BINATIONAL COLLABORATION IN RECOVERY OF ENDANGERED

SPECIES: THE MEXICAN WOLF AS A CASE STUDY

A Dissertation

by

JOSE F. BERNAL STOOPEN

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2004

Major Subject: Wildlife and Fisheries Sciences

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Approved as to style and content by:

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May 2004

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ABSTRACT

Binational Collaboration in Recovery of Endangered Species: The Mexican Wolf as a

Case Study. (May 2004)

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Chair of Advisory Committee: Dr. Jane M. Packard

The goal of this inductive study was to identify factors that facilitate and inhibit

binational collaboration in the recovery of endangered species in the northern Mexico

borderlands, focusing on the Mexican wolf (*Canis lupus baileyi*). A conceptual model

was developed using qualitative techniques, providing the basis for design of a mail

survey. The target population included participants with experience in recovery efforts

for over a dozen species at risk in the region.

Long interviews were recorded with 44 participants from Mexico and the United

States. Thematic hierarchical analysis was used to develop a conceptual model of how

interviewees talked about factors influencing binational collaboration. Issues were

classified in five thematic clusters: project, organization, people, resources,

culture/history.

The survey was used to conduct a needs assessment, measuring respondents'

attitudes about the relative priority of issues identified in the conceptual model. High

priority needs were identified from each thematic cluster: (a) equitable participation in

project design and implementation, (b) continuity of personnel, (c) coordination of federal, state and local efforts, (d) increased funding, managed with accountability, and (e) exchange visits to facilitate understanding of diverse perspectives. Responses to almost half the survey items indicated accord among the sample of respondents, providing a basis for shared common ground. The nature of discord was within the range of "manageable", with no clear polarization of attitudes measured.

This exploratory data analysis suggested that the structure of the conceptual model developed from the Mexican wolf case study was generally a valid basis for future deductive analysis and reflection by practitioners. For 82% of 22 statements of need, priorities of participants in the Mexican wolf recovery efforts did not differ significantly from other respondents. Nationality (of respondents) significantly affected priority rankings for only 18% of the need statements. Significant effects of five demographic variables indicated that interactive effects should be examined in future multivariate analyses to determine how respondents' attitudes on issues related to priority rankings.

Recommendations were provided for a more efficient and effective approach to collaborative problem-solving, engaging reflective practitioners from the private and public sectors in principled negotiation processes to better understand diverse perspectives.

DEDICATION

This dissertation is dedicated to my loving wife Lorie Mc Cracken Ortega, my daughters Ana Sofía and Danielle and son José Mariano. It is dedicated to my father Francisco José Bernal and my mother Mireille Stoopen de Bernal. Also, I extend this dedication to my sisters Mireille and Aline and my brothers Germán, Javier, Jean Paul and Yves. I also dedicated it to all my friends in Mexico, the United States and other countries. I want to dedicate this dissertation to Josefa, Carlos and Zapita, who were the first Mexican wolves I met and who introduced me to this unique world of protecting and conserving Mexican wolves and other highly endangered species.

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I would like to thank so many individuals and institutions that supported me with their friendship and logistical help during this very important stage of my personal and professional life.

I am very grateful to members of my graduate advisory committee, Dr. Tarla Peterson, Dr. William Grant and Dr. James Jensen of Texas A&M University (TAMU). I specially thank Dr. Richard Reading of the Denver Zoological Society who supported me as an advisor and as my very good friend. My sincere gratitude is extended to Dr. Jane M. Packard, who was with me every step of the way, who inspired me and gave me the strength to complete this journey. Her kindness, wisdom and experience has been fundamental during these past years.   To all, thank you very much.

I would also like to thank the following institutions that provided me with financial and logistical support to pursue my graduate studies at TAMU: Conacyt / Fulbright Fellowship, Wildlife Conservation Society, Earth Promise Family of Funds, Lincoln Park Zoo Neotropical Fund, Fossil Rim Wildlife Center and the Denver Zoological Society.

Thanks are extended to the following organizations, for facilitating the development of this research: Dirección General de Vida Silvestre, Semarnat, United States Fish and Wildlife Service, Dirección General de Zoológicos de la Ciudad de México, Zoológico de Chapultepec, Zoológico de San Juan de Aragon, Zoológico Africam Safari, Zoológico de Zacango, Universidad Nacional Autónoma de México,

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CHAPTER I

INTRODUCTION

Problem Definition

Conservation efforts, such as endangered species recovery, are usually complex and difficult tasks (Clark et al. 1994). Conservation biologists estimate that more that more than 20 percent of the world's biodiversity may disappear within the next 2 decades (Wilson 1989). In Mexico in particular, a country recognized as the third most biologically diverse in the world (Mittermeir 1988), a large number of species are becoming threatened or endangered as a result of habitat loss and fragmentation, illegal trade, poaching, and the introduction of exotic species (Mittermeir 1988). As of 1994, more than 20 years after passage of the Endangered Species Act, only 6 species had been recovered, and more than 3,000 species were considered as official candidates for federal protection in the United States (Clark et al. 1994).

With a common border of more than 3,600 kilometers, Mexico and the United States share diverse biological resources. Despite increased efforts to maintain biological diversity, approximately 85 species and subspecies historically distributed in both countries have been reportedas threatened or endangered (USFWS 1996). Perhaps one of the reasons endangered species conservation has not been successful is that extinction has been approached mostly as a biological phenomenon (Clark et al. 1994).

_____

This dissertation follows the format of Conservation Biology.

Clark et al. (1994) suggested that a major limitation in recovery of endangered species resides in the type of knowledge and problem-solving approaches that professionals apply in conservation problems. Most people and institutions involved in these programs usually emphasize biological assessments and solutions, even when conservationists recognize that species extinction results mostly from social, economic, and political factors (Kellert 1985, Kellert 1994; Yafee 1994). Often participants in recovery programs are trained in biological disciplines but lack sufficient knowledge of the broad-based social, economic, and political issues affecting these species.

In some networks of wildlife regulatory agencies, scientific information may be considered more important for decision-making than social or economic information; however, scientific data is not always convincing enough to inform or educate the general public or develop successful recovery programs (Weeks & Packard 1997). Many endangered species recovery programs ignore the importance of addressing and understanding social factors, as some biologists perceive these factors to be vague, irrelevant, and subjective (Kellert 1994). Focusing on biological causes contributes to the development of unsuccessful conservation programs that rarely garner enough public support for species recovery (Clark et al. 1994).

Endangered species recovery is characterized by a high degree of uncertainty and complexity (Soulé & Wilcox 1980; Clark et al. 1989). Clark & Cragun (1994:14) defined uncertainty in recovery programs as "the difference between what conservationists know when they start a recovery effort and what they must know to be successful." Orians et al. (1986) reported the following 5 sources of uncertainty in

ecological systems, which can also be identified in endangered species recovery

programs: 1) complexity and poor understanding of the relationship between the species

and its environment, 2) naturally unpredictable variability, 3) random variability, 4)

errors in estimation and measurement of small sample sizes, and 5) insufficient

information about the species and the factors affecting its survival. Decision-making in

recovery of endangered species is frequently based in ambiguous data (Maguire 1986),

and crucial management actions more commonly result from "crisis situations" than

from long-range planning (Snyder 1994). These sources of uncertainty lead to

complexity, to disagreement over facts and theories, and often to conflict (Wondolleck et

al 1994).

The sources of conflict are further complicated in endangered species recovery

where multiple individuals and organizations are involved in the planning, decision-

making and implementation stages of recovery programs, as is usually the case.

Differences in perspectives among individuals and organizations can hinder recovery

efforts. For example, intensive research and conservation efforts for the California

condor *(Gymnopis californianus)* were delayed for more than a decade due to the

conflict resulting from the different perspectives among the U.S. Fish and Wildlife

Service and the California Fish and Game Commission, regarding the most appropriate

management techniques (Snyder 1994). Recovery efforts for the black-footed ferret

(*Mustela nigripes*) were complicated by the conflicting perspectives of state, federal and

non-governmental organizations, over applying techniques such as captive breeding,

radiotelemetry, and intrusive research (Reading & Miller 1994).

Differences in interests, attitudes, and beliefs among stakeholders may result in conflict situations that, if improperly managed, can also hamper recovery efforts. Conflicts over the parties' differing interests and efforts to ameliorate those conflicts have been extensively reported in the literature (O'Connell 1994; Thornton 1994). For example, in the late 1970's, environmental organizations, landowners, developers, and government representatives from Wyoming and Nebraska tried to reconcile their differences regarding the construction of the Grayrocks Dam. Construction of this dam would have reduced water flow of the North Platte River, affecting critical habitat for the whooping crane (*Grus americana*). After many years of negotiations, a settlement was reached that allowed construction of the dam and establishment of a $7.5 million trust for whooping crane research (Wondolleck et al. 1994)

Unequal participation of stakeholders in decision-making processes may lead to (1) decisions that do not meet the needs of all the parties involved, (2) a lack of consensus in conservation actions, and (3) conflicts that result from framing solutions as win/lose situations (Bolton 1979; Folger et al. 1993). For example, conservation efforts for the golden-cheeked warbler (*Dendroica chrysoparia*) have been characterized by strong conflicts (Peterson & Horton 1995), related in part to ineffective approaches to including the perspectives of private landowners in the decision-making process.

Sources of conflict in endangered species recovery programs have been examined more within the United States than within Mexico. On the border between these two countries, formal negotiated settlements have addressed international disputes over water rights, pollution, toxic waste disposal, and immigration (Castillo 1986; Stoddard 1986).

Informal processes of problem-solving have also been used by state and federal agencies involved in managing protected areas, endangered species, and game species in the border states of Mexico and the USA. However, the issues associated with informally coordinating biodiversity conservation efforts between two nations had not been examined prior to the research described in this dissertation (Chapters II and III).

In this dissertation, my underlying conceptual model is that: a better understanding of the theoretical perspectives of conflict management will aid in more effective collaboration between Mexico and the United States in their joint efforts to conserve biodiversity. If participants from both countries become more efficient in comprehending issues of conflict and applying the most appropriate conflict management procedures, then both parties will be able to (1) understand and acknowledge their differences, (2) more easily reach decisions based on consensus, and (3) implement and evaluate the effectiveness of collaborative problem-solving approaches in endangered species recovery (Chapter IV).

Theoretical Perspectives on Conflict Management

Conflict has been defined as the "interaction of people who perceive incompatible goals and interference from each other in achieving these goals" (Folger et al. 1993:4). This definition emphasizes two of the most important features of conflict: interaction and perception. Conflict by nature is interactive; for a conflict to arise, the behavior of one party must have consequences for the other party (Folger et al. 1993).

Often, conflict is not based on objective reality but on the different ways in which protagonists frame the issues (Putnam & Holmer 1992). Thus, conflict may occur not

only because of incompatible of goals but because the disputants believe their goals are

incompatible, and their interactions are emotionally charged due to this belief. A third

important feature of conflict is communication. Inappropriate communication (or

different communication styles derived from diverse cultural backgrounds) can cause

misunderstandings. Although communication difficulties can lead to conflictive

interactions, they rarely constitute the essence of disagreements (Folger et al. 1993).

Many conflicts in endangered species conservation result from differences in the

attitudes, beliefs, opinions, perceptions, knowledge, and values that individuals or

groups hold toward these species. In this dissertation, the following definitions will be

used. Attitudes describe how people feel about something (Bern 1970). They refer to

the positive or negative evaluations that we associate with diverse entities, for example,

individuals, groups, objects, situations, or actions (Kuper & Kuper 1985). While it is

generally accepted that attitudes are based on beliefs, some researchers have also

suggested that attitudes may also contribute to what we believe (Kuper & Kuper 1985).

Beliefs are assessments of what a person thinks is true or false, exists or does not exist,

without any implication of goodness or badness (Bern 1970). Statements of belief are

opinions, about situations or things, which do not necessarily reflect an objective state

(Bern 1970). An opinion is a belief or conviction based on what seems probable,

although it might not be grounded in demonstrated fact. Opinions are commonly

expressed on narrow and specific points, and a number of opinions may imply the

existence of a more general attitude (Calhoun 2002). Perceptions are important

components of attitudes, and they refer to what an individual senses and understands

about an issue, based on experience, information, and knowledge (Calhoun 2002). Knowledge also influences attitudes because it refers to a person's understanding of experiences, interactions, and information (Reading & Clark 1996).

Conflicts may also arise when the parties hold or believe they hold incompatible values. In the social-psychological literature, values are described as a particular class of attitudes (Brown & Manfredo 1987). Psychologists have referred to values as preferences for certain end-states of existence (i.e., equality or freedom) or modes of conducts (i.e., honesty or friendship) (Bern 1970). Values guide attitudes, evaluations, and justifications; and they serve as the criteria for opinions, preferences, choices, and behaviors (Rokeach 1979). Values arise from several factors such as: 1) a person's perceptions, motivations, and attitudes, 2) the context of the perception or valuation, 3) the cultural and social setting, and 4) the influence of social institutions (Reading 1993; Reading & Clark 1996). People's values and attitudes regarding conservation of endangered species are influenced by real and perceived factors related to: 1) the characteristics of the species, 2) their knowledge about the species, 3) human/animal relationships, and 4) laws and regulations (Reading & Kellert 1993; Kellert 1994; Reading & Clark 1996).

In western cultures, conflicts have been associated with situations that involve disagreements, incompatibility, impasse, destruction, and mistakes (Jandt 1972; Bolton 1979). This negative perception of conflict has affected Western paradigms of effective ways to deal with conflict. In the decades since the inception of the United Nations, the western view of conflict has expanded due to the development of approaches to resolve

international conflicts involving multicultural disputes (Fisher & Ury 1991; Folger et al. 1993).

In contrast to the traditional Western view, conflict may be viewed as neither negative nor positive (Maser 1996; Folger et al. 1993). Depending on how parties approach conflict and how they apply constructive conflict management skills, conflicts can represent either opportunities for growth and improvement, or situations that may lead to the failure, impasse, or destruction that the Western mindset has feared (Maser 1996; Folger et al. 1993). Conflict may be negative when it is not recognized, when it is avoided or handled inappropriately, when it is disruptive, when it has escalated to antagonism and hostility, and when it has foreclosed valuable alternatives (Clark et al. 1989; Wondolleck et al. 1994; Maser 1996). On the other hand, conflict may be accepted as positive and creative when viewed as a natural element of human interactions that can have a constructive outcome when managed productively (Folger et al. 1993). A major challenge in endangered species recovery is to develop opportunities for participants to work out their differences and reach decisions that satisfy their attitudes, beliefs, values, needs, and concerns (Wondolleck et al. 1994).

Schön (1983) has described two major ways in which professionals approach and solve problems. In the first model, "technical rationality" (TR), problems are considered objective entities, universal laws are accepted, and reliable knowledge is obtained through rigid experimentation. This model has traditionally been used in conservation issues, for which scientists commonly believe they can solve problems through rational and systematic inquiry based on the scientific method. In the second model, "reflective

practice" (RP), knowledge is derived from a variety of sources, is contextual, and encourages active learning. In the RP approach, several understandings of the problem exist, because the problem is defined differently by people who possess different attitudes, values, perspectives, experiences, and knowledge. When using the RP model, the major task is to develop a richer, more comprehensive appreciation of the problem from a variety of perspectives and to identify conflict management approaches that will satisfy the different interests, needs, and concerns of the constituencies involved.

In natural resource management, "conflict management" is a more appropriate term than "conflict resolution," as conflicts are not always resolved (Schön & Rein 1994). Conflict management involves several processes that can be applied to two or more parties in a conflict situation, including arbitration, mediation, negotiation, and alternative dispute resolution (Wondolleck et al. 1994). When there are strong incentives for conflict to continue, it is unlikely to be fully resolved (Peterson et al. 1994; Peterson & Horton, 1995; Peterson et al 2002). These concepts have been investigated for species within the United States, but not for endangered species that cross national borders.

Arbitration and mediation are two forms of third-party interventions, but they have fundamental differences. Arbitration is a judicial process, based on the law, intended to settle differences between parties in conflict by following formal procedures (Goodman 1993). Mediation involves the active participation of a mediator in situations in which none of the parties desire to make any more concessions (Touval & Zurtman 1985). A mediator's efforts should be directed toward influencing a collaborative process rather than toward influencing or deciding the outcome of the negotiations (Gray

1989). Negotiation is a process in which two or more parties in a conflict endeavor to find a solution themselves without the intervention of a third party as in mediation or arbitration (Cellich & Subhasch 2003).

Regarding natural resources, "environmental mediation", "environmental negotiation" and "environmental dispute settlement" are all diverse flavors of alternative dispute resolution (Wondolleck et al. 1994). The definition of alternative dispute resolution is "mediated out-of-court or before-court interactions between parties to a dispute or conflict" (Burton 1996:15). More commonly, alternative dispute resolution is defined as a relatively informal process that helps parties in a conflict deal with their differences in a more creative and collaborative manner (Wondolleck et al. 1994). Similarly, problem solving refers to a strategy for conflict management based on a common understanding of the problem, a collaborative search for an array of solutions, and the selection of an acceptable solution through group consensus (Bolton 1979).

In the last several decades, arbitration frequently has been used for environmental conflict management in the United States (Wondolleck et al. 1994). However, this court procedure is usually costly, relatively slow, and generally inappropriate for handling complex technical issues and policy problems (Wondolleck et al. 1994).   Arbitration can also lead to unilateral decisions or decisions that do not meet the needs of all parties involved (Wondolleck et al. 1994). Parties in a court usually perceive each other as adversaries or opponents, and they commonly believe that one side may win and the other may lose (Susskind & Cruikshank 1987). Often the arbitration process can lead to a higher level of mistrust between the parties, especially if

either of them lacks a good understanding of the administrative and legal procedures involved (Wondolleck et al. 1994).

Unlike arbitration, alternative dispute resolution and problem-solving constitute conflict management procedures that help parties build their trust and support, gain a broader understanding of the problem, and identify alternative solutions (Wondolleck et al. 1994). However, for these procedures to be effective, the parties must agree that they need a solution and be prepared to move from their initial, mutually unacceptable positions (Zartman & Bertman 1982). They must also have enough power to apply a sanction if one of the parties takes unilateral action, and enough influence to commit themselves and their constituents to the agreement reached (Wondolleck et al. 1994).

In general, collaborative efforts are more likely to fail when: 1) one or more of the parties lack enough urgency for resolving the conflict, 2) one of the parties has enough power to take unilateral action, 3) the conflict is rooted in basic ideological differences, 4) constitutional issues are involved, 5) the issues are too threatening because of historical antagonisms, 6) past interventions have repeatedly failed, and 7) maintaining a relationship represents substantial costs to the parties (Gray 1989). If the parties in a conflict are unable to find a solution among themselves due to lack of experience or due to past tensions, a mediator or facilitator can often assist in structuring and running the collaborative process. As indicated by Gray (1989), some of the tasks of a mediator are to assess the state of the dispute, to bring the parties together, to minimize resistance, to establish a climate of trust, to design and manage information, and to promote consensus among the parties.

One problem-solving method that has been applied successfully to a wide variety of conflicts, including both domestic and international disputes, is the Principled Negotiation Method developed at the Harvard Negotiation Project during the 1970's (Fisher & Ury 1991). Some of the basic dimensions of this method include analysis of the situation in terms of "people problems," "procedural problems," and "problems in inventing solutions" (Fisher & Ury 1978). Specifically, Fisher and Ury (1991) advocated separating people from the problem, focusing on interests rather than positions, identifying options for mutual gains, and using objective criteria for meeting needs. The problem resolution cycle guiding principled negotiation (Figure 1) can be seen as moving between the realms of reality and theory in four distinctive phases: 1) problem definition (practice); 2) problem analysis (theory); 3) identification of alternatives (theory); and 4) selection of the most feasible alternatives (practice) (Fisher & Ury 1991).

When the parties involved in a problem go through these phases together, they are more likely to reach consensus. An important element of the process seems to be the transformation of relationships between the parties that results from this problem solving
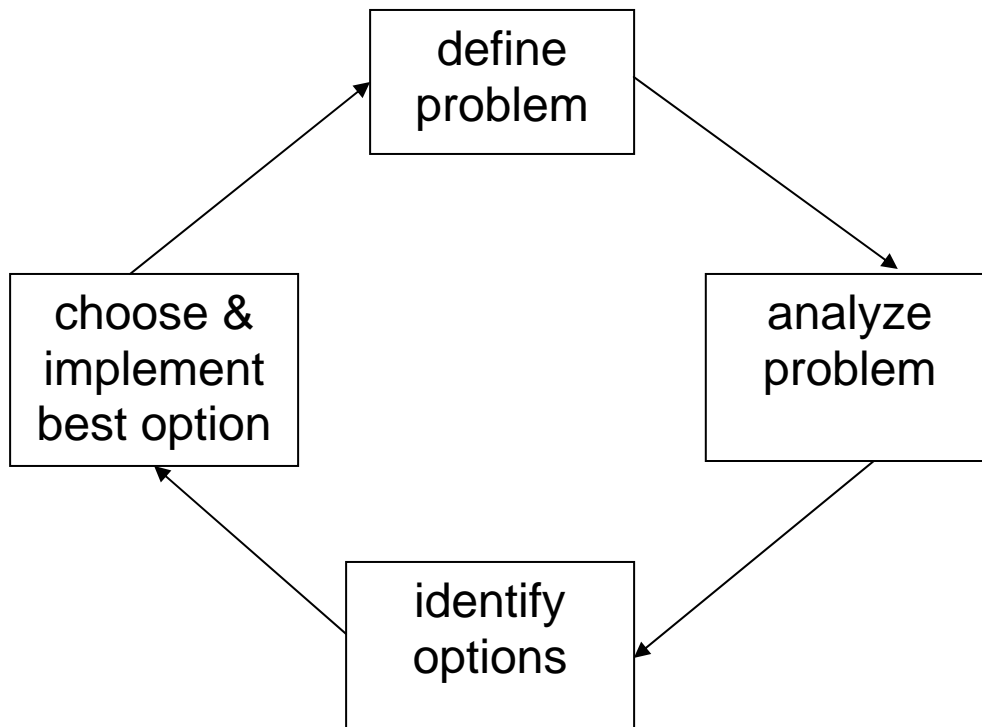
Figure 1. Problem resolution cycle guiding the principled negotiation method (redrawn from Fisher & Ury 1991).

process (Fisher & Ury 1991). The role of an external fact finder (scientist) can be useful in the theoretical phases; however, the affected parties must be engaged in providing information, identifying alternatives, and selecting the alternatives that best match reality as they perceive it.

Endangered species conservation efforts could benefit considerably if participants understood conflicts as forces for creativity and improvement. In addressing conflict, the goal should not necessarily be to remove these differences, but rather to gain a broader understanding of the problem and to identify options that may not have been considered. Several conflict management procedures (e.g., alternative dispute resolution and problem solving) constitute valuable procedures that may help parties in a conflict build trust and support, have a broader understanding of the problem, and identify alternative solutions for successful binational collaboration. These principles have not been applied formally to binational collaboration in recovery of endangered species.

Application of Theoretical Perspectives to Endangered Species Recovery

Although several studies have documented how differences in perspectives, interests, attitudes, and beliefs represent sources of conflicts in endangered species recovery programs within the United States (Clark et al. 1994), none has addressed conflict management in recovery programs that cross the international boundary between Mexico and the United States. The theoretical perspectives on alternative dispute resolution, as reviewed above, may provide powerful tools for studying conflict management approaches that could be applied to enhance the effectiveness and efficiency of

international efforts to jointly manage biodiversity in ecosystems that cross international borders.

The study described in this dissertation represents an inductive approach, in the sense that it is grounded in an in-depth case study of international efforts toward recovery of the Mexican wolf (Chapter II). I examine the external validity of these issues (Chapter III) by analyzing responses of participants within a broader conservation community involved in additional relevant endangered species recovery efforts. This study is embedded in a problem-resolution cycle (Figure 1) guiding the Principled Negotiation Method (Fisher & Ury 1991). It focuses primarily on the first 2 phases of the problem-resolution cycle described by Fisher & Ury (1978): problem definition and problem analysis. In Chapter IV, I address implications of the research for the third and fourth phases: identification of alternatives and selection of alternative solutions. Although I provide recommendations about processes that may facilitate binational collaboration in the third and fourth phases, ideally active participants would be involved directly, to enhance "ownership" of the procedures that are chosen for alternative dispute resolution and, ultimately, of the solution.

Goal and Objectives

The main goal of this research was to identify factors that facilitate and inhibit binational collaboration in the recovery of endangered species. The objective of Chapter II was to document the diverse perspectives of participants in the Mexican wolf program regarding factors that facilitate and inhibit binational collaboration. The objective of Chapter III was to assess the respondents' agreement on issues and priorities associated

with binational collaboration in the recovery of several endangered species with historical distribution in Mexico and the United States. The objective of Chapter IV was to provide recommendations on specific strategies to enhance binational collaboration in recovery of these endangered species.

For the study, a multidisciplinary advisory council representing both theoretical and applied science perspectives from Mexico (n=3) and the United States (n=7) was established. The main tasks of the advisory council were: a) to advise on the theoretical design of the project; b) to advise on the identification and selection of potential interviewees; c) to advise on the interdisciplinary nature of the project, integrating social and biological perspectives; d) to advise on the cross-cultural nature of the project, integrating American and Mexican perspectives; and e) to transform an individual academic project into a reflective collaborative project relevant to the participants.

In Chapter II, I discuss factors that influence binational collaboration in recovery of endangered species, focusing on Mexican wolves as a case study. I used the thematic hierarchical analysis (Peterson et al. 1994) to examine how participants talked about issues influencing binational collaboration in the recovery efforts for this subspecies. The purpose of the thematic hierarchical analysis was to represent the voice of the participants and the diverse "frames" from which they talk about the issues. "Frames" refer to the means by which individuals define, interpret, and conceptualize issues through their conversations, based on their past experiences (Putnam & Holmer 1992).

The information derived from this qualitative analysis provided the basis for developing a quantitative survey on factors influencing binational collaboration for other

endangered species with historical distribution in Mexico and the United States (Chapter III). The survey allowed me to move from an in-depth qualitative analysis of interviews, to two levels of what is called "external validity." These levels of validity can be thought as concentric circles, with experiences reported by interviewees at the core, surrounded by the experiences of other members of their groups, in turn surrounded by those of others involved in similar recovery efforts with diverse species.

Finally, based on the results derived from the qualitative (Chapter II) and quantitative (Chapter III) analyses, I provide specific recommendations on how to improve binational collaboration in recovery of endangered species (Chapter IV). These recommendations are meant to provide guidelines for adapting the processes of alternative dispute resolution, which may be useful in this decision-making arena.

Each of these chapters was prepared to be submitted to different refereed journals. Since the style for these journals differs, the reader may notice some stylistic differences between the chapters. An effort was made to avoid redundancy, but there is some duplication of information between this introductory chapter and the following, as well as some cross-referencing of information among chapters.

CHAPTER II

UNDERSTANDING DIVERSE PERSPECTIVES

Introduction

In this chapter, I identify issues that potentially influence binational collaboration in the

recovery of endangered species, focusing on the Mexican wolf as a case study. My

interest in this case is grounded in direct experience and personal observation (1989

through 1995). I will begin by discussing historical information about Mexican wolf

recovery efforts conducted in the United States and Mexico. Then, I will explain the

main goal of this qualitative research and describe how the methods were consistent with

the constructivist paradigm of naturalistic inquiry as defined by Lincoln & Guba (1995).

Next, I will elaborate on key issues that interviewees identified as facilitating or

inhibiting binational collaboration in the Mexican wolf program. Finally, I will compare

the issues that were identified in the present study, with those that have been reported in

the literature as influencing other endangered species recovery programs.

Mexican Wolves

The Mexican wolf (*Canis lupus baileyi*) is the southernmost and smallest subspecies of

the gray wolf (Young & Goldman 1944; Hall & Kelson 1959). This subspecies is the

most genetically distinct form of existing gray wolves, indicating an isolated

evolutionary history during the Pleistocene (Wayne et al. 1992; Garcìa-Moreno et al.

1996). In the United States, Mexican wolves were historically distributed in

southeastern Arizona, southern New Mexico, and western Texas. The historical range of

this subspecies in Mexico included the states of Chihuahua, Coahuila, Nuevo Leon, Durango, and Zacatecas and the adjoining highlands south to Mexico City (Young & Goldman 1944; Leopold 1959; Villa 1960).

The last confirmed reports of wild individual wolves in the southwestern United States occurred during the late 1960s and early 1970s (USFWS 1982). In the late 1970's, McBride (1980) conducted surveys of Mexican wolves in northern Mexico and reported that no more than 50 wolves remained in the wild. In the 1990's, several research teams searched for Mexican wolves in northern Mexico (Moctezuma 1993; Servin 1996; Carrera unpublished data). Although the presence of the subspecies in the wild has not been confirmed, some researchers believe that Mexican wolves may still exist in remote areas of the state of Durango and along the border of Chihuahua and Sonora (Servin 1996; Carrera personal communication).

This subspecies was eliminated throughout its range due to predator control programs, human encroachment, habitat degradation, and inadequate law enforcement (Leopold 1959; Villa 1960; Brown 1983). Beginning in the late 1800's, wolf eradication campaigns were developed in the southwestern United States by ranchers and federal, state, and local governments (Brown 1983; Burbank 1990). By the 1920s, Mexican wolves were almost extirpated from their original range due to intensive predator removal efforts (Brown 1983).

In Mexico, wolf control began after the introduction of domestic cattle during the Spanish conquest (Villa 1960). By the early 1890s, the wild wolf population started to decrease as human settlements expanded in the Sierra Madre Occidental and the

Antiplano region (Carrera personal communication). In the 1930s and 1940s, Mexican

ranchers started using some of the more effective wolf control techniques already in use

in the United States (Brown 1983). In the 1950s, the wolf population in Mexico was

severely decimated after the compound 1080 (sodium monofluoracetate) was introduced

by the U.S. Fish and Wildlife Service (USFWS) and the Pan American Sanitary Bureau

(USFWS 1982).

Mexican Wolf Recovery Efforts

Mexican wolves are considered the most endangered subspecies of the gray wolf

(Groombridge 1993). They are listed as endangered under the Endangered Species Act

of 1973 (Federal Register 1976, 41:17736) and the Norma Oficial Mexicana (NOM-059-

ECOL-94, Diario Oficial de la Federación 1994). Recovery efforts for this subspecies

started in 1975 when the governments of the United States and Mexico recognized the

need to maintain a genetic reserve of the subspecies through the development of a

captive-breeding program (Reyes & López 1989). Between 1977 and 1980, 5 (4 males

and 1 female) Mexican wolves were captured in the states of Chihuahua and Durango,

then transferred to captive facilities in the United States (McBride 1980). A Mexican

Wolf Recovery Team was appointed by the U.S. Fish and Wildlife Service in 1979, and

in 1982 the Mexican Wolf Recovery Plan was signed by representatives of the USFWS

and the Dirección General de la Fauna Silvestre (USFWS 1982; Reyes & López 1989).

During the mid 1980s, captive breeding of Mexican wolves in the United States had to

be restricted because the number of pups produced outgrew the available captive space

(Kewata personal communication). In 1987, the USFWS decided to end the captive-

breeding program because participants disagreed about suitable areas for reintroduction. The courts reversed this policy decision in 1990 after environmental groups sued the Department of the Interior and the Department of Defense for failing to accomplish their legal mandate to recover this endangered subspecies (Burbank 1990). In 1991, the USFWS established a new recovery team and hired a full-time recovery coordinator. Efforts were renewed to manage the captive population for reintroduction, identify potential reintroduction sites in the United States, and locate wild wolves in northern Mexico (Parsons & Nicholopolous 1995).

Since December of 1993, the captive Mexican wolf population in the United States has been managed through the Species Survival Plan (SSP) of the American Zoo and Aquarium Association (AZA) (Siminski 1993). Species Survival Plans were cooperative programs that promoted the maintenance of viable populations by reducing the genetic and demographic effects associated with small populations (Conway 1980; AZA 1994). Although the AZA administered the Mexican wolf's captive program, the U.S. Fish and Wildlife Service was the agency responsible for recovery efforts for the subspecies in the United States (Parsons & Nicholopolous 1995). Similarly, the U.S. Fish and Wildlife Service Mexican Wolf Coordinator has been assisted by an SSP Coordinator, a Propagation Group, and a Studbook Keeper (Siminski 1997).

In Mexico, the Mexican wolf captive-breeding program was initiated in 1987 after 3 breeding pairs were transferred from the United States (Bernal-Stoopen 1989, Packard & Bernal-Stoopen 2000). The captive population has been managed by the Mexican Federal Wildlife Agency, currently Dirección General de Vida Silvestre de la Secretaría

de Medio Ambiente, Recursos Naturales (INE/SEMARNAP 1997). During the first 10

years of the program, there was no federally approved recovery plan for the subspecies

in Mexico. A draft recovery plan was developed in 1997, and was being reviewed by

participants in the program (INE/SEMARNAP 1997).

An informal technical advisory committee was established in Mexico in 1991; it

consisted of representatives from government institutions, non-governmental

organizations, captive-breeding centers, and universities. This committee provided an

advisory group for the federal government concerning ex-situ and in-situ Mexican wolf

conservation. Although this committee had not been officially recognized, it interacted

informally with employees of the federal government (INE/SEMARNAP 1997).

As of 1997, there were 178 Mexican wolves distributed in 31 breeding facilities in

Mexico and the United States (Siminski 1997). After several years of internal and public

review, a plan to reintroduce Mexican wolves into eastern Arizona was approved in

1997 by the Secretary of the Interior (D. Parsons, personal communication). In 1998, 3

family groups were released in public lands in the Apache National Forest in eastern

Arizona. The reintroduction sites were within dispersal range of the Gila National

Forest in New Mexico, which contained almost 7,000 square miles of suitable habitat.

During the next 3 to 5 years, captive-raised family groups of wolves were released

pursuant to the recovery objective of 100 wolves in the Blue Range Wolf Recovery Area

(USFWS 1996). The White Sands Missile Range in south-central New Mexico was

another area within the United States, which was considered as a potential reintroduction

site. This area of approximately 1,000 square miles had a declining population of mule

deer, estimated as sufficient to support approximately 20 wolves (USFWS 1995).

Reintroduced wolves were designated under section 10 (j) of the Endangered

Species Act as a "nonessential, experimental population." This designation provided

greater management flexibility by allowing the capture, translocation, or even the killing

of specific individuals that caused damage to property (USFWS 1996).

Due to the limited area of suitable habitat in the United States, Mexican wolf

recovery could not be accomplished only by efforts conducted in the United States.

Since most of the potential habitat was in Mexico, the participation of both countries was

essential to achieving the conservation objectives for the Mexican wolf. The recovery

program for this subspecies represented an important binational collaboration effort

between Mexico and the United States. Federal governments, state agencies, non-

governmental organizations, captive-breeding centers, and scientists from both countries

have been working closely together to facilitate the recovery of this subspecies of wolf.

Purpose and Significance of this Case Study

The main goal of this qualitative case study was to identify factors that may have

facilitated or inhibited binational collaboration in the Mexican wolf recovery program.

This case study was designed to help participants better understand the diverse

perspectives of citizens from both nations. I chose to use interview techniques, rather

than questionnaires, so I could hear participants' descriptions of their experiences in their

own terms. Kellert (1997) identified the problems associated with international use of a

quantitative questionnaire written for Americans and subsequently distributed in Japan.

To reduce such problems of inter-cultural transfer, I wanted to fully understand the diverse perspectives of a select number of actual participants in both Mexico and the U.S.A., before designing a questionnaire to survey a broader sample (Chapter III).

Qualitative approaches to analyzing interview transcripts provide effective means to discover nuances and perspectives that may differ among stakeholders. For example, Peterson and Horton (1995) examined landowner perspectives on conservation efforts for the golden-cheeked warbler (*Dendroica chrysoparia*), a public debate that was characterized by intense conflict. Based on informant-directed interviews, landowners believed their perspectives had been ridiculed by environmentalists and not equally considered in the decision-making process. From the landowner's perspective, a top-down decision-making process seemed to exclude participation by citizens in ranching communities. In other words, they believed the government had made its decisions based on communication with one stakeholder group, environmentalists. Peterson and Horton (1995) suggested that collaborative decision-making processes, as described in Chapter I, could provide alternative approaches for decision-makers to address the biological needs of endangered species in a manner that would reduce public conflict among diverse stakeholders.

Interviews are also useful for examining the logic by which people understand their experiences and construct their worldviews. The long interview allows a researcher to step "into the mind of another person, to see and experience the world as they do themselves" (McCracken 1988:9). For valid interpretation of the results of a

questionnaire, an in-depth understanding of the perspectives of diverse stakeholders may be invaluable.

The qualitative methods used in this case study of the Mexican wolf recovery efforts were chosen to enhance the design, implementation, and interpretation of a subsequent questionnaire-based survey of participants in a larger set of binational recovery efforts. A thorough thematic analysis as appropriate for evaluation of grounded theory was beyond the scope of this dissertation (J. Packard, personal communication).

Methods

Methods will be presented in the following order. First, I will state how I determined which participants to interview. Second, I will discuss the purpose of the interviews and the main topics that were addressed. Third, I will summarize the interview technique that I used and will explain how the interviews were conducted. Finally, I will explain how the transcripts derived from the interviews were analyzed.

Sampling Design

To determine which individuals to interview, I developed a preliminary list of key actors in the Mexican wolf recovery efforts in both Mexico and the United States, based on participant observation and public records. This preliminary list was discussed with an advisory council (see Chapter I) and with colleagues, in an attempt to get a representative sample of diverse perspectives in both countries. I supplemented the list with "snowball sampling" (Rakow 1986), in which interviewees were asked to provide the names of additional key actors.

In a total of 44 interviews, more participants were from Mexico (n=26) than from the United States (n=18). Eighty-four percent of the interviewees were men, while 16 percent were women. Participants' ages ranged from 30 to 82 years. The sample was distributed among 5 stakeholder groups involved in Mexican wolf recovery efforts: (a) government agencies, (b) non-governmental organizations, (c) captive-breeding centers, (d) university/research centers, and (e) livestock producers. Informal discussions with an additional 25 participants helped to place the communication of the interviewees in a broader context.

Interview Procedures

The interviews were designed to give participants the opportunity to express their perspectives on Mexican wolf recovery efforts in their own words and to allow interviewers to understand the diverse factors influencing the motivation of interviewees (Peterson et al. 1994). The interviews were conducted using the general technique of the "long interview" (McCracken 1988) with the modifications described by Peterson et al. (1994).

The "long interview" is based on a small number of general and non-direct questions. The questions addressed (a) participation in the program, (b) the recovery efforts for the subspecies, (c) factors that may facilitate or inhibit collaboration, and (d) the style of decision-making processes within organizations. The questions followed a pattern that grew from the interviewees' own responses. Neutral prompts were used between questions. More specific information was requested when interviewees spontaneously shared specific themes, interests, and/or experiences.

The interviews were conducted by a team of 2 trained interviewers, from June 1995 to December 1995. One team member acted as the main interviewer, while the other was responsible for recording the session. Interviews with English-speaking informants were conducted by the interviewer whose first language was English, while interviews with Spanish-speaking informants were conducted by the interviewer whose first language was Spanish. Appointments were obtained by telephone, and personal interviews were conducted at locations chosen by the interviewees. Interview locations included private residences, offices, hotel lobbies, and coffee shops. Interview length depended on the interviewee's time, interest, and communication style, with the shortest interview taking nearly 1 hour and the longest taking over 3 hours. Most interviews lasted approximately one and a half hours.

Prior to the interview, a friendly, informal environment was created so the interviewees could formulate and express ideas in a non-threatening environment. The goal of the study was explained in detail, and the importance of the participatory design of the research was discussed. Since interview sessions were recorded, the rights and responsibilities of researchers and interviewees with regard to the use of the tapes were addressed in a written consent form signed by each interviewee and the researchers. We ensured confidentiality and anonymity to the interviewees and they were offered a transcript of their own interview.

The interview techniques and questions were refined during the interview process. For example, few interviewees responded readily to the question about decision-making styles of organizations. Throughout this process, some of the lessons I

learned included: (a) to adapt my communication style to the style of the interviewee, (b) to use some spontaneous questions that elicited more in-depth responses compared to the planned questions, (c) to be sensitive to a delicate balance between encouraging an interviewee to speak about issues that are personally important and addressing the topics identified by the researcher, and (d) to be able to handle the delicate matter of reciprocity in exchanging information about the recovery program with the interviewees.

Content Analysis

Tapes from 42 interviews were of sufficient quality for analysis. Of these, 37 were personally transcribed, and 5 were transcribed by professional typists. In textual analysis, we protected the identity of participants by omitting information that might compromise the anonymity of their statements. Words were placed in brackets within the text to indicate editorial changes made for the purpose of protecting the speaker's identity and/or clarifying the meaning of statements that might otherwise be misinterpreted when presented out of context.

The transcripts obtained from the interviews represented the main source for hierarchical thematic analysis (Peterson et al. 1994). The process of thematic analysis involved the following steps: (a) identifying themes within transcripts and copying the textual excerpts to a data file in which the themes could be coded, (b) developing details for each theme by grouping the textual excerpts that address similar themes, (c) determining the relative importance of themes by the degree of textual elaboration (within and between transcripts), (d) searching for relationships among thematic categories and grouping related thematic categories in broader classes, and (e)

comparing text across transcripts and within category classes, and identifying the linkages across category classes and oppositions that were represented by themes within thematic categories.

Thematic hierarchical analysis (Peterson et al.1994) is used in studies of communication to address the question, "How do people talk about issues?" This technique is analogous to taxonomic analysis; however, the units compared are sections of text rather than individual organisms. The hierarchical classification involves grouping units of text in main categories called "issue themes," analogous to species, and dividing the issue themes into subcategories of thematic oppositions, analogous to subspecies. Issue themes are grouped at a broader hierarchical level into "issue clusters" analogous to genera. Issue themes refer to points of discussion by which participants explain the essence of Mexican wolf recovery efforts. The purpose of the thematic hierarchical analysis is to represent the voice of the participants and the diverse "frames" from which they talk about the issues. "Frames" refer to the means by which individuals define, interpret, and conceptualize issues through their conversations, based on their past experiences (Putnam & Holmer 1992).

Results

For the scope of this chapter, I will be focusing exclusively on key aspects that interviewees identified as factors that may facilitate or inhibit binational collaboration in the Mexican wolf program. Results will be presented in the following order: I will begin by discussing the stakeholders participating in the binational aspects of the Mexican wolf recovery program; I will then present a conceptual map of the issue clusters that

emerged from the thematic analysis; finally, I will elaborate on some of the issue themes within the clusters.

Stakeholders

From the way interviewees talked about stakeholders, it became apparent that participation in the binational aspects of recovery primarily involved individuals with experience in captive-breeding organizations, government agencies, and university or research centers. Within these 3 main stakeholder groups, only certain individuals actively participated over several years in the binational dimensions of the program. Interviewees without binational experience, who spoke primarily about collaboration at the national level, included individuals with experience in non-governmental organizations and local organizations, such as residents, landowners, and managers of ranching and tourism enterprises.

Furthermore, interviewees with binational experience did not express a strong sense of stakeholder group identification. Particularly in Mexico, interviewees talked about participants who had moved among jobs in government, academia, and captive breeding. Via job mobility, participants accumulated diverse sets of perspectives, diffusing any sense of group identity among stakeholders. While it was extremely difficult to assign interviewees to well-defined stakeholder groups, it was possible to include in the study a wide range of perspectives of participants from both countries involved in the Mexican wolf recovery program. However, the perspectives of some stakeholders, such as landowners and ranchers, may be underrepresented in this analysis (or at least interpreted through the words of other participants).

Conceptual Model of Issue Clusters

The information derived from the thematic analysis was useful for developing a conceptual model of how interviewees from both countries talked about factors influencing binational collaboration in the Mexican wolf recovery program (Figure 2). The following 5 issue clusters emerged from this analysis: a) binational plan issues, (b) organizational issues, (c) people issues, (d) resource issues, and (e) cultural issues.

Since binational collaboration is the main goal of my analysis, it represents the center of the conceptual model (Figure 2). Binational collaboration is defined as the informal and formal interactions among participants involved in recovery efforts in both Mexico and the United States, in a manner that meets the needs of all parties involved. Binational collaboration is dependent on collaboration at the national level in Mexico and in the United States. That is, binational collaboration is influenced by the degree of national collaboration that occurs and by those issues influencing national collaboration in both countries.

Collaboration is also directly and indirectly influenced by resources, people, organizations, and culture. Resources include animals within the captive-breeding program, human resources, funding, and information/knowledge. Resources are influenced formally by the plans of participating organizations and informally by the dedicated efforts of key actors. Underlying all these other clusters of factors is the influence of culture (i.e., the history of shared experiences as defined by Singer 1987).

ISSUE CLUSTERS

Bilateral
Collaboration

MX

USA

economic

animals

information

human

Resources

**Bilateral
Projects**

Organizations

People

(history of shared experiences)

Culture
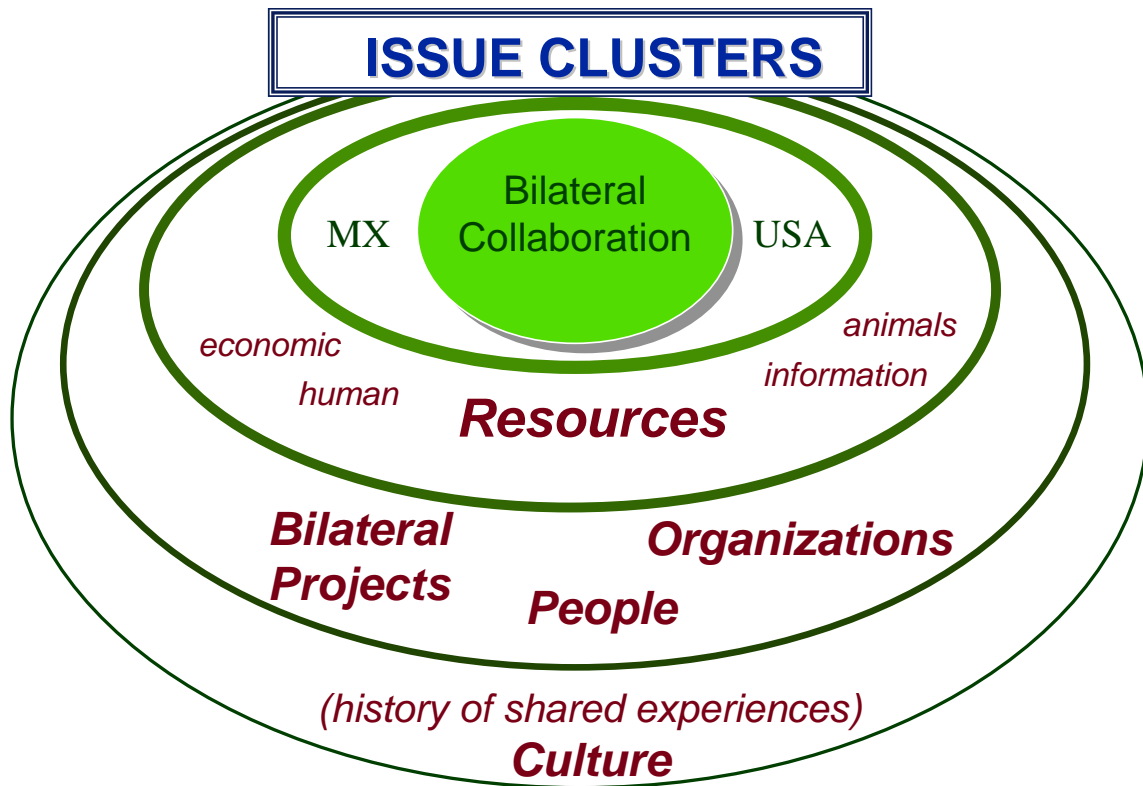
Figure 2. Conceptual model of issue clusters facilitating and inhibiting binational collaboration.

Issues Within Clusters

In the following pages, I will discuss 33 issue themes identified by interviewees as points of discussion regarding factors that facilitate or inhibit binational collaboration in Mexican wolf recovery efforts (Table 1). Sometimes interviewees talked about issue themes as problems; at other times, they framed issue themes in terms of positive improvements to enhance binational collaboration. Analysis of these issue themes will facilitate a better understanding of those factors that influence binational efforts for the recovery of this subspecies.

Binational Plan Issues

The cluster of binational plan issues included themes influencing binational collaboration on the recovery plan for the subspecies. Issue themes within this cluster referred to the development of a binational plan, clarification of the goals and objectives of the recovery effort, specification of participants' responsibilities, the degree of autonomy allowed in national efforts, and a balance between captive and field conservation activities.

Although the issue of a "binational plan" emerged throughout interviewees' discourse, participants from Mexico tended to use the term "binational program". Interviewees from the United States used the term "recovery plan." Both terms refer to an official written document that would be prepared by participants and approved by the governments of both countries. In concept, this document would recommend the most appropriate conservation activities for the recovery of the subspecies.

Table 1. Issues identified within clusters of themes that emerged from content analysis of interviews.

Issue Cluster	Issue Theme	Thematic Opposition	
		Facilitates collaboration	**Inhibits collaboration**
Binational project	Goals and objectives	Well defined	Ambiguous
	Participant responsibilities	Well defined	Ambiguous
	Autonomy of each national effort	Balanced	Imbalanced
	Captive / field effort	Balanced	Imbalanced
	Follow up and evaluation	Sufficient	Insufficient
Participating organizations	Active participation	High	Low
	Institutional commitment	High	Low
	Continuity in structure / procedures	High	Low
	Coordination / Interaction	Efficient	Inefficient
	Decision making process	Participative	Unilateral
	Task oriented decision making	Rapid	Slow
	Power / Authority	Balanced	Imbalanced
Participating people	Leadership	Strong	Weak
	Personal commitment	High	Low
	Continuity	High	Low
	Active communication	High	Low
	Personal interactions.	Adequate	Inadequate
	Differences in perspectives	Low	High
Resources	Availability of funds	Sufficient	Insufficient
	Equitable allocation of funds	Sufficient	Insufficient
	Management of funds	Adequate	Inadequate
	Availability of animals	Sufficient	Insufficient
	Animal distribution / replacement	Biological	Political
	Animal management philosophy	Appropriate	Inappropriate
	Knowledgeable people	Sufficient	Insufficient
	Information technical/programmatic	Sufficient	Insufficient
	Information exchange	Sufficient	Insufficient
	Binational access to technology	Sufficient	Insufficient
	Training opportunities	Sufficient	Insufficient
Cultural / Historical	Bilingualism	High	Low
	Intercultural understanding	High	Low
	Inequity in previous interactions	Low	High
	Value placed on trust / reciprocity	High	Low
	Resentment about the past	Low	High
	Stage of conservation movement	Advanced	Preliminary

The development of a binational plan for the subspecies recovery was identified as an important component for binational collaboration. Binational plans were described as useful tools to maintain focus in conservation efforts and facilitate coordination among those stakeholders participating in the program. When discussing the importance of developing a binational project for the Mexican wolf program, one U.S participant commented, "You have to have a plan with so many people involved, so many disciplines involved in order to keep your focus . . . so a recovery plan is critical to get something done of this magnitude."

Interviewees expressed the belief that binational plans could resolve problems related to 2 important issues in endangered species recovery efforts: institutional commitment and funding. A government official from the United States explained, "Recovery plans . . . I have found they are very helpful within the agency and using them to get other agencies to do things. Because, look . . ., here it is, you agree, your boss's name is on this document. It says that this is your responsibility." Another participant from the United States articulated how recovery plans are useful in the fundraising process: "You know, they [recovery plans] are supposed to change . . . They are put on the shelf and dusted off. It helps you in the budget process in the United States, getting money . . . everybody has to go and fight for money."

The lack of a truly binational recovery plan for the Mexican wolf was identified as inhibiting the collaborative process between Mexico and the United States. A colleague from Mexico voiced his frustration: ". . . for me there is not a binational plan for the wolf, that is the truth! Who knows it? That is what I am telling you! There is not a

program for the wolf, forget that." In 1982, the governments of Mexico and the United States approved the Mexican Wolf Recovery Plan. This plan is not a current guide for the conservation of this subspecies, as it has not been updated since its approval in 1982. When discussing reasons why the recovery plan had not been updated, one government official from the United States explained, "Simply because of the magnitude of the effort that we're trying to accomplish here in the U.S., [we] haven't had very much time to devote to the binational aspect of the effort, and it's been a real frustration of mine." Another interviewee from Mexico emphasized the difficulties of developing a binational plan, when one or both countries lacked a national recovery plan. He commented, "It doesn´t make sense to integrate a program between the 2 groups, if they have not yet defined what it is what they want and how they want to find a balance between them."

Interviewees identified a clear definition of the goals and objectives of a binational plan as a factor facilitating binational collaboration. Participants identified other projects that had well-defined objectives, tasks and responsibilities as examples of successful collaboration. Some interviewees indicated that the goal of the Mexican wolf recovery program was to recover the subspecies through captive breeding and reintroduction within parts of its historical distribution range. Other participants, who did not believe in the possibilities of a successful reintroduction, suggested that the goal was to maintain the subspecies in captive-breeding facilities or in protected, intensively managed reserves. One interviewee from Mexico stated, "For me, the wolf at that moment represented an opportunity for environmental education, to let people know how species can become extinct due to human activities . . . it was a project in which it was possible

to observe that the species would not be able to recover, only would prolong its existence in this world during some time." Thus, the goal of the loosely organized set of binational activities was diversely defined by interviewees, ranging from reintroduction, to preservation in captivity, to education about endangered species extinction.

A clear designation of tasks and responsibilities among participants in the program was identified as key for successful collaboration. A captive breeder from the United States indicated, "I think the collaboration comes in identifying who needs to do what and ... where the need properly rests in getting that done." A scientist from Mexico stated that the designation of tasks and responsibilities was essential to motivate participants in a recovery program. He explained, "I think that the basic ingredient, the key, the fundamental, is that the people are highly stimulated. Highly stimulated in this case means that ... my role or the role of a, b, or c, is perfectly specified and that I could see that my collaboration can have an impact, and a positive impact." The same interviewee emphasized the need for identifying and designating responsibilities among the key players from both countries. He said, "What it is missing is a project that really identifies what the United States and Mexico need to do, who are the actors in Mexico and who are the actors in the United States, what is their responsibility and what is our responsibility, that is what we need to do." One government official explained that not having designated tasks and responsibilities had prevented collaboration in Mexico. He stated, "So it is a matter that is more obvious in the reduced participation of the institutions involved, but also, it is because there is no real interaction between participants, and no one has the clarity on what he/she is supposed to do."

National autonomy in project implementation was an issue that emerged in some interviews. While interviewees clearly recognized that the Mexican wolf project was a binational recovery effort, they seemed to agree that it had to be implemented with some degree of national autonomy in each country. One captive breeder from the United States suggested that Mexico and the United States could collaborate more effectively through the following strategy: "I think they [Mexicans] have to organize on their own and then we have a collaborative agreement with the Mexican group of holders of Mexican wolves and the U.S. group and . . . that we get together and recognize that we are a little different because we got different regulations and that sort of thing, but we get together and ... do our planning and recommendations and that sort of thing together but still maintain some autonomy." A government official from Mexico indicated that the mutual respect shown for the way the project was implemented in the other country helped both countries to collaborate more successfully. He stated, ". . . the project in the United States was done in the United States; the project in Mexico was done in Mexico. Later we discussed both projects, we observed their similarities, their differences, their common objectives, their different objectives, . . . it was analyzed because it was the way that it had to be done in each one of the cases and that implementation was respected. In the United States, the project was going to be implemented by the United States participants and in Mexico, by the Mexicans".

The balance between ex-situ and in-situ conservation activities for the Mexican wolf was an issue expressed by interviewees from both countries. The higher support that the Mexican wolf captive-breeding program has received, when compared to

support for the conservation of the subspecies in the wild, was recognized as a factor that inhibited collaborative efforts. A participant from Mexico explained how the stronger support directed towards captive breeding had affected the status of the subspecies in the wild: "When they decided that [the need to start a captive-breeding program], and they go to Chihuahua to capture animals—since that time, the effort and funding was allocated...[at] 99% for captive breeding, and they forgot about the wild wolves."

Another participant from Mexico, associated with the federal government, emphasized the lack of integration between the in-situ and ex-situ conservation activities in both Mexico and the United States. He stated, "On one side, there is the captive-breeding program as it is, and on the other, the in-situ management or conservation in the wild. So why is there that divorce in the United States? So the same will be asked: Why does that divorce also exist in Mexico? Why are we only interested in the captive breeding and not in doing field work?" Participants recognized that an adequate balance and effective coordination between captive breeding and field efforts could facilitate collaboration in the Mexican wolf program.

In summary, interviewees suggested that binational collaboration for Mexican wolf recovery could be facilitated by developing a binational plan. They indicated a need for clear definition of goals, objectives, tasks and responsibilities of participating organizations. Similarly, interviewees stated that national autonomy in project implementation and a balance between ex-situ and in-situ conservation activities for the Mexican wolf were factors that facilitated binational collaboration. The inter-relations among these issues were complex (Figure 2). To the extent that plans were developed by

people within organizations, the issues associated with binational planning both directly influenced and were indirectly influenced by the issues identified in the organizational and people clusters described below.

Organizational Issues

The cluster of organizational issues addressed the following issue themes: commitment, coordination, continuity, decision-making processes, and issues of power/authority within and among organizations participating in the program. Interviewees did not use the term "organizational issues" when they talked about these themes. Rather, they talked in terms of how organizations in both nations addressed recovery efforts, emphasizing those factors that facilitated or inhibited binational collaboration. I chose this title for the thematic cluster, to facilitate comparison with themes identified in the published literature, as discussed in a later section of this chapter.

A high degree of "commitment" to the program on the part of organizations in both countries was identified as key to effective collaboration. Interviewees indicated that successful collaboration could only occur if those organizations participating in the program were highly committed to recovery efforts for the subspecies. Some colleagues declared that collaboration had been hindered as a result of the lack of commitment shown by government agencies from Mexico. A participant from Mexico commented on the low interest that the government of Mexico had shown in the Mexican wolf recovery program. He stated "The government of Mexico has never been a government with very much interest in the wolf; when the United States suggested the program they

accepted it, but they never had the initiative; they have always been following the United States." The same interviewee emphasized the ways this lack of interest in the program has affected Mexico's participation in recovery efforts: "I have always thought that the government of Mexico participates less; it seems that the government participates because it is forced; it seems that it is only interested in the wolf because they [the United States] have told them that they need to be interested in it. The government by itself never takes the initiative."

A weak interest on the part of organizations from the United States in the efforts conducted by Mexican organizations was identified as a factor that inhibited binational collaboration. Interviewees from Mexico expressed their frustration with the apathy that most organizations from the United States have shown regarding the limitations faced by participant organizations from Mexico. A government official stated, "What I know very clearly is that Mexico does not occur to United States participants in their sleepless nights. I don't think they [United States organizations] spend too much time in the night thinking about what is being done in Mexico; I think they only worry about the program in the United States." Another Mexican interviewee explained how this lack of interest had created a wrong image of the recovery efforts that were being conducted in Mexico: "I believe that one of the main factors that explains the poor collaboration is that participants from the United States think that we [Mexicans] are not organized in our efforts to recover Mexican wolves. They seem to believe that Mexico does not know what to do with the wolves . . ."

Interviewees identified effective coordination between organizations of both countries as key for successful collaboration. Interviewees talked about how several organizational structures had facilitated or inhibited binational coordination in the Mexican wolf recovery program, i.e., the United States-Mexico Joint Committee, the Mexican wolf recovery team and the Species Survival Plan, and formal agreements between organizations from both countries. Participants disagreed over how helpful the U.S.-Mexico Joint Committee had been in coordinating conservation actions. A government official from the United States explained how binational coordination had been facilitated through the Joint Committee: "Joint Committee... was a very good vehicle for joint cooperative programs. Because, if you could get it through the Committee, it gave you a green light to move down to the lower echelons where the work was going to be done and get it done."

Some interviewees indicated that the Mexican wolf recovery program was not a priority within the U.S.-Mexico Joint Committee, so the program had not received sufficient support. A colleague from Mexico declared, "It took me some time to notice the bureaucratic management of the projects in the Joint Committee; and when I figured it out, it was already too late. At that point I had no more interest in working with the Joint Committee, and they were no longer interested. This is very curious and very sad, because if they would have had interest in that project [Mexican wolves] and they supported it, I could guarantee you that we would still have wolves in Mexico."

The establishment of a recovery team with balanced representation of specialists from Mexico and from the United States was identified, by interviewees from both

nations, as a factor that would facilitate coordination. The fact that the current Mexican Wolf Recovery Team is composed almost entirely of U.S. representatives was described as hindering binational collaboration in recovery efforts. A government official from the United States commented on how the small representation from Mexico on the recovery team had inhibited collaborative efforts. He explained "The team mostly made up with U.S. representatives can't really know the nuances of getting things done in Mexico and make valid recommendations for actions to take place in Mexico."

Similarly, interviewees associated the establishment of recovery teams mainly composed of official representatives, rather than specialists, with poor coordination. An interviewee from the United States commented, "The other aspect of the binational part is that Mexico has always had a representative on the recovery team for diplomatic reasons." Another colleague from the United States candidly observed, "Well, sometimes they've appointed representatives that just have no business [being there], and they don't know what the hell it is all about . . . They don't say anything, they are just there . . . You need to get a real hot shot up there, coming out of Mexico . . . that knows what it is all about and speaks up for the Mexican interests."

Interviewees from both nations indicated that coordination between organizations from Mexico and the United States had improved through the Mexican Wolf Species Survival Plan (SSP). The SSP had promoted guidance, information exchange, and the transfer of genetic material among captive-breeding centers in both countries. Interviewees commented that participation by Mexicans in annual meetings of the Mexican SSP had facilitated a better understanding of varying perspectives and had

fostered friendships and more trust among participants from both countries. However, some colleagues from Mexico indicated that because Mexican captive facilities were not part of the SSP program, Mexican participants could express their opinions but could not participate in the decision-making processes of the program. When discussing the reasons why Mexican facilities had not become part of the SSP, one captive breeder from Mexico explained, "Personally, I think that every Mexican zoo should be involved in the program—should become part of the SSP. I proposed . . . I argued quite a lot . . . so that we could participate. But [I was told] that if you become part of the SSP, you are bound to accept their recommendations, and responsible for covering the expenses of every animal your institution transfers . . . It is convenient if you are able to cover the expenses, but I can't cover those expenses, so why should I commit [to something that I can't accomplish]."

While some interviewees indicated that formal agreements are good vehicles for joint programs, others questioned whether they promoted effective collaboration—especially at the operative or "ground" level of the binational project. For example, a United States government official commented, "What helps between the nations is really a formal agreement to be signed, and you try to get these agreements to expand an administration, hopefully in both countries, and when you have a piece of paper with signatures, you are legally bound to talk . . .". A scientist from Mexico expressed a very different perception: "That is, there are 2 spheres in how this works: one is the political, the theoretical, the diplomatic sphere. The other sphere is the dirty work done under the sun—observing Mexican wolves, taking care of them and everything. Good, the

political sphere is very satisfactory, the diplomatic sphere, the administrative sphere,

very good . . . binational agreements. But, what is there at the practical level? We have

been left behind!"

Another factor inhibiting successful collaboration was the frequent structural and

personnel changes, particularly within the government of Mexico, interviewees from

both countries indicated. With laughter, one captive breeder referred to this lack of

institutional continuity: "Let me make a parenthesis in my conversation, here [in

Mexico] government agencies change their names and philosophical postures as if they

were changing their socks, their hairstyles. One day they comb their hair this way and

tomorrow the other way."

Interviewees noted a higher continuity among organizations in the program in the

United States. One United States colleague commented, "In the United States, this is

managed with less instability, because the people stay longer in the programs and the

projects." When discussing some of the factors that might explain the differing degrees

of continuity in organizations, a government official from Mexico explained, "In Mexico

there are almost no civil servants as a career. In the United States, a civil servant,

reaches up to high levels of government structure. What is called 'political posts' . . . are

really high levels in government structure; an example of this is the U.S. Fish and

Wildlife Service director. That is a 'political post,' but from there immediately

downwards are 'civil servants.' This promotes more continuity in the decision-making

processes and makes possible a relatively permanent structure that allows for planning

things. In Mexico, lower structural level positions are still considered 'confidence posts,' and they can change and, in fact, do change every 6 years."

A government official from the U.S. explained how this lack of continuity within the government of Mexico affected his interaction with his counterpart organization: "I had trouble keeping track of who my counterpart in the government was because at that point in time these were largely political appointees. And about the time that I would find out what his name was and his phone number and call him, he had been replaced. And then, I would have to start the whole process all over again . . ." Another colleague from the United States commented on how this lack of continuity disrupted any long-range collaborative efforts with Mexican organizations. He stated, "In Mexico, the change in government is so disruptive to government agencies that it affects their ability to function . . . and that's not very conducive to a long-range collaborative effort."

Some interviewees suggested that the lack of institutional continuity could be partially overcome by stronger participation from the non-governmental sector and the academic communities in both countries. Interviewees identified the recent interest from the Mexican federal government to create an atmosphere favoring participation by the non-governmental sector as a factor facilitating collaboration among organizations. A government official from Mexico explained how this more active participation from the non-governmental sector had promoted stronger responsibility and cooperation among organizations. He stated, "In some ways... I think that with the work that we are doing, with our participative policy, I think that we have promulgated a stronger responsibility

in the participants in the program as a group—not as isolated entities within a program, but as active members of a group that shares common interests and objectives."

Interviewees from both countries indicated that long-term collaboration could be facilitated through a stronger interaction between academics and scientists from both countries. A government official from the United States emphasized the importance of cultivating stronger relationships among academic institutions of both countries: "You know... I think that most public trust is placed in the university systems in Mexico now; that is where the trust is . . . so, I think it is extremely important that we cultivate even stronger relationships between academic institutions; that is where the stuff is going to get done . . ."

Equity in decision-making processes would help facilitate binational collaboration, respondents said. Interviewees talked about how access to the decision making-process had been limited for Mexican organizations. A captive breeder from Mexico expressed his frustration: "It really worries me a lot . . . because I feel that the United States has an absolute dominance over the situation; everything [in terms of decision making] is made there, nothing is made here . . ., and I feel that is not the way it should be; it should be 50-50, and we would be better off". Another interviewee from the United States emphasized the insignificant amount of consultation that his country has had with Mexico in the recovery program. He stated, "My perception is that it is a totally U.S. . . . obviously, U.S.-dominated program . . . It just looks like a U.S. program with very little consultation with either the cattle industry on the Mexican side, or the NGOs on the Mexican side, or the Mexican government; and that is only my impression."

When interviewees discussed some of the reasons that led to this perception of unequal participation in the decision-making process, one of the issue themes that emerged was the economic difference between the two countries. A wildlife manager from Mexico commented, "[The lack of economic resources] puts you at a disadvantage, when one, as a Mexican, goes there [to the United States] to talk about Mexican wolf recovery, one goes there to see what they can give you, extending your hand [like a beggar]. So that is a difference that puts you at a tremendous disadvantage in our opinion."

Another way interviewees believed collaboration could be facilitated, was by achieving an appropriate balance of power/authority between organizations from Mexico and the United States. Dominance by the United States in the program was identified as an issue hindering binational collaboration. One colleague from Mexico commented, "It appears that it is the United States and Mexico, but Mexico remains in a secondary position; so, I think that we should definitely eliminate this idea [United States dominance]". In the words of a captive breeder from Mexico, collaboration could be more successful ". . . without them [the United States] keeping everything, but trying to share it with us—without putting their rules, but establishing a fair agreement —without saying 'I will give you, but I will tell you how I want things'."

In summary, interviewees indicated that binational collaboration could be facilitated by the participation of committed organizations, by an effective coordination among organizations from both countries, and by institutional continuity. On the other hand, binational collaboration could be inhibited by unequal participation from

organizations of both countries in the planning and decision-making processes and by an inappropriate balance in power/authority issues within and among organizations from both countries. Thus, in the conceptual model (Figure 2), organizational issues were placed where it was evident that they could directly influence as well as being indirectly influenced by issues associated with a "binational plan" and "people". The concept was that if positive linkages could be created among organizations as well as among people and projects, then resources for binational collaboration could be mobilized more easily.

People Issues

A cluster of issues related to people emerged as interviewees talked about themselves, their interactions with colleagues, and the interactions among other participants in the program. Some of the issues addressed by interviewees were leadership, personal commitment, continuity, personal interactions, differences in perspectives, and communication.

Lack of leadership by participants from both countries was identified as a factor inhibiting collaboration. When discussing some of the possible reasons for the lack of leadership at the binational level, interviewees referred to the poor leadership that existed particularly within Mexico. A scientist from Mexico commented "There hasn´t been a leader [in the Mexican program], who is able to agglutinate all those efforts, all that mass of people, and who knows how to lead them. So there hasn't been a leader, and there have been many dummies." Some interviewees indicated that, although there were leaders within certain institutions or informal working groups, these leaders were not usually recognized by participants from other constituencies. A member of a non-

governmental organization from Mexico explained, "For the Mexican wolf program, someone who could function properly should have a well-recognized reputation as an academic and conservationist, with strong experience with wolves. Someone like David Mech; if there was a Mexican David Mech, he would be the natural leader of our wolf committee in Mexico. But we don't have a similar person. So, those participants who have assumed some type of leadership [in the program] have not been recognized by other participants for several reasons."

The participation of personally committed individuals was identified as a key factor for successful collaboration. One government official from Mexico commented, "Look, there is a very important factor [for successful collaboration]: interest in the wolf. That is the first factor that makes people... see that people can work with the wolf." The close alignment between people and organizational issues was expressed by an interviewee from Mexico who emphasized how important commitment is in a collaborative effort. He declared, "I think that [commitment] is key, because no individual or country can commit their time, money, and effort to someone who is not committed to the cause. I can't commit myself to work in your house if you are not interested—if you are setting the job to the side."

Individuals who lacked enough interest in the subspecies or were motivated by incompatible personal goals, rather than by recovery goals, were described as inhibiting collaboration. One colleague from Mexico summarized some of the factors that had led to low personal commitment, and thus, to program displacement: "They are political issues, power struggles, caring about who keeps their work longer or who becomes the

director faster, instead of caring about having a real impact on conservation issues." A government official from the United States suggested that some individuals were more strongly identified with their position than with the restoration task and explained that this hampered the program: "Unfortunately, some of these people . . . and this is only my perspective—would come to the recovery team meetings and forget to leave their agency hats at home and that became very disruptive."

The continuity of people was identified as a factor influencing successful or unsuccessful collaboration between countries. Representatives from Mexico changed frequently during the first years of the program due to organizational structure. Interviewees talked about the difficulties of establishing and maintaining communication and rapport with people new to the program. One government official from the United States expressed these difficulties in the following way: "I dealt with 7 or 8 different directors in 6 or 7 years. There was no continuity. There is the problem . . . you get something going, you know . . . I could sit down and drink cerveza with this guy and work something out . . . The next day he is gone, and he never told anybody anything..." A government official from Mexico described the magnitude of this lack of continuity within the government of Mexico. He explained while laughing, "With the frequent administrative changes that we had in Mexico that were annual—not every 6 years, annual—let me tell you that in the 20-year period before [a director's name], we had 23 directors, not even just one per year."

Interviewees from both countries indicated that continuity of key participants from Mexico had considerably improved in the past few years, and they talked about how this

continuity had facilitated collaborative efforts. A government official from the United States stated, "Since [a particular director from Mexico], you have seen more continuity, I mean the people that were under this person are still there . . . and I have seen more continuity that bridges the administrations, with [a particular president from Mexico], and [another president from Mexico], and this new administration."

Interviewees also identified good personal interactions as a key component for successful collaboration. A scientist from Mexico explained how important it was for him to have a good personal relationship with a colleague. He said, "The scientist that trained me- well, one of the scientists that trained me... to him, the individual person was very important. He used to tell me, if you have a good relationship with a person, you will be able to function very well. There should be a click. If there is a clack, even if the other person is very good [as a professional] , it will not work out." He proceeded with laughter, "And we have tried that with people that we don't necessarily like, and we have had very bad experiences...". A U.S. government official who had been involved in several U.S.-Mexico efforts at endangered species recovery, made a similar observation. He said: "The first thing you have to do is understand the players . . . who's who and where they sit and . . . are they going to be there tomorrow? I will go to Mexico City and relearn the players and drink a lot of beer with them. I will tell them all our stories and will work something out. I will make all the contacts. If we decided we want to look at Chihuahua, want to look at Durango, who the hell do I know there? Who do I know who knows somebody that has thousands of hectares in that country? I will

go to talk to him and drink some beer, drink some coffee, or sit in his living room on the edge of a silk couch."

Interviewees talked about several factors that influence the development of rapport and friendships between participants, identifying 3 essential components: sincerity, trust, and respect. One government official from the United States captured the relationship between sincerity and rapport in this statement: "I would try to establish a little better rapport [to improve binational collaboration]; I think basically, the key to being able to establish a rapport with the Mexican government is to be sincerely interested in dealing with human beings." A captive breeder from the United States illustrated how the trust component between participants had been key in successful binational collaboration, despite the lack of trust that existed between the governments: "I think we, as many of these facilities, trusted each other and developed a personal rapport of trust between the individuals. So I think there was not a question there, but there has always been the question of trust between government levels." The role of respect in personal interaction was described by another U.S. colleague: "I'm concerned when I see a lot of 'big brother' attitude kind of things on the part of Americans going to Mexico. We think we have all the answers, and we're going to go down there to teach them. Whereas, I'm in the habit of working with them as partners and being really respectful . . . So, I think the fact that I have a great respect for them is a key thing, and I see many Americans who don't."

Also at issue were fundamental differences in perspectives among participants from both countries. Interviewees explained these differences in terms of the different

administrative, social, economic, and cultural realities that exist in Mexico and the

United States. For example, one scientist from Mexico commented, "The reality of the

United States is very different from the reality of Mexico in socioeconomic terms,

culturally, and in terms of how we administrate our natural resources; and, sometimes

we have not talked about it; so when you have a conversation between a technician from

here [Mexico] and one from there [the United States], there will be a complete

confrontation." Interviewees talked about some ways of improving collaboration despite

the differences in participants' perspectives. One colleague from Mexico emphasized

the importance of trying to better understand the position and concerns of the counterpart

from the other country. He said that collaboration between both countries could be

improved by "trying to understand better the culture and positions of both parties, and

trying to understand their positions perhaps more at a personal level than at a national

level . . ."

Communication among participants was also a theme that emerged during the

interviews. Infrequent communication among key participants was identified as a factor

inhibiting binational collaboration. Participants from both countries talked about the

reduced communication that existed some years ago between high-level government

officials. A government official from Mexico complained "I never received a report,

never in 3 years . . . received a report on the genetic research status, the wolf population

studbook . . . they hardly respond to the letters; communication was then very slow . . ."

Similarly, a government official from the United States expressed his frustration at the

lack of response he had received from his Mexican counterpart He said, "I think we

have had 4 meetings of the recovery team over the past 4 years. I believe [a participant from Mexico] has only attended one . . . And we have essentially left Mexico out of that process other than [a particular participant from Mexico] [who] is still invited to all the meetings and gets all the drafts and has opportunity to communicate, though I haven't seen much comment from him."

Interviewees commented that during the last few years, communication had increased among key participants of both countries. They connected this communication increase in some measure to the better attendance of the Mexican participants at the SSP annual meetings, attendance of U.S. participants in scientific meetings in Mexico, animal exchanges between captive-breeding centers of both countries, and site visits by participants from both countries to captive-breeding facilities in the other country. One captive breeder from the United States explained how communication and trust between participants had increased after the first animals were transferred to Mexico "I think communication now is better than it has ever been, and I think the transfer of animals down there was the key to both the Service and to the government of Mexico that we [Americans] are serious about this and that we really want this to happen." The same interviewee provided an example of how, by inviting key players from Mexico to the United States, he was able to develop personal friendships that helped to overcome institutional blocks. He stated, "I first began stimulating [communication] by inviting individuals from Mexico from Mexican wolf facilities . . . to come to [a particular city] to discuss the issues and to be involved in how we manage the Mexican wolf and to demonstrate [to] them how we did it. Perhaps they could gain something from that. But,

through that process, we developed communication—we kept communication going between both countries."

When interviewees discussed some of the factors inhibiting adequate binational communication, 3 of the themes that emerged were: language differences, differences in perspectives, and funding shortages. A government official from the United States explained how the language barrier had curtailed effective communication with his counterpart. He said, "But the language barrier has been a real problem for me. I don't speak Spanish other than just enough to say some initial amenities, but certainly not to engage in a technical conversation with my counterpart in Mexico. And my counterpart . . . speaks some English, but again, not enough to engage in a conversation where we truly understand each other at a technical level."

Even on occasions when participants were able to speak the language of their counterpart, differences in perspectives affected their communication. One wildlife manager from the United States said, "He spoke very good English, I speak a certain amount of Spanish, we can physically converse, but we were coming from such a different perspective. The whole thing of our perspective is so distant, is so separated that we couldn't talk to each other".

Limited funding presented a similar barrier to communication. A member of a non-governmental organization in the United States bemoaned the limited funding that kept him from developing stronger relationships in Mexico [or traveling to and telephoning colleagues in Mexico]. He said: "Everything we do in [this non-governmental organization] is volunteer and we never provide funds for personal

expenses including mine, but I wish there were more dialogue, more interaction between some of the people who are trying to do what I am trying to do in Mexico."

Although interviewees commented that communication, especially among key participants of the captive-breeding program, was better than ever, they were able to identify some communication gaps within the larger group of participants in the program. They discussed the importance of improving communication among government officials from both countries and expressed the need for developing communication opportunities among non-governmental organizations in Mexico and in the United States. They indicated that communication should be promoted not only between the "heads" of the program, but also among the different levels of participants involved in recovery efforts. Interviewees suggested the following strategies to overcome the communication gaps that they recognized: (a) developing scientific meetings, workshops, and informal gatherings and (b) creating a funding source that could help participants to travel from one country to another.

In summary, interviewees indicated that binational collaboration could be facilitated by: effective leadership, the participation of strongly committed individuals, and good personal relationships among participants from both countries. On the other hand, binational collaboration could be inhibited by lack of continuity in participants, fundamental differences in perspectives, and poor communication among participants. Thus, interviewees talked as if they believed that key actors could influence organizations, projects, and resources. Consistent with my conceptual model (Figure 2), they implied that people issues could be influenced by organizations and

cultural/historical issues. Their underlying mental model appeared to be that on occasions when collaboration was blocked as the result of organizational issues, committed key actors have been able to develop personal collaborative relationships that mobilized resources across the international border.

Resource Issues

The cluster of issues related to resources was the most diverse. I have included in this cluster human resources, economic resources, animal resources, and information/knowledge resources. Interviewees suggested that binational collaboration was influenced by all these types of resources.

Some interviewees attributed many of the planning, organizational and personal issues to a paucity of human resources in terms of the availability of (1) highly qualified people and (2) training opportunities to produce more qualified participants. One government official from the United States commented on dearth of qualified people to coordinate recovery efforts. He said, "Maybe the reality is that we don't have enough resources, human resources in both countries to really sit and talk about binational recovery plans." A scientist from Mexico emphasized the smaller number of qualified participants within the program in Mexico, when compared to the program in the United States. He stated, "If you talk about wolves, you will have 15 or 20 people who are working with them [in the United States]. Here [in Mexico] we don't have them; . . . we only have people that are trying a little bit here and a little bit there. We get involved either because we need to do so or because we are the only ones there." He continued with laughter, "Here in Mexico, we still don't have that type of specialists, and the ones

that we do have, we think that they are nuts, we think they are crazy, that there is something wrong with them . . ."

The development of training opportunities was cited as a factor facilitating binational collaboration. One scientist from Mexico indicated that training programs represented a more realistic scenario to address inequities between Mexico and the United States. He said, "At the operative level, at the practical level [of the program], why don't you select some of our people and train them in your country? You could ask the Mexican government to send you individuals from Mexico to receive training. For me, that would be a more participative scheme, a more real, a more practical collaboration. But the people who are working . . . why isn't there a program to promote cooperation so that you can select people and train them?"

Interviewees also described training programs as opportunities for establishing partnerships and friendships, and as vehicles for achieving better understanding of each other's perspectives among participants from both countries. One government official from the United States said, "A primary approach is education . . . While we are doing that with very few American dollars and pesos, we are investing in a tremendous resource, the best of all, the human resource. These are not only short-term investments, but they come back later; you know, they form partnerships, friendships, and promote better understanding for each other's countries."

Funding availability was identified as a factor that could facilitate or inhibit Funding binational collaboration. As one government official from the United States put it, ". . . money divides, and money brings people together." Scarcity of funds was

identified as one of the main limitations for successful collaboration between countries. One captive breeder from the United States commented, "I think part of the main problem— part of it was communication and language—but the other was money and being able to get the individuals funded; very simply, this was probably the biggest key to cooperation".

Interviewees from Mexico and the United States talked about how scarce funds had constrained communication and personal interaction among participants. A captive breeder from Mexico explained how the shortage of funds had limited his ability to communicate with colleagues. He said, "I do not have enough resources to send faxes or to send letters. There is a moment when it is very difficult for me to even try to make a phone call, because we don't have a telephone. I have to use a public telephone and stand in line so that I can use it." Similarly, a member of a non-governmental organization in the United States remarked, "It really gets expensive between phone calls and mail and all that, and we don't have any large fund to back up that stuff [communication with Mexico]." A captive breeder from Mexico could not attend the Mexican wolf SSP annual meeting as a result of a lack of funding. He stated, "This year they did not give me money, and only one person from another zoo went to the meeting; . . . we were really mad that we could not participate, because we really needed to receive orientation; we are very much interested in participating."

The asymmetry of economic resources available for Mexican wolf recovery efforts in Mexico and in the United States was perceived as inhibiting collaboration. Interviewees talked about the ways this asymmetry could have affected equal

participation of both countries in program activities and decision-making processes.

One colleague from Mexico declared, "I think that a situation where one of the parties

has [economic resources] and the other one doesn't, can make Mexicans feel inferior and

Americans feel superior . . . If the level is not balanced, I believe this situation will never

allow an authentic effort. I believe that the day both countries can contribute equally,

conservation will be working much better." A government official from Mexico noted

that organizations from the United States were more involved in the decision-making

process due to their greater access to funds. He said, "In relation to resources, the

United States obviously has a stronger follow-up of the program and is the one that is

dictating the objectives that need to be accomplished. Basically, Mexico is participating

'actively' [in quotation marks indicated by a gesture], with some breeding centers here,

but in reality, the directions for the program, they all come from the United States."

The unequal distribution of scarce funds between captive breeding and field

conservation activities was also an issue that drew comment. Some interviewees

identified the limited amount of money that has been directed towards in-situ

conservation activities as a factor inhibiting collaboration. A member of a non-

governmental organization from Mexico affirmed, "That is one of the biggest risks, the

way things are prioritized; governments prioritize and decide for only one [meaning

captive breeding or conservation in the wild], and they give to this one all their support

and money, and they forget about the others. And, in this case, the wild wolves were the

losers. It is nothing, the money and the effort that both governments have dedicated to

the wolf in the wild, but it is very respectable the amount of money and work that the

captive-breeding program has received." Other interviewees suggested that funding should have been applied towards the captive-breeding program, as they perceived the probabilities for wolves to exist in the wild as minimal. One captive breeder from Mexico recommended that rather than spending scarce funds on "imaginary" wild wolves, funding should be used to resolve some of the severe limitations faced by some captive-breeding centers. He explained, "[A particular zoo in Mexico] has achieved extraordinary results with a minimum of resources. I feel that the people who are working there are highly committed, and we should give them extraordinary support. So, instead of spending resources . . . to look for wolves in the north of the country, we should use those resources to improve the facilities in this zoo."

Breeding wolves were also perceived as a scarce resource. With regard to animals, some of the issues that emerged during the interviews were the size of the captive population, the transfer of wolves between countries, and the differences in animal management styles among captive breeders. Early in the program, institutions competed for the small number of animals in captivity. For some institutions, rare animals represented a scarce resource valued more for status than for recovery efforts. However, as captive reproduction became successful, captive-breeding centers became more open to exchange because they needed placement options to avoid overcrowding in limited facilities. A captive breeder from the United States explained how, as the number of wolves increased, captive-breeding centers became more responsive to collaboration. "Your facility has a lot of wolves, now everyone is fighting for wolves. We want a pair! We want a pair! We want a pair! That's the way it was here [in the United States], but

it´s going to get to the point were you are going to have a pair and you will say, well, I have 10 babies or 15 babies, and I don't have a place to put them; so ultimately, you will have to cooperate if you want to get rid of them and if you want to manage them professionally."

Exchanging animals among breeding centers from Mexico and the United States facilitated binational collaboration, respondents said. Interviewees observed that the transfer of animals from the United States to Mexico had increased trust between participants. A captive breeder from the United States commented, "The transfer of animals down there [Mexico] was the key to both the Service and to the government of Mexico that we [Americans] are serious about this and that we really wanted this to happen; it was actual action to demonstrate that we were serious about cooperating. So the transfer of animals was the key or even the turning point to the trust between both countries." Informants also perceived that communication between participants had increased after the first animals were transferred to Mexico. A government official from the United States commented, "It may have been '87 or something like that—I know there was an official request from Mexico to the U.S., and wolves were selected and sent to Mexico—and, once those wolves were in Mexican zoos, then it became easier for me to communicate with those people . . ."

Distributing animals among captive facilities for biological reasons enabled collaboration, but distributing or replacing them for personal or political reasons inhibited trust, interviewees said. Interviewees from Mexico described how collaboration had been inhibited when decisions about animal transference had been

based on personal or political reasons. One captive breeder from Mexico explained that for several years he couldn't replace a mate for a female due to a personal conflict with a colleague from Mexico. He emphasized that even though some participants from the United States were aware of the interpersonal nature of this decision, they didn't exert enough pressure to prevent the loss of this wolf's breeding potential. He stated, "I had a very strong disappointment that made me think badly [of my colleagues], because even if I had not received support because of an individual, a Mexican individual, why didn't the United States do something to support my request, considering that the female [wolf] was such an important genetic reservoir? I think that in this particular case, participants were not very professional, because it would have been better to take away the female if they didn't want to deal with me; but why affect the animal in that way?"

Differences in participants' philosophies regarding proper management of captive wolves were perceived as inhibiting collaboration. One captive breeder from Mexico expressed his disapproval of the intensive management style that had been proposed initially by the United States and was then followed by Mexico. He stated, "We fought quite a lot against the desire of the Federation [government agency] to develop a similar program to the one that was initiated by the United States . . . of intensive management of the animals, of giving them a series of different food items, of maintaining them in a program that we didn't think was appropriate for their recovery. We thought that the program that was being developed was entirely a program for a zoo animal, something that we were against." On the other side, another captive breeder from Mexico expressed his frustration in relation to how some wolves were minimally managed in

other captive centers in Mexico. He said, ". . . a lot of people were creating biological jewels that were maintained in glass cases to protect them even from the dust, . . . and they did not do anything with them because of the fear of managing them—because of the fear that they could die if they were handled. They wanted to have them protected in glass cases, to protect them against life . . . and part of life is death."

These differences in management philosophies have hindered collaboration in several ways. Interviewees felt that philosophical differences had prevented animal exchanges among captive facilities. A captive breeder from Mexico expressed his reluctance in exchanging animals as the result of intensive management policies implemented by other captive centers. He explained, "We have had discrepancies . . . in the sense that they have demanded that we adopt several management practices, that we have to exchange animals with other facilities, . . . and we haven't accepted them until now. We have had such disagreements that if they took even one wolf, they better take all of them, and we will no longer support the program, because we don't think their way is the best way of doing things. These are not zoo animals; if these animals are going to be reintroduced, we should start now to keep a line that is wild as it can be." Informants also talked about how these differences in management philosophy had affected the trust among the parties through the emergence of power and authority issues. One captive breeder from Mexico exemplified this sense of mistrust in the following statement: ". . . I am not 'your' place so that you [government] can place your animals and take them whenever you want. We have here a program with clear objectives, and I am not going to breed your animals so you can make whatever you want with them . . ."

Information/knowledge as a resource influencing binational collaboration was discussed by interviewees in the following terms: available information about the subspecies, knowledge about the program, the degree of information exchange, information distortion, and binational access to technology. The limited information about the subspecies was identified as a factor inhibiting collaboration. A scientist from Mexico described how some people had lost interest in supporting recovery efforts for the subspecies as a result of the lack of existing information. He stated, "I have noticed that sometimes they just lose interest because of the limited data available. They say, 'There is no data about wolves; how does it help me to know that they have heard one animal howling, or that they have seen a footprint, or to hear that they have killed a calf?' I think that this [lack of information] should be a flag to get our attention and say, 'If there are so few of them, we should direct more attention to them.' And many people in the United States, I have seen in the [name of a committee] or in the [name of a binational task group] that say, 'It would be better just to surrender.'"

Interviewees also commented on the limited knowledge that decision-makers in Mexico have about the subspecies and the program. They emphasized how this lack of knowledge had caused Mexico to be under-represented in the decisions made at the binational level. One captive breeder from Mexico declared, "The people who are in charge of the program don't know very much about the program, the directors of [a governmental agency in Mexico] . . . don't know it well, because the person from Mexico that represents them [the participants in the program] and goes to the meetings

doesn't know anything. So, why do they go? Only to sign their names and say that they

agree [with the decisions made], but they are not qualified to make decisions."

Interviewees described information exchange in terms of a resource that helped

participants to have more knowledge about the subspecies and recovery efforts. One

captive breeder explained that by exchanging information, he and his counterpart were

able to have a better understanding of how captive Mexican wolves were managed in

both countries. He stated, "So [a United States participant] took us to the zoo where he

was working and explained to us how his wolves were, which were the management

procedures that were being used, how they performed surgeries; we talked quite a lot

about how we both managed and handled them; we discussed practical management

aspects, and through this exchange, we both increased our knowledge about the wolves."

As a result, this same captive breeder described how he was better able to understand the

limitations that the program in the United States was facing. He said, "What I didn't

know were the problems that the program was facing. During that site visit, I

understood many things. I understood that Mexican wolves were politically a very

sensitive species, a species which some people wanted to become extinct, . . . that the

program was having many difficulties . . ."

At the time that interviews were conducted, information transfer among

participants from both nations was described as "better than ever." Still, interviewees

indicated that there was a need to increase the degree of information exchange between

countries. One government official from Mexico declared, "For different reasons, I

think that the United States doesn't know exactly what we are doing [in Mexico]. I think

that the United States also doesn't know precisely what problems participants [in Mexico] face when trying to work with wolves. In general terms, I think it is necessary that the United States know more about what we are doing." One captive breeder from the United States identified knowledge gaps that were preventing him from having a good understanding of the program in Mexico. He stated, "We don't understand the way processes work in Mexico; we don't know, and therefore, we are confused. What I am not sure in particular is how do Mexican facilities manage the wolves, individual animals, entering a pen, and what you do with puppies, and how do you evaluate them, and how you decide what to do? Is there a method that could be developed in Mexico like the Captive Management Committee—or let's just call it that because there is no SSP down there as far as I know."

Interviewees indicated that information exchange had been facilitated through site visits, exchange programs, and training opportunities among participants from Mexico and the United States. They also noted that it had been promoted by the development of meetings, workshops, and scientific events. They described how the development of the international studbook and other published reports had facilitated information transfer between countries. One Mexican interviewee commented on the value of recovery plans as a tool that "can allow you to update considerable information." On the other hand, informants implied that information transfer was negatively affected by the lack of resources, an inability to visit other sites or to attend workshops, a lack of continuity in organizations and/or individuals, inappropriate personal interactions, a lack of trust and respect among participants, and language barriers.

Some interviewees talked as if collaboration had been severely affected by specific cases of information distortion. A colleague from Mexico gave accounts of information being distorted by middle-level managers and explained how this distortion had affected the program in one of the breeding centers in Mexico: ". . . the information that was managed by the technicians in [name of the breeding center] did not reach the higher levels which were managing the objectives, the relationships . . . or if [information] reached this level, it was distorted, because the middle managers wanted to use that information for their own benefit, or because they wanted to delimit certain management practices that were occurring inside their own departments, like deviating a little bit the funds to other activities that were coordinated by the same department and justifying them with the Mexican wolf program, when in reality, funds were not being applied to Mexican wolves. This was never presented to higher management levels, and when the information, the outcomes, the authorizations, the budget were evaluated, we were told that the funds had been used up on the program."

The last theme that emerged under the cluster of "information/knowledge as a resource" was binational access to technology. Interviewees described some of the differences in the use of technology in the 2 countries. One wildlife manager from Mexico explained, "There [in the United States], they are working with radio telemetry equipment; I push this button, and the animal is immobilized, and I proceed to check him. Here [in Mexico] we are looking for someone to lend us some boots to work in the field because the stones are very sharp; so, the equipment and technology that we use are very different . . ." One scientist from Mexico said, "Sometimes we feel . . . that

research in the United States is often gadget-oriented, and in Mexico it is not. In the

United States, research is gadget-oriented, and our research is more of pickets and

ropes."

Conversely, an unbalanced access to technology was described as inhibiting

binational collaboration. One scientist from Mexico provided an example of how

unequal access could hamper collaborative efforts. He stated, ". . . a scientific paper of

mine was reviewed by an American editor, and he rejected it because we were not using

a $60,000 [piece of] equipment. Essentially, his criticism was not based on the content

of the paper, but on the fact that it could have been improved by using a better [piece of]

equipment. But if the conclusions are valid and we don't have $60,000 to buy that

[piece of] equipment . . . Those with gadget-oriented research tend to focus mostly on

the methodology, on the gadget and not always on the objectives, which in this program

is the conservation of the wolf. So, that could be an element that does not promote

collaboration; definitely it does not promote it."

Interviewees did not necessarily identify these technological differences as

inhibiting collaboration. A government official from Mexico indicated that while these

differences could make one country dependent on the other, they did not necessarily

affect collaborative efforts. He said, "A good example was the genetic research that was

conducted to determine the purity of some lineage of wolves, when we [Mexicans] had

to depend on what was being developed in the United States. These types of projects are

very expensive, and we have other priorities [in Mexico]. So I think that from a

scientific-technical standpoint, we will be dependent for a long time. This situation will

remain until we have enough economic capacity to develop our technological resources. But I don't think this situation makes [collaboration] more difficult, or that it divides the 2 countries; it doesn't divide us because we have shared objectives and common interests." Another government official from Mexico suggested how this technological dependence could be overcome. He explained, "I am convinced that the technological and economical dependence will be overcome when science becomes global and universal; when science is no more restricted to certain feuds; when the technique, science, and information become part of the universal knowledge. So as collaboration for technical and scientific training is promoted and increases, collaboration will increase to achieve this social, economic, and political globalization . . ."

Some interviewees implied that collaboration was facilitated on occasions when technology was shared by participants from both countries. One captive breeder from Mexico commented, "I think that [science and technology] can bring our countries together if it's well managed. They [the United States] have many technological tools, for example, the genetic software SPARKS, which makes their work easier. We [Mexicans] don't have them, but we can ask them to share it with us. So, I think it is an element by which we can cooperate if they [Americans] allow us to share their technology." A captive breeder from the United States also indicated that the use of software had facilitated consensus among captive breeders of both countries. He explained, "The software thing I think can bring the Mexican group and the U.S. group together . . . for instance, with the SPARKS program and the GENE program, we are all

talking the same language and [that] makes understanding the decision-making a lot better [regarding] why we do certain things, and I think that is important . . ."

In summary, interviewees suggested that binational collaboration could be facilitated by: (1) the participation of highly qualified people, (2) the development of training opportunities, (3) animal exchanges among captive facilities (based on biological criteria, not personal whim), (4) information exchange, and (5) binational access to technology. On the other hand, binational collaboration could be inhibited by: 1) scarcity of funds, 2) asymmetry of economic resources for recovery efforts in Mexico and the United States, 3) unequal distribution of scarce funds between captive breeding and field conservation, 4) differences in captive management philosophy, 5) limited information about the subspecies and program, and 6) cases of information distortion. Interviewees indicated that resource issues could influence binational plans, organizations and participating people, which were subsequently influenced by cultural/historical issues (Figure 2). Interviewees suggested that positive linkages among people, organizations, and projects would create feedback loops that would facilitate the mobilization of resources. Similarly, resources could facilitate collaboration of projects, people, and organizations committed to recovery efforts.

<u>Cultural/Historical Issues</u>

Underlying many themes identified in the clusters described above, were the cross-cutting issues of bilingualism, intercultural understanding between participants, resentment about previous negative interactions, and differences in the stage of the conservation movement between Mexico and the United States. In this context, I chose

the term "culture" to convey the meaning of the history of experiences shared among participants. Perhaps "subculture" would be a better term, since the participants in the recovery effort shared experiences unknown to the broader public. However, many of their experiences reflected feelings shared by others in cross-cultural settings.

Interviewees mentioned not being able to speak the language of their counterparts as a barrier to effective communication. One captive breeder from the United States expressed with laughter how the language barrier had inhibited communication between himself and his counterpart in Mexico: "I'm trying to get hold of the people in [a state in Mexico] and . . . you know, my Spanish is so poor; I am not quite sure of what they are saying, and their English is . . . not quite what I said . . . you know." A government official from Mexico described how the language barrier led to information failures and program difficulties. He explained, "Another reason [for collaborative failure] was because of the lack of bilingualism, many times within the middle and low administrative levels . . . if high-level administrators were not bilingual, they had the assistance of translators from both countries; but in the middle, low, and technical levels, many times a deficiency existed. So those issues that needed to receive first attention never arrived at the higher levels of management to be resolved. So certain difficulties, such as interpretation problems or lack of communication, became really big problems that sometimes represented huge difficulties for the program, for the binational relationships of the project, or for the activities of the same project."

Bilingual ability was described as a tool that facilitated effective communication and good information transfer between participants in the program. A government

official from the United States indicated, "This alone just—if we could communicate well on a technical level, I would likely be on the telephone . . . once a month or so just talking about issues—what we're doing and what are you doing and how we can work together—but with the language, it's truly a barrier to that happening." Another interviewee emphasized how communication between agencies and among participants could be improved if more participants spoke their counterpart's language. He said, "They [U.S. government agency] need that contact at both levels. They need people along the border who understand the culture and preferably the language, because it's very difficult if you need an interpreter all the time." A colleague from the United States asserted, "I think the language skills are important, and I wish I was more fluent so that I could communicate better down there [in Mexico]." On the other hand, some interviewees suggested that the language barrier could be overcome if both parties were highly committed to recovery efforts. One interviewee from Mexico asserted that collaboration could be promoted when the parties shared a common interest, even if they did not speak the language of the other country. With laughter, he said, "When there is a common interest, even when none of the parties can speak a word of the other language, the objective is the same, and finally neither wolves nor turtles speak Spanish or English."

The degree of cultural understanding among participants was an issue that emerged during the interviews. Poor knowledge and understanding of the other country's culture was identified as a factor inhibiting binational collaboration. A government official from the United States commented on the poor knowledge that some

Americans had of Mexico: "What are you going to do, you know? They don't know

what the hell—once you cross that Rio Grande they don't know what's there. They have

no concept whatsoever. They don't know anything about it. You know, they go to

Mexico, they go to the border towns, they go to Tijuana . . ." Lack of cultural sensitivity

among participants was also described as a factor inhibiting collaboration. One scientist

from Mexico said patronizing attitudes could affect collaborative efforts between the

countries: "One of the things that kills, that cuts the neck of any collaborative project, is

a paternalistic attitude: what you call in the United States a patronizing attitude. The

moment a patronizing attitude is displayed here in Mexico, we block ourselves, and it is

something that I share, something I don't like. I consider myself a good researcher in

my area, and I don't like to receive lessons; if we can cooperate together, then that is

perfect." Another government official from the United States expressed his concern

over the "Big Brother" attitude shown by some Americans when interacting with

Mexico. "I'm concerned when I see a lot of 'Big Brother' attitude kind of thing on the

part of Americans going to Mexico. We think we have all the answers, and we're going

to go down there to teach them."

Interviewees commented that in the Mexican wolf program and other binational

programs, collaboration had been improved partly because participants and institutions

became more culturally sensitive towards their counterparts, over time. A scientist from

Mexico observed, ". . . we work together very positively on a thousand things. Starting

with science, there is an enormous collaboration between Mexico and the United States

without any problems or with only a few problems. Currently, I see that the authorities

in the United States are very sensitive towards Mexico; that has been an interesting change . . . The people I see in [a particular U.S. government agency] are extremely good, very sensitive, very positive, and have the desire to do things correctly—not for their own sake, but for helping Mexico. I think we are having the same attitude [here in Mexico]". One government official from Mexico described how difficulties that resulted from cultural barriers had been successfully overcome by organizations with individuals specifically trained to interact with the other culture. He said, ". . . some institutions are conscious about the cultural difficulties, and they make conscious efforts to overcome them. The [U.S. government agency] has [name of the person] in their international office who is specifically trained to interact with Latin American countries."

One government official from the United States emphasized the role of respect in intercultural collaborative efforts: "I have always felt that, if it's in Mexico, it should be done by Mexicans. Now, if there is something they need from us [Americans], a person with some kind of specifically technical knowledge, fine, we'll furnish that. But it is not going to be a playground for Americans to run down and do things in Mexico. Let the goddamn Mexicans do the good things." Similarly, a colleague from the United States commented, "We took so much advantage scientifically of Mexico for years with no credit to Mexico. These guys would just run across the border, and they would take this and do that . . . no credit, no permits; come up here, write the papers. No acknowledgments, nothing. That left a sour taste, still leaves a sour taste." This resentment and lack of trust in regard to collaborative efforts in the past were illustrated

by an interviewee from Mexico with an analogy describing the stewards of natural

resources of one country as similar to parents handing over a daughter to a potential son-

in-law:

> [Natural resources are] something that Mexicans have worked hard to conserve; they have faced many things to have it, and to suddenly let it go just like that [shaking of the hand]. Maybe you realize that I relate many things like work, conservation efforts, or social issues with what families are for us. But I think that this is the roots that we Mexicans have, very deep roots, which is our society, our family. It is similar to what it is like for the father or the mother, when the groom asks them to marry their daughter. One knows that he is a gentleman, that he is going to improve her as a person, that it will be for her benefit, but it still is very difficult to let her go. And one approves his request only after one is completely convinced that the groom's interest is authentic, that he really loves the daughter, that he will help her to grow, and that he will not take advantage of her. It is very similar; I see it that way. In this case the United States is representing the role of the groom and my natural resources are my sibling. This is what I have seen grow, and you are taking it, and until I am completely convinced that you want to take it to improve it, I will not let you. You have to first demonstrate this to me. And the frustration of the United States scientific community is the same as the groom's [frustration]. Why do I need to give them so many explanations? I want to take her, and I will take her, that's it. And as they stole brides some time ago, there are still many people that steal natural resources.

Finally, different historical development of the conservation movement in Mexico,

compared to the United States, was noted by informants. One interviewee from Mexico

explained how this asymmetry affected collaborative efforts: "It is simply that we

[Mexicans] have many years of disadvantage, while in the United States conservation

issues and research have been common issues for persons that have already 80 or 90

years. In Mexico persons like [a particular researcher] or other researchers, who are

very young, have just heard about these issues a few years ago. Thirty years ago in

Mexico, no one ever spoke about conservation of endangered species or protection of

natural resources; they simply spoke about using them for their survival. So we Mexicans, we are not so familiar with ecological issues as Americans are."

In summary, bilingual ability combined with a good knowledge and understanding of the other country's culture were described by interviewees as factors facilitating binational collaboration. On the other hand, binational collaboration could be inhibited by (1) lack of cultural sensitivity, (2) resentments derived from previous selfish efforts, and (3) differences between nations in the historical development of the conservation movement.

Discussion

In this section, I will discuss how the specific issues described above reflect themes identified in the peer-reviewed literature. First, I will address my conceptual model of how issue clusters were related. Then I will examine the linkages among issues within clusters. Finally, I will relate the conceptual model to design of a needs assessment survey to place the Mexican wolf case study in a broader context.

Conceptual Model of Issue Clusters

The information derived from the thematic analysis was useful for developing a conceptual model of the ways interviewees from both countries talked about factors influencing binational collaboration (Figure 2). Three of the clusters in this conceptual model (labeled binational plan issues, organizational issues, and people issues) loosely correspond to the components of a conceptual model presented by Reading (1993). In Reading's model of factors affecting reintroduction success, the respective components were valuational, biological/technical, and organizational factors. Valuational aspects

included the values, attitudes, and perceptions of individuals involved in reintroduction

efforts, superficially similar to the "people cluster" that emerged from the present study.

Biological/technical aspects referred to the biological and ecological information related

to the species, habitat, and reintroduction procedures, somewhat similar to the

"binational plan cluster". Organizational aspects referred to the influence of the

organizational structure and ideology on the conservation efforts, a direct match to the

"organizational cluster".

Reading diagrammed the major 3 factors affecting reintroduction success as

inter-dependent and ultimately influencing behavior of key actors. In his model, key

actors included all those individuals and organizations involved in or affected by

reintroduction efforts (Reading 1993). Beyond these superficial similarities, the

purposes of the two models were quite different. Reading's model was designed to

illustrate predictive factors applied across many cases of reintroductions. My model

illustrated many perspectives associated with activities leading up to reintroduction in

one case study. My focus was on understanding how participants talked about binational

collaboration, a dimension not present in the cases included in Reading's study. Neither

the interviewees in the present study, nor I, had been trained in social science, so it is not

surprising that we used different words than Reading in talking about the issues in the

present case study of the Mexican wolf recovery effort. Interviewees talked in terms of

the people, the organizations, and the projects that influenced binational collaboration.

Issues within Clusters

Many of the issues voiced by interviewees in the present study, also have been identified

with respect to other recovery efforts reported in the literature. In this section, I will

discuss the similarities and differences, for each of the issue clusters in my conceptual

model (Figure 2).

    <u>Binational Plan</u>

    Interviewees from both nations identified the need to develop a binational plan for

the Mexican wolf. Although recovery plans in the United States are supposed to be

reviewed every 5 years, frequent delays in recovery plan development and review have

been documented in the literature on the U.S. Endangered Species Act (ESA). For

example, an average time of 6.5 years between listing and plan approval has been

reported for 271 species (General Accounting Office 1988). Lack of time was identified

by interviewees from the United States as a main constraint on updating the Mexican

Wolf Recovery Plan. Colleagues from Mexico mostly talked about the difficulties of

developing a binational plan when they were still in the process of completing a national

program for the subspecies. Interviewees indicated that collaboration could be

facilitated by developing a binational plan for the long-term management of the

subspecies.

    The classical view of recovery plans is that detailed, long term planning is suitable

and recommended. Endangered species recovery is characterized by a high degree of

uncertainty and complexity (Soulé & Wilcox 1980; Clark & Harvey 1991; Kohm 1991;

Miller et al. 1994). Often, there is not sufficient information about the species' ecology,

or of the biological and the non-biological variables affecting its survival (Soulé 1986; Reading 1993). Decision-making in the recovery of endangered species is frequently based in ambiguous data (Maguire 1986), and crucial management actions often result from "crisis situations" rather than from long-range planning (Clark 1989; Snyder 1994). This uncertain and complex environment often limits the development and application of a detailed course of action (Miller et al. 1994).

Recovery plans usually present a large number of recommendations based on the limited information available for some species and the high degree of uncertainty in which they exist (Snyder 1994). It has been reported that fewer than half of the long term planning tasks and recommendations in recovery plans are ever initiated (General Accounting Office 1988). Recovery plans are very important as guidelines for a species' recovery, but the amount of time and effort invested in this long-term and detailed planning is not always justified.

Frequently, endangered species recovery suffers from inadequate definition of the conservation problem (Clark et al. 1994; Clark & Reading 1994, Clark et al. 1996). Similarly, informants in the present study talked as if success was dependent on a clear definition of goals and objectives for the Mexican wolf recovery program. Interviewees from Mexico identified the need to define more accurately the Mexican wolf conservation problem in their country.

Problem definition has been described as the most important step in conflict management and collaboration (Gray 1989; Folger et al. 1993; Fogler & LeBlanc 1995). Problem definition shapes all subsequent steps of the conflict management process, thus

if a problem is narrowly defined, effective goals, objectives, and solutions cannot be generated. While most recovery plans emphasize biological and technical variables that have contributed to the decline of the species, they rarely address non-biological issues. As Clark et al. (1994:5) have indicated: "Because extinction is viewed largely as a biological phenomenon, the dominant professional and organizational response has been to focus on biology, obscuring non-biological dimensions." This narrow definition of many recovery programs has led to a vague definition of goals and objectives, poor program guidance, delays in conservation action, deviation of plans during implementation, and limitations for program review.

One objective for any binational plan, which interviewees in the present study suggested, was to promote an appropriate balance between in-situ and ex-situ conservation efforts. The role of captive breeding in endangered species recovery has been extensively discussed in the literature (Conway 1980; Conway, 1989; AZA 1994; Hutchins et al. 1995). For many species such as the California condor (*Gymnopis califonianus*), the black- footed ferret (*Mustela nigripes*), the red wolf (*Canis rufus*), and the Mongolian wild horse (*Equus przewalski*), captive breeding was the only option remaining for survival of the species. Similarly, captive breeding for the Mexican wolf represented the difference between its survival and extinction in the short term. However, in the long term, captive breeding should not be considered the sole solution for the Mexican wolf, parallel effort should be directed toward the conservation of appropriate habitat and supporting ecosystem processes.

<u>Organizations</u>

Interviewees in the present study indicated that stronger commitment and more effective coordination between organizations from both countries would improve binational collaboration in the Mexican wolf. Endangered species recovery programs often have failed because of lack of commitment and poor coordination among participating organizations (Miller et al. 1994), albeit across federal/state boundaries of jurisdiction, rather than an international boundary. Program management and coordination were identified by interviewees as key components for the Mexican wolf program's success. Recovery programs can fail as a result of poor management and coordination, even when they are well-funded, have knowledgeable participants, have good information about the species, and are strongly supported by the general public (Reading et al. 1997. As Backhouse et al. (1994:265) reported, "How a recovery program is organized dictates task assignments, resource allocations, information channels, control of communication, and more—all of which influence program effectiveness."

 One difference between the results of the present study and the literature was awareness of how organizational structure could have influenced binational collaboration. The structure of an organization has been reported as strongly influencing how a recovery program is managed (Harrison 1972; Clark 1986; Clark et al. 1989; Clark et al. 1996). Different researchers have emphasized that individuals´ behavior, conflict approaches, decision-making procedures, and program performance are highly dependent upon the style of an organization (Galbraith 1997; Clark & Cragun 1991,

Groves 1994). Organizational experts have described 2 main styles of organizations and management (Gordon 1983; Westrum 1994). "Calculative" rational organizations are highly hierarchical and dependent on laws, rules, and regulations; they rely mostly on standard operating procedures. "Generative" organizations, on the other hand, have a limited and flexible structure. They rely on a participative management style and encourage self-evaluation and future performance. "Calculative" rational structures, such as government bureaucracies, are reportedly effective in routine and familiar tasks, but their efficiency when dealing with complex and uncertain situations, such as endangered species, has been questioned (Clark & Westrum 1989; Miller et al. 1994; Reading & Miller 1994; Westrum 1994).

Interviewees in the Mexican wolf recovery program did not talk about the relationship between the style of an organization and program performance. They talked mostly about how different management styles of key individuals within the same organization had influenced program performance. For example, interviewees from Mexico explained that collaboration among participants had considerably improved after the appointment of a federal government official who promoted a more participative, flexible, and less centralized management style in the Mexican wolf program.

Ideally, well-constituted and empowered recovery teams could provide an alternative for recovery efforts dominated by "calculative" rational management styles of bureaucratic government agencies. In reality, most recovery teams have been composed of political representatives chosen because their perspectives were in line with the dominant organization. Miller et al. (1994) reported that in 32 recovery plans that

they examined, 77% of the group composition was represented by government personnel, 11% by members of non-government organizations, and only 8% by academics. The same authors reported that approximately 89% of the leaders in these recovery teams were federal or state government representatives. Team membership in many occasions resulted from the ability of an individual to represent his/her organization's goals, rather than from her/his knowledge, expertise, and interest in species' recovery (Mattson & Craighead 1994; Reading & Miller 1994, Snyder 1994).

Interviewees from the Mexican wolf program explained how binational collaboration had been hindered by similar constraints on their recovery team's membership. They indicated that the current recovery team is formed almost entirely of participants from the United States; in fact, there is only one representative from Mexico. They also emphasized that Mexico's representative on the recovery team has usually been a political representative with little expertise on or interest in the Mexican wolf. Interviewees indicated that these representatives have more often reflected agency and political concerns than the needs and concerns of Mexico's participants. This situation has severely limited Mexico's ability to participate equally in Mexican wolf recovery efforts.

Similar to issues identified by Bolton (1979, 1994) and Yaffee (1994), several interviewees concluded that unequal participation of all parties in the decision-making process may have led to (1) decisions that did not meet the needs of all parties involved, (2) a lack of consensus in conservation actions, and (c) conflicts resulting from framing problems in terms of a win/lose situation. Successful collaboration was associated, by

interviewees, with an equal level of participation from organizations in Mexico and the United States in the decision-making process. Interviewees from both countries talked about Mexico's under-representation in the decisions regarding the Mexican wolf program. They indicated that the Mexican wolf program was mostly dominated by representatives from the United States without enough consultation with Mexico.

In a similar manner, conservation efforts for the golden-cheeked warbler have been characterized by strong conflicts among conservation agencies, environmental groups, and private landowners from the United States (Peterson & Horton 1995). Some of these conflicts have resulted because the perspectives of private landowners were not adequately considered in the decision-making process. During informal discussions, government employees explained that potential troublemakers were excluded from recovery teams, whose mandate was to make decisions based solely on biological data.

Unequal participation of the parties involved in a collaborative effort can also lead to issues of control and power. Conflicts over control based on power and authority can severely reduce the effectiveness of conservation programs for endangered species. Conflicts over program control have been reported in programs ranging from the grizzly bear (*Ursus horribilis*; Mattson & Craighead 1994), to the Florida panther (*Felis concolor*; Alvarez 1994), to the black-footed ferret recovery efforts (Reading & Miller 1994).

People

Strong and effective leadership was identified, by interviewees, as a factor facilitating collaboration. Lack of leadership in the Mexican wolf program was

identified by interviewees as a factor inhibiting collaboration. Several authors have recognized the importance of strong and effective leadership in recovery efforts. For example, Backhouse et al. (1994) report that one of the major weaknesses of the Australian eastern barred bandicoot recovery program was a lack of strong leadership at all levels of the program. As Westrum (1994) notes, strong leaders enhance cognitive performance by encouraging free discussion, flow of ideas, and problem-solving. Addressing similar themes, participants in the Mexican wolf program talked about leadership in terms of an individual (a) highly committed o recovery efforts for the subspecies, (b) who knew how to listen and was able to integrate different ideas, (c) who was able to motivate and make other participants responsible for recovery efforts, (d) knowledgeable about the system (the social, economic, and political environment), who had the political finesse to promote collaboration instead of confrontation, and (e) who had moral authority, thought of him- or herself as another member of the team, and was able to promote a good working environment.

Interviewees from both Mexico and the United States talked about the lack of leadership at the binational level. As Backhouse et al. (1994) suggested, strong leadership is necessary for strategic vision, resource mobilization, decision-making, and participants' inspiration. Strong leadership at the binational level would facilitate development of a binational project, equal participation by both countries in decision-making, effective coordination and communication, and continuity among participants.

High turnover of participants has been reported as a factor inhibiting program success in several endangered species recovery efforts. Continuity among participants

of the Mexican wolf program was also considered key for successful collaboration. Backhouse et al. (1994) reported on the effect the continual changes in government officials and senior managers had on conservation efforts for the Australian eastern barred bandicoot. Reading and Miller (1994) describe how the black-footed ferret program was disrupted after the species coordinator was changed twice in a period of 3 years. Westrum (1994) characterizes working groups as having a core and peripheral membership. For a group to be successful, its core membership should be relatively stable, while its peripheral membership could allow more changes. While moderate and gradual membership changes can provide new information, expertise, and alternative approaches to the conservation problem, constant changes usually lead to coordination difficulties, program delays, and collaborative failures.

The participation of highly committed individuals was also identified, by interviewees, as a factor facilitating collaboration. They spoke of cases in which recovery efforts had been affected by unprincipled individuals who pursued personal or political agendas more than the goal of Mexican wolf recovery. Similar cases of "goal displacement" (Sills 1957)—that is, the precedence of personal or agency goals over recovery goals—have been reported in several endangered species programs. For example, Mattson & Craighead (1994) indicate that some participants in the Yellowstone grizzly bear recovery program were more strongly motivated by careerist and agency goals than by species conservation. Reading and Miller (1994) described how task-oriented participation in the black-footed ferret program was inhibited by participants who were more strongly identified with their agency's goals and mandates.

Interviewees indicated that differences in perspectives among participants had inhibited binational collaboration. For example, those participants who believe that captive breeding is the key to recovery success were more likely to collaborate with those of like mind and less likely to collaborate with those who view recovery in the wild as paramount. Diversity of perspectives is often an element associated with conflict situations, depending on the way we deal with these differences, conflict can either be positive or negative (Folger et al. 1993). Differences in perspectives can represent an opportunity to have a better understanding of the problem and to identify new ideas for its solution. Schön (1983) described 2 ways of approaching problems. In the technical traditional approach, problems are viewed as "objective" entities, and only one understanding of the problem exists. In the second approach, problems are defined differently by people who have different perspectives, beliefs, values, and experiences. This broader understanding of the problem is the essence of the collaborative process (Gray 1989). Collaboration has been defined as a process by which parties who perceive different components of a problem can compare their differences, define the problem more broadly, and identify alternative solutions (Gray 1989).

Resources

Interviewees from both countries indicated that binational collaboration could be more successful if there were more knowledgeable people to address recovery goals. Clark et al. (1996) reported that one of the main limitations in endangered species recovery is the narrowly based knowledge that professionals use to solve problems. Most participants in recovery programs are trained in biological disciplines and therefore

lack sufficient knowledge of the social, economic, and political issues affecting these species. This disciplinary bias may present a major problem, because as Schaller (1992:47) noted, "conservation problems are economic, not scientific, yet biologists have traditionally been expected to solve them." Various authors have reported the limits this ignorance of non-biological issues places on participants' ability to effectively approach the endangered species problem. For example, Miller et al. (1994) report that organizational problems are often explained by participants in terms of "biopolitics" or "personalities." The authors suggest that this narrow perspective has made participants unable to identify organizational problems and develop effective problem-solving strategies. Reading and Miller (1994) indicate that collaboration in the black-footed ferret project was inhibited because many participants had no expertise in leadership, conflict resolution, and teamwork. Effective solutions for endangered species problems could be more easily developed if participants had more expertise in decision-making procedures in uncertain environments and crisis situations (Westrum 1994).

Funding availability was identified by interviewees as critical for binational collaboration. Successful collaboration would be unlikely when sufficient funding has not been allocated for conservation issues (General Accounting Office 1998). Collaboration is a relatively expensive process, and enough funding should be identified by organizations to ensure that the parties participate equally in recovery task implementation (Gray 1989). Endangered species conservation depends on the participation of highly trained and committed individuals (Clark 1986), and these individuals should receive be strong economical rewards so that they can bring the best

to their performance. Scarce funds for field or captive recovery activities more often result in inappropriate management and poorly chosen funding allocations. As Snyder (1994:195) indicated, "Unfortunately, the stable asymptomatic state is one of near paralysis at the field, with enormous budgets being dedicated almost entirely to middle levels of administrators and spent almost completely on nearly useless committee meetings, training sessions, pointless paperwork, and salaries, travel, and benefits for administrators."

In the Mexican wolf program, binational collaboration was facilitated through animal exchanges between captive facilities in the United States and Mexico. Endangered species, simply because of their small populations, are highly vulnerable to deterministic and stochastic factors (Soulé & Wilcox 1980; Gilpin & Soulé 1986). The need to maintain healthy, genetically diverse, and demographically stable captive populations has been extensively recognized in the literature (Conway 1986; Ralls et al 1988, Seals 1985; Lacy & Clark 1990). To avoid the genetic and demographic problems associated with the maintenance of small captive populations, all Mexican wolves should be managed as one single population (AZA 1994). Similarly, it has been recommended that the transfer of animals for breeding purposes should be primarily based on their kinship values, inbreeding coefficients, and behavioral compatibility with other individuals (AZA 1994). To use personal or political criteria to decide whether an animal should be transferred or replaced in an institution can compromise the rest of the population and increase conflict.

Differences in philosophy regarding the most appropriate care for captive Mexican wolves were identified by interviewees as inhibiting collaboration. Conflicts derived from differences in management philosophies have been reported in several recovery programs. For example, during the early 1980s, a lack of consensus between the U.S. Fish and Wildlife Service and the California Fish and Game Commission, regarding management approaches for the California condor delayed intensive research and conservation efforts for many years (Snyder 1994). Similarly, recovery efforts for the black-footed ferret were affected by disagreements between the Wyoming Game and Fish Department and other government and non-governmental organizations over the degree of intensive approaches to use (i.e., captive breeding, radio-telemetry, and intrusive research) (Reading & Miller 1994).

Another factor that inhibited collaboration in the Mexican wolf program was the limited information about the subspecies. Interviewees commented on how some individuals and organizations had lost interest in supporting Mexican wolf conservation as a result of the minimal available data. They also did not appear to recognize the relationship between scarce data and the risks of what Janis (1972) has called "group-thinking," wherein groups base their decisions on "traditional" philosophies and ideas without examining new alternatives. Snyder (1994) has reported an example of the negative effects of groupthink in the California condor recovery program. For several decades, condor management was based on the assumption that habitat protection was key for condors' conservation and that condors were extremely sensitive to human activities. These assumptions, which were later proved false, were not examined

thoroughly for many years and thus accepted as facts. Group-thinking in the condor case prevented the use of radio-telemetry, management practices for an earlier detection of the birds' exposure to lead poisoning, and captive breeding as an alternative for their recovery.

Information-exchange combined with equal access to technology were identified by interviewees as factors facilitating binational collaboration. Information-exchange helped participants increase their knowledge about the subspecies' biology, ecology, and captive care. On the other hand, collaboration was inhibited in specific cases in which information was distorted within the Mexican wolf program in Mexico. Although some subordinates believe it is necessary to reduce the amount of information given to higher level managers, substantial information distortion has affected program management in other cases (Mattson & Craighead 1994; Snyder 1994). In extreme cases of information distortion, information has been manipulated by middle-level managers to satisfy their own personal interests or meet the expectations of their supervisors. This type of information distortion could reduce the trust among participants and lower the morale of highly committed individuals.

<u>Cultural/Historical</u>

The theme of cultural influences, which emerged during this binational study, has not been identified in other studies of endangered species programs. However, it was identified in studies of natural resource conflicts in border-states (Hansen 1986). Perhaps this is a factor that should also be examined within each nation. The differences

in shared experience may be greater between field personnel and captive-breeders within each country, than within disciplines across the border.

Bilingual ability was identified by interviewees as a factor facilitating collaboration. Interviewees from both countries indicated that bilingualism had promoted communication, coordination, and information transfer with their counterparts. On the other hand, informants described how the language barrier had inhibited effective communication and understanding in collaborative efforts. On some occasions, the lack of bilingualism caused information distortion and delays in decision-making. Some interviewees indicated that when both parties share the same interest and are highly committed to the conservation cause, the language barrier can be easily overcome. While bilingual ability certainly facilitates communication and collaboration between participants, lack of bilingual ability should not by itself lead to collaborative failure. If participants are not functionally bilingual or have very limited comprehension of the other country's language, communication can be facilitated by the help of translators, the application of computer software, the development of simulation models, and the use of quantitative information.

Intercultural understanding was identified as a factor facilitating binational collaboration. Interviewees indicated that participants who had a good knowledge of the other country's culture and history were more successful in their collaborative efforts. When participants demonstrated little understanding of or appreciation for the socio-economic context in which recovery efforts were conducted in the other country, collaboration was inhibited.

Lack of cultural sensitivity between participants was also described as a factor inhibiting binational collaboration. Interviewees explained how paternalistic or patronizing attitudes had affected joint recovery efforts. They indicated that lack of cultural sensitivity had led to a lack of trust and respect, ineffective communication, and personal conflicts between participants. Informants suggested that cultural understanding could be promoted by addressing the needs, concerns, dislikes, way of thinking, and idiosyncrasies of participants from the other country. They also described how binational collaboration had improved during the last years because participants and organizations were becoming more culturally sensitive.

On the other hand, interviewees used stories about the actions of scientists who were disrespectful of Mexican laws and procedures to explain why distrust would inhibit collaboration in recovery efforts between both countries. They described, as inhibitors to collaboration, those participants who did not understand the constraints of their counterparts who worked in an environment where conservation awareness was a relatively recent development.

Application to Design of a Needs Assessment Survey

By considering the case of the Mexican wolf recovery effort in the context of broader knowledge of other case studies referred to above, both similarities and differences become apparent.   To what extent are the issued raised in this case study relevant to recovery efforts for other species that cross the northern border of Mexico? If certain needs for problem-solving are shared by a larger group of people, then the justification for allocating resources to address such problems would be stronger than if the issues are

limited to the 44 persons interviewed in the present study. For this reason, the knowledge gained in the present qualitative study provided a sound foundation for the design of a quantitative needs assessment.

Preliminary interviews are an appropriate approach for exploratory studies in which the main objectives are to gain a broad understanding of a problem, to identify the most salient aspects of a topic, and to develop a questionnaire for a quantitative survey (Dillman 1978; Dillman 1991). However, quantitative analysis of the variation in public perspectives is needed to construct recommendations for decision-makers on how to design effective conservation programs and democratic policies. Questionnaire-based surveys are appropriate tools for examining public perceptions, attitudes, knowledge, and behaviors toward wildlife and endangered species conservation in the United States (Kellert 1985; Kellert & Berry 1987; Bath 1987; Bath 1991; Reading 1993; Peterson & Horton 1995; Lohr et al.1996; Reading et al. 1997). However, difficulties have been noted when questionnaires designed for one culture have been applied in another culture (Kellert 1997). The present study has provided a truly binational frame suitable for addressing cross-cultural issues within the initial design of a needs-assessment survey (Chapter III).

Qualitative Summary

1. Interviewees with binational experience did not express a strong sense of stakeholder group identification. Particularly in Mexico, interviewees talked about participants who moved among jobs in government, academia, and captive breeding, thereby accumulating diverse sets of perspectives and diffusing a sense

of group identity. Although it was difficult to assign interviewees to well-defined

stakeholder groups, the study was designed to include a wide range of perspectives,

including both Mexican and American participants involved in the Mexican wolf

recovery efforts.

2. Information derived from the thematic analysis was useful for developing a

conceptual model of how interviewees from both countries talked about factors

influencing binational collaboration in the Mexican wolf recovery program (Figure

2). The following 5 issue clusters emerged from this analysis: a) binational project

issues; b) organizational issues; c) people issues; d) resource issues; and e) cultural

issues.

3. Factors facilitating binational collaboration included: (a) a clear definition of a

project's goals and objectives and participants' roles and responsibilities, (b)

participation of committed individuals and organizations, (c) effective coordination

and communication, associated with participative decision-making, (d) strong

leadership, bilingualism, appropriate personal interactions, and (e) access to

resources, i.e. skills training, information exchange, and animal transfers.

4. Binational collaboration can be inhibited by (a) unequal support for in-situ or ex-

situ conservation, (b) lack of project follow-up and review, (c) lack of continuity in

individuals and organizations, (d) poorly handled power and authority issues, (e)

inefficient communication, (f) failure to appreciate different perspectives, (g)

inappropriate management or allocation of funding, (h) information distortion, (i) a

lack of cultural sensitivity, and (j) inequity in previous interactions.

5. To place this case study of the Mexican wolf recovery effort in a broader context of problem-solving procedures, further quantitative research is recommended to determine the perspectives of a larger sample of participants engaged in other endangered species recovery programs within the same region of the northern Mexico borderlands.

CHAPTER III

NEEDS ASSESSMENT FOR RECOVERY EFFORTS

Introduction

In this chapter, I examine the priorities associated with binational collaboration, placing the Mexican wolf recovery efforts in the broader context of over a dozen other binational recovery efforts. I will begin by explaining the main goal of this quantitative research and the methods used throughout the study. Next, I will describe how survey participants ranked priority needs to be addressed in binational recovery efforts. Finally, I will analyze respondents´ accord and discord in issues associated with binational collaboration efforts.

Background

The history of the environmental movement in Mexico (Simonian 1995) and the United States (Dalton 2003) have followed different trajectories, yet citizens of both countries have been brought together in shared concern for threatened species that cross the international border (Table 2). In a previous qualitative study of the issues discussed by participants in one binational recovery effort, the Mexican wolf program, both similarities and differences emerged compared to the published literature on collaborative processes (Chapter II). Questions identified in the qualitative study included: (a) to what extent did the themes discussed by interviewees

Table 2. Recovery programs of endangered species or subspecies with historical distribution in Mexico and the United States, as included in the survey*

Species at risk	Border States
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Tamaulipas, Texas
Aplomado falcon (*Falco femoralis*)	Tamaulipas, Nuevo León, Coahuila, Texas, New Mexico
Imperial woodpecker (*Campephilus imperialis*)	Chihuahua, Arizona, New Mexico, Possibly extinct
Mexican spotted owl (*Strix occidentalis*)	Chihuahua, Sonora, New Mexico, Arizona
Thick-billed parrot *(Rhynchopsitta pachyrhyncha)*	Chihuahua, New Mexico, Arizona
Black bear *(Ursus americanus)*	Coahuila, Texas
Black footed ferret (*Mustela nigripes*)	Chihuahua, 11 U.S. States
Jaguar (*Felis onca*)	Sonora, Arizona, New Mexico
Jaguarundi (*Felis yagouaroundi*)	Tamaulipas, Texas
Mexican wolf (*Canis lupus baileyi*)	Coahuila, Chihuahua, Sonora, New Mexico, Arizona, Texas
Ocelot Felis pardalis)	Tamaulipas, Texas
Peninsular pronghorn (*Antilocapra americana peninsularis*)	Baja California Sur
Mexican prairie dog (*Cynomis mexicanus*)	Coahuila, Nuevo León, San Luis Potosí, Zacatecas (formerly)

[*] Includes endangered and threatened status, as listed by CITES and/or either country.

in the Mexican wolf project reflect the perspective of a broader circle of participants in the same recovery effort, and (b) to what extent did the experiences discussed by participants in the Mexican wolf program reflect concerns shared with participants in recovery efforts for other endangered species in the borderlands.

The theoretical context for this study is consistent with the constructivist paradigm of naturalistic inquiry, as defined by Lincoln & Guba (1995). An inductive process grounded in personal experience, participant observation, interviews and survey questionnaires is appropriate for identifying general themes that emerge from the specific experiences of a select group of people (McCracken 1988). To the extent that such individuals have diverse backgrounds, and have been brought together to solve a relatively new problem (in the sense of cultural history), an inductive approach is more appropriate than a deductive approach. The inductive approach of naturalistic inquiry has been applied to problems in a diverse set of subject areas, including community health (Miller & Fredericks 2002), educational programs (Cox-Petersen et al. 2003), and endangered species recovery efforts (Chapter 1). Perspectives of participants in all of these subject areas have been both shaped by their shared experiences, and in turn have shaped the course they have steered in relatively "uncharted waters".

Purpose and Significance of this Study

The main goal of this chapter was to place into a broader context the issues that emerged from the qualitative analysis of interviews with a select number of participants in the Mexican wolf recovery effort (Chapter II). The objectives of the present quantitative survey were to identify: 1) priority needs within each cluster of issues described in a

conceptual model (Figure 2); 2) which issues might provide a foundation for common ground, based on high accord among participants; and 3) which issues were associated with high discord, i.e. themes where common ground might be based on "agreement to disagree".

Methods

The information derived from the qualitative analysis in Chapter II provided the basis for developing a quantitative survey of factors influencing binational collaboration for the Mexican wolf and other endangered species with historical distributions crossing the border of Mexico and the United States. The survey allowed me to move from an in-depth qualitative analysis of interviews to two levels of "external validity." These levels of validity can be thought as expanding circles, with experiences reported by interviewees at the core, surrounded by other members of their groups, in turn surrounded by others involved in similar recovery efforts with different species.

Sampling Design

The survey targeted a wide set of individuals with binational experience associated with the following five stakeholder groups: 1) government agencies, 2) captive breeding centers, 3) non-governmental organizations, 4) university/research centers, and 5) ranchers/livestock associations. Participants associated with some stakeholder groups (i.e. ranchers/livestock associations) were represented in lower numbers due to their limited involvement at the binational level. I would like to emphasize that survey respondents did not represent particular stakeholder groups; rather I sought to include a

wide range of perspectives to determine factors influencing and priorities associated with binational collaboration in recovery of endangered species.

Survey respondents included: 1) current participants in binational programs of endangered species with at least one year of experience, 2) individuals who had been involved for at least one year in binational programs of endangered species, but were currently involved in other programs and 3) individuals who serve as scientific advisors in binational recovery programs. Selection of survey respondents was done in the following systematic manner. First, I developed a list of participants involved in endangered species recovery programs from both countries. Second, I expanded it with advice from members of an academic committee, an external advisory council, and colleagues from both countries. Third, I supplemented this list with "snowball sampling" (Rakow 1986), where interviewees were asked to provide the names of colleagues who should be included on the list of survey recipients.

Binational programs that were considered in the survey focused on recovery efforts for endangered species or subspecies with historic distributions in Mexico and the United States, and that had at least five years of existence. Recovery programs for 13 species (Table 2) were represented in the sample of survey respondents.

Survey Procedures

Survey questions were chosen to represent issues from 5 clusters previously defined in the conceptual model resulting from interviews with participants in the Mexican wolf recovery effort (Chapter II). The survey consisted of 88 questions (Appendix A): (a) needs assessment (n = 26), (b) issues influencing binational

collaboration (n = 51), and (c) demographics (n = 11). Survey items (Appendix A) were phrased in a manner that resembled as closely as possible the words used by interviewees (Chapter II).

For questions in Section III, related to needs assessment, respondents were asked to assign a rank for each survey item within a cluster, based on the relative priority that it should receive in the following 3 years. Needs were ranked within each of 5 clusters. For questions in the "issues" category, responses were on a 5-point Lickert scale, where "1" indicated strongest agreement and "5" was strongest disagreement.

The survey was pretested, revised, and distributed according to the methods of Dillman (1978), with minor modification described below. Initial drafts of the survey were reviewed by members of the graduate advisory committee and an external advisory council. A penultimate draft was translated into Spanish. The English and Spanish versions were pre-tested with 28 individuals from both countries, all of whom had international experience.   Minor revisions were made based on the feedback.

The survey was distributed by mail with an explanatory cover letter, a question and answer sheet, and a self-addressed and stamped envelope. Respondents were assured of complete confidentiality on their responses. Surveys were numbered for follow-up inquiries and the information provided by respondents was managed in accordance with the ethical standards of the Committee for Social Science Research at Texas A&M University.   Spanish versions were sent to addresses in Mexico, and English versions to American addresses.

A "reminder and thank you" postcard was mailed to all survey recipients after one week. Non-respondents were sent a second copy of the survey after 3-4 weeks (one week later for Mexican addresses). The overall response rate was lower for participants from Mexico (47%) compared to participants from the United States (70%). To increase the sample size from Mexico, some surveys were distributed and collected on a person-to-person basis in Mexico City. Non-respondents living outside of Mexico City were contacted by telephone to encourage participation.

The list of 245 survey-recipients included individuals living in Mexico (n = 137), or the United States (n = 105); 3 recipients were citizens of other countries (Venezuela, Spain and New Zealand). The overall response rate to the survey was 58%. The functional response rate was 65%; 6 surveys were undeliverable and 20 recipients declined, replying that they did not have enough binational experience to respond to the survey.

Data Analysis

For this inductive approach, the SYSTAT statistical package was used for exploratory data analyses. The criteria for significance ($p \leq 0.05$) was used as an indication of the relative strength of trends in the data. Survey response variables were tested for normality and were checked for homogeneity of group variance using Barlett's test. The two-sample t-test was used to compare means for independent variables with two categories, e.g. nationality (MX vs. USA), gender (male vs. female) and program (Mexican-wolf vs. other). Multiple means were compared using analysis of variance (ANOVA) for all other independent variables. Pairwise comparisons of means were

performed using the Bonferroni post-hoc test. Count and percent data were compared

using Pearson's chi-square test for variables with more than two response categories, and

Fisher's exact test for variables with two response categories.

For the purpose of needs assessment, a Priority Index was calculated for survey

items that respondents ranked within each thematic issue cluster. The Priority Index was

calculated by multiplying the number of response scores for each priority category by a

weighting factor, summing across response categories, and dividing by the number of

ranks for the cluster, since the number of survey items differed across clusters. The

range of the Priority Index was 0 to 100, where 100 was highest priority and 0 was

lowest priority. For example, to calculate the Priority Index for the first "need" in Table

4, the number of respondents who chose First Priority (Appendix B) was multiplied by a

weight of "5" and added to the products (weight times the number of responses in that

category) for each of the other categories of response (Second, Third, Fourth, Fifth), then

divided by the number of response categories (five) for the project cluster.   In

comparison, the value of the denominator for calculating the Priority Index in the

"People Cluster" (Table 5, on page 113) was 6 because there were 6 needs that

respondents ranked within that cluster.

For interpretation of the Priority Index, a threshold value of 70 was chosen to

categorize each need as high priority within each cluster. The reasoning underlying this

analysis was that high priorities needed to be identified within each of the clusters,

considering each cluster to be equally relevant to overall binational collaboration. In

other words, I did not ask respondents to rank needs related to "project design" relative

to needs related to "resources". Rather the relative needs within each cluster (i.e. "project design") were ranked separately from the other clusters.

To address the objective of identifying potential sources of accord and discord among participants in binational recovery programs (Appendix C), each survey item was categorized based on its distribution of response scores (Appendix B). Using the Chi-square Goodness of Fit Test, the distribution pattern of observed responses was compared with expected distributions of responses (Figure 3). The categories were: (1) accord (agree or disagree) and (2) discord (manageable or polarized). Survey items with response distributions that differed significantly from all four categories were classified as "Ambiguous" (Appendix C). For example, the observed distribution of responses on the survey item "Recovery efforts for this species should be implemented in Mexico only by Mexicans and in the U.S.A. only by Americans" best fit the pattern defined as "b" in Figure 3, so it was classified as "accord-disagree" in Appendix C. The response distribution for the item "Captive breeding is of primary importance for recovery" differed significantly from all the distribution patterns defined in Figure 3, so it was classified as "ambiguous" (Appendix C).

To develop hypotheses about how potential sources of variation influenced the distribution of responses for each survey item, effects of demographic variables on mean response values were examined and reported in the appendices (C through G). This exploratory type of data analysis is essential prior to the design of multivariate analyses, which were determined to be beyond the scope of this dissertation (J. M Packard, personal communication).
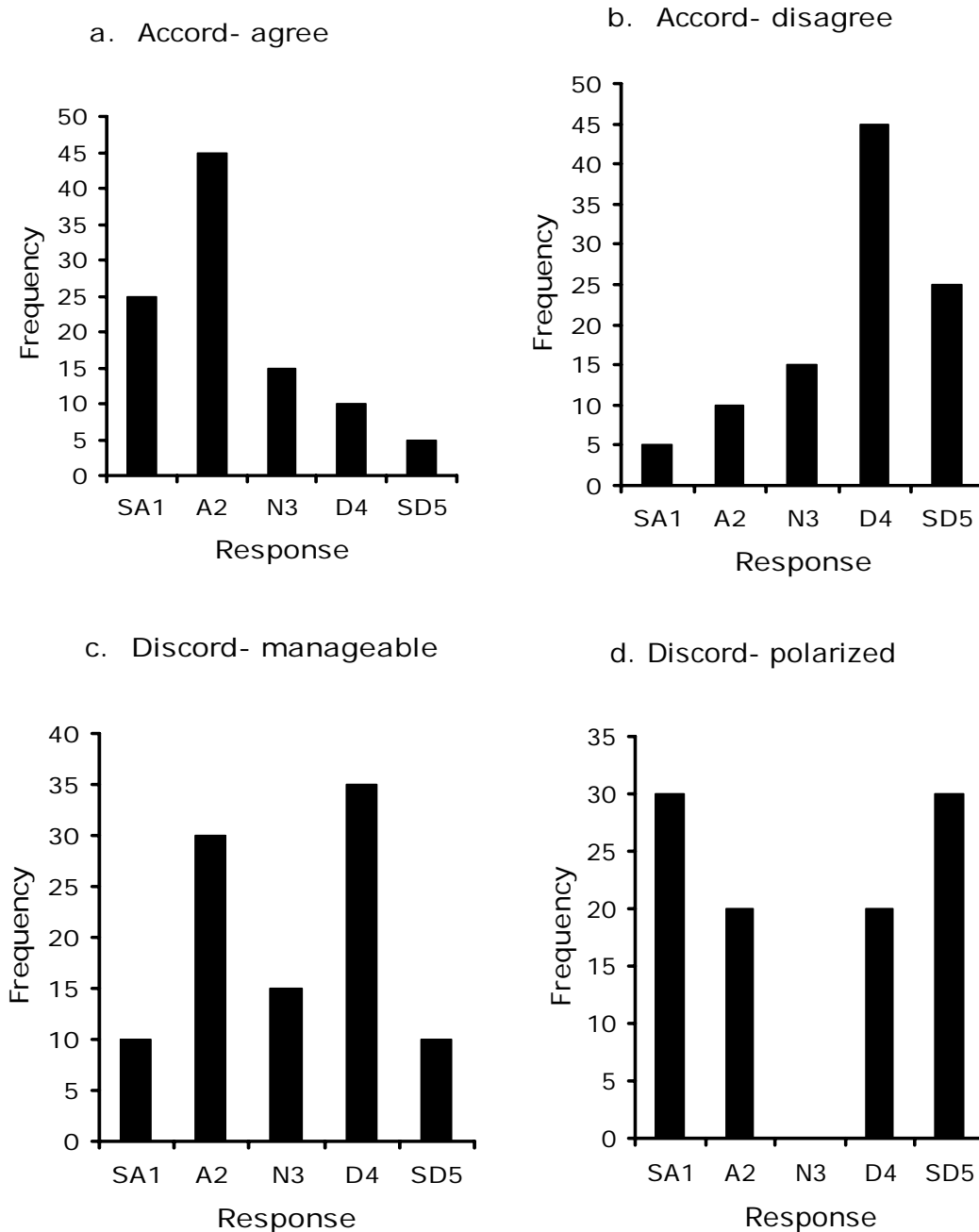
Figure 3. Expected distributions used to define each category of accord and discord to classify patterns of responses to survey items. Responses are on a Lickert scale of Strongly Agree (SA1), Agree (A2), Neutral (N3), Disagree (D4) and Strongly Disagree (SD5).

Results

Prior to describing the results of the needs assessment and associated analysis of

accord/discord on issues, it is important to understand the demographic variation within

the sample of respondents. Although the survey was designed to include all

stakeholders, the responses actually received were not equally representative of all

stakeholder groups, nor were samples equivalent from both sides of the international

border. An understanding of these sampling imbalances is essential for appropriate

interpretation of the results, given the inductive nature of this study.

Description of the Respondent Sample

The sample of survey respondents from Mexico (45%) and the U.S.A. (55%) represented

participants with primary experience in the Mexican wolf recovery effort (39%) as well

as over a dozen other binational recovery programs (Table 3). Although 45% of

respondents indicated they had over 6 years of general experience in recovery efforts,

only 33% indicated over 6 years experience with the species that they chose as the basis

for responses on this survey.

The sample was unevenly distributed among occupational categories (Table 3).

Almost one third (33%) of the respondents were working for universities, 22% for state

and federal government agencies, 22% for captive breeding centers, and 17% for non-

government organizations. Very few surveyed respondents were ranchers or retired

participants (6%). Almost half of all respondents surveyed were less than 40 years old

(43%) and about three quarters of them were males (75%). Most respondents had earned

a graduate degree (62%); more than half were fully or functionally bilingual (61%).

Table 3. Demographics of survey respondents partitioned by country of residence: Mexico (MX) and the United States (USA).

Parameter value categories	Respondents (% within sample)		
	All (n=141)	*MX (45%)*	*USA (55%)*
Basis for response (program)			
Mexican wolf	39	36	41
other species	61	64	59
General participation (years)			
less than 2	26	33	20
3 to 5	29	25	31
more than 6	45	41	49
Program participation (years)			
less than 2	31	33	28
3 to 5	36	40	33
more than 6	33	27	39
Current position*			
government	22	20	24
non-governmental (NGO)	17	18	15
captive breeders	22	13	30
scientists	33	46	23
ranchers or retired	6	3	8
Age (years)*			
18 to 39	43	61	27
40 to 49	34	30	36
over 50	23	9	35
Degree of education			
college or less	38	36	40
Masters	26	23	30
Ph.D. or D.V.D.	36	41	30
Degree of bilingualism*			
fully bilingual	31	48	13
functionally bilingual	29	41	19
limited comprehension	28	9	46
not bilingual	12	2	22
Gender			
male	75	78	73
female	25	22	27

* significant effect of nation, based on Chi-square test, $p < 0.05$.

Comparing participants from Mexico and the United States (Table 3), the respondent sample differed significantly for the following: age (χ^2, 19.72, df 2, P < 0.001), current position (χ^2, 11.26, df 4, P < 0.05), and bilingual ability (χ^2, 47.32, df 3, P < 0.001). A large proportion of respondents from Mexico were young (18 - 39 years: 61%) and only 9% were over 50 years old. On the other hand, less than one third (27%) of respondents from the United States were young; more than one third of Americans (35%) were over 50 years old. The sample of Mexican respondents worked for universities (46%), government agencies (20%), non-government organizations (18%), and captive breeding centers (13%). In contrast, more respondents from the United States worked in captive breeding centers (30%), compared to government agencies (24%), universities (23%), and non-governmental organizations (15%). The most under-represented occupational group was the ranchers (including retirees), for both the Mexican (3%) and American (8%) samples. Although most Mexican participants were fully or functionally bilingual (89%), less than one third (32%) of participants from the United States (32%) were bilingual. Similarly, while only 2 % of Mexican participants were non-bilingual, 22% of United States participants did not speak or read Spanish.

Priorities

Priority needs were easily identified within each of 5 clusters: project (Table 4), organizations (Table 5), people (Table 6), resources (Table 7) and culture (Table 8).

Table 4. Project-cluster needs-assessment: priority rankings by survey respondents, partitioned by country of residence.

Need[a]	Respondent Sample	"How would you rank these needs within the next 3 years?" (% within respondent sample)					Priority Index[b]
		First Priority	Second Priority	Third Priority	Fourth Priority	Fifth Priority	
Project design	Binational	63	20	7	4	7	86
	MX	59	20	8	2	11	
	USA	67	19	4	6	4	
Project management	Binational	15	49	25	9	2	73
	MX	11	45	27	13	3	
	USA	19	50	24	6	1	
Project review	Binational	12	14	28	26	20	54
	MX	15	18	20	27	20	
	USA	9	10	36	26	19	
Balance of captive/field effort[c]	Binational	10	12	23	25	30	49
	MX	13	11	25	23	28	
	USA	8	14	18	28	32	
National autonomy	Binational	3	7	18	34	38	41
	MX	3	7	28	34	34	
	USA	3	8	16	31	42	

[a] Nationality had no significant effect on the distribution of scores for all needs in this column, based on the t test (p = 0.05).

[b] Standardized score based on weighting first through fifth place rankings, and standardizing them on a scale of 1 to 100.

[c] Mexican wolf recovery participants ranked this item significantly higher priority than did participants of other programs (t, -4.18, P = 0.001)

Table 5. Organization-cluster needs-assessment: priority ranking by survey respondents, partitioned by country of residence.

Need[a]	Respondent group	"How would you rank these needs within the next 3 years?" (% within Respondent Group)					Priority Index[b]
		First Priority	Second Priority	Third Priority	Fourth Priority	Fifth Priority	
Coordination:	Binational	36	24	21	15	4	75
federal/state/local	MX	31	24	24	18	3	
	USA	41	24	17	14	5	
Institutional	Binational	31	31	16	11	10	72
continuity	MX	32	33	11	13	11	
	USA	30	30	21	10	8	
Balance of government	Binational	11	19	22	22	23	53
and non-governmental	MX	15	13	18	24	31	
organizations	USA	8	26	29	21	17	
Formal procedures	Binational	18	13	21	26	22	46
	MX	58	32	3	6	0	
	USA	26	48	10	12	4	
Decentralization of	Binational	6	12	21	25	36	45
decision-making[c]	MX	8	17	19	25	31	
	USA	5	8	24	21	43	

[a] Nationality had no significant effect on the distribution of scores for needs in this column, based on the t test ($p > 0.05$).

[b] Standardized score based on weighting first through fifth place rankings, and standardizing them on a scale of 1 to 100.

[c] Mexican wolf recovery participants ranked this item significantly lower priority than did participants of other programs (t, 2.4, $P = 0.018$).

Table 6. People-cluster needs-assessment: priority rankings by survey respondents, partitioned by country of residence.

Need	Respondent group	"How would you rank these needs within the next 3 years?" (% within Respondent Group)			Priority Index[b]
		First/Second Priority	Third/Fourth Priority	Fifth/Sixth Priority	
Communication skills	Binational	58	37	5	84
	MX	57	38	5	
	USA	61	33	6	
Continuity of participants	Binational	43	33	25	73
	MX	42	34	25	
	USA	45	33	21	
Understanding perspectives[b]	Binational	43	31	28	73
	MX	41	28	32	
	USA	42	34	24	
Leadership skills	Binational	30	32	39	64
	MX	28	30	42	
	USA	33	32	34	
Personal interaction skills[c]	Binational	19	43	38	60
	MX	26	49	25	
	USA	10	39	52	
Negotiation skills[d]	Binational	14	28	58	52
	MX	8	26	66	
	USA	19	29	50	

[a] Standardized score based on weighting first through sixth place rankings, and standardizing them on a scale of 1 to 100

[b] Mexican wolf recovery participants ranked this item significantly higher priority than did participants of other programs (t, -2.3, P = 0.027)

[c] Mexican respondents ranked this item significantly higher priority than did Americans (t, -3.5, P = .001)

[d] Mexican respondents ranked this item significantly lower priority than did Americans (t , 2.4, P = 0.019).

Table 7. Resource-cluster needs-assessment: priority rankings by survey respondents, partitioned by country of residence.

Needs	Respondent Sample	"How would you rank needs within the next 3 years?" (% within respondent sample)			Priority Index[b]
		First/Second Priority	Third/ Fourth Priority	Fifth/ Sixth Priority	
Funding increase	Binational	61	23	15	81
	MX	60	23	16	
	USA	56	25	18	
Funding management	Binational	41	31	28	71
	MX	32	36	31	
	USA	48	26	25	
Information exchange	Binational	32	42	25	68
	MX	29	38	32	
	USA	36	47	17	
New information[b]	Binational	27	43	30	66
	MX	23	39	38	
	USA	31	44	25	
Skills training[c]	Binational	27	32	42	65
	MX	35	36	28	
	USA	18	27	54	
Technology transfer	Binational	18	28	53	54
	MX	22	29	49	
	USA	17	32	50	

[a] Standardized score based on weighting first through sixth place rankings, and standardizing them on a scale of 1 to 100.

[b] Mexican wolf recovery participants ranked this item significantly lower priority than did participants of other programs (t, 2.9, P = 0.004).

[c] Mexican respondents ranked this item significantly higher priority than did Americans (t, -.9, P = 0.005).

Table 8. Culture-cluster needs-assessment: priority rankings by survey respondents, partitioned by country of residence.

Needs	Respondent Sample	"How would you rank needs within the next 3 years?" (% within respondent sample)				Priority Index[a]
		First Priority	Second Priority	Third Priority	Fourth Priority	
Exchange visits	Binational	46	32	12	11	79
	MX	45	33	10	12	
	USA	49	30	14	10	
Trust/reciprocity	Binational	33	32	20	14	71
	MX	31	31	25	13	
	USA	35	31	18	16	
Bilingual skills	Binational	16	18	27	40	53
	MX	22	17	29	32	
	USA	11	19	24	47	
Intercultural skills[b]	Binational	7	18	40	34	49
	MX	5	15	38	43	
	USA	9	22	43	26	

[a] Standardized score based on weighting first through fourth place rankings, and standardizing them on a scale of 1 to 100.
[b] Mexican respondents ranked this item significantly lower priority than did Americans (t, 2.1, P = 0.038).

Based on the Priority Index values for the project cluster (Table 4), two needs emerged as highest priority: "project design" and "project management "National autonomy" was ranked lowest priority by respondents, and there was no significant effect of nationality on the pattern of responses in this project-cluster (Table 4). Participants in the Mexican wolf program ranked "balance of captive/field efforts" significantly higher than participants in other programs (Table 4); however, all respondents considered this need to be relatively low priority compared to project design and management.

Within the organization-cluster, needs for "coordination of federal/state/local" and "institutional continuity" were ranked as the highest priorities (Table 5). Nationality had no significant effect on distribution of scores for needs within the organization-cluster (Table 5). Participants in the Mexican wolf program ranked "decentralization" as significantly lower priority compared to participants in recovery efforts for other species (Table 5).

"Communication skills" emerged as top priority within the people cluster (Table 6). Based on the Priority Index, the need to better "understand different perspectives" tied with the need to promote "continuity among program participants". Nation had no significant effect on the distribution of scores for these high priority needs (Table 6). Participants in the Mexican wolf program ranked "understanding" significantly higher than participants in recovery efforts for other species (Table 6). For the need ranked lowest priority, "negotiation skills", American respondents chose significantly higher values than did Mexican respondents (Table 6).

In terms of resources, "funding increase" was identified as the first priority (Table 7). Over 60% of the total respondents ranked this need as the highest or second highest priority within the resources cluster. More than 41% of the respondents chose "funding management" as the first or second priority. Nation significantly affected the distribution of scores for "skills training," which was ranked as a higher priority by Mexicans than by Americans (Table 7). Participants in the Mexican wolf program ranked the need for "new information" significantly lower than did participants in other recovery efforts (Table 7). "Technology transfer" was ranked as the lowest priority.

The top two needs in the "cultural/historical" cluster were: "exchange visits" and "trust and reciprocity" (Table 8). Nearly half of all respondents (46%) indicated that promoting exchange visits among counterparts should receive the highest priority within the cultural/historical needs cluster. Overall lowest priority, "intercultural communication skills" were ranked significantly higher by Americans than by Mexicans (Table 8).

Accord on Issues

The high priority need for good design and implementation of projects may be understood in more depth by examining the responses to selected items in the project-cluster (Table 9). Respondents agreed that (a) binational collaboration was hindered when tasks were not well defined, and (b) protection of habitat was of primary importance. They disagreed with the statement that recovery efforts should only be conducted by nationals within each country, indicating a clear openness to partnering across the border. However, within this general accord, variation in the level of

Table 9. Basis for common ground: survey items for which the response distribution best fit the category of accord.

Cluster Category	Survey Item	Significant effect of*
Project	"Binational collaboration was hindered when the tasks of participants were not clearly defined"	current position
	"Protection of the habitat is of primary importance for the recovery of the species"	nation, current position
	"Recovery efforts for this species should [not] be implemented in Mexico only by Mexicans and in the U.S.A only by Americans"	
Organization	"A formal group with equal binational representation would facilitate coordination of binational efforts toward recovery"	nation, age, bilingualism
	"Participation by border-state agencies has facilitated binational collaboration in recovery efforts for this species"	
	"Discontinuity due to governmental changes could be addressed by more involvement of universities and NGO's"	nation, bilingualism
People	"Continuity of participation by a core group of people facilitated binational collaboration"	
	"Friendships have influenced binational collaboration more than formal agreements"	nation, species program
	"The biggest logistical limitation to binational collaboration is getting the people together from both countries"	
	"Recovery program for the species had well defined leaders in my country"	nation
	" Key participants from my country had been chosen on the basis of their expertise and commitment in recovery of this species"	nation
Resources	"The transfer of animals between both countries has increased trust among participants"	current position, species program
	" Training of key people to facilitate collaboration at the binational level would enhance recovery efforts for the species"	nation
	"Federal funding for this binational effort should [not] be distributed exclusively to federal agencies"	education, current position
Culture	"Cultural insensitivity and disrespect between participants have [not] inhibited binational collaboration in recovery efforts"	nation, current position
	"Exchange visits increased trust on a personal level in binational efforts for recovery of this species"	

* See Appendix C for values of statistical tests.

agreement was related to current position in 2 of the 3 survey items (Table 9). The value of protecting habitat scored significantly higher within the Mexican than American sample of respondents ($t = -2.7$, $p = 0.05$; Appendix C), and lower for captive breeders ($F = 2.6$, $p = 0.05$; Appendix C).

The high priority assigned to the need for better coordination (across local, state and federal organizations), combined with continuity within organizations, was consistent with how respondents scored survey items in the organization-cluster. Respondents agreed that binational collaboration would be enhanced by: (a) a formal group with binational representation, (b) participation by border states, and (c) greater involvement of non-governmental organizations capable of bridging the discontinuity inherent in government programs (Table 9). Responses on two of these three survey items were significantly influenced by nation and bilingualism. The value of a formal binational group scored higher for Mexican ($t = 3.4$, $p = 0.01$) and for functionally bilingual respondents ($F = 2.9$, $p = 0.05$) less than 40 years old ($F = 3.1$, $p = 0.05$) (Appendix D). Respondents most likely to agree with the statement about engaging universities and NGO's, to better cope with governmental discontinuity, were Mexican ($t = 4.41$, $p = 0.05$), fully bilingual ($F = 3.8$, $p = 0.05$) with current positions in scientific or governmental organizations and experience other than the Mexican wolf program (Appendix D).

Related to the cluster of people issues, the high priority needs for communication skills, continuity of participants and understanding perspectives, were consistent with survey items for which there was high agreement among respondents (Table 9).

Respondents agreed that a core group with continuity of participation facilitated binational collaboration; in contrast, the barriers to bringing people together inhibited collaboration on recovery efforts.   Nation had a significant effect on the degree of agreement for three survey items: (a) friendships ($t = 2.3$, $p = 0.05$), (b) well-defined leaders ($t = 2.9$, $p = 0.05$), and (c) expertise of key participants ($t = 3.1$, $p = 0.05$). American respondents were significantly more likely to agree with each of these three survey items (Appendix E). Respondents with experience outside the Mexican wolf recovery program were more likely to agree with the statement about the importance of friendships ($t = 2.1$, $p = 0.05$).

The needs for more funding and better management of resources may be understood in more depth by examining accord on survey items in the resource cluster (Table 9). Respondents agreed with the following statements: (1) "The transfer of animals between both countries has increased trust among participants" and (2) "Training of key people to facilitate collaboration at the binational level would enhance recovery efforts for the species". Nation had a significant effect on the mean response to the issue of "training" ($t = -2.4$, $p = 0.05$), with Mexicans more likely to agree than Americans (Appendix F). Responses to the issue of "transfer of animals" were significantly affected by species program ($t = -3.7$, $p = 0.01$) and current position ($F = 5.2$, $p = 0.01$). Respondents who agreed most strongly with this survey item were captive breeders on the U.S. side of the Mexican wolf program, primarily female, functionally bilingual in the Mexican sample and not bilingual in the American sample (Appendix F). Respondents disagreed with the statement that "Federal funding for this

binational effort should be distributed exclusively to federal agencies", the more highly

educated respondents more so than others ($F = 3.8$, $p = 0.05$).

With respect to cultural issues (Appendix G), respondents agreed with the value of

exchange visits and disagreed with the statement that cultural insensitivity and disrespect

had inhibited binational collaboration (Table 9). Respondents who disagreed most

strongly were likely to be from the U.S.A. ($t = 3.3$, $P = 0.01$), and captive breeders ($F =$

3.0, $p = 0.05$) (Appendix G).

Thus, there were items of substantial accord for respondents within each issue

cluster. Although selected demographic variables did have significant effects on the

degree of accord on responses to specific survey items, there was no strong overall

pattern consistently explained by any one demographic variable such as nation or species

program. Instead, there appeared to be subtle interactive effects of several variables,

including bilingualism, current position and age. Such interactive effects could not be

tested given the univariate statistics used in this analysis, although further multivariate

analyses would be appropriate for testing selected hypotheses generated by examination

of this exploratory data analysis.

Discord on Issues

Although none of the responses to survey items were classified as polarized discord

(Figure 4), 37% fit the pattern of manageable discord, and 16% were ambiguous (not

fitting clear patterns of accord or discord as defined in Figure 3). Selected indicators of

issues where discord might be highest will be described below for each issue cluster.
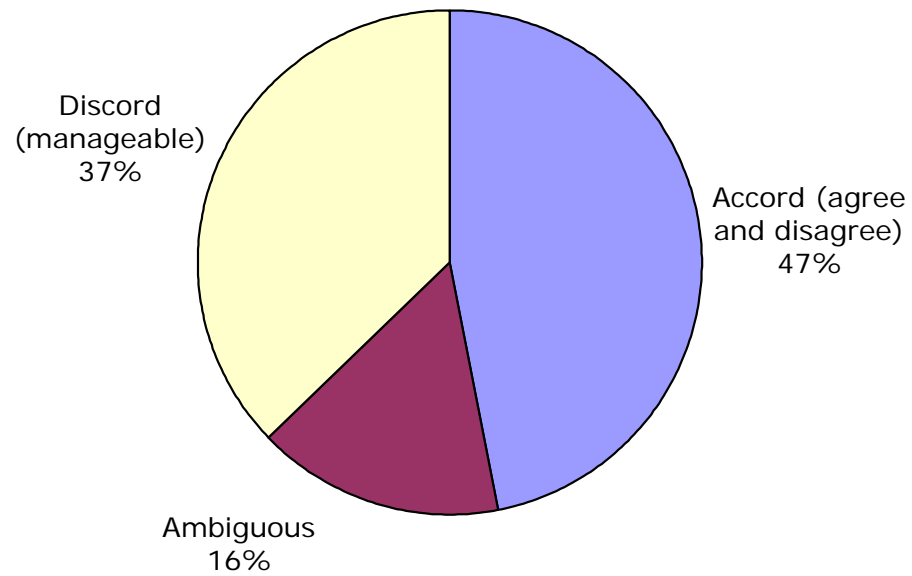
Figure 4. Percentage of survey items classified with response distributions defined as discord and accord. See Figure 3 for expected distributions used in Ch-square Goodness of Fit analysis.

Although there was a significant effect of nation ($t = 2.4$, $p = 0.05$), distribution of responses was within the category of manageable discord for the issue statement "Federal agencies from my country have considered equally the perspectives of all stakeholders in decisions for this recovery effort" (Figure 5). Mexican respondents were more likely to agree, and American respondents to disagree (Appendix C). Within the U.S. sample, the stronger disagreement was associated more with recovery programs other than the Mexican wolf and higher bilingual skills. Women were significantly more likely to disagree in the Mexican sample (Appendix D).

The different perspectives across the international border were evident in the responses to the survey item "Binational collaboration has been hindered because recovery efforts in the other country have not been well organized" (Figure 6). ($t = 4.2$, $p = 0.01$). Respondents in the Mexican sample were more likely to disagree, compared to the U.S. sample (Appendix D). Age, bilingualism and current position had significant effects on responses to this survey item (Appendix D).

Discord was not highly polarized for responses to the survey item "Binational recovery goals have not been achieved due to lack of economic resources in my country" (Figure 7). Mean scores indicated more agreement in the Mexican sample compared to the U.S. sample, and this difference was significant ($t = -4.3$, $p = 0.01$). Bilingual respondents were more likely to agree than non-bilingual respondents (Appendix F).
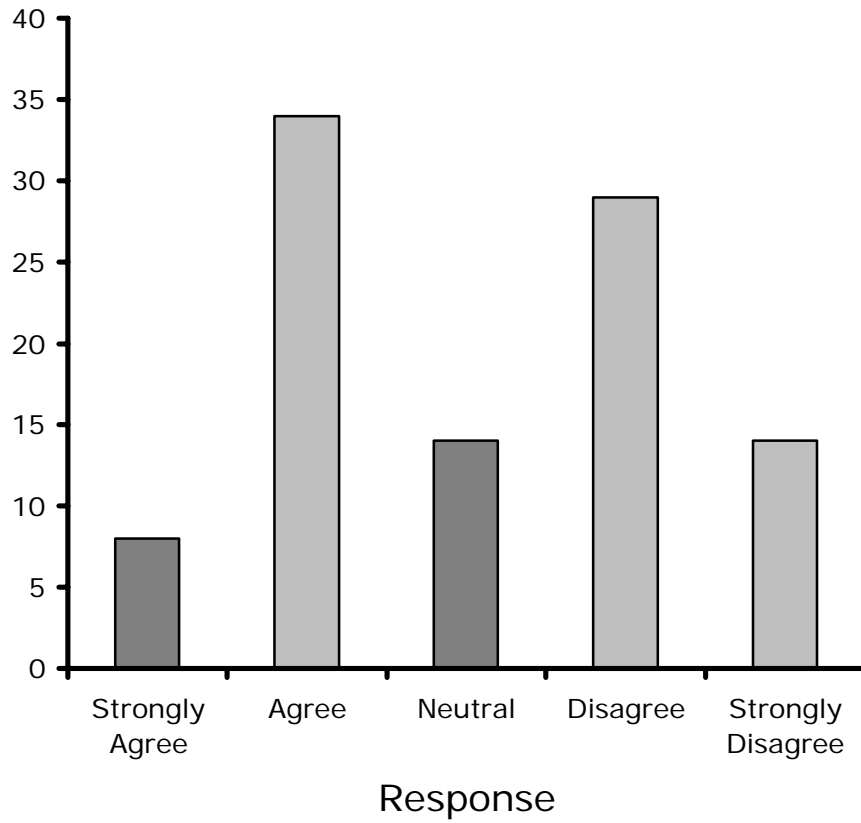
Figure 5. Response to survey item "Federal agencies from my country have considered equally the perspectives of all stakeholders in decisions for this recovery effort"
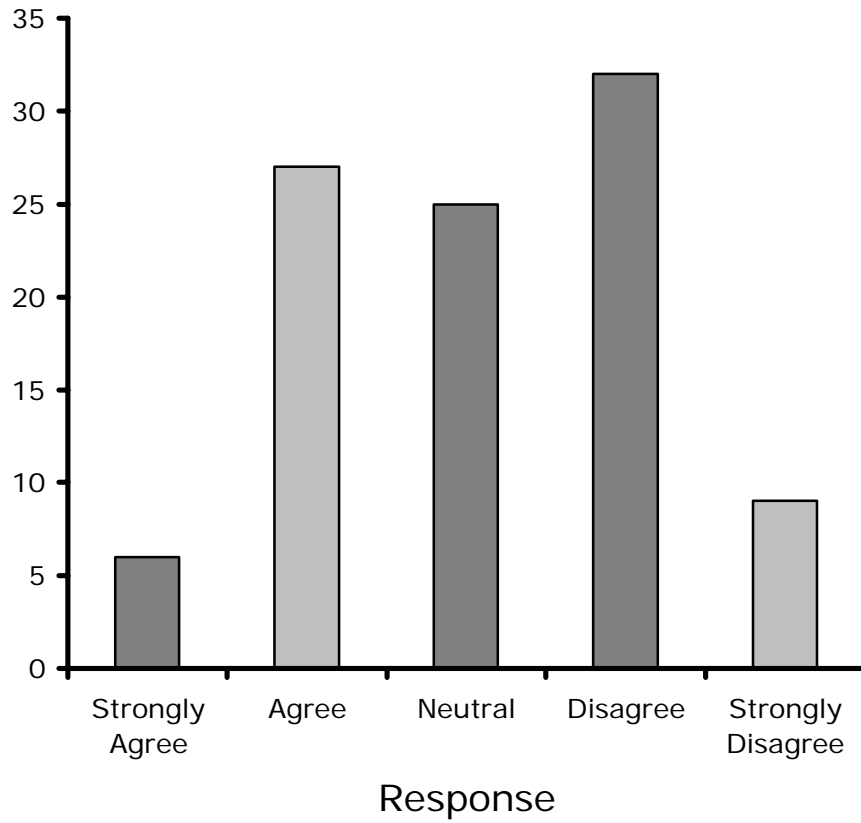
Figure 6. Response to survey item "Binational collaboration has been hindered because recovery efforts in the other country have not been well organized"
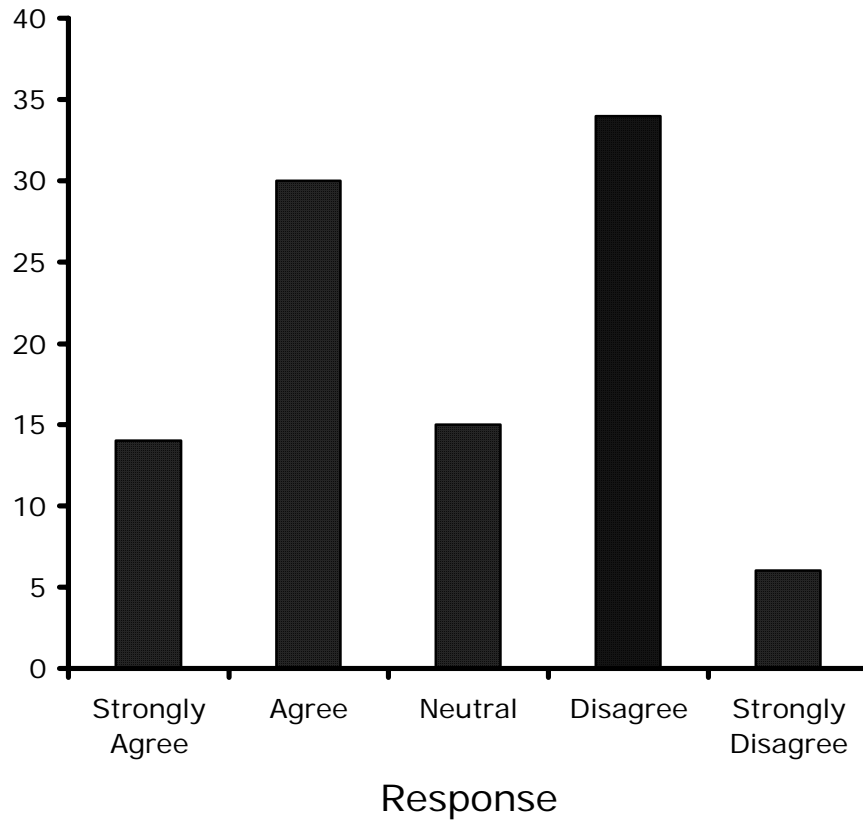
Figure 7. Response to survey item "Binational recovery goals have not been achieved due to lack of economic resources in my country"
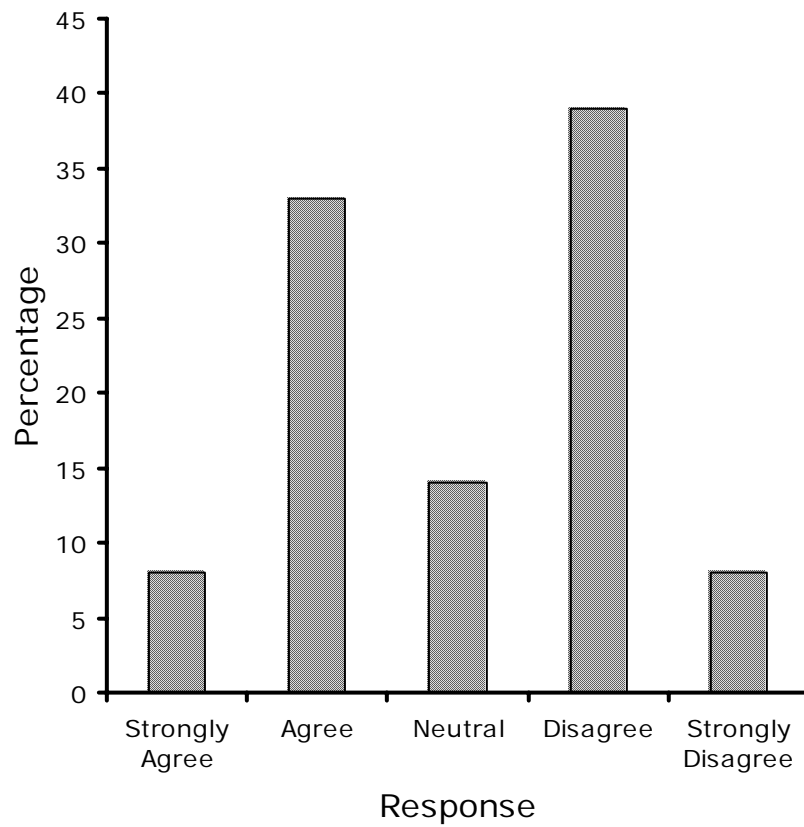
Figure 8. Response to survey item "Decision makers who influence binational collaboration in my country have sufficient knowledge about on-the-ground recovery efforts"

Minor discord was apparent in responses to the survey item "Decision makers who influence binational collaboration in my country have sufficient knowledge" (Figure 8). The significant effect of nation ($t = -2.6$, $p = 0.05$) was associated with a tendency for Mexicans to agree and Americans to disagree (Appendix G).

Discussion

In this discussion, I will address first the question of how the survey data provided a broader perspective on the previous results of interviews with a limited number of participants on the Mexican wolf recovery effort (Chapter II). Then I will address which aspects of the Mexican wolf case study appear to be unique and in what ways the case might have broader interest for binational recovery efforts in general.

Common Ground for Participants in the Mexican Wolf Recovery Effort

Survey results were useful for understanding, in a broader context, the specific experiences and opinions expressed by interviewees in the case study of the Mexican wolf recovery effort (Chapter II). Almost half of the survey items appeared to have general validity for a sample of respondents (n = 141), many more people than could be included using the in-depth interview technique (n = 44).

These items of accord appeared in each of five thematic clusters that had emerged from qualitative analysis of interview transcripts (Chapter II), and which provided the conceptual model for design of the survey instrument. Thus, in a limited sense, the overall structure of the conceptual model based on the specifics of the Mexican wolf case study was validated for a larger sample of participants in recovery efforts focused on Mexican wolves as well as a dozen other species in the region.

This quantitative approach also documented substantial discord and ambiguity in response patterns measurable within the broader group of participants. In other words, the interviewees from the Mexican wolf project were not perfect spokespersons for the group as a whole. Some of the issues important to certain interviewees were not opinions shared by all members of the larger population of stakeholders.

From my personal experience, I expected responses to some survey items to indicate polarized attitudes. However, no strong polarizations were evident in the larger sample of respondents. The survey was useful in identifying specific survey items for which the response pattern was "ambiguous", fitting neither patterns of clear accord nor disaccord. Knowledge of which issues might be problematic would be useful in the future for facilitators working with a larger set of participants to enhance binational collaboration within the Mexican wolf recovery effort. The survey instrument used in this research could be adapted for use in workshops to facilitate communication among participants in the future.

Unique Aspects of the Mexican Wolf Recovery Efforts

The results of this needs-assessment pinpointed 4 of 22 items for which the responses of participants in the Mexican wolf recovery effort differed significantly from the priorities of participants in other recovery efforts. Compared to other respondents, Mexican wolf program participants ranked the following needs as higher priority: (a) balance of captive and field efforts in design of a binational program, and (b) understanding the differences in perspectives among stakeholders. Other respondents ranked the following

needs as higher priority, compared to participants in the Mexican wolf program: (a)

decentralization in decision-making, and (b) acquiring new information.

To further explore the similarities and differences between the Mexican wolf

recovery efforts compared with the recovery efforts for other species, it would be

valuable to conduct multivariate analysis of the data set (J. M. Packard and R. Reading,

personal communication). However, multivariate analyses were beyond the scope of the

present study, which was designed to describe general patterns in the data, not to test

specific hypotheses.

Clearly, differences between programs were minor when considering the broader

picture of how decision-makers might choose to set priorities for future actions that

would benefit the greatest number of species and people engaged in binational

collaboration on behalf of species at risk in the northern Mexico borderlands. All needs

identified by participants as the highest priority represented consensus, not influenced

significantly by program. For these high priority needs, the responses of participants in

the Mexican wolf case were not uniquely different from the responses of participants

with experiences in other programs.

Generalizability to the Binational Recovery Effort

Based on survey results, the climate for enhanced binational collaboration appeared to be

favorable. There was no evidence of polarized attitudes, nor division in terms of the

nationality of participants. In comparison with other disputes about endangered species,

such as the Florida key deer (Peterson et al. 2002), the discord documented in the present

study was relatively minor. However, this sample of respondents may have been "self-

selected" in the sense that stakeholders living in the region were not well-represented. In the future, it would be valuable to conduct another study using the same survey instrument, to better document the pattern of attitudes of local residents in the region. From my experience, I would hypothesize that local residents have not been included in binational efforts for endangered species recovery in the northern Mexico borderlands. The validity of this hypothesis needs to be tested.

If strong polarization had been identified, on the basis of either nationality or program, the goal of a facilitator would have been enhancing trust, confidence and communication among the polarized parties. Since the discord appears to be more a matter of degree, rather than kind, the conflict may still be in the range of what a facilitator would consider "manageable" in the sense described by Gray (1989).

In the hands of a skilled facilitator, the results of this study will provide deeper understanding of the diversity of perspectives, as needed to decide which people to invite to which table to discuss which issues in the process of moving forward on binational recovery processes. Since there were no clear clusters of issues that separated respondents on the basis of nation or species of concern, this suggests that boundary lines have not been drawn and individuals should be addressed not as representatives of groups but as persons with unique sets of experiences, united for a greater cause.

It is beyond the scope of this study to determine whether insights from the Mexican wolf case study would appear valid to another group of people on another international border, under a different set of political and economic conditions. The material may be useful in other contexts to generate discussion around a table, so that

participants reflect on their own framework for understanding a problem and better understand how others frame the issues.

Quantitative Summary

1. High priority needs included: (a) equitable binational participation in project design and implementation, (b) continuity of participating personnel bridging the discontinuities resulting from turnover of personnel within institutions, (c) coordination of federal, state and local efforts, (d) increased funding, managed with accountability, to facilitate exchange visits in a manner that would enhance reciprocal sharing of information and reinforce enduring personal relationships built on the confidence and trust that aids in understanding diverse perspectives.

2. Responses to almost half of the survey items indicated accord among the sample of respondents, providing detailed information for identification of common ground. The nature of discord was within the range of "manageable", with no clear polarization of attitudes measured.

3. The general structure of the conceptual model, derived from interview data on the Mexican wolf recovery effort, appeared to have broader validity for the larger sample of respondents in this study, which included more participants from the Mexican wolf program as well as participants in recovery efforts on behalf of over a dozen other species in the northern Mexican borderlands.

4. The exploratory data analysis described in this chapter provides the basis for multivariate analysis of specific hypotheses to be identified in the future, and for recommendations outlined in more detail in Chapter IV.

CHAPTER IV

SUMMARY AND RECOMMENDATIONS

The underlying conceptual framework for this dissertation is a cyclical problem-solving model (Figure 1). The cyclical process was designed to bring together multi-national stakeholders, such that they could find meaningful ways to collaborate and overcome conflicts that inevitably arise in international negotiations (Fisher & Ury 1991). The specific challenge addressed in the present study of binational collaboration has been the integration of recovery efforts for endangered species that cross the border between Mexico and the United States of America (Chapter 1).

Consistent with the paradigm of naturalistic inquiry (Lincoln & Guba 1995), the purpose of this study was to present facilitating and inhibiting issues of binational collaboration in the recovery of shared endangered species that emerged from dialogue with a selected set of participants, reflecting perspectives told in a specific space, context and time. It would be beyond the scope of this study to determine the generality of these findings for the entire population of citizens inhabiting two nations as diverse as Mexico and the United States of America. The intent was to provide information for reflective practitioners who decide at some future time to assemble teams to complete the cycle of redefining problems, identifying options, choosing and implementing solutions.

In this chapter, I will first summarize the results of the needs assessment, integrating qualitative and quantitative results from my research. Second, I will describe a vision for optimal solutions to these needs, as if the world were ideal for binational recovery efforts (assuming that the very real constraints that exist could be ignored).

Finally, I will consider the constraints of the real world, as I know it, in presenting recommendations for the participants who could be invited to the table in the future, and some of the options they might want to consider. I can help define the multiple dimensions of the problem, but the stakeholders will be the ones to decide what actions to take in the future given this knowledge.

Needs Assessment: Integrating Diverse Perspectives

To gain a deeper understanding of factors that facilitate and inhibit binational collaboration in binational efforts for the recovery of the Mexican wolf, interviews were conducted with participants from Mexico and the United States. The qualitative analysis, described in Chapter 2, provided a conceptual framework (Figure 2) to design a survey instrument. Subsequently, standardized mail questionnaire techniques were used to collect information about the perspectives of participants from a wider network that included other endangered species as well as Mexican wolves (Chapter 3). This analysis was informed and benefited from experiences derived of several recovery programs reported in the literature.

The priority needs identified by survey respondents are summarized in Tables 9-11. These needs were ranked by survey respondents within each of five categories that emerged from the qualitative analysis of interviews: project, organization, people, resources and culture/history. The needs in three of these categories (organization, people, culture/history) were so inter-related that the themes were collapsed into a single category for the purpose of presenting Table 10.

The integration of perspectives provided by qualitative and quantitative information was useful for interpreting the results of this assessment. On one hand, some of the issues identified by interviewees were not salient for the larger sample of respondents to questionnaires. On the other hand, the quantitative results helped to focus analyses on issues of high priority to the highest number of participants. It is my hope that an emerging understanding of how diverse perspectives might create accord and disaccord among past participants will provide a sound scientific basis for future decisions.

In the following section, I provide a series of recommendations on specific actions to enhance binational collaboration in recovery of endangered species, based on the results derived from the qualitative (Chapter II) and quantitative (Chapter III) analyses and literature review. These recommendations are meant to provide guidelines for promoting a more efficient and effective approach to binational endangered species conservation. The intended audience for these recommendations includes participants of this study and decision makers at local, state and national levels in the public and private sectors of Mexico and the United States. I have chosen to draw freely from my own experience as a participant-observer in several recovery efforts in choosing the most salient issues for further elaboration.

Vision for Ideal Solutions to Priority Needs

In an ideal world, the diverse issues identified by participants in this study would be addressed in a comprehensive manner, because these issues are inter-related like the mechanisms of a Chinese puzzle box. While acknowledging the real constraints on

actually achieving such an ideal, a vision emerged from this participatory research

process that could help guide future efforts. In this section, the core elements of that

vision are elaborated. As outlined in Table 9, needs for the design and implementation

of binational recovery efforts ideally would involve coordinated effort from

organizations at several administrative levels. However, to achieve such effective

binational recovery efforts, the needs of individuals and organizations must be addressed

on both sides of the international border (Table 10). Participants seemed to agree that

such ideals would not be achieved without addressing constraints in terms of funding

and information exchange (Table 11 and Table 12).

Design Principles

Recommended elements of a program design that would enhance binational

collaboration in recovery efforts are listed in Table 9, and described more fully below.

A truly binational approach to conservation of shared endangered species is unlikely to

result solely from recovery plans developed at the national level.

As suggested by the qualitative and quantitative results from this study, program

design and implementation are some of the most important components of endangered

species recovery. Unfortunately, government agencies in Mexico and the United States

apparently lack enough human and economic resources to promote opportunities for

shared planning and implementation of binational programs. Representatives of both

countries were described as mostly focused on their national agendas, applying available

resources to achieve federal state or local recovery goals. In an ideal world, survival

opportunities for many of the species could be increased considerably by designing a

Table 10.   Design and implementation of projects: recommended actions to be considered in addressing high priority needs, as identified in Table 4.

Need	Recommended action	Participants*

1. Design of binational recovery planning processes

a.	Design plans that appropriately define conservation problems, both biological and non-biological, integrating perspectives of diverse stakeholders	FA, SA, LA, NGO, CB SRA LO, BC
b.	Consider clusters of species at risk within similar eco-regions, to avoid duplication of effort or incompatible actions	FA, SA, SRA
c.	Design plans with clear and comprehensive goals	FA, SA, LA, NGO, CB SRA, BC
d.	Design plans with well-defined objectives to attain the goals	FA, SA, LA, NGO, CB SRA, BC
e.	Clearly define and designate tasks and responsibilities to meet each objective	FA, SA, LA, NGO, CB SRA, BC
f.	Determine mechanisms for binational support, while providing for national autonomy in implementation	FA, BC
g.	Develop procedures for review and evaluation of progress toward achieving goals and objectives.	SRA, BC

2. Implementation of binational efforts

a.	Evaluate progress at two levels: substance of the binational effort and function of the recovery program	BC, SRA
b.	Periodically reevaluate the problem definition and suitability of objectives to address any changes that may have occurred	FA, SA, LA, NGO, CB SRA, BC
c.	Adjust allocation of effort to address the most salient problems as well as proactive effort to reduce cycles of crisis management	FA, SA, LA, NGO, CB SRA, BC
d.	Analyze program progress in terms of well-defined and measurable criteria	BC, SRA
e.	Learn from past experience to improve future performance, considering historical trends and future projections	FA, SA, LA, NGO, CB SRA, BC
f.	Establish teams with balanced representation of specialists from both countries.	FA, NGO, CB SRA, BC
g.	Promote active participation, communication and exchange among participants of both countries, bridging periods of discontinuity	FA, SA, LA, NGO, CB SRA, BC

*   codes represent federal agencies (FA), state agencies (SA), local agencies (LA), non-governmental organizations (NGO), captive breeding specialists (CB), scientific research advisors (SRA), ranchers/landowners (LO), bicultural consultants (BC).

Table 11. Organizations and personnel: recommended actions to be considered in addressing high priority needs, as identified in Tables 5, 6 and 8.

Need	Recommended action	Participants*
1. Increased continuity: participating individuals and organizations		
a.	Facilitate continuity of experienced personnel with appropriate expertise within government organizations of both countries	FA, SA, LA
b.	Promote continuity despite political change; engage committed experts from the non-governmental and academic sectors	NGO, SRA
c.	Establish a volunteer network of qualified citizen scientists to bridge institutional discontinuity	NGO, SRA,
2. Coordinated actions across local/state/federal networks		
a.	Focus on common ground for recovery efforts, elevating efforts above competing personal, organizational or political goals	BC
b.	Establish mechanisms for parallel "task-oriented" teams (e.g. local/state/federal)	FA, SA, LA, BC
c.	Establish mechanisms for binational coordination of actions, within horizontal networks (e.g. state agencies)	BC, FA, SA, LA
3. Effective communication among individuals and institutions		
a.	Select reflective practitioners experienced in principled leadership	BC
b.	Reward and provide visibility for effective communication	NGO
c.	Identify and discuss barriers to communication	BC
4. Understanding of diverse perspectives among participants		
a.	Enhance understanding of the divergent history of socio/political/economic realities in both countries	BC
b.	Utilize acknowledged differences as opportunities for better understanding issues and problems	BC
c.	Engage participants in identifying and explaining solutions that meet the needs, interests and concerns of all stakeholders	BC
5. Exchange visits among participants		
a.	Reinforce and expand effective cross-cultural relationships	FA, SA, LA, NGO, CB SRA, BC
b.	Promote rapport and enduring friendships among participants	FA, SA, LA, NGO, CB SRA, BC
c.	Organize events, such as training workshops, scientific/technical exchanges and meetings	FA, SA, LA, NGO, CB SRA, BC
6. Trust and reciprocity among participants		
a.	Enhance awareness of potential effects of paternalistic or patronizing attitudes	BC
b.	Enhance a climate of openness, respect and acceptance	BC
c.	Train participants in inter-cultural and problem-solving skills	BC

* codes represent federal agencies (FA), state agencies (SA), local agencies (LA), non-governmental organizations (NGO), captive breeding specialists (CB), scientific research advisors (SRA), ranchers/landowners (LO), bicultural consultants (BC).

Table 12. Resources: actions to be considered in addressing high priority needs, as identified in Table 7.

Need	Recommended action	Participants*

1. Funding increase

a.	Solicit participation by non-governmental organizations capable of generating matching donations from the private sector	BC, NGO
b.	Document and communicate benefits of continued funding from the public sectors in both countries, thereby increasing evidence of public support	NGO, FA, SA, LA
c.	Target funding sources available for international efforts, matching sources available for national efforts	NGO

2. Funding management

a.	Allocate economic resources according to program priorities, as identified in recovery planning processes	FA, SA, LA
b.	Pool resources across endangered species programs to address shared problems and opportunities more efficiently	FA
c.	Establish and promote accountability practices in periodic review and revision of binational recovery efforts	BC, FA, SA, LA, NGO

3. Information exchange

a.	Prepare competitive proposals for existing funding sources that support international scientific and technical exchange	SRA,
b.	Promote exchange across recovery programs that address similar issues, as well as within species-specific networks	SRA, NGO
c.	Identify new and innovative approaches for cost-sharing incentives in exchange visits for participants	BC, NGO, SRA

*codes represent federal agencies (FA), state agencies (SA), local agencies (LA), non-governmental organizations (NGO), captive breeding specialists (CB), scientific research advisors (SRA), ranchers/landowners (LO), bicultural consultants (BC).

Binational Recovery Plans

In designing and developing effective binational recovery plans, the species

recovery problem should be defined comprehensively, by considering not only the

biological factors responsible for species decline, but the full array of non-biological

factors affecting the species, such as socio/political constraints (Clark et al. 1989; Clark

et al. 1994; Clark et al. 2000; Cork et al. 2000). The non-biological factors identified by

participants in the present study included: the lack of a truly binational plan, ineffective

program management, poor coordination and communication, insufficient leadership and

commitment, power and authority issues, insufficient economic resources, lack of

cultural sensitivity and inequity in previous collaborative interactions (Chapter 2).

In an ideal world, an appropriate process for problem-definition should consider

the perspectives of all constituencies involved or affected by recovery efforts (Bolton

1979; Folger et al. 1993). Recovery plans that failed to integrate different perspectives

have resulted in (a) a lack of consensus on conservation actions, (b) fragmented or poor

involvement and (c) ultimately, failure to recover the species (Backhouse et al 1994;

Reading & Miller 1994). Binational recovery plans should strive to integrate a richer

definition of the problem by considering the full range of perspectives, interests, needs

and concerns of participants from Mexico and the United States.

To improve binational collaboration, recovery efforts should have clearly defined

goals and objectives (Tear et al. 1995; Miller et al. 1994). The desirable outcome of the

conservation problem of each shared species should be defined (Clark et al. 1995).

Participants from diverse stakeholder groups should explicitly examine the similarities

and differences in their understandings of the goal of the recovery effort. Specific and quantifiable objectives should be evaluated relative to achieving stated goals (Kleiman et al. 2000). Appropriate measures might include: numbers of individuals and populations, population sizes, percentage of historical distribution, maximum acceptable levels of genetic and demographic loss, estimated time periods for delisting, and a time frame for recovery efforts (Tear et al. 1995).

Binational recovery plans should clearly define: (a) roles and responsibilities of participants and (b) assignments, timelines and budgets for each recovery action. This clear definition of roles and responsibilities could improve communication among participants, coordination among different stakeholder groups and overall program performance (Clark & Cragun 1994). It would also reduce potential conflict due to poor program guidance, duplication of functions and actions, and inappropriate utilization of available resources (Reading 1993).

In an ideal world, binational recovery plans should represent useful general guidelines for endangered species conservation. To be able to effectively respond to changing external circumstances, recovery plans should be designed in terms of overall strategy, not detailed tactics (Snyder 1994). Participants from Mexico and the United States should meet every year to discuss and fine-tune the detailed tactics. Ideally the agenda for such meetings should include (a) assessment of progress toward meeting short-term recovery goals, (b) recommendations for critical issues that may not have been anticipated in the last meeting, and (c) priorities for recovery efforts within a more

reasonable time frame. Recommendations for the design of implementation processes are described in more detail below.

Implementation Procedures

Recovery of endangered species is a dynamic process, where problems need to be re-evaluated as the context changes for decision-makers due to new information and unanticipated experiences (Clark & Cragun 1991; Clark & Cragun 1994). Due to high uncertainty and complexity, binational recovery plans periodically should be evaluated and updated to reflect the current status of the conservation problem (Snyder 1994. 1994). Several authors recommended periodic review of recovery efforts (Clark et al. 1995, Clark 1996; Kleiman et al. 2000). As Clark et al. (1996:4) suggested, the goal of program reviews should be "to determine how well past and ongoing efforts have been carried out and to assign responsibility and accountability for success or failure." Ideally, evaluations would help participants to learn from past experiences, in order to improve future program implementation (Backhouse et al. 1994). However, program review did not emerge as a salient issue in either the qualitative or quantitative results of the present study. This may represent a gap in knowledge, where specific educational needs should be addressed for participants in binational recovery efforts along the northern Mexico border.

Evaluations should include two levels of analysis: program operation and program effectiveness (Kleiman et al. 2000). When evaluating program operation, participants should discuss goals and progress toward meeting objectives. If these latter have not been achieved, the reasons should identified and an effort made to select the

most appropriate solutions. When evaluating program effectiveness, participants should

analyze whether recovery efforts have been effective and efficient for a certain time

period. Effective responses and efficient use of resources are essential elements for

successful long-term recovery efforts.

Similar to the design process, program evaluation should start with a

comprehensive definition of the problem (Dery 1985). Participants need to evaluate past

recovery actions and define future program directions and developments. They should

discuss (1) whether the goal of the program has been achieved, (2) if the goal is still

adequate for what the program is trying to achieve and, (3) if the objectives are still

appropriate for goal achievement (Clark 1996; Clark & Brunner 1996; Backhouse &

Clark 1995). Ideally, participants should discuss results and analyze program advances.

They also should evaluate how the program is operating, recognize the main problems

faced by recovery efforts and identified the most appropriate solutions.

Organizational Principles

Recommended actions for more effective involvement of diverse organizations are listed

in Table 10. Selected priorities are described more fully below in the following order:

(1) continuity, (2) coordination, and (3) inclusiveness.

Continuity

Effective binational collaboration in recovery of endangered species has been

strongly related to the continuity of the participants and institutions involved in recovery

programs (Reading & Miller 1994; Mattson & Craighead 1994). Study participants

provided several examples on how lack of continuity affected program continuity,

communication among participants and institutions, and program coordination between both countries. Similarly, the literature on recovery programs has documented several cases where recovery efforts failed due to lack of continuity among participants (Backhouse et al 1994, Reading & Miller 1994). As most recovery efforts are coordinated by government agencies, recovery programs are subject to periodic changes in federal and state governments. Although the negative impact of discontinuity in government programs was described by interviewees with respect to Mexico, due to the binational nature of the recovery effort, this effect influenced people on both sides of the border.

Some constraints on binational collaboration could be reduced by legal or institutional reform. For example, legislation promoting a civil servant career could facilitate continuity within Mexican federal agencies. Such a proposal was presented to the Mexican Congress in 2003 in the form of a Civil Service Career Law. If this bill were enacted, individuals with more than three years of experience within the government could not be as easily removed from an agency. Ideally, these individuals would be promoted to higher positions within the government as they obtained more knowledge and experience with more years of service. Approval of this law would provide more stability to participants from Mexico, which would promote continuity in binational efforts for the recovery of more species than just the Mexican wolf.

Stronger involvement of the non-governmental groups and the academic communities could facilitate greater continuity. As political change is less likely to affect these sectors, they could promote stronger continuity with respect to binational

recovery efforts. Participants in the present study identified issues related to (1) the discontinuous participation of academics on specific research projects, (2) potential for participation on a limited-time basis, and (3) the suggestion that academics could provide untapped resources. Similarly, while a very small number of non-governmental groups are strongly involved in binational recovery efforts, several participated in specific projects associated with fund raising, environmental education and social awareness. To have a stronger impact on conservation issues, representatives from academia and non-governmental groups should participate more actively in recovery programs. Such participants might serve several roles, e.g. as experts, consultants, program advisors and leaders of binational recovery teams.

Development of binational recovery plans could promote higher continuity among institutions involved in binational efforts. In an ideal world, recovery plans would represent components for binational collaboration that could promote institutional commitment and secure funding for recovery efforts. By developing binational recovery plans with well-defined goals and objectives and a clear designation of roles and responsibilities, participating organizations from Mexico and the United States could more easily commit resources to recovery actions. However strong organizational commitment derived from good recovery planning should not be expected per se. A major challenge is to develop strategies whereby participating organizations could commit formally toward task completion. Perhaps signing formal agreements in which organizations from both countries commit themselves to achieve program goals and specific program activities for a certain time frame could promote stronger commitment.

These strategies could promote program continuity even in situations where government agencies were subjected to administrative changes.

Coordination: local/state/federal

Successful binational collaboration requires better coordination among local, state and federal organizations in both countries. Interviewees spoke about several instances during which collaboration between Mexico and the United States failed as a result of coordination difficulties at the national and/or binational levels (Chapter 2). However, dedicated individuals working at a local level were able to overcome such setbacks.

For effective collaboration, several authors have emphasized that parties must coordinate themselves effectively and participants must be prepared to move from adopted positions (Zartman & Bertman 1982). Binational coordination in recovery of endangered species must improve at the two following levels of interaction: among organizations and among participants from Mexico and the United States.

On the first level, decision-makers within participating organizations would ideally have a strong interest for the species' recovery. The involvement of an organization motivated by personal administrative, political or power issues, rather than by recovery goals may negatively impact collaboration. Lack of commitment (defined as the sense of dedication to a cause) has been identified as one of the strongest constraints on actual collaboration (Gray 1989). Participation of organizations with goals alignment with recovery and decision-makers who are enthusiastic about completing tasks designed to meet that goal could improve binational programs considerably. Government agencies may not always be the ideal choice to lead binational recovery efforts. Several authors

have suggested that government agencies, characterized by strong hierarchies and regulations are less likely to perform well at addressing uncertain and complex problems (Clark et al. 1989; Miller et al. 1994; Clark 1997). As recommended by Clark & Cragun (1994), rather than attempting to modify the organizational styles of these complex structures, recovery efforts would benefit from parallel "peristatal" organizations, structured for rapid analysis and response to previously unfamiliar problems

To improve binational collaboration on recovery efforts, I recommend creating a binational working group for each endangered species. In an ideal world, each binational working group would be structured in line with the "generative" organizational model described by Gordon (1983) and Westrum (1994). Ideally, coordination would result from horizontal interactions and decisions would be based on consensus among team members. The informal structure of such binational working groups would aid members in processing information rapidly and ensuring accessibility to key information. For optimal functioning, members should be goal oriented, knowledgeable, and experienced, as well as willing to set aside personal agendas (Clark & Westrum 1989). Persons more interested in agency goals or agenda are not appropriate choices for such groups. Ideally, binational working groups would include a balanced representation of participants from both countries.

Binational working groups should not only provide the best biological recommendations for the species recovery, but should also consider pertinent social, organizational, economic, political and cultural issues. This concept of a working group differs from that of an advisory board. In the past, decision makers overlooked the

recommendations of advisory boards. In an ideal world, members of binational working groups would have enough power to contribute to the planning, decision making and implementation stages of a recovery effort. Ideally, groups would call for implementing the most appropriate recovery actions, thereby impeding institutional or political interests that would otherwise inhibit recovery.

Some interviewees talked as if they believed that collaboration among participants from Mexico and the United States could increase by simply creating opportunities for participants to get together and communicate (Chapter 2). Results from the qualitative and quantitative studies suggest establishing a fund specifically for transferring participants from one country to another under an site visit exchange program would promote communication and coordination (Chapter 3). Developing periodical meetings, scientific and awareness events and training opportunities could also promote a stronger coordination among program participants.

Inclusion of diverse stakeholders

For successful binational collaboration, diverse stakeholders from Mexico and the United Sates should participate actively in the planning, decision making and implementation stages of programs. Some interviewees believed that recovery programs failed simply because one of the countries was not actively involved in program activities (Chapter 2). During interviews, Mexican participants often emphasized how their limited access to the decision making process had negatively affected collaborative efforts.

Considering the interests and concerns of all parties involved in a recovery program could facilitate binational collaboration. The literature provides several examples of how collaborative efforts in the United States failed because the perspectives of some stakeholders were not considered in the planning and decision making processes (Snyder 1994; Peterson & Horton 1995). As indicated previously, unequal participation by all parties in the decision making process usually leads to (1) decisions that do not meet the needs of all parties, (2) lack of consensus in conservation actions, and (3) conflicts resulting from win/lose situations. Similarly, unequal participation of the parties involved in a collaborative effort can lead to a predominance of control and power issues, severely reducing the effectiveness of conservation programs for endangered species.

Integrating perspectives of all stakeholders would represent a considerable amount of energy and dedication. Although "good faith" efforts have been conducted by the federal and state agencies in Mexico and the United States, more often stakeholders believe that many of their perspectives, interests, needs and recommendations have not been included in the recovery processes. Within each country, the federal government ideally would meet annually with representatives of the different stakeholder groups to hear their perspectives and integrate their needs and recommendations into the planning process. Non-governmental organizations and the academic sector would play a more active role in acknowledging, understanding and integrating the perspectives of all stakeholders

Although decision-making based on consensus may demand more time and energy from stakeholders, it usually leads to greater satisfaction (Folger et al. 1993; Wondolleck et al. 1994). Decisions derived from consensus are more easily supported and implemented because solutions better represent the perspectives of all parties. Quick (1992) suggested the following four steps to facilitate reaching decisions based on consensus: (1) create an open and sincere atmosphere where participants can feel free to express their perspectives without being evaluated or criticized, (2) stimulate the group to emphasize positive over disliked aspects of proposals expressed by others, (3) find out how serious ?conflicts? are and how they can be more easily resolved, and (4) recognize and focus on areas of agreement until a decision that is acceptable to all can be reached.

Personnel Principles

Closely aligned with the priorities for improved coordination among agencies, are priorities for developing the skills and knowledge of the people within those organizations (Table 10). The selected issues described below include: (1) communication skills, (2) effective leadership, and (3) conflict management skills needed to improve communication among diverse stakeholders.

Communication skills

Participants from Mexico and the United States should communicate more efficiently to facilitate binational collaboration. Interviewees commented on how collaborative efforts were more successful in situations where participants from Mexico and the United States were able to meet each other and communicate effectively

(Chapter 2). Similarly, survey participants recognized the importance of improving communication among participants; they ranked communication as the first priority to address within the cluster of issues related to people (Table 10). To better interact, participants involved in binational recovery efforts should improve their communication skills and communicate more clearly to avoid misunderstandings or misinterpretations. Program participants ideally would communicate among themselves in ways that reflected openness, trust and respect. Good communication among participants is essential for (1) information exchange, (2) early conflict prevention and (3) appropriate program management (Clark & Reading 1994). Counterparts helping each other in both language learning and gaining a broader knowledge of the history and culture of their countries would also facilitate communication.

Leadership skills

Survey respondents agreed that stronger leadership would facilitate binational collaboration (Chapter 3). Some interviewees perceived that lack of leadership at the binational level had broader repercussions, such as (1) inhibited developing a binational plan, (2) ineffective coordination among institutions of both countries, and poor communication among participants, and (3) equal participation by both countries in recovery efforts (Chapter 2). Similarly, the literature on endangered species programs provides several examples of how recovery efforts in the United States were hampered due to the lack of strong and effective leadership (Backhouse et al. 1994, Reading & Miller 1994).

According to Phillips & Hunt (1992), three basic skills typify the actions of the most effective leaders in western cultures: strategic thinking, innovative thinking, and decision making. Strategic thinking basically refers to the process by which a leader develops and communicates to other individuals a coherent and strategic vision. The second skill, innovative thinking, is the ability of a leader to assess internal and external opportunities and develop implementation plans that promote successful change. Through the third skill leaders promote change by dealing effectively with the operational issues and decisions characteristic of the implementation process. Smilarly Robert (1991) identified the following skills that characterize transformative leaders: (1) creating a vision that is action oriented, (2) clearly communicating this vision to induce enthusiasm and commitment, and (3) establishing guidance based on trust and personal behavior.

While it is accepted that some leadership skills are innate, many skills can be taught and perfected through practical experience (Gardner1993; Westrum 1994). Participants from Mexico and the United States should receive training in leadership skills. Ideally, training would improve abilities of program leaders to facilitate collaboration by (1) understanding different perspectives, (2) considering different positions before discarding them, and (3) motivating participants to implement recovery efforts. Leaders should create an atmosphere in which participants can communicate openly. Ideally, leaders would promote group consensus and recognize problems before they escalate above manageable levels by learning to maintain an optimal level of conflict that is productively focused. Binational leaders would promote a common

vision, a sense of urgency and strong commitment towards species recovery among program participants from both countries.

Conflict management skills

Improving conflict management skills of participants from Mexico and the United States could facilitate binational collaboration. Many participants in endangered species recovery programs have been trained in biological disciplines, but not enough have received training in conflict management. While participants in this study identified sources of conflict that affected recovery efforts and suggested solutions to overcome these limitations (Chapter 2), they did not discuss problem-solving processes that could more effectively reduce conflict. Perhaps this is another topic where training workshops would be appropriate.

Participants in shared endangered species recovery programs should modify their negative perception of conflicts. In an ideal world, participants would understand that conflicts occur in most human interactions, they are therefore both inevitable and necessary for successful interactions (Folger et al. 1993; Maser 1996). While conflicts may be unproductive or detrimental when not recognized, avoided or handled inappropriately, they could also represent opportunities for growth and improvement if managed productively (Weeks 1992).

To address conflicts more effectively, participants should differentiate between problems that lead to dysfunction from those that stimulate creativity, innovation and improvement (Folger et al. 1993). In an ideal world, individuals involved in recovery efforts would recognize problems early, before conflict escalates above manageable

levels. An optimal level of tension may actually stimulate improvement through innovation. To cope effectively with conflicts, participants must be able to define the problem comprehensively, describe the most important causes, identify the most salient solutions and apply the most appropriate management tactics.

In an ideal world, participants from Mexico and the United States would choose judiciously when to use traditional problem-solving approaches. As indicated previously, the high uncertainty and complexity associated with most recovery programs commonly leads to conflicts, which are usually exacerbated by differences in attitudes, interests and perspectives among participants. Where traditional problem-solving approaches failed to consider these differences, results were insufficient at finding alternative solutions, led to unilateral decisions, lacked consensus, and poorly managed conflict.

To improve collaboration, participants should apply alternative problem solving approaches (Wondolleck et al. 1994) to binational endangered species recovery efforts. These problem solving approaches should promote: (1) a more comprehensive appreciation of the problem, (2) a better understanding of different perspectives, 3) a climate of trust and respect among stakeholders, 4) identifying solutions that satisfy the perspectives, needs, interests, and concerns of the different stakeholders, and 5) implementing decisions based on group consensus.

Ideally, participants in binational recovery efforts would receive formal training in problem-solving skills. These training opportunities would help participants better understand and deal more effectively with conflicts. Participants who know how to

apply effective and constructive conflict resolution techniques to complex endangered species problems would facilitate binational collaboration.

Cultural/Historical Principles

Survey respondents agreed that exchange visits that would enhance the spirit of trust and reciprocity could better meet the needs for enhanced cultural awareness (Table 10), rather than by overt training in bilingual or intercultural skills. Therefore, the cluster of issues that appeared distinctive in analysis of interviews, merged indistinguishably into a larger set of needs associated with the skills and knowledge of people within participating organizations based on the survey data. Nevertheless, I believe it important to elaborate on the following cultural considerations.

Improving cross-cultural awareness among program participants could facilitate binational collaboration in recovery of endangered species. Binational programs involve multiple organizations, many with distinctive cultures that may or may not be apparent to participants. Similar to Singer (1987), I use the word culture to mean shared and learned patterns of perceptions, attitudes, values, and language accepted and expected by a particular group. As such, cultural norms profoundly influence how participants (within organizations on both sides of the northern Mexico border) view, behave, and respond to their external environment.

Study participants, specifically those involved in Mexican wolf recovery efforts, provided several examples on how cultural differences among participants negatively affected recovery efforts for the subspecies (Chapter 2). However, cultural similarities or differences per se did not promote or negatively affect the interaction of individuals

and organizations. It was the lack of cultural understanding, cultural insensitivity and poor intercultural communication skills as personal characteristics that related to success or failure in developing sustained friendships. Promoting (a) cultural understanding, (b) communication skills and (b) cross-cultural relationships among participants from Mexico and the United States could help overcome such constraints.

Providing participants with broader knowledge of the historical, social and cultural context in which recovery efforts are developed in the other country could facilitate binational collaboration. This better understanding could help participants to interact more effectively by being more respectful, open and tolerant with their counterparts. As some interviewees explained (Chapter 2), effective interaction was prevented by the limited knowledge that most participants had of the other country. In some cases, joint recovery efforts were negatively affected due to the paternalistic or patronizing attitudes of some American participants. Therefore, building effective cross-cultural relationships based on a broader understanding, higher cultural sensitivity, mutual trust and respect could facilitate binational collaboration.

In an ideal world, individuals involved in binational recovery efforts would possess strong inter-cultural communication skills. Bilingual skills were perceived as facilitating effective communication, coordination, and information transfer among participants; however, language training was not ranked high by survey respondents. Perhaps poor language skills are merely correlated with other barriers to collaborations that were associated with misunderstandings, communication difficulties, and program delays.

To avoid misunderstandings in cross-cultural interactions, Mexican and United States participants would ideally understand the different communication styles of their counterparts. According to one model, communication styles can be classified as high- or low-context (Hall 1976). In the "low context" communication style, information is explicit in the message being sent. In the "high – context" communication style, even the same word may have different meanings depending on the context. According to prevailing stereotypes, Mexicans are more likely to use the "high-context" style and Americans to use the "low-context" style.

Helping participants know how to interact more appropriately with their counterparts from distinct cultures within each nation could result in more successful collaboration. Enhanced awareness of the distinction between individualist and collective cultures might help improve cross-cultural interactions (Brislin et al 1994; Hofstede 1990, Hui 1990). In individualist cultures, people tend to emphasize their own goals over group goals. In collective societies, individuals downplay personal goals to pursue goals established by the group. In general terms, "individualists" are more competitive, less likely to commit their time and energy into projects that will not benefit them personally, and less likely to share material and non-material resources with their communities than are collectivists. In general, "collectivists" are more respectful of status and less likely to question authority figures, express their own opinions if different from the group's, or approach conflicts or problems openly compared to individualists.

In his study of international relationships, Hofstede (1980) characterized the United States as the "world's most individualistic nation" and suggested that Mexico is a

collectivist culture. The results of this study suggest this is an over-generalization, and that instead both individualistic and collectivist norms exist in each nation. Indeed, differences may be greater among cultural groups within nations than within each cultural group on either side of the international boundary. Such cultural norms may characterize institutional cultures, and individuals employed by organizations with diverse cultures may learn to alter their personal style of interaction to conform to the expectations of other group members.

Triandis et al. (1988) provided a series of recommendations for cross-cultural interactions between individualists and collectivists that could help participants in binational recovery efforts. According to the Triandis Model, individualists collaborating with collectivists should learn to (1) establish closer emotional ties, (2) conform to the more strongly defined hierarchy and established regulations of collectivist organizations, and (3) emphasize reciprocity over competition in personal interactions. Alternatively, when interacting with their individualist colleagues, those from a collectivist culture should learn to (1) develop a network of useful contacts, (2) establish a sharp distinction between co-workers and friends, and (3) maintain a less hierarchical working environment.

Training workshops for participants in binational recovery efforts could facilitate greater awareness of such models for inter-cultural awareness. One example of effective training for multinational working groups is that associated with the Population and Habitat Viability Analysis Workshops organized by a non-profit organization, the Conservation Breeding Specialist Group (CBSG) of the International Union for the

Conservation of Nature (IUCN) (CBSG 1994). Such workshops are expensive, and have been conducted for only two of the endangered species that cross the northern Mexico border: Sonoran pronghorn and Mexican wolves.

Resources

The need to increase the amount of funding for binational recovery efforts was ranked as high priority by survey respondents (Table 10). Respondents indicated that limited funding negatively affected recovery planning, goal achievement and overall program performance. Interviewees talked about the strong relationship between scarce economic resources and reduced collaboration within both national and binational networks. Salient issues are described below in the following order: (1) increased funding and (2) information exchange.

Increased funding

Binational recovery efforts require more financial support. In an ideal world, the governments of Mexico and the United States would provide sufficient economic support to recovery efforts in compliance with national laws. Species recovery would represent a priority within the national agenda of both countries. However, in reality, the available funding remains insufficient to support all the activities identified in existing recovery plans for species that cross the border.

In an ideal world, creating a working team dedicated to identify alternative funding sources could address the limited government capacity to provide sufficient funds for species recovery. This team, integrated by external advisors would work closely with federal and state governments of Mexico and the United States to identify priority

recovery actions and obtain external funding. Private and non-profit organizations should identify national and international funds. This working team should closely monitor funding allocation and management for each recovery action.

Information exchange

Study participants recognized the strong relationship between information exchange and binational collaboration. They indicated that information exchange had improved communication among participants, coordination among institutions, knowledge about the species, information about recovery efforts and successful program performance. Although they recognized that more information exchange was greater during the last years of the program, they still prioritized information exchange to improve binational collaboration in shared endangered species efforts.

To facilitate information exchange, Mexico and the United States should promote opportunities for key participants from a recovery program to meet at least annually. Through these meetings participants could define program priorities, establish concrete and measurable goals and objectives, and determine roles and responsibilities among participant institutions. They could also evaluate recovery performance by analyzing program advances and limitations for a specific time period. These meetings would not only represent valuable occasions for information exchange; they would represent opportunities for participants to meet and establish a climate of trust and develop friendships that could facilitate stronger collaborative relationships.

Establishing working teams integrated by specialists from both countries could also promote information exchange. These working groups, (e.g., recovery teams, advisory

groups or captive propagation groups) could help individuals from one country obtain information and better understand recovery efforts conducted in the other country. More active participation by the academic sector of both countries could also promoted information exchange. Through the development of scientific studies Mexican and American researchers could acquire and exchange key information about the species and the program. Scientific meetings, events to enhance awareness, and site visits in both countries provide valuable opportunities for participants to exchange information about recovery efforts while building trust and rapport.

To facilitate information exchange, I recommend using the "generative model" of organizational structure (Westrum 1994) for future binational working groups. Access to centralized databases should not be limited to certain organizations or individuals; such information should be processed rapidly and shared with all participants involved in recovery efforts. This free information flow would allow participants to gain new information about the species or recovery efforts in time to fine-tune adjustments to unanticipated changes. It would promote group discussions and active participation of diverse stakeholders who otherwise might be excluded from the decision making processes. Establishing a system of open communication would minimize instances of information distortion and enhance trust.

To summarize, I have elaborated on selected recommendations in this section. The recommendations were based on my vision of an ideal world. I did so because only participants in the decision making processes can adequately determine how to weigh constraints when making a decision. My aim was to present an ideal; to serve as a

"reflecting board" for future discussion by participants. This information, couple with who is included in the discussion, will determine the ultimate outcome.

Key Organizations to Include in Future Efforts

Decisions about who to invite to the table for discussion of needs, as outlined above, are key to the success of binational recovery efforts in the future. Clearly several recovery teams shape common needs despite working to address each endangered species as a separate problem. Although there are differences associated with the biological needs of each species, cross-cutting similarities in social and organizational problems exist that could be better addressed by bicultural experts trained in solving people problems in the international arena. In this section, I explain why the evidence documented here led me to propose that binational recovery efforts of the future should involve bicultural consultants as key players.

For each of the needs identified in Tables 10-12, program participants should come to together and discuss how to solve each need. Some needs fall outside the jurisdiction of existing government agencies. Participants I vaguely describe as "bicultural consultants" could fill this gap. Such consultants currently assist businesses that seek to expand operations on both sides of the northern Mexico border. However, to my knowledge this expertise remains untapped in the context of binational recovery efforts.

A consortium of governmental and non-governmental organizations could contract such bicultural consultants. The precedent for this was established by the CBSG, under the umbrella of IUCN. In the case of CBSG, participating zoos and aquaria help fund staff who maintain the databases and organize workshops that bring together experts in

planning for recovery efforts. However, the continuity required to actually implement such plans is often missing. CBSG serves an international clientele. Currently, no organization serves as a binational clientele. The subtleties, historical antecedents, personal quirks, talents and friendships of each program should be considered in sustained binational recovery efforts. I propose that bicultural consultants could fill this need.

Bicultural consultants would occupy a neutral position from which to assemble an ad-hoc team of external advisors from both countries to work closely with federal, state and local governments. This team of experts could help coordinate workshops with the participation of appropriate stakeholders. The use of dynamic models to scope the social and organizational issues involved in binational species recovery could represent a valuable tool to explore in these workshops. Costanza & Ruth (1998) have illustrated several examples on how these new modeling tools help to bring consensus among a broad range of stakeholders in environmental problems.

By including bicultural consultants in joint recovery efforts, a neutral entity would help establish faith that the perspectives of all participants would be considered. Working under contract, such consultants could bring different stakeholders together to define a certain conservation problem, to identify conservation priorities, to develop measurable goals and objectives, to determine roles and responsibilities and to establish time frames for program achievements. By bringing appropriate participants to the table to assess progress toward meeting the goals of recovery plans, bicultural consultants could also provide continuity for organizing periodic reviews of recovery efforts,

completing the problem-solving cycle (Figure 1). Ideally, these consultants would help cross-fertilize ideas between species-specific networks of participants, thereby expanding the personal networks of participants and the coordinated impact of recovery efforts for species confronted by similar problems.

Which participants would sit around the discussion tables facilitated by bicultural consultants? Participants should include federal agencies, state agencies, local agencies, non-governmental organizations, captive breeding specialists, scientific research advisors and ranchers/landowners. In the following paragraphs, I elaborate on the types of people to consider for each of these broad and loosely defined categories. Consistent with the results of Chapter 1, certain individuals might represent several categories due to their experience in several different positions.

Federal agencies include both those that have a legislative mandate to protect species at risk and those mandated to comply with federal laws and international treaties while managing lands and species under their jurisdiction. The former include SEMARNAT, U.S. Fish and Wildlife Service, and National Biological Services. The latter include CONANP, National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, Army Corps of Engineers, Bureau of Land Management, Bureau of Indian Affairs. In the past, such linkages were facilitated through the Mexico – United States Joint Committee.

Appropriate state agencies should be identified from the border states of Mexico (Tamaulipas, Nuevo León, Coahuila, Chihuahua, Sonora and Baja California) and the U.S.A. (Texas, New Mexico, Arizona, and California). Similar to federal agencies,

counterparts would include participants from both the agencies that manage endangered species and those that manage lands providing habitat for endangered species.

State and federal agencies should identify local government agencies within the municipios, ejidos, counties, and cities that lie within the geographic range of each species. Appropriate local agencies should include those that influence local land use practices influencing desert springs, forest cover, grazing practices, predator control, consumptive and non-consumptive use of wildlife. In Mexico, the legal basis for local governments to request assistance through state and federal agencies is provided by the Law for Integrated Ecosystem Management. In the U.S.A., the system of county agents affiliated with Land Grant Institutions provides an existing network of local contacts Habitat Conservation Planning is a mechanism whereby development interests are brought together with local and regional experts to resolve questions of endangered species recovery in the U.S.A.

Non-governmental organizations include citizen's groups of several distinct types: (a) donor foundations, (b) grass-roots advocacy groups, and (c) project-based grant recipients. For example, donor foundations based in Mexico might include Fondo Mexicano para la Conservación and Fundación Mexicana. Donor foundations based in the United States might include The Nature Conservancy, World Wildlife Fund-US, the Ford Foundation and the Pew Charitable Trust. International donor foundations might include the World Bank and the Organization of American States. Examples of grass-roots advocacy groups might include Defenders of Wildlife and Naturalia. NGOs that

are primarily project-based grant recipients might include Pronatura, Profauna, the

Sonoran Desert Museum, the Mexican Wolf Coalition, and Wildlife Trust.

Captive breeding specialists include professionals associated with zoological parks

(Chapultepec Zoo, Africam Safari, Guadalajara Zoo, Wildlife Conservation Society, The

Fossil Rim Wildlife Center, Arizona Sonora Desert Museum, etc.) or zoo related

associations (Asociación de Zoológicos y Criaderos de la República Mexicana,

American Zoo and Aquarium Association, International Association of Zoo Directors,

Species Survival Plans, Propagation Groups, etc.).

Scientific research advisors should be identified through universities, academic

centers and professional networks such as the Society for Conservation Biology, IUCN

Specialist Groups, the Mexico Chapter of the Ecological Society of America, the

Southwestern Association of Naturalists, and Southwest Section of The Wildlife Society.

Ranchers/landowners may include citizens affected by decisions made by

government agencies. For the Mexican wolf such groups included the Cattlemen's

Association, Ganaderos Diversificados, Livestock Producers, The Malpais Group, etc.

Most of these groups would also have a stake in the protection of other endangered

species that cross the northern Mexico border.

Options for the Future

In terms of strategic planning for binational recovery efforts, the following management

options emerged from the information provided by participants in this study: (1)

maintain the status quo, (2) conduct binational planning for selected species led by

federal agencies, (3) create ad-hoc working groups led by volunteer scientists and

advocates, (4) begin coordinated planning for sets of endangered species managed by regional offices of federal agencies, or (5) build capacity for a set of bicultural consultants flexible enough to respond to funding opportunities identified by a coalition of governmental, non-governmental and stakeholder groups. These are certainly not all of the possible options; however, they represent a sufficient starting point for strategic planning. I summarize the pros and cons for each of these options.

(1) Status quo: If no effort is made to enhance binational collaboration in recovery of endangered species that cross the northern border of Mexico, the biodiversity in the region is likely to irrevocably decline. The natural heritage of both countries will degrade, reducing options available for future generations. However, state and federal agencies on both sides of the border will expend minimal effort at minimal cost. This option seems to fall on the "low cost, low gain" end of the continuum of options.

(2) Binational planning for selected species led by federal agencies. If federal funding becomes available through advocacy groups, the mechanisms are already in place to organize a binational planning process for selected focal species. However, funding for travel, communication, organization of workshops and publication of results is required. Given the current economic climate, federal employees are over-worked and under-funded in both nations. Their efforts are more likely allocated to "hot-button" issues influenced by the current political climate than by systematic strategic planning. Successful implementation of this option would likely reduce the extinction risk for selected species; however, it is unlikely to result in coordinated planning for sets of

species occupying ecoregions. This option would likely result in "moderate cost, moderate gain."

(3) <u>Ad-hoc working groups led by volunteer scientists and advocates.</u> Through professional organizations, dedicated leaders from the private and academic sectors could take the initiative to seek funding for the workshops and exchange visits identified as priorities by the participants in this study. Such dedicated professionals have been effective in the past, and there is little question that key actors can exert a major impact. The disadvantage of relying on volunteer effort is that individuals are often spread too thin. Although this option might cost little, gains would remain unpredictably high or low.

(4) <u>Coordinated planning for sets of endangered species</u>. The private sector might support coordinated planning efforts that would lift restrictions upon development in certain regions. Addressing habitat regulations for several species at one time would increase efficiency for government personnel from regional offices where one person is responsible for several species. This multi-species approach will more likely provide positive, long-term impacts compared to single species approaches. However, the funding required for a systematic planning process of this nature is relatively high. To the extent that the needs of a broader contingency are met by this approach, it may be possible to acquire matching funds from a wider consortium of interests. I believe this option falls on the "high cost, high gain" end of the continuum.

(5) <u>Capacity building for a set of bicultural consultants</u>. The consulting industry expands and contracts with the market for its services. One option might be to seek seed

funding for expanding small business enterprises from otherwise untapped international sources. A successful pilot program initiated under the umbrella of an existing NGO might generate proof of the success of this concept. If successful, additional matching funds might become available to build the capacity for a sustainable business. This would help buffer well-qualified and dedicated individuals who moved between service in the public and private sectors during their careers. Due to the potential support of highly effective individuals, this option also represents a "high cost, high gain" approach.

Conclusions

1. Mexican wolf participants believed that binational collaboration in Mexican wolf recovery efforts could be facilitated by: (a) a clear definition of a project's goals and objectives and participants' roles and responsibilities, (b) participation of committed individuals and organizations, (c) effective coordination and communication, associated with participative decision-making, (d) strong leadership, bilingualism, appropriate personal interactions, and (e) access to resources, i.e. skills training, information exchange, and animal transfers.

2. Interviewees suggested that binational collaboration could be inhibited by (a) unequal support for in-situ or ex-situ conservation, (b) lack of project follow-up and review, (c) lack of continuity in individuals and organizations, (d) poorly handled power and authority issues, (e) inefficient communication, (f) failure to appreciate different perspectives, (g) inappropriate management or allocation of

funding, (h) information distortion, (i) a lack of cultural sensitivity, and (j) inequity in previous interactions.

3. No major significant differences were observed on how survey respondents from Mexico and the United States ranked priority needs for binational efforts. High priority needs included: (a) equitable participation in project design and implementation, (b) continuity of personnel (c) coordination of federal, state and local efforts, (d) increased funding, managed with accountability, and (e) facilitation of exchange visits among participants from both countries.

4. Responses to almost half of the survey items indicated accord among the sample of respondents, providing detailed information for identification of common ground. The nature of discord was within the range of "manageable", with no clear polarization of attitudes measured. Sensitive issues included: (a) inequitable consideration of perspectives of all stakeholders, (b) more resources, better national and binational organization of recovery efforts, and (c) relevant knowledge of decision makers.

5. The general structure of the conceptual model, derived from interview data on the Mexican wolf recovery effort, appeared to have broader validity for the larger sample of respondents in this study, which included more participants from the Mexican wolf program as well as participants in recovery efforts on behalf of over a dozen other species in the northern Mexican borderlands.

6. This study provides a series of recommendation to facilitate binational collaboration in shared endangered species programs. These actions may be

implemented through one of the following management options derived from the analysis: : (a) maintenance of the status quo, (b) implementation of binational planning for selected species led by federal agencies, (c) creation of ad-hoc working groups led by volunteer scientists and advocates, (d) coordinated planning for sets of endangered species managed by regional offices of federal agencies, or (e) capacity building for a set of bicultural consultants flexible enough to respond to funding opportunities identified by a coalition of governmental, non-governmental and stakeholder groups.

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APPENDIX A

DATABASE DESIGN FOR SURVEY INSTRUMENT

Variable	Survey Item

V01 Survey   Survey Number

Section I   **Recovery efforts**

V02 Experien   Recovery efforts for which you have experience.

a)	Mexican wolf
b)	Peninsular pronghorn
c)	Prairie dog
d)	Black-footed ferret
e)	Thick-billed parrot
f)	Kemp's ridley turtle
g)	Ocelot
h)	Jaguar
i)	Jaguarundi
j)	Aplomado falcon
k)	Mexican spotted owl
l)	Black bear
m)	Imperial woodpecker
n)	Other

V03 Basis   Which one of these programs will be the primary basis for your response to this questionnaire?

From the several programs, I decided to group them in 3: 1) Mexican wolf, 2) programs that fit the description that we provided on binational recovery programs and 3) programs that did not quite fitted (e.g. volcano rabbit, collaborative agreements, and similar responses)

Section II   **Factors Influencing Binational Collaboration.**

V04 Coordin   Overall, binational collaboration in recovery of this species has been well coordinated.

V05 Recovplan   Development of a recovery plan for this species facilitated binational collaboration.

V06 Goal_obj   Binational recovery goals and objectives have been clearly defined for this species.

V07 Tasks   Binational collaboration was hindered when the tasks of participants were not clearly defined.

V08 Implement   Recovery efforts for this species should be implemented in America only by Americans and in Mexico only by Mexicans.

V09 Habprot   Protection of the habitat is of primary importance to the recovery of the species.

V10 Captbreed   Captive breeding is of primary importance to the recovery of this species.

V11 Locals   Participation of local residents/landowners in decision-making is of primary importance to the recovery of this species.

V12 Equal   Equal participation of Americans and Mexicans is important for joint recovery efforts.

V13 Interest   Government officials from Mexico are interested only in the program within their nation.

V14 Personnel   It has been difficult to collaborate in the long-term due to changes in personnel within the participating organizations of Mexico.

V15 NGOs   Discontinuity due to governmental changes could be addressed by more involvement of universities and non-governmental organizations.

V16 Organizat   Binational collaboration has been hindered because recovery efforts in Mexico have not been well organized.

V17 Equalinvol   Both countries have been equally involved in major decisions affecting recovery of this species.

V18 Slow_deci   Collaboration was hindered when decisions were made slowly in one of the countries.

V19 Persp_stak   Federal agencies from my country have considered equally the perspectives of all stakeholders in the decisions for this recovery effort.

V20 Politic_iss   Political issues have blocked binational collaboration in recovery efforts for this species.

V21 MoreNGO   More participation of the non-governmental sector would facilitate binational collaboration in recovery of this species.

V22 Def_leadr   The recovery program for this species in America has well-defined leaders.

V23 Succ_lead   Program leaders in America have been successful in facilitating binational collaboration.

V24 Experts   Key participants from America were chosen on the basis of their expertise and commitment in recovery of this species.

V25 Core_grp   Continuity of participation by a core group of people facilitated binational collaboration.

V26 Peopl_tog   The biggest logistical limitation to binational collaboration is getting the people together from both countries together so they can talk.

V27 Frndship   Friendships have influenced binational collaboration more than formal agreements.

V28 Prsonality   Binational collaboration has been influenced more by personality than cultural differences.

V29 NatlPersp   Differences in national perspectives have inhibited binational collaboration in recovery efforts.

V30 Field_capt   Differences in perspectives about the relative importance of field and captive recovery efforts have inhibited binational collaboration.

V31 EconmRes   Binational recovery goals have not been achieved due to the lack of economic resources in America.

V32 UnilatDec   Most unilateral decisions in binational recovery efforts have been made by the country with more economic resources.

V33 ChngeReg   It has been difficult to collaborate in the long-term with Mexico due to changes in regulations within their participating organizations.

V34 FedralFund   Federal funding for this binational effort should be distributed exclusively to federal agencies.

V35 StateAgnc   Participation by border-state agencies has facilitated binational collaboration in the recovery effort for this species.

V36 DivertFund   Funding for binational collaboration has been used for other activities in America.

V37 TrnsfrAnim   The transfer of animals between America and Mexico has increased trust among participants.

V38 Resources   When resources were scarce, binational collaboration was inhibited more than were resources were abundant.

V39 Knowledge   Decision-makers who influence binational collaboration in America have sufficient knowledge about on-the-ground recovery efforts.

V40 Academics   Research has served the interests of academics more than contributing to recovery of this species.

V41Know_othr   I have good knowledge about recovery efforts for the species in Mexico.

V42 InfoExch   There is sufficient information exchange between participants from both countries.

V43 Technlgy   National differences in access to technology have inhibited binational collaboration for this species.

V44 InfoNeed   More information about this species needs to be collected to facilitate binational collaboration.

V45 ExpDiff   Differences in the level of expertise of Americans and Mexicans has inhibited binational collaboration in this program.

V46 Training   Training of key people to facilitate collaboration at the binational level would enhance recovery efforts for this species.

V47 Language   Language differences were a barrier to effective binational collaboration in recovery efforts.

V48 CultInsen Cultural insensitivity and disrespect between participants have inhibited binational collaboration in recovery efforts.

V49 Exchange   Exchange visits increased trust on a personal level in binational efforts for recovery of this species.

V50 CultDiffer Cultural difference between participants have inhibited binational collaboration.

V51 ConsMove   Differences in the development of the conservation movement on either country have inhibited binational collaboration for this species.

V52 EconDev   Differences in economic development in either country have inhibited binational collaboration in recovery of this species.

V53 Descntral Decentralized decision-making would facilitate binational collaboration in recovery efforts for this species.

V54 FormlGrp   A formal group with equal binational representation would facilitate coordination of binational efforts toward recovery of this species.

Section III Priorities to be addressed in the future

Binational Project Development

V55 Prodesign Project design (goals and objectives)
V56 Promang   Project management (tasks and responsibilities)
V57 Natauton   National autonomy in project implementation
V58 Captfiel   Balance captive/field efforts
V59 Prorev   Project review

Participating Organizations

V60 Continst   Continuity of institutions
V61 Coordlsf   Coordination of local state and federal efforts
V62 Descdm   Decentralization in decision-making
V63 Forbi   Formal procedures for binational decision-making
V64 Gov_NGO   Balance of governmental and non-governmental organizations

Participating people

V65 Leadrship Leadership skills
V66 Negotiat   Negotiation skills
V67 Continuity Continuity of participants
V68 Communic   Active communication between participants
V69 Persinter Improvement of personal interactions
V70 Undpers   Understanding the differences in perspectives among stakeholders

Resources

V71 Incfund   Increased funding from diverse sources
V72 Fundalloc   Funding allocation, management and accountability
V73 Newinf   Acquiring new information
V74 Infexch   Exchanging existing information about the species/habitat
V75 Techtran   Technology transfer between nations
V76 Training2   Technical training of participants

Cultural/Historical

V77 Bilingual   Bilingual skills training
V78 Intercomm   Training in intercultural communication
V79 Trust   Improvement of trust/reciprocity
V80 Exchvisi   Exchange visits among counterparts

Section IV

V81 Gen_part   In general, how long have you been a participant in binational recovery programs?
V82 Spec_part   How long have you participated in the binational program that is the primary basis for your responses on this questionnaire?
V83 Position   Please circle as many of the following categories that describe the positions or roles that you have held in endangered species programs for more than one year.
V84 CurrPos   Please indicate which one of the above categories best describes your current role or position?
V85 Age   To which age group do you belong?
V86 Educatn   Which of the following degrees have you received?
V87 Nation   What is your nationality?
V88 Gender   What is your gender?
V89 Bilingual   How well developed are your bilingual skills in Spanish and English?

_____

APPENDIX B

FREQUENCY OF RESPONSE TO SURVEY ITEMS

Which one of these programs will be the primary basis for your response to this questionnaire?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	53	37.3	38.7	38.7
	2	84	59.2	61.3	100.0
	Total	137	96.5	100.0	
Missing	System	5	3.5		
Total		142	100.0		

Overall, binational collaboration in recovery of this species has been well coordinated.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	11.3	12.3	12.3
	2	43	30.3	33.1	45.4
	3	21	14.8	16.2	61.5
	4	42	29.6	32.3	93.8
	5	8	5.6	6.2	100.0
	Total	130	91.5	100.0	
Missing	System	12	8.5		
Total		142	100.0		

Development of a recovery plan for this species facilitated binational collaboration.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	14.8	16.7	16.7
	2	61	43.0	48.4	65.1
	3	20	14.1	15.9	81.0
	4	17	12.0	13.5	94.4
	5	7	4.9	5.6	100.0
	Total	126	88.7	100.0	
Missing	System	16	11.3		
Total		142	100.0		

Binational recovery goals and objectives have been clearly defined for this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	11.3	12.5	12.5
	2	41	28.9	32.0	44.5
	3	19	13.4	14.8	59.4
	4	39	27.5	30.5	89.8
	5	13	9.2	10.2	100.0
	Total	128	90.1	100.0	
Missing	System	14	9.9		
Total		142	100.0		

Binational collaboration was hindered when the tasks of participants were not clearly defined.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	14.8	17.4	17.4
	2	58	40.8	47.9	65.3
	3	18	12.7	14.9	80.2
	4	23	16.2	19.0	99.2
	5	1	.7	.8	100.0
	Total	121	85.2	100.0	
Missing	System	21	14.8		
Total		142	100.0		

Recovery efforts for this species should be implemented in America only by Americans and in Mexico only by Mexicans

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	8	5.6	5.8	5.8
	2	10	7.0	7.2	12.9
	3	12	8.5	8.6	21.6
	4	57	40.1	41.0	62.6
	5	52	36.6	37.4	100.0
	Total	139	97.9	100.0	
Missing	System	3	2.1		
Total		142	100.0		

Protection of the habitat is of primary importance to the recovery of the species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	108	76.1	79.4	79.4
	2	19	13.4	14.0	93.4
	3	4	2.8	2.9	96.3
	4	4	2.8	2.9	99.3
	5	1	.7	.7	100.0
	Total	136	95.8	100.0	
Missing	System	6	4.2		
Total		142	100.0		

Captive breeding is of primary importance to the recovery of this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	53	37.3	38.4	38.4
	2	38	26.8	27.5	65.9
	3	10	7.0	7.2	73.2
	4	16	11.3	11.6	84.8
	5	21	14.8	15.2	100.0
	Total	138	97.2	100.0	
Missing	System	4	2.8		
Total		142	100.0		

Participation of local residents/landowners in decision-making is of primary importance to the recovery of this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	90	63.4	65.2	65.2
	2	40	28.2	29.0	94.2
	3	7	4.9	5.1	99.3
	4	1	.7	.7	100.0
	Total	138	97.2	100.0	
Missing	System	4	2.8		
Total		142	100.0		

Equal participation of Americans and Mexicans is important for joint recovery efforts.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	75	52.8	54.7	54.7
	2	49	34.5	35.8	90.5
	3	7	4.9	5.1	95.6
	4	5	3.5	3.6	99.3
	5	1	.7	.7	100.0
	Total	137	96.5	100.0	
Missing	System	5	3.5		
Total		142	100.0		

Government officials from [other country] are interested only in the program within their nation.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	5	3.5	4.3	4.3
	2	33	23.2	28.4	32.8
	3	23	16.2	19.8	52.6
	4	45	31.7	38.8	91.4
	5	10	7.0	8.6	100.0
	Total	116	81.7	100.0	
Missing	System	26	18.3		
Total		142	100.0		

It has been difficult to collaborate in the long-term due to changes in personnel within the participating organizations of [other country].

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	17	12.0	17.2	17.2
	2	28	19.7	28.3	45.5
	3	21	14.8	21.2	66.7
	4	30	21.1	30.3	97.0
	5	3	2.1	3.0	100.0
	Total	99	69.7	100.0	
Missing	System	43	30.3		
Total		142	100.0		

Discontinuity due to governmental changes could be addressed by more involvement of universities and non-governmental organizations.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	39	27.5	30.0	30.0
	2	64	45.1	49.2	79.2
	3	16	11.3	12.3	91.5
	4	8	5.6	6.2	97.7
	5	3	2.1	2.3	100.0
	Total	130	91.5	100.0	
Missing	System	12	8.5		
Total		142	100.0		

Binational collaboration has been hindered because recovery efforts in [other country] have not been well organized.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	4.9	6.4	6.4
	2	30	21.1	27.5	33.9
	3	27	19.0	24.8	58.7
	4	35	24.6	32.1	90.8
	5	10	7.0	9.2	100.0
	Total	109	76.8	100.0	
Missing	System	33	23.2		
Total		142	100.0		

Both countries have been equally involved in major decisions affecting recovery of this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	1.4	1.6	1.6
	2	28	19.7	23.0	24.6
	3	18	12.7	14.8	39.3
	4	61	43.0	50.0	89.3
	5	13	9.2	10.7	100.0
	Total	122	85.9	100.0	
Missing	System	20	14.1		
Total		142	100.0		

Collaboration was hindered when decisions were made slowly in one of the countries.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	25	17.6	21.2	21.2
	2	66	46.5	55.9	77.1
	3	19	13.4	16.1	93.2
	4	7	4.9	5.9	99.2
	5	1	.7	.8	100.0
	Total	118	83.1	100.0	
Missing	System	24	16.9		
Total		142	100.0		

Federal agencies from my country have considered equally the perspectives of all stakeholders in the decisions for this recovery effort.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	7.0	7.9	7.9
	2	43	30.3	34.1	42.1
	3	18	12.7	14.3	56.3
	4	37	26.1	29.4	85.7
	5	18	12.7	14.3	100.0
	Total	126	88.7	100.0	
Missing	System	16	11.3		
Total		142	100.0		

Political issues have blocked binational collaboration in recovery efforts for this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	15	10.6	12.5	12.5
	2	45	31.7	37.5	50.0
	3	29	20.4	24.2	74.2
	4	29	20.4	24.2	98.3
	5	2	1.4	1.7	100.0
	Total	120	84.5	100.0	
Missing	System	22	15.5		
Total		142	100.0		

More participation of the non-governmental sector would facilitate binational collaboration in recovery of this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	39	27.5	29.1	29.1
	2	74	52.1	55.2	84.3
	3	15	10.6	11.2	95.5
	4	6	4.2	4.5	100.0
	Total	134	94.4	100.0	
Missing	System	8	5.6		
Total		142	100.0		

The recovery program for this species in [own country] has well-defined leaders.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	14.8	15.6	15.6
	2	66	46.5	48.9	64.4
	3	13	9.2	9.6	74.1
	4	28	19.7	20.7	94.8
	5	7	4.9	5.2	100.0
	Total	135	95.1	100.0	
Missing	System	7	4.9		
Total		142	100.0		

Program leaders in [own country] have been successful in facilitating binational collaboration.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	9	6.3	7.1	7.1
	2	51	35.9	40.2	47.2
	3	33	23.2	26.0	73.2
	4	27	19.0	21.3	94.5
	5	7	4.9	5.5	100.0
	Total	127	89.4	100.0	
Missing	System	15	10.6		
Total		142	100.0		

Key participants from [own country] were chosen on the basis of their expertise and commitment in recovery of this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	15	10.6	12.3	12.3
	2	54	38.0	44.3	56.6
	3	24	16.9	19.7	76.2
	4	22	15.5	18.0	94.3
	5	7	4.9	5.7	100.0
	Total	122	85.9	100.0	
Missing	System	20	14.1		
Total		142	100.0		

Continuity of participation by a core group of people facilitated binational collaboration.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	29	20.4	23.6	23.6
	2	57	40.1	46.3	69.9
	3	23	16.2	18.7	88.6
	4	12	8.5	9.8	98.4
	5	2	1.4	1.6	100.0
	Total	123	86.6	100.0	
Missing	System	19	13.4		
Total		142	100.0		

The biggest logistical limitation to binational collaboration is getting the people together from both countries so they can talk.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	20	14.1	15.3	15.3
	2	54	38.0	41.2	56.5
	3	22	15.5	16.8	73.3
	4	30	21.1	22.9	96.2
	5	5	3.5	3.8	100.0
	Total	131	92.3	100.0	
Missing	System	11	7.7		
Total		142	100.0		

Friendships have influenced binational collaboration more than formal agreements.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	29	20.4	24.6	24.6
	2	49	34.5	41.5	66.1
	3	24	16.9	20.3	86.4
	4	16	11.3	13.6	100.0
	Total	118	83.1	100.0	
Missing	System	24	16.9		
Total		142	100.0		

Binational collaboration has been influenced more by personality than cultural differences.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	15	10.6	13.2	13.2
	2	47	33.1	41.2	54.4
	3	25	17.6	21.9	76.3
	4	24	16.9	21.1	97.4
	5	3	2.1	2.6	100.0
	Total	114	80.3	100.0	
Missing	System	28	19.7		
Total		142	100.0		

Differences in national perspectives have inhibited binational collaboration in recovery efforts.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	7.7	9.4	9.4
	2	61	43.0	52.1	61.5
	3	24	16.9	20.5	82.1
	4	21	14.8	17.9	100.0
	Total	117	82.4	100.0	
Missing	System	25	17.6		
Total		142	100.0		

Differences in perspectives about the relative importance of field and captive recovery efforts have inhibited binational coordination.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	7.7	9.6	9.6
	2	44	31.0	38.3	47.8
	3	23	16.2	20.0	67.8
	4	33	23.2	28.7	96.5
	5	4	2.8	3.5	100.0
	Total	115	81.0	100.0	
Missing	System	27	19.0		
Total		142	100.0		

Binational recovery goals have not been achieved due to the lack of economic resources in [own country].

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	18	12.7	13.7	13.7
	2	40	28.2	30.5	44.3
	3	20	14.1	15.3	59.5
	4	45	31.7	34.4	93.9
	5	8	5.6	6.1	100.0
	Total	131	92.3	100.0	
Missing	System	11	7.7		
Total		142	100.0		

Most unilateral decisions in binational recovery efforts have been made by the country with more economic resources.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	28	19.7	23.3	23.3
	2	66	46.5	55.0	78.3
	3	10	7.0	8.3	86.7
	4	16	11.3	13.3	100.0
	Total	120	84.5	100.0	
Missing	System	22	15.5		
Total		142	100.0		

It has been difficult to collaborate in the long-term with [other country] due to changes in regulations within their participating organizations.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	4.9	6.7	6.7
	2	27	19.0	26.0	32.7
	3	29	20.4	27.9	60.6
	4	39	27.5	37.5	98.1
	5	2	1.4	1.9	100.0
	Total	104	73.2	100.0	
Missing	System	38	26.8		
Total		142	100.0		

Federal funding for this binational effort should be distributed exclusively to federal agencies.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	2	1.4	1.5	1.5
	2	3	2.1	2.3	3.8
	3	11	7.7	8.3	12.1
	4	76	53.5	57.6	69.7
	5	40	28.2	30.3	100.0
	Total	132	93.0	100.0	
Missing	System	10	7.0		
Total		142	100.0		

Participation by border-state agencies has facilitated binational collaboration in the recovery effort for this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	17	12.0	15.0	15.0
	2	40	28.2	35.4	50.4
	3	28	19.7	24.8	75.2
	4	17	12.0	15.0	90.3
	5	11	7.7	9.7	100.0
	Total	113	79.6	100.0	
Missing	System	29	20.4		
Total		142	100.0		

Funding for binational collaboration has been used for other activities in [own country].

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	2.8	4.8	4.8
	2	19	13.4	22.9	27.7
	3	24	16.9	28.9	56.6
	4	30	21.1	36.1	92.8
	5	6	4.2	7.2	100.0
	Total	83	58.5	100.0	
Missing	System	59	41.5		
Total		142	100.0		

The transfer of animals between America and Mexico has increased trust among participants.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	14.8	24.1	24.1
	2	42	29.6	48.3	72.4
	3	19	13.4	21.8	94.3
	4	2	1.4	2.3	96.6
	5	3	2.1	3.4	100.0
	Total	87	61.3	100.0	
Missing	System	55	38.7		
Total		142	100.0		

When resources were scarce, binational collaboration was inhibited more than were resources were abundant.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	9	6.3	9.3	9.3
	2	54	38.0	55.7	64.9
	3	19	13.4	19.6	84.5
	4	14	9.9	14.4	99.0
	5	1	.7	1.0	100.0
	Total	97	68.3	100.0	
Missing	System	45	31.7		
Total		142	100.0		

Decision-makers who influence binational collaboration in [own country] have sufficient knowledge about on-the-ground recovery efforts.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	7.0	7.6	7.6
	2	43	30.3	32.6	40.2
	3	18	12.7	13.6	53.8
	4	51	35.9	38.6	92.4
	5	10	7.0	7.6	100.0
	Total	132	93.0	100.0	
Missing	System	10	7.0		
Total		142	100.0		

Research has served the interests of academics more than contributing to recovery of this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	13	9.2	9.8	9.8
	2	36	25.4	27.3	37.1
	3	11	7.7	8.3	45.5
	4	61	43.0	46.2	91.7
	5	11	7.7	8.3	100.0
	Total	132	93.0	100.0	
Missing	System	10	7.0		
Total		142	100.0		

I have good knowledge about recovery efforts for the species in [other country].

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	24	16.9	18.6	18.6
	2	52	36.6	40.3	58.9
	3	16	11.3	12.4	71.3
	4	33	23.2	25.6	96.9
	5	4	2.8	3.1	100.0
	Total	129	90.8	100.0	
Missing	System	13	9.2		
Total		142	100.0		

There is sufficient information exchange between participants from both countries.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	9	6.3	6.9	6.9
	2	39	27.5	30.0	36.9
	3	23	16.2	17.7	54.6
	4	52	36.6	40.0	94.6
	5	7	4.9	5.4	100.0
	Total	130	91.5	100.0	
Missing	System	12	8.5		
Total		142	100.0		

National differences in access to technology have inhibited binational collaboration for this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	4.2	4.6	4.6
	2	51	35.9	38.9	43.5
	3	31	21.8	23.7	67.2
	4	40	28.2	30.5	97.7
	5	3	2.1	2.3	100.0
	Total	131	92.3	100.0	
Missing	System	11	7.7		
Total		142	100.0		

More information about this species needs to be collected to facilitate binational collaboration.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	31	21.8	23.3	23.3
	2	56	39.4	42.1	65.4
	3	17	12.0	12.8	78.2
	4	26	18.3	19.5	97.7
	5	3	2.1	2.3	100.0
	Total	133	93.7	100.0	
Missing	System	9	6.3		
Total		142	100.0		

Differences in the level of expertise of Americans and Mexicans has inhibited binational collaboration in this program.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	4.2	4.9	4.9
	2	28	19.7	23.0	27.9
	3	21	14.8	17.2	45.1
	4	61	43.0	50.0	95.1
	5	6	4.2	4.9	100.0
	Total	122	85.9	100.0	
Missing	System	20	14.1		
Total		142	100.0		

Training of key people to facilitate collaboration at the binational level would enhance recovery efforts for this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	53	37.3	37.9	37.9
	2	71	50.0	50.7	88.6
	3	10	7.0	7.1	95.7
	4	5	3.5	3.6	99.3
	5	1	.7	.7	100.0
	Total	140	98.6	100.0	
Missing	System	2	1.4		
Total		142	100.0		

Language differences were a barrier to effective binational collaboration in recovery efforts.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	2.8	3.1	3.1
	2	34	23.9	26.2	29.2
	3	18	12.7	13.8	43.1
	4	60	42.3	46.2	89.2
	5	14	9.9	10.8	100.0
	Total	130	91.5	100.0	
Missing	System	12	8.5		
Total		142	100.0		

Cultural insensitivity and disrespect between participants have inhibited binational collaboration in recovery efforts.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	2.8	3.4	3.4
	2	14	9.9	12.1	15.5
	3	25	17.6	21.6	37.1
	4	50	35.2	43.1	80.2
	5	23	16.2	19.8	100.0
	Total	116	81.7	100.0	
Missing	System	26	18.3		
Total		142	100.0		

Exchange visits increased trust on a personal level in binational efforts for recovery of this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	37	26.1	31.9	31.9
	2	66	46.5	56.9	88.8
	3	8	5.6	6.9	95.7
	4	3	2.1	2.6	98.3
	5	2	1.4	1.7	100.0
	Total	116	81.7	100.0	
Missing	System	26	18.3		
Total		142	100.0		

Cultural difference between participants have inhibited binational collaboration.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	4.2	4.7	4.7
	2	22	15.5	17.3	22.0
	3	26	18.3	20.5	42.5
	4	64	45.1	50.4	92.9
	5	9	6.3	7.1	100.0
	Total	127	89.4	100.0	
Missing	System	15	10.6		
Total		142	100.0		

Differences in the development of the conservation movement on either country have inhibited binational collaboration in recovery of this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	7.7	8.8	8.8
	2	49	34.5	39.2	48.0
	3	23	16.2	18.4	66.4
	4	39	27.5	31.2	97.6
	5	3	2.1	2.4	100.0
	Total	125	88.0	100.0	
Missing	System	17	12.0		
Total		142	100.0		

Differences in economic development in either country have inhibited binational collaboration in recovery of this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	13	9.2	10.2	10.2
	2	67	47.2	52.8	63.0
	3	19	13.4	15.0	78.0
	4	25	17.6	19.7	97.6
	5	3	2.1	2.4	100.0
	Total	127	89.4	100.0	
Missing	System	15	10.6		
Total		142	100.0		

Descentralized decision-making would facilitate binational collaboration in recovery efforts for this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	23	16.2	18.5	18.5
	2	59	41.5	47.6	66.1
	3	18	12.7	14.5	80.6
	4	20	14.1	16.1	96.8
	5	4	2.8	3.2	100.0
	Total	124	87.3	100.0	
Missing	System	18	12.7		
Total		142	100.0		

A formal group with equal binational representation would facilitate coordination of binational efforts toward recovery of this species.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	56	39.4	41.8	41.8
	2	55	38.7	41.0	82.8
	3	10	7.0	7.5	90.3
	4	10	7.0	7.5	97.8
	5	3	2.1	2.2	100.0
	Total	134	94.4	100.0	
Missing	System	8	5.6		
Total		142	100.0		

Project design (goals and objectives)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	85	59.9	62.5	62.5
	2	27	19.0	19.9	82.4
	3	9	6.3	6.6	89.0
	4	5	3.5	3.7	92.6
	5	10	7.0	7.4	100.0
	Total	136	95.8	100.0	
Missing	System	6	4.2		
Total		142	100.0		

Project management (tasks and responsibilities)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	20	14.1	14.7	14.7
	2	67	47.2	49.3	64.0
	3	34	23.9	25.0	89.0
	4	12	8.5	8.8	97.8
	5	3	2.1	2.2	100.0
	Total	136	95.8	100.0	
Missing	System	6	4.2		
Total		142	100.0		

National autonomy in project implementation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	2.8	3.1	3.1
	2	9	6.3	7.0	10.2
	3	23	16.2	18.0	28.1
	4	43	30.3	33.6	61.7
	5	48	33.8	37.5	99.2
	7	1	.7	.8	100.0
	Total	128	90.1	100.0	
Missing	System	14	9.9		
Total		142	100.0		

Balance captive/field efforts

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	13	9.2	9.9	9.9
	2	16	11.3	12.2	22.1
	3	30	21.1	22.9	45.0
	4	32	22.5	24.4	69.5
	5	39	27.5	29.8	99.2
	7	1	.7	.8	100.0
	Total	131	92.3	100.0	
Missing	System	11	7.7		
Total		142	100.0		

Project review

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	11.3	11.9	11.9
	2	18	12.7	13.4	25.4
	3	37	26.1	27.6	53.0
	4	35	24.6	26.1	79.1
	5	27	19.0	20.1	99.3
	7	1	.7	.7	100.0
	Total	134	94.4	100.0	
Missing	System	8	5.6		
Total		142	100.0		

Continuity of institutions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	41	28.9	31.1	31.1
	2	42	29.6	31.8	62.9
	3	21	14.8	15.9	78.8
	4	15	10.6	11.4	90.2
	5	13	9.2	9.8	100.0
	Total	132	93.0	100.0	
Missing	System	10	7.0		
Total		142	100.0		

Coordination of local state and federal efforts

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	47	33.1	35.9	35.9
	2	32	22.5	24.4	60.3
	3	27	19.0	20.6	80.9
	4	20	14.1	15.3	96.2
	5	5	3.5	3.8	100.0
	Total	131	92.3	100.0	
Missing	System	11	7.7		
Total		142	100.0		

Decentralization in decision-making

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	8	5.6	6.4	6.4
	2	15	10.6	12.0	18.4
	3	26	18.3	20.8	39.2
	4	31	21.8	24.8	64.0
	5	45	31.7	36.0	100.0
	Total	125	88.0	100.0	
Missing	System	17	12.0		
Total		142	100.0		

Formal procedures for binational decision-making

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	24	16.9	18.3	18.3
	2	17	12.0	13.0	31.3
	3	27	19.0	20.6	51.9
	4	34	23.9	26.0	77.9
	5	29	20.4	22.1	100.0
	Total	131	92.3	100.0	
Missing	System	11	7.7		
Total		142	100.0		

Balance of governmental and non-governmental organizations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	15	10.6	11.5	11.5
	2	26	18.3	19.8	31.3
	3	30	21.1	22.9	54.2
	4	29	20.4	22.1	76.3
	5	31	21.8	23.7	100.0
	Total	131	92.3	100.0	
Missing	System	11	7.7		
Total		142	100.0		

Leadership skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	14.8	16.3	16.3
	2	18	12.7	14.0	30.2
	3	16	11.3	12.4	42.6
	4	24	16.9	18.6	61.2
	5	17	12.0	13.2	74.4
	6	33	23.2	25.6	100.0
	Total	129	90.8	100.0	
Missing	System	13	9.2		
Total		142	100.0		

Negotiation skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	8	5.6	6.1	6.1
	2	10	7.0	7.6	13.6
	3	15	10.6	11.4	25.0
	4	23	16.2	17.4	42.4
	5	35	24.6	26.5	68.9
	6	41	28.9	31.1	100.0
	Total	132	93.0	100.0	
Missing	System	10	7.0		
Total		142	100.0		

Continuity of participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	27	19.0	21.1	21.1
	2	28	19.7	21.9	43.0
	3	22	15.5	17.2	60.2
	4	20	14.1	15.6	75.8
	5	20	14.1	15.6	91.4
	6	11	7.7	8.6	100.0
	Total	128	90.1	100.0	
Missing	System	14	9.9		
Total		142	100.0		

Active communication between participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	45	31.7	33.8	33.8
	2	32	22.5	24.1	57.9
	3	33	23.2	24.8	82.7
	4	16	11.3	12.0	94.7
	5	7	4.9	5.3	100.0
	Total	133	93.7	100.0	
Missing	System	9	6.3		
Total		142	100.0		

Improvement of personal interactions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	2.8	3.1	3.1
	2	20	14.1	15.5	18.6
	3	21	14.8	16.3	34.9
	4	35	24.6	27.1	62.0
	5	22	15.5	17.1	79.1
	6	27	19.0	20.9	100.0
	Total	129	90.8	100.0	
Missing	System	13	9.2		
Total		142	100.0		

Understanding the differences in perspectives among stakeholders

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	30	21.1	22.9	22.9
	2	25	17.6	19.1	42.0
	3	27	19.0	20.6	62.6
	4	13	9.2	9.9	72.5
	5	22	15.5	16.8	89.3
	6	14	9.9	10.7	100.0
	Total	131	92.3	100.0	
Missing	System	11	7.7		
Total		142	100.0		

Increased funding from diverse sources

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	53	37.3	39.3	39.3
	2	30	21.1	22.2	61.5
	3	19	13.4	14.1	75.6
	4	12	8.5	8.9	84.4
	5	14	9.9	10.4	94.8
	6	7	4.9	5.2	100.0
	Total	135	95.1	100.0	
Missing	System	7	4.9		
Total		142	100.0		

Funding allocation, management and accountability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	20	14.1	15.3	15.3
	2	34	23.9	26.0	41.2
	3	22	15.5	16.8	58.0
	4	18	12.7	13.7	71.8
	5	17	12.0	13.0	84.7
	6	20	14.1	15.3	100.0
	Total	131	92.3	100.0	
Missing	System	11	7.7		
Total		142	100.0		

Acquiring new information

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	20	14.1	15.2	15.2
	2	16	11.3	12.1	27.3
	3	26	18.3	19.7	47.0
	4	30	21.1	22.7	69.7
	5	12	8.5	9.1	78.8
	6	28	19.7	21.2	100.0
	Total	132	93.0	100.0	
Missing	System	10	7.0		
Total		142	100.0		

Exchanging existing information about the species/habitat

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	24	16.9	18.5	18.5
	2	18	12.7	13.8	32.3
	3	29	20.4	22.3	54.6
	4	26	18.3	20.0	74.6
	5	20	14.1	15.4	90.0
	6	13	9.2	10.0	100.0
	Total	130	91.5	100.0	
Missing	System	12	8.5		
Total		142	100.0		

Technology transfer between nations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	2.8	3.1	3.1
	2	19	13.4	15.0	18.1
	3	13	9.2	10.2	28.3
	4	23	16.2	18.1	46.5
	5	31	21.8	24.4	70.9
	6	37	26.1	29.1	100.0
	Total	127	89.4	100.0	
Missing	System	15	10.6		
Total		142	100.0		

Technical training of participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	18	12.7	14.1	14.1
	2	16	11.3	12.5	26.6
	3	22	15.5	17.2	43.8
	4	19	13.4	14.8	58.6
	5	33	23.2	25.8	84.4
	6	20	14.1	15.6	100.0
	Total	128	90.1	100.0	
Missing	System	14	9.9		
Total		142	100.0		

Bilingual skills training

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	14.8	15.7	15.7
	2	24	16.9	17.9	33.6
	3	36	25.4	26.9	60.4
	4	53	37.3	39.6	100.0
	Total	134	94.4	100.0	
Missing	System	8	5.6		
Total		142	100.0		

Training in intercultural communication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	9	6.3	6.9	6.9
	2	24	16.9	18.3	25.2
	3	53	37.3	40.5	65.6
	4	45	31.7	34.4	100.0
	Total	131	92.3	100.0	
Missing	System	11	7.7		
Total		142	100.0		

Improvement of trust/reciprocity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	44	31.0	33.3	33.3
	2	42	29.6	31.8	65.2
	3	27	19.0	20.5	85.6
	4	19	13.4	14.4	100.0
	Total	132	93.0	100.0	
Missing	System	10	7.0		
Total		142	100.0		

Exchange visits among counterparts

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	61	43.0	45.9	45.9
	2	42	29.6	31.6	77.4
	3	16	11.3	12.0	89.5
	4	14	9.9	10.5	100.0
	Total	133	93.7	100.0	
Missing	System	9	6.3		
Total		142	100.0		

In general, how long have you been a participant in binational recovery programs?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		6	4.2	4.2	4.2
	< 2 years	36	25.4	25.4	29.6
	> 6 years	61	43.0	43.0	72.5
	3-5 years	39	27.5	27.5	100.0
	Total	142	100.0	100.0	

How long have you participated in the binational program that is the primary basis for your responses on this questionnaire?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	4	2.8	2.8	2.8
< 2 years	43	30.3	30.3	33.1
> 6 years	46	32.4	32.4	65.5
3 - 5 years	49	34.5	34.5	100.0
Total	142	100.0	100.0	

Please indicate which one of the above categories best describes your current role or position?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	30	21.1	22.2	22.2
	2	23	16.2	17.0	39.3
	3	30	21.1	22.2	61.5
	4	44	31.0	32.6	94.1
	5	8	5.6	5.9	100.0
	Total	135	95.1	100.0	
Missing	System	7	4.9		
Total		142	100.0		

To which age group do you belong?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	> 70	2	1.4	1.4	1.4
	18 - 29	5	3.5	3.5	4.9
	30 - 39	56	39.4	39.4	44.4
	40 - 49	48	33.8	33.8	78.2
	50 - 59	22	15.5	15.5	93.7
	60 - 69	8	5.6	5.6	99.3
	missing	1	.7	.7	100.0
	Total	142	100.0	100.0	

Which of the following degrees have you received?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Doctoral	38	26.8	26.8	26.8
	Doctoral stu	3	2.1	2.1	28.9
	High school	7	4.9	4.9	33.8
	High sUnderg	1	.7	.7	34.5
	Masters	37	26.1	26.1	60.6
	missing	1	.7	.7	61.3
	Undergraduat	40	28.2	28.2	89.4
	Veterinarian	13	9.2	9.2	98.6
	Vocational	2	1.4	1.4	100.0
	Total	142	100.0	100.0	

What is your nationality?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	2.8	2.8	2.8
	M	64	45.1	45.1	47.9
	U	74	52.1	52.1	100.0
	Total	142	100.0	100.0	

What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.7	.7	.7
	F	35	24.6	24.6	25.4
	M	106	74.6	74.6	100.0
	Total	142	100.0	100.0	

APPENDIX C

PROJECT ISSUE CLUSTER: SIGNIFICANT STATISTICAL RESULTS

Significance of statistical tests (T or F) is indicated by the number of astericks: p<0.05 (*), p<0.01 (**), p<0.001 (***). Codes represent Mexico (MX), United State of America (USA), and the entire binational sample (All).   The statements in quotes are survey items. Responses were coded on a Likert scale (1= highly agree, 5= highly disagree). Means and standard Deviations (SD) are reported. Descriptive statistics for each survey item are listed in Appendix B. Survey items are classified by distribution of responses as shown in Figure 3. Response distributions that differed significantly from the categories of Accord and Discord were categorized as "Ambiguous".   A Chi-square Goodness of Fit test was used as the statistic to determine best fit to the distributions specified in Figure 3.

Box C1. Categorization of response items by response distribution, and results of a test of difference in mean response related to nationality of respondent.

Response Distribution Category of Survey Item		MX		USA	
	t-score	mean	SD	mean	SD
Accord					
"Binational collaboration was hindered when the tasks of participants were not clearly defined"	0.47	2.4	1.1	2.3	0.9
"Protection of the habitat is of primary importance for the recovery of the species"	-2.7*	1.1	0.4	1.5	0.9
"Recovery efforts for this species should be implemented in Mexico only by Mexicans and in the U.S.A only by Americans"	1.40	3.8	1.2	4.1	1.1
Ambiguous					
"Captive breeding is of primary importance for recovery "	1.27	2.2	1.4	2.5	1.6
Discord- Manageable					
"Binational recovery goals and objectives have been clearly defined"	-1.05	2.8	1.2	3.0	1.3
"Overall, binational recovery of this species has been well coordinated"	0.94	3.0	1.2	2.8	1.2

Box C2. "Binational collaboration was hindered when the tasks of participants were not clearly defined"

Demographic variable	F-Value	All Mean	All SD
Current position	2.8*		
Government		2.4	0.1
Non-Government		1.9	0.2
Captive Breeders		2.8	0.1
Scientists		2.3	1.6
Ranchers/Retired		1.8	0.4

Box C3. "Recovery efforts for this species should be implemented in Mexico by Mexicans and in the United States by Americans".

Subset: demographic variable	F-Value	USA Mean	USA SD
USA: Length of Program Participation	5.0**		
< 2 years		4.1	0.2
3-5 years		3.5	0.2
> 6 years		4.5	0.2

Box C4. "Captive breeding is of primary importance for the recovery of the species".

Variable	Test	All Mean	All SD
Current Position	F=5.5**		
Government		2.1	0.2
Non-Government		2.9	0.3
Captive Breeders		1.5	0.2
Scientists		2.8	0.2
Ranchers/Retired		3.2	0.5
Recovery program	t=-9.8***		
Mexican Wolf		1.3	0.5
Other Binational Programs		3.0	1.5

Box C5. "Captive breeding is of primary importance for the recovery of the species".

Demographic variable	Statistical test	MX Mean	MX SD	USA Mean	USA SD
Current Position	F-value	2.7*		4.4*	
Government		1.7	0.3	2.4	0.3
Non-Government		2.9	0.4	3.0	0.4
Captive Breeders		1.3	0.5	1.6	0.3
Scientists		2.5	0.2	3.1	0.3
Ranchers/Retired		1.5	0.9	3.8	0.6
Recovery Program	t-value	-5.0***		-8.7***	
Mexican Wolf Program		1.4	0.5	1.3	0.6
Other Program		2.6	1.4	3.4	1.4

Box C6. "Protection of the habitat is of primary importance to the recovery of this species".

Demographic variable	F-Value	All Mean	All SD
Current Position	2.6*		
Government		1.4	0.1
Non-Government		1.0	0.1
Captive Breeders		1.6	0.1
Scientists		1.1	0.1
Ranchers/Retired		1.1	0.2

Box C7. "Binational collaboration in recovery of this species has been well coordinated".

Demographic variable	t-score	All Mean	All SD
Recovery Program	-3.3***		
Mexican Wolf		2.5	1.0
Other Binational Programs		3.1	1.2

Box C8. "Overall, binational collaboration in recovery of this species has been well coordinated".

Demographic variable	Statistical Test	MX Mean	MX SD	US Mean	US SD
Current Position	F-value	1.2		5.7***	
Government		2.3	0.3	3.5	0.2
Non-Government		3.0	0.3	3.0	0.3
Captive Breeders		3.5	0.4	1.9	0.2
Scientists		3.0	0.2	2.8	0.2
Ranchers/Retired		3.0	0.8	3.0	0.5
Recovery Program	t-score	-5.0**		-8.7***	
Mexican Wolf Program		2.9	1.1	2.1	0.8
Other Program		3.0	1.2	3.1	1.2

Box C9. "Binational recovery goals and objectives have been clearly defined".

Demographic variable	Statistical Test	All Mean	All SD
Current Position	F-value	4.3*	
Government		3.4	0.2
Non-Government		3.1	0.3
Captive Breeders		2.1	0.2
Scientists		3.0	0.1
Ranchers/Retired		2.7	0.4
Recovery Program	t-score	-3.0**	
Mexican Wolf Program		2.5	1.1
Other Recovery Programs		3.1	1.2

APPENDIX D

ORGANIZATION ISSUE CLUSTER: SIGNIFICANT STATISTICAL RESULTS

Significance of statistical tests (T or F) is indicated by the number of astericks: p<0.05 (*), p<0.01 (**), p<0.001 (***). Codes represent Mexico (MX), United State of America (USA), and the entire binational sample (All). The statements in quotes are survey items. Responses were coded on a Likert scale (1= highly agree, 5= highly disagree). Means and standard Deviations (SD) are reported. Descriptive statistics for each survey item are listed in Appendix B. Survey items are classified by distribution of responses as shown in Figure 3. Response distributions that differed significantly from the categories of Accord and Discord were categorized as "Ambiguous". A Chi-square Goodness of Fit test was used as the statistic to determine best fit to the distributions specified in Figure 3.

Box D1. Categorization of response items by response distribution, and results of a test of difference in mean response related to nationality of respondent.

Response Distribution Category of Survey Item		MX		USA	
	t-test	mean	SD	mean	SD
Accord					
"A formal group with equal binational representation would facilitate coordination of binational efforts toward recovery"	3.36**	1.6	0.8	2.1	1.1
"Participation by border-state agencies has facilitated binational collaboration in recovery efforts for this species"	0.83	2.8	1.1	2.6	1.2
"Discontinuity due to governmental changes could be addressed by more involvement of universities and NGO's"	4.41*	1.7	0.8	2.3	0.9
Ambiguous					
"It has been difficult to collaborate in the long-term due to changes in regulations"	0.93	3.1	1.0	3.0	0.9
Discord- Manageable					
"Federal agencies from my country have considered equally the perspectives of all stakeholders in decisions for this recovery effort"	2.39*	2.8	1.3	3.3	1.2
"Binational collaboration has been hindered because recovery efforts in the other country have not been well organized"	4.20**	3.6	1.1	2.8	1.0

Box D2. "A formal group with equal binational representation would facilitate binational efforts towards recovery of this species".

Demographic Variable	F-Value	Mean	SD
Age	3.1*		
19-39 Years		1.6	0.1
40-49 Years		2.0	0.1
> 50 Years		2.0	0.2
Bilingualism	2.9*		
Fully Bilingual		1.9	0.1
Functional Bilingual		1.5	0.1
Limited Comprehension		2.1	0.2
Not Bilingual		1.8	0.2

Box D3. "A formal group with equal binational representation would facilitate binational efforts towards recovery of this species".

Demographic Variable	Statistical test	MX Mean	MX SD	USA Mean	USA SD
Age	F-value	7.6***		0.4	
18-39 years		*1.3*	*0.1*	*2.3*	*0.3*
40 -49 years		2.0	0.2	2.0	0.2
>50 years		1.8	0.3	2.0	0.2
Current Position	F-value	2.6*		0.6	
Government		1.2	0.2	2.2	0.3
Non-Government		1.8	0.2	2.5	0.3
Captive Breeders		1.0	0.2	1.9	0.3
Scientists		1.6	0.1	2.1	0.3
Ranchers/Retired		2.5	0.5	2.4	0.5
Degree of Bilingualism	F-value	5.1**		3.7*	
Fully Bilingual		1.7	0.1	2.7	0.3
Functional Bilingual		1.4	0.1	1.7	0.3
Limited Comprehension		1.0	0.3	2.4	0.2
Not Bilingual		4.0	0.8	1.6	0.3

Box D4. "Federal agencies from my country have considered equally the perspectives of all stakeholders in the decisions for this recovery effort".

Demographic Variable	t-test	Mean	SD
Gender	2.0*		
Female		3.4	1.0
Male		3.0	1.2
Recovery Program	-3.1*		
Mexican Wolf Program		2.7	1.0
Other Recovery Programs		3.3	1.3

Box D5. "Federal agencies from my country have considered equally the perspectives of all stakeholders in the decisions for this recovery effort".

Demographic Variable	Statistical test		MX Mean	MX SD	USA Mean	USA SD
Gender	t-score	-3.2**			0.5	
Female			3.7	0.9	3.2	1.0
Male			2.6	1.2	3.4	1.2
Degree of Bilingualism	F- value	3.7*			5.1**	
Fully Bilingual			3.1	0.2	3.7	0.3
Functional Bilingual			2.5	0.2	4.2	0.3
Limited Comprehension			1.3	0.7	3.0	0.2
Not Bilingual			5	1.1	2.9	0.3
Recovery Program	t-score	-1.4			-2.9**	
Mexican Wolf Program			2.5	1.0	2.8	1.0
Other Programs			3	1.3	3.7	1.1

Box D6. "Binational collaboration has been hindered because recovery efforts in the other country have not been well organized".

Demographic Variable	F-Value	Mean	SD
Age	4.3*		
18-39 Years		3.3	0.1
40-49 Years		3.2	0.1
> 50 Years		2.5	0.2
Bilingualism	2.8*		
Fully Bilingual		3.2	0.1
Functional Bilingual		3.5	0.2
Limited Comprehension		2.8	0.1
Not Bilingual		2.7	0.3

Box D7. "Binational collaboration has been hindered because recovery efforts in the other country have not been well organized".

Demographic Variable	Statistical Test		USA Mean	USA SD
Current Position	F-value	1.8		4.1**
Government			2.3	0.2
Non-Government			2.4	0.3
Captive Breeders			3.5	0.2
Scientists			3.0	0.2
Ranchers/Retired			2.1	0.4

Box D8. "Discontinuity due to governmental changes could be addressed by more involvement of universities and non-governmental organizations".

Demographic Variable	F-Value	Mean	SD
Bilingualism	3.8*		
Fully Bilingual		1.7	0.1
Functional Bilingual		1.8	0.1
Limited Comprehension		2.3	0.1
Not Bilingual		2.4	0.2

Box D9. "Discontinuity due to governmental changes could be addressed by more involvement of universities and non-governmental organizations".

Demographic Variable	Statistical Test	MX Mean	MX SD
Current Position	F-value	3.0*	
Government		1.5	0.2
Non-Government		1.8	0.2
Captive Breeders		1.8	0.3
Scientists		1.4	0.1
Ranchers/Retired		4.0	0.8

APPENDIX E

PEOPLE ISSUE CLUSTER: SIGNIFICANT STATISTICAL RESULTS

Significance of statistical tests (T or F) is indicated by the number of astericks: p<0.05 (*), p<0.01 (**), p<0.001 (***). Codes represent Mexico (MX), United State of America (USA), and the entire binational sample (All).   The statements in quotes are survey items. Responses were coded on a Lickert scale (1= highly agree, 5= highly disagree). Means and standard Deviations (SD) are reported. Descriptive statistics for each survey item are listed in Appendix B. Survey items are classified by distribution of responses as shown in Figure 3. Response distributions that differed significantly from the categories of Accord and Discord were categorized as "Ambiguous".   A Chi-square Goodness of Fit test was used as the statistic to determine best fit to the distributions specified in Figure 3.

Box D1. "Categorization of response items by response distribution, and results of a test of difference in mean response related to nationality of respondent".

Response Distribution Category of Survey Item		MX		USA	
	t-test	mean	SD	mean	SD
Accord					
"Continuity of participation by a core group of people facilitated binational collaboration"	0.8	2.3	1.0	2.2	0.9
"Friendships have influenced binational collaboration more than formal agreements"	2.3*	2.4	1.0	2.0	0.9
"The biggest logistical limitation to binational collaboration is getting the people together from both countries"	0.6	2.6	1.2	2.5	1.1
"Recovery program for the species had well defined leaders in my country"	*2.9**	*2.8*	*1.2*	*2.2*	*0.9*
" Key participants from my country had been chosen on the basis of their expertise and commitment in recovery of this species"	*3.1**	*3.0*	*1.2*	*2.3*	*0.9*
Ambiguous					
"Program leaders in my country have been successful in facilitating binational collaboration"	0.6	2.8	1.1	2.7	1.0
"It has been difficult to collaborate in the long-term due to changes in regulations"	0.9	3.1	1.0	3.0	0.9
"Differences in national perspective have inhibited binational collaboration in recovery efforts"	3.3**	2.2	0.8	2.7	0.9
Discord- manageable					
"It had been difficult to collaborate in the long-term due to changes in personnel within the participating organizations of the other country"	2.6*	3.0	1.1	2.5	1.1
" Binational collaboration had been influenced more by personality than by cultural differences"	4.5***	3.0	1.0	2.2	0.8

Box E2. "Program leaders in my country have been successful in facilitating binational collaboration".

Demographic Variable	Statistical Test	Mean	SD
Gender	t-score	2.3*	
Female		3.2	1.0
Male		2.6	1.0
Stakeholder	F-value	2.8*	
Government		3.0	0.2
Non-Government		2.5	0.2
Captive Breeders		2.3	0.2
Scientists		3.0	0.1
Ranchers/Retired		3.3	0.4
Recovery Program	t-score	-2.9*	
Mexican Wolf Program		2.5	0.8
Other Program		3.0	1.1

Box E3. "Program leaders in my country have been successful in facilitating binational collaboration".

Demographic Variable	Statistical Test	MX Mean	MX SD	USA Mean	USA SD
Gender	t-score	-2.6*		-0.6	
Female		3.5	1.0	2.9	1.1
Male		2.6	1.0	2.7	1.0
Current Position	F-value	1.6		3.6**	
Government		2.5	1.2	3.2	0.2
Non-Government		2.6	0.9	2.3	0.3
Captive Breeders		2.7	1.0	2.1	0.2
Scientists		3.0	1.1	3.0	0.2
Ranchers/Retired		4.5	0.7	2.8	0.4
Bilingualism	F-value	2.8*		1.0	
Fully Bilingual		2.5	0.1	2.7	0.4
Functional Bilingual		3.0	0.2	2.8	0.3
Limited Comprehension		3.2	0.4	2.6	0.2
Not Bilingual		5.0	1.0	2.4	0.3
Program	t-score	-0.3		-3.6***	
Mexican Wolf Program		2.8	0.9	2.2	0.6
Other Recovery Programs		2.9	1.1	3.0	1.1

Box E4. "It had been difficult to collaborate in the long-term due to changes in personnel within the participating organizations of the other country".

Demographic Variable	F-Value	Mean	SD
Age	9.5**		
18-39 Years		3.2	0.1
40-49 Years		2.4	0.2
> 50 Years		2.1	0.2
Participation Time	4.8**		
< 2 Years		3.2	0.2
3 – 5 Years		2.8	0.2
> 6 Years		2.4	0.1

Box E5. "It had been difficult to collaborate in the long-term due to changes in personnel within the participating organizations of the other country".

Demographic Variable	Statistical Test		USA Mean	USA SD
Age	F-value	4.0*		
18-39 years			3.3	0.3
40 -49 years			2.2	0.2
>50 years			2.1	0.6

Box E6. "Friendships have influenced binational collaboration more than formal agreements".

Demographic Variable	t-score	All Mean	All SD
Recovery Program	2.1*		
Mexican Wolf Program		2.5	1.0
Other Program		2.0	0.9

Box E7. "Friendships have influenced binational collaboration more than formal agreements".

Demographic Variable	Statistical Test		MX Mean	MX SD	USA Mean	USA SD
Degree of Education	F-value	*				
HS Undergraduate			3.0	0.2	2.0	0.3
Masters			2.0	0.2	1.9	0.2
Ph D Vet			2.2	0.2	2.0	0.2
Current Position	F-value	1.2			3.2*	
Government			2.4	0.3	1.8	0.2
Non-Government			2.7	0.3	1.9	0.3
Captive Breeders			2.7	0.4	2.6	0.2
Scientists			2.2	0.2	1.7	0.3
Ranchers/Retired			4.0	1.0	1.7	0.3

Box E8. "Differences in national perspectives have inhibited binational collaboration in recovery efforts".

Demographic Variable		MX Mean	MX SD	USA Mean	USA SD
Gender	t-score	4.6*		0.0	
Female		2.2	1.6	2.7	0.6
Male		2.6	0.9	2.7	0.9
Degree of Education		*			
HS Undergraduate		1.9	0.1	2.9	0.2
Masters		2.0	0.2	2.4	0.2
Ph D Vet		2.5	0.1	2.8	0.2
Current Position				*	
Government		2.5	0.2	1.8	0.2
Non-Government		2.1	0.3	1.9	0.3
Captive Breeders		1.8	0.3	2.6	0.2
Scientists		2.3	0.2	1.7	0.2
Ranchers/Retired		1.5	0.6	1.7	0.3

Box E9. "Binational collaboration had been influenced more by personality than by cultural differences".

Demographic Variable	F-Value	All Mean	All SD
Current Position	2.4*		
Government		2.3	0.2
Non-Government		2.4	0.2
Captive Breeders		3.0	0.2
Scientists		2.8	0.1
Ranchers/Retired		2.0	0.3
Age	9.5**		
18-39 Years		3.2	0.1
40-49 Years		2.4	0.1
> Years		2.1	0.2

APPENDIX F

RESOURCE ISSUE CLUSTER: SIGNIFICANT STATISTICAL RESULTS

Significance of statistical tests (T or F) is indicated by the number of astericks: $p<0.05$ (*), $p<0.01$ (**), $p<0.001$ (***). Codes represent Mexico (MX), United State of America (USA), and the entire binational sample (All). The statements in quotes are survey items. Responses were coded on a Lickert scale (1= highly agree, 5= highly disagree). Means and standard Deviations (SD) are reported. Descriptive statistics for each survey item are listed in Appendix B. Survey items are classified by distribution of responses as shown in Figure 3. Response distributions that differed significantly from the categories of Accord and Discord were categorized as "Ambiguous". A Chi-square Goodness of Fit test was used as the statistic to determine best fit to the distributions specified in Figure 3.

Box D1. Categorization of response items by response distribution, and results of a test of difference in mean response related to nationality of respondent.

Response Distribution Category of Survey Item		MX		USA	
	t-test	mean	SD	mean	SD
Accord					
"The transfer of animals between both countries has increased trust among participants"	0.01	2.1	1.0	2.1	0.9
" Training of key people to facilitate collaboration at the binational level would enhance recovery efforts for the species"	-2.4*	1.6	0.7	1.9	0.8
"Federal funding for this binational effort should be distributed exclusively to federal agencies"	1.35	4.2	0.7	4.0	0.8
Ambiguous					
"Differences in national perspectives have inhibited binational collaboration in recovery efforts	3.3**	2.2	0.8	2.7	0.9
Discord- manageable					
" Binational recovery goals have not been achieved due to lack of economic resources in my country"	-4.3**	2.4	1.1	3.3	1.1
"I have good knowledge about recovery efforts for the species in the other country"	0.3	2.5	1.2	2.6	1.1
" Decision makers who influence binational collaboration in my country have sufficient knowledge about on-the-ground recovery efforts"	-2.6*	2.7	1.1	3.2	1.1
" Funding for binational collaboration had been used for other activities in my country"	-0.1	2.8	1.2	3.0	1.2
"Differences in the level of expertise between participants of Mexico and the U.S.A. has inhibited binational collaboration in this program"	1.36	3.1	1.1	3.4	1.0
"There is sufficient information exchange between	0.21	3.1	1.1	3.0	1.1

participants from both countries"

Box F2. "Transfer of animals between Mexico and the United States had increased trust among participants".

Demographic Variable	Statistical Test	Mean	SD
Current Position	F-value	5.2**	
Government		2.1	0.2
Non-Government		2.5	2.2
Captive Breeders		1.5	1.7
Scientists		2.5	0.1
Ranchers/Retired		2.0	0.4
Species Program	t- score	-3.7**	
Mexican Wolf Program		1.8	0.8
Other Recovery Programs		2.5	0.9

Box F3. "Transfer of animals between Mexico and the United States had increased trust among participants".

Demographic Variable	Statistical Test	MX Mean	MX SD	USA Mean	USA SD
Current Position	F-value	5.9***		5.5***	
Government		1.3	0.3	3.0	0.3
Non-Government		2.4	0.3	2.5	0.3
Captive Breeders		1.3	0.3	1.6	0.2
Scientists		2.7	0.2	2.2	0.2
Ranchers/Retired		2.0	0.8	2.0	0.4

Box F4. "Federal funding for the binational effort should be distributed exclusively to federal agencies".

Demographic Variable	F-Value	Mean	SD
Education Level	3.8*		
HS Undergraduate		4.0	0.1
Masters		3.9	0.1
Ph D./ Vet		4.4	0.1

Box F5. "Federal funding for the binational effort should be distributed exclusively to federal agencies".

Demographic Variable			USA Mean	USA SD
Degree of Bilingualism	F-value	3.6*		
Fully Bilingual			4.1	0.3
Functional Bilingual			4.1	0.2
Limited Comprehension			4.2	0.1
Not Bilingual			3.4	0.2

Box F6. "Federal funding for binational collaboration had been used for other activities in my country".

Demographic Variable	F-Value	All Mean	All SD
Current position	2.4*		
Government		3.5	0.2
Non-Government		3.2	0.2
Captive Breeders		2.6	0.3
Scientists		3.0	0.2
Ranchers/Retired		3.4	0.4
Experience	3.4*		
< 2 Years		2.9	0.2
3 – 5 Years		2.7	0.1
> 6 Years		2.2	0.1

Box F7. "I have good knowledge about recovery efforts for the species in the other country".

Demographic Variable	Statistical Test	All Mean	All SD
Gender	t-score	2.3*	
Female		2.9	1.0
Male		2.4	1.1
Participation Time	F-value	5.6*	
< 2 Years		2.9	0.1
3 – 5 Years		2.7	0.1
> 6 Years		2.0	0.1

Box F8. " Differences in the access to technology have inhibited binational collaboration recovery efforts".

Demographic Variable	F-Value	All Mean	All SD
Participation Time	3.1*		
< 2 Years		3.1	0.1
3 – 5 Years		2.7	0.1
> 6 Years		2.6	0.1

Box F9. Most unilateral decisions have been made by the country with more economic resources.

Demographic Variable	F-Value	Mean	SD
Education	3.3*		
HS Undergraduate		2.3	0.1
Masters		2.1	0.1
Ph.D./Vet		1.8	0.1

Box F10. Binational recovery goals have not been achieved due to a lack of economic resources in my country.

Demographic Variable	F-Value	Mean	SD
Bilingualism	2.6*		
Fully Bilingual		2.6	0.1
Functional Bilingual		2.6	0.1
Limited Comprehension		3.1	0.1
Not Bilingual		3.3	0.3

APPENDIX G

CULTURE/HISTORY ISSUE CLUSTER: SIGNIFICANT STATISTICAL RESULTS

Significance of statistical tests (T or F) is indicated by the number of astericks: $p<0.05$ (*), $p<0.01$ (**), $p<0.001$ (***). Codes represent Mexico (MX), United State of America (USA), and the entire binational sample (All).   The statements in quotes are survey items. Responses were coded on a Lickert scale (1= highly agree, 5= highly disagree). Means and standard Deviations (SD) are reported. Descriptive statistics for each survey item are listed in Appendix B. Survey items are classified by distribution of responses as shown in Figure 3. Response distributions that differed significantly from the categories of Accord and Discord were categorized as "Ambiguous".   A Chi-square Goodness of Fit test was used as the statistic to determine best fit to the distributions specified in Figure 3.

Box D1. Categorization of response items by response distribution, and results of a test of difference in mean response related to nationality of respondent.

Response Distribution Category for Survey Item		MX		USA	
	t-test	mean	SD	mean	SD
Accord					
"Cultural insensitivity and disrespect between participants have inhibited binational collaboration in recovery efforts"	3.3**	3.3	1.1	3.9	1.0
"Exchange visits increased trust on a personal level in binational efforts for recovery of this species"	0.9	1.9	0.8	1.8	0.7
Discord- manageable					
"Language differences were a barrier to effective binational collaboration in recovery efforts"	1.0	3.4	1.1	3.2	1.0
"Cultural differences between participants have inhibited binational collaboration"	2.7*	3.1	1.0	3.6	1.0

Box G2. "Language differences were a barrier to effective collaboration in recovery efforts".

Demographic Variable	Statistical Test	All Mean	All SD
Bilingualism	F-value	3.7*	
Fully Bilingual		3.6	0.2
Functional Bilingual		3.5	0.2
Limited Comprehension		3.0	0.2
Not Bilingual		2.9	0.3
Recovery Program	t-score	-2.9*	
Mexican Wolf Program		3.0	1.0
Other Recovery Programs		3.5	1.0

Box G3. "Language differences have been a barrier for effective collaboration".

Demographic variable	Statistical Test	MX Mean	MX SD	US Mean	US SD
Degree of Bilingualism	F-value	0.9		3.4*	
Fully Bilingual		2.2	0.2	4.0	0.3
Functional Bilingual		2.6	0.2	3.6	0.2
Limited Comprehension		3.4	0.5	3.0	0.1
Not Bilingual		2.2	1.2	3.0	0.2

Box G4. "Cultural differences between participants had inhibited binational collaboration".

Demographic variable	F-Value	Mean	SD
Age	3.1*		
18-39 Years		3.1	0.1
40-49 Years		3.6	0.1
> Years		3.3	0.2

Box G5. "Cultural insensitivity and disrespect between participants had inhibited binational collaboration in recovery efforts".

Demographic variable	F-Value	Mean	SD
Current Position	3.0*		
Government		3.5	0.2
Non-Government		3.1	0.2
Captive Breeders		4.2	0.2
Scientists		3.5	0.1
Ranchers/Retired		3.7	0.3

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The Jersey Wildlife Preservation Trust
The University of Kent, Canterbury

Dilploma in Wildlife Veterinary Medicine
The Zoological Society of London

Research Intern: The Bronx Zoo, Wildlife Conservation Society
The Denver Zoological Society
The Fossil Rim Wildlife Center
US Fish and Wildlife Service

Professional Experience: Wildlife Coordinator
Secretaria de Medio Ambiente y Recursos Naturales

Veterinarian
Zoológico de Chapultepec

Behavioral Enrichment Coordinator
Dirección General de Zoológicos de las Ciudad de México

General Director
Zoológico de Chapultepec

Current Position: Wildlife General Director
Procuraduría Federal de Protección al Ambiente
Secretaría de Medio Ambiente y Recursos Naturales