

Protecting Biodiversity in the Chihuahuan Desert Transboundary Corridor: A Strategy for Binational Collaborative Management

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EXECUTIVE SUMMARY

This document provides information that can be used by protected area managers in the Chihuahuan Desert Transboundary Corridor (“Transboundary Corridor”) to develop a program for binational collaborative management of natural resources in this unique ecoregion. Hence, this paper aims:

- 1) To create a coordination structure for integrated management and conservation actions along the border region between the US and Mexico that encompasses federal protected lands on both sides of the border and state protected lands in Texas. This objective is consistent with the US Department of Interior’s Letter of Intent, signed with Mexico’s SEMARNAP, which commits the signatories to coordinated resource management for protected areas along the US/Mexico border in the Big Bend region of Texas, Coahuila, and Chihuahua.
- 2) To support the long-term maintenance and protection of water flow through the transboundary area by protecting the flow of water on the Rio Conchos and the Rio Bravo and the riparian zones along both rivers.

Regional collaborative management has become the new paradigm for the conservation of natural resources and biodiversity subsequent to the realization that traditional local management approaches are not adequately protecting our ecosystems. Coordinating conservation efforts across regions not only preserves essential linkages between populations, habitats, and ecological processes, but also establishes linkages between management agencies. The information presented in this document provides managers with an overview of the Transboundary Corridor’s history, the factors that may promote or inhibit collaboration between Mexico and the United States, the issues affecting each area, and a general framework for creating a collaborative management program. The document is intended to support a series of workshops that will be held during the summer of 2002.

The Chihuahuan Desert is the largest desert ecosystem in North America, encompassing nearly 630,000 square kilometers along Rio Grande/Río Bravo River in the southwestern United States and northern Mexico. This desert has been identified as one of the most biologically diverse arid ecoregions in the world due to its unique assemblage of flora and fauna, including significant populations of large mammals and several rare and/or endemic species. Within the Transboundary Corridor, which has been designated as a high priority conservation area, are six large “protected” areas including Cañon de Santa Elena Área de Protección de Flora y Fauna and Maderas del Carmen Área de Protección de Flora y Fauna in Mexico and Black Gap Wildlife Management Area, Big Bend Ranch State Park, and Big Bend National Park in the United States. These adjacent protected areas represent a protected core of the Chihuahuan Desert, and offer a unique opportunity to establish the first binational cooperative management program between Mexico and the U.S.

The long and complex history of the Transboundary Corridor, which has been characterized as a “region of conflict and cultural mistrust”, includes over 350 years of conflict between Americans, Mexicans, and indigenous peoples. This era of conflict ended relatively recently and, in conjunction with current cultural differences and economic asymmetries, is one obstacle that must be recognized when developing binational, collaborative management programs. Mexican and American histories have been interconnected not only through conflict but also through cooperation in this region that has been described as “a most singular country”. There is a long history of efforts to create an international park in the Big Bend region to “create ties of kindly sentiment that would multiply and become stronger between the Mexican and American peoples, now almost unknown to each other”. The State of Texas acquired 700,000 acres for a national park in 1942 and Big Bend National Park was born with the transfer of these lands to the NPS on June 12, 1944. Despite the inability to create an International Park in the Transboundary Corridor, cooperative working relationships between the United States and Mexico have been formalized through several international agreements which have helped to establish a rapport between the protected area managers and set the stage for collaborative efforts. There are currently a tremendous number of binational cooperative activities along the border.

Binational Collaborative Management in the CDTC: Chapter 2– Historical Overview

The ability of the protected areas to engage in collaborative programs is affected by the area's policy framework, including legislation and legal mandates, agency missions and policies, and international agreements. The 1997 Letter of Intent signed by the United States and Mexico, and the La Paz and North American Free Trade Agreements have established a basis for binational cooperative activities at the national level. Responses to a questionnaire that was distributed among the five protected area managers in August 2001 indicated that the general missions of the protected areas are similar. Although managers identified similar missions, individual responses to questions regarding current issues and research needs differed as a result of differing agency missions and mandates, area-specific management objectives, funding, and personal interests. Four of the five respondents identified funding as the most influential factor in their ability to manage wildlife and biodiversity. All five managers expressed interest in participating in binational collaborative management programs.

The concept of adaptive management and the potential benefits of collaborative management at the regional scale are discussed in Appendix A. A general process for the development and implementation of collaborative programs is presented, as well as an example that demonstrates the application of this process.

There currently exists a unique opportunity to initiate cooperative management programs in the Chihuahuan Desert Transboundary Corridor. This is supported by several facts. All five managers have expressed an interest in collaborative management. All five protected areas share a common resource– the Chihuahuan Desert– and a similar mission to protect biodiversity within this ecoregion. There are existing relationships among the managers and staff of all five protected areas. There are relatively few impediments to developing and implementing collaborative management programs.

CHAPTER 1: INTRODUCTION

The Chihuahuan Desert is the largest desert ecosystem in North America, encompassing nearly 630,000 square kilometers in the southwestern United States and northern Mexico. While the Chihuahuan Desert lies mostly within the Mexican states of Chihuahua and Coahuila, approximately one third is located in southeastern Arizona, southern New Mexico, and western Texas (Figure 1). The Rio Grande/Río Bravo River bisects the Chihuahuan Desert ecoregion and, while the river provides a convenient political boundary between the United States and Mexico, it does not represent an ecological boundary. Both nations share the ecological wealth of this unique ecoregion.

Given the extraordinary opportunity to promote binational cooperation, WWF commissioned this paper to address two main objectives:

- 1) To create a coordination structure for integrated management and conservation actions along the border region between the US and Mexico that encompasses federal protected lands on both sides of the border and state protected lands in Texas. This objective is consistent with the US Department of Interior's Letter of Intent, signed with Mexico's SEMARNAP, which commits the signatories to coordinated resource management for protected areas along the US/Mexico border in the Big Bend region of Texas, Coahuila, and Chihuahua.
- 2) To support the long-term maintenance and protection of water flow through the transboundary area by protecting the flow of water on the Rio Conchos and the Rio Bravo and the riparian zones along both rivers.

The Chihuahuan Desert has been identified as one of the most biologically diverse arid ecoregions in the world, supporting terrestrial and aquatic biotas of global significance (Olson and Dinerstein 1998). Analyses of continental biodiversity patterns indicate that this ecoregion is also among the most biologically diverse in North America (Ricketts et al. 1999). Features that distinguish the Chihuahuan Desert ecoregion are the diversity of taxa ("species richness") and high levels of endemic species (species restricted to this ecoregion). Species richness derives from the diversity of habitats and the latitudinal extent of this ecoregion. Recent inventories in the United States portion of the Chihuahuan Desert have identified at least 2,260 plant species, 250 bird species, 100 mammalian species, and a diversity of invertebrates that includes nearly 250 butterfly species. Endemism is most pronounced among the Chihuahuan Desert flora, with some 1,000 endemic plant species including several Cactaceae (Johnston 1977, Hernandez and Barcenas 1995). Isolated basins throughout the ecoregion support numerous endemic fish species, including pupfish (*Cyprinodon* spp.), cichlids (*Cichlasoma* spp.), and poeciliids (*Gambusia* spp.; Miller 1977, Minckley 1977).

In 1997, a team of world-renowned scientists conducted a biological assessment to determine which North American ecoregions, and specific areas within these ecoregions, harbored unique or important resources relative to biological diversity. The team then prioritized these areas in terms of potential threats to biodiversity and their need for protection (World Wildlife Fund 2000). Through this process, the Chihuahuan Desert Transboundary Corridor (CDTC) was identified as a *high priority* site for the conservation of both terrestrial and freshwater ecosystems. The CDTC is a relatively wild, unfragmented portion of Chihuahuan Desert that lies along the Rio Grande/Río Bravo and includes lands in the Big Bend region of Texas and adjacent areas in the Mexican states of Chihuahua and Coahuila (Figure 2). The landscape of this region is extremely varied, and includes mountains, foothills, deserts, canyons, riparian corridors, and the Rio Grande/Río Bravo. As a result of the varied ecological communities associated with these diverse physiographic features, and its location (29°15' N latitude) in a convergence zone where the geographic ranges of temperate and tropical species overlap, the CDTC supports a unique assemblage of flora and fauna, including significant populations of large mammals and several rare and endemic species. The area also lies within an important bird migration route.

Binational Collaborative Management in the CDTC: Chapter 2– Historical Overview

The establishment of six large “protected” areas within the CDTC indicates formal recognition of the region’s ecological importance. These adjacent areas, which include Cañon de Santa Elena Área de Protección de Flora y Fauna and Maderas del Carmen Área de Protección de Flora y Fauna in Mexico and Black Gap Wildlife Management Area, Big Bend Ranch State Park, and Big Bend National Park in the United States, represent a 2.41 million acre protected region in the center of the Chihuahuan Desert (Figure 2). The ecological importance and uniqueness of the CDTC is further attested to by the inclusion of Big Bend National Park as the core area of the Chihuahuan Desert Biosphere Reserve (UNESCO 2001). A segment of the Rio Grande River was designated as a Wild and Scenic river pursuant to the Wild and Scenic Rivers Act (Public Law 90-542). This section of Wild and Scenic river, which is managed by the National Park Service, is the sixth protected area within this region and is 196 miles in length beginning near Mariscal Canyon, and the Chihuahua/Coahuila border.

Although all six areas are considered protected, ownership and management of the Mexican areas is very different from those in the United States. The federal or state government purchases protected areas in the U.S., and sole management responsibility for these public lands lies with the governmental agencies



Figure 1. Chihuahuan Desert Ecoregion

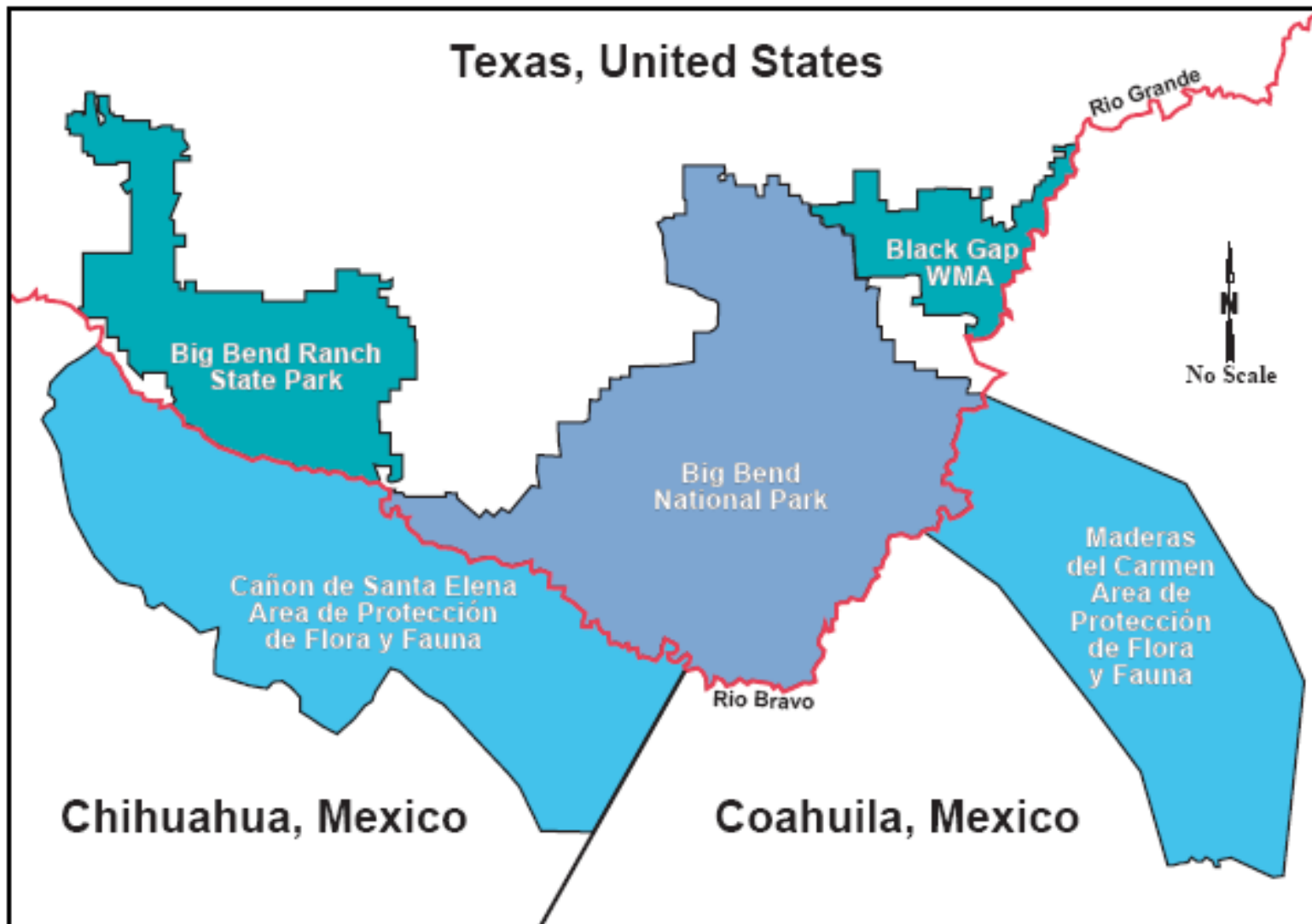


Figure 2. Chihuahuan Desert Transboundary Corridor

(National Park Service for Big Bend National Park and Texas Department of Parks and Wildlife for Black Gap Wildlife Management Area and Big Bend Ranch State Park). When an Área de Protección de Flora y Fauna is established in Mexico, there is no transfer of land to the government and ownership of lands within the area typically include a combination of ejidos (communal lands), privately-owned lands, and incorporated communities. Thus, while the Áreas de Protección de Flora y Fauna are managed by the Instituto Nacional de Ecología (a department of La Secretaría de Medio Ambiente y Recursos Naturales-SEMARNAT), management activities within the areas are somewhat constrained by the lack of government ownership and area managers must work closely with those groups who own the lands. The following briefly describes the five protected areas within the CDTC, as well as the Rio Grande Wild and Scenic River. More detailed descriptions of the protected area goals and objectives are presented in Chapter 3.

Rio Grande Wild and Scenic River

Frontage on Rio Grande: 196 river miles/313 km (¼ mile wide on the US side of the river)

Year Established: 1978

Ownership/Management: National Park Service

Purpose for Designation: To preserve the primitive, free-flowing character and natural and scenic conditions of this river segment.

Significant and Unique Ecological Features: Rio Grande River and tributaries, large canyons, riparian and aquatic habitats.

Annual Visitation: 1000 permits

Manager: Frank Deckert

Phone Number: (915) 477-2251

Cañon de Santa Elena Área de Protección de Flora y Fauna (CSE)

Size (Acres/Hectares): 685,000 acres/ 277,220 hectares

Frontage on Rio Grande: 60 miles/96 km

Year Established: 1994

Ownership/Management: Cañon de Santa Elena is managed by the Instituto Nacional de Ecología. Ownership of lands includes 59% ejidos, 35% private land, and 6% incorporated lands, and it encompasses the communities of Manuel Benavides and Ojinaga in the State of Chihuahua, Mexico.

Purpose for Creation: The primary purpose for establishing Cañon de Santa Elena was to protect the Conchas River watershed.

Significant and Unique Ecological Features: Large expanse of the Chihuahuan Desert along the international border, many sensitive and protected wildlife and plant species, diverse geological formations, intact riparian habitats, abundant historical and cultural resources, and the diversity of desert and forest ecosystems (Río Bravo, Sierra Rica, bajadas, etc.). Elevations range from 2250 to 7966 feet (725-2401 m).

Current Research and Management Programs: Active programs in Cañon de Santa Elena include environmental education in *ejidos* and the community of Manuel Benevidas (aka “San Carlos”), particularly relating to black bears and the monarch butterfly, animal husbandry, vegetative inventory and mapping, research on soil erosion, and the recovery of *candelilla*.

Annual Visitation: NA

Manager: Pablo Domínguez González

Phone Number: 614-413-8424

Maderas del Carmen Área de Protección de Flora y Fauna (MDC)

Size (Acres/Hectares): 515,000 acres / 208,421 hectares

Frontage on Rio Grande: 20 miles/ 32 km

Year Established: 1994

Ownership/Management: Maderas del Carmen is managed by the Instituto Nacional de Ecología. Ownership of lands includes 64% ejidos and 36% private land, and it encompasses the communities of Ocampo, Acuña, and Múzquiz in the State of Coahuila, Mexico.

Purpose for Creation: The primary purpose for establishing Maderas del Carmen was to conserve native biodiversity and to protect an important mountain corridor used by a variety of wildlife species.

Significant and Unique Ecological Features: Sierra del Carmen mountains, and surrounding valleys and bajadas of Chihuahuan Desert. Elevation ranges from 1,350-8,400 feet (450-2,800 m).

Current Research and Management Programs: Active programs in Maderas del Carmen include the development of a historical museum in the border community of Boquillas, fire monitoring and control, construction and monitoring of vegetation enclosures, monitoring peregrine falcons and their nesting success. The area staff also works with the local *ejidos* and communities on education about the environment, wildlife, and natural resources.

Annual Visitation: NA

Manager: Julio Carrera

Phone Number: 8-414-4997

Big Bend National Park (BBNP)

Size (Acres/Hectares): 801,000 acres/32,4165 hectares

Frontage on Rio Grande: 118 miles/189 km

Year Established: 1944

Ownership/Management: National Park Service

Purpose for Creation: The 1935 enabling legislation (49 Stat. 393) states “lands...as necessary for recreational park purposes...are hereby established, dedicated and set apart as a public park for the benefit and enjoyment of the people”.

Significant and Unique Ecological Features: Large, unfragmented tract of the Chihuahuan Desert, diverse habitats and wildlife populations, Chisos Mountains, Rio Grande River. Big Bend National Park has been designated as a part of the Chihuahuan Desert Biosphere Reserve. Elevation ranges from 1,350-7,825 feet (450-2,800 m).

Current Research and Management Programs: Big Bend National Park currently supports numerous studies, some of which include air quality monitoring, bats, mountain lions and black bears, peregrine falcons, water quality and quantity in the Rio Grande, and area history and paleontology. Some other projects include eradication of Tamarisk along the Rio Grande, GIS mapping of park resources, and monitoring rare plant communities. The park also offers binational workshops (i.e. fire management), and provides numerous interpretive programs and opportunities for public recreation (camping, hiking, rafting, wildlife viewing, auto tours, etc.).

Annual Visitation: 350,000

Manager: Frank Deckert

Phone Number: (915) 477-2251

Big Bend Ranch State Park (BBRSP)

Size (Acres/Hectares): 280,000 acres/113,316 hectares

Frontage on Rio Grande: 25 miles/40 km

Year Established: 1988

Ownership/Management: Texas Parks and Wildlife Department

Purpose for Creation: The primary goal of the area is to “preserve intact a large expanse of the Trans-Pecos ecosystem” (TPWD 1988).

Significant and Unique Ecological Features: Remote and rugged terrain, including two mountain ranges and an ancient extinct volcano (El Solitario), within the Chihuahuan Desert ecoregion, Rio Grande River, supports a tremendous diversity of animal and plant species, including 14 bat species, several species of hummingbirds, and at least 11 other rare plants and animals.

Current Research and Management Programs: Biodiversity inventories, studies on bats (Texas Tech), small mammals (Texas Tech), mountain lions (TPWD), and geology (University of Texas, Sul Ross), KORIMA Foundation activities for urban students (Sul Ross), workshops (desert survival and photography), and longhorn cattle drives. Public recreation opportunities include primitive camping, hiking, rafting, hunting (quail, mule deer, javelina, aoudad, and ibex), swimming, bicycling, auto tours, wildlife viewing, and horseback riding.

Annual Visitation: 10,000

Manager: Luis Armendariz

Phone Number: (915) 229-3416

Black Gap Wildlife Management Area (BGWMA)

Size (Acres/Hectares): 107,000 acres/43,303 hectares

Frontage on Rio Grande: 25 miles/40 km

Year Established: 1948

Ownership/Management: Texas Parks and Wildlife Department

Purpose for Creation: The primary goal of the Black Gap Wildlife Management Area is to serve as a facility where research and demonstration projects can be implemented to aid private land management of natural resources and provide opportunities for public recreation (TPWD 1994).

Significant and Unique Ecological Features: Black Gap Wildlife Management Area is where the Sierra del Carmen Mountain range enters Texas. This rugged ridge and valley country is rich in birds, mammals, including desert bighorn sheep, and cacti and succulents in some of the lowest elevations of the Chihuahuan Desert found in the United States.

Current Research and Management Programs: Biodiversity inventories, wildlife studies (mule deer, desert bighorn sheep, rattlesnakes, black bear, peregrine falcon, and elf owl). Public recreation opportunities include primitive camping, hiking, hunting (dove, quail, mule deer, javelina, and rabbit), fishing, bicycling, auto tours, wildlife viewing, and horseback riding.

Annual Visitation: 3,000

Manager: Mike Pittman

Phone Number: (915) 837-3251

Binational Collaborative Management in the CDTC: Chapter 2– Historical Overview

Collaborative (or cooperative) management has been established throughout the world as the new paradigm for the conservation of natural resources and biodiversity. Collaborative strategies have become increasingly popular in North America pursuant to an important realization– traditional management approaches have been unsuccessful in halting the decline of species and their habitats. Since even the largest protected areas do not contain enough land area to prevent the loss of species (Newmark 1987), scientists and resource managers have come to recognize the need for a “big picture perspective” across regions and continents (Salwasser 1991). Coordinating conservation efforts across regions, which is necessary to create essential linkages between populations, habitats, and ecological processes, requires the establishment of linkages between the managers responsible for conserving biodiversity in these regions (Hudson 1991, Noss 1991). Policies and actions for conserving biodiversity in the United States are highly fragmented (Salwasser 1991), and largely reflect differing philosophies of the management agencies. Collaborative approaches are therefore required to facilitate regional-scale conservation efforts that typically involve multiple agencies.

While cooperative programs have been implemented for the management of natural resources and biodiversity within the United States, such strategies have yet to be used to manage biological resources that span the international boundary between the United States and Mexico. The protected areas within the CDTC provide an opportunity to protect biodiversity within this unique ecoregion through the development and implementation of collaborative programs. Not only would collaborative management set an important precedent and create a model for the protection of transboundary resources, but it would also afford numerous ecological and sociopolitical benefits including:

- coordinating management actions and reducing disparate management activities;
- protecting ecosystems and ecosystem processes across the region;
- monitoring biodiversity changes and trends at the regional scale;
- improving understanding and management of wide-ranging species;
- protecting movement corridors and preserving genetic flow between populations;
- documenting effects of different management regimes/activities;
- increasing efficiency and effectiveness of management programs.
- improving international relations;
- promoting goodwill and understanding;
- facilitating exchange of information and expertise;
- sharing management responsibilities and resources (funding, staff, etc.);
- bringing political recognition to the region (and associated money and power); and
- providing social and economic benefits to local communities.

These six adjacent protected areas in the CDTC represent a protected core of the Chihuahuan Desert, and present a unique opportunity to establish the first binational cooperative management program between Mexico and the U.S. While these areas have the Chihuahuan Desert in common, they are separated by an international boundary, cultural and economic differences, and differing management goals. We want to emphasize that our interest is to facilitate collaborative management among the protected areas and improve the conservation of biodiversity within this unique ecoregion. This report provides information that informs the development and implementation of a collaborative, binational management strategy, and includes chapters on the region’s history (Chapter 2), legislation of the protected areas (Chapter 3), area management objectives (Chapter 4), a collaborative management framework (Chapter 5), and a summary (Chapter 6).

Collaborative programs are unique as a result of the specific ecological and socio-political setting, program goals, and participant involvement. The strategies and examples presented within this report are solely for explanatory and demonstration purposes, and we do not purport to know the goals and interests of the protected area managers. We hope that this report is reviewed in this spirit, and used as a tool by the managers, as they are the people ultimately responsible for the development of binational collaborative programs in the CDTC.

CHAPTER 2: HISTORICAL OVERVIEW OF INTERNATIONAL RELATIONS

A. An Era of Conflict

In his seminal study on the history of the Big Bend area, Arthur Gomez characterizes the Chihuahuan Desert Transboundary Corridor as a “region of conflict and cultural mistrust” (Gomez 1995). Regional hostilities started during the Spanish colonial rule of Mexico in the 16th century. The northward migration of Spanish settlers into the Big Bend region between 1550 and 1600 resulted in conflict with native inhabitants. In the 17th century, the regional Indian tribes (Apache, Comanche, and Mescaleros) “wreaked havoc” on communities throughout the Transboundary Corridor and forced Spanish settlers out of Texas (Gomez 1995). In an attempt to protect settlers and drive the indigenous tribes out of the area, Spain proceeded to establish a series of presidios along the Rio Grande/Río Bravo. The presidios did little to ameliorate conflict in the region, and Indians continued to attack settlers even after Mexico gained its independence from Spain in 1821. The turbulent 17th century concluded with several significant social disruptions that forever changed the region. The most significant of these changes involved the extirpation of the Conchos Indians, the retreat of the Tarahumara Indians into the Sierra Madre, and the arrival of the Apache Indians who inhabited the lands previously occupied by the Conchos and Tarahumaras.

American expansionism into Texas during the 1820s renewed regional conflict, this time pitting Mexico against the United States. In 1836, American settlers rebelled against Mexican rule and eventually forced Texas’ independence from Mexico. A decade later, the United States’ pursuit of Manifest Destiny resulted in the Mexican-American War, which concluded with the cession of nearly half of the Mexican territory to the United States. As American occupation of the border region increased after the War, local Indian tribes “launched a furious assault in retaliation against the unwelcome intruders” (Gomez 1995). The United States’ “forceful” military response included pursuit of Indians into Mexico, which created international tensions due to “the violation of Mexico’s territorial sovereignty” (Gomez 1995).

There was an increase cross-border crime in Transboundary Corridor during the late 19th and early 20th centuries. The prelude to the Mexican Revolution was a turbulent period when criminals “terrorized defenseless farmers and ranchers” living along the border (Gomez 1995). The loss of American lives at the hand of regional criminal and America’s disregard for Mexico’s territorial sovereignty renewed international tensions and brought the neighboring countries to the “brink of war” that was only averted through intense negotiations (Gomez 1995). Political stability in Mexico and the United States’ commitment to improving diplomatic relations through the Good Neighbor policy largely brought an end to overt conflict in the transboundary region in the late 1920s.

From the Mexican perspective, the period between 1841 and 1848 was a critical one along the frontier. The subject of ceding Texas and other lands to the United States was hotly debated among the different political parties. Many Mexicans favored defending their territory, and for many years Mexico fought against the United States for national sovereignty. However, Mexico was ultimately forced to accept a difficult and painful negotiation at the Treaty of Guadalupe Hidalgo in 1848. This Treaty not only established a definitive international border between Mexico and the United States, but it also allowed settlers from the eastern United States to displace the Spanish and Mexican peoples who had inhabited the Chihuahuan Desert Transboundary Corridor for centuries.

The long and complex history of this region includes over 350 years of hostility between Americans, Mexicans, and indigenous peoples. This era of conflict ended relatively recently and, in conjunction with existing political and economic asymmetries, continues to exert influence between Mexico and the United States and is one obstacle that managers must recognize when attempting to develop binational, collaborative programs to conserve biodiversity in the Transboundary Corridor.

B. The International Park Concept

Setting the Stage in the United States

Everett Ewing Townsend, who first experienced the region in 1894 while patrolling the Rio Grande on horseback for the U.S. Customs Service, is largely credited with the original idea of creating a park in the Big Bend area. U.S. Congressman C.B. Hudspeth of El Paso introduced the first legislative bills for a national park in the Big Bend in 1924 and 1929 (Jameson 1987). While the Hudspeth bills did not specifically call for an international park, proponents certainly recognized the significance of Big Bend's international setting, including amazing views of the Mexican landscape and the magnificent canyons of the Rio Grande River. The Great Depression and the Dust Bowl of the 1930's stimulated interest in a Big Bend national park (Welsh 2001). These economic and ecological crises harmed the ranching and oil industries that had defined the regional economy, and the creation of a national park was envisioned as a major economic catalyst that would lift the area out of the Great Depression (Nash 1977). When Franklin D. Roosevelt was elected to his first term as American president in 1933, he immediately sought to remedy the country's economic problems by instituting the "New Deal". The New Deal had important implications for the creation of a national park in Big Bend. First, it resulted in the establishment of a Civilian Conservation Corps (CCC) camp in the Big Bend area, creating national recognition of the region. Second, one component of the administration's economic reform package was expansion of the national park system, and the government was searching for potential new park locations. Finally, Roosevelt's "Good Neighbor Policy", which embodied the principles of friendship, cooperation, and non-interference with neighboring nations, sought to create parks, monuments, and wildlife reserves along the international borders.

Setting the Stage in Mexico

Simultaneous with implementation of Roosevelt's New Deal and Good Neighbor policies, Lázaro Cárdenas was elected as president of Mexico in 1934. One key aspect of Cárdenas' reform movement was environmental preservation and the protection of natural resources, and he continued the environmental policies initiated by president Sebastián Lerdo de Tejada in 1876 to establish protected areas throughout Mexico (Beltrán 1974, Simonian 1996). Cárdenas was the most active Mexican president with regards to creating national parks and protected areas, creating 36 protected areas encompassing a total of nearly two million acres during his tenure (Gómez and Dirzo 1995). The primary goal of setting aside these large protected areas was to stop non-sustainable exploitation of the forests and prevent deterioration of the nation's watersheds. Cárdenas created the Departamento Autónomo Forestal, de Caza y Pesca (Department of Forestry, Hunting, and Fishing) under the direction of Miguel Ángel de Quevedo. de Quevedo supported forest preservation, and was a major force behind the first Mexican federal legislation (Forest Law of 1926) aimed at forest protection (Instituto Nacional de Ecología 1999). Cárdenas not only promoted the establishment of national protected areas, but he also shared Roosevelt's vision of an international park in the CDTC and actively pursued this vision at the top levels of the Mexican government. Collectively, the Great Depression and the ideological principles of the new Mexican and American administrations created the political momentum that would ultimately result in the establishment of a national park in Big Bend.

The Movement to Establish a National/International Park

The international park concept was first proposed by Robert Wagstaff at the turn of the century, and then again in 1933 by the Chamber of Commerce in Alpine, Texas. The Chamber envisioned a "Friendly Nations" park that would become "a living example of World Peace" and international cooperation (Jameson 1977). In 1934, the Texas State Parks Board informed the National Park Service (NPS) that it was attempting to obtain one million acres in the Big Bend area for the establishment of an international park, and was working with Mexico to set aside "a like amount on the Mexican side of the river" (Welsh 2001). Subsequently, a 1935 NPS report on Big Bend noted the "highly intriguing aspects of a possible international park" which would "create ties of kindly sentiment that would multiply and become stronger between the Mexican and American peoples, now almost unknown to each other" (Jameson 1977, Welsh 2001). At the same time, Texas State legislator E. E. Townsend submitted an unsolicited report to the NPS entitled "Adjoining Area in Mexico". This report urged the agency to enjoin the Mexican government in the creation of an international park, which "would tend to solidify more securely the friendship that has been forming for

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some years” and “would represent a *zona libre*” wherein tourists from either country would be free of all customs and immigration regulations (Welsh 2001).

These events indicate strong political support in the United States at the local and state levels for the creation of an international park in the Big Bend region during the mid-1930s. As previously noted, the international park concept also coincided with philosophies of the new administrations in Washington and Mexico City. In a February 1935 letter to President Roosevelt, U.S. Senator Morris Sheppard proposed the establishment of an international park. Roosevelt, who was pursuing better relations with Mexico, was intrigued and he asked Secretary of the Interior Harold Ickes to evaluate Sheppard’s request (Jameson 1977). Ickes immediately responded “the possibility of an international park in this region meets with my approval” and stated “the Mexican government should be invited to cooperate with the United States in the establishment of such an international park” (Welsh 2001).

On March 4, 1935, R. Ewing Thomason introduced Congressional House Resolution 6373 (“A Bill to provide for the establishment of the Big Bend National Park, in the State of Texas, and for other Purposes”) and Senators Tom Connally and Morris Sheppard submitted similar legislation in the Senate (Bill 2131; Jameson 1977). The Connally-Sheppard bill, which provided for the acquisition of lands necessary “to establish a Big Bend National Park for recreational purposes,” was unopposed and passed the Senate with “unprecedented promptness” (Anderson 1967). President Roosevelt signed the bill (Public Law No. 157) on June 20, 1935.

Although the bill did not include any language relative to an international park, the tentative boundaries for the proposed park encompassed 800,000 acres in Texas and 700,000 acres in the adjacent Mexican States of Chihuahua and Coahuila (Pospisil 1994). The fact that Secretary of State Cordell Hull was asked to solicit support for an international park from Mexican officials within 48 hours of the creation of Public Law No. 157 indicates that the international dimension was implicit in President Roosevelt’s intentions. Hull later would report that Mexican officials were “most enthusiastic” about the international park proposal (Welsh 2001).

A series of formal meetings in 1935 allowed Mexican and American representatives to tour the region and discuss the international park. During these meetings, the Mexican government adopted a resolution to create an international park in an effort to “foster a closer understanding between the peoples of the two nations and inaugurate a joint effort for the conservation of natural resources” (Welsh 2001). Another outcome of these meetings was the formation of a joint commission to further investigate the international park concept and to recommend potential park boundaries. The joint commission met on several occasions in 1936, and both countries “seemed intent on achieving as quickly as possible the goal of an international park” (Jameson 1977).

The International Park Concept Loses Momentum

Although Cardenas was successful in establishing a large number of national protected areas, and embraced the international park concept, his policies were not well received at the local level. Private landowners were not included in the conceptualization, establishment, or operation of the protected areas. Since the government did not have a mechanism to obtain outright ownership of lands within the national protected areas, management authority largely remained with the landowners. This disparity between ownership and management continued to adversely affect the creation and management of national protected areas under the subsequent administrations of Avila, Camacho, Alemán, Ruiz Cortines and Lopez Mateos. Near the end of Cardenas’ tenure as president of Mexico, the Forestry Department was eliminated. The agrarian reform and labor movements, as well as nationalization of the oil industry, significantly changed the focus of the nation and Mexican optimism for an international park in the Big Bend region was lost. The level of federal support for such a park that was exhibited during the Cardenas administration has never been regained (Instituto Nacional de Ecología 1999).

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Despite the loss of momentum at the federal level in Mexico, the NPS waged a full-scale campaign to promote the international park concept in the United States with little success. The final official action of either government relative to the international park occurred in October 1937 when Mexico accepted the proposed boundaries for the park (Welsh 2001). While interest in the idea continued, the inability of Texas to acquire property for the U.S. portion of the park, deteriorating relations between Mexico and the United States, and the initiation of World War II, ultimately undermined the creation of an international park in Big Bend. Although the concept lost political momentum at the national level after 1937, local and regional support continued. The Town of Alpine continued to promote the idea for economic revitalization throughout the late 1930s and early 1940s. The State of Texas finally acquired 700,000 acres for the national park in 1942 and Big Bend National Park was born with the transfer of these lands to the NPS on June 12, 1944 (Anderson 1967).

Scientific surveys conducted by the NPS and U.S. Fish and Wildlife Service (USFWS) in 1944 identified an abundance of wildlife on the Mexican side of the Rio Grande/Río Bravo, and for the first time explicit support for the proposed international park derived from an ecological perspective. Dr. Walter Taylor noted that, as Mexico represented the “center of abundance for some of the Big Bend mammals,” the establishment of an international park on the Mexican side would facilitate restoration of several species that had been extirpated from the American side, including bighorn sheep, pronghorn, black bear, and gray wolf (Welsh 2001). This was the first time that endorsement of the international park formally centered on potential ecological benefits.

The park idea was revived in October 1944 when President Roosevelt wrote to Mexican President Manuel Avila Camacho, “I do not believe that this undertaking in the Big Bend will be complete until the entire park area in this region on both sides of the Rio Grande forms one great international park.” Camacho agreed and instructed Mexican authorities to investigate the Mexican section of the international park (Lobello 2001). Despite Mexico’s failure to follow through on such investigations and Roosevelt’s untimely death in 1945, the international park concept continued to be pursued at the highest levels of government. In 1946, U.S. President Harry Truman urged President Camacho to pursue the establishment of the Big Bend International Park, and Truman created the International Park Commission (IPC) the following year (Jameson 1977). The IPC obtained a promise from Mexico to create the “Parque Nacional de la Gran Comba” adjacent to Big Bend National Park, but the promise was never fulfilled.

The end of Camacho’s term in 1946 and U.S. involvement in the Korean War limited official international park negotiations for nearly a decade, although local efforts continued as evidenced by the Alpine Chamber of Commerce’s formation of a binational peace park commission in 1953. While the commission held meetings in both Mexico and the town of Alpine, results were limited to “continued enthusiasm over the idea of an international park” (Jameson 1977). The formal dedication ceremony for Big Bend National Park in 1955 provided the next opportunity for the United States to promote the international park, since invited guests included several Mexican representatives. A dedication speech by Secretary of Interior Douglas McKay “optimistically speculated” that the international park would soon be realized (Jameson 1977). But the coming decades saw little progress toward this goal despite continued Mexican promises to create the Parque Nacional de la Gran Comba.

C. Existing Collaboration within the Chihuahuan Desert Transboundary Corridor

Despite the inability to create an “International Park” in the Chihuahuan Desert Transboundary Corridor, Mexican and American histories in this “most singular country” (Gomez 1995) have been interconnected not only through conflict but also through cooperation. The historical ranching and mining industries in Big Bend relied heavily on the expertise of Mexican *vaqueros* and laborers, and likely represented the origins of transboundary collaboration in this region. More recently, cooperative working relationships between the United States and Mexico have been formalized. The countries signed the 1983 *Cooperation for the Protection and Improvement of the Environment in the Border Area* and an agreement of understanding was signed by the NPS and the Mexican states of Coahuila and Chihuahua in 1988 to promote cooperative

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research and preservation activities. These agreements have helped to establish a rapport between the protected area managers and set the stage for current collaborative efforts.

While binational cooperation is encouraged through these agreements and other federal legislation such as the North American Free Trade Agreement (NAFTA) and associated programs (see Chapter 3), legislation alone is inadequate for the development of collaborative programs which require interest and involvement at the local level. The managers of the protected areas in the CDTC, realizing the potential benefits of collaboration, already participate in cooperative relationships of varying levels of formality. Some of the past and current collaborative programs include:

- BBNP and BBRSP conducted environmental education programs in Mexico;
- CSE and BBNP collaborated on fish research in the Rio Grande;
- SEMARNAT and BBNP completed biological and water quality studies on the Rio Grande;
- BGWMA assisted CEMEX (in the MDC) with the re-establishment of desert bighorn sheep;
- MDC, CSE, and BBNP participated in cooperative fire management training;
- Firefighters from Chihuahua (Los Diablos) assisted BBNP with wildfires;
- CSE and MDC completed a cooperative animal husbandry/disease eradication program;
- BBNP prepared vegetative mapping for MDC using GIS technology;
- BBRSP has assisted the residents of Ojinaga, Mexico with various problems; and
- MDC assisted BBRSP with exhibits in the Barton Warnock Environmental Education Center.

As evidenced by these examples, most of the current cooperative programs involve only a few of the protected areas (rather than all five) and the programs generally tend to be somewhat informal. However, these examples are significant for several reasons. First, they indicate that the managers have developed interpersonal relationships with one another. Second, they imply that the managers have an interest and desire to participate in collaborative programs. Third, they suggest that the managers not only recognize the ecological interdependence of the protected areas but also are seeking some degree of interdependence with respect to resource management. Thus, the existing relationships and desire to participate create a solid foundation upon which formal, comprehensive collaborative programs can be based.

CHAPTER 3: POLICY FRAMEWORK FOR COOPERATIVE MANAGEMENT

The ability of the protected areas to engage in collaborative programs is affected by the policy framework within which each area operates. The term policy framework is utilized in a broad sense to include legislation and legal mandates, agency missions and policies, and international agreements between Mexico and the United States. We distinguish between internal and external factors to facilitate an assessment of the policies that could either positively or negatively influence binational collaborative programs in the Chihuahuan Desert Transboundary Corridor. Internal factors are specific to each protected area, and include formal legislation (i.e., enabling acts) as well as the missions, goals, and policies of the associated management agencies. External factors are not area-specific and generally operate at the national/international levels, including federal programs and binational accords that “promote” collaboration. An evaluation of the 1997 Letter of Intent signed by the United States and Mexico is presented separately since this document is often referenced during discussions of collaborative management in the region (page 20).

A. Internal Factors: Mandates and Missions

Management of each protected area is ultimately governed by a particular combination of legislative mandates and agency policies. We present analyses of area-specific policy framework to facilitate comparison of management goals and identification of potential constraints to the development of binational cooperative management programs.

Cañon de Santa Elena Área de Protección de Flora y Fauna

Cañon de Santa Elena Área de Protección de Flora y Fauna (CSE) was established by decree on November 7, 1994. The primary reasons for creating this protected area included its ecological representation of the Chihuahuan Desert, the number of sensitive and protected species occupying the area, the diverse geological and hydrological features, abundant historical and cultural resources, and the diversity of desert and forest ecosystems.

The management plan indicates that the primary goals of CSE are to preserve the region’s natural habitats and fragile ecosystems, to preserve biological diversity and maintain evolutionary and ecological processes, and to ensure the sustainable use of natural resources by local residents and communities (SEMARNAP 1997). Specific management objectives include preserving biological diversity (particularly wildlife species), developing programs for the sustainable use of natural resources in this ecosystem, preventing ecological damage as a result of non-regulated or illicit activities, raising community awareness of the benefits of conserving biological, paleontological, and cultural resources, and encouraging local economic development via non-consumptive activities such as eco-tourism. The management plan does not contain explicit language relating to international cooperative activities, but there are no regulations/policies that inhibit participation in cooperative programs with the United States.

Maderas del Carmen Área de Protección de Flora y Fauna

Maderas del Carmen Área de Protección de Flora y Fauna (MDC) was established by decree in 1994 after more than 60 years of effort by researchers, protected area managers, politicians, and NGOs to protect the Sierra del Carmen mountains that rise dramatically from the desert floor. The creation of MDC was an important step towards the protection of a large expanse of the Chihuahuan Desert along the international border (in addition to BGWMA, BBNP, BBRSP, and CSE).

The MDC management plan indicates that the primary objective of this protected area is to conserve native habitats and biological diversity, protect the fragile ecosystem, preserve evolutionary and ecological processes, and develop programs for the sustainable use of the natural resources (SEMARNAP 1997). Specific management objectives include the preservation of genetic diversity and populations of rare and endemic species by maintaining the biological corridor along this mountain range, and the development of sustainable economic opportunities for local residents that do not harm the natural resources. The management plan does not contain explicit language relating to international cooperative activities, but there are no regulations/policies that inhibit participation in cooperative programs with the United States.

Black Gap Wildlife Management Area

There is no formal enabling legislation that identifies the purpose for establishing BGWMA (Dennis Gissell, Texas WMA Facilities Coordinator, personal communication). According to the current BGWMA management plan (TPWD 1994), the state purchased the land and established this park to:

*“provide an area designed to demonstrate to private landowners
the feasibility of tested wildlife management practices”*

and

*“provide a place where research may be conducted and where controlled
experimental management practices may be adequately demonstrated.”*

The primary objectives for the BGWMA include resource management (plants, wildlife, and communities), research of wildlife populations and habitats, and public hunting and compatible non-consumptive uses (TPWD 1994). The management plan does not contain any language relating to cooperative international activities, and the manager of the BGWMA indicated that there are no TPWD regulations or policies that influence his ability to work with his counterparts in Mexico (Mike Pittman, TPWD, personal communication). BGWMA has assisted a private landowner within MDC with the re-establishment of desert bighorn sheep.

Big Bend Ranch State Park

There is no formal enabling legislation that identifies the purpose for establishing BBRSP (John Foshee, TPWD Land Management Council, personal communication). According to the BBRSP management plan (TPWD 1988), the state purchased these lands to:

*“preserve intact a large expanse of the Trans-Pecos ecosystem containing remarkably
diverse natural and cultural resources largely unchanged from historic times. It is
significant for its abundance of flora, fauna, geologic, and hydrological resources
singly and in combinations that are rarely found in the Chihuahuan Desert.”*

The primary goal of the BBRSP is to provide opportunities for “public recreation and scientific study without degrading its natural resources.” The management plan contains no language relating to cooperative international activities. BBRSP manager Luis Armendariz indicated that there are no TPWD regulations that constrain his ability to work with the Mexican protected areas (Luis Armendariz, TPWD, personal communication). Mr. Armendariz did point out that the agency’s international travel policy requires submission of a formal application and agency approval prior to traveling into Mexico. Since the application approval process often takes longer than one month, he noted that this policy does adversely affect his ability to travel to/from Mexico without significant advance notice.

The BBRSP staff has been involved in numerous collaborative programs with Mexico, and has developed “partnerships” with citizens in adjacent Mexican communities. Some of the most prominent programs include environmental education in local schools, training workshops relating to desert survival, recovery of archaeological/cultural artifacts, and ecotourism, and assisting Mexican officials with protection of dinosaur bones and fossils. The staff’s commitment to their Mexican relationships is evidenced by their willingness to not only make “official” visits during working hours, but also to help on their own time (Luis Armendariz, TPWD, personal communication).

Big Bend National Park

BBNP is ultimately administered pursuant to the 1935 enabling legislation (49 Stat. 393) and the Organic Act of 1916 (39 Stat. 535). The enabling legislation states that “lands... as necessary for recreational park purposes... are hereby established, dedicated and set apart as a public park for the benefit and enjoyment of the people”, and stipulates that “administration, protection, and development of the aforesaid park” are subject to the provisions of the Organic Act of 1916 (“Organic Act”). The Organic Act states that the purpose of national parks is “to conserve the scenery and the natural and historic objects and the wildlife

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therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

A revised strategic plan for BBNP was completed in 2001 (NPS 2001b). According to this plan, the BBNP mission is as follows:

“The National Park Service at Big Bend National Park preserves and protects a representative area of the Chihuahuan Desert along the Rio Grande for the benefit and enjoyment of present and future generations. The park includes rich biological and geological diversity, cultural history, recreational resources, and outstanding opportunities for binational protection of shared resources.”

Pursuant to this mission, the goals of BBNP include protection of natural and cultural resources, providing recreational activities compatible with resource protection, and creation of educational and interpretive programs (NPS 2001b). The BBNP mission statement does contain explicit reference to cooperative management and “binational protection” of natural resources, and the strategic plan states that “crossings over the international border between the three park areas, management of shared resources, and other similar issues of a transboundary nature” necessitate the development of cooperative management strategies (NPS 2001b). The BBNP strategic plan also includes a section entitled *Cooperative Efforts Between Big Bend National Park and Maderas del Carmen and Cañon de Santa Elena Protected Areas in Northern Mexico*, which promotes continued cooperation with the Mexican protected areas (NPS 2001b). Thus, the documents that ultimately guide management of BBNP recognize the importance of cooperative relationships with Mexico and explicitly promote the establishment of such relationships.

The Superintendent of BBNP indicated that he is very interested in developing cooperative management programs and has been involved in several such programs (Frank Deckert, NPS, personal communication). Mr. Deckert noted that there are no funds appropriated for such activities, and that even the basic park programs are currently under-funded. He noted that while there are no NPS mandates or policies that constrain binational cooperation, the agency’s international travel policy does inhibit employee travel to Mexico without significant advance notice (Frank Deckert, NPS, personal communication). As a federal agency, park activities are governed by a host of federal legislative mandates such as the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, and the Endangered Species Act of 1973. These Acts have no provisions that pertain to international collaboration.

BBNP is part of the Chihuahuan Desert Biosphere Reserve, and is also responsible for the management of the Rio Grande Wild and Scenic River. These additional responsibilities, while adding to the complexity of park management, both expand the area’s involvement in binational programs. The following presents a brief description of the Chihuahuan Desert Biosphere Reserve and the Rio Grande Wild and Scenic River.

Biosphere Reserve

The United Nations Educational, Scientific and Cultural Organization (UNESCO) established the Man and the Biosphere (MAB) program in 1968 to “develop the basis, within the natural and the social sciences, for the sustainable use and conservation of biological diversity, and for the improvement of the relationship between people and their environment globally” (UNESCO 2001). MAB designates “Biosphere Reserves” throughout the world pursuant to its mission of reconciling the dual goals of conserving biodiversity and promoting economic/social development.

Biosphere reserves are representative of major bioregions, and contain an important ecosystem and varying intensities of human use/activity. Reserves function as natural laboratories for developing and implementing individualized programs that promote sustainable development, and typically consist of three concentric zones that support differing intensities of human use. These zones include a legally protected inner “core” area for scientific research, a middle managed-use “buffer”

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area supporting limited human activity (i.e., experimental research and tourism), and an outer “transition” zone in which conceptual strategies for sustainable development are tested.

The Chihuahuan Desert Biosphere Reserve was designated in 1976, and is comprised of three sites; BBNP in Texas, Jornada Experimental Range in New Mexico, and Mapimi in the Mexican states of Chihuahua, Coahuila, and Durango. BBNP serves as the reserve core since it represents a relatively pristine, fully protected portion of the Chihuahuan Desert. Since the Biosphere Reserve includes sites in the United States and Mexico, it provides an opportunity for binational cooperation.

Rio Grande Wild and Scenic River

The Wild and Scenic Rivers Act (Public Law 90-542) seeks to protect the natural character of rivers and adjacent lands. Each river within the National Wild and Scenic River System is managed by one of four federal agencies (U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Land Management, or National Park Service) in a manner that protects its significant natural values without substantially interfering with public use and enjoyment of these values. Designation as a Wild and Scenic River neither gives nor implies government control of private lands within the river corridor, and management restrictions apply only to public lands.

Congress authorized 191 miles of the Rio Grande River between river miles 842 (Mariscal Canyon in BBNP) and 651 (boundary of Terrell County and Val Verde County, Texas) as Wild and Scenic in 1978 to preserve the free-flowing character and natural and scenic conditions of this river segment. BBNP is responsible for administration of the entire Rio Grande Wild and Scenic River, including 69 miles that are within the boundaries of BBNP. NPS management objectives for the Rio Grande Wild and Scenic River include:

- preserving the free-flowing condition within restrictions of international treaties;
- protecting the scenic, geologic, fish and wildlife, recreational, scientific, and other similar values along the river; and
- providing opportunities for recreation consistent with the river's primitive character.

BBNP’s jurisdiction includes only that portion of the river within the United States. While the Wild and Scenic Rivers Act and Big Bend National Park enabling legislation do not contain explicit language regarding binational cooperation, the fact that the Rio Grande represents the international boundary has significant implications for cooperative management. In order to meet the intent of the Act and successfully manage the river as a whole, it is necessary to protect both sides along the entire 191-mile segment. Management of the Rio Grande Wild and Scenic River thereby creates an opportunity for binational cooperation between Mexico and the United States.

B. External Factors: Federal Programs And Cooperative Arrangements

A host of agencies, programs, and agreements have been developed over the last century in an effort to promote cooperative management of the United States-Mexico border. Although these agencies, programs, and agreements operate at the national and/or international levels, the majority of them rely on development and implementation at the local level through the cooperation of individual managers. The following identifies some of the more significant programs and arrangements.

Binational Institutions and Programs Involving Mexico and the United States

International Boundary and Water Commission

Pursuant to problems with demarcation of the international boundary, the United States and Mexico signed a treaty in 1889 that created the International Boundary Commission (IBC). The IBC was mandated to resolve boundary problems caused by changes in the courses of the Colorado and Rio Grande rivers. In 1944, the United States and Mexico signed a second agreement (Treaty on Utilization of Waters of the Colorado and

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Tijuana Rivers and of the Rio Grande) that transformed the IBC into the International Boundary and Water Commission (IBWC), and broadened its purview to include issues regarding water quality, conservation, and use along the boundary, and apportioning the waters in these rivers.

Agreement on Cooperation for the Protection and Improvement of the Environment in the Border Area

In 1983, the United States and Mexico signed the Agreement on Cooperation for the Protection and Improvement of the Environment in the Border Area in La Paz, Baja California. The “La Paz Agreement” established a framework for binational cooperation to reduce air, water, and land pollution within a zone extending 100 kilometers (62 miles) either side of the international boundary. The La Paz Agreement established six binational workgroups to develop and implement cooperative projects on environmental issues, particularly wastewater treatment, hazardous substances, and air emissions.

Border XXI Program

The Border XXI Program is an innovative binational effort through which diverse U.S. and Mexican federal agencies work cooperatively toward the common goal of sustainable development in the border region. The mission of Border XXI is to promote a clean environment, protect public health and natural resources, and encourage sustainable development. Border XXI emphasizes public involvement and cooperation among involved agencies to ensure sustainable growth. Agencies involved with Border XXI programs include the Secretariat for Environment, Natural Resources and Fisheries (SEMARNAP) and the Secretariat for Social Development (SEDESOL) in Mexico, and the Environmental Protection Agency (EPA), Department of the Interior (DOI), and Department of Agriculture (USDA) in the United States. Border XXI is implemented through nine binational workgroups; the six established by the La Paz Agreement and three new ones (environmental information resources, natural resources, and environmental health).

Integrated Environmental Plan for the U.S.-Mexican Border Area

The 1992 Integrated Environmental Plan for the Mexican-U.S. Border Area (IBEP) was a binational plan created pursuant to the La Paz Agreement to protect border ecosystems under the philosophy that long-term economic growth is dependent upon environmental protection. IBEP objectives included increased cooperative planning and education to improve our understanding of the border environment. IBEP provided the basis for environmental protection aspects of the Border XXI Program.

The North American Free Trade Agreement

The North American Free Trade Agreement (NAFTA) was signed by Canada, the United States, and Mexico in 1994 to foster increased trade among these nations. In order to address the environmental challenges of regional free trade, two side-agreements were included in NAFTA. The North American Agreement on Environmental Cooperation (NAAEC) promotes sustainable development through mutually supportive environmental and economic policies. Pursuant to NAAEC, the Commission for Environmental Cooperation (CEC) was established to pursue binational conservation projects in the border region.

The second environmental side-agreement was the U.S.-Mexico Agreement Concerning the Establishment of a Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADB), which established two binational institutions to address transboundary environmental problems. BECC works with government agencies and local communities to formulate effective solutions to border environmental problems, and determines whether environmental infrastructure projects (i.e. water supply, wastewater treatment) are eligible for NADB financing. The NADB finances construction of BECC-certified environmental projects. Both agencies are equally funded and governed by Mexico and the United States.

Binational Accords Relating to the Border Environment

Numerous binational accords have been developed between the United States and Mexico to encourage information exchange and cooperation in the management of natural resources along the border. These accords take two principal forms that vary in their formality and significance in establishing active programs.

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The most formal and significant is the Memorandum of Understanding (MOU), a legally binding agreement that must go through a legislative process in each country prior to approval and signature. MOUs often include mandates for the development of specific programs and activities as required to meet the terms of the agreement. The less formal accords are Letters of Intent and Agreements, which in effect represent promises of “good faith” and are not subject to a legislative process. These accords do not identify programs or activities and are often not supported with the funding necessary for agency follow-through (Susan Goodwin, DOI U.S.-Mexico Coordinator, personal communication). The following list identifies some of the Mexico–U.S. accords related to cooperative, binational environmental management in the border region:

- United States-Mexican Convention for the Protection of Migratory Birds and Game Mammals (1936).
- Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (1942).
- Mexico-United States Cooperative Fisheries Program (1983).
- Mexico-United States Agreement on Co-operation for the Protection and Improvement of the Environment in the Border Area (La Paz Agreement of 1983).
- Agreement Between the Secretary of Agriculture and Hydraulic Resources (SARH) and the USDA to Facilitate Sustainable Forestry (1984).
- Memorandum of Understanding between NPS and SEDESOL on Cooperation in Management and Protection of National Parks and Other Protected Natural and Cultural Sites (1988).
- Agreement Between SARH and USDA to Cooperatively Prevent and Fight Forest Fires in the States of Sonora, Mexico, and Arizona, United States (1988).
- Letter of Intent for Scientific Investigations Between SARH and the USDA Forest Service (1992).
- Memorandum of Understanding Between USGS and INEGI on Border Digital Spatial Mapping (1992).
- Supplemental Agreement on Scientific and Technical Cooperation on Forest Matters between SARH and the USDA (1993).
- Memorandum of Understanding Between USGS and the National Autonomous University of Mexico (UNAM) on Cooperative Research on Hydrology and Geology (1994).
- Memorandum of Understanding Between the NPS and Mexico National Institute of Ecology (1994).
- Memorandum of Understanding to Realize Cooperative Scientific and Technical Actions Between Mexico’s National Commission for the Understanding and Use of Biodiversity (CONABIO) and the USGS (1995).
- Memorandum of Understanding to Establish the Canada/Mexico/United States Trilateral Committee for Wildlife, Plants, and Ecosystem Conservation and Management (1996).
- Letter of Intent Between the DOI and SEMARNAP for Joint Work in Natural Protected Areas on the United States-Mexico Border (1997).
- Wildfire Protection Agreement Between SEMARNAP and DOI to Promote Joint Firefighting Efforts along the International Border (1999).
- Memorandum of Understanding Between SEMARNAP and DOI to Work Jointly in Matters Related to the Protection and Conservation of the Environment (2000).
- Joint Declaration Between the SEMARNAP and DOI to Enhance Cooperation to Protect the Ecological Integrity of the Rio Grande/Río Bravo (2000).
- Joint Declaration Between SEMARNAP and DOI to Enhance Cooperation in the Colorado River Delta (2000).

International Programs Within Federal And State Agencies

U.S.-Mexico Border Field Coordinating Committee (FCC)

The Department of Interior- FCC was established in 1994 to enhance management and conservation of shared natural resources along the United States-Mexico border. The FCC provides a framework for addressing natural and cultural border resource issues through the implementation of issue teams composed of scientific experts. The FCC coordinates DOI activities on sustainable development and natural resource protection within three focus areas, including environmental education, research and management of shared water resources, and habitat restoration. A sample of FCC projects include:

- synthesis of current habitat conservation activities along the United States-Mexico Border;
- cooperative, binational nest surveys for sea turtles, including the endangered Kemp's Ridley;
- survey of threatened and endangered species on tribal lands along the United States-Mexico border;
- transboundary gap analysis of biological conservation for the Rio Grande ecosystem in Mexico;
- habitat suitability studies and population estimates for the Yuma clapper rail in Mexico;
- determination of in-stream flow and habitat requirements for indigenous fish and riparian vegetation along the lower Rio Grande;
- training courses on “Management of Protected Areas” involving the Instituto Nacional de Ecología, Profana, NPS, and USFWS;
- a binational assessment of natural resources along the Rio Grande; and
- jaguar research in northeastern Sonora, Mexico.

United States Geological Survey (USGS)

The USGS Biological Resources Division established the Lower Rio Grande Ecosystem Initiative (LRGEI) to address research and information needs on the biotic resources of the river and adjacent terrestrial habitats. LRGEI has collaborated with American and Mexican government agencies on several projects along the international border, including:

- evaluating effects of contaminants on fish in the Rio Grande River;
- identifying ecological and contaminant issues in resacas (oxbows) in the Lower Rio Grande Valley;
- examining peregrine falcon reproduction in the vicinity of Big Bend National Park;
- creating a geographic information system (GIS) database of Mexican lands adjacent to the lower Rio Grande River; and
- developing a bibliographic database on natural resources of the Rio Grande River.

U.S. Fish and Wildlife Service International Affairs

The U.S. Fish and Wildlife Service (USFWS) International Affairs office “works multilaterally with many partners and nations in the implementation of international treaties, conventions, and on-the-ground projects for conservation of species and the habitats on which they depend” (USFWS 2001). The goal of this office is to strengthen Mexico’s capacity to manage and conserve its biological resources. USFWS has worked with SEMARNAP to develop the Wildlife Without Borders-Mexico program, which has funded more than 100 projects during the last five years. The program jointly promotes natural resource conservation in both nations, and has fostered more effective means for international conservation and greater investment in resource conservation in Mexico.

The International Affairs office promotes conservation of biological diversity by developing international treaties, conventions, protocols, agreements, and regional initiatives with the following objectives:

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- develop personnel resources to effectively manage natural resources;
- conserve habitats, buffer zones, corridors, and other designations associated with protected areas;
- raise public awareness on a local and regional basis to promote conservation;
- catalyze conservation partnerships at the local and international levels; and
- promote communication and information exchange among communities, institutions, and countries.

The long history of USFWS and SEMARNAP cooperation in natural resource conservation continues today with programs on migratory birds, endangered species, wetlands, and protected areas. Over the past decade this collaboration has increased pursuant to the North American Wetlands Conservation Act, the North American Waterfowl Management Plan, and the Trilateral Committee for Wildlife and Ecosystem Conservation. These agencies have also developed joint funding for projects on the conservation and sustainable use of Mexico's fish, wildlife, and plant resources.

NPS United States-Mexico Affairs Office

The mission of the NPS United States-Mexico Affairs Office is to develop joint strategies for the conservation of natural and cultural resources along the border. This office coordinates international conservation projects among the NPS and other agencies in the United States and Mexico, including the Instituto Nacional de Antropología e Historia and the Instituto Nacional de Ecología. Primary goals of the NPS United States-Mexico Affairs Office include:

- enhancing communications between the National Park Service and United States-Mexico agencies;
- developing specialized education programs for United States-Mexico managers;
- enhancing NPS-Mexico research programs; and
- cooperating with United States-Mexico organizations for the establishment of protected natural areas in both countries.

Current projects of this office include training on management of natural protected areas, development of environmental interpretation programs in Mexican natural protected areas, and an international forum on cooperative management of natural, cultural, and recreational resources.

Texas Parks and Wildlife International Affairs

The TPWD- International Affairs program facilitates exchange of environmental information between Texas and Mexico, arranges foreign tours of Texas State Parks and Wildlife Management Areas, and helps Mexican environmental agencies procure funding for projects (Maria Araujo, TPWD, personal communication). Program staff has established relationships with CSE and MDC, but have had only limited interaction with these protected areas.

C. The Letter of Intent

On May 5, 1997, DOI Secretary Bruce Babbitt and SEMARNAP Secretary Julia Carabias Lillo signed a Letter of Intent entitled Joint Work in Natural Protected Areas on the United States-Mexican Border. This Letter of Intent declares, “the two agencies plan to expand existing cooperative activities in the conservation of contiguous natural protected areas in the border zone, and to consider new opportunities for cooperation in the protection of natural protected areas on the United States-Mexico border” (DOI-SEMARNAP 1997). It further states, “cooperation under this Letter of Intent is to be undertaken beginning with two pilot projects in the following natural protected areas and National Parks: ...the wildlife protection areas in Mexico of Maderas del Carmen in Coahuila and Cañon de Santa Elena in Chihuahua, and the adjacent protected area in the United States, Big Bend National Park in Texas.”

Binational Collaborative Management in the CDTC: Chapter 3– Policy Framework

Although the 1997 Letter of Intent is referenced as a mandate for cooperative binational management, there is no supporting legislation and it represents only a proposition of “good faith” (Susan Goodwin, DOI U.S.-Mexico Coordinator, personal communication). The Letter of Intent does not require the establishment of any programs nor does it appropriate funding for cooperative activities. What it does, however, is establish a basis for the development of cooperative working relationships between the protected areas in the CDTC. Pursuant to the Letter of Intent, the DOI-Chihuahuan Desert Initiative was initiated to facilitate coordinated management efforts and scientific and technical exchange between protected areas. Although a series of binational meetings has been held over the past three years through the Chihuahuan Desert Initiative, it has not resulted in the establishment of any cooperative activities.

D. Summary

There are currently a tremendous number of cooperative activities along the United States-Mexico border. The internal policy framework of the protected areas neither promotes nor inhibits the development of binational collaborative programs. Of all six protected areas, only the BBNP management plan explicitly promotes cooperative management. Conversations with the protected area managers indicated a willingness and desire to further existing binational relationships. The external policy framework for binational management is well established, and numerous programs promote international cooperation in the management of the border region environment. The creation of binational agencies and programs pursuant to NAFTA, and signing of accords by the two countries, indicate that there does exist a supporting institutional framework for cooperative management of biodiversity in the CDTC.

Constraints to cooperative management appear to be limited to TPWD and NPS international travel policies, which inhibit spur-of-the-moment travel to Mexico. Amending these policies to improve flexibility with respect to travel to/from Mexico would likely facilitate the implementation of collaborative programs in the CDTC. Conversations with the U.S. managers indicated that changing current travel restrictions would improve their ability to work on the other side of the border.

CHAPTER 4: COMPARATIVE ASSESSMENT OF MANAGEMENT OBJECTIVES

A. Introduction

The ultimate goal of this report is to assist managers in developing a strategy for collaborative, binational management of biodiversity within the 2.41 million protected acres within the CDTC. While the five protected areas in this region have similar general missions, the specific goals and activities within these areas differ considerably. Understanding the interests, objectives, and desires of each manager is an essential step in the development of cooperative management programs. A questionnaire was developed and distributed among the five protected area managers in August 2001 to obtain area-specific information on: 1) the managers interest in participating in cooperative programs; 2) missions and management objectives; 3) natural resource goals and needs; and 4) potential impediments to cooperative working relationships. The following individuals completed questionnaires:

- Pablo Domínguez González, Cañon de Santa Elena Área de Protección de Flora y Fauna
- Carlos Sifuentes, Maderas del Carmen Área de Protección de Flora y Fauna
- Frank Deckert, Big Bend National Park & Rio Grande Wild & Scenic River
- Mike Pittman, Black Gap Wildlife Management Area
- Luis Armendariz, Big Bend Ranch State Park

While different questionnaires were used in Mexico and the United States, both versions obtained similar information and facilitated comparison of management objectives, interest in collaborative management, and potential impediments to cooperative programs. Responses to the questions are presented in Table 1. These responses provide valuable insights that may eventually help the establishment of collaborative programs in the CDTC, and provide the basis for future discussions among the managers. The remainder of this chapter analyzes the survey results, and identifies the potential opportunities and constraints relative to binational cooperation based upon the managers' responses.

B. Analysis of Questionnaire Results

This section presents an analysis of questionnaire results, including general similarities and differences in the managers' responses. We have separated this analysis into three sections to facilitate an understanding of the questionnaire results, and the implications of the responses.

Management Goals and Biodiversity Issues

The general missions of the protected areas are similar, and involve the protection and management of natural and cultural resources. Although managers identified similar missions, individual responses to questions regarding current wildlife/biodiversity issues and research needs differed. These differences likely reflect the combined influence of differing agency missions and mandates, area-specific management objectives, and available resources (funding/staffing), as well as the personal interests of the individual managers. Responses from the Mexican managers tended to be more general in nature, and indicated more "basic" goals (i.e. inventories), while the U.S. managers tended to be more specific. This difference likely reflects discrepancies in available resources for the U.S. and Mexican protected areas as well as the diverse interests of individual managers. The recognition and understanding of such differences is an important initial step in the development of collaborative programs. It is important to note that there were issues identified by more than one manager, including environmental education, wildlife inventories, threatened and endangered species, and general resource management. Just as it is necessary to understand differences, it is important to identify those goals and interests that the managers share in common.

Table 1. A Summary of the Questionnaire Responses

Question or topic	Cañon de Santa Elena	Maderas del Carmen	Big Bend National Park	Black Gap WMA	Big Bend Ranch State Park
What is the primary mission of your protected area?	Conservation of natural resources.	Conservation of natural resources.	Preserve and protect natural and cultural resources, and provide for their enjoyment by present and future generations.	Manage and conserve natural and cultural resources for use and enjoyment of present and future generations.	Manage and conserve natural and cultural resources for use and enjoyment of present and future generations.
List the 5 most important wildlife/biodiversity issues affecting your area.	<ol style="list-style-type: none"> 1. soil conservation 2. plant inventories 3. wildlife inventories 4. environmental education 5. studies of historical resource use 	<ol style="list-style-type: none"> 1. conservation 2. research and monitoring 3. resource use 4. environmental education 	<ol style="list-style-type: none"> 1. air quality 2. Rio Grande water quality & quantity 3. exotic species 4. T & E species and sensitive habitats 5. ecosystem restoration 	<ol style="list-style-type: none"> 1. management of wildlife populations and habitats 2. research on wildlife populations and habitats 3. demonstration of habitat management practices 4. protection of T&E species 5. hunting & public use 	<ol style="list-style-type: none"> 1. mule deer 2. mountain lions 3. auodad 4. ibex 5. birding
Which of these five issues are common among all five areas?	<ol style="list-style-type: none"> 1. Wildlife inventories 2. Environmental education 	<ol style="list-style-type: none"> 1. Research and Monitoring 2. Ecosystem characteristics 3. Wildlife 	All five	Management of wildlife populations/habitats and protection of T&E species.	Mule deer
Rank the following in order of their influence on wildlife/biodiversity (1 = least important 5 = most important)	Inadequate funding is most important.	Inadequate funding is most important.	<ul style="list-style-type: none"> • funding 5 • agency mandates 2 • personal interest 4 • staffing 3 • conflict with other goals/objectives 1 	<ul style="list-style-type: none"> • funding 3 • agency mandates 1 • personal interest 4 • staffing 2 • conflict with other goals/objectives 5 	<ul style="list-style-type: none"> • funding 4 • agency mandates 2 • personal interest 1 • staffing 3 • conflict with other goals/objectives 5

Table 1. A Summary of the Questionnaire Responses (cont'd)

Question or topic	Cañon de Santa Elena	Maderas del Carmen	Big Bend National Park	Black Gap WMA	Big Bend Ranch State Park
How interested are you in cooperative management?	Very interested	Very interested	Very interested	Very interested	Very interested
What are the advantages of collaborative management?	Exchange of information and technical expertise.	Information exchange, regional-scale research and monitoring, and better river management.	Improved management of migratory and wide-ranging species and the Rio Grande River; promote ecotourism beyond border villages.	Provide for travel corridors and regional-scale research of wide-ranging species; address common problems.	Ability to share information between these connected areas.
List 3 topics that have the highest potential for collaborative management	1. research on wide-ranging species 2. reintroduction 3. environmental education	1. research 2. fire programs 3. environmental education	1. exotic species 2. impacts of ecotourism 3. role of human communities surrounding Mexican protected areas.	1. impacts of ecotourism 2. research/management of aquatic species 3. wide-ranging species	1. exotic species 2. wide-ranging species 3. bighorn sheep reintroduction
What factors are important to the development of collaborative strategies?	1. Establishing common objectives 2. Managers' attitudes for working together	1. Periodical meetings 2. Common management objectives 3. Shared resources	1. attitudes of managers 2. developing trust among managers 3. eliminating bureaucratic roadblocks 4. get adequate funding	1. communication between managers 2. identify goals, strategies, problems, and needs 3. re-opening La Linda bridge	1. communication between managers 2. respect for common goals 3. desire
What policies inhibit binational collaboration?	1. International travels 2. Bureaucracy 3. Working with annual permission for scientific collection	1. Lack of understanding of management plans 2. Border access 3. Research Projects are not carried out according to needs of the ANP's	International travel policies	None	International travel policies

Table 1. A Summary of the Questionnaire Responses (cont'd)

Question or topic	Cañon de Santa Elena	Maderas del Carmen	Big Bend National Park	Black Gap WMA	Big Bend Ranch State Park
What are your current research needs?	1. Baseline inventories of plants and fishes 2. Description of water bodies 3. Motivation to local people about conservation	1. Grazing 2. Recreation 3. Restoration of deteriorated areas 4. Exotic species 4. Community development	1. baseline inventories 2. resource monitoring 3. landscape restoration	1. restoration and ecology of desert bighorn sheep 2. black bear ecology 3. habitat restoration restoration	1. determine park boundaries 2. cultural resource surveys 3. develop list of neighbors
What role do NGO's have in collaborative management programs?	1. funding 2. staff support and training 3. program management	1. funding 2. technical resources	1. political influence 2. personnel	None	1. personnel
List the outside pressures that affect your area	1. Lajitas urbanization 2. Tourism without control 3. External researchers	1. Lack of communication between producers and owners 2. Productive programs out of ANP management policy 3. Lack of communication among institutions	1. air quality 2. water quality	1. political 2. funding 3. increased public use	1. trespassing by humans and livestock
What are the potential benefits of an international park along the border?	1. Physical infrastructure on both sides 2. Possible benefits to communities 3. Are local people really interested in an international park?	1. Major diffusion of values about ANP importance 2. More economic possibilities for inhabitants and people who give technical services 3. More participation of people to regional level 4. More support of international agencies (conservationists) 5. Planning of regional management plan	1. formal recognition that area on both sides of border are part of Chihuahuan Desert 2. greater protection from threats to biodiversity 3. foster international cooperation	1. prevent habitat fragmentation 2. provide political pressure for water issues	1. increase the political power of the region 2. help address pollution problems

Binational Collaborative Management in the CDTC: Chapter 4- Comparative Assessment

When asked to identify the factors that most influenced their ability to manage wildlife and biodiversity, funding was identified by four of the five respondents as one of the most important. The fact that funding was the only response given by both Mexican managers indicates the significance of this factor, and suggests that this issue must be addressed for successful cooperative management of biodiversity in the Chihuahuan Desert Transboundary Corridor. Other factors listed by the U.S. managers included agency mandates and the influence of competing agency goals and objectives.

Collaborative Management

All five managers expressed interest in participating in binational collaborative management programs with one another. Perceived advantages of collaborative management included increased exchange of information and technical expertise, improved ability to better manage and protect wide-ranging and migratory species, enabling regional-scale research, and facilitating solutions to shared problems/issues at the regional and local levels. When asked which issues had the greatest potential for successful collaborative management, individual responses varied considerably, and no one issue was identified by all five managers. However, responses exhibited some general similarities, and four issues were listed by more than one manager:

- research on wide-ranging species (1 Mexican and 2 U.S. managers);
- environmental education (2 Mexican managers);
- managing exotic species (2 U.S. managers); and
- research on the impacts of ecotourism (2 U.S. managers).

The U.S. managers were asked to identify the factors they believe are critical for successful collaboration. Responses included maintaining open lines of communication, developing trust and respect, and obtaining adequate program funding. The only agency policies that the U.S. managers identified as potentially constraining collaboration were the NPS and TPWD international travel policies, which require submission of an application for approval approximately 4 weeks in advance and thereby, hinder staff travel to/from Mexico.

Miscellaneous

Four of the five managers indicated that NGO's do have a role in collaborative management programs in the CDTC. Specific NGO functions listed by the managers included: 1) providing funding, personnel, and other resources; 2) bringing some political power to the region; and 3) facilitating staff training and technical support. All five managers indicated that the establishment of such a park would benefit regional biodiversity by preventing further habitat fragmentation, conferring benefits associated with political recognition (i.e. funding), and fostering international cooperation and unified management.

C. Factors Influencing the Potential for Cooperative Working Relationships

The information obtained through the questionnaires is important for a variety of reasons. Most significantly, the managers' responses provide insights into one another's perceptions, needs, and desires relative to the management of biodiversity in the CDTC. This information also establishes a basis for future discussions among managers regarding collaborative management. Finally, the responses provide insight into the potential opportunities and constraints that would affect the success of such programs. The following summarizes the opportunities (factors promoting collaboration) and constraints (factors inhibiting collaboration) based upon questionnaire responses and personal interviews.

Opportunities

Interest in Collaboration

Perhaps the greatest single opportunity is provided by the fact that all the managers indicated that they were "very interested" in collaborative management programs. The desire to participate is fundamental to successful collaborative management programs (see Chapter 5), and the high interest level bodes well for collaboration in the CDTC. Additionally, the similar concerns and issues expressed by managers in both questionnaire responses and interviews indicates shared interests and represents a solid foundation for the pursuit and development of cooperative programs.

Existing Relationships

A second opportunity derives from the fact that the managers already know each other, and have previously worked with one another (see Chapter 2). While the majority of current and past collaborative activities have involved only two or three protected areas (rather than all five), these activities have facilitated the establishment of personal and professional relationships, as well as communication and trust, among the managers—all of which are prerequisites for successful collaborative programs.

Policy Framework and Letter of Intent

Chapter 3 indicates that the existing policy framework generally supports collaborative management programs. Several of the existing binational agencies, programs, and cooperative arrangements promote cooperation between Mexico and the U.S., and create legitimacy for collaborative programs in the border region. Additionally, the BBNP strategic plan calls for “binational protection of shared resources”.

The Letter of Intent is perhaps the most significant policy document relative to collaborative management in the CDTC. As previously noted, this document promotes “cooperation in the protection of natural protected areas on the United States-Mexico border”, and specifically calls for the development of cooperative projects between MDC, CSE, and BBNP. While the Letter of Intent is not a legislative mandate, it establishes political legitimacy for the development of collaborative programs between the five protected areas in the CDTC.

Constraints

Funding

Funding appears to be one of the most significant constraints relative to the development and implementation of cooperative management programs. Responses indicated that current funding levels are not adequate to support such programs. In addition to inadequate funding, binational collaborative programs have to overcome potential barriers associated with economic disparities inherent to the countries. The disparity in national funding will add a layer of complexity to the development of cooperative programs in the CDTC, and will require creative solutions to adequately address the financial and social dimensions of this issue.

Staffing

While limited staffing is generally associated with funding problems, the issue is presented separately to facilitate discussion. Current staffing at the Mexican protected areas generally consists of two on-site field personnel and an off-site director/manager with a limited administrative staff. In both CES and MDC, the two field personnel have their hands full with existing programs, and at least one manager indicated the need for additional staff. It would likely be difficult for these areas to commit significant staff time to cooperative programs given their existing staff levels and the time demands of their own programs and activities.

Although the U.S. protected areas tend to have larger staffs and budgets, personnel and financial resources are currently utilized at capacity on existing programs in all three areas. While the BBNP manager appears to have some flexibility in appropriating available money and hiring/reassigning personnel to new programs (i.e. cooperative management), managers of BGWMA and BBRSP have less autonomy. Funding and staffing in these areas is tightly controlled by the State legislature, and managers do not have the authority to hire new personnel even with adequate funding. Staffing is a potential constraint that would have to be addressed prior to the development and implementation of cooperative management programs but as noted in Chapter 5, there are many different approaches to overcoming this constraint.

Travel Policies

Current NPS and TPWD policies regarding international travel require a formal approval of a written application, a process that can take more than four weeks to complete. This process effectively precludes spur-of-the-moment travel to Mexico, and limits the ability of managers and their staff to immediately respond to requests for assistance. While one manager indicated that they “change out of their uniforms and take their personal vehicles across the border” rather than negotiate the formal agency approval process, revision of the NPS and TPWD international travel policies could facilitate last-minute travel and eliminate a potential constraint to cooperative management activities

CHAPTER 5: A FRAMEWORK FOR SUCCESSFUL COLLABORATION

A. Collaboration Among the Protected Areas

“Political boundaries have little to do with ecological realities”

Over the past decade, there has been an increased recognition of the disparity between ecological and political boundaries. Ecosystems, and the biodiversity they support, often span multiple political and agency jurisdictions, a characteristic that greatly complicates natural resource management. Additionally, managers have to negotiate a political landscape that often includes multiple agencies and to reconcile the demands of user groups with disparate interests and agendas. The complexity of resource management is further exacerbated when resources cross international boundaries.

In response to the problems arising from differences in political and ecological boundaries, and an awareness of the benefits of managing natural resources on a regional basis, cooperative or collaborative approaches have gained popularity over the past two decades. These collaborative approaches are known by a variety of names depending upon the specific program goals and objectives: ecosystem management, interagency management, sustainable development, and community stewardship. Regardless of the label, these programs share one common feature— they improve management of natural resources by bringing together managers from various agencies in the decision-making process and eliminating arbitrary political and jurisdictional boundaries. Collaborative management processes have emerged as the paradigm for conserving biodiversity in the 21st century.

Benefits of Coordinated Management

The potential benefits of collaborative management of natural resources are manifold and, while the international dimension of the Big Bend region adds to the overall complexity of cooperative strategies, it also increases the potential benefits. Transboundary areas share more than common borders; they share common values, common visions, and common problems. Therefore, they present significant opportunities for managing biodiversity at larger spatial scales and fostering international cooperation and understanding (Hamilton et al. 1996). Collaborative management of transboundary resources can also provide important political and social benefits that, in conjunction with ecological benefits, can improve the overall efficiency and effectiveness of efforts to conserve biodiversity. The most significant benefit of collaborative programs is often referred to as “capacity building” (Singh 1999), which refers to the development of a group’s core skills and abilities. In the CDTC, this would include regional-level protection of biodiversity, coordination of management goals and objectives, information exchange and dissemination, and resource efficiency (sharing staff, expertise, program costs, etc.).

Benefits of collaborative efforts are program-specific, and largely depend upon specific goals and objectives. While managers may focus on ecological benefits, the political and social benefits can be of equal or greater importance in transboundary settings. Potential benefits of collaboration include:

Ecological

- ❖ coordinated management/protection of biodiversity within CDTC
- ❖ development of regional strategies that ensure equal protection across all five areas
- ❖ improved management/protection of internationally-shared resources (i.e. Rio Grande)
- ❖ preserve/re-establish migration routes and movement corridors
- ❖ improved management of and research on wide-ranging species
- ❖ regional-scale evaluation of flora and fauna populations, ecosystem changes, anthropogenic impacts
- ❖ coordinated eradication of exotic species (i.e. *Tamarix* spp.)
- ❖ rehabilitation/restoration of disturbed lands
- ❖ species restoration programs at local and regional level

Political and Economic

- ❖ increase international attention on region
- ❖ foster international understanding at the national, regional, and local levels
- ❖ reduce agency resistance to development of cooperative working relationships
- ❖ create a model for cooperative working relationships between the US and Mexico
- ❖ develop mechanism for joint responses to border problems
- ❖ increase funding/donor support associated with political recognition of the border region
- ❖ improve efficiency and cost-effectiveness of natural resource management programs

Social and Cultural

- ❖ promote cooperation between neighboring countries despite economic and cultural differences
- ❖ increase goodwill and understanding between the five protected areas and the two nations
- ❖ create sustainable livelihoods for adjacent communities (i.e. *ejidos*)

Potential for Binational, Cooperative Management in the Big Bend Region

Based upon interviews with managers of the five protected areas and the questionnaire results presented in Chapter 4, there currently exists a unique opportunity to initiate cooperative management among the protected areas in the Transboundary Corridor. Stated simply, it is the right time for international collaboration in the Big Bend region and there are several factors that support this statement.

The first and most important factor is that all five managers have expressed an interest in collaborative management. As presented in Appendix A, the desire to participate in and be supportive of such programs is critical elements of successful cooperative programs. The fact that all five managers are personally interested also provides political legitimacy for cooperative activities within their agencies. It is important to take advantage of the current interest and initiate cooperative programs before agency focus and/or personnel changes reduce current interest levels.

Second, all five protected areas share both a common resource (the Chihuahuan Desert) and a common mission (to protect biodiversity within this ecoregion). Despite being separated by an international border and cultural and socioeconomic differences, the five areas share common ecological interests, issues, and problems. Potential benefits and/or advantages of collaborative management that were identified by managers include ability to conduct large-scale research and monitoring, management of wide-ranging species, exchange of technical information and expertise, providing and protecting travel corridors, addressing common problems, and managing the Rio Grande/Rio Bravo. There is a unique opportunity for binational, collaborative management within this 2.41 million-acre protected core of the Chihuahuan Desert.

Third, there are existing relationships among the managers and staff of all five protected areas. The managers know one another on a personal level and, as indicated in Chapter 2, personnel from the five areas have been participating in cooperative programs. While these programs have generally involved joint training rather than collaborative management, and have often not involved all five areas, the existing relationships provide a basis for developing the levels of dialogue and trust necessary to support collaborative management.

Fourth, there are relatively few impediments to the development and implementation of cooperative programs. International travel policies were the only factor identified by managers as potentially inhibiting cooperative work, and most managers have been “working around” these travel policies for some time now. General impediments, such as inadequate funding and staffing, are common among collaborative management programs (Appendix A). However, these issues may be exacerbated in programs involving the five protected areas due to the funding and staffing discrepancies that exist between the two nations. Overcoming economic and sociopolitical differences will be a crucial element in the development and implementation of binational, collaborative programs in the Transboundary Corridor.

B. A Generic Framework

We present a general framework for developing and implementing collaborative management among the five protected areas in Figure 3. It is important to note that while this framework is useful as a reference, the actual strategy and process will ultimately be devised by the protected area managers. Accordingly, the framework presented in Figure 3 is not intended to be “the” strategy utilized in the Big Bend region but is meant to be a guide and facilitate workshop discussions.

The general framework (Figure 3) follows an iterative process in which information obtained by monitoring is evaluated to determine changes necessary to improve program effectiveness. This strategy is based on a series of formal workshops to plan, develop, and assess/revise the collaborative program. As initial cooperative efforts will likely involve individual projects (i.e. research on individual species, fire management, exotic species, etc.) rather than large-scale management programs, a process may be developed for each project. Appendix A contains detailed information on the process presented in Figure 3, including an example of collaborative research and management of pumas (*Puma concolor*) in the Chihuahuan Desert Transboundary Corridor.

C. The Big Picture

The primary purpose of this document is to provide information that can be used by protected area managers in their development of cooperative management programs. It is our hope that the managers use this document as a reference during the formal workshop sessions, and as guidance during the process. While in the short-term this document and the associated workshops will help to define specific issues, develop a process for collaboration, and create a coordinated vision for management actions in the Transboundary Corridor, it is important to recognize the long-term goals. As previously noted, the ultimate goal of these initial processes is to establish a framework for coordinated regional-level management activities involving all five protected areas. This document, in conjunction with the workshops, will initiate a dialogue among the protected area managers and establish a level of familiarity and trust with one another. These are essential to the long-term success of regional cooperative programs (Appendix A). While the document and workshops will help to develop binational cooperation on specific projects/activities, the ultimate goal is to develop large-scale management programs that rely on and utilize the combined knowledge, resources, and expertise of the Mexican and American protected areas. The development of such an “ecosystem management” perspective will ultimately result in improved management of biodiversity within the Chihuahuan Desert Transboundary Corridor.

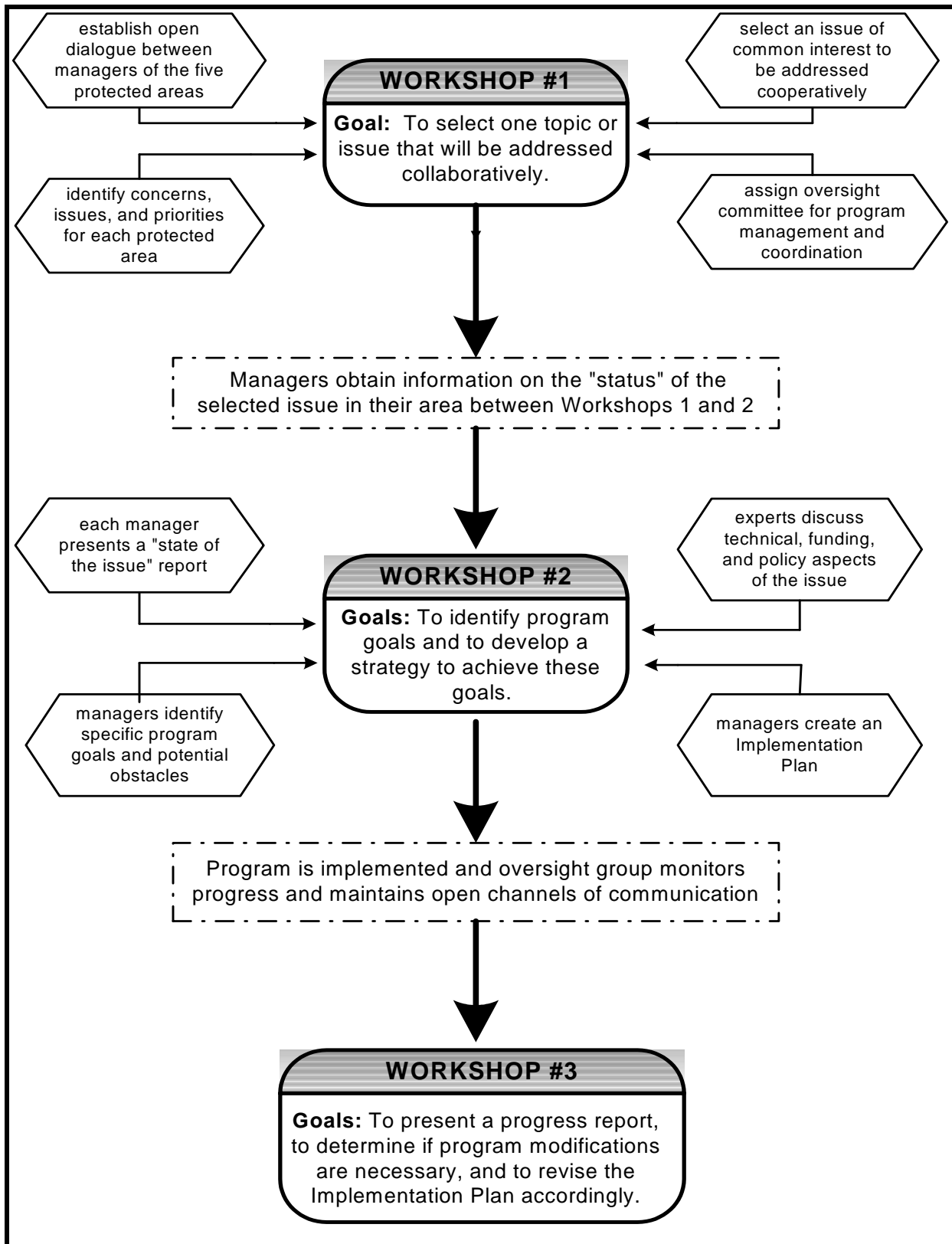


Figure 3. A Generic Framework for Collaborative Management

APPENDIX A

DEVELOPING SUCCESSFUL COLLABORATIVE PROGRAMS

A. The Case for Collaboration Among Protected Areas

“Political boundaries have little to do with ecological realities”

Emergence of Collaborative Management

Over the past decade, there has been an increased recognition of the disparity between ecological and political boundaries. Ecosystems, and the biodiversity they support, often span multiple political and agency jurisdictions, a feature that greatly complicates the protection of natural resources. Additionally, contemporary resource managers have to negotiate a political landscape that often includes multiple agencies and to reconcile the demands of user groups with disparate interests and agendas. The complexity of resource management is further exacerbated when resources cross international boundaries.

In response to the problems arising from differences in political and ecological boundaries and with an awareness of the benefits of managing natural resources on a regional basis, cooperative or collaborative approaches have gained popularity over the past two decades. These collaborative approaches are known by a variety of names depending upon the specific program goals and objectives, some of which include: interagency management, interagency cooperation, community stewardship, and ecosystem management. Regardless of their label, these programs share one common feature— they improve management of natural resources by bringing together various interested groups in the decision-making process and eliminating arbitrary political and jurisdictional boundaries. Collaborative-style management processes have emerged as the paradigm for conserving biodiversity in the 21st century.

Perhaps nothing exemplifies the collaborative process better than the concept of ecosystem management (EM). While EM is a somewhat ambiguous the concept grew from the realization that land managers in the United States had to start looking at the “big picture” to preserve the nation’s biodiversity. As defined by Grumbine (1994), ecosystem management integrates scientific knowledge into the complex sociopolitical decision-making framework to promote the general goal of protecting the long-term integrity of native ecosystems. The essence of ecosystem management can be distilled into the following core concepts:

- **Use of ecological boundaries**– management is based upon ecological rather than political and/or social boundaries;
- **Interagency cooperation**– protection of biodiversity requires collaborative decision-making and management by involved agencies across multiple jurisdictions; and
- **Adaptive Management approach**– facilitates “learning by doing” in recognition that natural resource management is an inherently complex and uncertain process.

Ecosystem management has been embraced by natural resource management agencies within the United States, particularly the United States Forest Service, and the core principles have been adopted in numerous collaborative efforts throughout the United States. One such effort involves the Interagency Grizzly Bear Study Team (IGBST). The IGBST, responsible for obtaining ecological information on the grizzly bear (*Ursus arctos horribilis*) population in the Greater Yellowstone Ecosystem, was established in 1973 pursuant to the realization this wide-ranging, endangered species occupied lands under the jurisdiction of multiple federal agencies across three different states. The IGBST is a cooperative effort of the USGS- Biological Resources Division, Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, and the States of Idaho, Montana, and Wyoming with a primary mission of conducting research and disseminating information to aid grizzly bear management decisions.

While the IGBST represents an example of successful cooperative management, this program is relatively easy as it is 1) focused on a single species, 2) only involves agencies from the United States, and 3) is federally funded. Collaborative management of resources that span international boundaries as well as jurisdictions of multiple agencies is more complex. National differences in resource policies and management objectives, and

fundamental political, social, and economic disparities present significant barriers to development of binational cooperative working relationships. However, the principles of ecosystem management presented above provide an important framework for developing strategies for the conservation of transboundary biodiversity.

Benefits of Coordinated Management

The potential benefits of collaborative management of natural resources are manifold and, while the international dimension of the Big Bend region adds to the overall complexity of cooperative strategies, it also increases the potential benefits. Transboundary areas share more than common borders; they also share common values and common problems. Therefore, they present significant opportunities for managing biodiversity at larger spatial scales and fostering international cooperation and understanding (Hamilton et al. 1996). Collaborative management of transboundary resources can also provide important political and social benefits that, in conjunction with ecological benefits, can improve the overall efficiency and effectiveness of efforts to conserve biodiversity. The most significant general overall benefit of collaborative programs is often referred to as “capacity building” (Singh 1999). Capacity building refers to the development of a group’s core skills and abilities, which in this case would include regional-level and protection of biodiversity, coordinated or “harmonized” management goals and objectives, exchange and dissemination of information, and resource efficiency (sharing staff, expertise, program costs, etc.).

Specific benefits of collaborative efforts are program specific and largely depend upon the program goals and objectives. While managers may focus on the potential ecological benefits, the political and social benefits can be of equal if not greater importance in transboundary settings. Potential benefits of collaborative management in the CDTC include the following:

Ecological

- ❖ coordinated management/protection of biodiversity
- ❖ development of regional strategies that ensure equal protection across all five areas
- ❖ improved management/protection of internationally-shared resources (i.e. Rio Grande)
- ❖ preserve/re-establish migration routes and movement corridors
- ❖ improved management of and research on wide-ranging species
- ❖ regional scale evaluation of flora and fauna populations, ecosystem changes, anthropogenic impacts on natural resources
- ❖ coordinated eradication of exotic species (i.e. *Tamarix* spp.)
- ❖ rehabilitation/restoration of disturbed lands
- ❖ species restoration programs at local and regional levels
- ❖ coordinated fire management

Political and Economic

- ❖ increase international attention on region
- ❖ foster international understanding at the national, regional, and local levels
- ❖ reduce agency resistance to development of cooperative working relationships
- ❖ create a model for cooperative working relationships between the US and Mexico
- ❖ develop mechanism for joint responses to border problems
- ❖ increase funding/donor support associated with political recognition of the border region
- ❖ improve efficiency and cost-effectiveness of natural resource management programs, training, etc.

Social and Cultural

- ❖ promote cooperation between neighboring countries despite economic and cultural differences
- ❖ increase goodwill and understanding between the five protected areas and the two nations
- ❖ create sustainable livelihoods for adjacent communities (i.e. *ejidos*)

The Time for Binational, Cooperative Management in the Big Bend Region

Based upon interviews with managers of the five protected areas and the questionnaire results presented in Chapter 4, there currently exists a unique opportunity to initiate cooperative management programs in the CDTC. Stated simply, “international collaboration in the Big Bend region makes sense”—and there are several factors that support this statement.

The first and most important factor is that all five managers have expressed an interest in collaborative management. As discussed later in this section, the desire to participate in and support such programs is a critical element for successful collaborative management. The fact that all five managers are interested provides political legitimacy to the concept within their agencies, and sets the stage for cooperative activities. It is important to take advantage of the current interest and establish a program before agency focus and/or personnel changes reduce support for such programs.

Second, all five protected areas share a common resource—the Chihuahuan Desert—and a similar mission to protect biodiversity within this ecoregion. Despite being separated by the international border and cultural and socioeconomic differences, the five areas share common ecological interests, issues, and problems. Potential benefits and/or advantages of collaborative management that were identified by managers include ability to conduct large-scale research and monitoring, management of wide-ranging species, exchange of technical information and expertise, providing and protecting travel corridors, addressing common problems, and managing the Rio Grande/Rio Bravo. There is a unique opportunity for binational, collaborative management within this 2.41 million-acre protected core of the Chihuahuan Desert.

Third, there are existing relationships among the managers and staff of all five protected areas. The managers know one another on a personal level and, as indicated in Chapter 3, personnel from the five areas have been participating in cooperative programs. While these programs have generally involved joint training rather than collaborative management, and have often not involved all five areas, the existing relationships among the protected area personnel provide a basis for collaborative management.

Fourth, there are relatively few impediments to developing and implementing collaborative management programs. International travel policies were the only factors identified by managers as potentially inhibiting cooperative work, and most managers have been “working around” such policies for some time now. General impediments, including inadequate funding and staffing, are typical of collaborative programs and may be exacerbated in trans-boundary situations due to discrepancies in funding and staffing. Overcoming economic and sociopolitical differences will be a crucial to the development of successful binational collaborative programs.

In summary, the time is right for collaborative management between Cañon de Santa Elena, Maderas del Carmen, Big Bend, Big Bend Ranch, and Black Gap. The managers are interested in the idea, they share interests and visions, they have previously worked together, and there are no significant agency policy barriers.

B. A Strategy for Coordinated Management

Every cooperative management program is somewhat unique as a result of the ecological and sociopolitical setting, the skills, abilities, and desires of involved individuals, and the ultimate program goals and objectives. However, previous collaborative efforts can provide insight into the factors that promote successful collaboration. This section presents an overview of the adaptive management process, some lessons from other cooperative programs, and a generic framework for the development and implementation of cooperative management in the CDTC.

Adaptive Management

Over the past decade, many federal agencies in the United States have started to use the adaptive management process (AM) for the management of ecosystems and associated biodiversity. This new paradigm has arisen in response to the inability of previous management programs to preserve ecosystems and biodiversity and to arrest the decline of species (Gray 2000). While AM is a vague term, the essence of AM is relatively

straightforward— it is a formal process designed to improve natural resource management by helping managers and scientists learn from consequences of operational programs (Holling 1978). Simply stated, it is “learning by doing”.

The central tenet of AM is that management of natural resources, particularly large scale collaborative efforts involving multiple, diverse agencies, is an inherently complex and uncertain process. Rather than allowing this complexity and uncertainty to inhibit natural resource management, the AM process embraces these aspects. Adaptive Management represents a continuous learning process in which program performance is monitored and assessed relative to the program goals. The program is occasionally modified based upon its results to improve overall effectiveness and efficiency. As noted by Johnson (1999), the overall goal of AM is not so much to maintain an optimal state of the resource, as it is to develop an optimal management strategy.

It should be noted that the individual protected area managers likely use the AM process during their daily activities and when evaluating their programs and resource utilization. While they are probably not consciously aware of AM in their day-to-day decision-making, it is important to formalize the AM process when developing and implementing collaborative management programs involving individuals from a variety of agencies on issues of varying scales and complexity. AM provides a forum for reconciling differing viewpoints, overcoming inherent complexity and uncertainty, and balancing sociopolitical demands and ecological facts. Adaptive Management is a crucial feature of strategies for the cooperative, binational management of biodiversity.

The AM process generally consists of six phases (Figure A-1). It is an iterative process with a continuous feedback loop through which results of management programs are assessed. As the program develops and managers evaluate the results, the program is modified to improve effectiveness relative to previously defined goals.

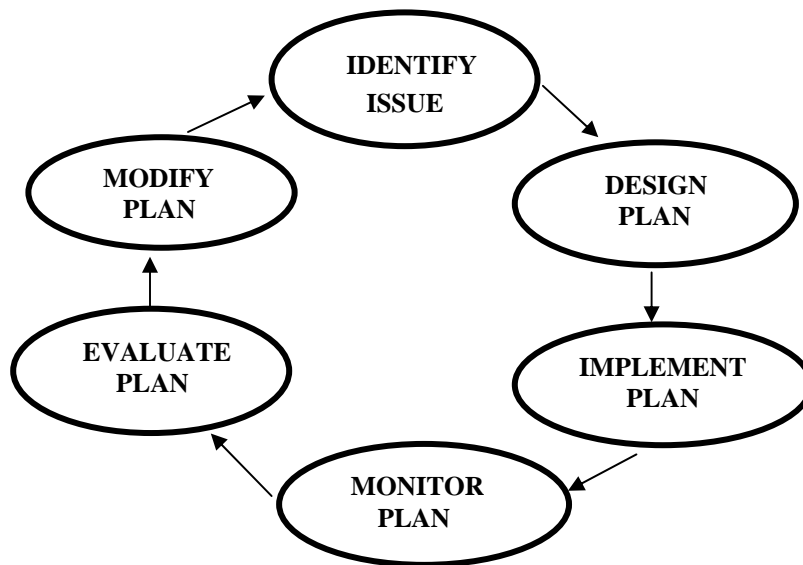


Figure A-1. The Adaptive Management Process

The following briefly describes each of the six phases:

1. Identify the Issue

Initial step includes identifying the issue, defining its scope, and identifying existing knowledge base and information needs.

2. Design the Program

Second step includes determining program objectives, exploring alternative management actions, and developing an Implementation Plan.

3. Implement the Program

Third step is to follow the Implementation Plan.

4. Monitor the Program

Fourth step is to follow the monitoring plan, identify deviations from the management plan, and document and communicate program results.

5. Evaluate the Program

Fifth step is to analyze data from the monitoring plan, document expected and unexpected results, and identify whether program goals are being met.

6. Modify the Program

Based upon information from the fifth step, assess and modify the program to improve effectiveness and efficiency. Re-evaluate goals in light of monitoring results and changes in manager's priorities, interests, etc. Revise Implementation Plan and initiate revised program.

Lessons from Other Cooperative Efforts

The increased use of collaborative management arrangements over the past decade, particularly in the realm of ecosystem management, provides insight into the factors that contribute to the program success and/or failure. Although each collaborative program is unique, successful cooperative efforts can provide information on the general factors that contribute to program success. This section presents an overview of some of fundamental features of successful collaborative efforts.

Personal Relationships

“Fundamentally, successful collaborative efforts are built on human relationships” (Yaffee and Wondolleck 2000). Perhaps nothing is more important to cooperative management programs than the development of close working relationships and friendships among participants. It is essential to build a level of trust so that participants feel that they are able to freely exchange thoughts, ideas, criticisms, etc. Development of personal relationships also promotes recognition of interdependence among participants and an understanding of common goals, issues, and interests. While relationship building is often done through formal workshops and conferences, informal meetings, field trips, and other activities can also be beneficial.

Shared Ownership

It is critical that participants create a shared sense of ownership in the process. This can greatly assist in other requirements for successful collaboration identified in this section including development of trust and good working relationships, maintaining long-term interest of participants, obtaining funding, and generating political recognition and support. As the purpose of a transboundary collaborative program is to improve management of a common resource/region (i.e., biodiversity in the Chihuahuan Desert), it is important to acknowledge and embrace a sense of place. Many successful collaborative programs develop a mission statement and an identity, often creating a name that identifies the group, the region, and/or the mission (i.e., Cameron County Agricultural Coexistence Committee). This is important to not only provide the participants with an identity outside of their agency or organization, but also to bring attention to their efforts. Successful collaborative programs parlay this identity into political and financial support. Creation of an identity and mission can also help thwart potential threats associated with changes in personnel and/or political priorities.

Desire to Participate

One of the most important aspects to developing a successful collaborative program is making sure that all participants (i.e. the five protected area managers) are both interested and committed to the program. They must be willing to support the process to the best of their ability and to provide follow-through. Disinterest of any one participant can adversely affect the program regardless of the desire and efforts of the interested participants.

Entrepreneurial Spirit

Natural resource management is an inherently complex and uncertain process, and one primary benefit of collaborative programs is that they provide flexibility that is often not available in agency settings. Successful collaborative efforts embrace risk and persistently seek innovative solutions to potential impediments. It is important that collaborative programs utilize the diverse expertise, viewpoints, and interests of team members, and encourage creative problem solving. Collaborative programs benefit by removing restrictions and risk-avoidance tendencies of agencies, thereby freeing participants to develop and implement unique and creative management actions. Such an approach also encourages the use of existing connections and institutional networks to secure resources (funding, personnel, etc.) as well as political and financial support.

Adaptive Management Approach

Most successful collaborative efforts utilize the AM framework that facilitates partnerships, promotes program implementation despite uncertainties and information gaps, encourages risk talking, and learns from previous actions. The AM process requires specific monitoring and information exchange mechanisms that facilitate program revision to meet changing socio-political circumstances and/or ecological contexts.

Maintaining Interest Over the Long-Term

Critical to the success of collaborative management programs is maintaining participant interest once the initial excitement of participating wears off. Assigning individual tasks throughout the implementation phase and ensuring that all participants have a voice in decision-making are two methods of maintaining interest levels. Many programs use occasional meetings and/or workshops to promote open dialogue and renew enthusiasm. Completing the AM process steps (evaluation, assessment, and program revision) also helps to maintain the interest of participants.

Maintaining Funding Over the Long-Term

As with interest levels, it is necessary to ensure adequate program funding subsequent to the initial implementation. Many collaborative programs have perished because, although they had adequate funding for the initial program phases, funding sources had not been established for the latter steps of the AM process. Programs that rely on a single funding source are also more vulnerable to changes in political priorities and/or personnel. Many successful programs use NGO's or other groups to assist in the identification of funding sources and proposal development.

C. A Generic Framework for Collaborative Management in the CDTC

Based upon the information presented in this Chapter, we created a framework for collaborative management among the five protected areas in the CDTC. This framework is based upon 1) the AM process and 2) lessons derived from other collaborative efforts. It is important to note that, while we are presenting a general framework, the five managers will ultimately devise a strategy that they believe will best facilitate successful collaboration. In this context, the framework presented in this chapter is not intended to be “the” strategy utilized in the Big Bend region but rather is meant to facilitate future discussions regarding the development of a collaborative program.

The general framework (Figure A-2) follows the iterative AM process in which information obtained by program monitoring and evaluation is assessed to determine what changes would improve program effectiveness and efficiency. This strategy is based on the use of formal workshops to plan, develop, and

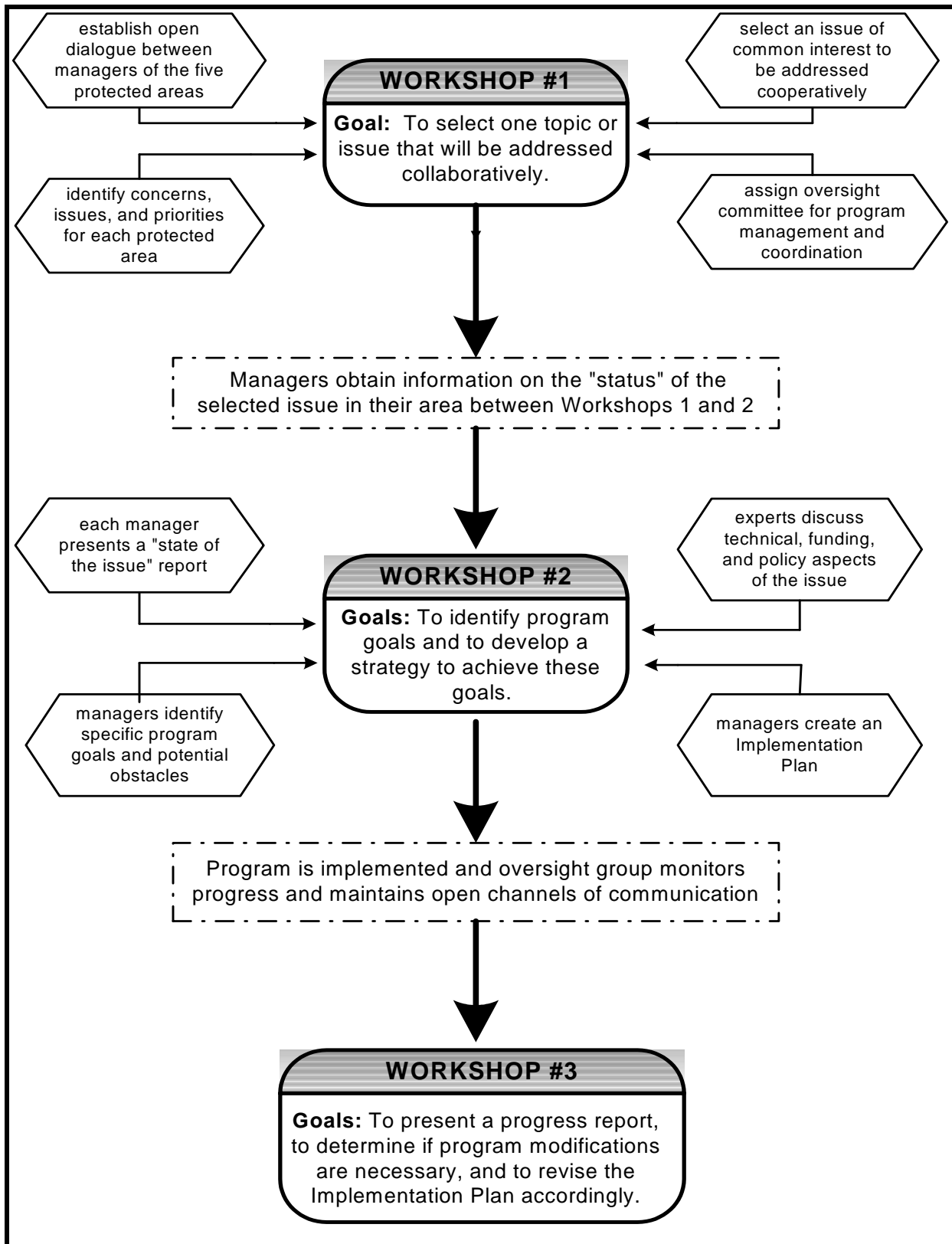


Figure A-2. A Generic Framework for Collaborative Management

assess/revise the collaborative program. As initial cooperative efforts among the five protected areas will likely involve specific projects (e.g. research on individual species, fire management, exotic species, etc.) rather than large-scale ecosystem management programs, this process may be completed for each individual project.

The following presents a general description of the steps in this framework, including tasks to be completed during each of the three workshops. We want to reiterate that this framework is presented only as a reference, and we encourage the managers to use this as a basis for developing their own unique collaborative programs.

Workshop #1

The ultimate goal of this workshop is to select a topic or issue of common interest that will be addressed collaboratively. It is important that this workshop provide a forum for relationship building and free, open dialogue among participants— they must feel that they are among friends and must not be constrained by agency politics. Workshop discussions should primarily involve the managers and associated staff, and should allow each protected area manager time to present area-specific concerns, issues, and priorities. This information will ultimately help in the selection of an issue of common interest. Previous collaborative efforts have benefited greatly from the use of facilitators (i.e. one Mexican and one American) to guide the discussions. Facilitators are beneficial because they are unbiased, can maintain the focus of discussions, and can ensure the goals of the workshop are achieved.

Upon selection of a topic/issue, the final task of workshop #1 is to assign an “oversight committee” that will be responsible for 1) program development and implementation, 2) coordinating program monitoring and information exchange, 3) maintenance of communication networks, and 4) planning future workshops and meetings. As managers have their hands full with their existing duties, many collaborative programs rely on NGO’s or other groups (i.e. Friends of Big Bend) for program oversight. While non-agency personnel can provide many benefits (i.e. enthusiasm, resources, connections, etc.), their oversight committee could include agency personnel (i.e. protected area managers). The most important considerations are that the managers are comfortable with the oversight committee and that the committee has the resources necessary to manage the program.

Thus, at the conclusion of the first workshop, the managers will have selected both the issue to pursue cooperatively and the oversight committee to manage the program. Additionally, the managers and support personnel (i.e. NGO’s) should attempt to identify experts on the selected topic. These experts will be invited to attend and speak at the second workshop. During the time between workshop #1 and workshop #2, the managers will be required to gather information on the “status” of the issue within their protected area. This may include results of previous research, the current condition and historical trends of the resource, concerns and needs of local communities, goals and desires of the managers, and information or resources necessary to improve their ability to manage the resource. Each manager will present this information in a “state of the issue” report at the beginning of the second workshop.

Workshop #2

The goals of the second workshop include identifying specific program objectives and developing appropriate strategies to achieve these objectives. The first task of this workshop is the “state of the issue” presentation by each of the five protected areas managers. Information from these presentations will facilitate information exchange and establish the basis for future discussions regarding program development.

The second task will involve interactive presentations by three experts to provide managers with information necessary to develop a cooperative program and overcome potential barriers. A “scientific” expert would address the technical and/or scientific aspects of the issue, including results of recent research, information gaps, strategies to address the issue, and methodologies for monitoring and data analysis. A “funding” expert would discuss sources of financing for the proposed program and strategies to obtain available funding. Later in the process, this expert may also assist in the development of funding proposals. A “policy” expert could also be invited to discuss policy aspects of the cooperative program. This expert would discuss

policies that might affect the program at the national, state, and agency levels, and identify strategies to overcome potential policy impediments. While the policy expert may not be necessary for every collaborative project, information provided by technical and funding experts would greatly increase the potential for a successful collaborative management program regardless of the topic.

The third task is to develop specific program goals and objectives based upon the information presented by the individual managers and the experts. This will form the basis for the collaborative strategy, and should explicitly state program goals and objectives. Many collaborative efforts have used a facilitator for this task to keep discussions focused and ensure the process culminates in the identification of program goals and objectives, which will provide the basis for the fourth task— development of an Implementation Plan.

The Implementation Plan will ultimately guide all aspects of the cooperative management program. The Implementation Plan should generally include the following:

- *An Action Program*— identifies the activities or actions to be completed, how and when they will be completed, and who will complete them (assign tasks);
- *A Funding Program*— identifies potential funding sources to be targeted, who will complete funding proposals, and who will manage funding for the collaborative program (select funding program manager); and
- *A Monitoring and Communication Program*— identifies monitoring protocol (how, when, where, etc.), who will conduct the monitoring, and communication network for disseminating information.

Many collaborative programs use NGO's and other non-agency support to manage the individual programs. These organizations can 1) provide direct resources, including staff and funding, 2) solicit political support at the local, state, and national levels, and 3) develop funding proposals and cultivate relationships with donors. Thus, the product of workshop #2 is a comprehensive, detailed Implementation Plan, which provides a blueprint for the collaborative management program.

In the time between workshop #2 and workshop #3, the program will be implemented and the oversight group will monitor results and maintain communication among all participants.

Workshop #3

The goal of the third workshop is to revise the collaborative program based upon an assessment of program results and re-evaluation of manager's goals and objectives. This assessment and revision workshop represents the critical step of the AM process. Since managers are not forever committed to a management action/strategy and utilize management actions as learning opportunities, this portion of the process encourages creativity and experimentation. In essence, workshop #3 facilitates "adaptation" within the AM process. As with the previous workshops #1 and #2, the third workshop can utilize facilitators to direct discussions and ensure the workshop goals are attained. The products of this workshop might include revised program goals and objectives, revisions to any or all of the four Implementation Plan programs, a revised program schedule, and a revised list of participants.

D. An Example of Collaborative Management in the CDTC

This section describes the framework presented above in the context of a real world example. One issue that arose in both interviews and questionnaire responses was the topic of wide-ranging species. Wide-ranging species exemplify the benefits of cooperative management and the need for regional collaboration, and this topic was mentioned by three managers as having a high potential for successful collaborative management in the CDTC.

For this example, we have selected a collaborative research program on mountain lions (*Puma concolor*). This is an appropriate and applicable topic because: 1) Pablo indicated that a study on mountain lions will soon be starting in Cañon de Santa Elena; 2) Luis listed mountain lions as the second most important issue at Big Bend Ranch State Park; 3) Big Bend National Park conducted mountain lion studies in the 1980's that provides baseline information; 4) Black Gap has previously worked with mountain lions; and 5) this is truly a wide-ranging species that inhabits all five protected areas and moves across the international border. It is important to reiterate that this example does not necessarily reflect the manager's interests and/or desires. It is presented only to demonstrate the strategy for cooperative management as presented above.

Workshop #1

Task 1: Manager's participate in a facilitated discussion of potential issues, concerns, interests, and priorities relative to mountain lions. Formal and informal discussions, icebreakers, and workshop sessions provide a forum for developing working relationships, establishing trust, and promoting improved understanding of the participants and their protected areas.

Task 2: Select issue/topic to be addressed cooperatively. We assume for the purposes of this example that the managers select a collaborative study of mountain lion ecology within the CDTC.

Task 3: Create program name to help establish an identity that can be used for political support and awareness, fundraising, and general public relations purposes. The name can either be program-specific (i.e. Chihuahuan Desert Transboundary Mountain Lion Management Program) or more descriptive of the general cooperative program (i.e. Chihuahuan Desert Transboundary Corridor Management Alliance).

Task 4: Assign an oversight committee to organize, coordinate, and manage the project. The oversight committee could be comprised of one Mexican manager (or a member of their staff), one US manager (or a member of their staff), and two or three non-agency members. For this example, the oversight committee will include Pablo (or his designated representative), Mike (or his designated representative), two individuals from the Friends of Big Bend, and one individual from Profauna.

Task 5: With the assistance of the facilitator and involved NGO's, the managers will identify "experts" who will be invited to workshop #2. These experts can be either from within or outside the agencies, and should include: 1) a scientific expert with expertise on mountain lions; 2) a funding expert with expertise on wildlife programs, international programs, and cooperative programs; and 3) a policy expert with expertise in agencies and international settings. Depending on the topic, the managers may not know who the appropriate "experts" are and will rely on the oversight committee and/or supporting NGO's to identify and invite the appropriate individuals to the second workshop.

Interlude Between Workshops #1 and #2

Managers are responsible for gathering information on the "status" of mountain lions within their areas. This would include results of previous studies, management goals and objectives relative to the species, and information gaps/needs. Managers should explicitly identify what they want to know about mountain lion ecology at both the local and regional scales. This information should be organized in a manner that will facilitate a 10-15 minute presentation at the start of workshop #2.

The oversight committee will prepare transcripts of the first workshop and distribute copies to all participants. The committee will identify experts and arrange for them to attend the second workshop. The committee would also organize the second workshop, including accommodations (meals, lodging, meeting space, etc.), travel arrangements for all invitees, and a general schedule. The oversight committee should also work with agencies and NGO's to obtain funding for workshop costs. This may involve arranging a loan from an interested third party (i.e. agency, NGO, federal program) that would be paid back when funding is obtained for the overall program.

Workshop #2

Task 1: Each manager presents a state of the issue report on mountain lions for their area. Pablo would identify the goals and methods of the proposed study in Cañon de Santa Elena. Frank and Mike would discuss findings of previous research conducted in Big Bend National Park and Black Gap WMA, respectively. All managers would discuss information needs, management goals and objectives, and their “vision” for a cooperative program.

Task 2: Given the information derived from Task 1, the next step is to identify program goals. The managers need to establish specific objectives for the cooperative program, and to discuss perceived obstacles and/or impediments to these goals. For this example, the overall goal is to improve the knowledge of mountain lion ecology within the CDTC to facilitate cooperative, binational management of the species. This goal will require the development and implementation of a mountain lion research study to investigate mountain lion ecology in all five protected areas, with emphasis on determining population sizes, distribution and habitat use, prey utilization, and movement patterns/corridor use. Perceived obstacles may include limited funding, inadequate support staff, lack of technical expertise, and agency-related international travel policies.

Task 3: Experts, who have listened to the previous two tasks, give presentations that are oriented towards the manager’s goals and address methods of overcoming potential obstacles.

- **Scientific expert**– A selected expert on mountain lion ecology, preferably with regional expertise in (Chihuahuan Desert or southwest United States/northeast Mexico) presents a discussion that includes results of previous studies, current research efforts, a review of study designs including research methods and data analysis, general estimates of project time frames and costs, and a list of individuals, organizations, and/or academic institutions that could assist with the development and implementation of a mountain lion research program. The ultimate goal of this presentation is to provide insight and guidance on study design, field techniques, and data analysis relative to the manager’s project goals.
- **Funding expert**– An expert on funding would provide an overview of who funds these types of projects. Potential funding sources should include, among others, those interested in 1) mountain lion/wildlife research, 2) biodiversity in the Chihuahuan Desert, 3) the transboundary region, and 4) binational collaborative management. Given the nature of the project and the anticipated long term costs, this expert should provide insights into potential funding sources, mechanisms of long term funding, and strategies for obtaining funding. The ultimate goal of this presentation is to provide guidance on funding sources and mechanisms relative to anticipated program costs.
- **Policy expert**– The policy expert would review current policies and work with the managers to devise methods of either overcoming existing constraining policies or create new policies that support the program. This expert could also identify how other programs have dealt with policy issues. One potential policy issue associated with a mountain lion research program are existing international travel policies. The ultimate goal of this presentation is to provide guidance on creating a policy framework that facilitates the collaborative mountain lion research program.

Task 4: Managers develop the Implementation Plan, including details of the three program areas, with assistance from involved NGO’s, invited experts, and appropriate agency personnel.

- **Action program**– The action program presents the details of fieldwork and data analysis associated with the mountain lion research project, and should be developed in consultation with the scientific expert. For the purposes of this example, the project will obtain data through the relocation of marked animals over a five-year period. The goal will be to capture at least five mountain lions within each of the five protected areas and fit them with radiocollars. This will require one or more houndsmen with trained hounds and a biologist with experience in mountain lion immobilization and handling.

Once mountain lions are marked, they will be monitored via radio telemetry both on the ground and from the air. The goal will be to relocate each mountain lion at least once a week, with more frequent relocations if personnel are available. Bi-monthly radio tracking flights will be conducted to augment ground monitoring and relocate individuals that cannot be relocated from the ground. When an individual exhibits significant movement (traveling between areas or across the international border), biologists will obtain daily relocations from the ground to track its movements. Prey sequence investigations will be conducted in each of the five protected areas during the five-year study period to determine prey selection and utilization rates.

Biologists will prepare semi-annual status reports that include results of the capture and monitoring programs. The status reports will include maps and some data analysis, and will be distributed to the managers.

Data analysis will be completed at the conclusion of fieldwork, and should include development of population estimates, mapping of mountain lion distribution, habitat use, and movement patterns at local and regional spatial scales, and evaluation of prey utilization and selection. The analysis should also include identification of important habitats or corridors. Genetic analysis, based on tissue samples obtained during capture, will data on mountain lion interactions among protected areas and across the international border. The analysis will utilize data from previous studies that have been conducted in the region. It is anticipated that data analysis and preparation of a final report will require approximately one year.

The action program should also identify personnel and/or resources for the various tasks. Protected area managers should identify general resources (staffing, equipment, etc.) that they can contribute to the project. Potential houndsmen and biologists should also be identified, preferably from both Mexico and the United States. Universities and/or individual professors that have demonstrated an interest in mountain lion research, particularly in the Big Bend region should be identified. Individuals that were responsible for previous research in Black gap and Big Bend could also be approached to determine their interest level in this research program.

- **Funding program**– The funding program includes strategies for obtaining both short and long term funding for the research project, and should be developed in consultation with the funding expert. This program will identify potential donors, and provide a general schedule for developing and submitting funding proposals. The managers should retain someone with expertise in grant writing (i.e. funding expert, NGO personnel, etc.) to prepare the funding proposals. The program should designate a “treasurer” to track proposals and all aspects of program accounting. This person may either be from an agency or NGO/external group.
- **Monitoring and communication program**– The monitoring and communication program will outline monitoring methodology and dissemination of data/information to all project participants. This program will be coordinated with the action program, and will assign specific responsibilities to individuals/groups. This program will establish 1) a

communication network that includes managers and project participants and 2) a public relations plan to promote the program.

Interlude Between Workshops #2 and #3

Implementation plan is initiated. Action plan is initiated, with the selection and contracting of houndsmen and biologists to conduct fieldwork. Funding proposals are developed and submitted.

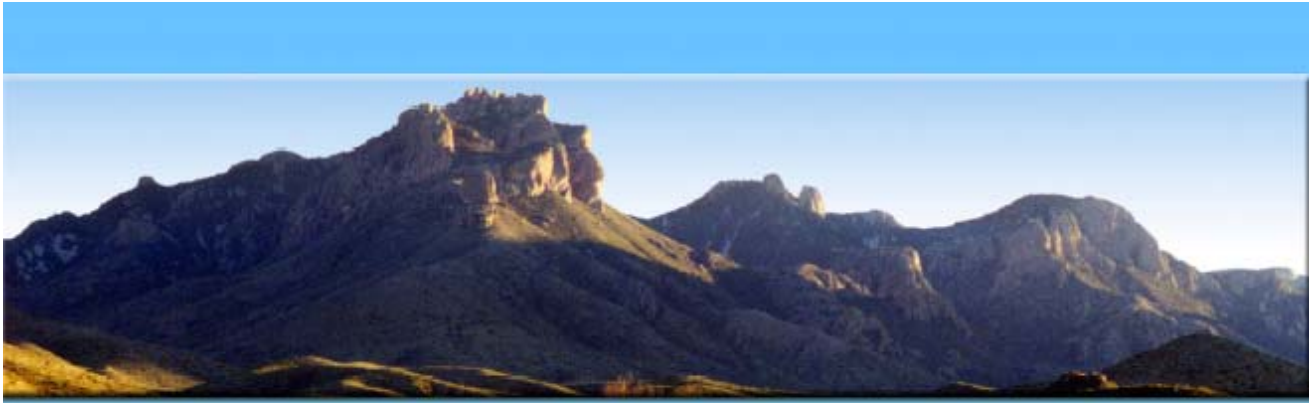
Workshop #3

Task 1: Project status report by oversight committee. Overview of general progress including fieldwork results (animal capture and marking, monitoring, etc.), proposals submitted and funding obtained, and other issues.

Task 2: Identification of problems or impediments that have been experienced during the project. These should include technical problems (study design, fieldwork, etc.), finance issues (inability to obtain funding, inadequate funding for certain activities, etc.), and policy problems (international travel restrictions, problems with relocation flights that cross the border, etc.).

Task 3: Discussion of project goals and necessary revisions to maximize effectiveness and efficiency given the available resources.

Task 4: Revise programs within Implementation plan accordingly, and schedule next workshop meeting to continue adaptive management process.



**Protecting Biodiversity in the
Chihuahuan Desert
Transboundary Corridor:
A Strategy
for Binational
Collaborative Management**

