L. P. (1996). Endangered species management on US Air Force lands. *Endangered Species Update*. Retrieved from <http://www.umich.edu/~esupdate/library/96.09/boice2.html>
- Boice, L. P. (2003). Developing new conservation partnerships: Expanding opportunities for integrating resource stewardship and mission requirements. *Federal Facilities Environmental Journal*, 14(2), 21–27.
- Boice, L. P. (2006). Defense and conservation: Compatible missions. *Endangered Species Bulletin*, XXXI(2), 4–7. Retrieved from http://www.dodpif.org/downloads/articles/ESB_2006_04-07.pdf
- Bouwen, B., & Taillieu, T. (2004). Multiparty collaboration as social learning for interdependence: developing relational knowledge for sustainable natural resource management. *Journal of Community and Applied Social Psychology*, 14(March), 137–153.
- Bryson, J. M., Crosby, B. C., & Stone, M. M. (2006). The Design and Implementation of Cross-Sector Collaborations: Propositions from the Literature. *Public Administration Review*, (December), 44–55.
- Callicott, J. B., & Mumford, K. (1997). Ecological Sustainability as a Conservation Concept. *Conservation Biology*, 11(1), 32–40.
- Cardinale, B. J., Duffy, J. E., Gonzalez, A., Hooper, D. U., Perrings, C., Venail, P., Narwani, A., Mace, G. M., Tilman, D., Wardle, D. A., Kinzig, A. P., Daily, G. C., Loreau, M., Grace, J. B., Larigauderie, A., Srivastava, D. S., & Naeem, S. (2012). Biodiversity loss and its impact on humanity. *Nature*, 489(7415), 59–67.
- Clark, T. W., & Brunner, R. D. (1996). Making partnerships work in endangered species conservation. *Endangered Species Update*, 13(9).
- Conley, A., & Moote, M. A. (2002). Evaluating Collaborative Natural Resource Management. *Society & Natural Resources*, 16(5), 371–386.
- Cox, M. (2015). A basic guide for empirical environmental social science. *Ecology and Society*, 20(1), 63.
- Cox, M., Arnold, G., & Villamayor, S. (2010). A Review of Design Principles for Community-based Natural Resource Management. *Ecology and Society*, 15(4).
- Creswell, J. W. (2014). *Research design: qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications, Inc.

- Creswell, J. W., & Miller, D. L. (2000). Determining Validity in Qualitative Inquiry. *THEORY INTO PRACTICE*, 39(3), 124–130.
- Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.
- Creswell, L. L. (1994). *Endangered species on military training lands: cooperation between the military services and the United States Fish and Wildlife Services*. Naval War College.
- Dalsimer, A. (2016). DoD Natural Resources Program. Retrieved from http://www.dodnaturalresources.net/DoD_NR_Program_fact_sheet_8-17-16.pdf
- Dalsimer, A. A. (2017). Threatened and Endangered Species on DoD Lands. DoD Natural Resources Program. Retrieved from http://www.dodnaturalresources.net/files/te__s_fact_sheet_2-21-13.pdf
- Defries, R., & Nagendra, H. (2017). Ecosystem management as a wicked problem. *Science*, 356(6335), 265–270.
- Delmas, M., & Toffel, M. (2004). Stakeholders and environmental management practices: An institutional framework. *Business Strategy and the Environment*, 13, 209–222.
- Department Of Defense. DoD Instruction 4715.03: Natural Resources Conservation Program (2011).
- Drury, R., Homewood, K., & Randall, S. (2011). Less is more: the potential of qualitative approaches in conservation research. *Animal Conservation*, 14, 18–24.
- Emerson, K., Nabatchi, T., & Balogh, S. (2012). An Integrative Framework for Collaborative Governance. *Journal of Public Administration Research and Theory*, 22(1), 1–29.
- Emerson, R. W. (1860). American Transcendentalism Web. Retrieved September 9, 2017, from <https://archive.vcu.edu/english/engweb/transcendentalism/authors/emerson/essays/worship.html#crit>
- Faulkner, D., & de Rond, M. (2000). *Cooperative Strategy: Economic, Business, and Organizational Issues*. New York: Oxford University Press.
- Forstchen, A. B., & Smith, C. A. (2014). The Essential Role of Human Dimensions and Stakeholder Participation in States ' Fulfillment of Public Trust Responsibilities. *Human Dimensions of Wildlife*, 19(5), 417–426.

- Frisinger, J. (2016). DoD Cooperative Ecosystem Studies Units (CESU) Network. *Natural Selections*, 8–9.
- Fulmer, C. A., & Gelfand, M. J. (2012). At What Level (and in Whom) We Trust: Trust Across Multiple Organizational Levels. *Journal of Management*, 38(4), 1167–1230.
- Gibb, D. (2005). *Best Practices for Integrated Natural Resources Management Plan (INRMP) Implementation*. Falls Church, VA.
- Gray, B. (1985). Conditions Facilitating Interorganizational Collaboration. *Human Relations*, 38(10), 911–936.
- Guba, E. G., & Lincoln, Y. S. (1981). *Effective evaluation: Improving the usefulness of evaluation results through responsive and naturalistic approaches*. San Francisco, CA: Jossey-Bass.
- Han, H., Hsu, L.-T. (Jane), & Sheu, C. (2010). Application of the theory of planned behavior to green hotel choice: Testing the effect of environmentally-friendly activities. *Tourism Management*, 31, 325–334.
- Hare, D., Decker, D. J., Smith, C. A., Forstchen, A. B., & Jacobson, C. A. (2017). Applying Public Trust Thinking to Wildlife Governance in the United States: Challenges and Potential Solutions. *Human Dimensions of Wildlife*, 1–18.
- Harland, P., Staats, H., & Wilke, H. A. M. (1999). Explaining Proenvironmental Intention and Behavior by Personal Norms and the Theory of Planned Behavior. *Journal of Applied Social Psychology*, 29(12), 2505–2528.
- Hatch, J. A. (2002). *Doing qualitative research in education settings*. Suny Press.
- Johnson, C. N., Balmford, A., Brook, B. W., Buettel, J. C., Galetti, M., Guangchun, L., & Wilmshurst, J. M. (2017). Biodiversity losses and conservation responses in the Anthropocene. *Science*, 356(6335), 270–275.
- Kaiser, F., Hubner, G., & Bogner, F. X. (2005). Contrasting the Theory of Planned Behavior With the Value-Belief-Norm Model in Explaining Conservation Behavior. *Journal of Applied Social Psychology*, 35(10), 2150–2170.
- Karppinen, H. (2005). Forest owners' choice of reforestation method: an application of the theory of planned behavior. *Forest Policy and Economics*, 7(3), 393–409.
- Kenney, D. S. (2000). *Arguing About Consensus: Examining the Case Against Western Watershed Initiatives and Other Collaborative Groups Active in Natural Resources Management*. Boulder, CO. Retrieved from www.colorado.edu/Law/NRLC
- Kretser, H. E., Glennon, M. J., & Smith, Z. (2017). NGOs Enhance State Wildlife

- Agencies' Capacity to Meet Public Trust Doctrine Obligations. *Human Dimensions of Wildlife*, 19(5), 437–447.
- Lam, S.-P. (1999). Predicting Intentions to Conserve Water From the Theory of Planned Behavior, Perceived Moral Obligation, and Perceived Water Right. *Journal of Applied Social Psychology*, 29(5), 1058–1071.
- Lamb, J., Willis, K., & Wyckoff, G. R. (2008). Managing for threatened, endangered, and sensitive species. In N. Benton, J. D. Ripley, & F. Powledge (Eds.), *Conserving Biodiversity on Military Lands: A Guide for Natural Resources Managers* (pp. 104–117). Arlington, VA: NatureServe. Retrieved from <http://www.dodbiodiversity.org>
- Lauber, T. B., Connelly, N. A., Niederdeppe, J., & Knuth, B. A. (2017). Collaborative Management and Public Trust Responsibilities : A Help or a Hindrance ? *Human Dimensions of Wildlife*, 19(5), 458–468.
- Lauber, T. B., Decker, D. J., & Pomeranz, E. F. (2017). Public Trust Philosophy for Fish and Wildlife Management: Implications for Human Dimensions. *Human Dimensions of Wildlife*, 19(5), 393–396.
- Lawson, D. M., Regan, H. M., & Mizerek, T. L. (2008). *Multi-species Management Using Modeling and Decision Theory: Applications to Integrated Natural Resources Management Planning*. Retrieved from <https://www.dodlegacy.org/legacy/index.aspx>
- Lee Jenni, G. D. (2011). *Military attitudes on biodiversity conflict and public participation in environmental decision-making*. North Carolina State University.
- Lee Jenni, G. D., Peterson, M. N., Cubbage, F. W., & Jameson, J. K. (2012). Assessing biodiversity conservation conflict on military installations. *Biological Conservation*, 153, 127–133.
- Leedy, P. D., & Ormrod, J. E. (2013). *Practical research planning and design* (10th ed.). Pearson Education, Inc.
- Leong, K. M., Emmerson, D. P., & Byron, R. R. (2011). The New Governance Era: Implications for Collaborative Conservation and Adaptive Management in Department of the Interior Agencies. *Human Dimensions of Wildlife*, 16, 236–243.
- Lewis & Clark Expedition - Scientific Discovery. (2004). Retrieved April 15, 2017, from https://www.fws.gov/lewisclark/journey_intro.html
- Mascia, M. B., Brosius, J. P., Dobson, T. A., Forbes, B. C., Horowitz, L., McKean, M. A., & Turner, N. J. (2003). Conservation and the Social Sciences. *Conservation Biology*, 17(3), 649–650.

- Meine, C., Soule, M., & Noss, R. F. (2006). "A Mission-Driven Discipline": the Growth of Conservation Biology. *Conservation Biology*, 20(3), 631–651.
- Moon, K., Brewer, T. D., Januchowski-Hartley, S. R., Adams, V. M., & Blackman, D. A. (2016). A guideline to improve qualitative social science publishing in ecology and conservataion journals. *Ecology and Society*, 21(3).
- Muller-Rommel, F., & Meyer, H. (2001). Social Sciences and Environmental Sciences: A State of the Art Review. *Environmental Politics*, 10(4), 49–62.
- Mulrooney, J., Boice, L. P., Dalsimer, A. A., Golla, D., & Rutherford, S. (2010). *Threatened and Endangered Species Interagency Research Coordination Manual*.
- National Wildlife Federation. (2017a). Endangered Species Act. Retrieved July 24, 2017, from <https://www.nwf.org/Wildlife/Wildlife-Conservation/Endangered-Species-Act.aspx>
- National Wildlife Federation. (2017b). What is Biodiversity? Retrieved from <https://www.nwf.org/Wildlife/Wildlife-Conservation/Biodiversity.aspx>
- Newing, H., Eagle, C., Puri, R., & Watson, C. W. (2011). *Conducting research in conservation: A social science perspective*. New York, NY: Routledge.
- Noss, R. (1990). Indicators for monitoring biodiversity: A hierarchical approach. *Conservation Biology*, 4(4), 355–364.
- Noss, R. F. (1987). From Plant Communities to Landscapes in Conservation Inventories: A Look at The Nature Conservancy (USA). *Biological Conservation*, 41(1), 11–37.
- Ostrom, E. (1990). *Governing the commons: the evolution of institutions for collective action*. Cambridge, UK: Cambridge University Press.
- Ostrom, E. (2009). A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science*, 325(5939), 419–422.
- Ostrom, E., & Cox, M. (2010). Moving beyond panaceas: a multi-tiered diagnostic approach for social-ecological analysis. *Environmental Conservation*, 37(4), 451–463.
- Peshkin, A. (1993). The goodness of qualitative research. *Educational Researcher*, 22(2), 23–29.
- Peterson, M. N., Peterson, M. J., & Peterson, T. R. (2005). Conservation and the Myth of Consensus. *Conservation Biology*, 19(3), 762–767.
- Peterson, M. N., Peterson, M. J., & Peterson, T. R. (2006). Why Conservation Needs

- Dissent. *Conservation Biology*, 20(2), 576–578.
- Peterson, M. N., Peterson, M. J., Peterson, T. R., & Leong, K. (2013). Why transforming biodiversity conservation conflict is essential and how to begin. *Pacific Conservation Biology*, 19(2), 94–103.
- Pomeranz, E. F., Decker, D. J., Siemer, W. F., Kirsch, A., Hurst, J., & Farquhar, J. (2014). Challenges for Multilevel Stakeholder Engagement in Public Trust Resource Governance. *Human Dimensions of Wildlife*, 19(5), 448–457.
- Powledge, F. (2008). Beyond the fenceline: partnerships with surrounding communities. In N. Benton, J. D. Ripley, & F. Powledge (Eds.), *Conserving Biodiversity on Military Lands: A Guide for Natural Resources Managers* (pp. 144–153). Arlington, VA: NatureServe. Retrieved from <http://www.dodbiodiversity.org>
- Pringle, R. M. (2017). Upgrading protected areas to conserve wild biodiversity. *Nature*, 546, 91–99.
- Reddy, S. M. W., Montambault, J., Masuda, Y. J., Keenan, E., Butler, W., Fisher, J. R. B., Asah, S. T., & Gneezy, A. (2017). Advancing Conservation by Understanding and Influencing Human Behavior. *Conservation Letters*, 10(2), 248–256.
- Redford, K. H., & Richter, B. D. (1999). Conservation of Biodiversity in a World of Use. *Conservation Biology*, 13(6), 1246–1256.
- Redpath, S. M., Young, J., Evelyn, A., Adams, W. M., Sutherland, W. J., Whitehouse, A., Amar, A., Lambert, R. A., Linnell, J. D.C., Watt, A., & Gutierrez, R. J. (2013). Understanding and managing conservation conflicts. *Trends in Ecology & Evolution*, 28(2), 100–109.
- Ripley, J. D. (2008). Legal and Policy Background. In N. Benton, J. D. Ripley, & F. Powledge (Eds.), *Conserving Biodiversity on Military Lands: A Guide for Natural Resources Managers*. Arlington, VA: NatureServe. Retrieved from <http://www.dodbiodiversity.org>
- Ritchie, J., & Lewis, J. (Eds.). (2003). *Qualitative research practice: A guide for social science students and researchers*. Sage publications.
- Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences*, 4, 155–169.
- Rodgers, K., Willcox, A., & Willcox, E. (2017). Common Influences on the Success of Habitat Conservation Planning under the Endangered Species Act. *Human Dimensions of Wildlife*, 22(5), 438–453.
- Rudolph, B. A., & Riley, S. J. (2014). Factors Affecting Hunters' Trust and Cooperation.

Human Dimensions of Wildlife, 19(5), 469–479.

- Sagawa, S., & Segal, E. (2000). Common Interest, Common Good: Creating Value through Business and Social Sector Partnerships. *California Management Review*, 42(2), 105–122.
- Saldaña, J. (2016). *The Coding Manual for Qualitative Researchers* (3rd ed.). London: SAGE Publications Ltd.
- Sandbrook, C., Adams, W. M., Buscher, B., & Vira, B. (2013). Social Research and Biodiversity Conservation. *Conservation Biology*, 27(6), 1487–1490.
- Saunders, C. D., Brook, A. T., & Eugene Myers, O. (2006). Using psychology to save biodiversity and human well-being. *Conservation Biology*, 20(3), 702–705.
- Stake, R. E. (1995). *The Art of Case Study Research*. Sage publications.
- Stake, R. E. (2010). *Qualitative research: Studying how things work*. Guilford Press.
- Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, 29(3), 309–317.
- Stein, B. A. (2008). Biodiversity and the military mission. In N. Benton, J. Ripley, & F. Powledge (Eds.), *Conserving Biodiversity on Military Lands: A Guide for Natural Resource Managers* (pp. 2–33). Arlington, VA: NatureServe. Retrieved from <http://www.dodbiodiversity.org>
- Stein, B. A., Scott, C., & Benton, N. (2008). Federal Lands and Endangered Species: The Role of Military and Other federal Lands in Sustaining Biodiversity. *BioScience*, 58(4), 339–347.
- Stern, M. J., & Coleman, K. J. (2015). The Multidimensionality of Trust: Applications in Collaborative Natural Resource Management. *Society & Natural Resources*, 28(2), 117–132.
- Thomson, A. M., & Perry, J. L. (2006). Collaboration Processes: Inside the Black Box. *Public Administration Review*, (December), 20–32.
- Tittensor, D. P., Walpole, M., Hill, S. L. L., Boyce, D. G., Britten, G. L., Burgess, N. D., Butchart, S. H. M., Leadley, P. W., Regan, E. C., Alkemade, R., Baumung, R., Bellard, C., Bouwman, L., Bowles-Newark, N., J., Chenery, A. M., Cheung, W. W. L., Christensen, V., Cooper, H. D., Crowther, A. R., Dixon, M. J. R., Galli, A., Gaveau, V., Gregory, R. D., Guiterrez, N. L., Hirsch, T. L., Hoft, R., Januchowski-Hartley, S. R., Karmann, M., Krug, C. B., Leverington, F. J., Loh, J., Lojenga, R. K., Malsch, K., Marques, A., Morgan, D. H. W., Mumby, P. J., Newbold, T., Noonan-Mooney, K., Pagad, S. N., Parks, B. C., Pereira, H. M., Robertson, T., Rondinini, C.,

- Santini, L., Scharlemann, J. P. W., Schindler, S., Sumaila, U. R., The, L. S.L., van Kolck, J., Visconti, P., & Yimin, Y. (2014). A mid-term analysis of progress toward international biodiversity targets. *Science*, 346(6206), 241–244.
- U.S. General Accounting Office. (2003). *Military Training: Implementation Strategy Needed to Increase Interagency Management for Endangered Species Affecting Training Ranges: GAO-03-976. Report to Congressional Requesters.*
- Unnasch, B. (2008). Understanding Conservation Science. In N. Benton, J. D. Ripley, & F. Powledge (Eds.), *Conserving Biodiversity on Military Lands: A Guide for Natural Resources Managers* (pp. 34–53). Arlington, VA: NatureServe. Retrieved from <http://www.dodbiodiversity.org>
- US Department of Defense. (2016). Department of Defense Announces Winners of the 2016 Secretary of Defense Environmental Awards. Retrieved from <https://www.defense.gov/News/News-Releases/News-Release-View/Article/722676/departement-of-defense-announces-winners-of-the-2016-secretary-of-defense-enviro/>
- US Fish and Wildlife Service. (2004). Integrated Natural Resources Management Plans. Retrieved July 21, 2017, from [https://www.fws.gov/fisheries/sikes_act/documents/INRMP Fact Sheet.pdf](https://www.fws.gov/fisheries/sikes_act/documents/INRMP_Fact_Sheet.pdf)
- US Fish and Wildlife Service. (2015). Legislative History of the Sikes Act. Retrieved July 21, 2017, from https://www.fws.gov/fisheries/sikes_act/sikes_act_history.html
- Viseu, A. (2015). Integration of social science into research is crucial. *Nature*, 525, 291.
- Wondolleck, J. M., & Yaffee, S. L. (2000). *Making Collaboration Work: Lessons from Innovation in Natural Resource Management*. Washington, D.C.: Island Press.
- Wood, D. J., & Gray, B. (1991). Toward a Comprehensive Theory of Collaboration. *Journal of Applied Behavioral Science*, 27(2), 139–162.
- World Resources Institute. (1992). *Global Biodiveristy Strategy*. Retrieved from http://pdf.wri.org/globalbiodiversitystrategy_bw.pdf
- Yaffee, S. L., & Wondolleck, J. M. (2000). Making Collaboration Work: Lessons from a comprehensive assessment of over 200 wideranging cases of collaboration in environmental management. *Conservation*, 1(1).
- Yin, R. K. (2003). *Case Study Research: Design and Methods* (Third Edit). Thousand Oaks, CA: SAGE Publications, Inc.
- Yin, R. K. (2013). *Case study research: Design and methods* (5th ed.). Sage publications.

Young, O. R., Lambin, E. F., Alcock, F., Haberl, H., Karlsson, S. I., McConnell, W. J., Myint, T., Pahl-Wostl, C., Polsky, C., Ramakrishnan, P. S., Schroeder, H., Scouvar, M., & Verburg, P. H. (2006). A Portfolio Approach to Analyzing Complex Human-Environment Interactions : Institutions and Land Change. *Ecology and Society*, 11(2).

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 22-02-2018		2. REPORT TYPE Master's Thesis		3. DATES COVERED (From - To) Sept 2016 - March 2018	
4. TITLE AND SUBTITLE A Surprising Symbiosis: Examining the Mutualism in Department of Defense Conservation Partnerships				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Lankow, Andrew J, Capt				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air Force Institute of Technology Graduate School of Engineering and Management (AFIT/EN) 2950 Hobson Way, Building 640 WPAFB OH 45433-8865				8. PERFORMING ORGANIZATION REPORT NUMBER AFIT-ENS-MS-18-M-134	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Intentionally Left Blank				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.					
13. SUPPLEMENTARY NOTES This material is declared a work of the U.S. Government and is not subject to copyright protection in the United States.					
14. ABSTRACT Because of the DoD's unique and significant role in the conservation of natural resources, military leaders and natural resource managers need a trail guide to frame interagency collaboration in a way that shapes productive partnerships. The purpose of this research was to examine successful DoD conservation partnerships in order to identify key success factors (KSFs) and the most prominent challenges faced, and how those characteristics enable the accomplishment of each partner's objectives. The research questions were answered through a comprehensive literature review and the use of the multiple-case study method. 19 key informants from three installations participated in semi-structured interviews, and the solicitation of documentation and archival records from the same installations provided additional data. The research identified four themes of KSFs that enhance a partnership's ability to overcome four key groups of challenges. The presence of these KSFs, and the partnership's ability to overcome the challenges, leads to the achievement of three main categories of organizational objectives. The culmination of this effort was the development of a collaborative guide and framework to outline the key elements in the formation and maintenance of successful partnerships. Finally, recommendations to implement this framework, along with recommendations for future research, are discussed.					
15. SUBJECT TERMS Collaboration, Conservation, Natural Resource Management, Partnerships					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 135	19a. NAME OF RESPONSIBLE PERSON Maj Benjamin T. Hazen, AFIT/ENS benjamin.hazen@afit.edu
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U			19b. TELEPHONE NUMBER (include area code) (937) 255-3636 x4337